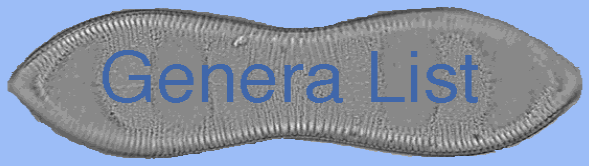
Great Lakes Diatoms

This work is intended primarily as a resource for professional biologists and ecologists. However, teachers, students, and anyone interested in the microscopic freshwater world will find this useful. Making this information widely available and cataloging the inventory of diatoms of the Laurentian Great Lakes of North America are the main purposes of this work. As essential constituents of primary producer communities, diatoms are useful indicators of environmental change in modern and paleoecological studies.

Generally, the Great Lakes Diatom Home Page is constructed as a hierarchy linking the genera list to species lists for each genus, and linking species lists to individual species "cards." Each species has its own "card" with a micrograph and includes information on morphological measurements, where the specimen was found, ecology of the species, and additional information (which may be useful). From each card, you will always be able to move to other species in the genus you choose, return to the genera list, or return to this page of the Great Lakes Diatom Home Page. In addition, a checklist of Great Lakes diatoms is available for viewing.

This is a work in progress; therefore, there will be ongoing additions and changes. Before you start, check the **FYI** page to facilitate understanding how to use this home page.

If you are unsure about where to start, follow the major groups button to enter a page which has pictures and text to direct you where to go. If you know what you're looking for go to the genera list.



Many **people** are involved in this project. We value your feedback or comments on technical aspects of taxonomy, suggestions for improvements of this page, and questions concerning it. You can also access other sites that have information concerning diatoms such as those listed **here**.

This project is one of a number of products as a the result of an NSF award for PEET. You may find out more about old additional **PEET products**.

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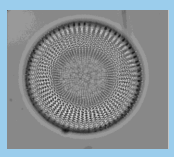
Thanks for using the Great Lakes Diatom Home Page!

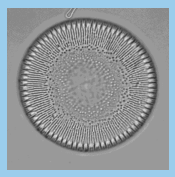
Major Groups

Below is an artificial grouping of diatom genera based on major morphological characteristics. As a more natural classification is developed, these groupings will be modified. Choose the group label that most closely matches your specimen and click on it to proceed to a listing of genera for that group.

Eucentric

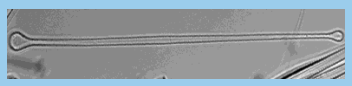
In these genera, valve surface ornamentation is radially symmetric around a central point and the valve outline is circular. A few species, thus far not seen in the Great Lakes, are elliptical.

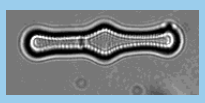




Araphid

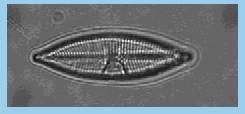
In these genera, valve surface ornamentation is bilaterally symmetrical to a central thickening called the central sternum. In a few species the central axis is bent.

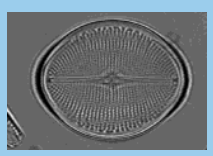


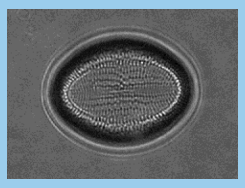


Monoraphid

These genera are also bilaterally symmetrical. One valve has a central sternum. The other has fissures through th ecentral sternum called a raphe. The raphe has two branches separated

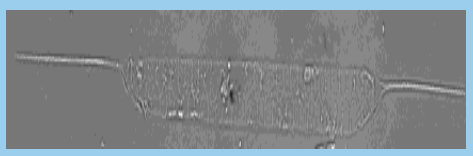






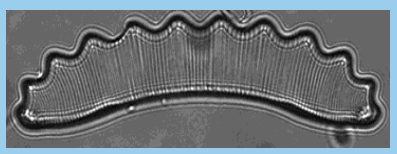
Eccentric

In these genera, valve surface ornamentation is radially symmetric around a central point, but the valve outline is bipolar or multipolar.



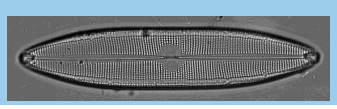
Eunotioid

These genera also have a raphe on both valves, but it is reduced to a short structure on each end of the valve. Longitudinal axis is usually bent. The convex margin of some species is elaborately scalloped.



Naviculoid

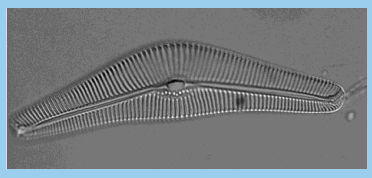
These genera have a raphe on both valves and are symmetrical to both the longitudinal and transverse axis of the valve. This is a very large and diverse group.



by a blank area.

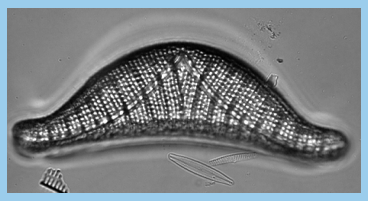
Cymbelloid

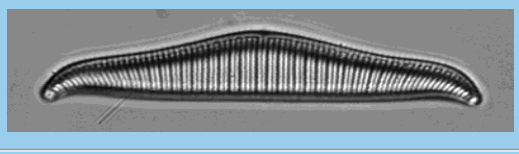
These genera also have a raphe on both valves, but are asymmetric to either the longitudinal or transverse axis. An apical pore field may be visible on one or both ends of the valve.



Epithemioid

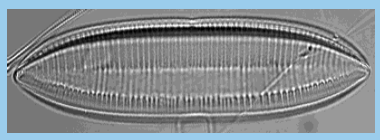
These genera have a raphe on both valves which is borne on a specialized tube-like structure called a canal. The canal raphe is usually displaced from the midline of the valve.





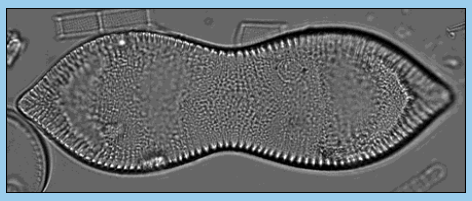
Nitzschioid

These genera have raphes on both valves, raised above the valve surface on a structure called a keel. The keel may be on the midline of the valve or displaced toward the valve margin.



Surirelloid

In these genera, the raphe is wrapped around the margin of each valve and raised in a special structure called a wing. Cells are usually relatively large.



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Genera

Acanthoceras
Achnanthes
Achnanthidium
Actinocyclus
Actinoptychus
Amphipleura
Amphiprora
Amphora
Aneumastus
Anomoeoneis
Asterionella
Aulacoseira
Bacillaria
Brachysira
Caloneis
Campylodiscus
Capartogramma
Cavinula
Chaetoceras
Chamaepinnularia
Cocconeis
Coscinodiscus
Cosmioneis
Ctenophora
Craticula
Cyclotella
Cyclostephanos
Cylindrotheca
Cymatopleura
Cymbella
Cymbellonitzschia
Cymbopleura
Denticula
Diadesmis
Diatoma
Didymosphenia
Diploneis
Ellerbeckia
Encyonema

Encyonemopsis
Entomoneis
Epithemia
Eucocconeis
Eunotia
Fallacia
Fistulifera
Fragilaria
Fragilariaforma
Frustulia
Geissleria
Gomphocymbella
Gomphoneis
Gomphonema
Gomphosphenia
Gyrosigma
Hannaea
Hantzschia
Hippodonta
Karayevia
Kobayasia
Kolbesia
Lemnicola
Luticola
Lyrella
Martyana
Mastogloia
Mayamaia
Melosira
Meridion
Muelleria
Navicella
Navicula
Neidium
Nitzschia
Nupela
Oestrupia
Opephora
Orthoseira
Oxyneis
Pinnularia
Placoneis

Plagiotropis
Planothidium
Pleurosigma
Pleurosira
Psammodictyon
Psammothidium
Pseudostaurosira
Punctastriata
Reimeria
Rhoicosphenia
Rhopalodia
Rossithidium
Rouxia
Sellaphora
Skeletonema
Stauroneis
Staurophora
Staurosira
Staurosirella
Stenopterobia
Stephanocostis
Stephanocyclus
Stephanodiscus
Surirella
Synedra
Tabellaria
Tabularia
Terpsinoe
Thalassiocyclus
Thalassiosira
Tropidoneis
Tryblionella
Urosolenia

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CHECKLIST OF GREAT LAKES DIATOMS

Provided below is the updated checklist which was published by Stoermer, Kreis and Andresen (1999) in the Journal of Great Lakes Research 25(3):515-566. Taxa as originally reported appear in the main body of the list. If a taxon has a synonym it is linked to the recommended synonym.

Acanthoceras zachariasii (Brun) Simonsen

Achnanthes affinis Grunow
Achnanthes altaica (Poretzky) A.Cleve
Achnanthes amoena Hust.
Achnanthes atacamae Hust.
Achnanthes biasolettiana (Kütz.) Grunow (see note 1)
Psammothidium abundans fo. *rosenstockii* (Lange-Bert. *in* Lange-Bert. & Krammer) Bukht.
Achnanthes bioreti Germain
Achnanthes brevipes C. Agardh
Achnanthes brevipes var. *intermedia* (Kütz.) Cleve
Achnanthes calcar (Cleve) Cleve
Achnanthes clevei Grunow
Achnanthes clevei var. *balcanica* fo. *rostrata* Hust.
Achnanthes clevei var. *rostrata* Hust.
Achnanthes coarctata (Bréb.) Grunow
Achnanthes conspicua A.Mayer
Achnanthes conspicua var. *brevistriata* Hust.
Achnanthes deflexa C.W.Reimer *in* Patrick & Reimer
Achnanthes delicatula (Kütz.) Grunow
Achnanthes depressa (Cleve) Hust.
Achnanthes detha Hohn and Hellerm.
Achnanthes didyma Hust.
Achnanthes dispar Cleve
Achnanthes dispar var. *angulata* Hust.
Achnanthes dispar var. *fontellii* A.Cleve
Achnanthes duthii Sreen.
Achnanthes elliptica var. *elongata* A.Cleve
Achnanthes exigua Grunow
Achnanthes exigua var. *constricta* (Grunow) Hust.
Achnanthes exigua var. *heterovalva* Krasske
Achnanthes exigua var. *heterovalva* fo. *semiaperta* H.Guermeur
Achnanthes exigua var. *heterovalvata* Krasske [orthographic error]

Achnanthes exigua var. *heterovalva* Krasske
Achnanthes exilis Kütz.
Achnanthes flexella (Kütz.) Brun
Achnanthes flexella var. *alpestris* Brun
Achnanthes gibberula Grunow
Achnanthes gracillima Hust. emend. Foged (see note 2)
Achnanthes gracillima var. *nipponica* Sovereign
Achnanthes hauckiana Grunow
Achnanthes hauckiana var. *rostrata* Schulz
Achnanthes hetensis A.Cleve [orthographic error]
Achnanthes hettensis A.Cleve
Achnanthes hungarica (Grunow) Grunow
Achnanthes incognita Krasske
Achnanthes joursacense Hérib.
Achnanthes kolbei Hust.
Achnanthes kryophila J.B.Petersen
Achnanthes kryophila var. *africana* Choln.
Achnanthes lanceolata (Bréb.) Grunow
Achnanthes lanceolata var. *abbreviata* C.W.Reimer
Achnanthes lanceolata var. *apiculata* R.M.Patrick
Achnanthes lanceolata var. *bimaculata* Hust.
Achnanthes lanceolata var. *dubia* Grunow
Achnanthes lanceolata var. *elliptica* Cleve
Achnanthes lanceolata var. *genuina* A.Mayer
Achnanthes lanceolata var. *haynaldii* (Schaarsch.) Cleve
Achnanthes lanceolata var. *lanceolatoides* (Sovereign) C.W.Reimer
Achnanthes lanceolata var. *omissa* C.W.Reimer
Achnanthes lanceolata var. *robusta* Hust.
Achnanthes lanceolatoides Sovereign
Achnanthes lapidosa Krasske
Achnanthes lapponica (Hust.) Hust.
Achnanthes lapponica var. *ninckei* (H.Guerm. & Mang.) C.W.Reimer (see note 3)
Achnanthes laterostrata Hust.
Achnanthes lauenburgiana Hust.
Achnanthes lemmermannii Hust.
*Achnanthes levanderi*Hust.
Achnanthes levanderi var. *helvetica* Hust.
Achnanthes lewisiana R.M.Patrick
Achnanthes linearis (W.Sm.) Grunow
Achnanthes linearis var. *pusilla* Grunow
Achnanthes linearis var. *nipponica* Skvortzov
Achnanthes linearis fo. *curta* H.L.Sm.
Achnanthes marginulata Grunow
Achnanthes microcephala (Kütz.) Grunow
Achnanthes minutissima Kütz.
Achnanthes minutissima var. *cryptocephala* Grunow

Achnanthes minutissima var. *robusta* Hust.
Achnanthes nodosa A.Cleve
Achnanthes nollii Bock
Achnanthes oestrupi (H.Bachm. & A.Cleve) Hust.
Achnanthes oestrupi var. *lanceolata* Hust.
Achnanthes oestrupii var. *pungens* (A.Cleve) Lange-Bert. *in* Lange-Bert. & Krammer
Achnanthes peragalli Brun & Hérib.
Achnanthes peragalli var. *fossilis* Temp. & M. Perag.
Achnanthes peragalli var. *parvula* (R.M.Patrick) C.W.Reimer
Achnanthes pinnata Hust.
Achnanthes ploenensis Hust.
Achnanthes procera Hust.
Achnanthes recurvata Hust.
Achnanthes sublaevis Hust.(see note 5)
Achnanthes subsaloides Hust.
Achnanthes subsalsa J.B.Petersen
Achnanthes suchlandti Hust. [orthographic error]
Achnanthes suchlandtii Hust.
Achnanthes thermalis (Rabenh.) Schönfeld
Achnanthes trinodis (W.Sm.) Grunow
Achnanthes ventralis (Krasske) Lange-Bert. *in* Lange-Bert. & Krammer
Achnanthes ventraloconfusa fo. *simplex* Lange-Bert. *in* Lange-Bert. & Krammer
Achnanthes wellsiae C.W.Reimer

Achnanthidium affine (Grunow) Czarn.
Achnanthidium biasolettianum (Grunow *in* Cleve & Grunow) Bukht. & Round
Achnanthidium brevipes var. *intermedia* (Kütz.) Cleve
Achnanthidium clevei (Grunow *in* Cleve & Grunow) Czarn.
Achnanthidium clevei var. *rostratum* (Hust.) M.B.Edlund
Achnanthidium delicatulum Kütz.
Achnanthidium duthii (Sreen.) M.B.Edlund
Achnanthidium exiguum (Grunow) Czarn.
Achnanthidium exiguum var. *heterovalvum* (Krasske) Czarn.
Achnanthidium exilis (Kütz.) Bukht.
Achnanthidium flexellum (Kütz.) Bréb.
Achnanthidium hungaricum Grunow
Achnanthidium kryophila (J.B.Petersen) Bukht.
Achnanthidium lanceolatum Bréb. *in* Kütz.
Achnanthidium lanceolatum var. *elliptica* Cleve
Achnanthidium lanceolatum var. *genuinum* A.Mayer
Achnanthidium lanceolata var. *haynaldii* (Schaarsch.) Cleve
Achnanthidium lineare W.Sm.
Achnanthidium microcephalum (Kütz.) vide Rabenh.
Achnanthidium minutissimum (Kütz.) Czarn.
Achnanthidium trinodis Arnott *ex* Ralfs *in* Pritchard

Actinocyclus niagarae H.L.Sm.
Actinocyclus normanii (Greg.) Hust.
Actinocyclus normanii fo. *subsalsa* (Juhl.-Dannf.) Hust.
Actinocyclus normanii var. *subsalsa* (Juhl.-Dannf.) Hust. [*nom. nud.*]

Actinoptychus sp.

Amphipleura arctica R.M.Patrick & Freese
Amphipleura delicatissima [*nom. illegit.*]
Amphipleura kriegeriana (Krasske) Hust.
Amphipleura pellucida (Kütz.) Kütz.
Amphipleura sigmoida W.Sm.

Amphiprora alata (Ehrenb.) Kütz.
Amphiprora calumetica Thomas *in* Thomas & Chase
Amphora calumetica (Thomas *ex* Wolle) M.Perag.
Amphiprora ornata J.W.Bail.
Amphiprora paludosa W.Sm.

Amphitropis ornata (J.W.Bail.) Grunow

Amphora bullatoides Hohn & Hellerm.
Amphora calumetica (Thomas *in* Thomas & Chase) M.Perag.
Amphora coffeaeformis (C.Agardh) Kütz.
Amphora coffeiformis (C.Agardh) Kütz. [orthographic error]
Amphora coffeaeformis var. *acutiuscula* (Kütz.) Hust.
Amphora coffeiformis var. *acutiuscula* (Kütz.) Hust. [orthographic error]
Amphora coffeiformis (C.Agardh) Kütz. [orthographic error]
Amphora commutata Grunow
Amphora crucifera A.Cleve
Amphora cruciferoides Stoermer & Yang
Amphora delicatissima Krasske
Amphora exigua Greg.
Amphora fonticola Maill.
Amphora gigas Ehrenb.
Amphora hemicycla Stoermer & Yang
Amphora hemicyla Stoermer & Yang [orthographic error](see note 6)
Amphora huronensis Stoermer & Yang
Amphora inariensis Krammer
Amphora lanceolate var. ? [*nom. illegit.*]

Amphora libyca Ehrenb.
Amphora michiganensis Stoermer & Yang
Amphora montana Krasske
Amphora neglecta Stoermer & Yang
Amphora normanii Rabenh.
Amphora oligotraphenta Lange-Bert. *in* Lange-Bertalot & Metzeltin
Amphora ovalis (Kütz.) Kütz.
Amphora ovalis var. *affinis* (Kütz.) VanHeurck *ex* DeToni
Amphora ovalis var. *affins* (Kütz.) Van Heurck [orthographic error]
Amphora ovalis var. *constricta* Skvortzov
Amphora ovalis var. *gracilis* (Ehrenb.) Van Heurck
Amphora ovalis var. *libyca* (Ehrenb.) Cleve
Amphora ovalis var. *minor* H.H.Chase [*nom. illegit.*]
Amphora ovalis var. *minutissima* (W.Sm.) Hurter
Amphora ovalis var. *pediculatus* (Kütz.) Van Heurck [orthographic error]
Amphora ovalis var. *pediculus* (Kütz.) Van Heurck *ex* DeToni
Amphora ovalis var. ? [*nom. illegit.*]
Amphora ovalis var. *b* [*nom. illegit.*]
Amphora ovalis var. ? Kütz. [*nom. illegit.*]
Amphora ovalis var. *nov.* [*nom. illegit.*]
Amphora parallelistriata Mang.
Amphora perpusilla (Grunow) Grunow
Amphora rotunda Skvortzov
Amphora sibirica Skvortzov & Meyer
Amphora subcostulata Stoermer & Yang
Amphora submontana Hust. (see note 7)
Amphora tenuistriata Mang. *in* Bourr. & Mang.
Amphora thumensis (Mayer) A.Cleve
Amphora veneta Kütz.
Amphora veneta var. *angularis* [*nom. nud.*]
Amphora veneta var. *capitata* Haworth

Aneumastus minor (Hust.) Lange-Bert.
Aneumastus stroesei (Østrup) D.G.Mann *in* Round, Crawford & Mann
Aneumastus tusculus (Ehrenb.) D.G.Mann & Stickle *in* Round, Crawford & Mann

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Anomoeoneis costata (Kütz.) Hust.
Anomoeoneis exilis Kütz.
Anomoeoneis follis (Ehrenb.) Cleve
Anomoeoneis sculpta (Ehrenb.) O.Müll.
Anomoeoneis serians (Bréb.) Cleve
Anomoeoneis serians var. *brachysira* (Bréb.) Hust.
Anomoeoneis sphaerophora (Ehrenb.) Pfitz.
Anomoeoneis sphaerophora fo. *costata* (Kütz.) A.M.Schmid

Anomoeoneis sphaerophora var. *sculpta* O.Müll.
Anomoeoneis styriaca (Grunow) Hust.
Anomoeoneis vitrea (Grunow) Ross *in* Patrick & Reimer
Anomoeoneis zellensis (Grunow) Cleve
Anomoeoneis zellensis fo. *difficilis* (Grunow) Hust.

Asterionella bleakeleyi W.Sm.
Asterionella falfsii W.Sm. [orthographic error]
Asterionella formosa Hass.
Asterionella formosa var. *acaroides* Lemm.
Asterionella formosa var. *gracillima* (Hantzsch) Grunow *in* VanHeurck
Asterionella formosa var. *subtilis* Grunow
Asterionella gracillima (Hantzsch) Heib.
Asterionella ralfsii W.Sm.

Attheya zachariasii Brun

Aulacoseira agassizii (Ostenf.) Simonsen
Aulacoseira agassizii var. *malayensis* (Hust.) Simonsen
Aulacoseira alpigena (Grunow) Krammer
Aulacoseira ambigua (Grunow) Simonsen
Aulacoseira canadensis (Hust.) Simonsen
Aulacoseira distans (Ehrenb.) Simonsen
Aulacoseira distans var. *alpigena* (Grunow) Simonsen
Aulacoseira distans var. *limnetica* (O.Müll.) Simonsen
Aulacoseira granulata (Ehrenb.) Simonsen
Aulacoseira granulata var. *angustissima* (O.Müll.) Simonsen
Aulacoseira granulata var. *angustissima* fo. *spiralis* (Hust.) Czarn. & Reinke
Aulacoseira granulata var. *muzzanensis* (F.Meister) Simonsen
Aulacoseira islandica (O.Müll.) Simonsen
Aulacoseira islandica subsp. *helvetica* (O.Müll.) Simonsen
Aulacoseira italica (Ehrenb.) Simonsen
Aulacoseira italica var. *tenuissima* (Grunow) Simonsen
Aulacoseira italica var. *valida* (Grunow) Simonsen
Aulacoseira italica subsp. *subarctica* (O.Müll.) Simonsen
Aulacoseira lirata var. *alpigena* (Grunow) Haworth
Aulacoseira subarctica (O.Müll.) Haworth
Aulacoseira valilda (Grunow) Krammer *in* Krammer & Lange-Bert.

Aulacosira granulata (Ehrenb.) Simonsen [orthographic error]
Aulacosira granulata var. *angustissima* (O.Müll.) Simonsen [orthographic error]
Aulacosira islandica (O.Müll.) Simonsen [orthographic error]

Aulacosira italica (Ehrenb.) Simonsen [orthographic error]
Aulacosira italica subsp. *subarctica* (O.Müll.) Simonsen [orthographic error]

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*Bacillaria paradoxa*Gmelin
Bacillaria paxillifer (O.F.Müll.) Hendy

Biddulphia laevis Ehrenb.

Brachysira exilis (Kütz.) Round & D.G.Mann
Brachysira follis (Ehrenb.) Ross *in* Hartley
Brachysira brebissonii Ross *in* Hartley
Brachysira serians (Bréb. *ex* Kütz.) Round & D.G.Mann
Brachysira sphaerophora (Kütz.) Round *ex* D.G.Mann [transfer invalid](see note 8)
Anomoeoneis sphaerophora (Kütz.) Pfitz.
Brachysira styriaca (Grunow *in* VanHeurck) Ross *in* Hartley
Brachysira vitrea (Grunow) Ross *in* Hartley
Brachysira zellensis (Grunow) Round & D.G.Mann
Brachysira zellensis fo. *difficilis* (Grunow *in* VanHeurck) Hamilton

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Caloneis alpestris (Grunow) Cleve
Caloneis amphisbaena (Bory) Cleve
Caloneis bacillaris (Greg.) Cleve
Caloneis bacillaris var. *thermalis* (Grunow) A.Cleve
Caloneis bacillum (Grunow) Cleve
Caloneis bacillum var. *fontinalis* Hust.
Caloneis bacillum var. *lancettula* (Schulz) Hust.
Caloneis clevei (Lagerst.) Cleve
Caloneis clevei var. *undulata* Krasske
Caloneis fontinalis (Grunow) Lange-Bert. & Reichardt *in* Lange-Bertalot & Metzeltin
Caloneis formosa Greg.
Caloneis hyalina Hust.
Caloneis lamella Zakrz.
Caloneis lancettula (Schulz) Lange-Bert. & Witkowski *in* Lange-Bertalot & Metzeltin
Caloneis leptosoma (Grunow) Krammer *in* Krammer & Lange-Bert.
Caloneis lewisii R.M.Patrick
Caloneis liber (W.Sm.) Cleve
Caloneis limosa (Kütz.) R.M.Patrick
Caloneis limosa var. *gibberula* (Kütz.) Grunow
Caloneis limosa var. *subinflata* Grunow
Caloneis limosa var. *undulata* Grunow
Caloneis molaris (Grunow) Krammer *in* Krammer & Lange-Bert.
Caloneis nubicola (Grunow) Cleve

Caloneis pulchra Messik.
Caloneis pulchra var. *interrupta* Gandhi
Caloneis schumanniana (Grunow) Cleve
Caloneis schumanniana var. *biconstricta* Grunow
Caloneis schumanniana var. *lancettula* Hust.
Caloneis silicula (Ehrenb.) Cleve
Caloneis silicula var. *inflata* (Grunow) Cleve
Caloneis silicula var. *limosa* (Kütz.) VanLand.
Caloneis silicula var. *undulata* (Grunow) Cleve
Caloneis silicula var. *truncatula* (Grunow) Cleve
Caloneis silicula var. *tumida* Hust.
Caloneis silicata var. *tumida* Hust. [*nom. nud.*]
Caloneis tenuis (Greg.) Krammer *in* Krammer & Lange-Bert.
Caloneis undulata (Greg.) Krammer *in* Krammer & Lange-Bert.
Caloneis ventricosa (Ehrenb.) F.Meister
Caloneis ventricosa var. *minuta* (Grunow) R.M.Patrick
Caloneis ventricosa var. *truncatula* (Grunow) F.Meister
Caloneis ventricosa var. *trunculata* [orthographic error]

Campylodiscus clypeus Ehrenb.
Campylodiscus cribrosus W.Sm.
Campylodiscus decorus Bréb.
Campylodiscus echensis Ehrenb.
Campylodiscus hibernicus Ehrenb.
Campylodiscus hibernicus var. ? [*nom. illegit.*]
Campylodiscus noricus Ehrenb.
Campylodiscus noricus var. hibernica (Ehrenb.) Grunow [orthographic error]
Campylodiscus noricus var. *hibernicus* (Ehrenb.) Grunow

Capartogramma crucicula (Grunow) Ross

Catacombus gaillonii (Bory) D.M.Williams & Round

Cavinula cocconeiformis (Greg. *ex* Grev.) D.G.Mann & Stickle *in* Round, Crawford & Mann
Cavinula intractata (Hust.) Lange-Bert. *in* Lange-Bert. & Metzeltin
Cavinula jaernefeltii (Hust.) D.G.Mann & Stickle *in* Round, Crawford & Mann
Cavinula lacustris (Greg.) D.G.Mann & Stickle *in* Round, Crawford & Mann
Cavinula pseudoscutiformis (Hust.) D.G.Mann & Stickle *in* Round, Crawford & Mann
Cavinula scutelloides (W.Sm.) Lange-Bert. *in* Lange-Bert. & Metzeltin
Cavinula scutiformis (Grunow *ex* A.Schmidt) D.G.Mann & Stickle *in* Round, Crawford & Mann
Cavinula variostriata (Krasske) D.G.Mann & Stickle *in* Round, Crawford & Mann

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Ceratoneis arcus (Ehrenb.) Kütz. (see note 9)
Ceratoneis arcus var. *amphioxys* (Rabenh.) Brun

Chamaepinnularia begeri (Krasske) Lange-Bert.
Chamaepinnularia soehrensis (Krasske) Lange-Bert.
Chamaepinnularia mediocris (Krasske) Lange-Bert.
Chamaepinnularia evanida (Hust.) Lange-Bert.

Chaetoceros hohnii Graebn. & Wujek
Chaetoceros muelleri var. *subsalsum* J.R.Johans. & Rushforth
Chaetoceras sp.

Cocconeis diminuta Pant.
Cocconeis diminuta var. *aegagropilae* Murobuse
Cocconeis diruptoides Hust.
Cocconeis disculus (Schum.) Cleve
Cocconeis disculus var. *diminuta* (Pant.) A.Cleve
Cocconeis flexella (Kütz.) Cleve
Cocconeis flexulla (Kütz.) Cleve [orthographic error]
Cocconeis fluviatilis Wallace
Cocconeis japonica A.W.F.Schmidt
Cocconeis lineata Ehrenb.
Cocconeis neodiminuta Krammer *in* Krammer & Lange-Bert.
Cocconeis pediculus Ehrenb.
Cocconeis placentula Ehrenb.
Cocconeis placentula var. *euglypta* (Ehrenb.) Grunow
Cocconeis placentula var. *klinoraphis* Geitler
Cocconeis placentula var. *lineata* (Ehrenb.) VanHeurck
Cocconeis placentula var. *rouxii* (Hérib. & Brun) Cleve
Cocconeis rouxii Hérib. & Brun
Cocconeis schlettum [orthographic error]
Cocconeis rhombea Ehrenb.
Cocconeis scutellum Ehrenb.
Cocconeis scutellum var. *japonica* (A.W.F.Schmidt) Skvortzov
Cocconeis scutellum var. *parva* (Grunow) Cleve
Cocconeis thumensis A.Mayer
Cocconeis thwaitesii W.Sm.
Cocconeis transversalis Greg.

Cocconema cistula Hempr.
Cocconema cymbiforme (Kütz.) Ehrenb.
Cocconema fusidium Ehrenb.

Cocconema gastroides (Kütz.) Pell.
Cocconema lanceolatum Ehrenb.
Cocconema parva W.Sm.
Cocconema scotica W.Sm.

Colletonema lucustre VanHeurck

Comphonema constrictum Ehrenb. [orthographic error]

Coscinodiscus asteromorphus Ehrenb.
Coscinodiscus curvatalus Grunow
Coscinodiscus decrescens Grunow
Coscinodiscus lacustris Grunow
Coscinodiscus lanceolatum Ehrenb.
Coscinodiscus marginatus Ehrenb.
Coscinodiscus radiatus Ehrenb.
Coscinodiscus rothii (Ehrenb.) Grunow
Coscinodiscus rothii var. *subsalsa* (Juhl.-Dannf.) Hust.
Coscinodiscus subsalsa Juhl.-Dannf.
Coscinodiscus subsalsus Juhl.-Dannf. [orthographic error]
Coscinodiscus subtillis var. ? [*nom. nud.*]
Coscinodiscus tuberculatus Grev.
Coscinodiscus tuberculatus var. ? A.W.F.Schmidt [*nom. illegit.*]

Cosmioneis lundstroemii (Cleve *in* Cleve & Grunow) D.G.Mann *in* Round, Crawford & Mann
Cosmioneis pusilla (W.Sm.) D.G.Mann & Stickle *in* Round, Crawford & Mann

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Craspedodiscus coscinodiscus Ehrenb.
Craspedodiscus microdiscus Ehrenb.

Craticula accomoda (Hust.) D.G.Mann *in* Round, Crawford & Mann
Craticula ambigua (Ehrenb.) D.G.Mann *in* Round, Crawford & Mann
Craticula cuspidata (Kütz.) D.G.Mann *in* Round, Crawford & Mann
Craticula cuspidata var. *major* (F.Meister) Czarn.
Craticula halophila (Grunow) D.G.Mann *in* Round, Crawford & Mann
Craticula subhalophila (Hust.) Lange-Bert.
Craticula vixvisibilis (Hust.) Lange-Bert.

Ctenophora pulchella (Ralfs *ex* Kütz.) D.M.Williams & Round

Ctenophora pulchella var. *lacerata* (Hust.) Bukht.
Ctenophora pulchella var. *lanceolata* (O'Meara) Bukht.

Cyclostephanos costatilumbus (Kob. & Kob.) Stoermer, Håk. & Theriot.
Cyclostephanos dubius (Fricke) Round *in* Theriot, Håkansson, Kociolek, Round & Stoermer
Cyclostephanos invisitatus (Hohn & Hellerm.) Theriot, Stoermer & Håk.
Cyclostephanos tholiformis Stoermer, Håk. & Theroit

Cyclotella americana Fricke
Cyclotella antiqua W.Sm.
Cyclotella atomus Hust.
Cyclotella bodanica Eulenst.
Cyclotella bodanica-comta Eulenst.-(Ehrenb.) Kütz. [*nom. illegit.*]
Cyclotella bodanica var. *michiganensis* Skvortzov
Cyclotella bodanica var. *stellata* Skvortzov
Cyclotella caspia Grunow
Cyclotella catenata Brun
Cyclotella cavita [*nom. nud.*]
Cyclotella chaetoceras Lemm.
Cyclotella comensis Grunow
Cyclotella compta (Ehrenb.) Kütz. [orthographic error]
Cyclotella comta (Ehrenb.) Kütz.
Cyclotella comta var. *bodanica* Grunow
Cyclotella comta var. *glabriuscula* Grunow
Cyclotella comta var. *oligactis* (Ehrenb.) Grunow
Cyclotella comta var. *radiosa* Grunow
Cyclotella comta var. *paucipunctata* Grunow
Cyclotella cryptica Reimann, Lewin & Guillard
Cyclotella cyclopunctata Håk & Carter
Cyclotella delicatula Hust.
Cyclotella distinguenda Hust.
Cyclotella distinguenda var. *unipunctata* (Hust.) Håk.
Cyclotella dubia Hilse
Cyclotella facetia Hohn & Hellerm.
Cyclotella gamma Sovereign
Cyclotella glomerata Bachm.
Cyclotella glomerata-stelligera Bachmann-Cleve & Grunow [*nom. illegit.*]
Cyclotella krammeri Håk.
Cyclotella kuetzingiana Thwaites
Cyclotella kuetzingiana var. *phanetophora* Fricke [orthographic error]
Cyclotella kuetzingiana var. *planetophora* Fricke
Cyclotella kuetzingiana var. *radiosa* Fricke
Cyclotella kutzingiana Thwaites [orthographic error]
Cyclotella melosiroides (Kirchn.) Lemm.

Cyclotella meneghiniana Kütz.
Cyclotella meneghiniana fo. *plana* Fricke [orthographic error]
Cyclotella meneghiniana var. *plana* Fricke
Cyclotella meneghiniana var. *stellulifera* Cleve & Grunow
Cyclotella stelligera (Cleve & Grunow) VanHeurck
*Cyclotella michiganiana*Skvortzov
Cyclotella nana Hust.
Thalassiosira pseudonana Hasle & Heim.
Cyclotella ocellata Pant.
Cyclotella ocellata-kutzingiana [*nom. illegit.*]
Cyclotella operculata (C.Agardh) Kütz.
Cyclotella operculata var. *unipunctata* (Fricke) Hust.
Cyclotella operculata unipunctata (Fricke) Hust. [*nom. illegit.*]
Cyclotella planktonica Brunnth.
Cyclotella pseudostelligera Hust.
Cyclotella quadriiunta (Schroeter) Hust.
Cyclotella radiosa Grunow
Cyclotella rossii Håk.
Cyclotella rotula Kütz.
Cyclotella socialis Schutt
Cyclotella spinosa Schum.
Cyclotella stelligera (Cleve & Grunow) VanHeurck
Cyclotella striata (Kütz.) Grunow
Cyclotella striata var. *bipunctata* Fricke
Cyclotella strisignata Grunow [*nom. nud.*]
Cyclotella temperei M.Perag. & Hérib.
Cyclotella thienemannii var. *minuscula* Jurilj
Cyclotella ucculata Pant. [orthographic error]
Cyclotella wolterecki Hust.

Cymatopleura angulata Grev.
Cymatopleura apiculata W.Sm.
Cymatopleura cochlea Brun
Cymatopleura elliptica (Bréb. & Godey) W.Sm.
Cymatopleura elliptica var. *hibernica* (W.Sm.) VanHeurck
Cymatopleura elliptica fo. *spiralis* Boyer
Cymatopleura hibernica W.Sm.
Cymatopleura hibernica var. rhombica H.H.Chase
Cymatopleura solea (Bréb. & Godey) W.Sm.
Cymatopleura solea var. *apiculata* (W.Sm.) Ralfs
Cymatopleura solea var. *clavata* O.Müll.
Cymatopleura solea var. *gracilis* Grunow
Cymatopleura solea var. *pfuhlii* Torka
Cymatopleura solea var. *subconstricta* O.Müll.
Cymatopleura solea var. *regula* (Ehrenb.) Grunow

Cymatopleura spiralis H.H.Chase

Cymbella acutiuscula Cleve
Cymbella aequalis W.Sm.
Cymbella affinis Kütz.
Cymbella amphicephala Nägeli
Cymbella amphicephala var. *subundulata* Cleve
Cymbella anglica Lagerst.
Cymbella naviculiformis Auersw.
Cymbella angustata (W.Sm.) Cleve
Cymbella aspera (Ehrenb.) H.Perag.
Cymbella aspera var. *minor* (VanHeurck) Cleve
Cymbella austriaca Grunow
Cymbella brehmii Hust.
Cymbella caespitosa Brun
Cymbella cesatii (Rabenh.) Grunow *ex* A.W.F.Schmidt
Cymbella cistula (Ehrenb. *in* Hemprich & Ehrenb.) Kirchn. *in* Cohn
Cymbella cistula var. *gibbosa* Brun
Cymbella cistula var. *maculata* (Kütz.) VanHeurck
Cymbella cistula var. *truncata* Brun
Cymbella cuspidata Kütz.
Cymbella cuspidata fo. *impressa* Fusey
Cymbella cuspidata var. *schulzii* A.Cleve
Cymbella cymbiformis C.Agardh
Cymbella delicatula Kütz.
Cymbella designata Krammer *in* Krammer & Lange-Bert.
Cymbella diluviana (Krasske) Florin
Cymbella ehrenbergii Kütz.
Cymbella elginsis Krammer
Cymbella fonticolaÿ Hust.
Cymbella gastroides Kütz.
Cymbella gracilis (Rabenh.) Cleve
Cymbella hauckii VanHeurck
Cymbella hebridica Grunow
Cymbella helvetica Kütz.
Cymbella hustedtii Krasske
Cymbella hybrida Grunow
Cymbella inaequalis (Ehrenb.) Rabenh.
Cymbella incerta (Grunow) Cleve
Cymbella jordani Grunow
Cymbella lacustris (C.Agardh) Cleve
Cymbella laevis Nägeli *ex* Kütz.
Cymbella lanceolata (C.Agardh) C.Agardh
Cymbella lata Grunow
Cymbella latens Krasske

Cymbella leptoceros (Ehrenb.) Kütz.
Cymbella leptoceros var. *rostrata* Hust.
Cymbella leptocerus (Ehrenb.) VanHeurck [orthographic error]
Cymbella lunata W.Sm.
Cymbella maculata Kütz.
Cymbella mexicana (Ehrenb.) Cleve
Cymbella microcephala Grunow
Cymbella microcephala var. *crassa* C.W.Reimer
Cymbella minuta Hilse
Cymbella minuta var. *pseudogracilis* (Choln.) C.W.Reimer
Cymbella minuta var. *silesiaca* (Bleisch *ex* Rabenh.) C.W.Reimer
Cymbella minuta fo. *latens* (Krasske) C.W.Reimer
Cymbella moelleriana Grunow
Cymbella muelleri Hust.
Cymbella muelleri fo. *ventricosa* (Temp. & M. Perag.) C.W.Reimer
Cymbella naviculiformis Auersw. *ex* Heib.
Cymbella norvegica Grunow
Cymbella obtusa Greg.
Cymbella obtusiuscula Kütz.
Cymbella parva (W.Sm.) Wolle
Cymbella parvula Krasske
Cymbella pediculus Kütz.
Cymbella prostrata (Berk.) Cleve
Cymbella prostrata var. *auerswaldii* (Rabenh.) C.W.Reimer
Cymbella prostrata var. *caespitosa* [*nom. illegit.*]
Cymbella proxima C.W.Reimer
Cymbella pusilla Grunow
Cymbella rabenhorstii Ross
Cymbella rhombiodea Boyer [orthographic error]
Cymbella rotundata H.H.Chase
Cymbella rugosa Hust.
*Cymbella ruttneri*Hust.
Cymbella ruttneri var. *obtusa* Hust.
Cymbella scotica W.Sm.
Cymbella similis Krasske
Cymbella sinuata Greg.
Cymbella sinuata var. *ovata* Hust. [*nom. illegit.*]
Cymbella sinuata fo. *antiqua* (Grunow) C.W.Reimer
Cymbella sinuata fo. *ovata* (Hust.) Hust.
Cymbella sinuata var. *antiqua* (Grunow) Cleve
Cymbella stomatophora Grunow
Cymbella subaequalis Grunow
Cymbella subaequalis fo. *krasskei* (Foged) C.W.Reimer
Cymbella subventricosa Choln.
Cymbella triangularis (Ehrenb.) Cleve [orthographic error]
Cymbella triangulum (Ehrenb.) Cleve

Cymbella tumida (Bréb.) VanHeurck
Cymbella tumidula Grunow
Cymbella turgida Greg.
Cymbella turgida var. *pseudogracilis* Choln.
Cymbella turgidula Grunow
Cymbella ventricosa C.Agardh (see note 34)
Encyonema silesacum (Bleisch *in* Rabenh.) D.G.Mann *in* Round, Crawford & Mann pro parte
Encyonema minutum (Hilse *in* Rabenh.) D.G.Mann in Round, Crawford & Mann pro parte

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Cymbellonitzschia diluviana Hust.

Cyratopleura eliptica (Bréb. et Goday) W.Sm. [orthographic error]

Cystopleura gibba (Ehrenb.) Kuntze
Cystopleura turgida (Ehrenb.) Kuntze

Denticula elegans Kütz.
Denticula frigida Kütz.
Denticula lauta J.W.Bail.
Denticula tenuis Kütz.
Denticula tenuis var. *crassula* (Nägeli) W.West & G.S.West
Denticula tenuis var. *frigida* (Kütz.) Grunow
Denticula thermalis Kütz.

Diadesmis confervacea Kütz.
Diadesmis contenta (Grunow *ex* VanHeurck) D.G.Mann *in* Round, Crawford & Mann
Diadesmis contenta var. *biceps* (Arn. ms., Grunow *in* VanHeurck) Poulin
Diadesmis peregrina W.Sm.
Diadesmis perpusilla (Grunow) D.G.Mann *in* Round, Crawford & Mann

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Diatoma anceps (Ehrenb.) Kirchn.
Diatoma anceps var. *linearis* M.Perag.
Diatoma ehrenbergii Kütz.
Diatoma elongata C.Agardh
Diatoma elongatum (Lyngb.) C.Agardh
Diatoma elongatum var. *minor* Grunow
Diatoma elongatum var. *tenue* (C.Agardh) VanHeurck
Diatoma elongatum var. *tenuis* (C.Agardh) VanHeurck
Diatoma hiemale (Roth) Heib.
Diatoma hiemale var. *mesodon* (Ehrenb.) Grunow

Diatoma tenue C.Agardh
Diatoma tenue elongatum [orthographic error]
Diatoma tenue var. *elongarum* Lyngb. [orthographic error]
Diatoma tenue var. *elongatum* Lyngb.
Diatoma tenue var. *pachycephala* Grunow
Diatoma tenue var. *pachycephalum* [orthographic error]
*Diatoma tenue*var. *pachycephala* Grunow
Diatoma vulgare Bory
Diatoma vulgare var. *breve* Grunow
Diatoma vulgare var. *ehrenbergii* (Kütz.) Grunow
Diatoma vulgare var. *grande* (W.Sm.) Grunow
Diatoma vulgare var. *linearis* VanHeurck
Diatoma vulgare var. *ovale* (Fricke) Hust. [orthographic error]
Diatoma vulgare var. *ovalis* (Fricke) Hust.
Diatoma vulgare var. *producta* Grunow

Didymosphenia geminata (Lyngb.) M. Schmidt

Diploneis boldtiana Cleve
Diploneis domblittensis (Grunow) Cleve
Diploneis elliptica (Kütz.) Cleve
Diploneis elliptica var. *ladogensis* Cleve
Diploneis elliptica var. *pygmaea* A.Cleve
Diploneis finnica (Ehrenb.) Cleve
Diploneis interrupta (Kütz.) Cleve
Diploneis marginestriata Hust.
Diploneis oblongella (Nägeli) Ross
Diploneis oblongella var. *genuina* (Nägeli *ex* Kütz.) Ross
Diploneis oculata (Bréb.) Cleve
Diploneis ocellata Østrup
Diploneis ovalis (Hilse) Cleve
Diploneis papula (A.W.F.Schmidt) Cleve
Diploneis parma Cleve
Diploneis peterseni Hust.
Diploneis pseudovalis Hust.
Diploneis pseudoovalis Hust. [orthographic error]
Diploneis puella (Schum.) Cleve
Diploneis pupula (A.W.F.Schmidt) Cleve [orthographic error]
Diploneis smithii (Bréb.) Cleve
Diploneis smithii var. *pumila* (Grunow) Hust.
Diploneis subovalis Cleve

Ellerbeckia arenaria (Moore *ex* Ralfs) R.M.Crawford

Encyonema auerswaldii Rabenh.
Encyonema brehmii (Hust.) D.G.Mann *in* Round, Crawford & Mann
Encyonema caespitosum Kütz.
Encyonema gracile Rabenh.
Encyonema hebridica Grunow *ex* Cleve
Encyonema lacustre (C.Agardh) D.G.Mann *in* Round, Crawford & Mann
Encyonema latens (Krasske) D.G.Mann *in* Round, Crawford & Mann
Encyonema limula [*nom. nud.*]
Encyonema lunatum (W.Sm. *in* Grev.) VanHeurck
Encyonema minutum (Hilse *ex* Rabenh.) D.G.Mann *in* Round, Crawford & Mann
Encyonema minutum var. *pseudogracilis* (Choln.) Czarn.
Encyonema muelleri (Hust.) D.G.Mann *in* Round, Crawford & Mann
Encyonema muelleri fo. *ventricosa* (Temp. & M.Perag.) Czarn.
Encyonema norvegica (Grunow) Bukht.
Encyonema prostratum (Berk.) Kütz.
Encyonema rugosum (Hust.) D.G.Mann *in* Round, Crawford & Mann
Encyonema silesiacum (Bleisch *ex* Rabenh.) D.G.Mann *in* Round, Crawford & Mann
Encyonema triangulatum Kütz.
Encyonema triangulum (Ehrenb.) Kütz.
Encyonema turgidum (Greg.) Grunow
Encyonema ventricosa Kütz.
Encyonema ventricosum Kütz.

Entomoneis alata (Ehrenb.) Ehrenb.
Entomoneis ornata (J.W.Bail.) C.W.Reimer
Entomoneis paludosa (W.Sm.) C.W.Reimer

Epithemia adnata (Kütz.) Bréb.
Epithemia adnata var. *minor* (M.Perag. & Hérib.) R.M.Patrick
Epithemia adnata var. *porcellus* (Kütz.) R.M.Patrick
Epithemia adnata var. *proboscidea* (Kütz.) R.M.Patrick
Epithemia adnata var. *saxonica* (Kütz.) R.M.Patrick>/a>
Epithemia alpestris W.Sm.
Epithemia andrewsii Stoermer & Yang [*nom. superf.*]
Epithemia argus(Ehrenb.) Kütz.
*Epithemia argus*var. *alpestris* Grunow
*Epithemia argus*var. *amphicephala* Grunow
*Epithemia argus*var. *longicornis* (Ehrenb.) Grunow
Epithemia emarginata Andrews
Epithemia frickei Krammer
Epithemia gibba (Ehrenb.) Kütz.
Epithemia gibba var. *parallela* Grunow
Epithemia gibba var. *ventricosa* (Kütz.) Grunow

Epithemia gibberula (Ehrenb.) Kütz.
Epithemia hyndmanni W.Sm.
Epithemia intermedia Fricke
Epithemia muelleri Fricke
Epithemia ocellata (Ehrenb.) Kütz.
Epithemia reicheltii Fricke
Epithemia smithii Carruthers
Epithemia sorex Kütz.
Epithemia surex Kütz. [orthographic error]
Epithemia turgida (Ehrenb.) Kütz.
Epithemia turgida var. *granulata* (Ehrenb.) Brun
Epithemia turgida var. *plicata* Meist.
Epithemia turgida var. *westermannii* (Ehrenb.) Grunow
Epithemia turgida var. *zebrina* (Ehrenb.) Rabenh.
Epithemia ventricosa Ehrenb.
Epithemia zebra (Ehrenb.) Kütz.
Epithemia zebra var. *porcellus* (Kütz.) Grunow
Epithemia zebra var. *saxonica* (Kütz.) Grunow

Eucocconeis depressa (Cleve) Hust.
Eucocconeis flexella (Kütz.) Cleve
Eucocconeis flexella var. *alpestris* (Brun) Hust.
Eucocconeis lapponica Hust. (see note 3)
Eucocconeis lapponica var. *ninckei* (C.W.Reimer) Stoermer & Yang
Eucocconeis lapponica var. *ninckei* (Guermeur & Mang.) M.B.Edlund
Eucocconeis minuta (Cleve) Cleve

Eunotia acus nomem nudum [orthographic error]
Eunotia arcubus Nörpel & Lange-Bert. *in* Lange-Bert.
Eunotia arcus Ehrenb.
Eunotia arcus var. *bidens* Grunow
Eunotia arcus var. *fallax* Hust.
Eunotia bidens Ehrenb.
Eunotia curvata (Kütz.) Lagerst.
Eunotia diodon Ehrenb.
Eunotia exigua (Bréb.) Rabenh.
Eunotia flexuosa Bréb. *ex* Kütz.
Eunotia flexuosa var. *eurycephala* Grunow
Eunotia formica Ehrenb.
Eunotia glacialis F.Meister
Eunotia gracilis (Ehrenb.) Rabenh.
Eunotia granulata Ehrenb.
Eunotia incisa W.Sm.
Eunotia inflata (Grunow) Norpel-Schempp & Lange-Bert. *in* Lange-Bertalot

Eunotia intermedia (Krasske) Norpel-Schempp & Lange-Bert. *in* Lange-Bertalot
Eunotia lunaris (Ehrenb.) Grunow
Eunotia lunaris var. *excisa* Grunow
Eunotia major (W.Sm.) Rabenh.
Eunotia major var. *impressa* (W.Sm.) Rabenh.
Eunotia microcephala Krasske
Eunotia monodan (Ehrenb.) W.Sm. [orthographic error]
Eunotia monodan var. *major* (W.Sm.) Hust. [orthographic error]
Eunotia monodon Ehrenb.
Eunotia monodon var. *major* (W.Sm.) Hust.
Eunotia monodontiforma Lange-Bert. & Nörpel *in* Lange-Bert.
Eunotia naegelii Migula
Eunotia parallela Ehrenb.
Eunotia pectinalis (O.Müll.) Rabenh.
Eunotia pectinalis var. *minor* (Kütz.) Rabenh.
Eunotia pectinalis var. *undulata* (Ralfs) Rabenh.
Eunotia pectinalis var. *ventricosa* Grunow
Eunotia pectinalis fo. *minor* (Dillwyn) Rabenh.
Eunotia perpusilla Grunow
Eunotia praerupta Ehrenb.
Eunotia praerupta var. *bidens* (Ehrenb.) Grunow
Eunotia praerupta var. *inflata* Grunow
Eunotia praerupta var. *laticeps*fo. *curta*Grunow
Eunotia pseudolunaris Venkt.
Eunotia robusta var. *tetraedon* (Ehrenb.) Ralfs
Eunotia septentrionalis Østrup
Eunotia serra Ehrenb.
Eunotia serra var. *diadema* (Ehrenb.) R.M.Patrick
Eunotia tenella (Grunow) Hust.
Eunotia trinacria Krasske
Eunotia valida Hust.
Eunotia vanheurckii R.M.Patrick
Eunotia vanheurckii var. *intermedia* (Krasske) R.M.Patrick
Eunotia woleirotii (Kütz.) Rabenh.
Eunotia zebrina Ehrenb.

Fallacia fracta (Hust. *ex* Simonsen) D.G.Mann *in* Round, Crawford & Mann
Fallacia helensis (Schulz) D.G.Mann *in* Round, Crawford & Mann
Fallacia insociabilis (Krasske) D.G.Mann *in* Round, Crawford & Mann
Fallacia monoculata (Hust.) D.G.Mann *in* Round, Crawford & Mann
Fallacia omissa (Hust.) D.G.Mann in Round, Crawford & Mann
Fallacia pseudomuralis (Hust.) D.G.Mann *in* Round, Crawford & Mann
Fallacia pygmaea (Kütz.) D.G.Mann*in*Round, Crawford & Mann
Fallacia subhamulata (Grunow *in* VanHeurck) D.G.Mann *in* Round, Crawford & Mann
Fallacia submitis (Hust.) D.G.Mann *in* Round, Crawford & Mann

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Fragellaria crotonensis Kitton [orthographic error]

Fragilaria acuta Ehrenb.
Fragilaria arcus (Ehrenb.) Cleve
Fragilaria atomus Hust.
Fragilaria bicapitata A.Mayer
Fragilaria bipunctata Ehrenb.
Fragilaria brevistriata Grunow *in* VanHeurck
Fragilaria brevistriata var. *binodis* (Pant.) A.Cleve
Fragilaria brevistriata var. *capitata* Hérib.
Fragilaria brevistriata var. *inflata* (Pant.) Hust.
Fragilaria brevistriata var. *subcapitata* Grunow *in* VanHeurck [name illegitimate]
*Fragilaria capucina*Desm.
Fragilaria capucina var. *acuta* (Ehrenb.) Rabenh.
Fragilaria capucina var. *lanceolata* Grunow
Fragilaria capucina var. *mesolepta* Rabenh.
Fragilaria constricta Ehrenb.
Fragilaria constricta fo. *stricta* (A.Cleve) Hust.
Fragilaria construens (Ehrenb.) Grunow
Fragilaria construens var. *bigibba* A.Cleve
Fragilaria construens var. *binodes* (Ehrenb.) Grunow [orthographic error]
Fragilaria construens var. *binodis* (Ehrenb.) Grunow
Fragilaria construens var. *capitata* Hérib.
Fragilaria construens var. *minuta* Temp. & M.Perag.
Fragilaria construens var. *pumila* Grunow
Fragilaria construens var. *subsalina* Hust.
Fragilaria construens var. *venter* (Ehrenb.) Grunow
Fragilaria crotenensis Kitton [orthographic error]
Fragilaria crotonensis Kitton
Fragilaria crotonensis var. *oregona* Sovereign
Fragilaria crotonensis var. *prolongata* Grunow
Fragilaria crotonensis var. *tenuissima* [*nom. nud.*]
Fragilaria entomon (Ehrenb.) Ehrenb.
Fragilaria gracillima Mayer
Fragilaria harrisonii Grunow
Fragilaria harrisonii var. *dubia* Grunow
Fragilaria harrisonii var. *rhomboides* Grunow
Fragilaria heideni Østrup
Fragilaria heideni var. *istvanffyi* (Pant.) Hust.
Fragilaria inflata (Heid.) Hust.
Fragilaria intermedia Grunow
Fragilaria intermedia var. *continua* A.Cleve
Fragilaria intermedia var. *fallax* (Grunow) A.Cleve

Fragilaria intermiedia var. *fallax* (Grunow) A.Cleve
Fragilaria intermedia var. *lanceolata* Fusey
Fragilaria kriegeriana Krasske
Fragilaria lapponica Grunow
Fragilaria leptostauron (Ehrenb.) Hust.
Fragilaria leptostauron var. *dubia* (Grunow) Hust.
Fragilaria leptostauron var. *fossilis* (Pant.) Reháková
Fragilaria leptostauron var. *rhomboides* (Grunow) Hust.
Fragilaria linearis Castracane
Fragilaria minuscula Grunow non D.M.Williams & Round (see note11)
Fragilaria mutabilis (W.Sm.) Grunow
Fragilaria mutabilis var. *intercedens* Grunow *in* VanHeurck
Fragilaria nitzschioides Grunow
Fragilaria pantocsekii var. *binodis* (Pant.) A.Cleve
Fragilaria parasitica (W.Sm.) Grunow
Fragilaria pinnata Ehrenb.
Fragilaria pinnata var. *intercedens* (Grunow *in* VanHeurck) Hust.
Fragilaria pinnata var. *lancettula* (Schum.) Hust.
Fragilaria radians (Kütz.) D.M.Williams & Round
Fragilaria rhomboides (Ehrenb.) DeToni [*nom. nud.*]
Fragilaria spinosa Skvortzov
Fragilaria vaucheriae(Kütz.) J.B.Petersen (see note 12)
Fragilaria vaucheriae var. *capitellata* (Grunow) R.M.Patrick
Fragilaria vaucheriae var. *fallax* Grunow
Fragilaria vaucheriae var. *lanceolata* A.Mayer
Fragilaria vaucheriae var. *parvula* (Kütz.) A.Cleve
Fragilaria vaucheriae var. *truncata* (Grev.) Grunow
Fragilaria virescens Ralfs
Fragilaria virescense [orthographic error]
Fragilaria virescens var. *capitata* Østrup
Fragilaria virescens var. *mesolepta* (Rabenh.) Schönf.
Fragilaria virescens var. *oblongella* Grunow

Fragilariaforma bicapitata (Mayer) D.M.Williams & Round
Fragilariaforma constricta (Ehrenb.) D.M.Williams & Round
Fragilariaforma constricta fo. *stricta* (A.Cleve) Poulin
Fragilariforma virescens (Ralfs) D.M.Williams & Round
Fragilariforma virescens var. *capitata* (Østrup) Czarn.

Fragilariopsis linearis (Castracane) Hust.

Frustulia erifuga Lange-Bert. & Krammer *in* Lange-Bertalot
Frustulia rhomboides (Ehrenb.) >DeToni

Frustulia rhomboides var. *amphipleuroides* (Grunow) Cleve *in* Cleve & Grunow
Frustulia rhomboides var. *crassinervia* (Bréb.) Ross
Frustulia rhomboides var. *saxonica* (Rabenh.) DeToni
Frustulia rhomboides var. *viridula* (Bréb.) Cleve
Frustulia saxonica Ehrenb.
Frustulia viridula (Bréb.) DeToni
Frustulia vulgaris (Thwaites) DeToni
Frustulia vulgaris var. *capitata* Krasske
Frustulia weinholdii Hust.

Gallionella distans Ehrenb.

Geissleria acceptata (Hust.) Lange-Bert. & Metzeltin *in* Lange-Bert.
Geissleria declivis (Hust.) Lange-Bert.
Geissleria decussis (Østrup) Lange-Bert. & Metzeltin *in* Lange-Bert.
Geissleria kriegeri (Krasske) Lange-Bert.>
Geissleria paludosa (Hust.) Lange-Bert. & Metzeltin *in* Lange-Bert.
Geissleria schoenfeldii (Hust.) Lange-Bert. & Metzetlin *in* Lange-Bert.
Geissleria similis (Krasske) Lange-Bert. & Metzeltin *in* Lange-Bert.
Geissleria tectissima (Lange-Bert.) Lange-Bert.
Geissleria thingvallae (Østrup) Metzeltin & Lange-Bert. *in* Lange-B

Gloeonema paradoxum Ehrenb.
Gloeonema triangulatum Ehrenb.

Gomphoneis eriense (Grunow) Skvortzov & Meyer
Gomphoneis geitleri Kociolek & Stoermer
Gomphoneis herculeana (Ehrenb.) Cleve
Gomphoneis herculeana var. *robusta* (Grunow) Cleve
Gomphoneis olivacea (Hornemann) Dawson *ex* Ross & Sims
Gomphoneis olivacea var. *calcarea* (Cleve) Poulin *in* Poulin, Hamilton & Proulx
Gomphoneis quadripunctata (Østrup) P.A.Dawson *ex* Ross & Sims
Gomphoneis quadripunctata var. *cochleariformis* Kociolek & Stoermer

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Gomphonema abbreviatum C.Agardh
Gomphonema abbreviatum var. *inflata* Hust.
Gomphonema acuminatum Ehrenb.
Gomphonema acuminatum var. *brebissonii* (Kütz.) Cleve
Gomphonema acuminatum var. *coronatum* (Ehrenb.) Rabenh.
Gomphonema acuminatum var. *intermedia* Grunow
Gomphonema acuminatum var. *laticeps* Ehrenb.

Gomphonema acuminatum var. *pusillum* Grunow
Gomphonema acuminatum var. *pussilum* Grunow [orthographic error]
Gomphonema acuminatum var. *sphaerophora* [*nom. illegit.*]
Gomphonema acuminatum var. *trigonocephalum* (Ehrenb.) Grunow
Gomphonema acuminatum var. *turris* Ehrenb. (see note 13)
Gomphonema affine Kütz.
Gomphonema affine var. *elongatum* (Mayer) Millie & Lowe
Gomphonema affine var. *insigne* (Greg.) Andrews
Gomphonema americanum Ehrenb.
Gomphonema angustatum (Kütz.) Rabenh.
Gomphonema angustatum var. *citera* (Hohn & Hellerm.) R.M.Patrick
Gomphonema angustatum var. *obtusatum* (Kütz.) Grunow
Gomphonema angustatum var. *productum* Grunow
Gomphonema angustatum var. *sarcophagus* (Greg.) Grunow
Gomphonema angustatum var. *sarcophagu* fo. *undulata* [*nom. illegit.*]
Gomphonema angustatum var. *undulata* Grunow
Gomphonema angustatum fo. *undulata* Grunow
Gomphonema apuncto Wallace
Gomphonema augur Ehrenb.
Gomphonema bohemicum Reich. & Fricke
Gomphonema brasiliense Grunow
Gomphonema capitatum Ehrenb.
Gomphonema clevei Fricke
Gomphonema consector Hohn & Hellerm.
Gomphonema constrictum Ehrenb.
Gomphonema constrictum var. *capitata* (Ehrenb.) VanHeurck
Gomphonema coronatum Ehrenb
Gomphonema crenulata (Ehrenb.) Kütz. [*nom. nud.*]
Gomphonema curvatum Kütz.
Gomphonema dichotomum Kütz.
Gomphonema eriense Grunow
Gomphonema exilissima (Grunow) Lange-Bert. & Reichart *in* Lange-Bert.
Gomphonema geminata (Lyngb.) C.Agardh
Gomphonema germainii Kociolek & Stoermer
Gomphonema gracile Ehrenb. em. VanHeurck
Gomphonema gracile var. *cymbelloides* Grunow
Gomphonema gracile var. *dicotoma* (Kütz.) Grunow
*Gomphonema gracile*var. *naviculacea* (W.Sm.) Cleve
Gomphonema grovei M.Schmidt
Gomphonema grovei var. *lingulatum* (Hust.) Lange-Bert. *in* Krammer & Lange-Bert.
Gomphonema grunowii R.M.Patrick
Gomphonema helveticum Brun
Gomphonema helveticum var. *tenuis* Hust.
Gomphonema herculeanum Ehrenb.
Gomphonema herculeanum var. *robusta* Grunow
Gomphonema intricatum Kütz. (see note 14)

Gomphonema intricatum var. *dichotomum* (Kütz.) Grunow
Gomphonema intricatum var. *fossilis* Pant.
Gomphonema intricatum var. *pumila* Grunow (see note 15)
Gomphonema intricatum var. *vibrio* (Ehrenb.) Cleve (see note 16)
Gomphonema lanceolatum Ehrenb.
Gomphonema lanceolatum var. *insignis* (Greg.) Cleve
Gomphonema laticeps Ehrenb.
Gomphonema leptocampum Kociolek & Stoermer
Gomphonema lingulatum Hust.
Gomphonema longiceps Ehrenb.
Gomphonema longiceps var. *gracilis* Hust. [*nom. nud.*]
Gomphonema longiceps var. *montana* (Schum.) Hust.
Gomphonema longiceps var. *subclavatum* Grunow
Gomphonema longiceps var. *subclavatum* fo. *gracilis* Hust.
Gomphonema longiceps fo. *gracilis* Hust.
Gomphonema manubrium M.Schmidt & Fricke
Gomphonema manubrium M.Schmidt & Fricke *sensu* Kociolek & Stoermer
Gomphonema montanum Schum.
Gomphonema obscurum (W.Sm.) J.W.Griff. & Henfr. [orthographic error]
Gomphonema olivaceoides Hust.
Gomphonema olivaceoides var. *cochleariformis* Mang.
Gomphonema olivaceoides var. *densestriata* Foged
Gomphonema olivaceoides var. *hutchinsoniana* R.M.Patrick
Gomphonema olivaceum (Lyngb.) Kütz.
Gomphonema olivaceum var. *calcareum* (Cleve) Cleve
Gomphonema olivaceum var. *minutissima*Hust.
Gomphonema olivaceum var. *olivaceoides* (Hust.) Lange-Bert. *in* Lange-Bert. & Krammer
Gomphonema olivacium (Lyngb.) Kütz. [orthographic error]
Gomphonema parvulum (Kütz.) Kütz.
Gomphonema parvulum var. *exilissima* Grunow
Gomphonema parvulum var. *lagenula* (Kütz.) Freng.
Gomphonema parvulum var. *micropus* (Kütz.) Cleve
Gomphonema parvulum var. *subelliptica* Cleve
Gomphonema productum Lange-Bert. & Reichardt *in* Lange-Bert.
Gomphonema pseudoaugur Lange-Bert.
Gomphonema pseudotenellum Lange-Bert.
Gomphonema pygmaeum Kociolek & Stoermer
Gomphonema quadripunctatum (Østrup) Wisl.
Gomphonema robustum Grunow
Gomphonema sarcophagus Greg.
Gomphonema semiapertum Grunow
Gomphonema sphaerophorum Ehrenb.
Gomphonema subclavata fo. *gracilis* (Hust.) Woodhead & Tweed
Gomphonema subclavatum (Grunow) Grunow
Gomphonema subclavatum fo. *gracilis* (Hust.) Woodhead & Tweed
Gomphonema subclavatum var. *mexicanum* [no author, see Kingston 1980] [nom. illegit.?] (see note

17)
Gomphonema subclavatum var. *mustela* (Ehrenb.) Cleve
Gomphonema longiceps Ehrenb.
Gomphonema submehleri Kociolek & Stoermer
Gomphonema subtile Ehrenb.
Gomphonema subtile var. *sagitta* (Schum.) Cleve
Gomphonema superiorensis Kociolek & Stoermer
Gomphonema tenellum Kütz.
Gomphonema tergestinum (Grunow) Fricke
Gomphonema trigonocephalum Ehrenb.
Gomphonema truncatum Ehrenb.
Gomphonema truncatum var. *capitatum* (Ehrenb.) R.M.Patrick *in* Patrick & Reimer
Gomphonema truncatum var. *macilentum* Kociolek & Stoermer
Gomphonema truncatum var. *turgidum* (Ehrenb.) R.M.Patrick *in* Patrick & Reimer
Gomphonema tumens Kociolek & Stoermer
Gomphonema turgidum Grunow
Gomphonema turris Ehrenb.
Gomphonema ventricosum Greg.
Gomphonema ventricosum Greg. *sensu* Kociolek & Stoermer 1987
Gomphonema vibrio Ehrenb.
Gomphonema vibrio var. *fossile* (Pant.) Ross
Gomphonema vibrio var. *intricatum* (Kütz.) Ross
Gomphonema vibrio var. *pumilum* (Grunow *in* VanHeurck) Ross

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Gyrosigma acuminatum (Kütz.) Rabenh.
Gyrosigma attenuatum (Kütz.) Rabenh. *Gyrosigma exilis* (Grunow) C.W.Reimer
Gyrosigma eximium (Thwaites) Boyer
Gyrosigma kuetzingii (Grunow) Cleve(see note 18)
Gyrosigma macrum (W.Sm.) J.W.Griff & Henfr.
Gyrosigma nodiferum (Grunow) C.W.Reimer *sensu* Reimer *in* Patrick & Reimer
Gyrosigma nodiferum (Grunow) C.W.Reimer *sensu* Krammer & Lange-Bert.
Gyrosigma obscurum (W.Sm.) J.W.Griff. & Henfr.
Gyrosigma obtusatum (Sull. & Wormley) Boyer
Gyrosigma parkeri (M.B.Harrison) Elmore
Gyrosigma reimeri Sterrenb.
Gyrosigma scalproides (Rabenh.) Cleve
Gyrosigma sciotense (Sull. & Wormley) Cleve [historical orthographic error sciotoense vs. sciotense]
Gyrosigma sciotoense (Sull. & Wormley) Cleve
Gyrosigma spencerii (Quek.) J.W.Griff. & Henfr.
Gyrosigma spencerii var. *curvula* (Grunow) C.W.Reimer
Gyrosigma spencerii var. *nodifera* (Grunow) Cleve(see note 35)
Gyrosigma strigile (W.Sm.) Cleve
Gyrosigma strigilis (W.Sm.) Cleve
Gyrosigma temperei Cleve
Gyrosigma wormleyi (Sull.) Boyer

Hannaea arcus (Ehrenb.) R.M.Patrick (see note 9)
Hannaea arcus var. *amphioxys* (Rabenh.) R.M.Patrick
Hannaea arcus var. *linearis* Holmboe

Hantzschia amphioxys (Ehrenb.) Grunow (see note 19)
Hantzschia amphioxys var. *capitata* O.Müll.
Hantzschia amphioxys var. *vivax* (Hantzsch) Grunow
Hantzschia virgata (Roper) Grunow *in* Cleve & Grunow
Hantzschia virgata var. *capitellata* Hust.

Hippodonta capitata (Ehrenb.) Lange-Bert., Metzeltin & Witkowski
Hippodonta costulata (Grunow) Lange-Bert., Metzeltin & Witkowski
Hippodonta hungarica (Grunow) Lange-Bert., Metzeltin & Witkowski
Hippodonta linearis (Østrup) Lange-Bert., Metzeltin & Witkowski
Hippodonta lueneburgensis (Grunow) Lange-Bert., Metzeltin & Witkowski
Hippodonta subcostulata (Hust.) Lange-Bert., Metzeltin & Witkowski

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Homoeocladia sigmoidea (Nitzsch.) Elmore

Hyalosynedra laevigata (Grunow) D.M.Williams & Round

Karayevia clevei (Grunow *in* Cleve & Grunow) Bukht. & Round
Karayevia laterostrata (Hust.) Bukht. & Round

Kobayasia jaagii (F.Meister) Lange-Bert.
Kobayasia subtilissima (Cleve) Lange-Bert.

Kolbesia kolbei (Hust.) Bukht. & Round
Kolbesia ploenensis (Hust.) Bukht. & Round

Krasskella kriegerana (Krasske) Ross & Sims

Luticola mutica (Kütz.) D.G.Mann *in* Round, Crawford & Mann
Luticola cohnii (Hilse) D.G.Mann *in* Round, Crawford & Mann
Luticola muticoides (Hust.) D.G.Mann *in* Round, Crawford & Mann
Luticola muticopsis (VanHeurck) D.G.Mann *in* Round, Crawford & Mann

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Lysigonium granulata (Ehrenb.) Kuntze
Lysigonium varians (C.Agardh) DeToni

Martyana martyi (Hérib.) F.E.Round *in* Round, Crawford & Mann

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Mastogloia braunii Grunow
Mastogloia grevillei W.Sm.
Mastogloia lacustris (Grunow) VanHeurck
Mastogloia smithii Thwaites
Mastogloia smithii var. *amphicephala* Grunow
Mastogloia smithii var. *lacustris* Grunow

Melosira agassizii Ostenf.
Melosira agassizii var. *malayensis* Hust.
Melosira ambigua (Grunow) O.Müll.
Melosira arenaria Moore *ex* Ralfs
Melosira binderana Kütz.
Melosira canadensis Hust.
Melosira crenulata (Ehrenb.) Kütz.(see note 20)
Melosira crenulata var. *tenuis* Kütz. (see note 20)
Melosira crotonensis (J.W.Bail.) H.L.Sm.
Melosira dickei (Thwaits) Kütz.
Melosira distans (Ehrenb.) Kütz.
Melosira distans var. *alpigena* Grunow
Melosira distans var. limnetica O.Müll.
Melosira granulata (Ehrenb.) Ralfs
Melosira granulata var. *angustissima* O.Müll.
Melosira granulata var. *angustissima* fo. *curvata* Grunow
Melosira granulata var. *angustissima* fo. *spiralis* O.Müll.
Melosira granulata var. *muzzanensis* (F.Meister) Bethge
Melosira granulata fo. *curvata* Grunow
Melosira granulata fo. *spiralis* Grunow
Melosira granulata status ÿ (O.Müll.) Hust. [*nom. illegit*]
Melosira granulate [orthographic error]
Melosira islandica O.Müll.
Melosira islandica subsp. *helvetica* O.Müll.
Melosira islandica-ambigua O.Müll. (Grunow) O.Müll. [*nom. illegit.*]
Melosira italica (Ehrenb.) Kütz.
Melosira italica var. *tenuis* (Grunow) O.Müll.
Melosira italica var. *tenuissima* (Grunow) O.Müll.
Melosira italica var. *valida* Grunow

Melosira italica subsp. *subarctica* O.Müll.
Melosira lacustris H.H.Chase [*nom. nud.*]
Melosira longispina Hust.
Melosira roseana Rabenh.
Melosira dendroteres (Rabenh.) Ross
Orthoseira dendroteres (Rabenh.) R.M.Crawford (see note 21)
Melosira undulata (Ehrenb.) Kütz.
Melosira undulata var. *normanii* Arn.
Melosira varians C.Agardh

Meridion anceps (Ehrenb.) D.M.Williams
Meridion circulare (Grev.) C.Agardh
Meridion circulare var. *constrictum* (Ralfs) VanHeurck
Meridion constrictum Ralfs
Meridion intermedium H.L.Sm.
Meridion intermedium var. *constrictum* H.L.Sm.
Meridion vernale C.Agardh

Microsiphona potamos Weber

Navicula aboensis (Cleve) Hust.
Navicula abiskoensis Hust.
Navicula absoluta Hust.
Navicula acceptata Hust.
Navicula accomoda Hust.
Navicula affinis Ehrenb.
Navicula agnita Hust.
Navicula aikensis R.M.Patrick
Navicula ambigua Ehrenb.
Navicula ambigua var. *craticularis* Ehrenb.
Navicula americana Ehrenb.
Navicula americana var. *alastis* Hohn & Hellerm.
Navicula amphibola Cleve
Navicula amphibola var.*perrieri* M.Perag. & Hérib.
Navicula amphibola var.*polymorpha* Fusey
Navicula amphiceros Kütz.
Navicula amphigomphus Ehrenb.
Navicula amygdalina Hust.
Navicula anatis Hohn & Hellerm.
Navicula anglica Ralfs *sensu* Hust.
Navicula anglica var. *signata* Hust.
Navicula anglica var. *subsalsa* (Grunow) Cleve
Navicula angusta Grunow

Navicula angustata W.Sm.
Navicula appendiculata (C.Agardh) Kütz.
Navicula arvensis Hust.
Navicula atomus (Kütz.) Grunow
Navicula atomus var. *permitis* (Hust.) Lange-Bert.
Navicula atomus var. *recondita* (Hust.) Lange-Bert.
Navicula aurora Sovereign
Navicula bacillaris Greg.
Navicula bacilliformis Grunow
Navicula bacillum Ehrenb.
Navicula bacillium Ehrenb. [orthographic error]
Navicula bacillus [orthographic error]
Navicula balcanica Hust.
Navicula begeri Krasske
Navicula bicapitata Lagerst.
Navicula bicapitellata Hust.
Navicula bicephala Hust.
Navicula bicontracta Østrup
Navicula binodis Ehrenb.
Navicula brebissonii Kütz.
Navicula bryophila J.B.Peters.
Navicula campylogramma Ehrenb.
Navicula canalis R.M.Patrick
Navicula capitata Ehrenb.
Navicula capitata var. *hungarica* (Grunow) Ross
Navicula capitata var. *linearis* (Østrup) Stoermer & Kreis
Navicula capitata var. *lueneburgensis* (Grunow) R.M.Patrick
Navicula capitata var. *lueneburgensis* fo. *elegans* Østrup
Navicula capitata var. *lunenbergensis* fo. *elegans* Østrup [orthographic error]
Navicula capitatoradiata Germain
Navicula capsa Hohn
Navicula cardinalis Ehrenb.
Navicula cari Ehrenb. (see note 22)
Navicula cari var. *angusta* Grunow
Navicula caroliniana R.M.Patrick
Navicula cascadensis Sovereign
Navicula castutata [Orthographic error]
Navicula certa Hust. (*non* F.Meister 1934)
Navicula cincta (Ehrenb.) Ralfs
Navicula cincta var. *rostrata* C.W.Reimer
Navicula circumtexta F.Meister
Navicula citrus Krasske
Navicula clamans Hust.
Navicula clementis Grunow
Navicula clementis var. *linearis* Brander
Navicula clementis var. *quadristigmata* Mang.

Navicula clementoides Hust.
Navicula cocconeiformis Greg. *ex* Grev.
Navicula confervacea (Kütz.) Grunow
Navicula confervacea var. *peregrina* (W.Sm.) Grunow
Navicula constans var. *symmetrica* Hust.
Navicula contenta Grunow
Navicula contenta var. *biceps* (Arn. ms., Grunow *in* VanHeurck) Cleve
Navicula contraria R.M.Patrick
Navicula costulata Grunow *in* Cleve & Grunow
Navicula costuloides Skvortzov
Navicula crucicula (W.Sm.) Donk.
Navicula cryptocefalsa Lange-Bert.
Navicula cryptocephala Kütz.
Navicula cryptocephala var. *exilis* (Kütz.) Grunow
Navicula cryptocephala var. *intermedia* VanHeurck
Navicula cryptocephala var. *lancettula* (Schum.) Grunow
Navicula cryptocephala var. *veneta* (Kütz.) Rabenh.
Navicula cryptocephaloides Hust.
Navicula cryptotenella Lange-Bert.
Navicula cuspidata (Kütz.) Kütz.
Navicula cuspidata var. *ambigua* (Ehrenb.) Cleve
Navicula cuspidata var. *major* F.Meister
Navicula declivis Hust.
Navicula decussis Østrup
Navicula densestriata Hust.
Navicula detenta Hust.
Navicula dicephala Ehrenb.
Navicula dicephala var. *abiskonensis* (Hust.) A.Cleve
Navicula dicephala var.*elginensis* (Greg.) Cleve
Navicula dilata Ehrenb.
Navicula diluviana Krasske
Navicula disputans R.M.Patrick
Navicula dissipata Hust.
Navicula distinctastriata Hohn & Hellerm.
Navicula divergens(W.Sm.) Ralfs
Navicula dubia Ehrenb.
Navicula dulcis Krasske
Navicula elegans W.Sm.
Navicula elginensis (Greg.) Ralfs
Navicula elginensis var. *lata* (M.Perag.) R.M.Patrick
Navicula elginensis var. *neglecta* (Krasske) R.M.Patrick
Navicula elginensis var. *rostrata* (A.Mayer) R.M.Patrick
Navicula elliptica Kütz.
Navicula elliptica var. *minutissima* Grunow
Navicula excelsa Krasske
Navicula exigua (Greg.) Grunow

Navicula exigua var. *capitata* R.M.Patrick
Navicula exiguiformis Hust.
Navicula exiguoides Hust.
Navicula exilis Kütz.
Navicula explanata Hust.
Navicula farta Hust.
Navicula festiva Krasske
Navicula fracta Hust.
Navicula gastriformis Hust.
Navicula gastrum (Ehrenb.) Kütz.
Navicula gastrum var. *signata* Hust.
Navicula gibba (Ehrenb.) Kütz.
Navicula gibbosa Hust.
Navicula globiceps Greg.
Navicula globosa F.Meister
Navicula goeppertiana (Bleisch) H.L.Smith
Navicula gottlandica Grunow
Navicula gracilis Ehrenb.
Navicula gracilis var. *schizonemoides* VanHeurck
Navicula graciloides A.Mayer
Navicula graciloides A.Mayer *sensu* Hust.
Navicula gregaria Donk.
Navicula grimmei Krasske
Navicula gysingensis Foged
Navicula halophila (Grunow) Cleve
Navicula halophila fo. *tenuirostris* Hust.
Navicula hambergii Hust.
Navicula hantzschia [orthographic error]
Navicula hassiaca Krasske
Navicula hasta Pant.
Navicula helensis Schulz
Navicula hemiptera Kütz.
Navicula heufleri Grunow
Navicula heufleri var. *leptocephala* (Bréb.) R.M.Patrick
Navicula hitchcockii Ehrenb.
Navicula hungarica Grunow
Navicula hungarica var. *capitata* (Ehrenb.) Cleve
Navicula hungarica var. *linearis* Østrup
Navicula hustedtii Krasske
Navicula hustedtii fo. *obtusa* (Hust.) Hust. (see note 23)
Navicula imbricata Bock
Navicula importuna Hust.
Navicula incerta Grunow
Navicula inflata Donk.
Navicula inflexa (Greg.) Ralfs
Navicula ingenua Hust.

Navicula ingrata Krasske
Navicula insignita Hust.
Navicula insociabilis Krasske
Navicula insociabilis var. *dissipatoides* Hust.
Navicula integra (W.Sm.) Ralfs
Navicula interglacialis Hust.
Navicula intractata Hust.
Navicula iridis Ehrenb.
Navicula iridis var. *affinis* VanHeurck
Navicula iridis var. *amphigomphus* Ehrenb.
Navicula iridis var. *amphirhynchus* Ehrenb.
Navicula iridis var. *firma* W.Sm.
Navicula iridis var. *producta* W.Sm.
Navicula jaagii F.Meister
Navicula jaernefeltii Hust.
Navicula jarnfeldtii Hust. [Orthographic error]
Navicula jentzschii Grunow
Navicula kotschyi Grunow (see note 24)
Navicula krasskei Hust.
Navicula kriegeri Krasske
Navicula lacunarum Grunow
Navicula lacustris Greg.
Navicula laevissima Kütz.
Navicula ladogensis Cleve
Navicula laevissima Kütz.
Navicula lanceolata (C.Agardh) Kütz. (see note 25)
Navicula lanceolata var. *cymbula* (Donk.) Cleve
Navicula lanceolata var. *tenuirostris* Skvortzov
Navicula latens Krasske
Navicula lateropunctata Wallace
Navicula laterostrata Hust.
Navicula lenzii Hust.
Navicula levanderi Hust.
Navicula limosa Kütz.
Navicula limosa var. *gibberula* (Kütz.) Grunow
Navicula limosa var. *subinflata* Grunow
Navicula limosa var. *undulata* Grunow
Navicula longa Ralfs
Navicula longirostris Hust. (see note 26)
Navicula lundstroemii Cleve
Navicula lundstromii (no authority cited), [orthographic error]
Navicula luzonensis Hust.
Navicula maculata Hust.
Navicula major Kütz.
Pinnularia major (Kütz.) Rabenh.
Navicula maxima Greg.

Navicula mediocris Krasske
Navicula menisculoides Hust.
Navicula menisculus Schum.
Navicula menisculus var. *krenneri* A.Cleve
Navicula menisculus var. *obtusa* Hust.
Navicula menisculus var. *upsaliensis* (Grunow *in* Cleve & Grunow) Grunow *in* VanHeurck
Navicula meniscus Schum.
Navicula mesolepta Ehrenb.
Navicula mesolepta var. ? Ehrenb. [*nom. illegit.*]
Navicula micropupula Choln.
Navicula minima Grunow
*Navicula minima*var. *okamurae* Skvortzov
Navicula minnewaukonensis Elmore
Navicula minuscula Grunow
Navicula minuscula var. *alpestris* Hust.
Navicula minusculoides Hust.
Navicula monoculata Hust.
Navicula muraliformis Hust.
Navicula muralis Grunow
Navicula mutica Kütz.
Navicula mutica var. *cohnii* (Hilse) Grunow
Navicula mutica var. *nivalis* (Ehrenb.) Hust.
Navicula mutica var. *tropica* Hust.
Navicula mutica var. *undulata* (Hilse) Grunow
Navicula muticoides Hust.
Navicula muticopsis VanHeurck
Navicula neoventricosa Hust.
Navicula nobilis (Ehrenb.) Kütz.
Navicula notha Wallace
Navicula nyassensis O.Müll.
Navicula nyassensis fo. *minor* O.Müll.
Navicula obdurata Hohn & Hellerm.
Navicula oblonga (Kütz.) Kütz.
Navicula oblongum var. *subcapitata* Pant.
Navicula odiosa Wallace
Navicula omissa Hust.
Navicula opportuna Hust.
Navicula oppugnata Hust.
Navicula ordinaria Hust.
Navicula paanaensis A.Cleve
Navicula paca Hohn & Hellerm.
Navicula paludosa Hust.
Navicula parva Ralfs
Navicula paucivisitata R.M.Patrick
Navicula pelliculosa Hilse
Navicula peratomus Hust.

Navicula peregrina (Ehrenb.) Kütz.
Navicula permitis Hust.
Navicula perpusilla (Kütz.) Grunow
Navicula perrotettii (Grunow) Cleve
Navicula perrotettii var. *enervis* Hust.
Navicula placenta Ehrenb.
Navicula placentula (Ehrenb.) Kütz.
Navicula placentula var. *rostrata* A.Mayer
Navicula platycephala O.Müll.
Navicula platystoma Ehrenb.
Navicula platystoma var. *pantocsekii* Wislouch & Kolbe
Navicula porifera var. *opportuna* (Hust.) Lange-Bert. *in* Krammer & Lange-Bert.
Navicula potzgeri C.W.Reimer
Navicula praeterita Hust.
Navicula praterita [orthographic error]
Navicula producta W.Sm.
Navicula protracta (Grunow) Cleve
Navicula protracta var. *elliptica* Gallik
Navicula protracta fo. *subcapitata* (Wislouch & V.S.Poretzsky) Hust.
Navicula pseudanglica Lange-Bert.
Navicula pseudobacillum Grunow
Navicula pseudoclementis Hust.
Navicula pseudomuralis Hust.
Navicula pseudoreinhardtii R.M.Patrick
Navicula pseudoscutiformis Hust.
Navicula pseudoventralis Hust.
Navicula punctata Donk.
Navicula pupla [orthographic error]
Navicula pupula Kütz.
Navicula pupula var. *aquaeductae* (Krasske) Hust.
Navicula pupula var. *bacillariodes* Grunow
Navicula pupula var. *capitata* Hust.
Navicula pupula var. *elliptica* Hust.
Navicula pupula var. *mutata* (Krasske) Hust.
Navicula pupula var. *rectangularis* (W.Greg.) Grunow
Navicula pupula var. *rostrata* Hust.
Navicula pusilla W.Sm.
Navicula pygmaea Kütz.
Navicula pygmaea var. *producta* [*nom. nud.*]
Navicula quadripartita Hust.
Navicula radiosa Kütz.
Navicula radiosa var. *intermedia* [*nom. nud.*]
Navicula radiosa var. *parva* Wallace
Navicula radiosa var. *tenella* (Bréb.*ex* Kütz.) Grunow *in* VanHeurck
Navicula radiosafallax Lange-Bert.
Navicula recondita Torka

Navicula reinhardtii Grunow
Navicula reinhardtii var. *elliptica* Hérib.
Navicula rhomboides Grunow
Navicula rhynchocephala Kütz.
Navicula rhynchocephala var. *amphiceros* (Kütz.) Grunow
Navicula rhynchocephala var. *germainii* (Wallace) R.M.Patrick
Navicula rhynchocephala var. *germanii* (Wallace) R.M.Patrick [orthographic error]
Navicula rhyncocephala Kütz. [orthographic error]
Navicula rhynchotella Lange-Bert.
Navicula rostellata Kütz.
Navicula rotaeana (Rabenh.) Grunow
Navicula rotaeana var. *excentrica* Grunow
Navicula rotunda Hust.
Navicula sabiniana R.M.Patrick
Navicula salinarum Grunow
Navicula salinarum var. *intermedia* (Grunow) Cleve
Navicula saugerii Desm.
Navicula schmassmannii Hust.
Navicula schoenfeldii Hust.
Navicula schroeteri var. *escambia* R.M.Patrick
Navicula schumanniana Grunow
Navicula sculpta Ehrenb.
Navicula scutelloides W.Sm.
Navicula scutiformis Grunow
Navicula secreta Pant.
Navicula secura R.M.Patrick
Navicula semen Ehrenb. *Navicula semenoides* Hust.
Navicula seminuloides Hust.
Navicula seminulum Grunow
Navicula seminulum var. *hustedtii* R.M.Patrick
Navicula seminulum var. *intermedia* Hust.
Navicula serians Kütz.
Navicula sigma Ehrenb.
Navicula similis Krasske
Navicula simplex Krasske
Navicula skabitschewskyi Sabelina
Navicula smithii Bréb.
Navicula sovereignae Hust.
Navicula sphaerophora Kütz.
Navicula splendicula VanLand.
Navicula staurifera Thomas
Navicula stauroptera var. *parva* (Ehrenb.) Grunow (see note 27)
Navicula stroemii Hust.
Navicula stroesei (Østrup) A.Cleve
Navicula subbacillum Hust.
Navicula subclementis Hust.

Navicula subcostulata Hust.
Navicula subgastriformis Hust.
Navicula subhalophila Hust.
Navicula subhamulata Grunow *in* VanHeurck
Navicula subhamulata var. *undulata* Hust.
Navicula submitis Hust.
Navicula submuralis Hust.
Navicula subocculta Hust.
Navicula subocculata Hust. [orthographic error]
Navicula subrhynchocephala Hust.
Navicula subrotundata Hust.
Navicula subrotundata fo. *lanceolata* Hust.
Navicula subseminulum Hust.
Navicula subsulcata Hust.
Navicula subtilissima Cleve
Navicula symmetrica R.M.Patrick
Navicula tabellaria (Ehrenb.) Kütz.
Navicula tantula Hust.
Navicula tecta Krasske
Navicula tenella (Bréb.) VanHeurck
Navicula tenera Hust.
Navicula termes Ehrenb. (see note 28)
Navicula terminata Hust.
Navicula texana R.M.Patrick
Navicula tridentula Krasske
Navicula tridentula var. *parallela* Krasske
Navicula trinodis Lewis
Navicula tripunctata (O.F.Müll.) Bory
Navicula tripunctata var. *cuneata* (Lauby) Stoermer & Yang
Navicula tripunctata var. *schizonemoides* (VanHeurck) R.M.Patrick
Navicula trochus Schum. (non. Ehrenb. 1838)
Navicula tumida W.Sm.(see note 29)
Navicula tuscula Ehrenb.
Navicula tuscula var. *angulata* Hust.
Navicula tuscula fo. *minor* Hust.
Navicula tuscula fo. *obtusa* Hust.
Navicula tuscula fo. *rostrata* Hust.
Navicula tuscula var. *rostrata* Hust.
Navicula vanheurckii R.M.Patrick
Navicula varians Greg.
Navicula variostriata Krasske
Navicula vaucheriae J.B.Peters.
Navicula ventosa Hust.
Navicula ventralis Krasske
Navicula ventralis fo. *simplex* Hust.
*Navicula verecunda*Hust.

Navicula viridis(Nitzsch.) Ehrenb.
Navicula viridula(Kütz.) Ehrenb.
Navicula viridula var. *avenacea* (Bréb.) VanHeurck
Navicula viridula var. *germainii* (Wallace) Lange-Bert.
Navicula viridula var. *linearis* Hust.
Navicula viridula var. *rostellata* (Kütz.) Cleve
Navicula viridula var. *tenella* [orthographic error]
Navicula vitabunda Hust.
Navicula vulpina Kütz.
Navicula vulpina var. *avenacea* (Van Heurck) R.M.Patrick
Navicula wittrockii (Lagerst.) Temp. & M.Perag.
Navicula zanoni Hust.
Navicula zanoii Hust. [orthographic error]

Neidium affine (Ehrenb.) Pfitz.
Neidium affine var. *amphirhynchus* (Ehrenb.) Cleve
Neidium affine var. *capitata* Mölder
Neidium affine var. *ceylonicum* (Skvortsov) C.W.Reimer
Neidium affine var. *hankense* (Skvortsov) C.W.Reimer
Neidium affine var. *humerus* C.W.Reimer
*Neidium affine*var. *undulatum* (Grunow) Cleve
Neidium amphigomphus (Ehrenb.) Pfitz.
Neidium ampliatum (Ehrenb.) Krammer *in* Krammer & Lange-Bert.
Neidium apiculatum C.W.Reimer
Neidium binode (Ehrenb.) Hust.
Neidium bisulcatum (Lagerst.) Cleve
Neidium bisulcatum var. *baicalense* (Skvortsov & K.I.Mey.) C.W.Reimer
Neidium bisulcatum var. *undulatum* O. Müll.
Neidium bisulcatum var. *subundulatum* (Grunow) C.W.Reimer *in* Patrick & Reimer
Neidium calvum Østrup
Neidium dilatatum (Ehrenb.) Cleve
Neidium distincte-punctatum Hust.
Neidium dubium (Ehrenb.) Cleve
Neidium dubium fo. *constrictum* (Hust.) Hust.
Neidium hankensis Skvortsov
Neidium hitchcockii (Ehrenb.) Cleve
Neidium iridis (Ehrenb.) Cleve
Neidium iridis var. *amphigomphus* (Ehrenb.) A.Mayer
Neidium iridis var. *ampliatum* (Ehrenb.) Cleve
Neidium iridis var. *amplicata* (Ehrenb.) Cleve [orthographic error]
Neidium iridis var. *vernalis* Reich.
Neidium kozlowi Meresch.
Neidium kozlowi var. *baicalensis* fo. *robusta* Stoermer
Neidium kozolwi Meresch. [orthographic error]
Neidium ladogense (Cleve) Stoermer & Yang

Neidium levanderi (Hust.) Lange-Bert. & Metzeltin *in* Lange-Bert.
Neidium mirum Krasske
Neidium productum (W.Sm.) Cleve
Neidium sacoense C.W.Reimer
Neidium temperei C.W.Reimer

Nitzschia accomodata Hust.
Nitzschia acicularioides Hust.
Nitzschia acicularioides sensu R.E.M.Archibald *non* Hust. 1930
Nitzschia acicularis (Kütz.) W.Sm.
Nitzschia acidoclinata Lange-Bert.
Nitzschia actinastroides (Lemm.) Van Goor
Nitzschia acula Hantzsch *ex* Cleve & Grunow
Nitzschia acuminata (W.Sm.) Grunow
Nitzschia acuta Cleve
Nitzschia adapta Hust.
Nitzschia agnewii Choln.
Nitzschia agnita Hust.
Nitzschia amphibia Grunow
Nitzschia amphibia var. *fossilis* Grunow
Nitzschia amphibia var. *frauenfeldii* Grunow
Nitzschia amphicephala Grunow
Nitzschia amphioxoides Hust.
Nitzschia amphioxys (Ehrenb.) W.Sm.
Nitzschia angustata (W.Sm.) Grunow
Nitzschia angustata var. *acuta* Grunow
Nitzschia angustatula Lange-Bert.
Nitzschia apiculata (Greg.) Grunow
Nitzschia archibaldii Lange-Bert.
Nitzschia bacata Hust.
Nitzschia bacata fo. *linearis* Hust.
Nitzschia bremensis Hust.
Nitzschia brevirostris Hust.
Nitzschia bulnheimiana (Rabenh.) H.L.Sm.
Nitzschia capitellata Hust.
Nitzschia circumsuta (Bail.) Grunow
Nitzschia clausii Hantzsch
Nitzschia closterium (Ehrenb.) W.Sm.
Nitzschia communis Rabenh.
Nitzschia communis var. *abbreviata* Grunow
Nitzschia commutata Grunow
Nitzschia confinis Hust.
Nitzschia debilis (Arn.) Grunow *in* Cleve & Grunow
Nitzschia delicatissima Cleve
Nitzschia denticula Grunow

Nitzschia diserta Hust.
Nitzschia dissidua [orthographic error]
Nitzschia dissipata (Kütz.) Grunow
Nitzschia dissipata var. *borneensis* Hust.
Nitzschia dissipata var. *media* (Hantzsch) Grunow
Nitzschia dissipata fo. *undulata* Sovereign
Nitzschia draveillensis Coste & Ricard
Nitzschia dubia W.Sm.
Nitzschia elegens Hust.
Nitzschia epiphytica Hust.
Nitzschia epiphyticoides Hust.
Nitzschia fasciculata Grunow
Nitzschia filiformis (W.Sm.) VanHeurck
Nitzschia filiformis var. *conferta* (Richart) Lange-Bert.
Nitzschia flexa Schum.
Nitzschia fluminenesis Grunow
Nitzschia fonticola Grunow
Nitzschia fonticola var. *capitata* A.Cleve
Nitzschia fonticola var. *pelagica* Hust.
Nitzschia fonticoloides Sovereign
Nitzschia frustulum (Kütz.) Grunow
Nitzschia frustulum (Kütz.) Grunow *sensu* Lange-Bert.
Nitzschia frustulum var. *minuta* Grunow *in* VanHeurck [orthographic error]
Nitzschia frustulum var. *minutula* Grunow *in* Van Heurck
Nitzschia frustulum var. *perminuta* Grunow
Nitzschia frustulum var. *perpusilla* (Rabenh.) Grunow
Nitzschia frustulum var. *subsalina* Hust.
Nitzschia frustulum var. *tenella* Grunow
Nitzschia gandersheimiensis Krasske
Nitzschia gessneri Hust.
Nitzschia graciliformis Lange-Bert. & Simonsen
Nitzschia gracilis Hantzsch
Nitzschia graciloides Hust. (see note 30)
Nitzschia hantzschiana Rabenh.
Nitzschia hantzschschiana [orthographic error]
Nitzschia heufleriana Grunow
Nitzschia heufleuriana Grunow [orthographic error]
Nitzschia hollerupensis Foged
Nitzschia holsatica Hust.
Nitzschia homburgiensis Lange-Bert.
Nitzschia hungarica Grunow
Nitzschia ignorata Krasske
Nitzschia impressa Hust.
Nitzschia inconspicua Grunow
Nitzschia incurvata var. *lorenziana* Ross
Nitzschia innominata Sovereign

Nitzschia insecta Hust.
Nitzschia intermedia Hantzsch
Nitzschia interrupta (Reich.) Hust.
Nitzschia kuetzingiana Hilse
Nitzschia kuetzingiana var. *exilis* Grunow
Nitzschia kuetzingioides Hust.
Nitzschia kutzingiana Hilse [orthographic error]
Nitzschia lacunarum Hust.
Nitzschia lacuum Lange-Bert.
Nitzschia lanceolatae [orthographic error]
Nitzschia lauenburgiana Hust.
Nitzschia laurenburgiana Hust. [orthographic error]
Nitzschia levidensis (W.Sm.) Grunow
Nitzschia linearis (C. Agardh) W.Sm.
Nitzschia linearis var. *tenuis* (Kütz.) Grunow
Nitzschia liskipata [orthographic error]
Nitzschia longissima (Bréb.) Ralfs
Nitzschia longissima var. *closterium* (W.Sm.) VanHeurck
Nitzschia longissima var. *reversa* Grunow
Nitzschia longissima fo. *parva* Grunow (see note 31)
Nitzschia lorenziana Grunow
Nitzschia luzonensis Hust.
Nitzschia macilenta Greg.
Nitzschia mediocris Hust.
Nitzschia microcephala Grunow
Nitzschia minutula Grunow
Nitzschia obsidialis Hust.
Nitzschia obtusa W.Sm.
Nitzschia obtusa var. *scalpelliformis* Grunow
Nitzschia ovalis Arn.
Nitzschia palea (Kütz.) W.Sm.
Nitzschia palea var. *debilis* (Kütz.) Grunow
Nitzschia palea var. *sumatrana* Hust.
Nitzschia palea var. *tenuirostris* Grunow (see note 31)
Nitzschia paleacea Grunow
Nitzschia paleoides Hust.
Nitzschia paradoxa (Gmelin) Grunow
Nitzschia paradoza [orthographic error]
Nitzschia parvula W.Sm.
Nitzschia parvula var. *terricola* Lund
Nitzschia perminuta (Grunow) M. Perag.
Nitzschia philippinarum Hust.
Nitzschia planctonica Hust.
Nitzschia pseudoamphioxys Hust.
Nitzschia pseudoatomus Stoermer [*nom. nud.*]
Nitzschia pseudofonticola Hust.

Nitzschia pumila Hust. [cf. Lange-Bert.]
Nitzschia pura Hust.
Nitzschia pusilla Grunow
Nitzschia pusilla (Kütz.) Grunow emend. Lange-Bert.
Nitzschia radicula Hust.
Nitzschia recta Hantzsch
Nitzschia romana Grunow
Nitzschia rostellata Hust.
Nitzschia scalaris (Ehrenb.) W.Sm.
Nitzschia sicula var. *migrans* (Cleve) Hasle
Nitzschia sigma (Kütz.) W.Sm.
Nitzschia sigma var. *diminuta* Grunow
Nitzschia sigma var. *rigida* (Kütz.) Grunow
Nitzschia sigma var. *sigmatella* (Greg.) Grunow
Nitzschia sigmoidea (Nitzsch.) W.Sm.
Nitzschia sinuata W.Sm.
Nitzschia sinuata var. *delognei* (Grunow) Lange-Bert.
Nitzschia sinuata var. *tabellaria* (Grunow) Grunow
Nitzschia sociabilis Hust.
Nitzschia sphaerophora A.Cleve
Nitzschia spiculoides Hust.
Nitzschia spiculum Hust.
Nitzschia stagnorum Rabenh.
Nitzschia stricta Hust.
Nitzschia subacicularis Hust.
Nitzschia subamphioxoides Hust.
Nitzschia subcapitellata Hust.
Nitzschia sublinearis Hust.
Nitzschia subrostrata Hust.
Nitzschia subrostroides Choln.
Nitzschia subtilis (Kütz.) Grunow
Nitzschia subtilis var. *paleacea* Grunow
Nitzschia tabellaria Grunow
Nitzschia tarda Hust.
Nitzschia tenuis W.Sm.
Nitzschia thermalis (Ehrenb.) Auersw.
Nitzschia thermalis var. *intermedia* Grunow
Nitzschia thermalis var. *minor* Hilse
Nitzschia tropica Hust.
Nitzschia tryblionella Hantzsch *in* Rabenh.
Nitzschia tryblionella var. *debilis* (Arn.) A. Mayer
Nitzschia tryblionella var. *levidensis* (W.Sm.) Grunow
Nitzschia tryblionella var. *victoriae* Grunow
Nitzschia valdestriata Aleem & Hust.
Nitzschia vulga Choln.
Nitzschia vermicularis (Kütz.) Hantzsch

Nitzschia vexans Grunow
Nitzschia vitrea Norman
Nitzschia woltereckii Hust.

Odontidium hymale [orthograhic error]
Odontidium mutabile W.Sm.

Oestrupia bicontracta (Østrup) Lange-Bert. & Krammer
Oestrupia zachariasi (Reich.) Hust.
Oestrupia zachariasi var. *undulata* (Schultz) Stoermer & Yang

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Opephora ansata Hohn & Hellerm.
Opephora martyi Hérib.
Opephora pinnata Ehrenb.

Orthosira dickiei Thwaites

Pinnularia abaujensis(Pant.) Ross
Pinnularia abaujensis var. *linearis* (Hust.) R.M.Patrick
Pinnularia abaugensis var. *rostrata* (R.M.Patrick) R.M.Patrick [orthographic error]
Pinnularia abaujensis var. *rostrata* (R.M.Patrick) R.M.Patrick
Pinnularia abaujensis var. *subundulata* (A.Mayer) R.M.Patrick
Pinnularia acrosphaeria W.Sm.
Pinnularia amphioxys Ehrenb.
Pinnularia appendiculata (C.Agardh) Cleve
Pinnularia biceps Greg.
Pinnularia biceps fo. *petersenii* Ross
Pinnularia borealis Ehrenb.
Pinnularia borealis var. *rectangularis* Carlson
Pinnularia brandelii Cleve
Pinnularia braunii (Grunow) Cleve
Pinnularia braunii var. *amphicephala* (A.Mayer) Hust.
Pinnularia braunii var. *amphipalor* [*nom. nud.*]
Pinnularia brebissonii (Kütz.) Rabenh.
Pinnularia brebissonii var. *diminuta* (Grunow) Cleve
Pinnularia brevicostata Cleve
Pinnularia burkii R.M.Patrick
Pinnularia cardinaliculus Cleve
Pinnularia cardinalis (Ehrenb.) W.Sm.
Pinnularia cocconeis Ehrenb.
Pinnularia dactylus Ehrenb.

Pinnularia distinguenda Cleve
Pinnularia divergens W.Sm.
Pinnularia divergens var. *bacillaris* (M. Perag.) Mills
Pinnularia divergens var. *elliptica* (Grunow) Cleve
Pinnularia fasciata Lagerst.
Pinnularia gentilis (Donk.) Cleve
Pinnularia gibba Ehrenb.
Pinnularia gibba var. *linearis* Hust.
Pinnularia gibba var. *parva* (Ehrenb.) Grunow
Pinnularia gibba fo. *subundulata* A. Mayer
Pinnularia globiceps Greg.
Pinnularia globiceps var. *krockii* (Grunow) Cleve
Pinnularia hemiptera (Kütz.) Rabenh.
Pinnularia intermedia (Lagerst.) Cleve
Pinnularia interrupta W.Sm.
Pinnularia interrupta var. *crassior* (Grunow) Cleve (see note 32)
Pinnularia kriegeriana Krasske emend. Foged
Pinnularia krockii (Grunow) Cleve
Pinnularia latevittata var. *domingensis* Cleve
Pinnularia legumen (Ehrenb.) Ehrenb.
Pinnularia leptosoma (Grunow) Cleve
Pinnularia leptosoma fo. *erlangensis* A. Mayer
Pinnularia lundii Hust.
Pinnularia major(maior) (Kütz.) Rabenh.
Pinnularia mesolepta (Ehrenb.) W.Sm.
Pinnularia microstauron (Ehrenb.) Cleve
Pinnularia microstauron var. *biundulata* O.Müll.
Pinnularia molaris (Grunow) Cleve
Pinnularia nobilis (Ehrenb.) Ehrenb.
Pinnularia nodosa (Ehrenb.) W.Sm.
Pinnularia obscura Krasske
Pinnularia radiosa W.Sm.
Pinnularia rupestris Hantzsch
Pinnularia ruttneri Hust.
Pinnularia semicruciata A.Cleve
Pinnularia socialis (T.C. Palm.) Hust.
Pinnularia stomatophora (Grunow) Cleve
Pinnularia subcapitata Greg.
Pinnularia subcapitata var. *paucistriata* (Grunow) Cleve
Pinnularia subrostrata (A.Cleve) A.Cleve
Pinnularia substomatophora Hust.
Pinnularia sudetica Hilse
Pinnularia tabellaria Ehrenb.
Pinnularia tenuis Greg.
Pinnularia tenuis var. *interrupta* (Font.) A.Cleve
Pinnularia termes Ehrenb.

Pinnularia termitina (Ehrenb.) R.M.Patrick
Pinnularia tibetana Hust.
Pinnularia torta (A. Mann) R.M.Patrick
Pinnularia trigonocephala Cleve
Pinnularia undulata Greg.
Pinnularia undulata var. *subundulata* Grunow
Pinnularia viridis (Nitzsch.) Ehrenb.
Pinnularia viridis var. *commutata* (Grunow) Cleve

Placoneis clementioides (Hust.) E.J.Cox
Placoneis clementis (Grunow) E.J.Cox
Placoneis dicephala (W.Sm.) Meresch.
Placoneis elginensis (Greg.) E.J.Cox
Placoneis exigua (Greg.) Meresch.
Placoneis gastrum (Ehrenb.) Meresch.
Placoneis placentula (Ehrenb.) Heinzerl.
Placoneis placentula fo. *rostrata* (A.Mayer) Bukht.
Placoneis pseudanglica (Lange-Bert.) E.J.Cox

Plagiotropis lepidoptera (Greg.) C.W.Reimer *in* Patrick & Reimer
Plagiotropis lepidoptera var. *proboscidea* (Cleve) C.W.Reimer *in* Patrick & Reimer

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Planothidium delicatulum (Kütz.) Bukht. & Round
Planothidium dubium (Grunow) Bukht. & Round
Planothidium ellipticum (A.Cleve) Bukht. & Round
Planothidium hauckianum (Grunow) Bukht. & Round
Planothidium haukianum (Grunow) Bukht. & Round [orthographic error]
Planothidium lanceolatum (Bréb.) Bukht. & Round
Planothidium perigallii (Brun & Hérib. *in* Hérib.) Bukht. & Round

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Pleurosigma acuminatum (Kütz.) Grunow
Pleurosigma attenuatum (Kütz.) W.Sm.>/a>
Pleurosigma delicatulum W.Sm.
Pleurosigma eximium (Thwaites) Cleve & Grunow
Pleurosigma kuetzingii Grunow(see note 18)
Pleurosigma obscurum W.Sm.
Pleurosigma sciotense Sull.
Pleurosigma spencerii Grunow
Pleurosigma spencerii var. *minor* Grunow [*nom. nud.*]
Pleurosigma wormleyi Sull.

Pleurosira laevis (Ehrenb.) Compère

Psammothidium altaicum (Poretzky) Bukht.
Psammothidium abundans fo. *rosenstockii* (Lange-Bert. *in* Lange-Bert. & Krammer) Bukht.
Psammothidium bioreti (Germain) Bukht. & Round
Psammothidium didymum (Hust.) Bukht. & Round
Psammothidium laurenbergianum (Hust.) Bukht. & Round
Psammothidium levanderi (Hust.) Bukht. & Round (see note 4)
Psammothidium marginulatum (Grunow) Bukht. & Round
Psammothidium subatomoides (Hust.) Bukht. & Round
Psammothidium ventralis Bukht. & Round

Pseudostaurosira brevistriata (Grunow *in* VanHeurck) D.M.Williams & Round
Pseudostaruosira brevistriata var. *inflata* (Pant.) M.B.Edlund

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Pseudoeunotia lunaris Ehrenb.

Reimeria sinuata (Greg.) Kociolek & Stoermer
Reimeria sinuata fo. *antiqua* (Greg.) Kociolek & Stoermer

Rhizosolenia eriense H.L.Sm.
Rhizosolenia eriensis H.L. Sm. *in* Briggs
Rhizosolenia eriensis var. *pusilla* Wolosz. *in* Schröd.
Rhizosolenia eriensis var. *zachariasi* (Brun) Playf.
Rhizosolenia gracilis H.L. Sm.
Rhizosolenia longiseta Zach.

Rhoicosphenia curvata (Kütz.) Grunow
Rhoicosphenia curvata var. *subacuta* M. Schmidt

Rhopalodia argus W.Sm.
Rhopalodia gibba (Ehrenb.) O.Müll.
Rhopalodia gibba var.*ventricosa* (Kütz.) Perag. & M.Perag.
Rhopalodia gibberula (Ehrenb.) O.Müll.
Rhopalodia patallel (Grunow) O.Müll. [orthographic error]
Rhopalodia parallela (Grunow) O.Müll.

Rossithidum pusillum (Grunow) Bukht. & Round

Rouxia californica var. *minuta* A.Cleve

Schizonema viridulum Bréb.
Schizonema vulgare Thwaites

Scoliopleura campylogramma (Ehrenb.) Rabenh.

Sellaphora americana (Ehrenb.) D.G.Mann
Sellaphora bacillum (Ehrenb.) D.G.Mann
Sellaphora laevissima (Kütz.) D.G.Mann
Sellaphora mutata (Krasske) Lange-Bert.
Sellaphora nyassensis (O.Müll.) D.G.Mann
Sellaphora seminulum (Grunow) D.G.Mann
Sellaphora parapupula Lange-Bert.
Sellaphora pupula (Kütz.) Mereschk.
Sellaphora pupula fo. *capitata* (Skvortsov & K.I.Mey.) Poulin *in* Poulin, Hamilton & Proulx
Sellaphora pupula var. *elliptica* (Hust.) Poulin *in* Poulin, Hamilton & Proulx
Sellaphora pupula var. *mutata* (Krasske) Poulin *in* Poulin, Hamilton & Proulx
Sellaphora pupula fo. *rostrata* (Hust.) Bukht.
Sellaphora pupula var. *rectangularis* (Greg.) Mereschk.
Sellaphora rectangularis (Greg.) Lange-Bert. & Metzeltin *in* Lange-Bert.
Sellaphora vitabunda (Hust.) D.G.Mann

Skeletonema costatum (Grev.) Cleve
Skeletonema potamos (Weber) Hasle *in* Hasle & Evensen
Skeletonema potainus (Weber) Halse [orthographic error]
Skeletonema subsalsum (A.Cleve) Bethge
Skeletonema subsalsa (A. Cleve) Bethge [orthographic error]

Sphinctocystis elliptica (Kütz.) Kuntze
Sphinctocystis librilis (Ehrenb.) Hass.

Stauroneis acuta W.Sm.
Stauroneis acutiuscula M. Perag. & Hérib. *in* Hérib.
Stauroneis agrestis J.B.Peters.
Stauroneis alabamae Heid.
Stauroneis amphioxys Greg.
Stauroneis anceps Ehrenb.
Stauroneis anceps var. *americana* C.W.Reimer

Stauroneis anceps var. *hyalina* Brun & M. Perag.
Staruoneis anceps var. *hylania* Brun & M.Perag. [orthographic error]
Stauroneis anceps var. *siberica* Grunow
Stauroneis anceps fo. *gracilis* Rabenh.
Stauroneis anceps fo. *linearis* (Ehrenb.) Hust.
Stauroneis borrichii fo. *subcapitata* (J.B.Petersen) Lund
Stauroneis dilatata Ehrenb.
Stauroneis dilitata Ehrenb. [orthographic error]
Stauroneis dilatata fo. *baicalensis* Skvortsov & K.I.Mey.
Stauroneis dilata var. *baicalensis* Skvortsov & K.I.Mey. [orthographic error]
Stauroneis fluminea R.M.Patrick & Freese
Stauroneis gracilis Ehrenb.
Stauroneis gregorii Ralfs
Stauroneis kriegeri R.M.Patrick
Stauroneis kriegeri fo. *undulata* Hust.
Stauroneis lauenburgiana Hust.
Stauroneis linearis Ehrenb.
Stauroneis livingstonii C.W.Reimer
Stauroneis neohyalina Lange-Bert. & Krammer *in* Lange-Bert.
Stauroneis nobilis var. *baconiana* (Stodd.) C.W.Reimer
Stauroneis obtusa Lagerst.
Stauroneis phoenicenteron (Nitzsch.) Ehrenb.
Stauroneis phoenicenteron var. *brevis* Dippel
Stauroneis phoenicenteron fo. *gracilis* (Ehrenb.) Hust.
Stauroneis phoenicenteron var. *intermedia* (Dippel) A.Cleve
Stauroneis phoenicenteron fo. *lanceolata* (Kütz.) Brun
Stauroneis phylloides Ehrenb.
Stauroneis producta Grunow
Stauroneis semen Ehrenb.
Stauroneis siberica (Grunow) Lange-Bert. & Krammer *in* Lange-Bert.
Stauroneis smithii Grunow
Stauroneis smithii var. *borgei* Ehrenb.
Stauroneis smithii var. *incisa* Pant.
Stauroneis smithii var. *minima* Haworth
Stauroneis smithii var. *minuta* Haworth [orthographic error]
Stauroneis stodderi Greenleaf

Staurophora amphioxys (Greg.) D.G.Mann *in* Round, Crawford & Mann

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Staurosira brevistriata Grunow (see note 33)
Fragilaria brevistriata Grunow
Staurosira capucina Borzsc. (see note 33)
Fragilaria capucina Desm.
Staurosira entomon Ehrenb. (see note 33)

Fragilaria entomon (Ehrenb) Ehrenb.
Staurosira mutabilis (W.Sm.) Grunow (see note 33)
Fragilaria pinnata Ehrenb.

Staurosira construens Ehrenb.
Staurosira construens fo. *subsalina* (Hust.) Bukht.
Staurosira construens var. *binodis* (Ehrenb.) Hamilton *in* Hamilton, Poulin, Prévost, Angell & Edlund
Staurosira construens var. *capitata* (Hérib.) Bukht.
Staurosira construens var. *venter* (Ehrenb.) Hamilton

Staurosirella lapponica (Grunow *in* VanHeurck) D.M.Williams & Round
Staurosirella leptostauron (Ehrenb.) D.M.Williams & Round
Staurosirella leptostauron var. dubia (Grunow) M.B.Edlund
Staurosirella leptostauron var. rhomboides (Grunow) Bukht.
Staurosirella pinnata (Ehrenb.) D.M.Williams & Round
Staurosirella pinnata var. *intercedens* (Grunow *in* VanHeurck) Hamilton *in* Hamilton, Poulin, Prévost, Angell & Edlund
Staurosirella pinnata var. *lancettula* (Schum.) Poulin *in* Poulin, Hamilton & Proulx

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Stenopterobia anceps (Lewis) Bréb.
Stenopterobia cruvula (W.Sm.) Krammer
Stenopterobia delicatissima (Lewis) Bréb. *ex* VanHeurck
Stenopterobia intermedia (Lewis) VanHeurck

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*Stephanodiscus alpinus*Hust.
Stephanodiscus astraea(Ehrenb.) Grunow
Stephanodiscus astraea var. *intermedia* Fricke
Stephanodiscus astraea var. *minutula* (Kütz.) Grunow *in* VanHeurck
Stephanodiscus astraea var. *minutulus* (Kütz.) Grunow
Stephanodiscus binderanus (Kütz.) WilliKreig.
Stephanodiscus binderanus var. *oestrupii* (A.Cleve) A.Cleve
*Stephanodiscus carconensis*Grunow
Stephanodiscus carconensis var. *pusilla* Grunow
Stephanodiscus conspiceuporus Stoermer, Håk. & Theriot [orthographic error]
Stephanodiscus conspicueporus Stoermer, Håk. & Theriot
Stephanodiscus dubius (Fricke) Hust.
Stephanodiscus hantzchii Grunow [orthographic error]
Stephanodiscus hantzschii Grunow
Stephanodiscus hantzschii Grunow fo. *hantzschii*
Stephanodiscus hantzschii var. *pusilla* Grunow
Stephanodiscus hantzschii fo. *tenuis* (Hust.) Håk. & Stoermer

Stephanodiscus hantzschii vel. *tenius* [*nom. illegit*.]
Stephanodiscus invisitatus Hohn & Hellerm.
Stephanodiscus kutzingiana [*nom. nud.*]
Stephanodiscus lucens Hust.
Stephanodiscus medius Håk.
Stephanodiscus minutula (Kütz.) Round
Stephanodiscus minutulus (Kütz.) Cleve & Möll.
Stephanodiscus minutus Grunow
Stephanodiscus niagara Ehrenb. [orthographic error]
Stephanodiscus niagarae Ehrenb.
Stephanodiscus niagarae var. *magnifica* Fricke
Stephanodiscus parvus Stoermer & Håk.
Stephanodiscus paruvs Stoermer & Håk. [orthographic error]
Stephanodiscus rotula (Kütz.) Hendey
Stephanodiscus rotula var. *minutula* (Kütz.) Grunow
Stephanodiscus subsalsus (A.Cleve) Hust.
Stephanodiscus subtilis (Van Goor) A.Cleve
Stephanodiscus subtransilvanicus Gasse
Stephanodiscus superiorensis Stoermer & Theriot
Stephanodiscus tenuis Hust.
Stephanodiscus transylvanicus Pant.
Stephanodisus transsylvanicus Pant. [orthographic error]
Stephanodiscus vestibulis Håk., Stoermer & Theriot

Striatella fenestrata (Lyngb.) Kuntze
Striatella flocculosa (Roth) Kuntze

Stsauroneis anceps Ehrenb. [orthographic error]

Surirella amphioxys W.Sm.
Surirella anceps Lewis
Surirella angusta Kütz.
Surirella angusta var. *panduriformis* W.Sm. nomum nudum
Surirella angustata Kütz. [orthographic error]
Surirella apiculata W.Sm.
Surirella bifrons Ehrenb.
Surirella birostrata Hust.
Surirella biseriata Bréb. & Godey
Surirella biseriata var. *bifrons* (Ehrenb.) Hust.
Surirella biseriata var. *bifrons* fo. *amphioxys* (W.Sm.) Hust.
Surirella biseriata var. *bifrons* fo. *punctata* Meister
Surirella biseriata var. *constricta* Grunow
Surirella biseriata var. *diminuta*A.Cleve

Surirella biseriata var. *orientalis* Skvortzov
Surirella brebissonii Krammer & Lange-Bert.
*Surirella cardinalis*Kitton
Surirella delicatissima Lewis
Surirella didyma Kütz.
Surirella elegans Ehrenb.
Surirella gracilis (W.Sm.) Grunow
Surirella guatemalensis Ehrenb.
Surirella iowensis R. L. Lowe
Surirella lagerheimii Cleve
Surirella librile Ehrenb.
Surirella linearis W.Sm.
Surirella linearis var. *constricta* Grunow
Surirella linearis var. *helvetica* (Brun) F.Meister
Surirella minuta Bréb. *in* Kütz.
Surirella molleriana Grunow
Surirella norvegica Eulenst.
Surirella oregonica Ehrenb.
Surirella ovalis Bréb.
Surirella ovalis var. *minuta* VanHeurck
Surirella ovalis var. *pinnata* W.Sm. [orthographic error]
Surirella ovata Kütz.
Surirella ovata var. *africana* Choln.
Surirella ovata var. *crumena* (W.Sm.) Hust.
Surirella ovata var. *pinnata* (W.Sm.) Rabenh.
Surirella ovata var. *salina* (W.Sm.) Rabenh.
Surirella panduriformis W.Sm.
Surirella peisonis Pant.
Surirella pinnata var. *pandurifoemis* (W.Sm.) Hust.
Surirella regina Janisch
Surirella robusta Ehrenb.
Surirella robusta var. *armata* Hust.
Surirella robusta var. *splendida* (Ehrenb.) VanHeurck
Surirella robustior MacKay
Surirella saxonica Auersw.
Surirella sigmoidea Ehrenb.
Surirella spiralis Kütz.
Surirella splendida Ehrenb.
Surirella striata Leud-Fortm.
Surirella striatula Turp.
Surirella suecica Grunow
Surirella suevica Zeller
Surirella tenera Greg.
Surirella tenera var. *nervosa* A. W. F. Schmidt
Surirella tennuis [Orthographic error]
Surirella tenuis Mayer

Surirella tenuissima Hust.
Surirella turgida W.Sm.
Surirella undulata Ehrenb.

Synedra actinastroides Lemm.
Synedra acus Kütz.
Synedra acus var. *angustissima* Grunow *in* VanHeurck
Synedra acus var. *radians* (Kütz.) Hust.
Synedra affinis Kütz.
Synedra amphicephala Kütz.
Synedra amphicephala var. *asiatica* Skvortzov
Synedra amphicephala var. *austraica* (Grunow) Hust.
Synedra amphicephala var. *intermedia* A. Cleve
Synedra capitata Ehrenb.
Synedra capitata var. *fossilis* [*nom. nud.*]
Synedra capucina [*nom. illegit.*]
Synedra chaseii Thomas
Synedra crotonensis Grunow
Synedra crotonensis var. *prolongata* Grunow
Synedra cyclopum Brutschy
Synedra danica Kütz.
Synedra delicatissima W.Sm.
Synedra delicatissima var. *angustissima* Grunow
Synedra demerarae Grunow
Synedra elongatum [*nom. nud.*]
Synedra famelica Kütz.
Synedra fameilica Kütz. [orthographic error]
Synedra familica Kütz. [orthographic error]
Synedra fasciculata (C. Agardh) Kütz.
Synedra fasciculata var. *truncata* (Grev.) R.M.Patrick
Synedra filiformis Grunow
Synedra filiformis var. *exilis* A.Cleve
Synedra gaillonii (Bory) Ehrenb.
Synedra goulardi Bréb.
Synedra goulardi var. *fluviatilis* (Lemm.) Freng.
Synedra hyperborea Grunow
Synedra hyperborea var. *rostellata* Grunow
Synedra incisa Boyer
Synedra laevigata Grunow
Synedra lanceolata Kütz.
Synedra longiceps Ehrenb.
Synedra longissima W.Sm.
Synedra lunaris Ehrenb.
Synedra mazamaensis Sovereign
Synedra menisculus [orthographic error]

Synedra minuscula Grunow *in* VanHeurck
Synedra montana Krasske
Synedra nana F.Meister
Synedra netronoides Hohn & Hellerm.
Synedra ostenfeldii (Kreig.) A.Cleve
Synedra oxyrhynchus Kütz.
Synedra parasitica (W.Sm.) Hust.
Synedra parasitica var. *subconstricta* (Grunow) Hust.
Synedra pulchella Ralfs
Synedra pulchella var. *lacerata* Hust.
Synedra pulchella var. *lanceolata* O'Meara
Synedra radians Kütz.
Synedra rumpens Kütz.
Synedra rumpens var. *familiaris* (Kütz.) Hust.
Synedra rumpens var. *fragilarioides* Grunow
Synedra rumpens var. *meneghiniana* Grunow
Synedra rumpens var. *scotia* Grunow
Synedra rumpens var. ? H.H. Chase [*nom. illegit.*]
Synedra simalongis W.Sm.
Synedra spathulifera Grunow
Synedra splendens Kütz.
Synedra stela Hohn & Hellerm.
Synedra tabulata (C. Agardh) Kütz.
Synedra tenera W.Sm.
Synedra tenuissima Kütz.
Synedra ulna (Nitzsch.) Ehrenb.
Synedra ulna var. *aequalis* (Kütz.) Hust.
Synedra ulna var. *amphirhynchus* (Ehrenb.) Grunow
Synedra ulna var. *biceps* (Kütz.) Kirchn.
Synedra ulna var. *chaseana* Thomas
Synedra ulna var. *chaseii* Thomas
Synedra ulna var. *claviceps* Hust.
Synedra ulna var. *constricta* Venkt.
Synedra ulna var. *contracta* Østrup
Synedra ulna var. *danica* (Kütz.) VanHeurck
Synedra ulna var. *impressa* Hust.
Synedra ulna var. *longissima* (W.Sm.) Brun
Synedra ulna var. *obtusa* (W.Sm.) Grunow
Synedra ulna var. *oxyrhynchus* (Kütz.) VanHeurck
Synedra ulna var. *oxyrhynchus* fo. *mediocontracta* (Forti) Hust.
Synedra ulna var. *spathulifera* (Grunow) VanHeurck
Synedra ulna var. *splendens* (Kütz.) VanHeurck
Synedra ulna var. *subaequalis* (Grunow) VanHeurck
Synedra utermohlii Hust.
Synedra vaucheriae (Kütz.) Kütz.
Synedra vaucheriae var. *capitellata* (Grunow) Cleve

Synedra vaucheriae var. *truncata* (Grev.) Grunow
Synedra vitrea Kütz.

Tabularia fasciculata (C. Agardh) D.M.Williams & Round

Tabellaria fenestrata (Lyngb.) Kütz.
Tabellaria fenestrata var. *asterionelloides* Grunow
Tabellaria fenestrata var. *geniculata* A.Cleve
Tabellaria fenestrata var. *intermedia* Grunow
Tabellaria flocculosa (Roth) Kütz.
Tabellaria flocculosa var. *linearis* Koppen
Tabellaria genestrata [orthographic error]
Tabellaria quadriseptata Knuds.
Tabellaria trinodis Ehrenb.

Terpsinoe musica Ehrenb.

Tetracyclus rupestris (Braun) Grunow

Thalassiosira bramaputrae (Ehrenb.) Håk. & Locker
Thalassiosira fluviatilis Hust.
Thalassiosira incerta Marakova
Thalassiosira guillardii Hasle
Thalassiosira lacustris (Grunow) Hasle
Thalassiosira levanderi Van Goor
Thalassiosira pseudonana Hasle & Heim.
Thalassiosira simplex Hust.
Thalassiosira visurgis Hust.
Thalassiosira weissflogii (Grunow) Fryxell & Hasle

Tropidoneis lepidoptera (Greg.) Cleve
Tropidoneis lepidoptera var. *proboscidea* Cleve

Treyblionella scutellum (Bail.) W.Sm. [orthographic error]

Tryblionella acuta (Cleve) D.G.Mann *in* Round, Crawford & Mann
Tryblionella angustata W.Sm.
Tryblionella angustata var. *acuta* (Grunow) Bukht.

Tryblionella apiculata Greg.
Tryblionella debilis (Arn.) Grunow *in* Cleve & Grunow
Tryblionella gracilis W.Sm.
Tryblionella hungarica (Grunow) D.G.Mann
Tryblionella levidensis W.Sm.
Tryblionella scutellum (Bailey) W.Sm.
Tryblionella victoriae Grunow

Urosolenia eriensis (H. L. Sm.) Round & R.M.Crawford *in* Round, Crawford & Mann
Urosolenia longiseta (Zach.) M.B.Edlund & Stoermer

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TAXONOMIC NOTES AND CONSIDERTATIONS

1. The concept of *Achnanthes biasolettiana* (Kütz.) Grunow carried at the Center for Great Lakes and Aquatic Sciences (formerly the Great Lakes Research Division) was based on Van Heurck 1880-1881. The entities assigned to *Achnanthes biasolettiana* would be best associated with Lange-Beralot and Krammer's *Achnanthes rosenstockii* Lange-Bert. in Lange-Bertalot and Krammer 1989. Bukhtiyatova and Round (1996) based *Psammodictyon abundans* fo. *rosenstockii* on Lange-Bertalot and Krammers's *Achnanthes rosenstockii*. The nomenclatural changes are noted for the morphological entity named *Achnanthes biasolettiana* in publications originating from the Center for Great Lakes and Aquatic Sciences.

2. Lange-Bertalot (1993) has synonymized *Achnanthes gracillima* (Meister) Mills non Hustedt 1927. Our speciem is identified in reference to the Hustedt concept emended by Foged. Hence the synonymy proposed by Lange-Bertalot is not included here.

3. Simonsen (1987) discusses the basis for transferring *Eucconeis lapponica* Hust. to *Achnanthes quadrataera* (Østrup) Möller *ex* Foged. Lange-Bertalot in Lange-Bertalot and Krammer (1989) suggests *Achnanthes lapponica (Eucocconeis lapponica)* be transferred to *Achnanthes laevis* var. *quadratarea* (Østrup) Lange-Bert. *in* Lange-Bert. & Krammer. Lange-Bertalot also suggested

Achnanthes lapponica var. *ninckei* be transferred to *Achnanthes laevis* var. *ninckei* (H. Guermer & Mang.) Lange-Bert. *in* Lange-Bert. & Krammer. Round, Crawford and Mann (1990) suggested *Eucocconeis* be considered a valid genus closely related to both *Achnanthidium* and *Cocconeis*. We retain the *Eucocconeis* designation pending further investigation into this little studied, complex group.

4. The citation *Psammothidium levanderi* (Hust.) Czarn. *in* Czarn. & Edlund is an error in Bukhtiyarova and Round 1996. *Psammodictyon* was erected in 1996 and Czarnecki and Edlund effected the change to *Achnanthidium* in 1995.

5. Lange-Bertalot in Lange-Bertalot & Krammer (1989) place *Achnanthes sublaevis* Hust. in synonymy with *Achnanthes ventralis* (Krasske) Lange-Bert. *in* Lange-Bert. & Krammer.

6. *Amphora hemicycla* Stoermer and Yang 1971
The original publication of this name has in the protologue *Amphora hemycyla* with the plate legend having *Amphora hemicycla*. Stoermer (1980)used *Amphora hemicycla* suggesting this is the intended name. Support for this argument is the plate legend and the habitat description of the taxon being primarily benthic in the protologue. It is suggested the original publication contains an orthographic error and the proper spelling of the specific epithet should be *hemicycla* not *hemicyla*. (Another interpretation for this may be *hemicyla* is not a proper word and subsequently needs to be corrected).

7. Krammer and Lange-Bertalot (1985) propose *Amphora submontana* Hust. as asynonym of *Amphora montana* and cite their synonymy decision in 1986. Simonsen (1987) claims the wrong slide (i.e. specimen) was used for the decision. Lange-Bertalot and Krammer (1987) acknowledge the correct Hustedt type and maintain their synonymy. The resolution of this problem requires careful examination of the Hustedt and Krasske types along with other collections to determine the variablity existing within the taxa to determine whether there are two distinct taxa or one taxon with a degree of variability.

8. This transfer has not been made by the authors indicated, neither is the transfer legitimate as *Anomoeoneis sphaerophora* is the type of *Anomoeoneis*.

9. In the Krammer and Lange-Bertalot Bacillariophyceae (1986, 1988, 1991a, 1991b) the minor genera in the Fragilariaceae (i.e. *Hannaea*) are combined into *Fragilaria*. We prefer to keep the classical smaller genera along with the modern approach.

11. The original list (Stoermer and Kreis 1978)had *Fragilaria minuscula* Grunow. Williams and Round (1987) created a new combination *Fragilaria miniscula* (Grunow *in* Van Heurck) with the basionym *Synedra miniscula* Grunow*in* Van Heurck. We have been unable to determine if our record is conspecific with the synonymy of Williams and Round.

12. Krammer & Lange-Bertalot consider *Fragilaria vaucheriae* and its varities to be *Fragilaria capucina*.

13. Lange-Bertalot & Reichardt *in* Lange Bertalot 1993 consider *Gomphonema acuminatum* var. *turris* (Ehrenb.) Cl. *sensu* Fricke to be *Gomphonema contraturris* Lange-Bert. & Reichardt. The application of this synonymy to the Great Lakes specimens needs further investigation.

14. Reichardt and Lange-Bertalot (1991) consider *Gomphonema intricatum* to be *Gomphonema dichotomum*Kütz. This is also suggested in Krammer and Lange-Bertalot (1991a, p. 416).

15. Reichardt and Lange-Bertalot (1991) consider *Gomphonema intricatum* var. *pumila* to be *Gomphonema pumilum* (Grunow) Krammer & Lange-Bert. This is also suggested in Krammer & Lange-Bertalot (1991a, p. 416).

16. Reichardt & Lange-Bertalot (1991) consider *Gomphonema intricatum* var. *vibrio* to be *Gomphonema vibrioides* Krammer & Lange-Bert.

17. In Patrick & Reimer (1975) *Gomphonema subclavatum* var. *mexicanum* (Grunow) R.M.Patrick is included and the name is credited as having been publilshed in Hohn (1961). In Hohn (1961) the name appears only in a list. There is no written description or any indication that it is a new variety. The name is invalidly published according to the International Code of Botanical Nomenclature (Greuter et al. 1994).

18. The synonymy reported in the original list which had *Gyrosigma kuetzingii* as a synonym of *Gyrosigma spencerii* (Stoermer and Kreis 1978) is incorrect according to Sterrenberg (1995). The synonymy is incompatable with the taxon bearing the superfluous and illegitimate name *G. spencerii* (Sterrenburg 1995).

19. Lange-Bertalot (1993) has proposed *Hantzschia amphioxys* (Ehrenb.) Grunow *pro parte* to be *Hantzschia abundans*. In order to apply this synonymy re-examination of the Great Lakes records needs to be conducted.

20. *Melosira crenulata* (Ehrenb.) Kütz. and *Melosira crenulata* var. *tenuis* Kütz. present problems of interpretation. These are old names which by contemporary standards were dumping grounds for *Melosira* specimens. Records at the Academy of Natural Science of Phildelphia Diatom Herbarium demonstrate the problem. Each of the Academy's records have samples associated with them so that verification can be made. Among the many records for *Melosira crenulata* there are seven different *Melosira* taxa listed in synonomy for various collections. Until we are able to examine the Great Lakes collections on which the *M. crenulata* records were based it would be most prudent to leave the names as they stand without attempts to suggest synonyms.

21. This combination comes from Krammer and Lange-Bertalot (1991a, p. 14) but R. M. Crawford has not made the transfer (personal communication, Crawford).

22. Lange-Bertalot (1993) places *Navicula cari* Ehrenb. *sensu* Hustedt into his manuscript name *Navicula cariocincta* Lange-Bertalot. This synonymy is an attempt to clarify a taxonomic problem in this group of *Navicula;* however, it only adds to the confusion. The name *Navicula cariocincta* does not meet the criteria for valid publication (Greuter et al. 1994).

23. In order to apply the synonymy proposed by Krammer & Lange-Bertalot (1986) for *Navicula hustedtii* fo. *obtusa* a thorough examination of the taxa *Navicula latersotrata* Hust., *Navicula hustedtii* fo. *obtusa* Hust., *Navicula hustedtii* fo. *japonica* Hust., and *Navicula absoluta* Hust. needs to be conducted.

24. Krammer & Lange-Bertalot (1986) have synonymized the *Navicula kotschyi* Grunow *sensu* Hust. *non* Grunow (Hustedt 1930) with *Navicula pseudokotschyi* Lange-Bert. There is sufficient difference between *Navicula kotschyi* Grunow *sensu* Hust. *non* Grunow and *Navicula kotschyi* Grunow to warrant caution in placing the synonymy in the list. We have not been able to verify the record of *N. kotschyi* Grunow with a reference specimen to ascertain which concept was employed at the time of identification.

25. Lange-Bertalot (1980) demonstrated *Navicula lanceolata sensu* Agardh, *Navicula lanceolata* Agardh *sensu* Kütz. *Navicula lanceolata* Agardh *sensu* Ehrenb. and *Navicula lanceolata* Agardh *sensu* Hust. to be three different species.

Navicula lanceolata (C.Agardh) Ehrenb. = *Navicula lanceolata*(C.Agardh) Ehrenb.
Navicula lanceolata (C.Agardh) Kütz. = *Navicula trivialis* Lange-Bert.
Navicula lanceolata (C.Agardh) Kutz. *sensu* Hust. = *Navicula pseudolanceolata* Lange-Bert.

We could assume the majority of *Navicula lanceolata* records were identified with either Hustedt (1930) or Patrick and Reimer (1966) which presents problems. Both authors cite (C.Agardh) Kütz. as the authority for the taxon. Patrick states having examined the Agardh type and established a lectotype (Agardh Herb. Lund No. 3401 "*Frustulia lanceolata*" Ge.B.A. +4) then gives Kützing as the authority. Adopting the synonymy of Lange-Bertalot (1980)would result in the following:
If Hustedt 1930 was used to identify a specimen the synonymy is:

Navicula lanceolata (C.Agardh) Kütz. = *Navicula pseudolanceolata* Lange-Bert.

If Patrick and Reimer (1966) was used to identify a specimen the synonymy is:

Navicula lanceolata (C.Agardh) Kütz. = *Navicula trivialis* Lange-Bert.

This is unsettling as Patrick in Patrick and Reimer (1966) clearly indicates Pl. 48, fig. 20 as a drawing of the Lectotype. This would mean identifications made using Patrick and Reimer (1966) and citing Pl. 48, fig. 20 represent the Agardh type and should not be considered *Navicula trivialis* Lange-Bert. which would be the case if one were to just do "paper taxonomy".

26. It is unlikely the record of *Navicula longirostris* is correct as the questionable transfer of *N. longirostris* to *Proschkinia* would suggest a marine diatom in the Great Lakes.

27. Van Landingham 1975 suggested *Navicula stauroptera* var. *parva* (Ehrenb.) Grunow to be a synonym of *Pinnularia parva* (Ehrenb.) Greg. This suggestion is not tenable based on original illustrations of the taxa. *Navicula stauroptera* var. *parva* (Ehrenb.) Grunow is weakly capitate with a stauroid central area reaching the margin of the valve and striae which are radiate at the center and convergent at the poles while *Pinnularia parva* (Ehrenb.) Greg. has rounded ends, a small central area which does not extend to the margin and striae radiate throughout the valve. Based on the valve outline, strial pattern and central area the two taxa do not appear to be similar. *Navicula stauroptera* var. *parva* (Ehrenb.) Grunow appears to be a *Pinnularia* but does not appear to be *Pinnularia parva* as VanLandingham suggests. Resolution of this problem requires examination of the type specimens.

28. The synonomy suggested by Van Landingham 1975 is untenable. O'Meara's illustration of

Navicula termes does not resemble Ehrenberg's 1841(1843) illustrations of *Pinnularia termes*. Although Ehrenberg's description is brief his illustration suggests a specimen with striae crossing the valve face while O'Meara's illustration has striae at the margin. The outlines are only superficially similar. Resolution of this problem requires investigation of the type specimens.

29. Our record of *Navicula tumida* Wm. Sm. appears to be a literature record as record of this taxon has not been located in the Center archives. It was listed in the first checklist (Stoermer and Kreis 1978). At that time the synonymy of *Navicula anglica* was presented. This should not be considered an orthographic error noting *Navicula tumida* Wm. Sm. is not to be confused with *Navicula tumida* Bréb. *ex* Kütz. Smith (1853) named a freshwater diatom from Bramley near Guildford, *Navicula tumida. Navicula tumida* Breb. *ex* Kutz. has been long associated with *Scoliopleura* and Mann in Round Crawford and Mann (1990) erected the genus *Scolioneis* with the type species *Navicula tumida* Breb *ex* Kutz. Hence the two should not be confused.

According to Krammer and Lange-Bertalot 1986 the systematics and nomenclature of the species complex comprising *Navicula dicephala, Navicula elginensis, Navicula anglica* and *Navicula exigua* is exceedingly complicated. Unfortunately their work has done little to uncomplicate the problem.

Krammer and Lange-Bertalot (1985) state on p. 90 that *Navicula tumida* is synonymous with *Navicula anglica* and *Navicula elginensis.* Then in 1986 Kammer and Lange-Bertalot state on p. 136 that *Navicula tumida* Wm. Sm. *non* Breb. *ex* Kutz. is synonymous with *Navicula elginensis* (Greg.) Ralfs in Pritchard and on p. 167 *Navicula tumida* Wm. Sm. *sensu* Grunow is synonymus with *Navicula pusilla* Wm. Sm. In both 1985 (p. 86) and 1986 (p. 137) Krammer and Lange-Bertalot state that *Navicula anglica* Ralfs *sensu* Hustedt 1930 is a new taxon, *Navicula pseudanglica,* and *Navicula anglica* Ralfs is synonymous with *Navicula elginensis* (Greg.) Ralfs (1985 p. 55 and 1986 p. 136).

This would lead us to the conclusion that our *Navicula tumida* Wm. Sm. and its suggested synonym *Navicula anglica* Ralfs should be *Navicula pseudanglica* Lange-Bertalot because most likely the species concept was based on the Hustedt (1930) presentation rather than that of Ralfs.

Cox (1987) resurrects *Placoneis* and suggests *Navicula pseudanglica* Lange-Bertalot for the basionym of *Placoneis pseudanglica* Cox. Cox (1987) admitting the systematics is confused bases her revision on Lange-Bertalot's interpretation of the nomenclatural history. So our *Navicula tumida* Wm. Sm. then should be named *Placoneis pseudanglica* Cox. However, if the identification of *Navicula tumida* was based on Wm. Smith Smith (1853) and not Hustedt's presentation then *Navicula tumida* should be *Navicula elginensis* according to Lange-Bertalot and *Placoneis elginensis* according to Cox.

It is considered best at this time to leave *Navicula tumida* Wm. Sm. without assigning a synonym until a specimen is located and examined in light of the recent approaches.

30. Depending on which Hustedt reference is used (Hustedt 1953, 1959) Lange-Bertalot *in* Krammer & Lange-Bertalot (1988) maintains different synonymies.
1953, *Nitzschia graciloides* = *Nitzschia gracilis* Hantz.
1959 *Nitzschia graciloides* = *Nitzschia graciliformis* Lange-Bert. & Simonsen

31. Bukhtiyarova (1995) proposed a number of nomenclatural changes, a few of which we disagree

with. It is our considered opinion that *Nitzschia longissima* fo. *parva* is not synonymous with *Nitzschia reversa* and *Nitzschia palea* var. *tenuirostris* is not synonymous with *Nitzschia capitellata.* Accordingly we have not incorporated these changes to the list.

32. Krammer (1992) transferred *Pinnularia interrupta* var. *crassior* (Grunow) Cleve to *Pinnularia lindii* Krammer. The concept of *P. interrupta* var. *crassior* carried at the Center for Great Lakes and Aquatic Sciences (fromerly the Great Lakes Research Division) is more consistent with *Pinnularia subrostrata* (A.Cleve) A.Cleve. Records from the Center for Great Lakes and Aquatic Sciences for *P. interrupta* var. *crassior* should be considered *P. subrostrata*, not *P. lindii*. Without further investigation we refrain from following the synonomy proposed by Van Landingham (1978)for *P. subrostrata*.

33. These *Staruosira* designations are not in accordance with the modern usage of Williams & Round 1987. They are from the first checklist (Stoermer and Kreis 1978) and represent literature reports of *Staurosira*.

34. Krammer suggests *Cymbella ventricosa* C.Agardh contains the concepts of both *Encyonema silesacum* (Bleisch *in* Rabenh.) D.G.Mann *in* Round, Crawford & Mann pro parte and *Encyonema minutum* (Hilse *in* Rabenh.) D.G.Mann in Round, Crawford & Mann pro parte. Accepting Krammer's suggestion requires individual examination of *Cymbella ventricosa* records to ascertain the appropriate *Encyonema* designation.

35. The original checklist (Stoermer and Kreis 1978) placed *Gyrosigma spenceri* var. *nodiferum* in synonymy with *Gyrosigma nodiferum.* Reimer in Patrick and Reimer (1966) created a new combination *Gyrosigma nodiferum* based on *Gyrosigma spenceri* var. *nodiferum.* Sterrenberg (1994) claims *Gyrosigma nodiferum* is his *Gyrosigma reimeri.* Additionally, Sterrenberg (1994) asserts the concept of *Gyrosigma spenceri* var. *nodiferum* (as *Gyrosigma nodiferum*) in Krammer and Lange-Bertalot 1986 differs from that of Reimer in Patrick and Reimer (1966). *Gyrosigma nodiferum* (*Gyrosigma spenceri* var. *nodiferum*) in Krammer and Lange-Bertalot 1986 is more properly *Gyrosigma sciotoense* while *Gyrosigma nodiferum* (*Gyrosigma spenceri* var. *nodiferum*) in Patrick and Reimer (1966) is *Gyrosigma reimeri.* Reports prior to 1966 containing *Gyrosigma spenceri* var. *nodiferum* should be examined to determine which concept should apply and reports after 1986 also need re-examination to determine which concept should apply, i.e. *Gyrosigma reimeri* or *Gyrosigma sciotoense.*

For Your Information...

1. This home page is best viewed and used with a browser such as Netscape 2.02 or a more recent version, and your computer should have a high-end graphics resolution capability and a wide screen.

2. The taxonomy presented is not always up to the modern standard. Much of the original taxonomic work was done in the 1970's. Since this is a work in progress, we are working to constantly update it as time permits.

3. The first set of measurements given on each species card refer to the first diatom image. In the species cards, measurements for length, width, and diameter are given in micrometers unless otherwise noted. Measurements per 10 micrometers are given for striae, costae, areolae, fibulae, keelpunctae, and punctae unless otherwise noted.

4. All species card images are from the collection number noted unless otherwise specified. When the collection number is selected, information about the collection site will appear at the top of the page.

5. When selecting a reference listed on a species card, the complete reference will appear at the top of the page. When selecting any other link on a species card, the result will appear at the top of the page. Select "Back" to return to the previous position on the species card; otherwise, select a button to leave the current species card.

6. For each genus, taxa which have not been identified to the species level are treated as species *incertae sedis* and are given numerical designations.

7. All diatom images are captured in transmitted light or bright field unless specified as: DIC=differential interference contrast; PC=phase contrast; DF=dark field; SEM=scanning electron micrograph; TEM=transmission electron micrograph.

8. Foreign characters, letters with diacritical marks, and other symbols may not translate exactly. We will make amendments if possible.

9. We wish to acknowledge permission from Diatom Research to include plates of SEM's from their journal in some of our species cards.

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- Algal Microscopy & Image Digitization Home Page (Bowling Green State University)
- California Academy of Science Home Page
- The Farlow Herbarium Diatom Catalog
- Loras College Freshwater Diatom Culture Collection
- Paleolimnology and Diatom Home Pages (Indiana University)
- Provasoli-Guillard National Center for Culture of Marine Phytoplankton Home Page
- The "Seaweed Page"
- University of Texas, Algae Culture Collection
- Mongolian Diatom Home Page

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Publications, Submissions, and Presentations Acknowledging PEET Award

Publications:

1. Edlund, M. B. and M. J. Wynne. 1996. Proposal to conserve the name *Acanthoceras* Honigm. (Bacillariophyceae) against *Acanthoceras* Kutz. (Rhodophyceae). Taxon 45: 529-530.

Submissions:

1. Edlund, M. B. and E. F. Stoermer. Accepted for publication. Taxonomy and morphology of *Amphora calumetica* (Thomas *ex* Wolle) M. Peragallo, an epipsammic diatom from post-Pleistocene large lakes. Paper accepted for publication in the Proceedings the 14th International Diatom Symposium, Tokyo.

2. Edlund, M. B. and E. F. Stoermer. Accepted for publication. Ecological, evolutionary, and systematic significance of diatom life histories. J. Phycol.

3. Edlund, M. B. and L. A. Brant. Accepted for publication. *Frustulia bahlsii* sp. nov., a freshwater diatom from the eastern U S A. Diatom Research.

4. Julius, M. L., G. F. Estabrook, M. B. Edlund and E. F. Stoermer. Accepted for publication. Recognition of taxonomically significant clusters near the species level, using computationally intense methods, with examples from the *Stephanodiscus niagarae* complex. J. Phycol.

5. Julius, M. L., E. F. Stoermer, C. M. Taylor and C. L. Schelske. Submitted for publication. Local extinction of *Stephanodiscus niagarae* Ehrenb. (Bacillariophyta) in the recent limnological record of Lake Ontario. J. Phycol.

6. Stoermer, E. F. and M. B. Edlund. Accepted for publication. No paradox in the plankton? - Diatom communities in large lakes. Paper accepted for publication in the Proceedings of the 14th International Diatom Symposium, Tokyo.

7. Stoermer, E. F. Submitted for publication. Thirty years of diatom studies on the Great Lakes. J. Great Lakes Res.

Presentations with Published Abstracts:

1. Alger, A. S., E. F. Stoermer and D. M. McKnight. 1997. Factors influencing algal abundance and species distribution in melt water stream in Taylor Valley, Antarctica. Phycologia 36 (Suppl.): 1. Abstracts of Papers Presented at the Sixth International Phycological Congress, Leiden, Netherlands.

2. Andresen, N. A. 1996. "Taxonomy and systematics of *Cyclotella*". Presented at the 14th International Diatom Symposium, Tokyo.

3. Bixby, R. J. and E. F. Stoermer. 1997. A preliminary phylogenetic analysis of the diatom genus *Fragilaria sensu lato*. Phycologia 36 (Suppl.): 8. Abstracts of Papers Presented at the Sixth International Phycological Congress, Leiden, Netherlands.

4. Edlund, M. B. and E. F. Stoermer. 1996. Patterns of diatom diversity in large lake ecosystems. Phycologia 36 (Suppl.): 27. Abstracts of Papers Presented at the Sixth International Phycological Congress, Leiden, Netherlands.

5. Edlund, M. B. and E. F. Stoermer. "Taxonomy and morphology of *Amphora calumetica* (Thomas *ex* Wolle) M. Peragallo, an epipsammic diatom from post-Pleistocene large lakes". Presented at the 14th International Diatom Symposium, Tokyo.

6. Edlund, M. B. and E. F. Stoermer. "Auxospore size and expansion in diatoms". J. Phycol. 32(Suppl.): 15.

Abstracts of Papers Presented at the Golden Anniversary Meeting of the Phycological Society of America, Santa Cruz.

7. Julius, M. L. and E. F. Stoermer. "Stratocladistic analysis of the freshwater Thalassiosiraceae". Presented at the 14th International Diatom Symposium, Tokyo.

8. Stoermer, E. F. "Timing and extent of diatom introductions and replacements in the Great Lakes". Special Session on Exotic Species, Annual Meeting of the American Society of Limnology and Oceanography, Santa Fe, New Mexico.

9. Stoermer, E. F. and M. B. Edlund. "No paradox in the plankton? - Diatom communities in large lakes". Presented at the 14th International Diatom Symposium, Tokyo.

Other Presentations

1. Systematics Association meeting.

   "Character resampling: a new technique for evaluating character based group separation," G. Estabrook, M. L. Julius, E. F. Stoermer; presented at the Society for Systematic Biologists Annual Meeting, Missouri Botanical Gardens, St. Louis, Missouri, June 19-23, 1996.

Educational and other Activities

1. "Systematics and Ecology of Diatoms" Class at Iowa Lakeside Laboratory

   Our PEET award provides support for one student per year to assist in the annual diatom course at Lakeside Lab. This both enriches the class and provides experience in teaching diatom systematics. Matt Julius assisted the 1996 class and Becky Bixby assisted in teaching the 1997 class. This year we added a one-week Diatom Clinic primarily for senior investigators working on diatom related projects, and advanced research students. The first year clinic was considered a success, and we hope to continue the experiment next year.

Experience Working In Large Collections.

Our PEET award also provides categorical support for students to gain experience working in large collections. Group visits to the Academy of Natural Sciences, Philadelphia were conducted during spring break 1996 and spring break 1997. Matt Julius spent this past June working at the California Academy of Sciences.

Supplemental Award

Through a supplemental award, E. F. Stoermer and Mark Edlund were able to join an NSF-sponsored expedition organized by the Academy of Natural Sciences of Philadelphia to Lake Hovsgol, Mongolia. Here is a picture of the group, taken in Hatgal, Mongolia, E. F. Stoermer and colleague, pictures of Mark Edlund and Soninkhishig Nadair, collecting at Ar Hel, on Lake Hovsgol, Mark and our self-appointed guide and helper, Gambat collecting near the outlet of Lake Hovsgol, and Mark, with the fruits of his labors, after a long day in the field.

We recovered 150 collections which are presently under study. Some of the interesting species found include:
An unknown species of *Stephanodiscus*;
Didymosphenia siberica, a member of the Baikal endemic swarm;
Cymbella stuxbergii, also found in Lake Baikal.

Meeting of the North American Diatom Symposium

Although this meeting is not directly sponsored by PEET, students and faculty investigators have been active hosting it. NADS will be held at the University of Michigan Biological Station, Pellston. MI, 24-28 September. Dr. Charlie O'Kelly will attend to represent NSF, and the PEET Program in particular.

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Eucentrics

Actinocyclus

Actinoptychus

Aulacoseira

Coscinodiscus

Cyclotella

Cyclostephanos

Ellerbeckia

Melosira

Orthoseira

Skeletonema

Stephanocostis

Stephanocyclus

Stephanodiscus

Thalassiocyclus

Thalassiosira

Araphid

Asterionella

Ctenophora

Diatoma

Fragilaria

Fragilariaforma

Hannaea

Lemnicola

Martyana

Meridon

Opephora

Oxyneis

Pseudostaurosira

Staurosira

Staurosirella

Synedra

Tabellaria

Tabularia

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Monoraphid

Achnanthes

Achnanthidium

Cocconeis

Eucocconeis

Karayevia

Kolbesia

Planothidium

Psammothidium

Pseudostaurosira

Punctastriata

Rossithidium

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Eccentrics

Acanthoceras

Chaetoceras

Pleurosira

Terpsinoe

Urosolenia

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Eunotioid

Eunotia

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Naviculoid

Amphipleura

Amphiprora

Aneumastus

Anomoeoneis

Brachysira

Caloneis

Capartogramma

Cavinula

Chamaepinnularia

Cosmioneis

Craticula

Diadesmis

Diploneis

Entomoneis

Fallacia

Fistulifera

Frustulia

Geissleria

Gyrosigma

Hippodonta

Kobayasia

Luticola

Lyrella

Mastogloia

Mayamaia

Muelleria

Navicula

Neidium

Nupela

Oestrupia

Pinnularia

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Plagiotropis

Pleurosigma

Rouxia

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Cymbelloid

Amphora

Cymbella

Cymbopleura

Didymosphenia

Encyonema

Encyonemopsis

Gomphocymbella

Gomphoneis

Gomphonema

Gomphosphenia

Navicella

Reimeria

Rhoicosphenia

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Nitzschioid

Bacillaria

Cylindrotheca

Cymbellonitzschia

Hantzschia

Nitzschia

Psammodictyon

Tryblionella

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Epithemioid

Denticula

Epithemia

Rhopalodia

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Surirelloid

Campylodiscus

Cymatopleura

Stenopterobia

Surirella

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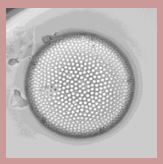
Species

- *Actinocyclus normanii* fo. *subsalsa* (Juhl.-Dannf.) Hust. 

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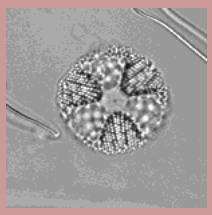
Species

- *Actinoptychus sp. #1* 

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Species

- *Amphipleura arctica* 
- *Amphipleura pellucida* 

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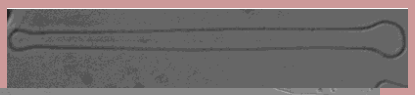
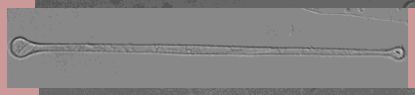
Species

- *Asterionella bleakeleyi* 
- *Asterionella formosa* 
- *Asterionella gracillima* 

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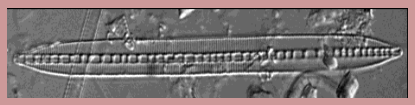
Species

- *Bacillaria paxillifer* 

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Species

- *Capartogramma* sp. #1 

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Species

- *Cocconeis pediculus* 

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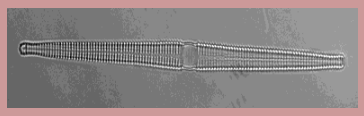
Species

- *Ctenophora pulchella* 

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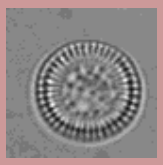
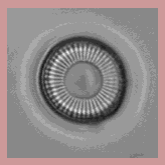
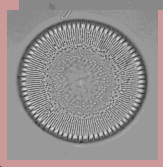
Species

- *Cyclotella americana sensu* Fricke 1900
- *Cyclotella comensis* Grunow in Van Heurck 1882 
- *Cyclotella distinguenda* Hustedt 1927 
- *Cyclotella gamma* Sovereign 1963
- *Cyclotella meneghiniana* Kutz. 1844
- *Cyclotella michiganiana* Skvortzow 1937 
- *Cyclotella planktonica* Brunnthaler 1901 
- *Cyclotella psuedostelligera* Hustedt 1939

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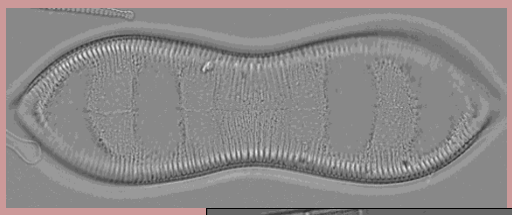
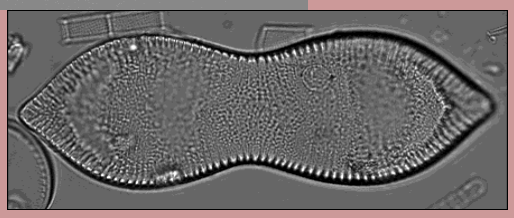
Species

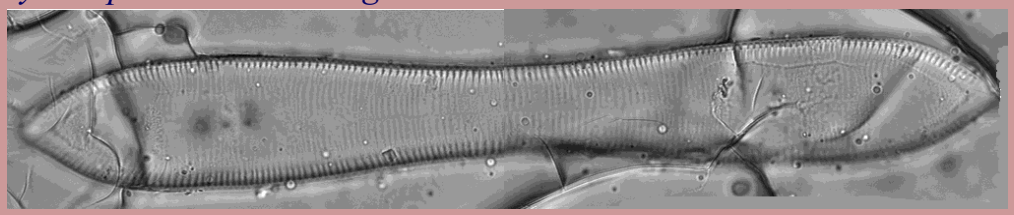
- *Cymatopleura solea*



- *Cymatopleura solea* var. *apiculata*



- *Cymatopleura solea var. gracilis*



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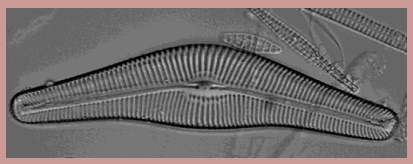
Species

- *Cymbella cistula* var. *gibbosa* 

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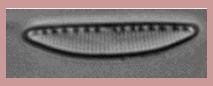
Species

- *Cymbellonitzschia diluviana* 

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Species

- *Denticula lauta* J.W. Bail. 1854 

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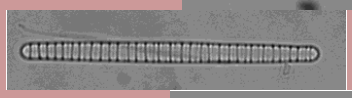
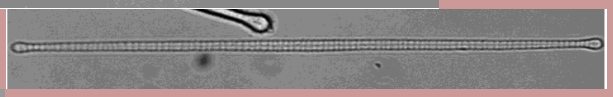
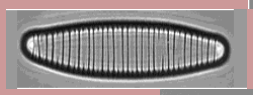
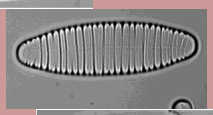
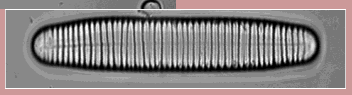
Species

- *Diatoma ehrenbergii* 
- *Diatoma hiemale* var. *mesodon* 
- *Diatoma tenue* Ag. 
- *Diatoma tenue* var. *elongatum* 
- *Diatoma tenue* var. *pachycephala* 
- *Diatoma vulgare* 
- *Diatoma vulgare* var. *breve* 
- *Diatoma vulgare* var. *linearis* 

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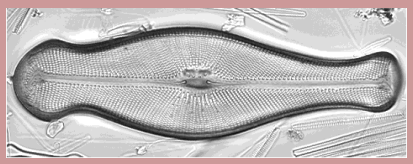
Species

- *Didymosphenia geminata* 

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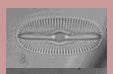
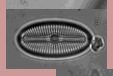
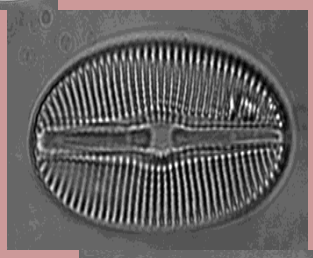
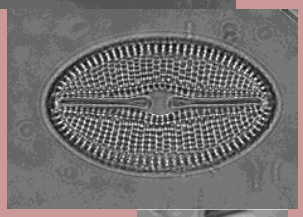
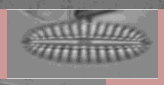
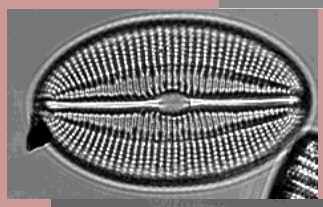
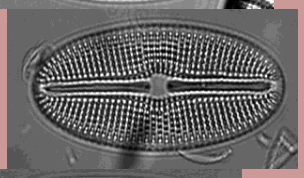
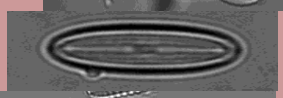
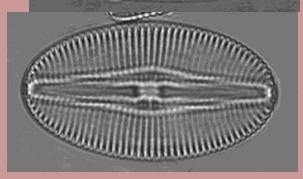
Species

- *Diploneis* sp. 2 
- *Diploneis* sp. 4 
- *Diploneis boltiana* 
- *Diploneis domblittensis* 
- *Diploneis elliptica* var. *pygmaea* 
- *Diploneis finnica* 
- *Diploneis oblongella* 
- *Diploneis oculata* 
- *Diploneis parma* 

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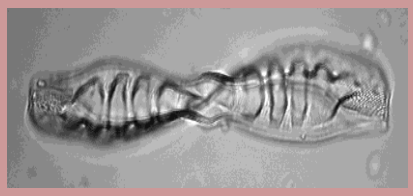
Species

- *Entomoneis ornata*



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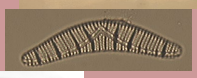
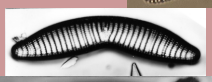
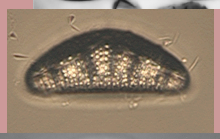
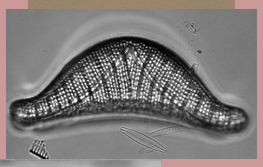
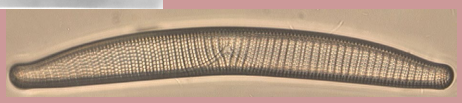
Species

- *Epithemia adnata* 
- *Epithemia adnata* var. *porcellus* 
- *Epithemia adnata* var. *saxonica* 
- *Epithemia argus* var. *alpestrus* 
- *Epithemia emarginata* 
- *Epithemia intermedia* 
- *Epithemia reicheltii* 
- *Epithemia smithii* 
- *Epithemia sorex* 
- *Epithemia turgida* 

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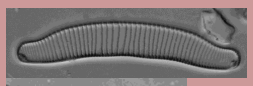
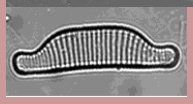
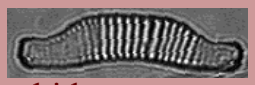
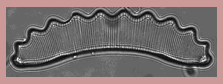
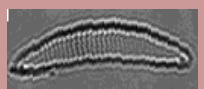
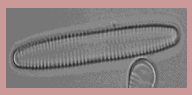
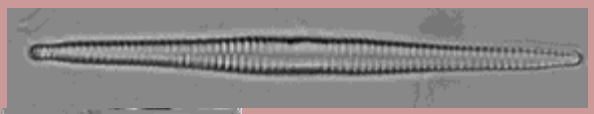
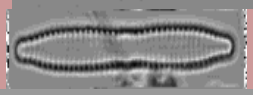
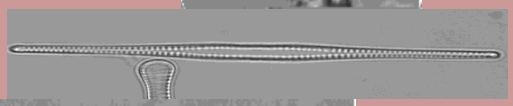
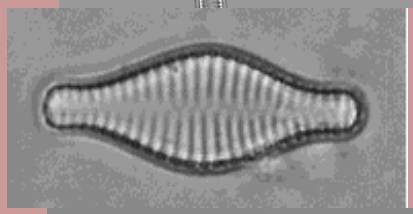
Species

- *Eunotia* sp. 1 
- *Eunotia* sp. 2 
- *Eunotia* sp. 3
- *Eunotia* sp. 4
- *Eunotia* sp. 5
- *Eunotia* sp. 6
- *Eunotia* sp. 7
- *Eunotia* sp. 8
- *Eunotia* arcus
- *Eunotia* arcus v. bidens
- *Eunotia* arcus v. fallax
- *Eunotia* curvata
- *Eunotia* diodon
- *Eunotia* exigua
- *Eunotia* flexuosa 
- *Eunotia* flexuosa v. eurycephala
- *Eunotia* formica
- *Eunotia* incisa
- *Eunotia* microcephala
- *Eunotia* naegelii
- *Eunotia* pectinalis
- *Eunotia* pectinalis v. minor 
- *Eunotia* pectinalis v. ventricasa
- *Eunotia* perpusilla
- *Eunotia* praerupta 
- *Eunotia* praerupta v. bidens
- *Eunotia* praerupta v. inflata
- *Eunotia* septentrionalis
- *Eunotia* serra 
- *Eunotia* tenella
- *Eunotia* trinacria
- *Eunotia* vanheurckii
- *Eunotia* vanheurckii v. 1
- *Eunotia* vanheurckii v. intermedia 

Species

- *Fragilaria capucina* 
- *Fragilaria capucina*var. *lanceolata* 
- *Fragilaria capucina*var. *mesolepta* 
- *Fragilaria crotonensis* 
- *Fragilaria heidenii* 
- *Fragilaria intermedia* 
- *Fragilaria spinosa* 

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Species

- *Gomphocymbella sp. #1* 

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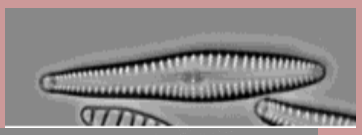
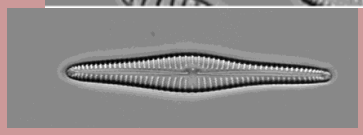
Species

- *Gomphonema germainii* Kociolek and Stoermer 
- *Gomphonema tumens* Kociolek and Stoermer 

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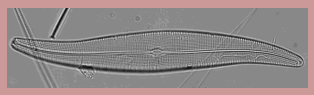
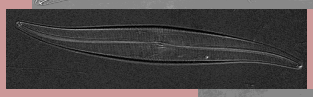
Species

- *Gyrosigma acuminatum* 
- *Gyrosigma attenuatum*
- *Gyrosigma nodiferum* 
- *Gyrosigma spencerii* 
- *Gyrosigma spencerii* var. *curvula* 

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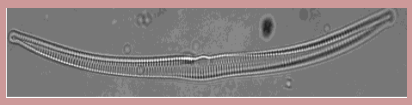
Species

- *Hannaea arcus* 

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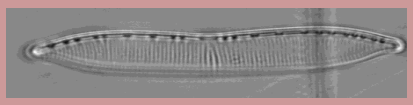
Species

- *Hantzschia amphioxys* 

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Species

- *Martyana martyi* 

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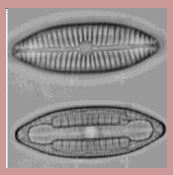
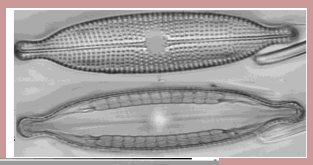
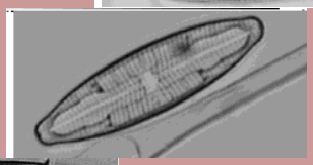
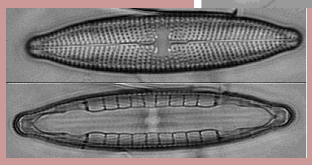
Species

- *Mastogloia grevillei* 
- *Mastogloia smithii* var. *amphicephala* 
- *Mastogloia smithii* var. *lacustris* 
- *Mastogloia smithii* 

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Species

- *Meridion circulare* 
- *Meridion circulare* var. *constrictum* 

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Species

- *Navicula vulpina* 

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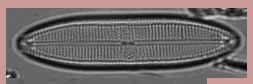
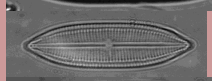
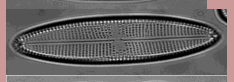
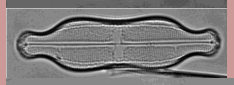
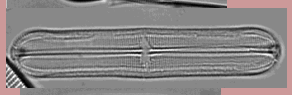
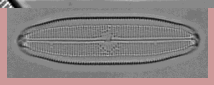
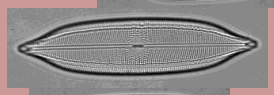
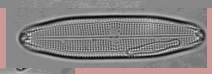
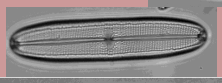
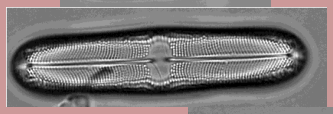
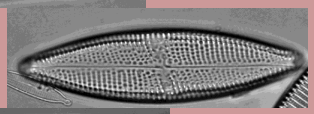
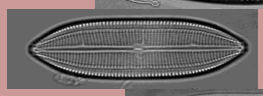
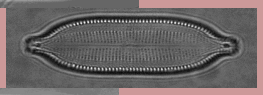
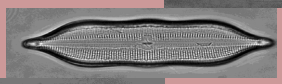
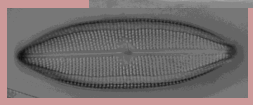
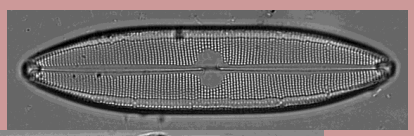
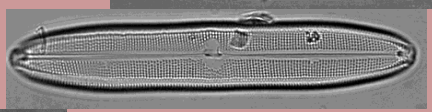
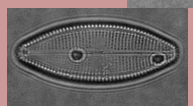
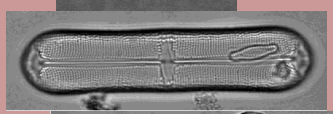
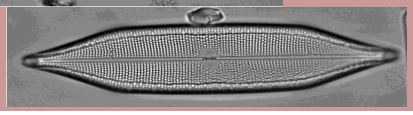
Species

- *Neidium* sp. 2 
- *Neidium* sp. 3 
- *Neidium* sp. 6 
- *Neidium* sp. 7 
- *Neidium* sp. 8 
- *Neidium affine* 
- *Neidium affine* var *amphirhynchus* 
- *Neidium affine* var. *humerus* 
- *Neidium affine* var *undulatum* 
- *Neidium bisulcatum* 
- *Neidium calvum* 
- *Neidium distincte-punctatum* 
- *Neidium dubium* var. 1 
- *Neidium dubium* f. *constrictum* 
- *Neidium hitchcockii* 
- *Neidium iridis* 
- *Neidium iridis* var *amphigomphus* 
- *Neidium iridis*var. *vernalis* 
- *Neidium ladogense* 
- *Neidium mirum* 
- *Neidium sacoense* 

- *Neidium temperei* 

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Species

- *Nitzschia lauenbergiana* Hust. 

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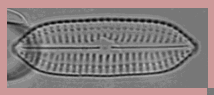
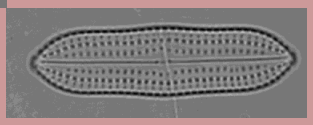
Species

- *Oestrupia zachariasi* 
- *Oestrupia zachariasi* var. *undulata* 

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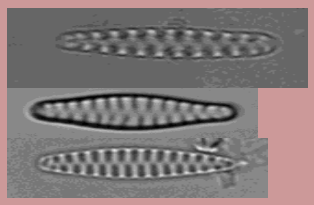
Species

- *Opephora* sp 1
- *Opephora* sp 2
- *Opephora* sp 3



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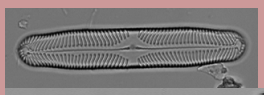
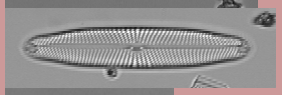
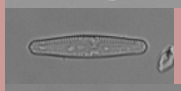
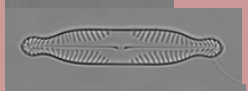
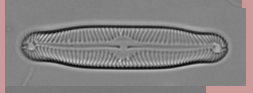
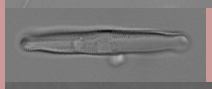
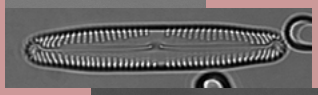
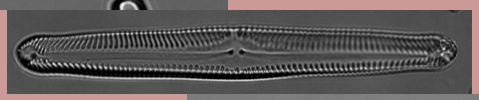
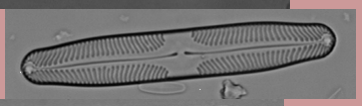
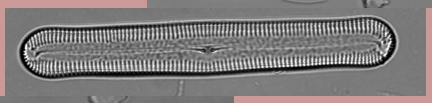
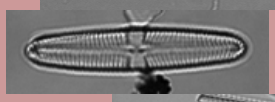
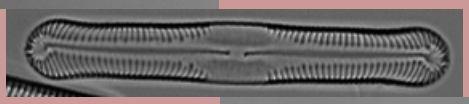
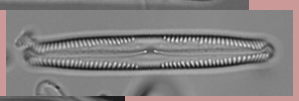
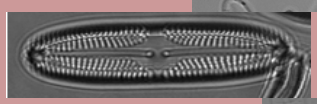
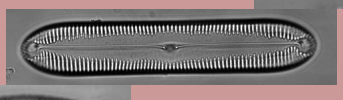
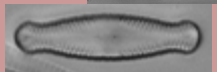
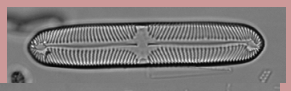
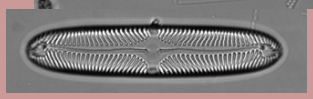
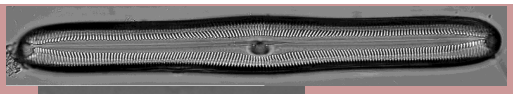
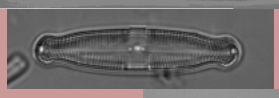
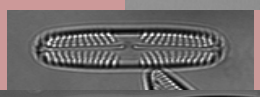
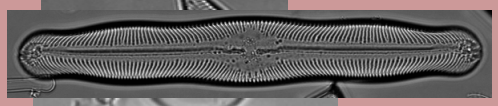
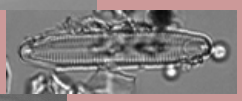
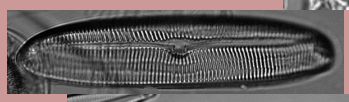
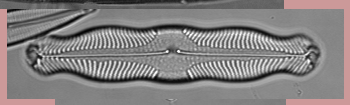
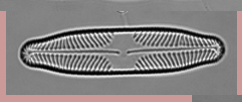
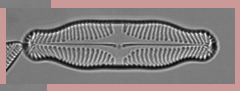
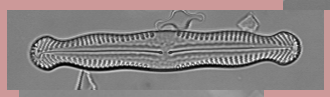
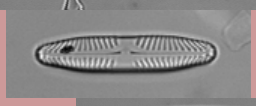
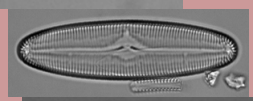
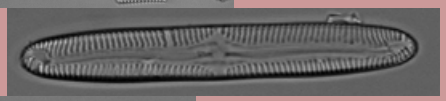
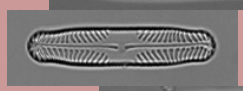
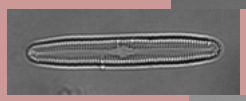
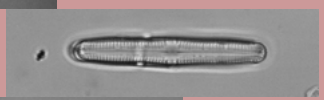
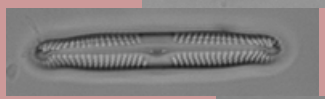
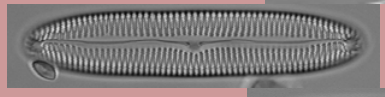
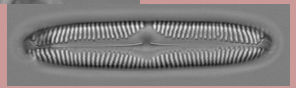
Species

- *Pinnularia* sp. 1 
- *Pinnularia* sp. 2 
- *Pinnularia* sp. 5 
- *Pinnularia* sp. 6 
- *Pinnularia* sp. 7 
- *Pinnularia* sp. 8 
- *Pinnularia* sp. 9 
- *Pinnularia abaujensis* 
- *Pinnularia abaujensis* var. *rostrata* 
- *Pinnularia acrosphaeria* 
- *Pinnularia* aff. *molaris* 
- *Pinnularia biceps* f. *petersenii* 
- *Pinnularia borealis* 
- *Pinnularia brandelii* 
- *Pinnularia braunii* v. *amphicephala* 
- *Pinnularia brebissonii* 
- *Pinnularia brebissoniidimi* var. *diminuta* 
- *Pinnularia brevicostata* 
- *Pinnularia burkii* 
- *Pinnularia divergens* var. *bacillaris* 
- *Pinnularia divergens* var. *elliptica* 

Pinnularia gentilis 

- *Pinnularia globiceps* 
- *Pinnularia globiceps* v. *krockii* 
- *Pinnularia intermedia* 
- *Pinnularia legumen* 
- *Pinnularia leptosoma* 
- *Pinnularia leptosoma* fo. *erlangensis* 
- *Pinnularia major* 
- *Pinnularia mesolepta* 
- *Pinnularia microstauron* 
- *Pinnularia microstauron* f. *binndulata* 
- *Pinnularia nodosa* 
- *Pinnularia obscura* 
- *Pinnularia semicruciata* 
- *Pinnularia stomatophora* 
- *Pinnularia subrostrata* 
- *Pinnularia substomatophora* 
- *Pinnularia tenuis* 
- *Pinnularia tenuis* v. *interrupta* 
- *Pinnularia termitina* 
- *Pinnularia undulata* v. *subundulata* 
- *Pinnularia viridis* 
- *Pinnularia viridis* var. *commutata* 

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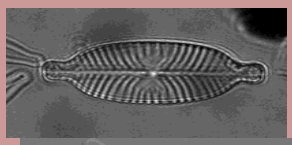
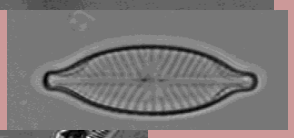
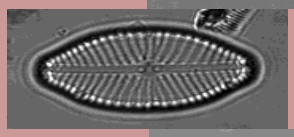
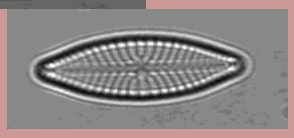
- *Placoneis elginensis* v. *lata* 
- *Placoneis exigua* v. *capitata* 
- *Placoneis gastrum* 
- *Placoneis gastrum*v. *signata* 

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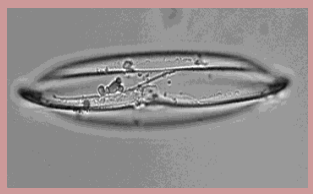
- *Plagiotropis lepidoptera* var. *probascidea*



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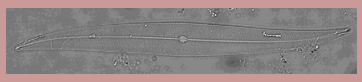
- *Pleurosigma delicatulum* 

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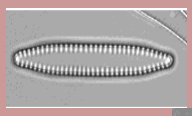
Species

- *Pseudostaurosira brevistriata* 
- *Pseudostaurosira brevistriata* var. *inflata* 

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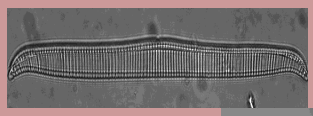
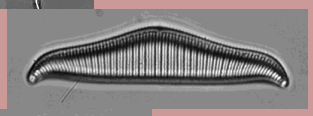
- *Rhopalodia gibba* 
- *Rhopalodia gibba* var. *ventricosa* 
- *Rhopalodia gibberula* 

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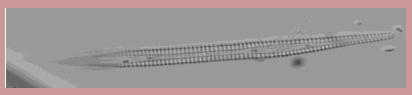
- *Rouxia californica* var. *minuta* 

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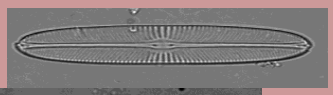
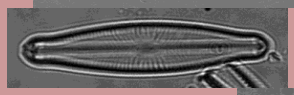
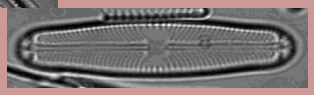
- *Sellaphora bacillum* 
- *Sellaphora pupula* 
- *Sellaphora pupula*v. *rectangularis* 

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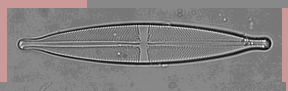
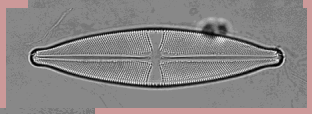
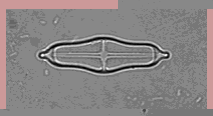
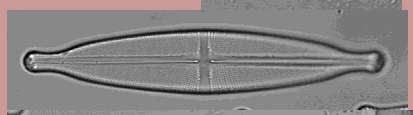
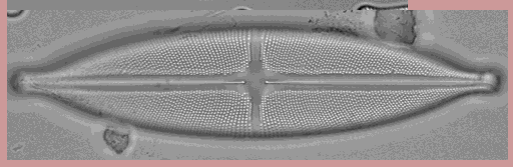
- *Stauroneis anceps* var*americana* Reim. 1961 
- *Stauroneis anceps* f*gracilis* Rahb. 1864 
- *Stauroneis phoenicenteron* Ehr. 1817 
- *Stauroneis smithii* Grun. 1860 
- *Stauroneis sp. 1* 
- *Stauroneis sp. 3* 

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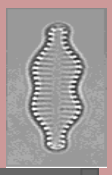
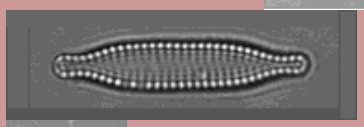
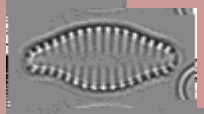
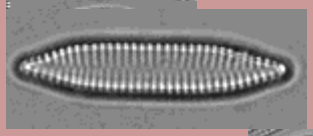
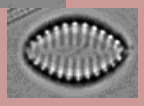
- *Staurosira construens* var. *binodis* 
- *Staurosira* sp. 1 
- *Staurosira* sp. 2 
- *Staurosira* sp. 3 
- *Staurosira* sp. 4 
- *Staurosira construens* var. *venter* 

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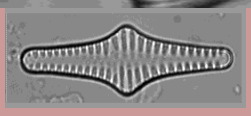
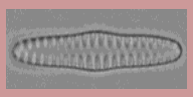
- *Staurosirella leptostauron* 
- *Staurosirella leptostauron*var. *dubia* 
- *Staurosirella leptostauron*var. *fossilis* 
- *Staurosirella pinnata* 
- *Staurosirella pinnata*var. *intercedens* 
- *Staurosirella* sp. 1 

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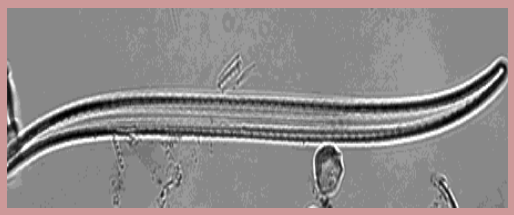
- *Stenopterobia intermedia*



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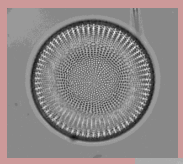
- *Stephanodiscus alpinus* Hust. 
- *Stephanodiscus* sp. aff. *transilvanicus* 

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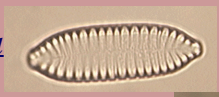
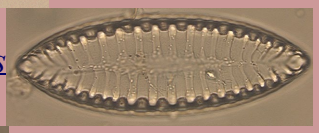
- *Surirella angusta* 
- *Surirella biseriata*var.*bifrons* 
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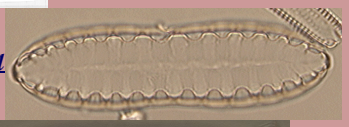
- *Surirella linearis*var.*constricta* 
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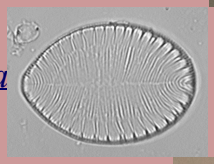
- *Surirella ovata* 
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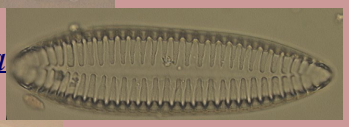
- *Surirella robusta*var.*splendida* 
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- *Surirella* sp. 2 
- *Surirella suecica* 

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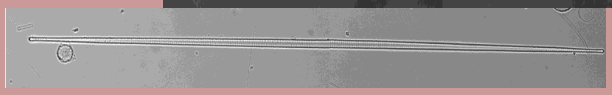
- *Synedra ulna* v. *longissima* 

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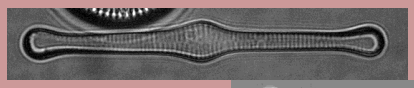
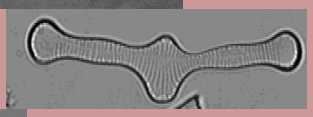
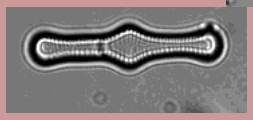
- *Tabellaria fenestrata* 
- *Tabellaria fenestrata* var. *geniculata* 
- *Tabellaria flocculosa* 

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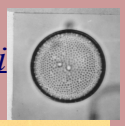
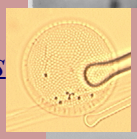
- *Thalassiosira levanderi* 
- *Thalassiosira visurgis* 
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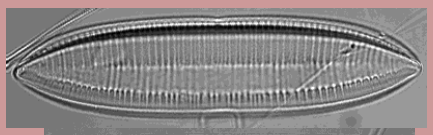
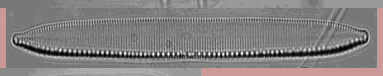
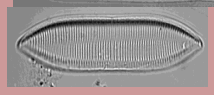
Species

- *Tryblionella gracilis* 
- *Tryblionella hungarica* 
- *Tryblionella levidensis* 

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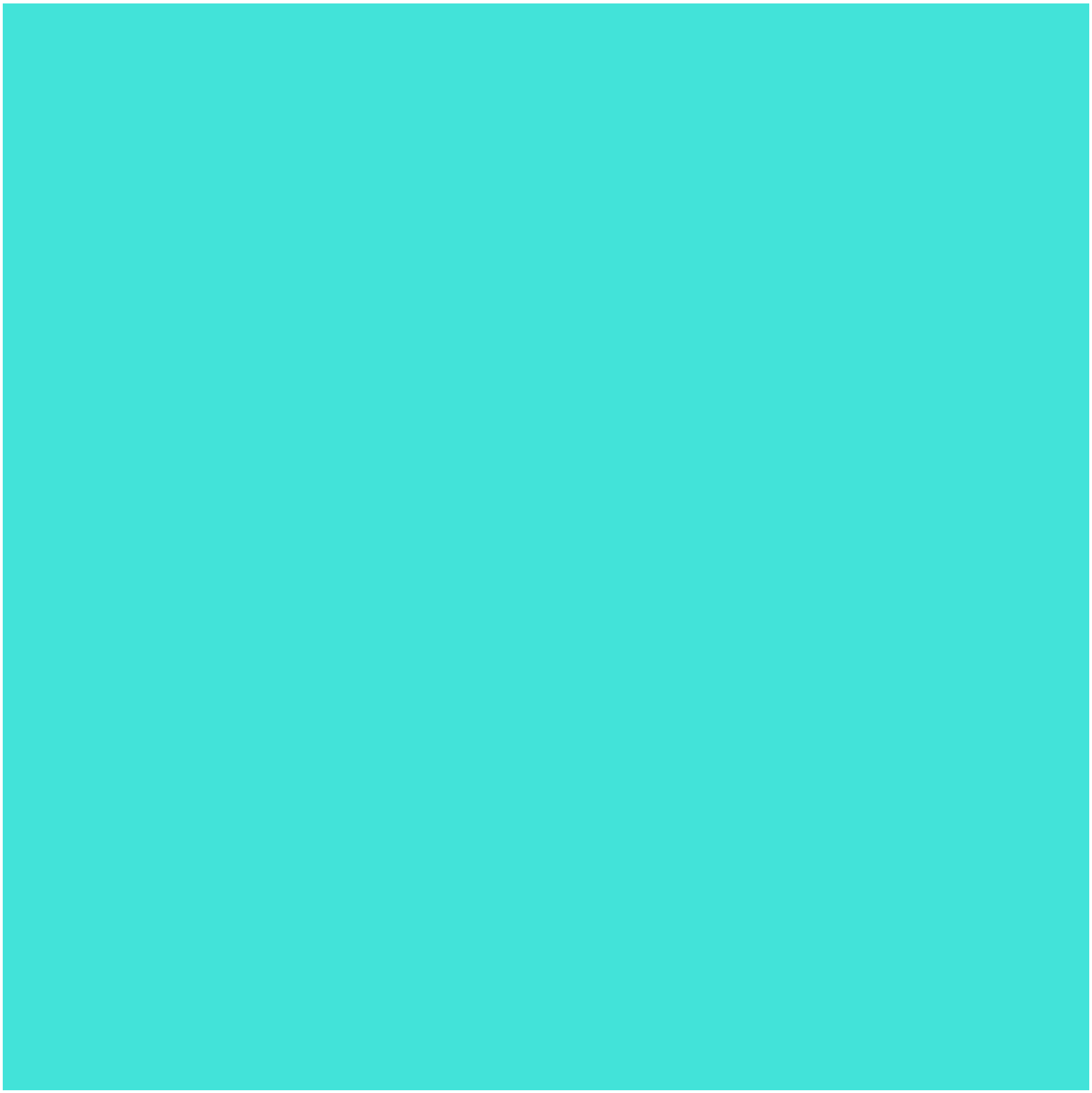

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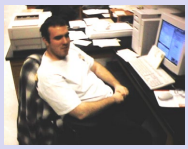
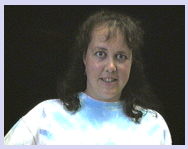
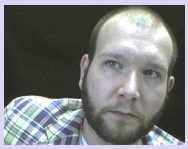
Past contributors to the Great Lakes Diatom Home Page...

 **Marinette Gonzalez** B.S. University of Michigan. Interests in biomedical and DNA research, and the diatom genera *Tabellaria.*	 **Heather Carleton** University of Michigan. Research interests are cell biology, microbiology, and the diatom genera *Rhopalodia*.	 **Adam Koch** University of Michigan computer science major. Primary interests are computer programming and web page development. Diatom interest is *Pinnularia.*
 **Christopher Donar** B.S. Eastern Michigan University, M.S. Eastern Michigan University. Previous research in reservoir paleolimnology. Just beginning work on diatom cell biology and paleolimnological reconstruction.	 **Alex Alger** B.S. University of Colorado. Just beginning work on diatom systematics. Previous research has been on algal communities in Antarctic streams.	 **Rebecca Williams** University of Michigan. Research interests include *Epithemia* and she constructed the Mongolian Diatom Homepage.
Laura Cyrocki B.S. University of Michigan. A multitude of interests including *Didymosphenia.*	**Neel Varde** University of Michigan. Research interests are in chemical engineering/materials science, Sanskrit, and the diatom genus *Eunotia.*	**Gabrielle Tamaska** Freshmen, University of Michigan. School of Natural Resources. From Colorado. Chief interests include the diatom genera*Surirella*, *Thalassiosira* and *Epithemia*. Future goals include the studying of large cats.
 **Becky Bixby** B.S. Albion College, M.S. University of Cincinnati. Just beginning work on the Great Lakes. Previous research in paleoecology.	 **Matt Julius** B.S. Butler University, M.S. University of Michigan. Primary interests are evolutionary rates and processes. Current research is on the genus *Cyclotella bodanica* group within the genus *Cyclotella.*	

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Selected photos from our picture gallery...

Collector of Mongolian diatoms. Be sure to see the PEET products page for more information.

Enthusiastic young diatomists!

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MICHIGAN

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TheLake.gif 300×466 pixels

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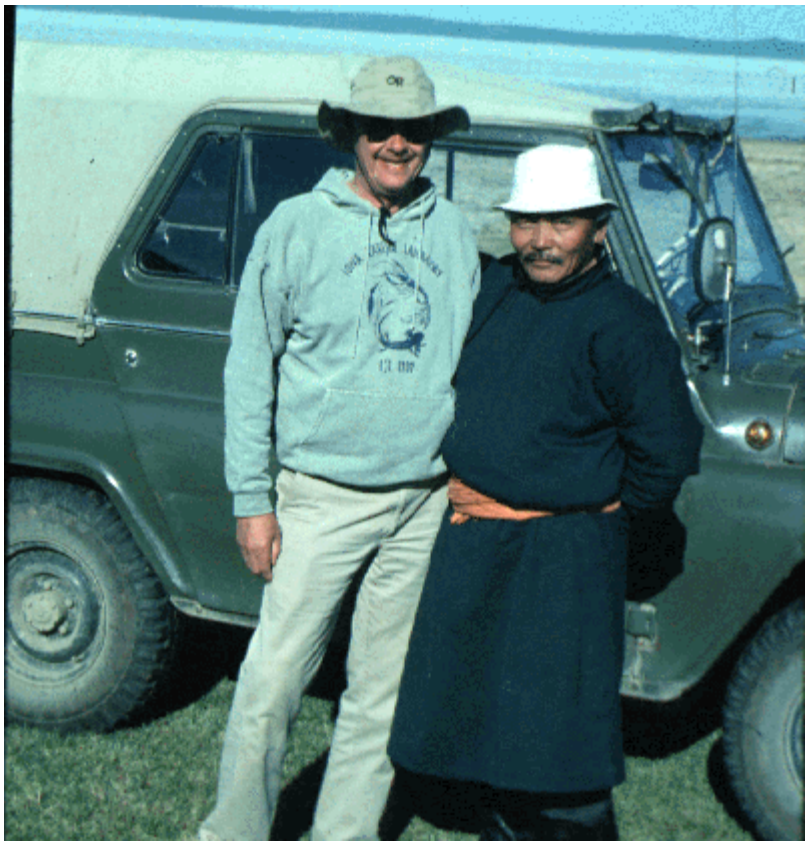

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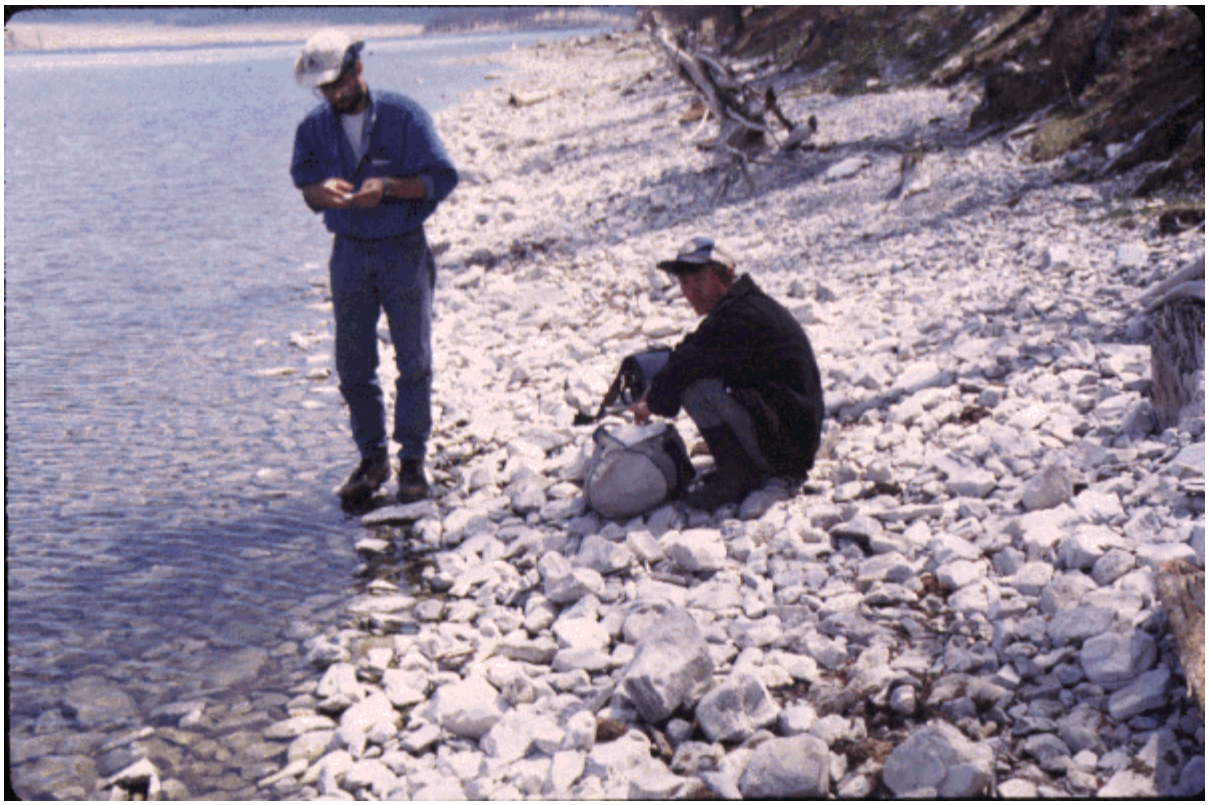
MarkontheLake.gif 600×398 pixels



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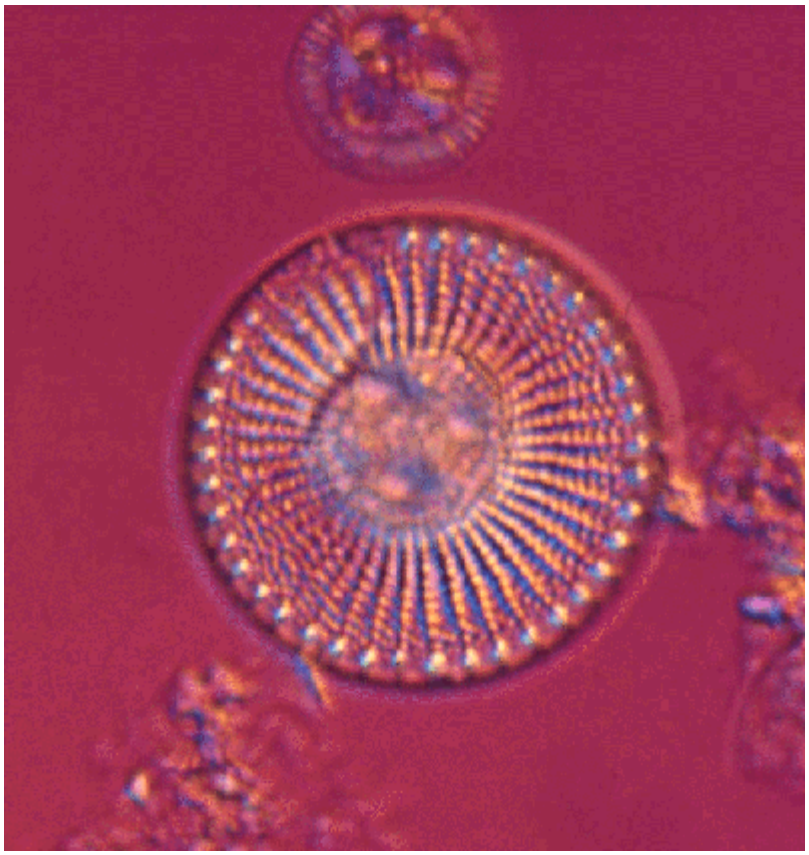
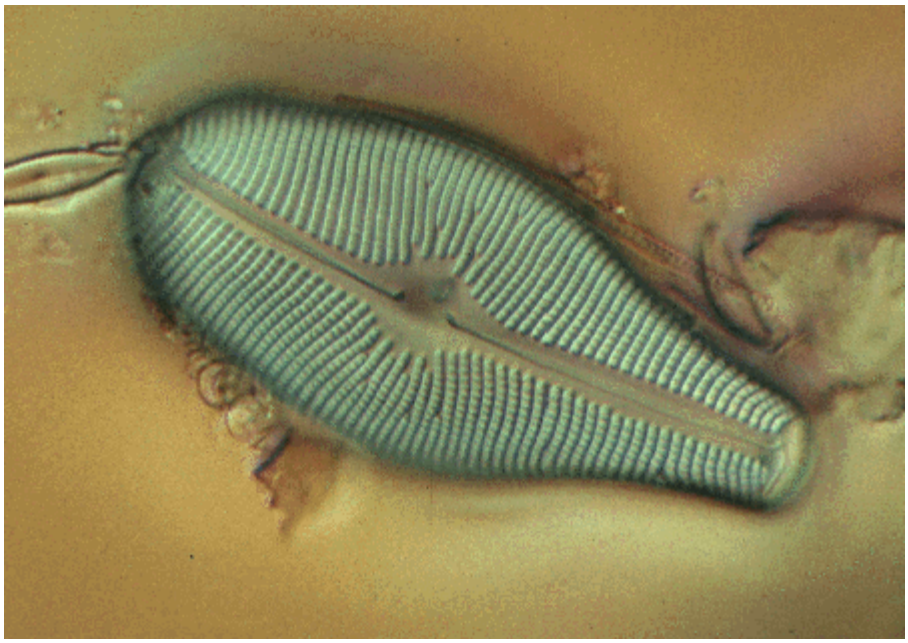
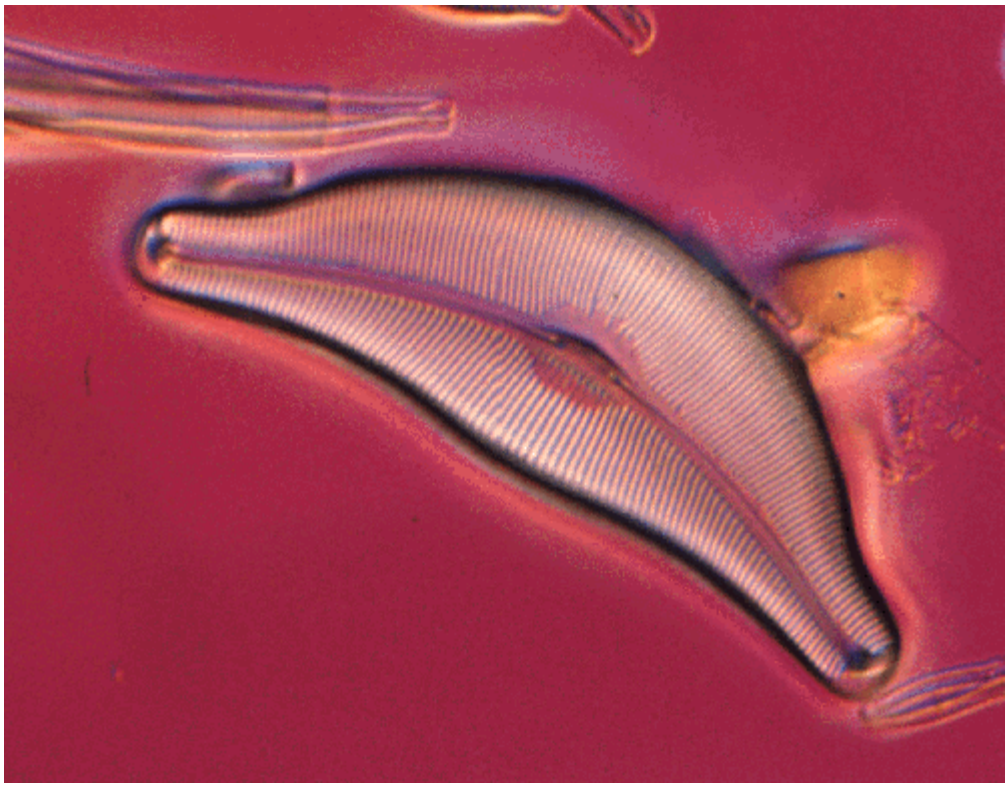


DidymospheniafromMongolia.gif 450×317 pixels



CymbellafromMongolia.gif 500×389 pixels



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Actinocyclus normanii fo. *subsalsa* (Juhl.-Dannf.) Hust. 1957

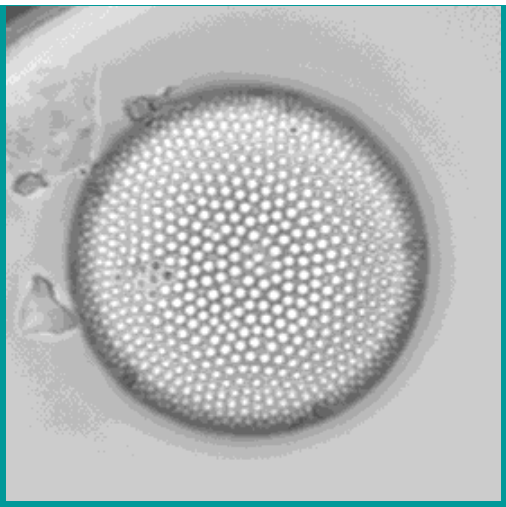
Diameter: 25

Areolae: 8-12

Collection 1141a

Other images

More information



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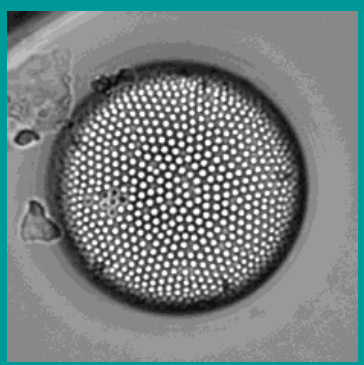
Authority information

Hustedt, F. 1957. Die Diatomeenflora des Fluss-systems der Weser in Gebiet der Hansestadt Bremen. Abh. Naturw. Ver. Bremen 34(3): 181-440.

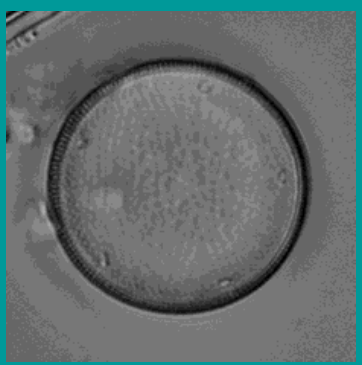
See also: Hasle, G. R. 1977. Morphology and taxonomy of *Actinocyclus normanii* fo. *subsalsa* (Bacillariophyceae). Phycologia 16(3): 321-328.

Other images



Valve view

Labiate processes



DIC, labiate processes

More information

This taxon is considered to be an invading species in the Laurentian Great Lakes (Hasle 1977, Mills et al. 1993). Stoermer et al. (1985) determined the first occurrence of *A. normanii* fo. *subsalsa* to be approximately 1938.
Hustedt (1957) erected two forms, *Actinocyclus normanii* fo. *normanii* and *Actinocyclus normanii* fo. *subsalsa*, based primarily on ecology and size. According to Hasle (1977) no substantial differences were observed between *A. normanii* fo. *normanii* and *A. normanii* fo. *subsalsa* aside from size and ecology so there appears to be no taxonomic reason to keep the forms separate; however she suggested for ecological perspectives the two forms may have some meaning and did not propose combining the taxa.

- **Ecology**
  Stoermer et al. (1985) stated it is one of the few Great Lakes diatoms with its maximum abundance near 20 degrees C. Hohn (1969) identified this taxon as *Coscinodiscus radiatus* in Lake Erie and reported it was most abundant in August and September while it was absent in the colder months of the year. Its late summer pulse first appeared in 1964 in the western basin of Lake Erie. It appears to be common in eutrophic waters (Mills et al. 1993), Green Bay (Stoermer and Yang 1969), Saginaw Bay (Stoermer and Theriot 1983) but uncommon in the offshore waters of Lake Ontario (Stoermer et al. 1974).
  Actinocyclus normanii fo. *normanii* appears to be more common in strongly eutrophic marine to brackish waters while *A. normanii* fo. *subsalsa* appears to be more of a fresh water to brackish form with its greatest concentrations in low Chloride waters (Hustedt 1957).

  - **Synonyms**
    Basionym
    Coscinodiscus subsalsus Juhlin-Dannfelt 1882

    Coscinodiscus subtilis var. *rothii* (Grun.) V.H. Type No. 533, 1855
    Coscinodiscus subtilis var. *fluviatilis* Lemmermann 1898
    Coscinodiscus rothii var. *subsalsa* (Juhl.-Dannf.) Hust. 1928
    Coscinodiscus rothii fo. *minor* Grun. in Van Heurck 1885

    Size ranges and morphology

    - Other morphological features
      *Actinocyclus*is characterized by the presence of a pseudonodulus. Hustedt (1957) recognized the pseudonodulus (= ocellus in his terminology). He recognized the pseudonodulus (=ocellus) on the larger specimens stating it is difficult to see the pseudonodulus (=ocellus) on smaller specimens. The SEM's of Hasle (1977) show the pseudonodulus at the transition zone between the valve face and the mantle.
      Another characteristic is the prominent labiate processes (=rimoportulae) situated on the mantle. These structures can be seen in normal mounts.

Actinoptychus sp. #1

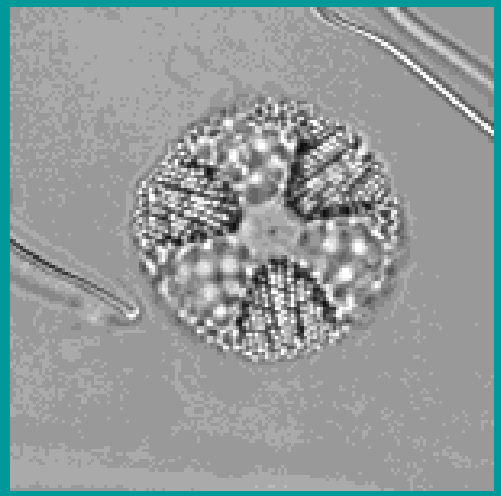
Diameter:18

Areolae:

Collection 1159a

Other images

More information



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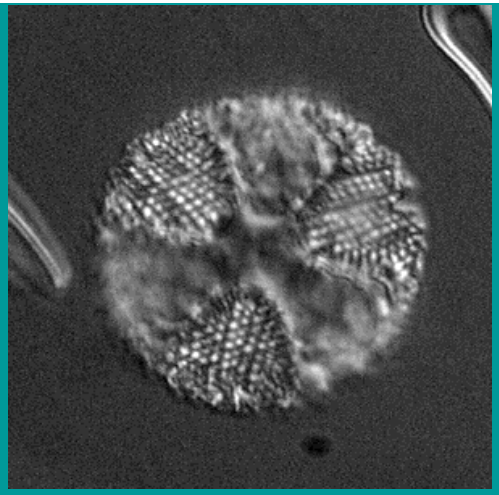
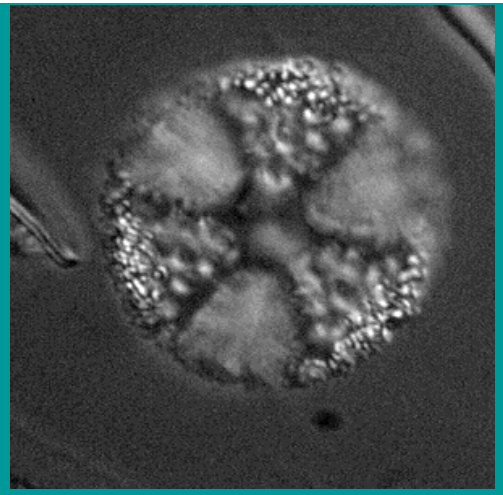
Authority information

Other images

These two images of the specimen depict different focal planes.





This is a colorized version of the specimen image.

More information

-
- **Ecology**
  This taxon is typically found in marine plankton assemblages, but may also occur in littoral regions of the oceans. Specimens found in the Great Lakes are almost certainly either fossil, derived form diatomites used as filtration media, etc., or anomalous occurrences derived from accidental transport by birds or ocean-going ships. It is extremely doubtful that any members of this genus presently grow in the Great Lakes (Hendey 1964).

  Size ranges and morphology

  -

Amphipleura arctica Patr. and Freese

Length:39 Width:5 Striae:25

Collection 1470a Other images More information

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Authority information

*Amphipleura arctica*Patrick and Freese, Proc. Acad. Nat. Sci. Philadelphia, 112:170, pl. 1, fig. 14. 1960. (Stoermer and Yang 1969).

Other images

 This image was taken utilizing DIC for the specimen above.

More information

This taxon has a linear valve and the raphe valve is about 1/4th the length of the valve. The central area is elongate and there is a distinct line. The striae of this taxon are parallel in the middle and convergent at the ends(Patrick and Freese 1960).

- **Ecology**
  Prefers brackish water(Patrick and Freese 1960)..

Size ranges and morphology

- Length is 31 to 35 micrometers(Patrick and Freese 1960).
- Width is 3 to 4 micrometers(Patrick and Freese 1960).
- Striae are 24 to 32 in 10 micrometers(Patrick and Freese 1960).

***Amphipleura pellucida*(Kütz.) Kütz.**

Length: 113 Width: 7 Striae: 40

Collection 1141a Other images More information

Return to Home Page | Return to Genera List | Return to Species List

Authority information

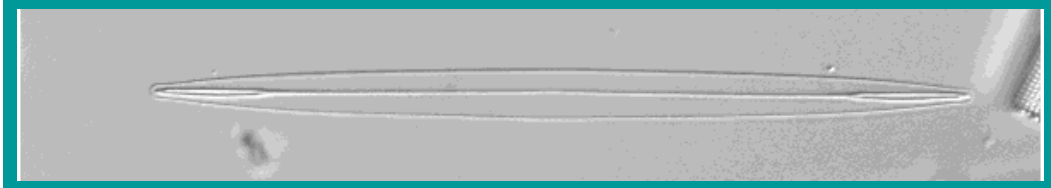
Kützing, F. 1844. Bacill., p. 103, pl. 3, fig. 32

Collection information

1141 Plankton, outside Muskegon north pier, Sec. 29, R17W, T10N, Muskegon County, Michigan. Diverse flora. Coll: E. F. Stoermer, 25 June 1966.

Other images

This is a bright field image.



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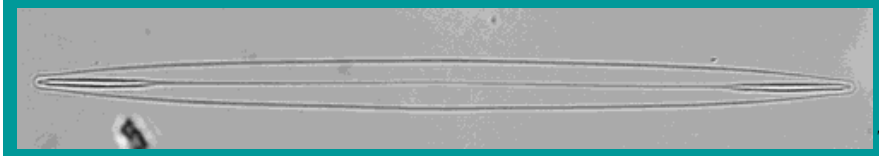
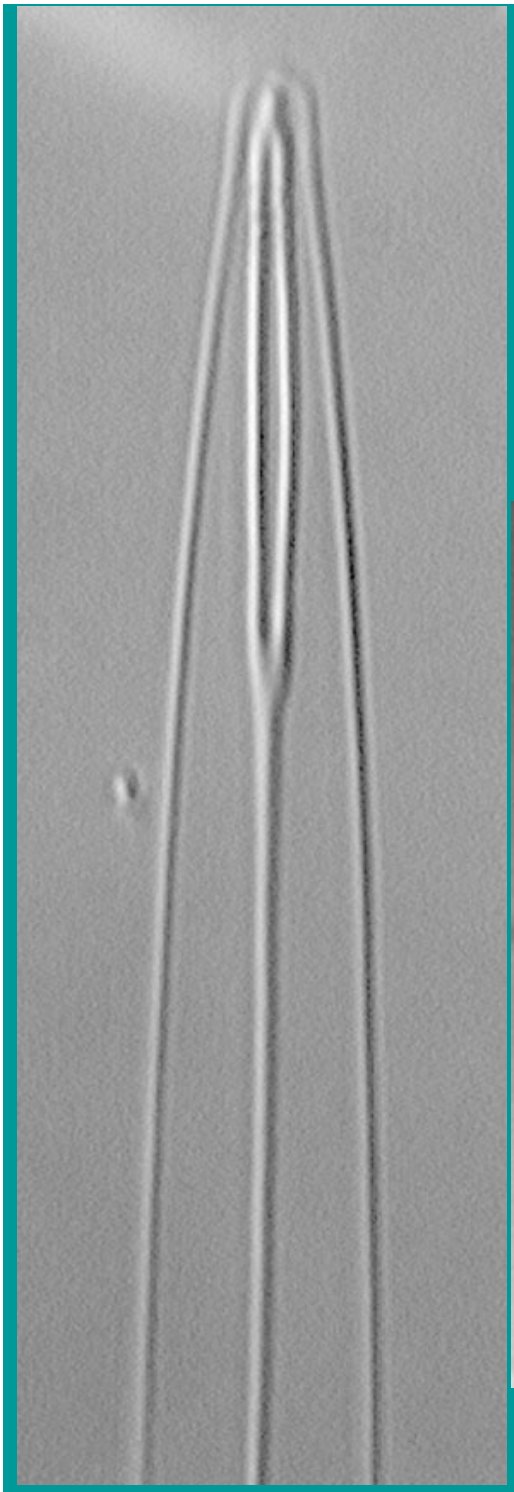
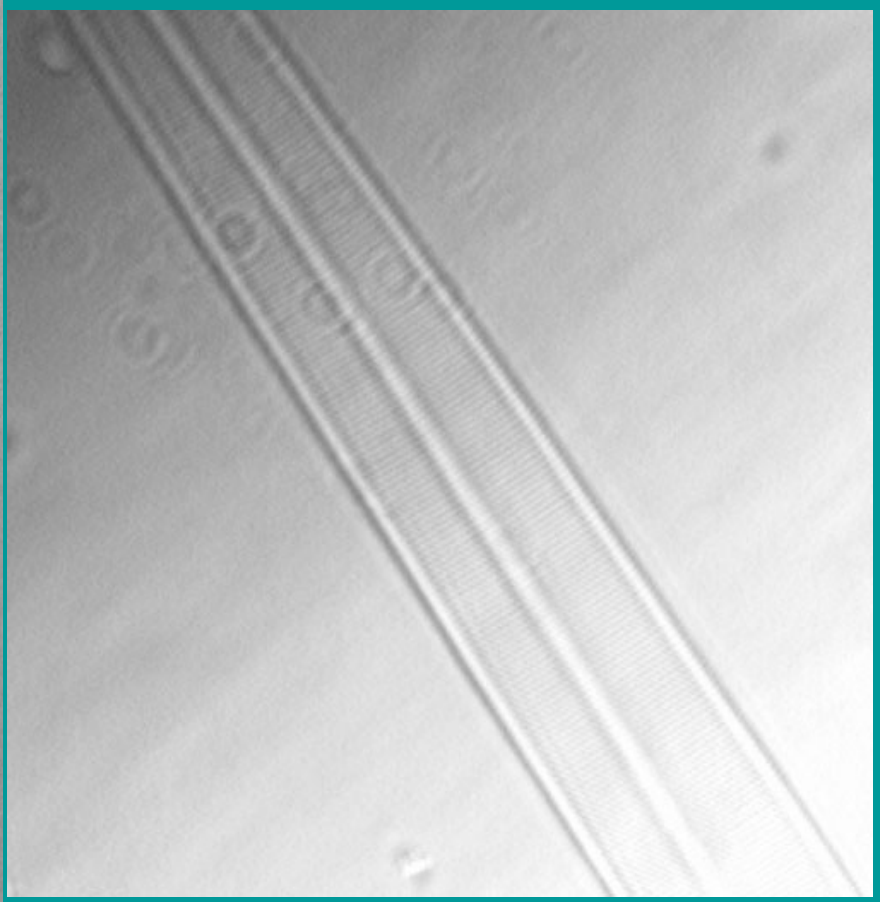


This is a bright field image of another specimen.

This is an enlargement of the end of the valve.

This is an image of the striae taken with oblique lighting.

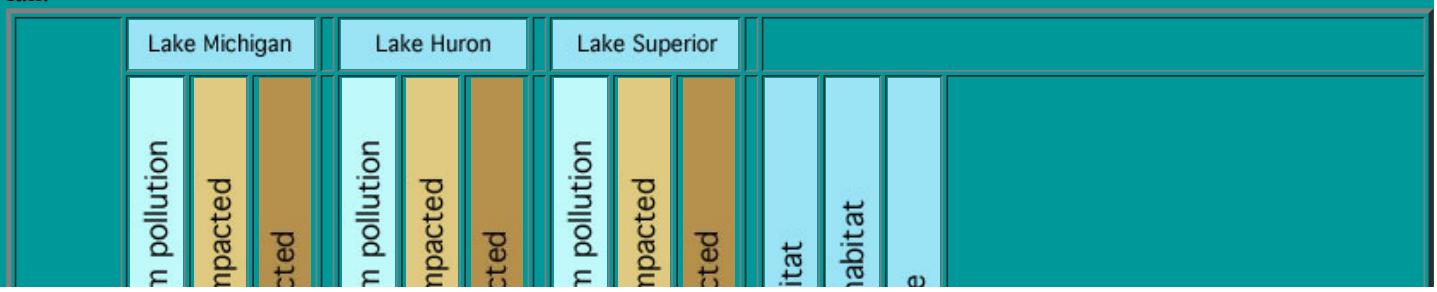




More information

Long considered an excellent specimen for testing microscope objectives, *Amphipleura pellucida*is one of a few natural specimens to be employed as such. The microscope was, for a time, the most important scientific instrument and development of its capabilities was the object of much research. Resolving power, the ability to determine detail clearly, was a constant driving force. Diatoms were used as test specimens and the literature of that period has many references as to which objective could resolve what specimen(s) and the detail that particular objective could resolve of the specimen(s). Test plates of diatoms were used to evaluate the resolving power of objectives. *Amphipleura pellucida*was the final test specimen on many test plates because of the fine structure of the cell wall. Stoermer and Pankratz (1964) give a concise summary of the historical work in reference to wall structure.
Being able to resolve the striae of *Amphipleura pellucida*demonstrates the capability (resolving power) of an objective and the level of skill by the microscopist. In an investigation of the effects of wave length of light and mounting media on the ability of microscope objectives to resolve the dots comprising the stria Trivelli and Lincke 1932 used *Amphipleura pellucida* as their test specimen. Stoermer (1996) utilized *Amphipelura pellucida* as a test specimen in a demonstration of the application of image analysis to diatom identification.

- Ecology
  Cox (1975) emphasizes *Amphipleura pellucida*as a free-living organism. Stoermer et al. (1965) state that *Amphipleura pellucida*in cultures grows in tubes. Andresen (personal experence) has collected *Amphipleura pellucida*in inland lakes in gelatineous masses but did not examine the mass for tubes.
  Stoermer (1980) states the disrtibution of *Amphipleura*taxa in the Laurentian Great Lakes is somewhat unusual. *Amphileura pellucida*is very widly distributed, mainly found in benthic associations and may get entrained into the plankton in disturbed areas where it may reach significant numbers. High populations of *Amphipleura pellucida*are characteristic of the Green Bay water mass and can be found in the plankton of other more eutrophic regions. Lowe (1974) characterizes *Amphipleura pellucida*as alkaliphilous, found in waters of pH range 6.2-8. He states it is a cosmopolitan, hard water taxon. Stoermer and Yang (1970) have *Amphipleura pellucida*occurring in low numbers in many samples as it gets injected into the plankton from its primarily benthic habitat. It is characteristic of disturbed habitats and always a minor constituent of the assemblage (Stoermer and Ladewski 1976). Based on field data it has its absolute abundance at 13°C and appears to be more commonly found in the fall.



	Isolated from pollution	Marginally impacted	Highly impacted	Isolated from pollution	Marginally impacted	Highly impacted	Isolated from pollution	Marginally impacted	Highly impacted	Primary habitat	Secondary habitat	Depth Range
A. arctica	V	R	R	O	V	O	O	O	O	SSv	T	I-D
A. pellucida	C	C	A	C	C	A	R	R	C	SSv	T	Sp-I

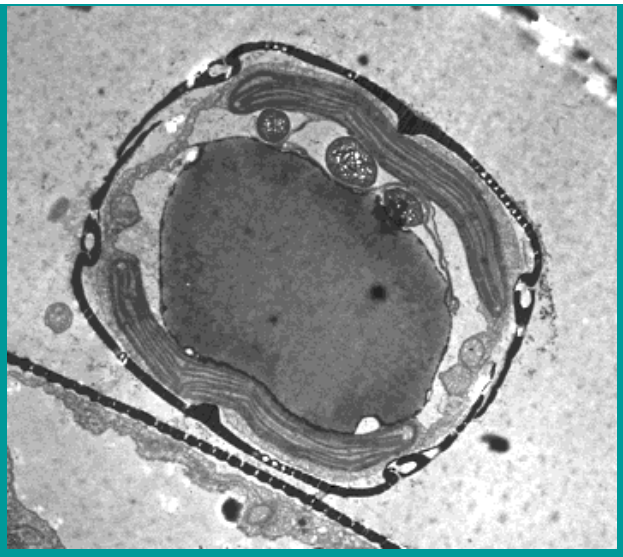
A = abundant populations, 5-20% of the total assemblage
C = common populations, 1-5% of the total assemblage
O = no information
R = rare populations, less than 1% of the total assemblage
V = very rare populations
SSv = epipelic, on sand or fine gravel, vagile
T = tychoplanktonic
I = intermediate depths, 2-10 m
D = deep stations, 10-30 m
Sp = same depth, protected from strong wave action

from Stoermer 1980

Size ranges and morphology

- Length = 80-140 µm
- Width = 7-9 µm
- Striae = 40/10 µm
    - Other morphological features

This is an unpublished transmission electron micrograph taken by E. F. Stoermer showing a cross section through a cell at the end. Visible here are the silica ribs which form the area where the raphe is present. Notice that these project into the cell and are not external structures. Cytoplasmic contents, mitochondria and cytoplasm are visible. Notice also the chambers in the side walls (mantle) of each valve.



This is an unpublished transmission electron micrograph taken by E. F. Stoermer showing a cross section through the middle of a cell. Visible here are plastids, mitochondria and a lipid droplet. The chambers in the side walls (mantle) are present suggesting these structures run the length of the cell.

Asterionella bleakeleyi W. Sm. 1856

Length:43 Width: Striae:fine

Collection 841 Other images More information

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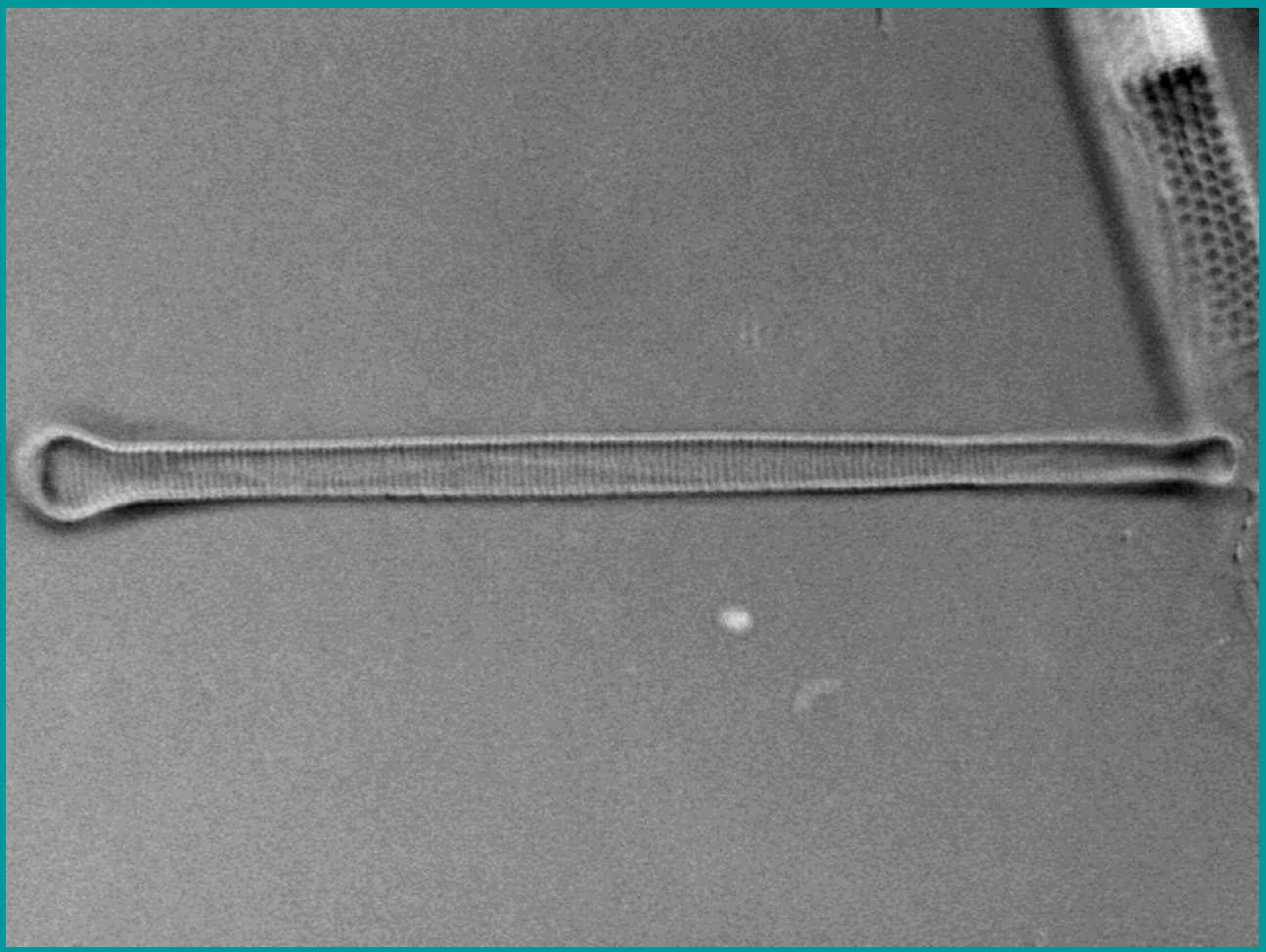
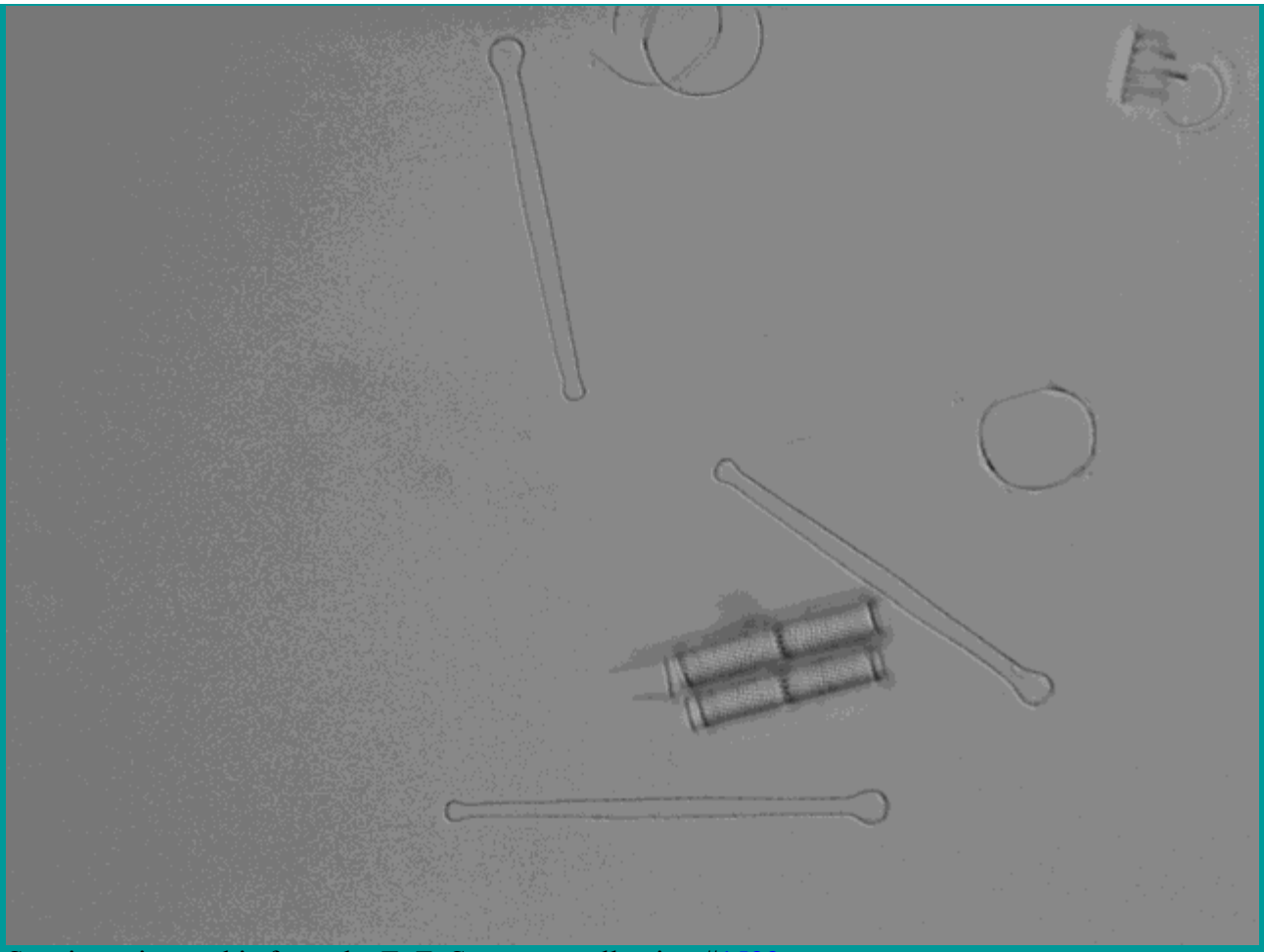
Authority information

W. Sm., Syn. British Diat., vol. 2, p. 82, 1856 (Patrick and Reimer 1966).

Other images





Specimen imaged is from the E. F. Stoermer collection #1522.

More information

- This species is usually slightly swollen in the middle region in both valve and girdle view. The type locality for this taxon is Marine, Harwich (Patrick and Reimer 1966).

- **Ecology**

  This taxon is usually found in brackish coastal waters, in estuaries of rivers or bays. In the Great Lakes, occurrences are most common in Lake Ontario and in marginal lakes and river mouths and nearby coastal waters (Patrick and Reimer 1966).

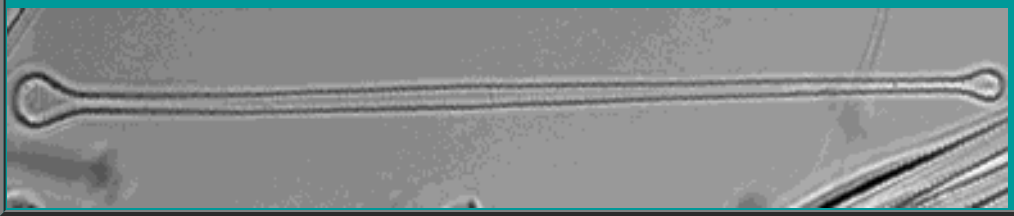
  Size ranges and morphology

  - Length is 45 to 65 micrometers (Patrick and Reimer 1966).
  - Striae are fine, about 20 to 27 in 10 micrometers (Patrick and Reimer 1966).

Asterionella formosa Hass. 1850

Length:84 Width:2 Striae:fine

Collection 826 Other images More information



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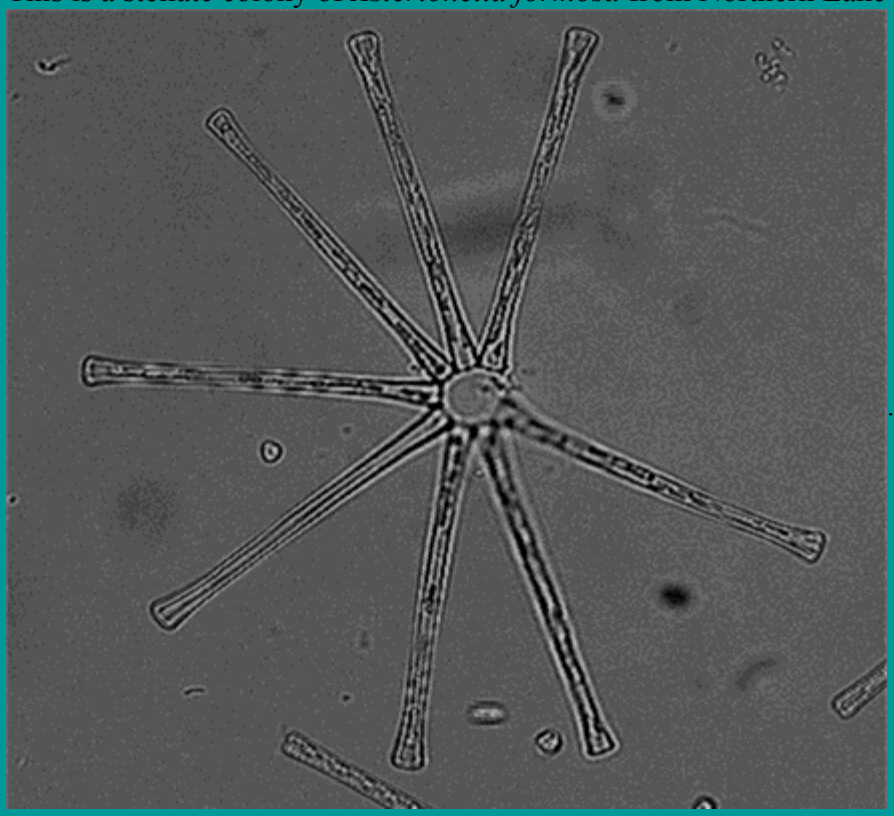
Authority information

Hass., Micr. Exam. Water, p. 10, pl 2(2), fig. 5., 1850 (Patrick and Reimer 1966).

Other images

This is a sharpened, close-up of striae, pseudoraphe, spines, and labiate process (barely visible).

This is a stellate colony of *Asterionella formosa* from Northern Lake Michigan.



More information

The frustules of this diatom are found in star-shaped colonies. This taxon was first discovered in the drinking water of Grand Junction Company from the Thames at Brentford. Typically, this diatom is found in plankton (Patrick and Reimer 1966). According to Jaworski et al. (1988), over a five-year period, sinking rates of a laboratory strain of*Asterionella formosa* were affected by the loss of the stellate arrangement of colonies. That is, the morphology of *Asterionella formosa* colonies influences sinking rates.

- **Synonyms** (Patrick and Reimer 1966)
  Asterionella formosa var. *subtilis* Grun. *in* V. H., Syn. Diat. Belgique, pl. 51, fig. 21. 1881.
  Asterionella formosa var. *subtilissima* Grun. *in* V. H., Syn. Diat. Belgique, pl. 51, fig. 24. 1881.

- **Ecology**
  This taxon may be found in mesotrophic to eutrophic waters (Patrick and Reimer 1966).

Size ranges and morphology

- Length is 40 to 130 micrometers (Patrick and Reimer 1966).
- Width is 1 to 3 micrometers (Patrick and Reimer 1966).
- Striae are fine, and there can be 24 to 28 in 10 micrometers (Patrick and Reimer 1966).

Asterionella gracillima (Hantz.) Heib. 1863

Length:43 Width: Striae:fine

Collection 1341a Other images More information

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Authority information

(Hantz.) Heib., Consp. Crit. Diat. Danicarum, p. 68, pl. 6, fig. 19, 1863 (Patrick and Reimer 1966).

Other images

More information

- This diatom is very similar to but usually smaller than *Asterionella formosa* . The type locality for this taxon is Elbufer im grossen Gehege bei Dresden. Typically, this diatom is found in plankton (Patrick and Reimer 1966).

- **Synonyms** (Patrick and Reimer 1966)
  Asterionella formosa var. *gracillima* (Hantz.) Grun. *in* V. H., Syn. Diat. Belgique, pl. 51, fig. 22. 1881.
  Diatoma gracillimum Hantz. *in* Rabh., Alg. Sachems resp. Mittleleuropas, No. 1104. 1861.

- **Ecology**

This taxon prefers cool to cold waters (Patrick and Reimer 1966).

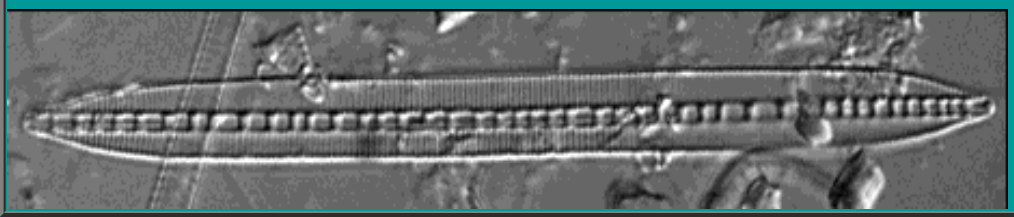
Size ranges and morphology

- Length is 35 to 90 micrometers (Patrick and Reimer 1966).
- Width is 2 to 3 micrometers (Patrick and Reimer 1966).
- Striae are fine, and there can be 20 to 27 in 10 micrometers (Patrick and Reimer 1966).

***Bacillaria paxillifer* (O. F. Mueller) Hendy 1964**

Length:78 Width:6 Keelpunctae:6-7 Striae:22

Collection 1366a Other images More information



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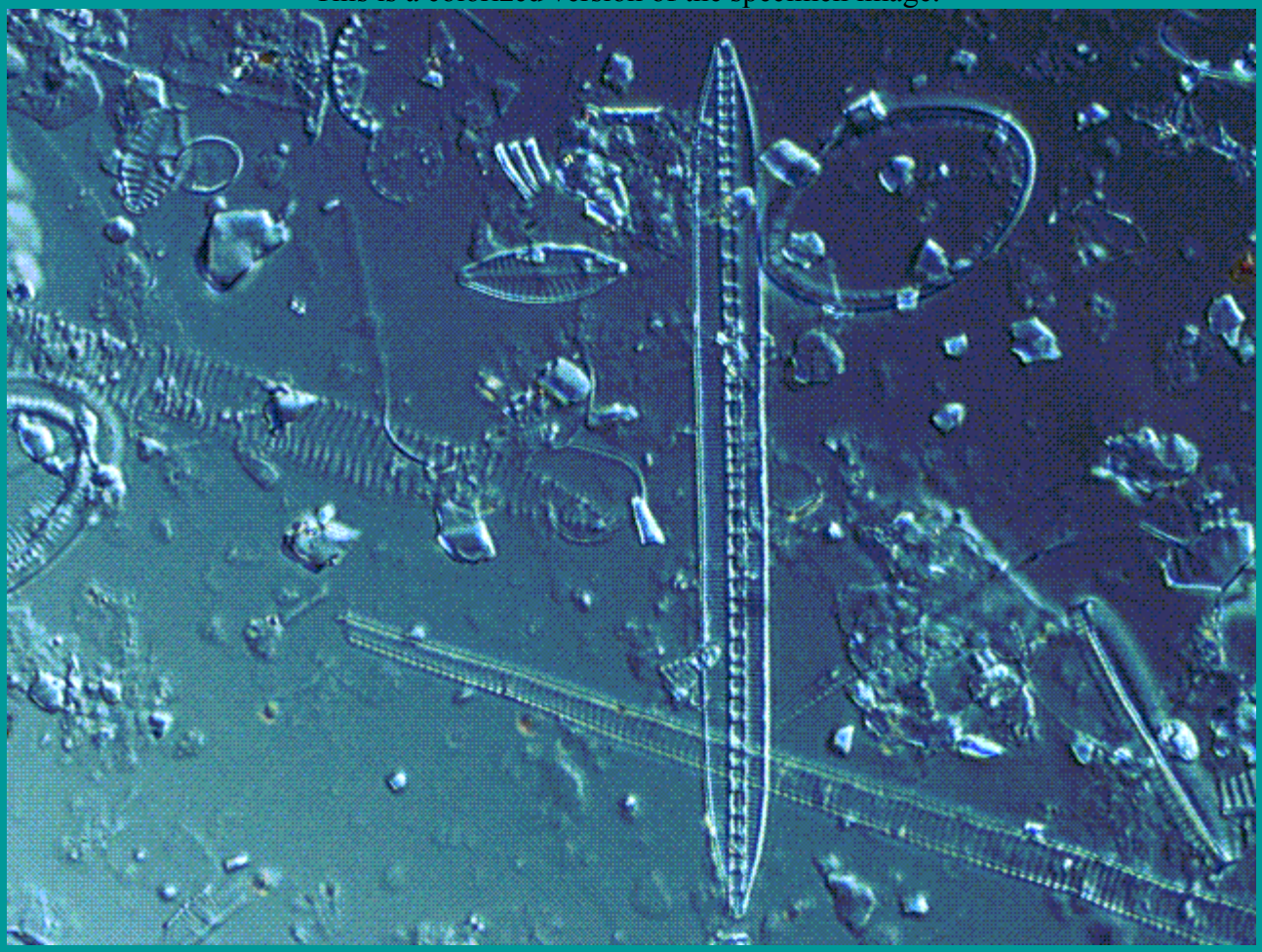
Authority information

(O. F. Muell.) Hendy, Fish. Invest. (London), Ser. 4, Part 5, pl 274, pl. 21, fig. 5. 1964 (Stoermer and Yang 1969).

Other images

This is a colorized version of the specimen image.



More information

This taxon is usually periphytic or epipelic (Lowe 1974). It grows in extensive colonies, and the colonies are bound together by extensions from the raphe. Living colonies exhibit an accordian-like motion, which is unique amongst diatoms.

- **Synonyms** (Stoermer and Yang 1969)

Vibrio paxillifer O. F. Mueller, Animal. Infus., p. 54. 1786.

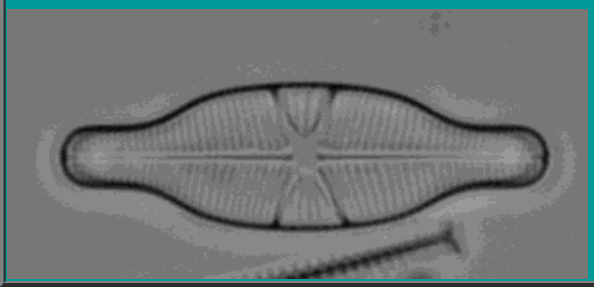
- **Ecology**
  - This taxon is most abundant in coastal marine habitats, but is also occasionally noted in inland waters which have high conductivity. In the Great Lakes, specimens found so far come from the vicinity of river mouths. According to Lowe (1974), it prefers cold water between 0 and 15 degrees C ().

Size ranges and morphology

Capartogramma sp. #1

Length:23 Width:8 Striae:22-24

Collection 1395 Other images More information



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Authority information

Other images

More information

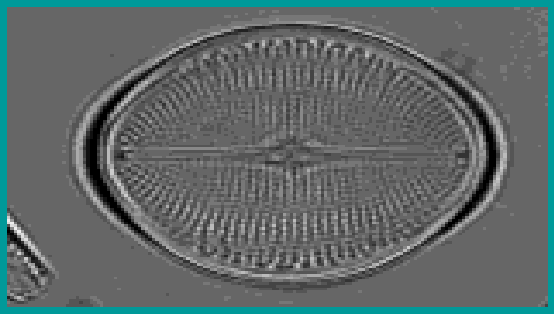
Capartogramma is closely related to *Stauroneis*. However, the central nodule region of *Capartogramma* consists of siliceous struts projecting into the interior of the frustule forming a structure resembling an "X." This structure, the tigullum, is attached to the inner surface of the valve and is connected to the pseudoseptum (Ross 1963). The pictured specimen may be *Capartogramma crucicula* (Grun. *ex* Cl.) (Patrick and Reimer 1966, pl. 30, fig. 16.). Size ranges for this taxon are 20-36 micrometers in length, 7.5-9 micrometers in width, and 24 striae in 10 micrometers (Patrick and Reimer 1966).

- **Ecology**
  Usually, this taxon is present in brackish waters. In Lake Michigan, *Capartogramma* has been found in shallow, eutrophied bays (Stoermer and Yang 1969).

Cocconeis pediculus Ehr.

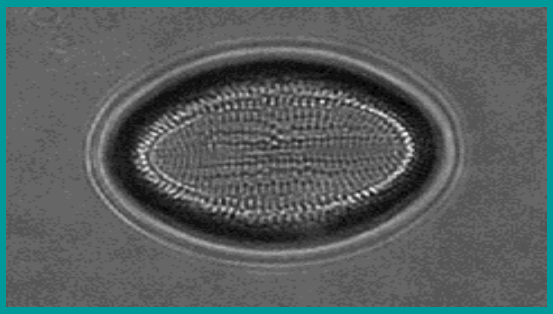
Raphe valve

Length: 25
Width: 20
Striae: 16-18



Pseudoraphe valve

Length:25.69
Width: 19.52
Striae: 14



Collection
808

Other images

More
information

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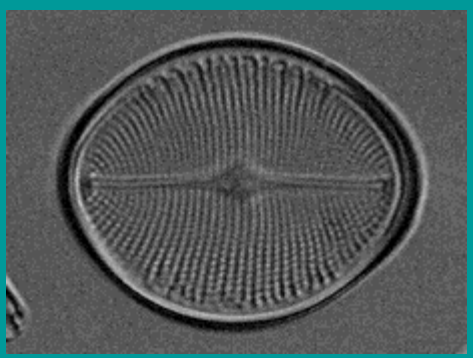
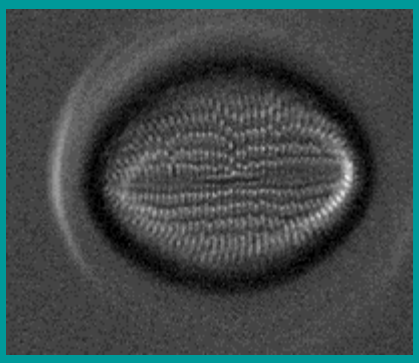
Authority information

Cocconeis pediculus Ehr,. Infusionsthierchen, p. 194, pl. 21, fig. 11. 1838(Patrick and Reimer 1966).

Other images



This image was taken using DIC.



This imge was taken using DIc of the pseudoraphe valve.

More information

This taxon has a broadly elliptical arched valve. The raphe valve has a narrow linear axial area that ends in a small semicircular clear space. there is a small central area that is circular to irregularily shaped. It is filiform with

close proximal ends. It has straight distal ends and curved radiate striae that is finely puntate. The straie do not extend to the margin but are interrupted by a continuous clear marginal area. The pseudoraphe valve is very narrow and linear. It has no central area. The striae are radiate and curved(Patrick and Reimer 1966).

- **Synonyms**

  Cocconeis communis Heib., Consp. Crit. Diat. Danicarum, p. 98. 1863(Patrick and Reimer 1966).

- **Ecology**

  This taxon is widespread. It si epiphytic on aquatic plants and other objects but it is not found in large numbers. This taxon is an alkaliphil and salt indifferent(Patrick and Reimer 1966).

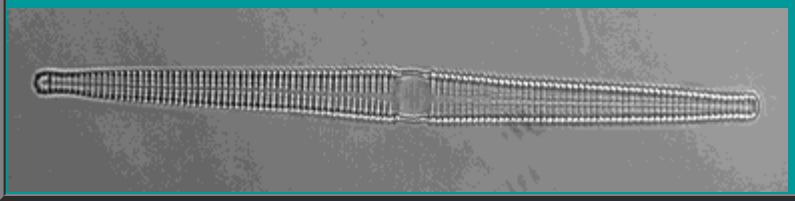
Size ranges and morphology

- Length is 11 to 30 micrometers (Patrick and Reimer 1966).
- Width is 6 to 20 micrometers (Patrick and Reimer 1966).
- Striae in the raphe valve are 20 in 10 micrometers along the axial area (Patrick and Reimer 1966).
- Striae in the raphe valve are 16 to 17 in 10 micrometers near the margin (Patrick and Reimer 1966).
- Striae in the pseudoraphe valve are 18 in 10 micrometers along the axial area (Patrick and Reimer 1966).
- Striae in the pseudoraphe valve are 15 to 16 in 10 micrometers near the margin (Patrick and Reimer 1966).

Ctenophora pulchella Brebisson

Length:83 Width :6 Striae:12 to 13

Collection 1407a Other images More information



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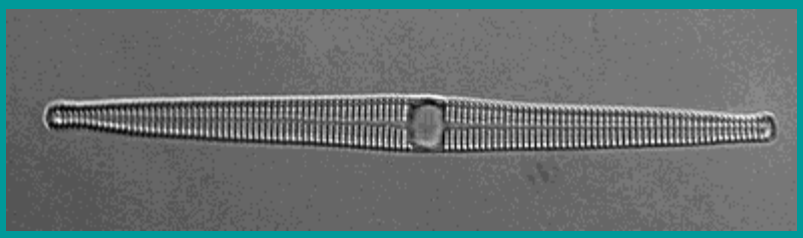
Authority information

Ctenophora pulchella Brebisson manuscript *vide* De Toni 1892, p. 652 (VanLandingham 1969).

Other images



This image was taken using DIC.

More information

This taxon used to be called *Synedra pulchella*. The frustules narrow toward the ends in girdle view. It has a linear valve tht is lanceolate and has slightly attenuated apices that are rostrate. The psuedoraphe is distinct and sometimes widens toward the central area, which is slightly swollen. The striae are punctate and parallel (Patrick and Reimer 1966).

- **Synonyms**

  Sunedra pulchella Ralfs *ex Kutz*., Bacill., p.68, pl. 29, fig. 87. 1844.

- **Ecology**

  This taxon is usually found in water that is fresh and has a high mineral content (Patrick and Reimer 1966).

Size ranges and morphology

- Length is 33 to 150 micrometers (Patrick and Reimer 1966).
- Width is 5 to 8 micrometers (Patrick and Reimer 1966).
- Striae are 12 to 16 in 10 micrometers (Patrick and Reimer 1966).
- Puncta are to in 10 micrometers (Patrick and Reimer 1966).

Cyclotella commensis Grunow in VanHeurck 1882

Diameter: 8

Costae:17

Collection 3799

Other images

More information

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Authority information

Van Heurck (1882) Synopsis des Diatomees de Belgique. Atlas, pl. 78-103

Other images

More information

- **Ecology**

  Wunsam et al. (1995) found *Cyclotella commensis* indicative of low total phosphorus and conductivity levels using canonical correspondence analysis and weighted averaging proceedures. In the Great Lakes, it is a major component of deep chlorophyll phytoplankton assemblages (Stoermer et al. 1996).

  ### Size ranges and morphology

  (Hakansson in Krammer and Lange-Bertalot 1991)

  - Diameter range for this species is 4 to 12 micrometers.
  - Costae range is 16-20 per 10 micrometers.

Cyclotella distinguenda Hustedt 1927

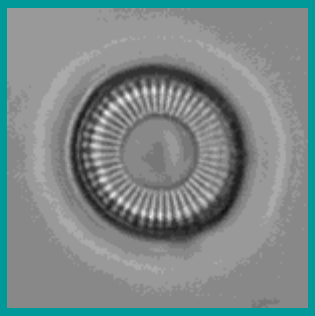
Diameter: 12

Costae:16

Collection 809

Other images

More information



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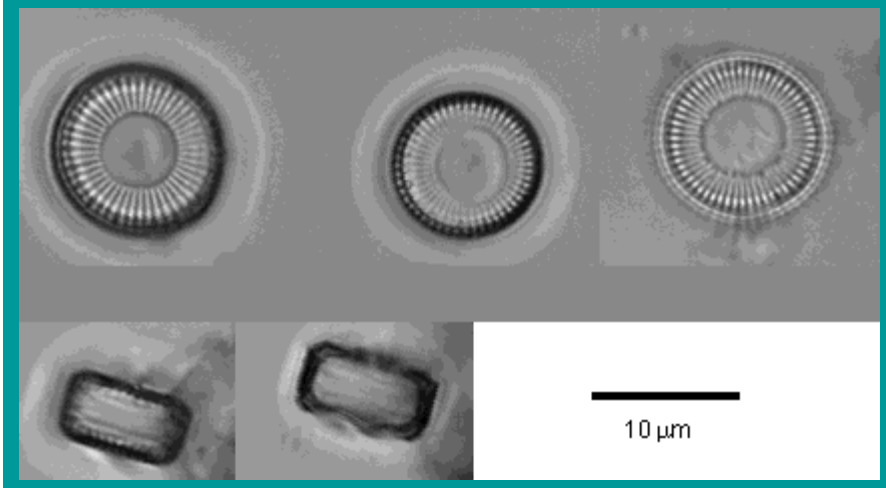
Authority information

Hustedt, F. (1927) Die Diatomeen der interstadialen Seekreide. In: *Die Geschichte der Lunzer Seen, Moore und Walder* (H. Gams, ed.). *Internationale Revue der gesamten Hydrobiologie,*18, 327-320.

Other images



More information

- **Nomenclatural History**

  This species has a complex nomenclatural history. Kutzing (1834) divided *Frustulia* C.A. Agardh into numerous subgenera, including the subgenus *Cyclotella* containing the species *Frustulia operculata* . Kutzing subsequently used this name for a centric diatom species in material from Tennstadt, Germany. The centric diatom in this material is what the name *Cyclotella operculata* has applied to since. Briebisson (1838) elevated *Cylotella* to generic rank (Hakansson 1989). Hakansson (1979) discovered this mistake and demonstrated the type of *Cyclotella operculata* (Ag.)Kutz. was invalid being based on a species of *Rhopalodia* . Hakansson and Ross (1984) proposed conserving the generic name *Cyclotella* (Kutz.) Breb. using Kutzing's Tennstadt, Germany material as the type for the genus. In the same publication Hakansson and Ross described *C. tecta* , the centric diatom previously identified as *C. operculata* , from the Kutzing material designating it the type. The proposal was accepted (Greuter et al. 1988) and the generic name *Cyclotella* is valid. Latter investigation (Hakansson 1989) of Hustedt's (1927) type material for *C. distinguenda* revealed morphological similarities between *C. tecta.* and *C. distinguenda*. Hakansson (1989) designated *C. tecta.* as a latter synonym of *C. distinguenda*, making *C. distinguenda* the valid name of this species and the type of the genus.

  - **Ecology**

    Stoermer and Yang (1970) found *Cyclotella operculata* in abundance in northern Lake Michigan and suggested the taxon was indicative of large oligotrohic lakes. Earlier investigators (Briggs 1872, Thomas and Chase 1887) reported the taxon from southern Lake Michigan, possibly having been eliminated through increased eutrophication in subsequent years.

    - **Synonyms**

      Frustulia operculata sensu Kutzing 1834, non C.A. Agardh
      Cyclotella operuculata auct., non (C.A. Agardh) Breibisson
      Cyclotella tecta Hakansson and Ross 1984

Size ranges and morphology

(Krammer and Lange-Bertalot 1991)

- Diameter range for this species is 6 to 35 micrometers.
- Costae range is 12-14 per 10 micrometers.
- Other morphological features
  Marginal fultoportulae occur on every costae in this species.

Cyclotella michiganiana Skvortzow 1937

Diameter: 9

Costae:18

Collection 1229

Other images

More information

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Authority information

Skvortow, B.V. (1937) Diatoms from Lake Michigan. I. The American Midland Naturalist. vol. 18, no. 4, p. 652-658.

Other images

More information

- **Ecology**

  Skvortzow (1937) described this taxon in Lake Michigan, but records of distribution from Europe (Krammer and Lange-Bertalot 1991) also exist. Stoermer and Ladewski (1976) found the taxon in highest abundance at temperatures above 16 C. Schelske et al. identified this species as an abundant member of summer phytoplankton assemblages in the upper Great Lakes, making it an important member of the native Lake Michigan phtoplankton flora (Stoermer and Yang 1969, 1970).

  Size ranges and morphology

  (Krammer and Lange-Bertalot 1991)

  - Diameter range for this species is 5 to 20.5 micrometers.
  - Costae range is 15-18 per 10 micrometers.

Cyclotella planktonica Brunnthaler 1901

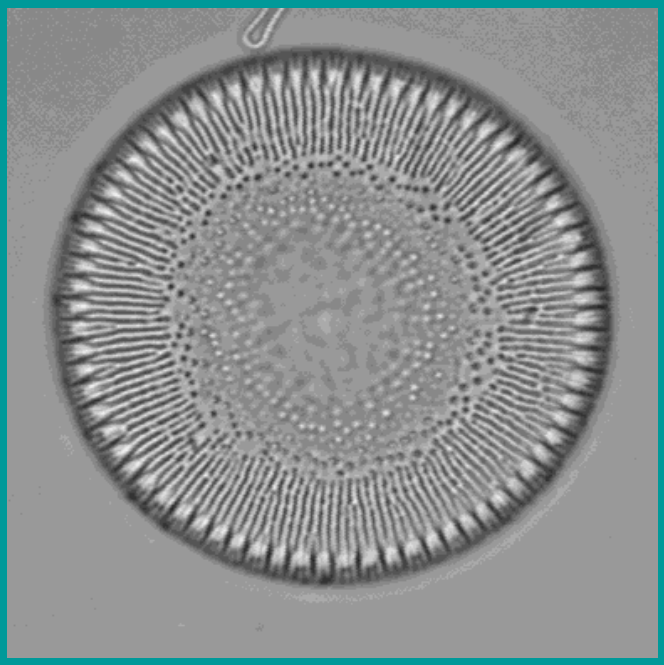
Diameter: 35

Costae: 17

Collection 1269

Other images

More information



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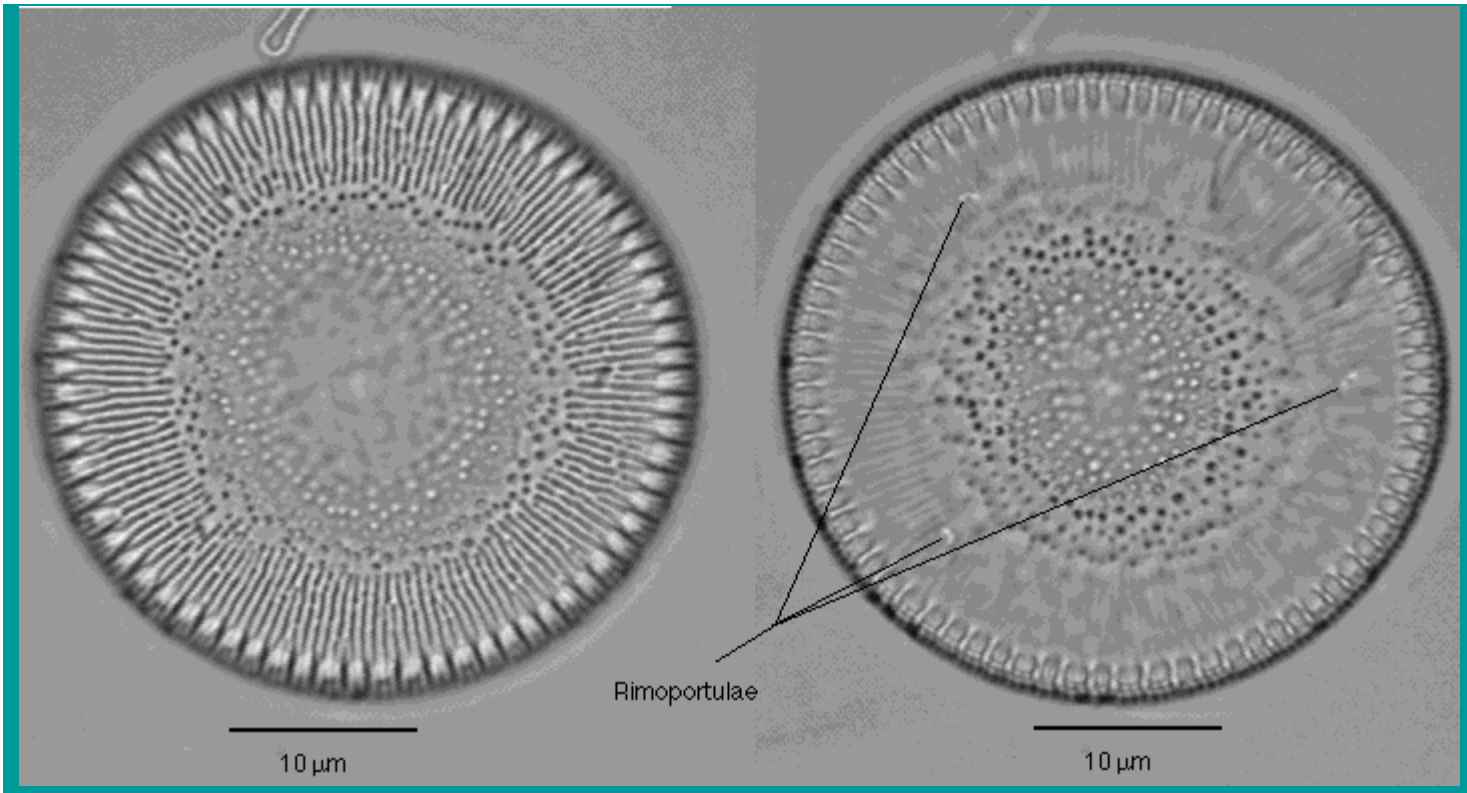
Authority information

Brunnthaler, J., Prowazek, S., und Wettstein, R. von (1901) Vorlaufige Mittheilungen uber das Plankton des Attersees in Ober-Osterreich. Osterreichische botanische Zeitschrift, Bd. 51.

Other images



More information

- **Ecology**

  This taxa is morphologically similar to species in the *Cyclotella radiosa/bodanica* complex. We suggest ecological prferences similar to this group, preferring relatively cold, oligotrophic conditions (Willen et al. 1990).

  Size ranges and morphology

  (Krammer and Lange-Bertalot 1991)

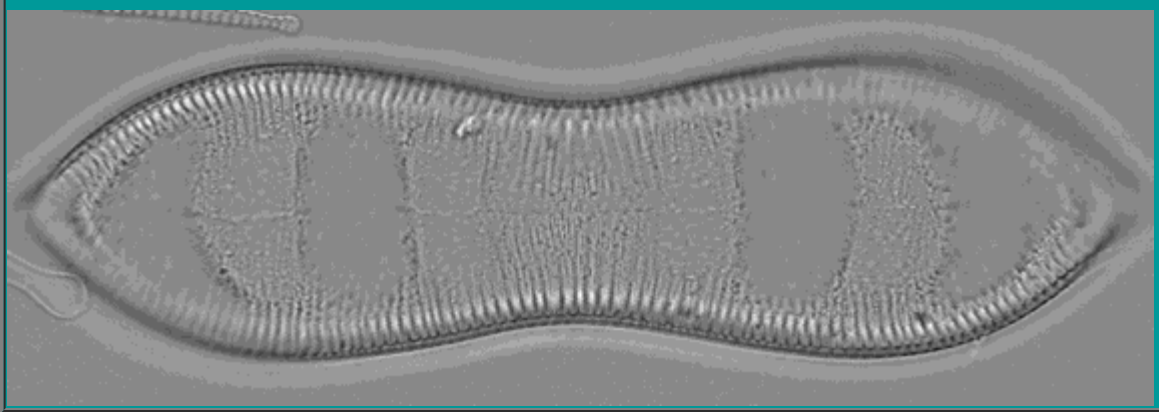
  - Diameter range for this species is 12 to 35 micrometers.
  - Costae range is 14-17 per 10 micrometers.
  - Other morphological features

    This species can be distinguished from *Cyclotella bodanica* through identification of a hyaline area between the margin of the central area and the costae.

***Cymatopleura solea*Brebisson**

Length:123 Width:34 Striae:

Collection 1158 Other images More information



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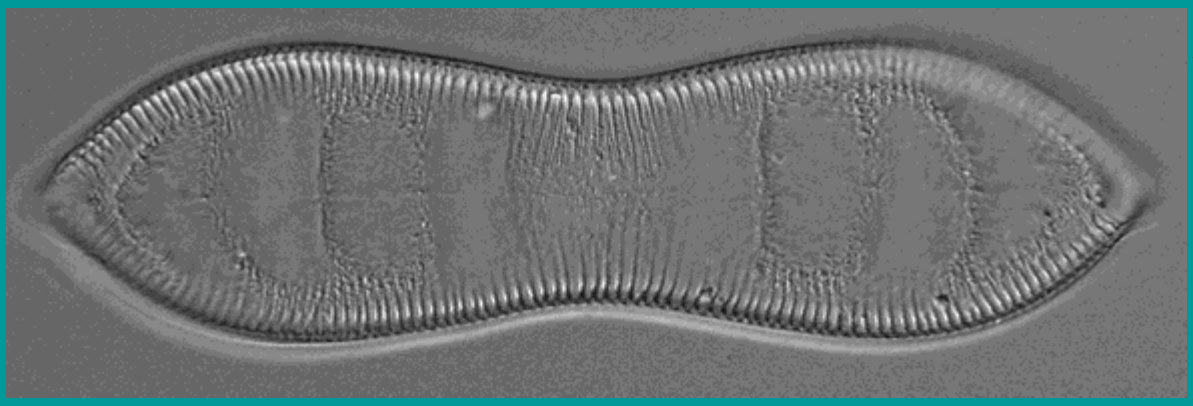
Authority information

Cymatopleura solea (Brebisson) W. Smith 1851 (Fig. 116:1-4; 117: 1-5; 118: 1-8; 122:4)(Krammer and Lange-Bertalot 1988).

Other images



This image was taken utilizing DIC for the specimen above.

More information

The valve is linear and can be broad to narrow. The ends are roundly wedged and peaked(Krammer and Lange-Bertalot 1988).

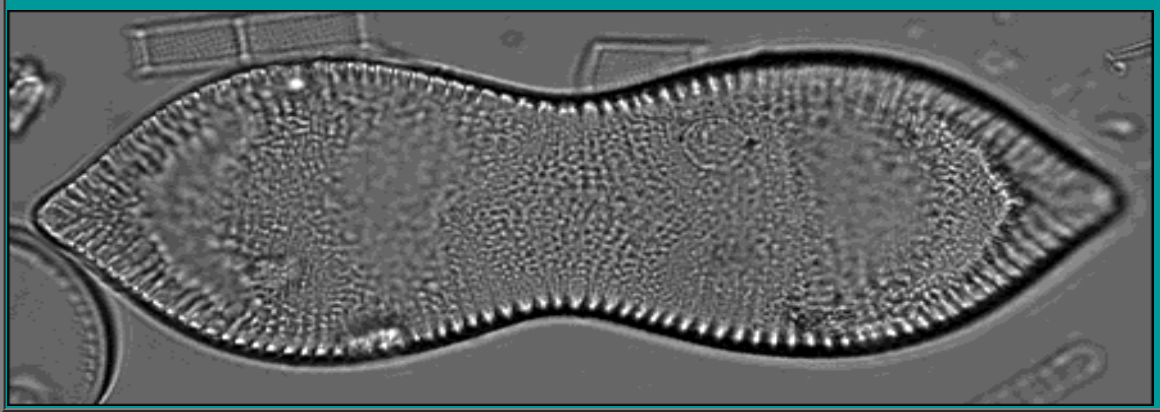
Size ranges and morphology

- Length is 30 to 300 micrometers(Krammer and Lange-Bertalot 1988).
- Width is 10 to 45 micrometers(Krammer and Lange-Bertalot 1988).
- Striae are 25 to 32 in 10 micrometers(Krammer and Lange-Bertalot 1988).

Cymatopleura solea var. *apiculata* W. Smith

Length:96 Width:33 Striae:15 Keelpunctae:7

Collection 1439a Other images More information



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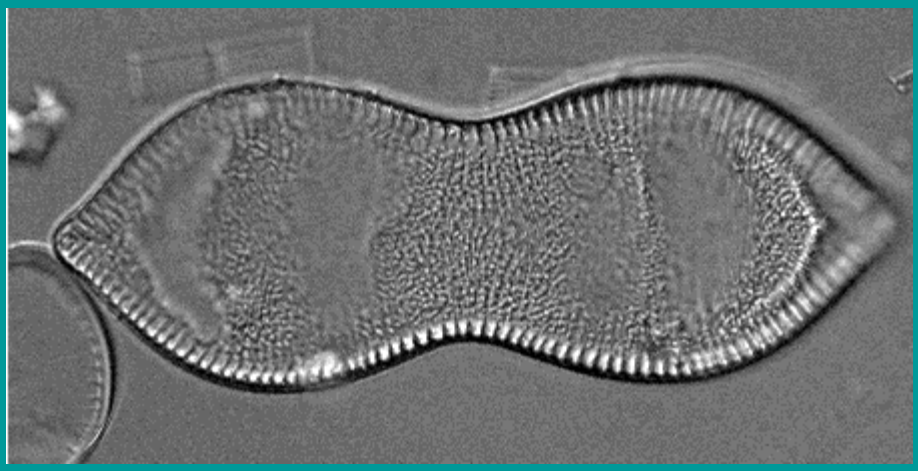
Authority information

Cymatopleura solea v. *apiculata* (W. Smith) Ralfs in Pritchard 1861 (Fig. 118:2,4-8) (Krammer and Lange-Bertalot 1988).

Other images



This image was taken utilizing DIC for the specimen above.

More information

This taxon is cosmopolitan and like the nominate variety is either and epiphyte or in the epiplion (Krammer and Lange-Bertalot 1988).

- **Ecology**
  Found in eutrophic water with medium to high electrophytic content (Krammer and Lange-Bertalot 1988).

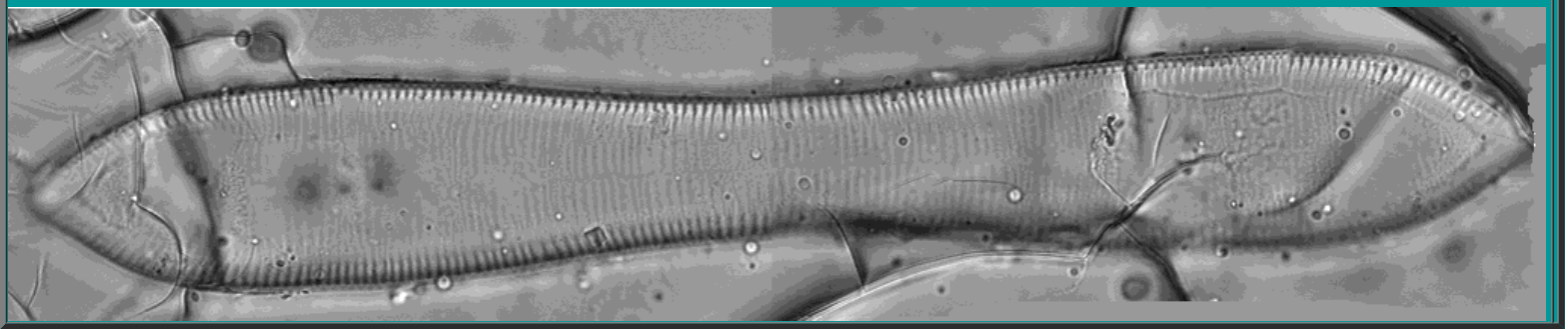
Size ranges and morphology

- Length is to micrometers (Patrick and Reimer 1966).
- Width is to micrometers (Patrick and Reimer 1966).
- Striae are to in 10 micrometers (Patrick and Reimer 1966).
- Puncta are to in 10 micrometers (Patrick and Reimer 1966).

***Cymatopleura solea* var. *gracilis*Grunow**

Length:208 Width at ends:28 Width in middle:19 Striae:7-8

Collection DC-0Cook Other images More information



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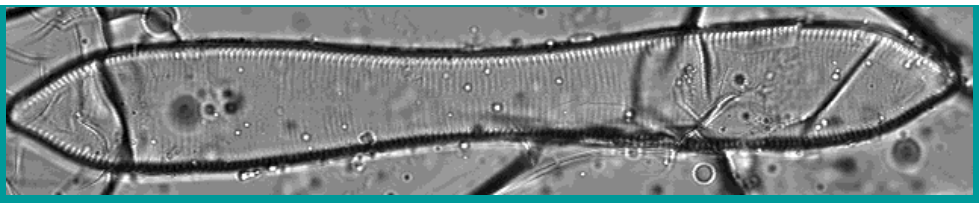
Authority information

Cymatopleura solea var. *gracilis*Grunow 1862, p. 466

Other images

This image was taken at 63x using brightfield.



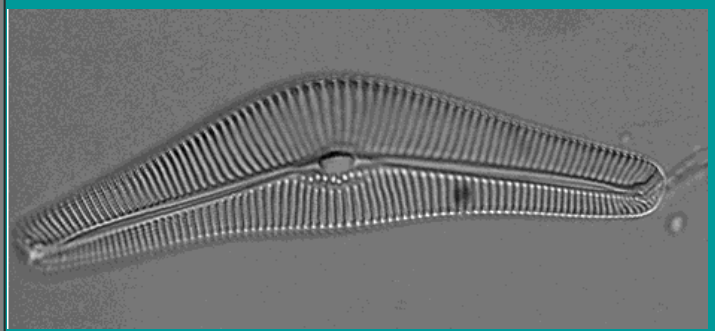
More information

Size ranges and morphology

Cymbella cistula var. *gibbosa* J. Brun 1895

Length: 95 Width: 36 Striae: 10 Puncta: 9

Collection 1158 Other images More information



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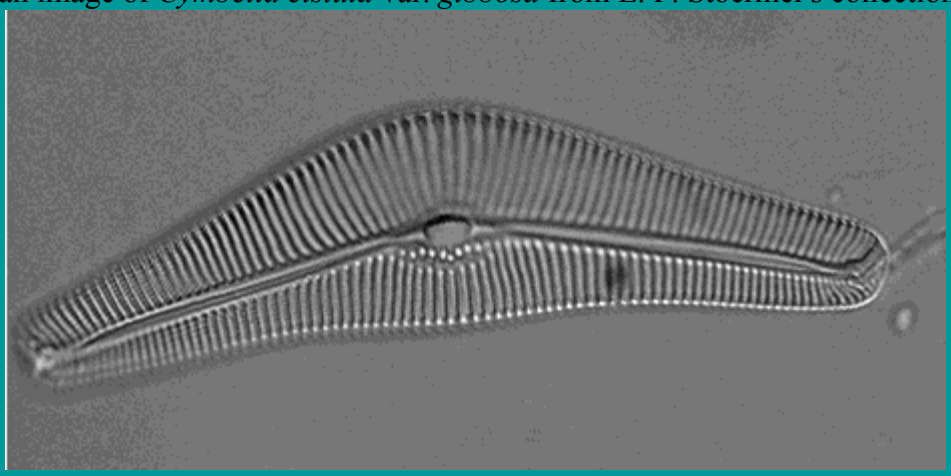
Authority information

J. Brun, Diatomiste, Vol. 2, pl. 14, fig. 27. 1895 (Stoermer and Yang 1969).

Other images

This is an image of *Cymbella cistula* var. *gibbosa* from E. F. Stoermer's collection 1157.



More information

- **Ecology**

Size ranges and morphology

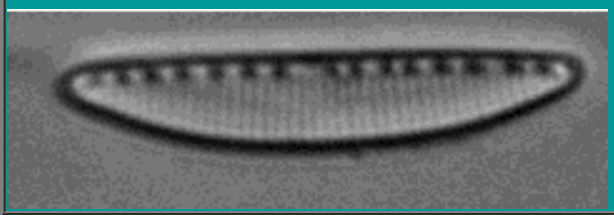
- Length range: 85 to 130 micrometers (Patrick and Reimer 1975).
- Breadth range: 20 to 26 micrometers (Patrick and Reimer 1975).
- Striae: 6-9 per 10 micrometers in the central area with 11 per 10 micrometers near the ends (Patrick and Reimer 1975).
- Puncta: 16-18 per 10 micrometers (Patrick and Reimer 1975).

    - Other morphological features
        A stigmata may be present on the dorsal side of the central area (Patrick and Reimer 1975).

Cymbellonitzschia diluviana Hustedt 1954

Length:18 Width:3 Keelpunctae:10 Striae:26

Collection 1566a Other images More information



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Authority information

Hustedt, Abh. Naturw. Verein Bremen 33(3): 453, fig. 23-24. 1954 (Stoermer and Yang 1969).

Other images

More information

- This taxon is found in epipelic communities in the deep waters of Lake Michigan (Stoermer and Yang 1969).

- **Ecology**

  - **Size ranges and morphology**

    - Length is 10 to 20 micrometers (Krammer and Lange-Bertalot 1988).
    - Width is 2.5 to 4 micrometers (Krammer and Lange-Bertalot 1988).
    - Keelpunctae are 8 to 12 in 10 micrometers (Krammer and Lange-Bertalot 1988).
    - Striae are 22 to 26 in 10 micrometers (Krammer and Lange-Bertalot 1988).

Denticula lauta J.W. Bail. 1854

Length:22.5 Width:5.5-6 Striae:24-26 Puncta:6-7

Collection 1159a Other images More information

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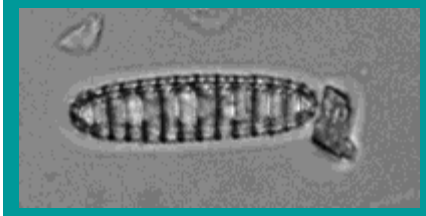
Authority information

J.W. Bail., Smithsonian Contr. Knowl., 7(3): 9, figs. 1-2, 1854 (accepted for publication, 1853). (Patrick and Reimer

1975).

Other images



More information

- **Synonyms** (Patrick and Reimer 1975)

- **Ecology**
  Based on limited data, it appears that this taxon prefers water of high conductivity. (Patrick and Reimer 1975).

  ### Size ranges and morphology

  - Length is 18-67 micrometers (Patrick and Reimer 1975).
  - Breadth is 5-10 micrometers (Patrick and Reimer 1975).
  - Striae range is about 20 in 10 micrometers (Patrick and Reimer 1975).
  - Costae across the valve, 2-4 in 10 micrometers (Patrick and Reimer 1975).
  - Short costae, 3-4 in 10 micrometers (Patrick and Reimer 1975).

    - Other morphological features:
      This taxon is distinguished by the usually alternate short and long costae and by the shape of the valve. The costae occur in two types: those that extend across the valve and those that extend only to the edges of the ocelli, which are in the craticula plate. Valves oblong with rounded apices. Striae distincly punctate. (Patrick and Reimer 1975).

Diatoma ehrenbergii Kuetz. 1844

Length:21 Width:4.5 Costae:6-7 Striae:

Collection 1348a Other images More information

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Authority information

Kuetzing, Bacill., p. 48, pl. 17, fig. 17 (1-3). 1844. (Stoermer and Yang 1969).

Other images

More information

- **Synonyms**

- **Ecology**

  ### Size ranges and morphology

Diatoma hiemale var.*mesodon* (Ehr.) Grun. 1839

Length:13.5 Width:7 Costae: 4 Striae:

Collection 1341a Other images More information

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Authority information

Ehr., Phys. Abh. Akad. Wiss. Berlin, for 1838:57, pl. 2(1), fig. 9. 1839 (Patrick and Reimer 1966).

Other images

More information

- **Synonyms** (Patrick and Reimer 1966)
  Odontidium hiemale var.*mesodon* (Ehr.) Grun., Verh. Zool.-Bot. Ges. Wien, 12: 357. 1862.
  Diatoma hiemale var.*mesodon* (Ehr.) Grun. *in* V.H., Syn. Diat. Belgique, pl. 51, figs. 3-4. 1881.
  - **Ecology**
    This taxon may be found in waters with mesotrophic conditions (Patrick and Reimer 1966).

    Size ranges and morphology

    - Length is 12-40 micrometers (Patrick and Reimer 1966).
    - Breadth is 6-15 micrometers (Patrick and Reimer 1966).
    - Striae range is 18-24 per 10 micrometers (Patrick and Reimer 1966).
    - Costae range is 2-4 per 10 micrometers (Patrick and Reimer 1966).

Diatoma tenue Ag. 1812

Length: 44.5 Width: 3 Costae: 7 Striae: fine

Collection 1578a Other images More information

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Authority information

Ag., Sv. Bot., vol. 7, pl. 491, figs. 4-5. 1812 (Patrick and Reimer 1966).

Other images

More information

- **Synonyms** (Patrick and Reimer 1966)
  Diatoma elongatum var.*tenue* (Ag.) V.H., Syn. Diat. Belgique, p. 160, 1885.
  Odontidium elongatum var.*tenue* (Ag.) Patr., Not. Nat. Adcad. Nat. Sci. Philadelphia, No. 28, p. 5. 1939.

- **Ecology**
  This taxon is often found in slightly salty waters (Patrick and Reimer 1966).

  ### Size ranges and morphology

  - Length is 20-55 micrometers (Patrick and Reimer 1966).
  - Breadth is 3-5 micrometers (Patrick and Reimer 1966).
  - Striae range is 16-20 per 10 micrometers (Patrick and Reimer 1966).
  - Costae range is 6-10 per 10 micrometers (Patrick and Reimer 1966).

Diatoma tenue var. *elongatum* Lyngb. 1819

Length:67 Width:3 Costae:10 Striae:

Collection 1233 Other images More information

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Authority information

Lyngb., Tent. Hydrophyt. Danicae, p. 179, pl. 61, figs. E1-2. 1819 (Patrick and Reimer 1966).

Other images

More information

- **Synonyms** (Patrick and Reimer 1966)
  Diatoma elongatum (Lyngb.) Ag., Syst. Alg., p.4. 1824.
  Odontidium elongatum (Lyngb.) Elm., Univ. Nebraska Stud., 21 (1/4) : 50, pl. 2 figs. 57-61. 1922.

- **Ecology**
  Preference is fresh or brackish waters for this taxon (Patrick and Reimer 1966).

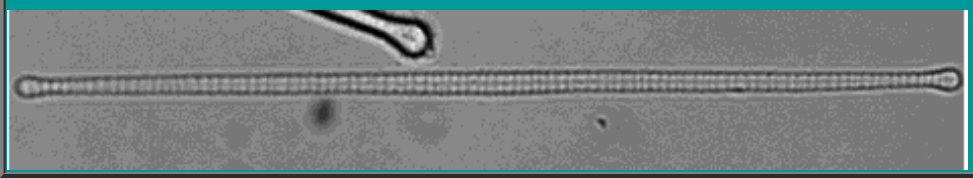
  Size ranges and morphology

  - Length is 40-120 micrometers (Patrick and Reimer 1966).
  - Breadth is 2-4 micrometers (Patrick and Reimer 1966).
  - Striae range is 16-18 per 10 micrometers (Patrick and Reimer 1966).
  - Costae range is 6-10 per 10 micrometers (Patrick and Reimer 1966).

Diatoma tenue var. *pachycephala* Grun. 1881

Length: 112.5 Width: 2.5 Costae: 9 Striae:

Collection 1223 Other images More information



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Authority information

Grunon *in* : Van Heurck, Syn. Diat. Belgique, pl. 50, fig. 15. 1881 (Stoermer and Yang 1969).

Other images

More information

- **Synonyms**

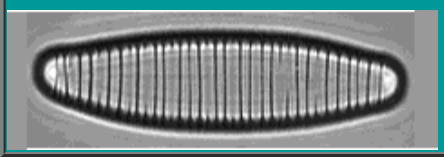
- **Ecology**

Size ranges and morphology

***Diatoma vulgare* Bory 1824.**

Length:46 Width: 10 Costae: 8-10 Striae:fine

Collection 808 Other images More information



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Authority information

Bory, Dict. Class. Hist. Nat., 5:461. 1824. Dict. Sci. Nat., Planch. Bot.: Veg. Acot. 10 (Arthrodiees-4th pl.) fig. 1. 1816-1829 (Patrick and Reimer 1966).

Other images

More information

- **Synonyms** (Patrick and Reimer 1966)
  Bacillaria vulgaris (Bory) Ehr., Ber. Akad. Wiss. Berin, for 1836:53, 56. 1836.
  Diatoma vulgare var. *productum* Grun., Verh. Zool.-Bot. Ges. Wien, 12:363. 1862.
  Odontidium vulgare (Bory) Pfitz., Bot. Abh. Geb. Morph. Physiol., 1 (2): 121, pl. 6, fig. 20. 1871.
  - **Ecology**
    Often, this taxon is found in waters of high nutrient content and prefers is cool, flowing waters (Patrick and Reimer 1966).

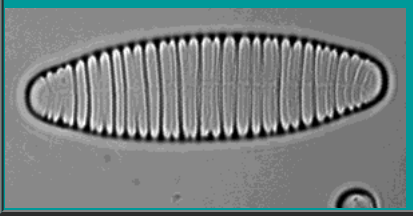
    ### Size ranges and morphology

    - Length is 30-60 micrometers (Patrick and Reimer 1966).
    - Breadth is 8-13 micrometers (Patrick and Reimer 1966).
    - Striae range about 16 per 10 micrometers (Patrick and Reimer 1966).
    - Costae range is 6-8 per 10 micrometers (Patrick and Reimer 1966).

Diatoma vulgare var. *breve* Grun. 1862.

Length: 43 Width:12 Costae: 7 Striae:

Collection 1236 Other images More information



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Authority information

Grun., Verh. Zoll.-Bot. Ges. Wien, 12:363. 1862 (Patrick and Reimer 1966).

Other images

More information

- **Synonyms** (Patrick and Reimer 1966)
  Odontidium vulgare var.*brevis* (Grun.) Patr., Not. Nat. Acad. Nat. Sci. Philadelphia, No. 28, p. 7. 1939.
  - **Ecology**
    This taxon prefers cool water (Patrick and Reimer 1966).

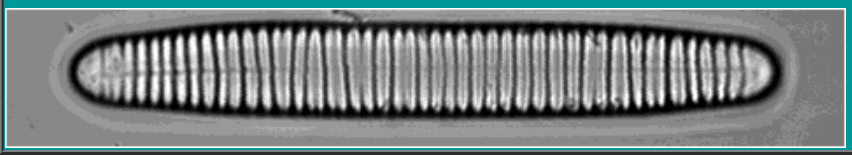
Size ranges and morphology

- Length is 24-50 micrometers (Patrick and Reimer 1966).
- Breadth is 11-13 micrometers (Patrick and Reimer 1966).
- Striae range about 16 per 10 micrometers (Patrick and Reimer 1966).
- Costae range is 6-8 per 10 micrometers (Patrick and Reimer 1966).

***Diatoma vulgare* var. *linearis* V.H. 1881.**

Length: 62 Width: 8 Costae: 6-7 Striae:

Collection 1578a Other images More information



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Authority information

V.H., Syn. Diat. Belgique, pl. 50, figs. 7-8. 1881 (text, p. 16-. 1885.) (Patrick and Reimer 1966)

Other images

More information

- **Synonyms** (Patrick and Reimer 1966)
  Odontidium vulgare var. *linearis* (V.H.) Patr., Not. Nat. Acad. Nat. Sci. Philadelphia, No. 28, p. 8. 1939.

- Ecology

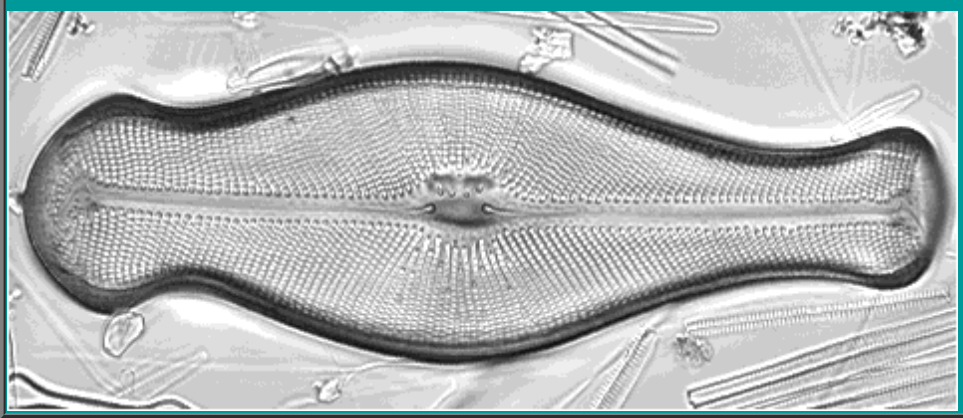
Size ranges and morphology

- Length is 44-75 micrometers (Patrick and Reimer 1966).
- Breadth is 7-10 micrometers (Patrick and Reimer 1966).
- Striae range about 16 per 10 micrometers (Patrick and Reimer 1966).
- Costae range is 5-8 per 10 micrometers (Patrick and Reimer 1966).

***Didymosphenia geminata* (Lyngb.) M. Schmidt 1899**

Length:124 Width:25 Striae:9

Collection C-5 Other images More information



Authority information

(Lyngbye 1819) M. Schmidt 1899 *in* Schmidt et al. 1874-__, 214:7-9 (VanLandingham 1969)

Other images

More information

- **Synonyms** (Patrick and Reimer 1975)
  Echinella geminata Lyngb., Tent. Hydrophyt. Danicae, p. 210, pl. 70, fig. D. 1819.
  Gomphonema geminatum (Lyngb.) Ag., Syst. Alg., p. 12. 1824.
  Didymosphenia geminatum (Lyngb.) M. Schmidt in A.S., Atlas Diat., pl. 214, figs. 9 10. 1899.

- **Ecology**
  This taxon prefers cool water of low conductivity (Patrick and Reimer 1975) and may be useful as indicators of increases in salt concentrations in the Great Lakes (E. F. Stoermer, personal communication).

Size ranges and morphology

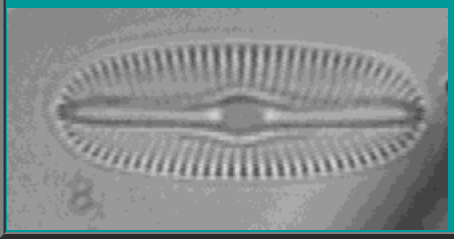
- Length range: 100 to 140 micrometers (Patrick and Reimer 1975).
- Breadth range: 25 to 43 micrometers (Patrick and Reimer 1975).
- Striae: 8-10 striae per 10 micrometers (Patrick and Reimer 1975).

- Other morphological features
  2 to 5 stigmata on one side of the central nodule (Patrick and Reimer 1975).

Diploneis sp. 2

Length:16 Width:6 Costae:20

Collection 1545 Other images More information



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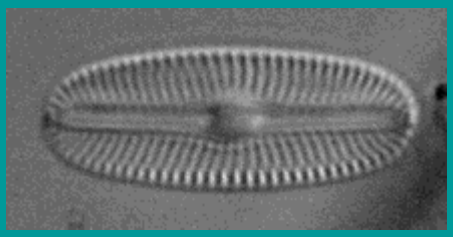
Authority information

Other images



This image was taken utilizing DIC for the specimen above.

More information

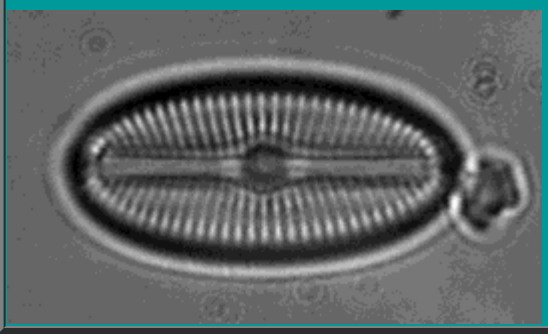
- **Type Locality**
- **Ecology**

Size ranges and morphology

Diploneis sp. 4

Length:16 Width: 8 Costae:20

Collection 1158a Other images More information



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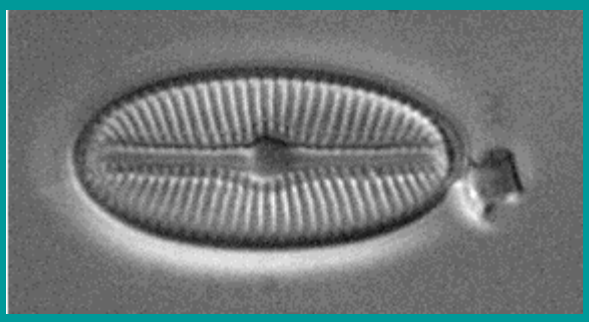
Authority information

Other images



This image was taken utilizing DIC for the specimen above.

More information

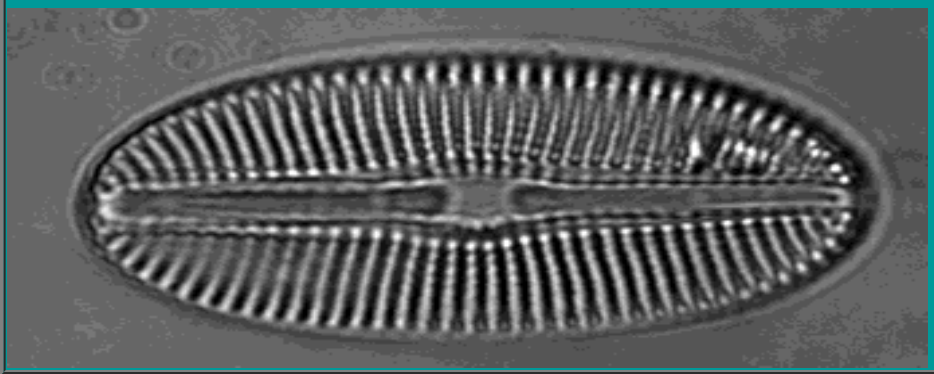
- **Type Locality**
- **Ecology**

Size ranges and morphology

***Diploneis boldtiana* Cleve**

Length:32 Width:16 Costae:12

Collection 1404 Other images More information



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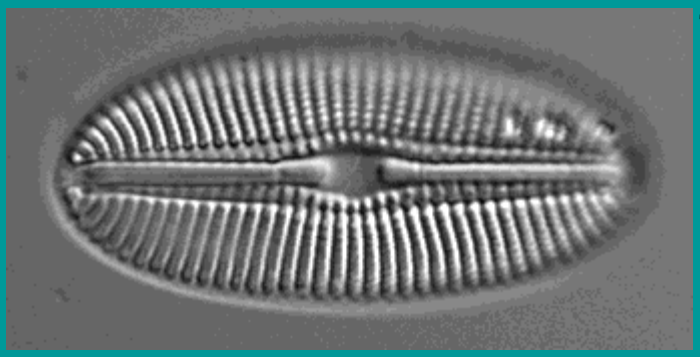
Authority information

Cleve, Acta Soc. Fauna Fl. Fennica, 8(2):43, pl.2, fig. 12. 1891.

Other images



This image was taken utilizing DIC for the specimen above.

More information

This taxon has a narrow raphe valve. The central knot is small and round and the longitudinal canals are narrow and linear. It also has linear-elliptic sides that are parallel and slightly convex. The ends are blunt and widely rounded (Krammer and Lange-Bertalot 1986).

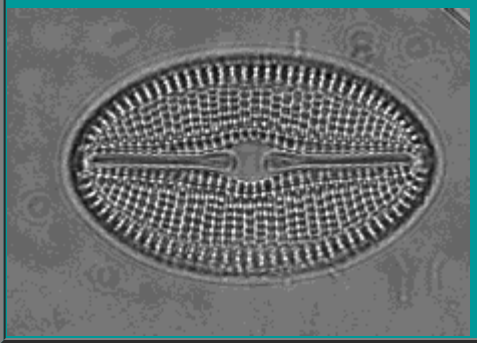
Size ranges and morphology

- Length is 23 to 38 micrometers (Krammer and Lange-Bertalot 1986).
- Width is 10 to 12 micrometers(Krammer and Lange-Bertalot 1986).
- Costae are 14 to 15 in 10 micrometers (Krammer and Lange-Bertalot 1986).
- Alveoli are 25 to 30 in 10 micrometers(Krammer and Lange-Bertalot 1986).

Diploneis domblitensis (Grun.) Cleve

Length:38 Width:24 Costae:10

Collection 1567 Other images More information



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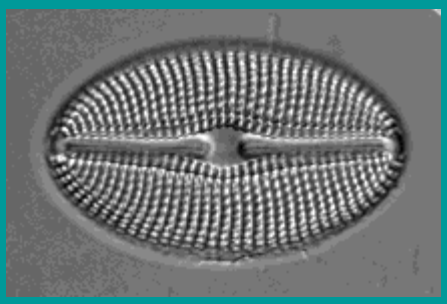
Authority information

(Grun.) Cleve, k. Svenska Vet.-Akad. Handl., Ny Goljd, 26(2):91, pl. 2. 1894 (Stoermer and Yang 1969).

Other images



This image was taken utilizing DIC for the specimen above.

More information

This taxon has a liner-elliptic valve. There is a linear raphe. The longitudinal canals are very small. Between the striae there are coarse ribs and the striae are slightly curved and more radial toward the ends (Krammer and Lange-Bertalot 1986).

- **Synonyms**

Navicula explets var*domblittensis* Grunow *in* : Mojsisovics and Neumayer, Beitr. Plalontol. Osterreich-Ungarns, Bd. 2, Heft 4, p. 156, pl. 30, fig. 60. 1882 (Stoermer and Yang 1969).

- **Ecology**

This taxon prefers the pH to be from 6.6 to 8.9 and it occurs in lakes and ponds (Lowe 1974;Beaver 1981).

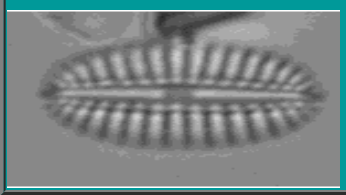
Size ranges and morphology

- Length is 23 to 60 micrometers(Krammer and Lange-Bertalot 1986).
- Width is 15 to 24 micrometers(Krammer and Lange-Bertalot 1986).
- Striae are 10 to in 10 micrometers(Krammer and Lange-Bertalot 1986).

Diploneis elliptica v. *pygmaea*

Length:11 Width:6 Costae:14

Collection 1159a Other images More information



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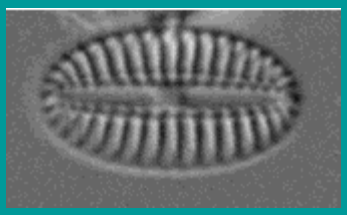
Authority information

Other images


This image was taken utilizing DIC for the specimen above.

More information

The identification of this taxon may not be correct.

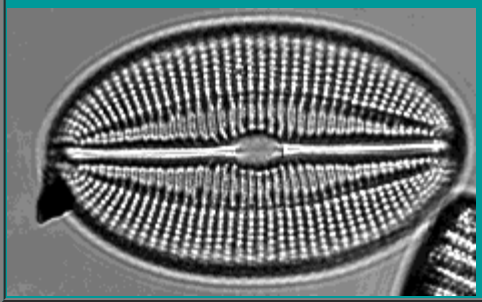
Ecology

Size ranges and morphology

***Diploneis finnica* (Ehr.)**

Length:51 Width:29 Costae:7

Collection 1779 Other images More information



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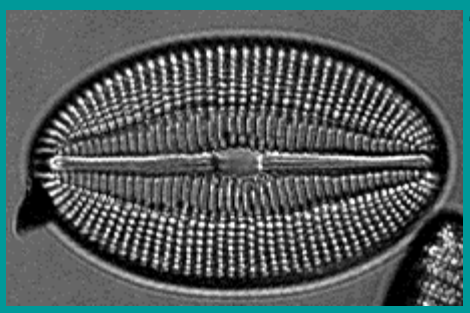
Authority information

(Ehr.)Cl., acta Soc. Fauna Fl. Fennica, 8(2):43, pl.2, fig. 11. 1891.

Other images



This image was taken utilizing DIC for the specimen above.

More information

The valve of this taxon is elliptical. It has a siliceous rib that encloses the raphe valve. The raphe valve is broad and well developed. The central area is elliptical as well. There are distinct, narrow extensions of the central area. The longitudinal canals are broad and the ends of the raphe valve are far apart. There are one or two rows of pores on the outer surface of this taxon. There are two rows of alveoli between the costae (Patrick and Reimer 1966).

- **Type Locality**
  Connecticut, Washington,Oregon (Patrick and Reimer 1966).
  - **Ecology**
    This taxon prefers fresh water that is standing. Small amounts of salt don't affect this taxon (Patrick and Reimer 1966).

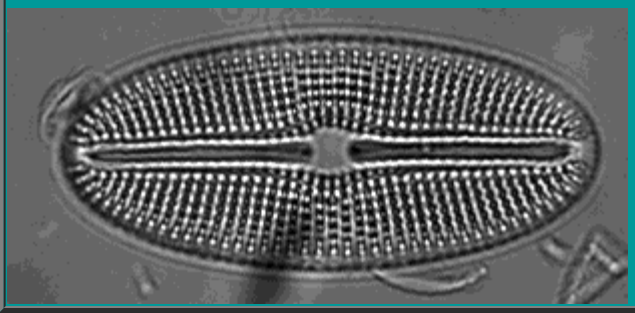
Size ranges and morphology

- Length is 35 to 85 micrometers (Patrick and Reimer 1966).
- Width is 25 to 45 micrometers (Patrick and Reimer 1966).
- Costae are 7 to 8 in 10 micrometers (Patrick and Reimer 1966).
- Alveoli are 12 in 10 micrometers (Patrick and Reimer 1966).

Diploneis oblongella (Nang. *ex* Kutz.)

Length:38 Width:16 Costae:12

Collection 1354 Other images More information



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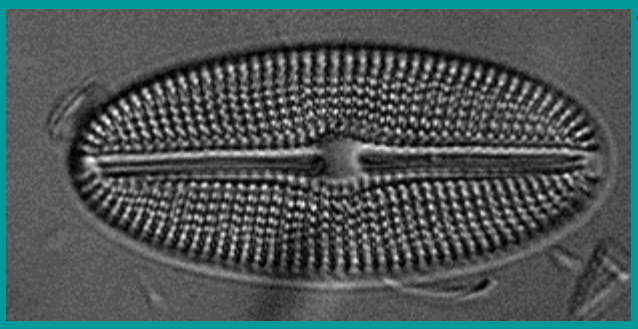
Authority information

(Naeg. *ex* Kutz.) Ross, Natl. Mus. Canada Bull., No. 97. p. 212. 1947.

Other images



This image was taken utilizing DIC for the specimen above.

More information

The valve of this taxon is linear-elliptical and it has rounded ends. The central area is rounded and it has narrow longitudinal canals. This taxon has one row of pores that are pplaced so as to look like a continuation of the alveoli. The costae are transverse and are radiate throughout the valve. There is one row of alveoli between the costae (Patrick and Reimer 1966). The characteristics of this taxon resembles *Diploneis parma* and *Diploneis subovalis*. The main difference is the single row instead of a double row of alveoli. The geographical distribution differs as well (Patrick and Reimer 1966).

- **Type Locality**
  Helvetia, Switzerland, New England States, Middle Atlantic States, Southeastern States, Gulf Coast States, South Central States, East Central States, West Central States, Plains States, Wyoming, Utah, Washington, and California (Patrick and Reimer 1966).

- **Synonyms**
  Diploneis ovalis (Naeg.*ex* Kutz.) *in* pl. 2, fig. 13. 1891 (Patrick and Reimer 1966).

- **Ecology**
  This taxon prefers fresh water that can be slightly brackish and it also likes damp places

(Patrick and Reimer 1966).

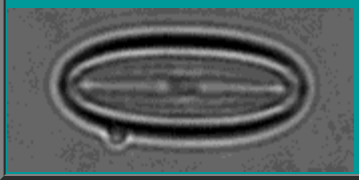
Size ranges and morphology

- Length is 10 to 100 micrometers (Patrick and Reimer 1966).
- Width is 6 to 35 micrometers (Patrick and Reimer 1966).
- Costae are to 10-19 in 10 micrometers (Patrick and Reimer 1966).
- Alveoli are 13-20 in 10 micrometers (Patrick and Reimer 1966).

***Diploneis oculata* (Breb.)**

Length:17 Width:7 Costae:22+

Collection 1245 Other images More information



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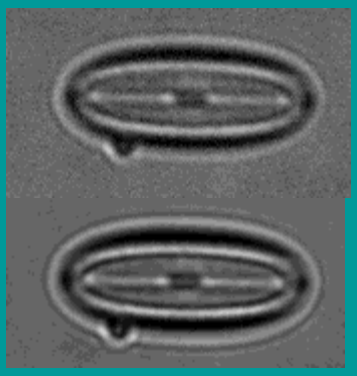
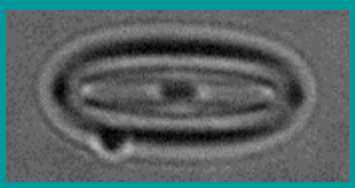
Authority information

(Breb.)Cl., K. Svenska Vet.-Akad. Handl., Ny Foljd, 26(2):92. 1894

Other images



This image was taken utilizing DIC for the specimen above.



These are another specimen of *Diploneis oculata* . One utilizes regular methods of capturing and the other utilizes dic.

More information

This taxon is characterized by a linear-elliptical valve. It has indistinct and narrow longitudinal canals. The costae are slightly radiate to parallel. It is very similar to *Diploneis marginestriata*. The striae are usually fine and parallel. It has a narrower longitudinal cananl than *Diploneis marginestriata* (Patrick and Reimer 1966).

- **Type Locality**
  Middle Atlantic States, Southeastern States, East Central States, and California (Patrick and Reimer 1966).
  - **Ecology**
    This taxon if found in fresh water. The water has variable mineral content (Patrick and Reimer 1966).

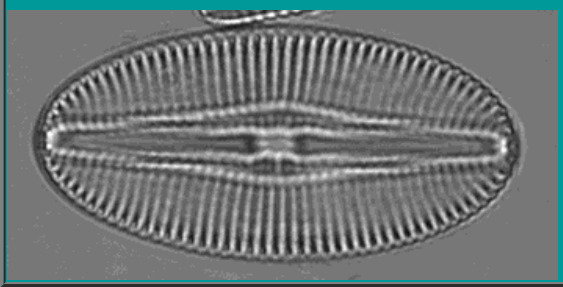
Size ranges and morphology

- Length is 10 to 20 micrometers (Patrick and Reimer 1966).
- Width is 5 to 8 micrometers (Patrick and Reimer 1966).
- Costae are 20 to 28 in 10 micrometers (Patrick and Reimer 1966).
- Alveoli are not distincte in 18 micrometers (Patrick and Reimer 1966).

***Diploneis parma* Cleve**

Length:36 Width:17 Costae:12

Collection 1158 Other images More information



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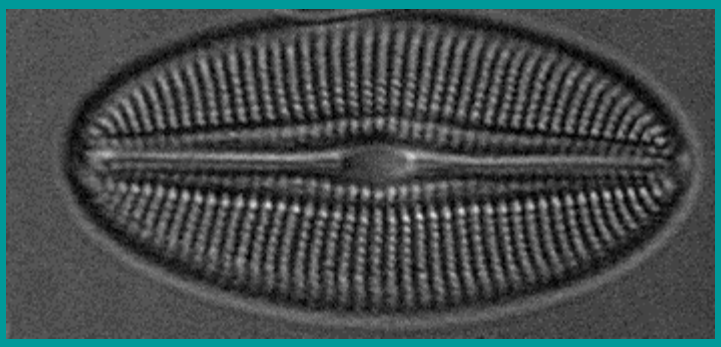
Authority information

Cleve 1891 (Fig. 109:1-7)

Other images



This image was taken utilizing DIC for the specimen above.

More information

This taxon is resembles Diploneis oblongella. It has a linear-elliptic valve and a rounded central area. It has a narrow longitudinal canal and it has a double row of alveoli between the costae (Patrick and Reimer 1966).

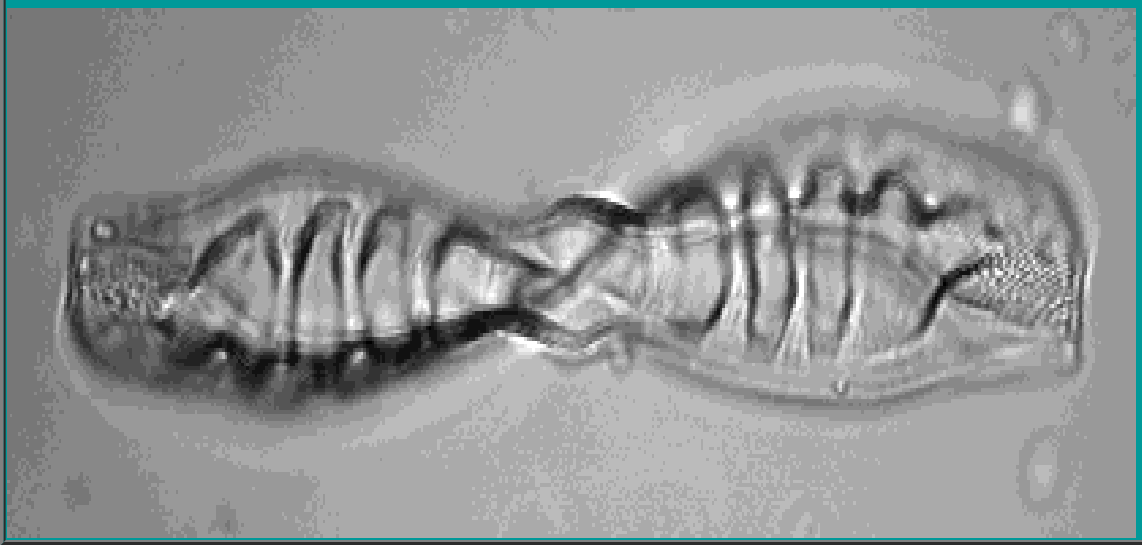
Size ranges and morphology

- Length is 20 to 50 micrometers(Krammer and Lange-Bertalot 1986).
- Width is 12 to 23 micrometers(Krammer and Lange-Bertalot 1986).
- Costae are 14 to 17 in 10 micrometers(Krammer and Lange-Bertalot 1986).
- Alveoli are 20 to 28 in 10 micrometers(Krammer and Lange-Bertalot 1986).

***Entomoneis ornata* (J. W. Bail.) Reim**

Length:91 Width: Striae: Puncta:

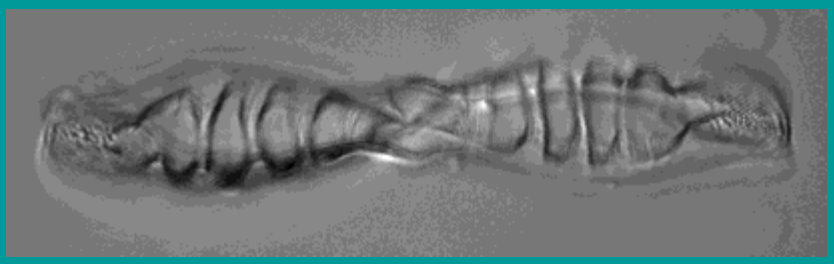
Collection 1035 Other images More information



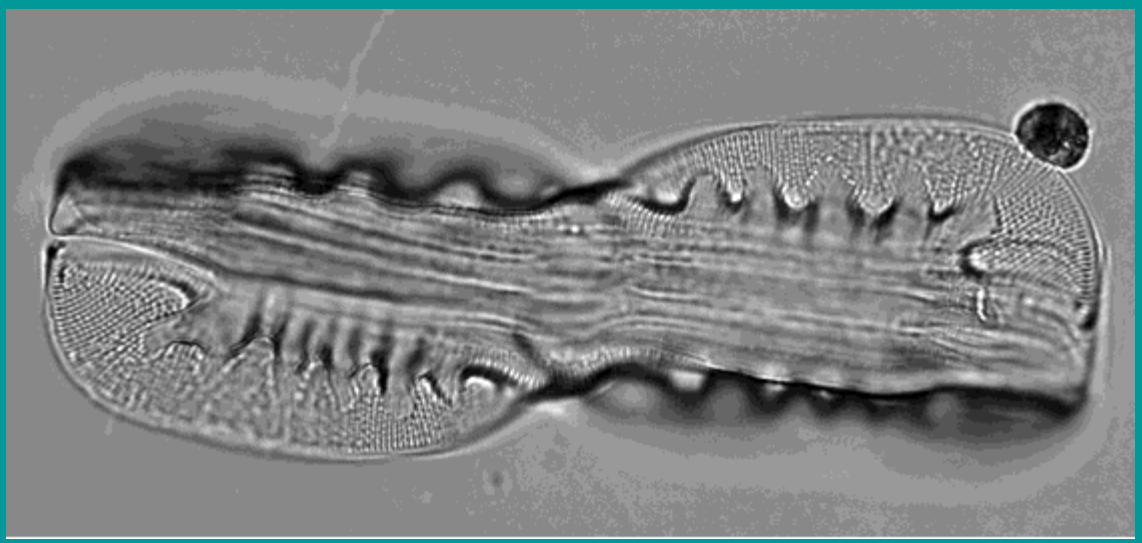
Authority information

(J. W. Bail.) Reim. comb. nov., var. ornata (Patrick and Reimer 1975).

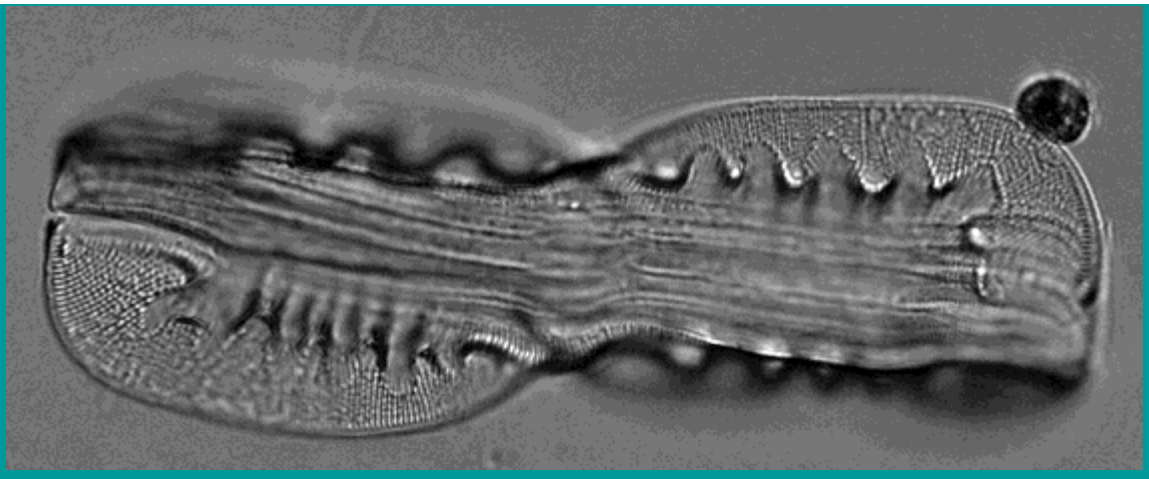
Other images



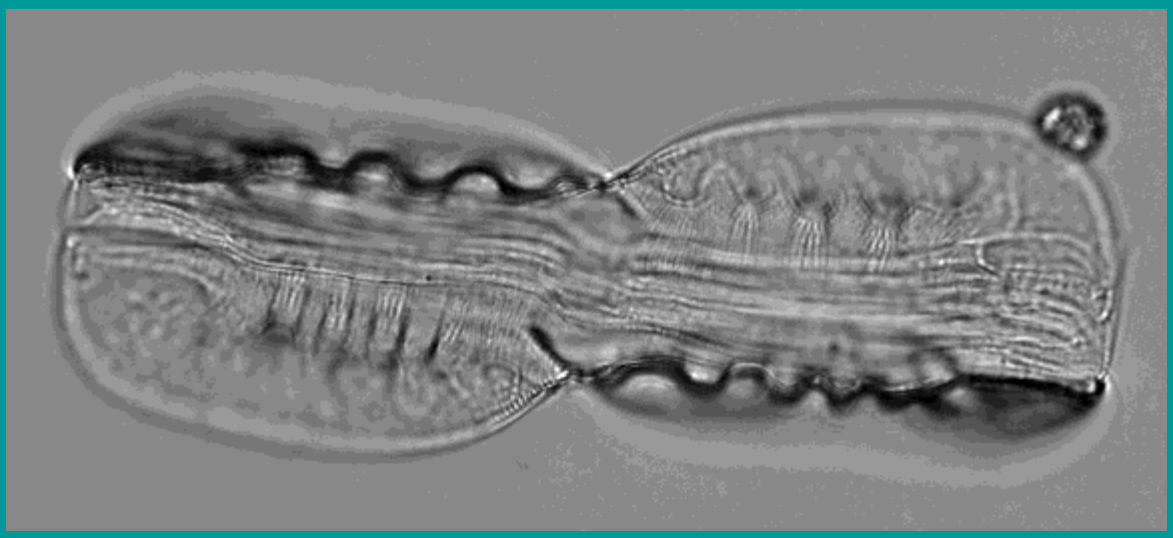
This image was taken utilizing DIC for the specimen above.



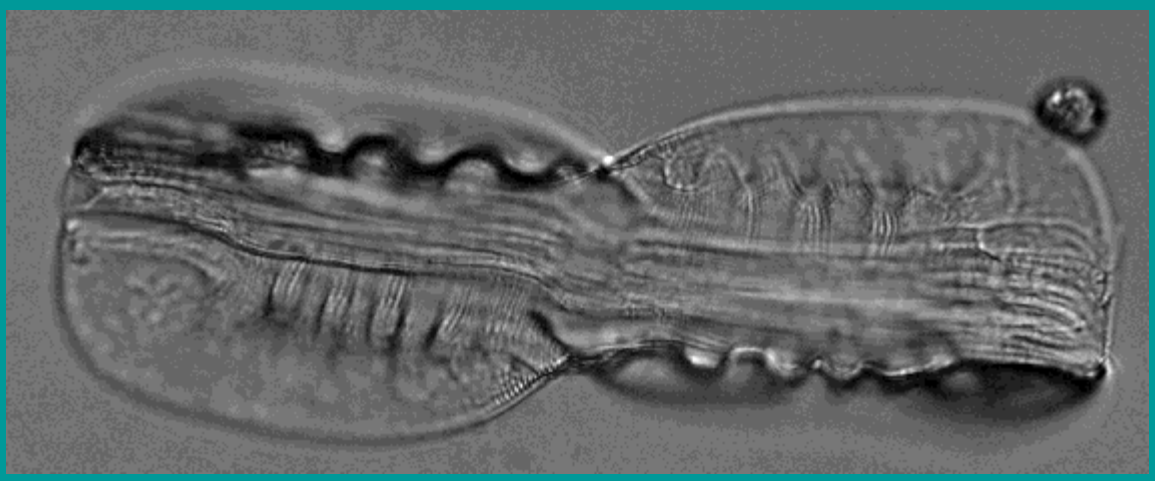
This is another image taken with slightly different focus. It was taken under brightfield illumination. In micrometers, length is 97, width is 30, and it has 18 to 20 striae in 10 micrometers.



This image was taken utilizing DIC. It is for the specimen directly above.



This is another image taken with slightly different focus. It was taken under brightfield illumination.



This image was taken utilizing DIC. It is for the specimen directly above.

More information

This taxon has a narrow valve that is linear and has capitate or pointed ends depending on which view you are looking at. There are indistincte striae that are closely punctate. In girdle view it has bilobate wings with thickened silicious dots as if distinctly punctate (Patrick and Reimer 1975).

- **Type Locality** New England States, Middle Atlantic States, Southeastern States, Florida, East Central States, West Central States, Lakes States, Plains States; Colorado, Montana, Washington (Patrick and Reimer 1975).

- **Synonyms** *Amphiprora ornata* J. W. Bail., Smithsonian Contr. Knowl., 2(8):38, pl. 2, figs 15, 23. 1851 (Patrick and Reimer 1975).

- **Ecology**
  This taxon is acidophilous to alkaliphilous. It tolerates small amounts of salt. It prefers pH of 7.5 and it occurs in both clean water and polluted habitats (Lowe 1974;Patrick and Reimer 1975;Beaver 1981).

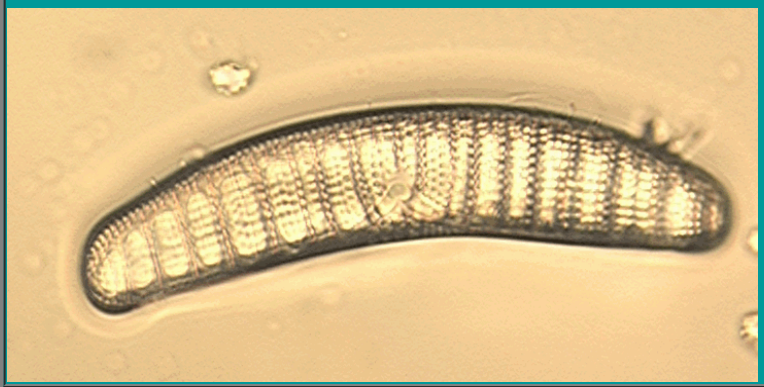
Size ranges and morphology

- Length is 50 to 115 micrometers (Patrick and Reimer 1966).
- Width is 28 to 42 micrometers in girdle view (Patrick and Reimer 1966).
- Striae and rows of silicious dots in valve view are about 18 to 24 in 10 micrometers (Patrick and Reimer 1966).

Epithemia adnata (Kutz.) Breb.

Length: 66 Width: 14 Striae: 14 Costae: 2-3

Collection 1776 Other images More information



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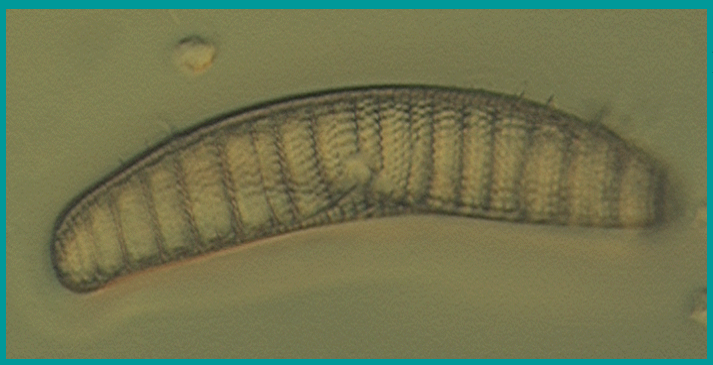
Authority information

Epithemia adnata (Kutz.) Breb., Consid. Diat., p. 16. 1838. (Patrick and Reimer 1975).

Other images



The image of this specimen was captured using DIC. It helps to distinguish fine detail.

More information

The valve has a convex dorsal margin, ventral margin slightly concave to straight. Apicies are not differentiated from the body of the valve. The raphe is only appearent in the middle of the valve in valve view, curved towards dorsal margin. The central pores of the raphe are located below the mid-width of the valve. Poores in the central canal plate are indistinct. Distinct costae, in girdle view ends of costae indistinctly capitate or rounded. Caracteristics of this species are the central pores of the raphe are located below the midpoint of the valve width. Rows of alveoli are more than two between the costae. In girdle view the costat are rounded and not distinctly capitate. This nominante has a valve not differentiated or set off from valve main body. (Patrick and Reimer 1975).

Special note

Hustedt 1930 lists this *Epithemia* under the name *Epithemia zebra*, a synonym. (Patrick and Reimer 1975). and (Krammer and Lange-Bertalot 1988). list it under the name *E. adnata. E. adnata* has been used here because that name was given before *E. zebra.*

Type Locality

USA, New England states, Middle Atlantic states, South Eastern states, Gulfcoast states, South Central states, East Central states, West Central states, Lake states, Plains states, Colorado, Wyoming, Montana, Utah, California, Oregon and Washington. (Patrick and Reimer 1975).

Synonyms

Epithemia zebra(Ehr.) Kutz., Bacill., p. 34, pl. 5, figs. 12,6(abc). 1844
Frustulia adnata Kutz., Alg., Dec 5, No41. 1833.
Frustulia adnata Kutz., linnaea, 8:544, pl. 13 fig. 15. 1833
Navicula zebra Ehrenberg 1833, p. 262; Ehrenberg 1838, p. 191, 14/7.
Eunotia zebra (Ehr.) Ehr., Infusionsthierchen, p. 191, pl. 14, fig 7 (*As N. zebra)* pl. 21, fig 19. 1838.
Cystopleura zebra (Ehr.) Kuntze, Reviso Gen. Plant., vol. 2, p. 891. 1891
(Patrick and Reimer 1975).

Ecological distribution

Found in lakes, ponds, rivers, springs/streams, lagoons, pools, oozing areas, thermal springs, swamps, and terrestrial pH: Acidobiontin, Acidophilous, Indifferent, Alkaliphilous, Alkalibiontic. Halobion: Oligohalobous, indifferent, euryhalobous. Saprobien: Beta range oligosaprobic (saproxenous to beta-mesosaprobic), saporxenous. Current: Indifferent, rheobiontic. Specific habitat: periphytic. Temperature: Euthermal, Mesothermal, Eurythermal. (Beaver 1981).

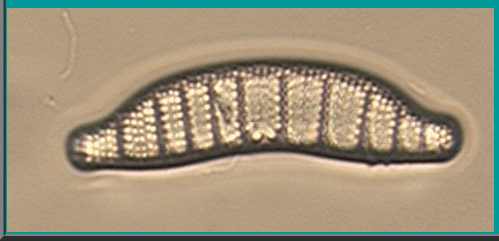
Size ranges and morphology

- Length is 15 to 150 micrometers (Patrick and Reimer 1975)
- Width is 7 to 14 micrometers (Patrick and Reimer 1975)
- Costae are about 3 to 5 in 10 micrometers (Patrick and Reimer 1975).
- Alveoli rows are 12 to 14 in 10 micrometers (Patrick and Reimer 1975).

Epithemia adnata var. *porcellus* (Kutz.) Patr.

Length: 40.5 Width: 9 Striae: 14 Costae: 3-4

Collection 1369 Other images More information



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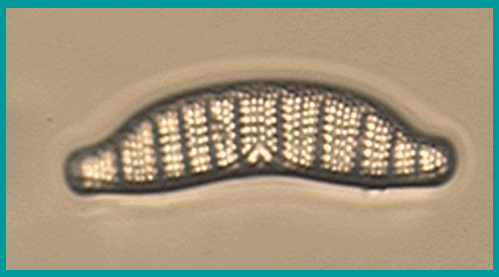
Authority information

Epithemia adnata var. *porcellus* (Kutz.) Patr. comb. nov., Patrick and Reimer, pl. 24, fig. 6, 1975. (Patrick and Reimer 1975).

Other images



The image of this specimen was captured using DIC. It helps to distinguish fine detail.

More information

The valve has a concave ventral margin and a convex ventral margin. The apices are narrow, turnicate to slightly capitate and sometimes a little reflexed. The raphe and costae ends are the same as *Epithemia adnata*: "The raphe is only apparent in the middle of the valve in valve view, curved towards dorsal margin. The central pores of the raphe are located below the mid-width of the valve. Poores in the central canal plate are indistinct. Distinct costae, in girdle view ends of costae indistinctly capitate or rounded." This taxon is most closely related to *C. adnata* var. *proboscidea* differing mainly in the apices, which are not as distinctly differentiated, and the length to breadth ratio3.7-4.1:1 rather than 5:1, it is also normally shorter than *C. adnata* var. *proboscidea*. (Patrick and Reimer 1975).

Type Locality

USA, New England states, Middle Atlantic states, Southeastern states, West Central states, Lake states; Arizona, California. (Patrick and Reimer 1975).

Synonyms

Epithemia porcellus Kutz., Bacill., pl. 5, figs. 18,19. 1844 *Epithemia zebra* var. *porcellus* (Kutz.) Grun., Verh. Zool.-Bot. Ges. Wien, 12:328, pl. 6 (Grun. pl. 9), figs 3,4. 1862. *Cytopleura zebra* var. *porcellus* (Kutz.) DeT., Syll. Alg., vol. 2, sect. 2, p. 785. 1892 (Patrick and Reimer 1975).

Ecological distribution

Found in lakes, ponds, rivers, springs/streams, lagoons, oozing areas, thermal springs, swamps, and terrestrially. Acidobiontic, Acidophilous, indifferent, Alkaliphilous, Alkalibiontic. (Beaver 1981).

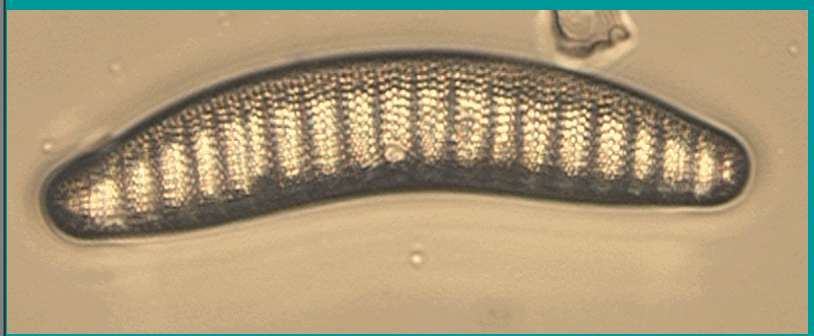
Size ranges and morphology

- Length is 20 to 125 micrometers (Patrick and Reimer 1975).
- Width is 8 to 14 micrometers (Patrick and Reimer 1975).
- Costae are about 4 to 5 in 10 micrometers (Patrick and Reimer 1975).
- Alveoli rows are 8 to 12 in 10 micrometers (Patrick and Reimer 1975).

Epithemia adnata var. *saxonica* (Kutz.) Patr.

Length: 72 Width: 13.5 Striae: 14 Costae: 3

Collection 1776 Other images More information



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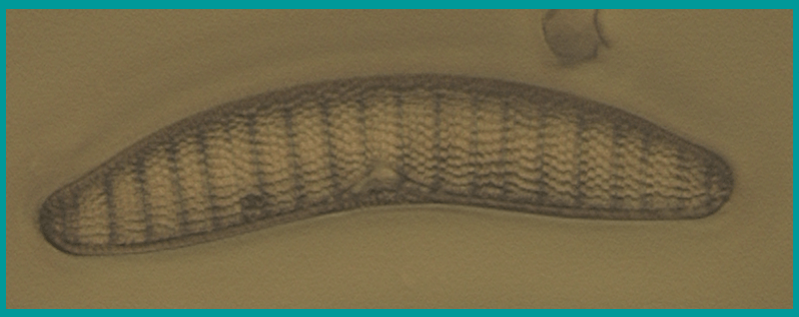
Authority information

Epithemia adnata var. *saxonica* (Kutz.) Patr. comb. nov., Patrick and Reimer, pl. 24, fig. 9. 1975 (Patrick and Reimer 1975).

Other images



The image of this specimen was captured using DIC. It helps to distinguish fine detail.

More information

The valve's dorsal margin is convex, the central margin concave. The valve narrows as it approaches the apices, they are not differentiated from the body of the valve. The raphe is the same as *Epithemia adnata*: "The raphe is only apparent in the middle of the valve in valve view, curved towards dorsal margin. The central pores of the raphe are located below the mid-width of the valve. Poores in the central canal plate are indistinct." This variety is very closely related to *Epithemia adnata*, so much so that its differentiation is questionable, but it does differ in that the ventral margin is more concave and sometimes smaller. (Patrick and Reimer 1975).

Type Locality

USA, New England states, Middle Atlantic states, Southeastern states, Lake states, East Central states, West

Central states, Plains states, Arizona, California, Oregon, and Washington. (Patrick and Reimer 1975).

Synonyms

Epithemia saxonica Kutz., Bacill., pl. 5, fig. 15. 1844.
Epithemia zebra var. *saxonica*(Kutz.) Grun., Verh. Zool.-Bot. Ges. Wien, 12:328, pl. 3 (Grun., pl. 6), fig. 6. 1862.
Cystopleura zebra var. *saxonica*(Kutz.) DeT., Syll. Alg., vol. 2, sect. 2, p. 784. 1892 (Patrick and Reimer 1975).

Ecological distribution

Found in Ponds, rivers, springs/streams, lagoons, oozing areas on rock walls, thermal springs, swamps, and terrestrially. Acidobiontic, acidophilous, indifferent, alkaliphilous and alkalibiontic. (Beaver 1981).

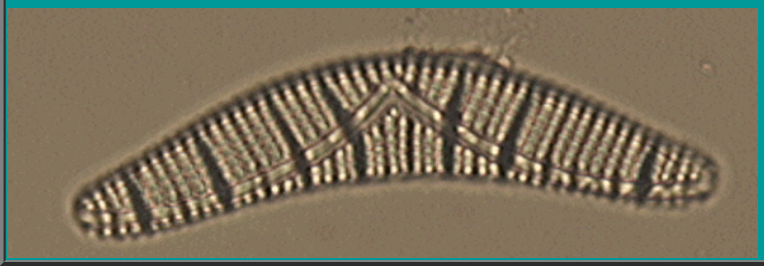
Size ranges and morphology

- Length is 15 to 70 micrometers (Patrick and Reimer 1975).
- Width is 8 to 10 micrometers (Patrick and Reimer 1975).
- Costae are about 4 to 9 in 10 micrometers (Patrick and Reimer 1975).
- Alveoli rows are 11 to 14 in 10 micrometers (Patrick and Reimer 1975).

Epithemia argus var. *alpestrus* Wm. Smith

Length: 47 Width: 10 Striae: 12 Costae: 2-3

Collection 1776 Other images More information



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Authority information

Epithemia argus var. *alpestrus* (Wm. Smith 1853) Grunow 1862, p32d, 3/28 (VanLandingham 1969).

Other images

The image of this specimen was captured using DIC. It helps to distinguish fine detail.

More information

The dorsal margin of the valve is convex and the ventral margin is slightly concave. There are somewhat recurved apices that are distinctly rostrate and capitate. The raphe is aparent along the ventral margin of the valve for part of its length. There is a central nodule at the midpoint of the valve or sometimes nearer the ventral margin.The costae ends in the girdle view are capitate. Distinguished by its distinctly capitate rostrate apices. (Patrick and Reimer 1975).

Type Locality

USA, New England states, New Jersey, Florida, Illinois, Lake Huron, Lake Michigan, Minnesota, and Washington. (Patrick and Reimer 1975).

Synonyms

Epithemia alpestrus W. Smith, Syn. British Diat., vol. 1, pg. 13, pl. 1, fig. 7, 1853.
Epithemia argus var. *amphicephala* Grun *in* V.H. Syn. diat. Belgique, pl. 31, fig 19. 1881. (Text p. 140) 1885.
Cystopleura argus var. *alpestris* Ehr. DeT., Syll. Alg., vol. 2, sect. 2, p. 783. 1892. (Patrick and Reimer 1975).

Ecological distribution

Found in lakes, ponds, rivers, oozing areas on rock walls and thermal springs. Oligohalobous, prefers water with a salt content less than 500 mg/L. Acidophilous, alkaliphilous and alkalibiontic. (Beaver 1981).

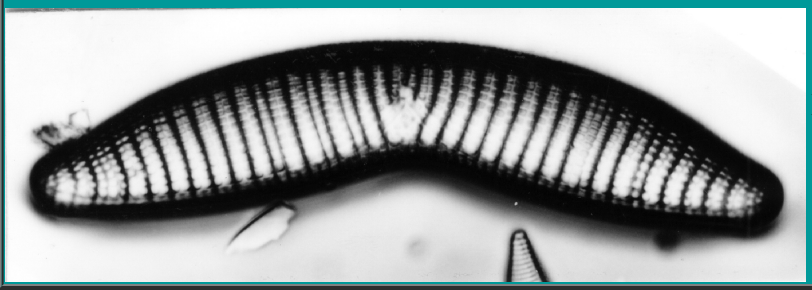
Size ranges and morphology

- Length is 55 to 62 micrometers (Patrick and Reimer 1975).
- Width is 7 to 10 micrometers (Patrick and Reimer 1975).
- Costae are about 3 in 10 micrometers (Patrick and Reimer 1975).
- Alveoli rows are 11 to 14 in 10 micrometers (Patrick and Reimer 1975).

Epithemia emarginata Andrews

Length: 97 Width: 18 Striae: 8 Costae: 4

Collection 1157a More information



This is a scanned in image from a previous picture of the specimen. The slide was missing so no new pictures could be taken.

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Authority information

Epithemia emarginata Anderws, Jour. Paleont., 42(1):244. 1968 (Patrick and Reimer 1975).

More information

Valve has a variously bent concave ventral margin and a convex dorsal margin. Apices sometimes somewhat protracted and much narrower than the middle part of the valve. The central nodule of the raphe is at or below the middle of the valve's width. Alveoli are narrower at central nodule. Closely related to *E. turgida* and may be abnormal forms of it in some cases. May be proven that it is an abnormal form of *E. turgida* but it has been recognised as a distinct species. closest to *E. turgide*var. *plicata*. Seems to prefer cool water. (Patrick and Reimer 1975).

Type Locality

USA, Lake Michigan. (Patrick and Reimer 1975).

Synonyms

Epithemia irregularis Andrews, U.S. Geol. Surv. Prof. Pap., 523-A:A-22, pl. 3 figs 22-25. 1966 (*non epithemia irregularis* Fritsch & Rich, Trans. Roy. Soc. South Africa, 12(4):277-284. 1925)
Epithemia andrewsii Stoerm. And Yang, Special Report #47, University of Michigan, p 67. 1967 (nomen superf) (Patrick and Reimer 1975).

Size ranges and morphology

- Length is 43 to 100 micrometers (Patrick and Reimer 1975).
- Width is 16 to 20 micrometers (Patrick and Reimer 1975).
- Costae are about 3-5 in 10 micrometers (Patrick and Reimer 1975).
- Alveoli rows are 7 to 10 in 10 micrometers (Patrick and Reimer 1975).

***Epithemia intermedia* Fricke**

Length: 51 Width: 16 Striae: 12 Costae: 2-4

Collection 1157a

More information

This is a scanned in image from a previous picture of the specimen. The slide was missing so no new pictures could be taken.

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Authority information

Epithemia intermedia Fricke*in* A.S., Atlas Diat., pl.249, fics. 14-18. 1904. (Patrick and Reimer 1975).

More information

Almost stiaight valve with ventral margin, slightly concave in the middle. Main body of the valve and apices not clearly differentiated. Raphe only slightly curved up on the ventral margin at the central nodule towards dorsal margin. Sometimes raphe is only visible in the valve view of the central portion. Closely related to E. *adnata* but E. *intermedia* usually has more distant costae, fewer rows of alveoli in ten micrometers, and the rows of alveoli and costae are parallel to each other. Costae ends in girdle view capitate. (Patrick and Reimer 1975).

Type Locality

USA, Iowa (Patrick and Reimer 1975).

Synonyms

Epithemia zebra var. *Intermedia* (Fricke 1904 *in* Schmidt *et al.* 1874 -) Hustedt 1934, p. 394 (VanLandingham 1969).

Ecological distribution

Found in lakes, ponds, rivers, springs/streams, pools, and oozing areas. Acidophilous, indifferent, alkaliphilous, alkalibiontic. Oligohalobous. (Beaver 1981).

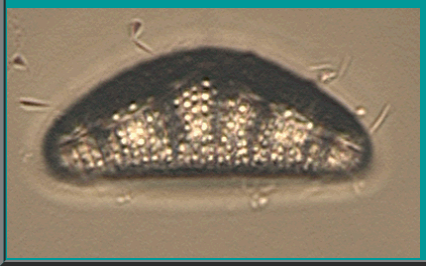
Size ranges and morphology

- Length is 20 to 55 micrometers (Patrick and Reimer 1975).
- Width is 9 to 15 micrometers (Patrick and Reimer 1975).
- Costae are about 3 to 4 in 10 micrometers (Patrick and Reimer 1975).
- Alveoli rows are 10 to 12 in 10 micrometers (Patrick and Reimer 1975).

Epithemia reicheltii Fricke

Length: 30 Width: 11 Striae: 11-12 Costae: 2

Collection 1258 Other images More information



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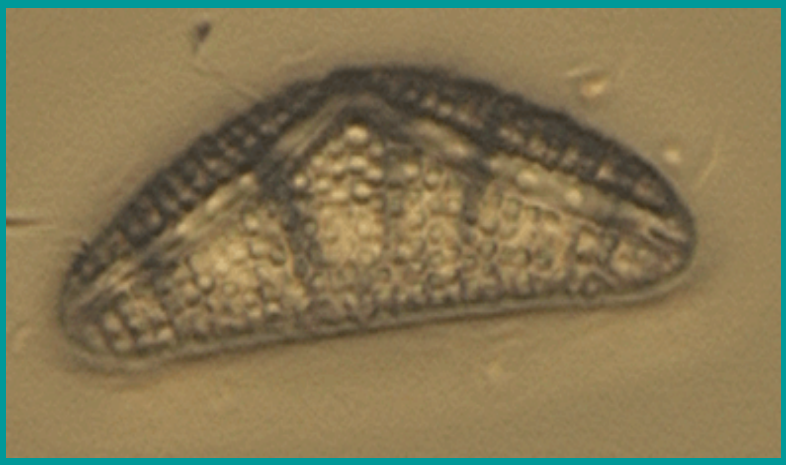
Authority information

Epithemia reicheltii (rachelti) Fricke 1904 *in* Schmidt *et al.* 1874- , 251/28-31 (VanLandingham 1969).

Other images



The image of this specimen was captured using DIC. It helps to distinguish fine detail.

More information

The dorsal margin of the valve is convex and the ventral margin is slightly concave. There are somewhat recurved apices that are distinctly rostrate and capitate. The raphe is aparent along the ventral margin of the valve for part of its length. There is a central nodule at the midpoint of the valve or sometimes nearer the ventral margin.The costae ends in the girdle view are capitate. Distinguished by its distinctly capitate rostrate apices. (Patrick and Reimer 1975).

Type Locality

USA, New England states, New Jersey, Florida, Illinois, Lake Huron, Lake Michigan, Minnesota, and Washington. (Patrick and Reimer 1975).

Synonyms

Epithemia alpestrus W. Smith, Syn. British Diat., vol. 1, pg. 13, pl. 1, fig. 7, 1853.
Epithemia argus var. *amphicephala* Grun *in* V.H. Syn. diat. Belgique, pl. 31, fig 19. 1881. (Text p. 140) 1885.
Cystopleura argus var. *alpestris* Ehr. DeT., Syll. Alg., vol. 2, sect. 2, p. 783. 1892. (Patrick and Reimer 1975).

Ecological distribution

Found in lakes, thermal springs, and swamps. Alkalibiontic. (Beaver 1981).

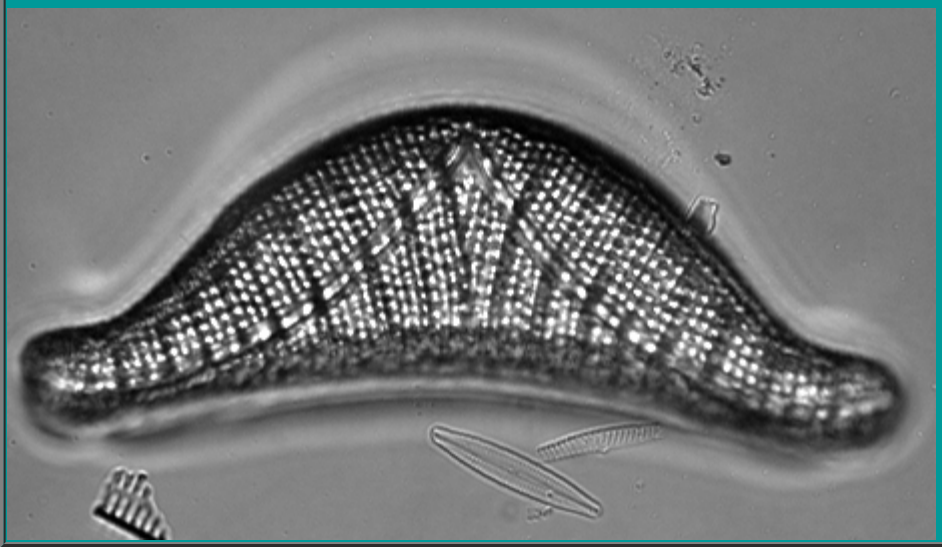
Size ranges and morphology

- Length is 55 to 62 micrometers (Patrick and Reimer 1975).
- Width is 7 to 10 micrometers (Patrick and Reimer 1975).
- Costae are about 3 in 10 micrometers (Patrick and Reimer 1975).
- Alveoli rows are 11 to 14 in 10 micrometers (Patrick and Reimer 1975).

Epithemia smithii Carruthers

Length: 94.5 Width: 28 Striae: 8-9 Costae: 2

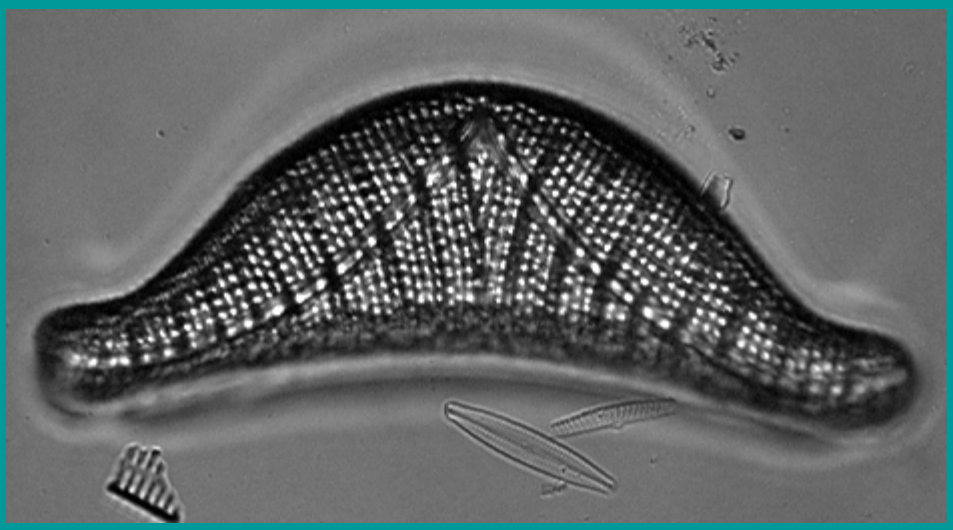
Collection 1776 Other images More information



Authority information

Epithemia smithii Carruthers 1864 (Patrick and Reimer 1975).

Other images



The image of this specimen was captured using DIC.

More information

The dorsal margin of the valve is strongly convex; the ventral margin is slightly concave. Ends are rounded, protracted, and occasionally slightly truncate and slightly recurved. (Patrick and Reimer 1975).

Ecological & geographical distribution

Found in fresh or brackish water. The fresh water habitat of Lake Michigan has relatively low conductivity. (Patrick and Reimer 1975).

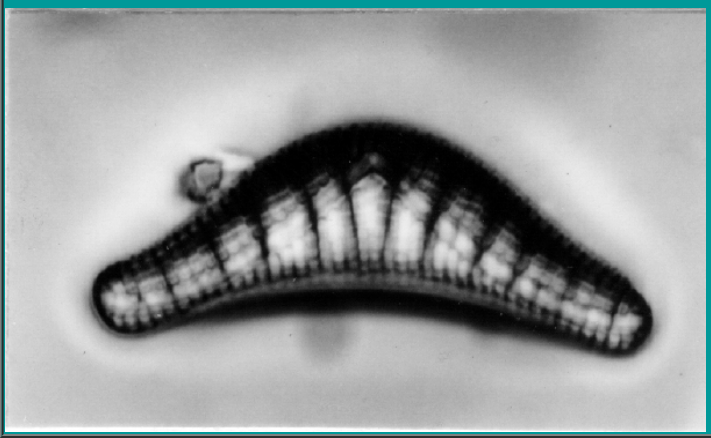
Size ranges and morphology

- Length is 30 to 73 micrometers (Patrick and Reimer 1975).
- Width is 9 to 18 micrometers (Patrick and Reimer 1975).
- Costae are 2 to 4 in 10 micrometers (Patrick and Reimer 1975).

Epithemia sorex Kutz

Length: 35 Width: 10 Striae: 12 Costae: 4

Collection 1157a More information



This is a scanned in image from a previous picture of the specimen. The slide was missing so no new pictures could be taken.

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Authority information

Epithemia sorex Kutz., Bacill., p. 33, pl. 5, fig. 12, 5 (a, b, c). 1844. (Patrick and Reimer 1975).

More information

Girdle view of frustule is eliptical-lanceolate. The valve has a slightly concave ventral margin and a very conves dorsal margin, narrowing toward the apices. Apices rostrate-capitate. The canal raphe is curved toward the dorsal margin of the valve and the central nodule is near the dorsal margin. Raphe visible through most of the length of the valve. Distinct costae in girdle view, without capitate ends. (Patrick and Reimer 1975).

Type Locality

USA, New England states, Mid Atlantic states, Texas, East Central states, Lake states, Plains states, New Mexico, Wyoming, Montana, Arizona, Utah, California, Oregon and Washington (Patrick and Reimer 1975).

Synonyms

Cystoplrura sorex (Kutzing 1844) Kuntze 1891, p. 891
Eunotia sorex (Kutzing 1844)Rabenhorst 1853, (p. 18), 1/7 (*epithemia*)
Epithemia sorex f. sporangiale Van Heurck 1881, 32/9-10
Epithemia sorex var. *crassa* Swirenko 1926, p. 35, fig 18
Epithemia sorex var. *genuina* Cleve-Euler 1952, p. 41, fig. 1412 a, b
(VanLandingham 1969).

Ecological distribution

Found in a wide range of habitats including lakes, ponds, rivers, springs or streams, pools, thermal springs, swamps and terrestrial. pH ranges from Acidobiontic to Alkalibiontic. It's Halobion spectrum includes mesohalobous, oligohalobous, halophilous, indifferent and euryhalobous. It prefers limnophilous and renophilous currents. It tends to be periphytic (Beaver 1981).

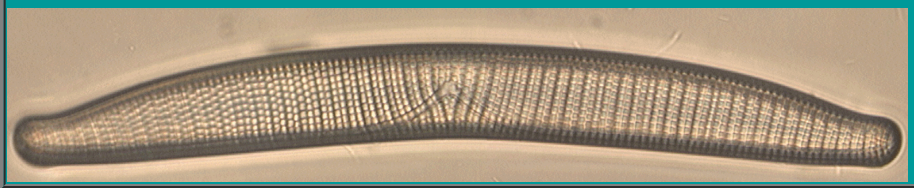
Size ranges and morphology

- Length is 20 to 65 micrometers (Patrick and Reimer 1975).
- Width is 6 to 15 micrometers (Patrick and Reimer 1975).
- Costae are about 5 to 7 in 10 micrometers (Patrick and Reimer 1975).
- Alveoli rows are 12 to 15 in 10 micrometers (Patrick and Reimer 1975).

Epithemia turgida (Ehrenberg) Kutz

Length: 92 Width: 18 Striae: 7 Costae: 3-4

Collection 1166 Other images More information



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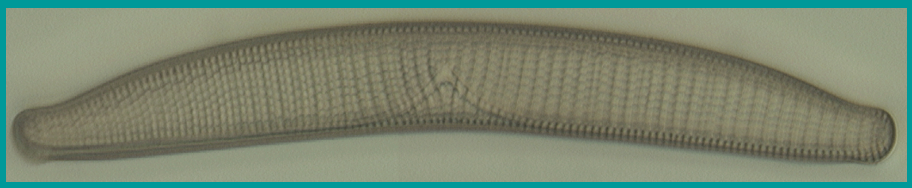
Authority information

Epithemia turgida Kutz., Bacill., p. 34, pl. 5, fig. 14. 1844. (Patrick and Reimer 1975).

Other images



The image of this specimen was captured using DIC. It helps to distinguish fine detail.

More information

The valve has a slightly concave ventral margin and a distinctly convex dorsal margin. Protracted rounded apices slightly recurved toward the dorsal side of the valve. Along the central margin raphe is sometimes apparent. The pores of the median end of the raphe and the central portion curve toward dorsal margin but do not reach the midpoint of the breadth of the valve. fairly distinct openings in the plate subtending raphe. Frustules in girdle view almost rectangular or variably swolen in middle portion. Costae in girdle view have rounded ends, not distinct or capitate. Two to three rows of alveoli between costae. (Patrick and Reimer 1975).

Type Locality

USA, North Eastern states, Gulfcoast states, South Central states, East Central states, West Central states, Lake states, Plains states, New Mexico, Colorado, Wyoming, Arizona, Utah, Oregon and Washington (Patrick and Reimer 1975).

Synonyms

Navicula turgida Ehr. Phys. Abh. Akad. Wiss. Berlin, for 1830:64 1832 [Described, Ibid., for 1831:80. 1832} Illustrated in Infusionsthierchen, pl. 14, fig. 5 1838.
Eunotia turgida Ehr. Ehr., Ber. Akad. Wiss. Berlin, for 1837:45 1837.
Cystopleura turgida Ehr. Kuntze, Revisio Gen. Plant., vol. 2, p. 891. 1891.
(Patrick and Reimer 1975).

Ecological distribution

Found in a wide range of habitats including lakes, ponds, rivers, springs or streams, lagoons, pools,oozing areas in rock faces, thermal springs, swamps and terrestrial. It ranges from Acidobiontic to Alkalibiontic. It's Halobion spectrum includes beta range, oligohalobous, indifferent and saproxenous. It is limnobiontic and limnophilous. (Beaver 1981).

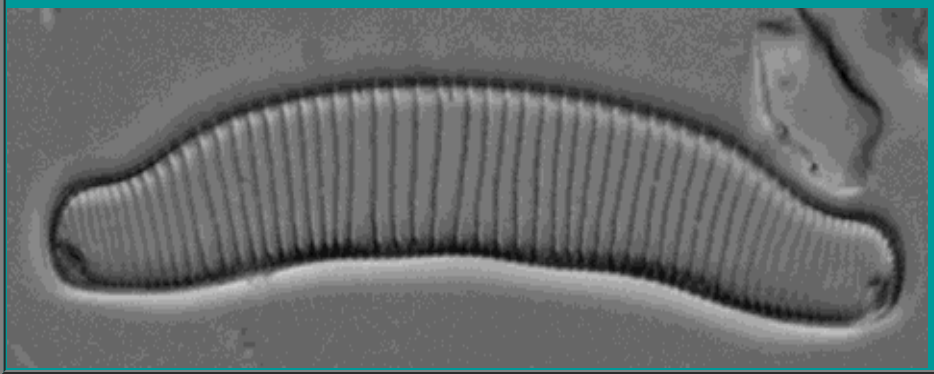
Size ranges and morphology

- Length is 60 to 150 micrometers (Patrick and Reimer 1975).
- Width is 15 to 20 micrometers (Patrick and Reimer 1975).
- Costae are about 3 to 5 in 10 micrometers (Patrick and Reimer 1975).
- Alveoli rows are 7 to 9 in 10 micrometers (Patrick and Reimer 1975). Note: Husted 1932 found the length to be up to 200 micro meters, Ehrenberg (1830) states they might be 22.5 -112 micrometers long.

Eunotia sp. 1

Length:61 Width:9 Striae:11 Puncta:

Collection 816 Other images More information



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Authority information

Other images

More information

- **Type Locality**
- **Ecology**

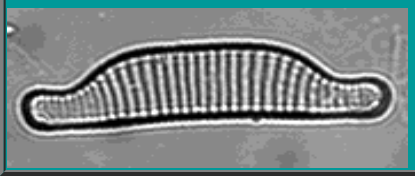
Size ranges and morphology

- Length is 61 micrometers
- Width is 9 micrometers
- Striae are 11 in number

Eunotia sp. 2

Length:36 Width:8 Striae:10-11 Puncta:

Collection 1177a Other images More information



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Authority information

Other images

More information

- **Type Locality**
- **Synonyms**
- **Ecology**

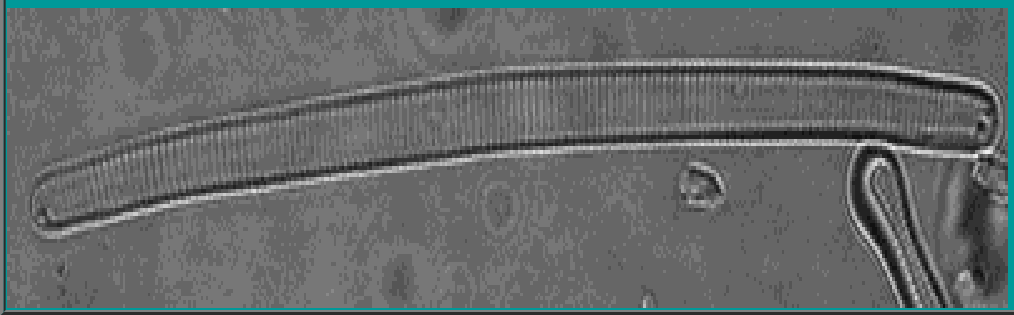
Size ranges and morphology

- Length is 36 micrometers .
- Width is 8 micrometers .
- Striae are 10-11 in number.

Eunotia flexuosa

Length:53 Width:3 Striae:15

Collection 1574 Other images More information



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Authority information

Eunotia flexuosa Breb. *ex* Kutz., Sp. Alg., p. 6. 1849.

Other images

More information

The frustles in the girdle view are linear. The valve is linear, usually slightly arched and somewhat swollen to form capitate ends. At the ends, the width of the valve is usually a little greater than at the center. The terminal modules are very distinct, at or very close to the ends of the valve on the ventral margin.(Patrick and Reimer 1966).

- **Type Locality**
- **Synonyms** (Patrick and Reimer 1966)

- **Ecology**(Patrick and Reimer 1966).
  This taxon is usually found in acidic water of low mineral content, where the current is slow.. Is also present in lak es, ditches, and ponds.

  Size ranges and morphology

  - Length is 90-300 micrometers (Patrick and Reimer 1966).
  - Width is 2-5 micrometers (Patrick and Reimer 1966).
  - Striae are 10 in number (Patrick and Reimer 1966).

Eunotia pectinalis v. minor

Length:31 Width:6 Striae:12 Puncta:

Collection 1790a Other images More information

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Authority information

(Kutz.) Rabh., Fl. Europaea Alg., sect. 1, p. 74. 1864(Patrick and Reimer 1966).

Other images

More information

The ventral margin is slightly concave. The dorsal margin is distinctly convex, often with two shallow undulations. The valve is somewhat narrower at the ends than at the center. The apices of the valve are rounded, somewhat narrower but not distinctly set off from the main body of the valve. The terminal nodules are near, but not at the ends of the valve, distinct but not large. The striae are straight, almost perpendicular to the ventral margin at the center of the valve, but somewhat curved at the ends(Patrick and Reimer 1966).

- ***Type Locality***
- ***Synonyms*** *(Patrick and Reimer 1966)*

  Himantidium minus
  Himantidium veneris
  Eunotia impressa
  Eunotia pectinalis var. impressa
  Eunotia pectinalis var. minor f. impressa
  - ***Ecology***

    This taxon is found in acid to circumneutral water, and has a high tolerance for calcium (Patrick and Reimer 1966).

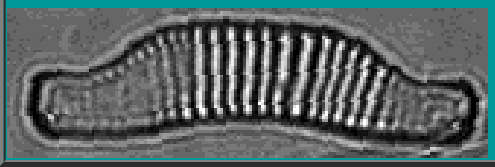
    Size ranges and morphology

    - *Length is 20-60 micrometers (Patrick and Reimer 1966).*
    - *Width is 4-7 micrometers (Patrick and Reimer 1966).*
    - *Striae are 14-16 in number (Patrick and Reimer 1966).*

Eunotia praerupta

Length:31.5 Width:7 Striae:9-11

Collection Other images More information



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Authority information

Eunotia praerupta Ehr., Phys. Abh. Akad. Wiss. Berlin, for 1841:414. 1843(Patrick and Reimer 1966).

Other images

More information

The frustles in the girdle view are rectangular. The ventral margin is usually slightly concave at the center, straight at the ends of the valve; sometimes almost straight throughout the entire length. The dorsal margin is convex; narrowed, often reflexed at the ends to form truncate, somewhat capitate apices. The dorsal margin is sometimes not so formedand the ends are truncate-rostrate. The terminal nodules are distinct, at the ends of the valve, extending upwards along the apices. The striae are parallel.(Patrick and Reimer 1966).

- **Type Locality**
- **Synonyms**
- **Ecology**

  This taxon is is usually found in in northern or mountainous localities in acid to circumneutral water(Patrick and Reimer 1966).

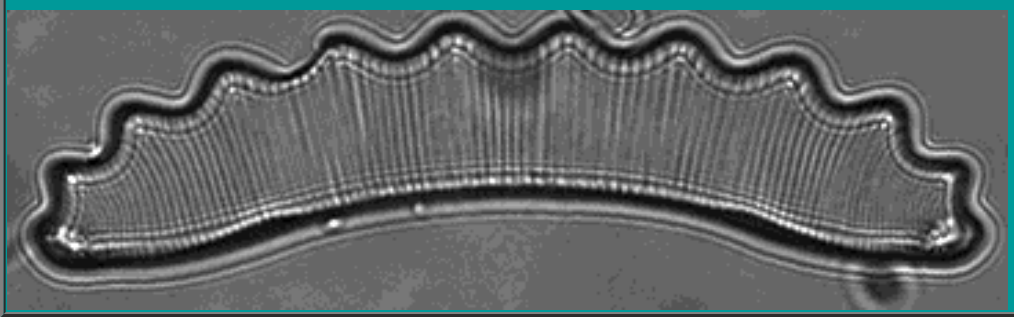
Size ranges and morphology

- Length is 20-100 micrometers (Patrick and Reimer 1966).
- Width is 4-15 micrometers (Patrick and Reimer 1966).
- Striae are 6-13 in number (Patrick and Reimer 1966).

Eunotia serra

Length:48 Width:13.5 Striae:12 Puncta:

Collection 1174 Other images More information



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Authority information

Eunotia serra Ehr. , Ber. Akad. Wiss. Berlin, for 1837:1845. 1837 (Patrick and Reimer 1966).

Other images

More information

The frustles in the girdle view are rectangular. The ventral margin is straight at the ends, concave toward the center of the valve. The dorsal margin is convex with from four to twenty undulations. Length of the valve varies with the number of undulations. The apices of the valve are rounded and not distinctly differentiated from the main body of the valve. The terminal nodules are distinct, on the ventral margin, a short distance from the apices of the valve. Striae are distinctly or indistinctly punctae. Striae are parallel and radiate over the terminal modules(Patrick and Reimer 1966).

- **Type Locality**
- **Synonyms** (Patrick and Reimer 1966)
  - *Eunotia bisoctonaria*Ehr., Ber. Akad. Wiss. Berlin, for 1840:209. 1840.
  - *Eunotia decaodon* Ehr., Ber. Akad. Wiss. Berlin, for 1840:209. 1840.
  - *Eunotia endecaodon* Ehr., Ber. Akad. Wiss. Berlin, for 1840:209. 1840.
  - *Eunotia enneodon*Ehr., Ber. Akad. Wiss. Berlin, for 1840:209. 1840.
  - *Eunotia heptodon*Ehr., Ber. Akad. Wiss. Berlin, for 1840:209. 1840.
  - *Eunotia icosodon*Ehr., Ber. Akad. Wiss. Berlin, for 1840:210. 1840.
  - *Eunotia octodon*Ehr., Ber. Akad. Wiss. Berlin, for 1840:209. 1840.
  - *Eunotia serrulata*Ehr., Ber. Akad. Wiss. Berlin, for 1840:209. 1840.
  - *Eunotia septena*Ehr., Phys. Abh. Akad. Wiss. Berlin, for 1841:pl. 4(2), fig. 13. 1843.
  - *Eunotia polyodon*Ehr., Ber. Aikad. Wiss. Berlin, for 1845:77. 1845.
  - *Eunotia hendecaodon*Ehr., Mikrogeol., pl. 4(1), fig. 19. 1854.
  - *Eunotia dodecaodon*Ehr., Mikrogeol., pl. 4(1), fig. 20. 1854.
  - *Eunotia prionotus*Ehr., Mikrogeol., pl. 17(1), fig. 41. 1854.
  - *Eunotia quindenaria*Ehr., Mikrogeol., pl. 17(1), fig. 42. 1854.
  - *Eunotia scalaris*Ehr., Mikrogeol., pl. 17(1), fig.44. 1854.
  - *Eunotia quatuordenaria*Ehr., Mikrogeol., pl. 33(10), fig. 6. 1854.
  - *Eunotia tredenaria*Ehr., Mikrogeol., pl. 33(10), fig. 9. 1854.
  - *Eunotia undenaria*Ehr., Mikrogeol., pl. 33(10), fig. 12. 1854.
  - *Eunotia robusta*Ralfs *in* Pritch., Hist. Infusoria, 4th ed., p. 763. 1861. (in part).
  - *Eunotia* var. *polyodon* Meist., Beitr. Kryptog.-Fl. Schweiz, 4(1), pl. 11, fig. 1 1912.

- **Ecology**
  This taxon is commonly found in oligotrophic or dystrophic water (Patrick and Reimer 1966).

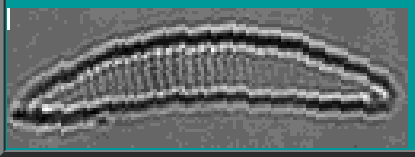
  Size ranges and morphology

  - Length is 50-150 micrometers (Patrick and Reimer 1966).
  - Width is 5-25 micrometers (Patrick and Reimer 1966).
  - Striae are 10-14 in number (Patrick and Reimer 1966).

Eunotia vanheurckii v. *intermedia* (Krasske *ex* Hust. *in* Rabh.)

Length:19 Width:3 Striae:17

Collection 1788 Other images More information



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Authority information

Eunotia vanheurckii var. *intermedia* (Krasse *ex* Hust. *in* Rabh.,) Patr., Not. Nat. Acad. Nat. Sci. Philadelphia, No. 312, p. 14, fig. 13. 1958(Patrick and Reimer 1966).

Other images

More information

The ventral margin is straight, with the wall thickened in areas halfway between the center of the valve and the ends. The dorsal margin is convex. The dns are not disctinctly formed, but confluent with the rest of the valve. The terminal nodules are distinct, near the ends of the valve. The striae are parallel(Patrick and Reimer 1966).

- **Type Locality**
- **Synonyms**

  Eunotia pectinalis v. *minor* f. *intermedia*Krasse *ex* Hust. *in* Rabh., Kryptog.-Fl. Deutschland, vol. 7(2), no.2, p. 298, figs. 763 l-o. 1932(Patrick and Reimer 1966).
  - **Ecology**

    This taxon prefers characteristically oligotrophic water(Patrick and Reimer 1966).

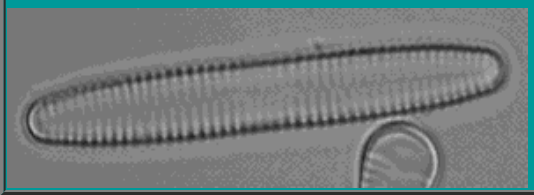
    Size ranges and morphology

    - Length is 15-40 micrometers (Patrick and Reimer 1966).
    - Width is 4-5 micrometers (Patrick and Reimer 1966).
    - Striae are 14-16 in number (Patrick and Reimer 1966).

Fragilaria capucina Desm. 1825

Length: 29 Width: 4 Striae:15

Collection 1236 Other images More information



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Authority information

Desm., Plant. Crypt. Nord. France, 1st ed., Fasc. 10, No. 453. 1825 (Patrick and Reimer 1966).

Other images

More information

- **Ecology**
  This species is considered benthic but is a successful facultative planktont with frustules forming bandlike colonies (Huber-Pestalozzi 1942). This species in commonly found in nearshore communities with some occasional populations in open water (Stoermer and Yang 1969). This species is often found in eutrophic waters and seems to respond to nutrient input into the Great Lakes (Stoermer and Yang 1969). In Lake Michigan populations, the greatest abundances have been found in polluted harbors with some populations immediately offshore (Stoermer and Yang 1970). In western Lake Erie, this species increased in number with an increase in pollution levels (Hohn 1969). In Green Bay, this species was dominant in spring collections at all stations and dominant in both spring and fall stations from the southern areas of the bay (Stoermer and Yang 1970). This species is common at all temperatures; however high absolute and relative abundances are correlated with high temperatures (Stoermer and Ladewski 1976).

  Size ranges and morphology

  - Length is 25-170 micrometers (Patrick and Reimer 1966).
  - Breadth is 2-5 micrometers (Patrick and Reimer 1966).
  - Striae range is14-18 per 10 micrometers (Patrick and Reimer 1966).
  - In the Great Lakes, the length of this species ranges from 15-80 micrometers. The valve breadth ranges from 2-5 micrometers and striae range from 14-18 in 10 micrometers (Stoermer and Yang 1969).

*Fragilaria capucina*var.*lanceolata* Grun. 1881

Length: 48 Width: 2.6 Striae:15-16

Collection 1234a Other images More information

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Authority information

Grunow *in* V.H., Syn. Diat. Belgique, Pl. 45, Fig. 5, 1881.

More information

This variety is distinguished by having elongate valves that are evenly narrowed from the center to the ends of the valves (Stoermer and Yang 1969). The ends of the valves are usually capitate. Other characters are similar to those of the nominate (Stoermer and Yang 1969).
The distributions in Lake Michigan were recorded as the highest between 1937-47 near Chicago and have declined to the present day (Stoermer and Yang 1970). This taxon was uncommon in samples collected in the 1960s. Stoermer and Yang (1970) state that not enough is known about this taxon's ecology to explain its distributions.

- **Synonyms**

- **Ecology** This taxa is more common in offshore collections and has the same distribution patterns as the nominate variety (Stoermer and Yang 1969).

Size ranges and morphology

*Fragilaria capucina*var.*mesolepta* Rabh. 1864.

Length: 17 Width: 5 Striae:14

Collection 829 Other images More information

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Authority information

Rabh., Fl. Europaea Alg., sect. 1, p. 118. 1864 (Patrick and Reimer 1966).

More information

- **Synonyms** (Patrick and Reimer 1966)
  Fragilaria mesolepta Rabh. 1861

- **Ecology**
  - This species lives in slightly alkaline fresh water. It is sometimes found in slightly brackish water (Patrick and Reimer 1966). The growth and habitat preference are similar to those of the nominate variety (Stoermer and Yang 1970); however this species is generally considered to have larger abundances in more eutrophic areas compared to the nominate variety (Stoermer and Yang 1970).
  - This species is generally less common than the nominate variety in Lake Michigan studies. The low abundances have been consistent since 1879 (Stoermer and Yang 1970).

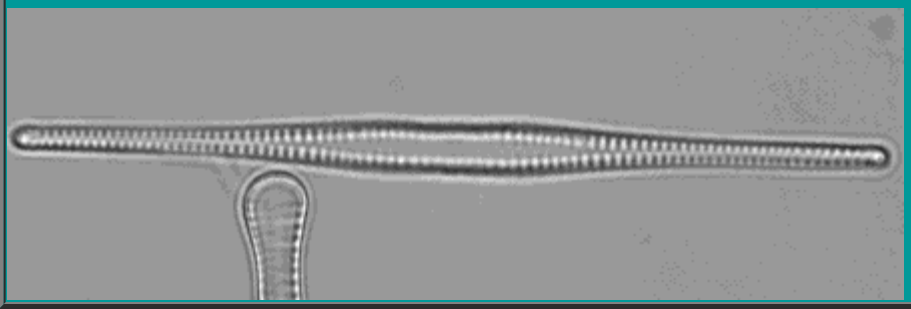
Size ranges and morphology

- This variety is distinguished from the other varieties of this species by the constriction in the middle of the valve (Patrick and Reimer 1966). The central area is usually a hyaline fascia (Stoermer and Yang 1969).
- Length is 30-35 micrometers (Patrick and Reimer 1966).
- Breadth is 2-4 micrometers (Patrick and Reimer 1966).
- Striae range is 15-18 per 10 micrometers (Patrick and Reimer 1966).

Fragilaria crotonensis Kitton 1869

Length: 57 Width: 3 Striae:15

Collection 1227 Other images More information



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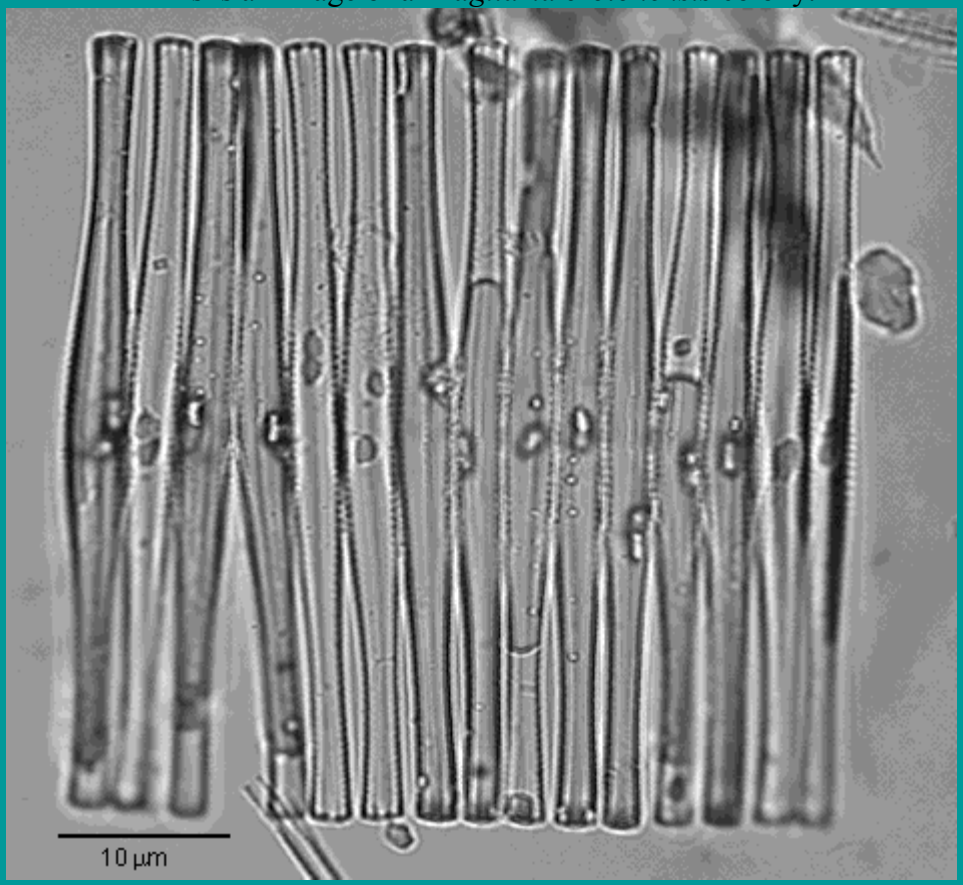
Authority information

Kitton, Sci. Gossip, 5: 110, fig. 81. 1869 (Patrick and Reimer 1966).

Other images

This is an image of a *Fragilaria crotonensis* colony.



More information

- The frustules are attached at the swollen central portion by valve faces into long ribbon-like colonies (Stoermer and Yang 1969).
- **Synonyms** (Patrick and Reimer 1966)

  Synedra crotonensis (Kitton) Cl. and Moll, 1878.
  Synedra crotonensis var.*prolongata* Grun.
  Fragilaria smithiana Grun.
  - **Ecology**

    This species is planktonic and mesotrophic (Patrick and Reimer 1966).

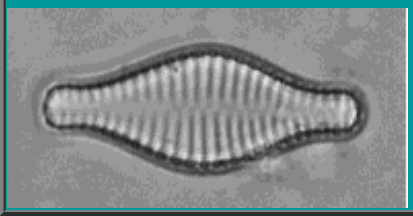
Size ranges and morphology

- Length is 40-112 micrometers (Patrick and Reimer 1966).
- Breadth is 2-4 micrometers (Patrick and Reimer 1966).
- Striae range is 12-16 per 10 micrometer (Patrick and Reimer 1966).
- In samples from Lake Michigan, the length of this species ranges from 40-112 micrometers. The breadth at the widest area ranges from 2-5 micrometers. Striae are indistinct with 12-16 striae in 10 micrometers (Stoermer and Yang 1969).

Fragilaria heidenii Ostrup 1910

Length: 23 Width: 8 Striae:12

Collection 1250a Other images More information



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Authority information

Ostrup, Danske Diat., p. 190, pl. 5, fig. 118, 1910.

More information

The valves are lanceolate in shape with an expanded, well demarcated central area and a wide axial area (Stoermer and Yang 1969). The valve ends are bluntly rounded to subcapitate (Stoermer and Yang 1969). The striae are parallel to the midline of the valve (Stoermer and Yang 1969).

- **Synonyms**

Synedra inflata Heiden 1900 (Stoermer and Yang 1969)
Fragilaria inflata (Heid.) Hustedt 1931 non Pantocsek 1902 (Stoermer and Yang 1969)
Fragilaria longirostris Frenguelli 1941 (?) (Krammer and Lange-Bertalot (2/3) 1991)

- **Ecology**

This taxa is a littoral zone species and was only noted in inshore collections (Stoermer and Yang 1969). The valve surfaces are attached to form band-like colonies (Stoermer and Yang 1969).

Size ranges and morphology

The length ranges from 20-50 micrometers (Krammer and Lange-Bertalot (2/3) 1991).
The breadth ranges from 6-10 micrometers (Krammer and Lange-Bertalot (2/3) 1991).
The striae are 13-15 in 10 micrometers (Krammer and Lange-Bertalot (2/3) 1991).

- In Lake Michigan samples:

The length ranges from 22-40 micrometers (Stoermer and Yang 1969).
The breadth ranges from 7-10 micrometers (Stoermer and Yang 1969).

Fragilaria intermedia Grun. 1881

Length: 45 Width: 3.5 Striae:11

Collection 804 Other images More information

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Authority information

Grun. *in* Van Heurck, Syn. Diat. Belgique, pl. 45, figs. 9-1, 1881 (Patrick and Reimer 1966).

Other images

More information

- The frustules form long, ribbon-like colonies and are attached at swollen central portions of the valve faces (Stoermer and Yang 1969). The valves are linear to lanceolate in shape with rostrate to subcapitate ends. The axial area is narrow and linear with a distinct border. The central area is a unilateral fascia and not visibly thickened. Often, indistinct or rudimentary striae can be resolved.
- **Synonyms** (Patrick and Reimer 1966)
  Synedra vaucheriae Kutz.
  Fragilaria vaucheriae (Kutz.) Peters.
  Early work discusses this taxon's similarity to *Synedra vaucheriae* Kutz. [*Fragilaria vaucheriae* (Kutz.) Peters.], based on isotype observations and proposed synonomy (Petersen 1938). In the Lake Michigan populations, the two taxa are easily distinguished using several morphological characteristics (thicker striae, more strongly silicified valve structure, and the absence of a distinctly thickened border around the central area)(Stoermer and Yang 1969). This question warrants further investigation.
  - **Ecology** (Stoermer and Yang 1969)
    This taxa has variable populations in Lake Michigan. Historical populations have been recorded primarily from littoral areas; however, Stoermer and Yang (1969) report large populations in offshore plankton. These offshore populations are more elongate and lanceolate rather than linear and may represent a different form or variety.

Size ranges and morphology

- In samples from Lake Michigan, the length of this species ranges from 25-65 micrometers. The breadth at the widest area ranges from 3-5 micrometers. Striae are coarse and cross lineate with 8-13 striae in 10 micrometers (Stoermer and Yang 1969).

***Fragilaria spinosa* Skvortzow 1937**

Length:32 Width:5 Striae:7

Collection 1395 Other images More information

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Authority information

Skvortzow, B.W., Philippine Journal of Science 37: 307, figs. 13 and 27, plate 4, fig 13, figs. 3 and 19, pl. 5, 54-59. 1937.

More information

The valve outline is highly variable from linear/elliptical to lanceolate. The valves are often gibbous near the midportion of the valve(Stoermer and Yang 1969). The striae are coarse and chambered and do not extend past the midline of the valve(Stoermer and Yang 1969). The axial area is broad and lanceolate with no visible structure and no distinct central area(Stoermer and Yang 1969). There are distinct submarginal spines extending out between each striae which hold the frustules together in band-like colonies (Skvortzow 1937a). Compared to Lake Baikal specimens, specimens from Great Lakes have much narrower valve widths. The ratio is 1/5 or 1/6 rather than 1/3.5 to 1/5 (Stoermer and Yang 1969). However, the valves have similar ornamentation. This species was compared to *Fragilaria robusta* Hustedt *nom. nud.* [not *Fragilaria robusta sensu* (Fusey) Manguin] (Skvortzow 1937a).

- **Synonyms** (Stoermer and Yang 1969)

  Fragilaria mutabilis var. *robusta* Skvortzow and Meyer 1928.

  - **Ecology** This species was rare in samples from the Great Lakes and was generally in the periphyton community from deep water samples (Stoermer and Yang 1969).

Size ranges and morphology

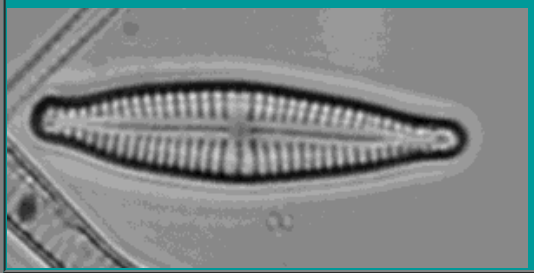
In Lake Michigan samples:

The length ranges from 25-46 micrometers (Stoermer and Yang 1969).
The width ranges from 5-8 micrometers (Stoermer and Yang 1969).
The striae range from 5-8 in 10 micrometers (Stoermer and Yang 1969).

Gomphocymbella sp. #1

Length: 22 Width: 5 Striae: 16-18

Collection 1549 Other images More information



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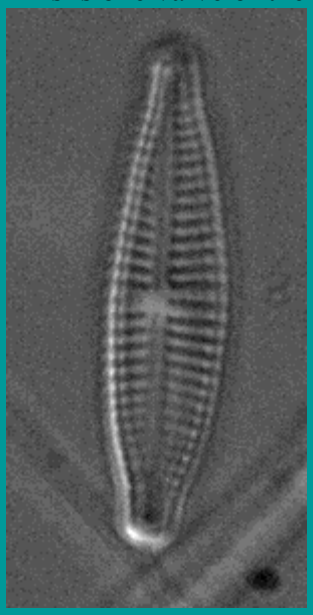
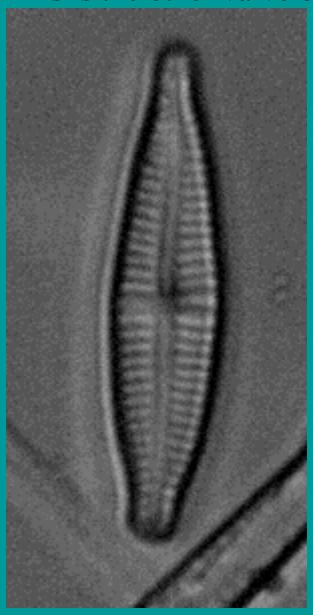
Authority information

Other images

This is one valve of the specimen.



This is the other valve of the specimen.



More information

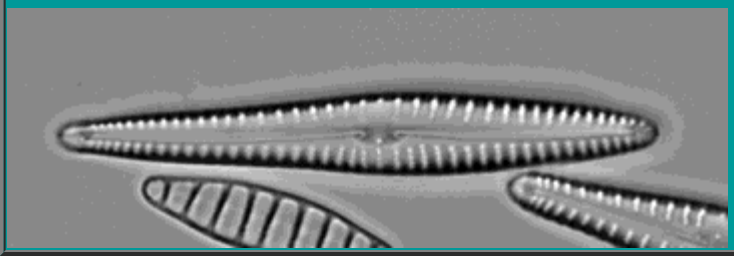
-
- **Ecology**

  ### Size ranges and morphology

Gomphonema germainii Kociolek and Stoermer 1990

Length:35 Width:4.8 Striae:11

Collection 1884 Other images More information



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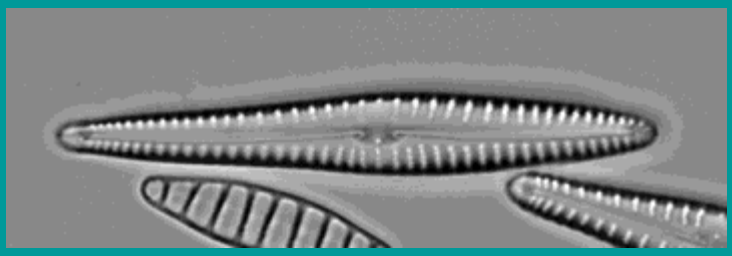
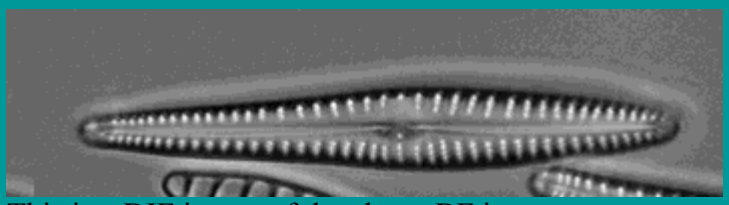
Authority information

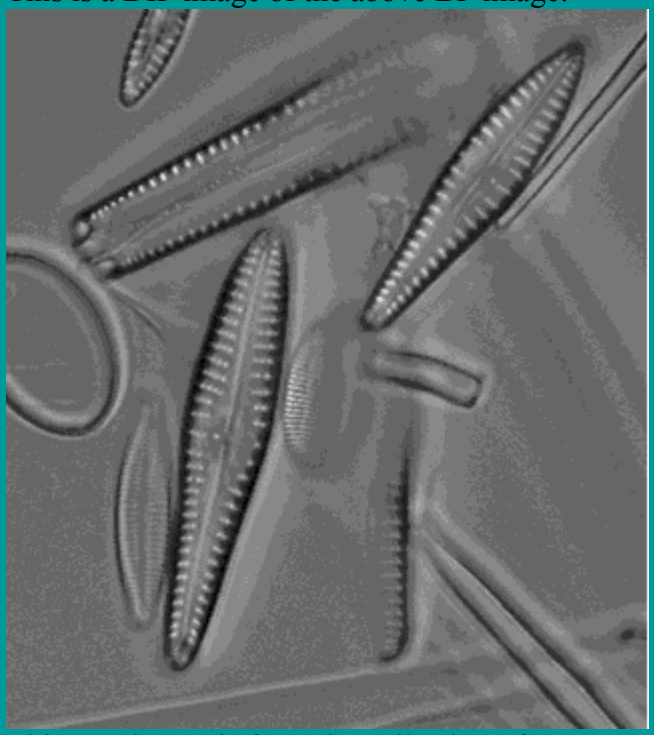
Kociolek and Stoermer 1990. *in* Ouvrage dédié à la Memorie du Professeur Henry Germain, pp. 139-144.

Other images





This is a DIF image of the above BF image.



This DIF image is from the collection of E. F. Stoermer #1884 showing a portion of the size range of *Gomphonema germainii*.

More information

- *Gomphonema gremainii* resembles *Gomphonema validium* var. *elongata* which has a more truncated head pole. The ultrastructure is consistent with other Gomphonema species having puncta with external flaps C-shaped, The apical pore field porelli are structurally different and separated from the striae puncta. Septa and pseudosepta are present at the poles. (Kociolek and Stoermer 1990).

- **Ecology**

  This taxon grows in deep water, (8-15 meters) attached to rocks in nearshore habitats in Lakes Superior, Michigan and Huron. (Kociolek and Stoermer 1990).

Size ranges and morphology

- Length: 20 to 58 µm (Kociolek and Stoermer 1990).
- Width: 4.5 to 7.0 µm (Kociolek and Stoermer 1990).
- Striae are punctate, radiate, 9 to 11 in 10 µm (Kociolek and Stoermer 1990).

  - The valve is linear-clavate to lanceolate with an apiculate head pole. The foot pole is narrow. In the central area the median stria is longer that the other striae and comes close to the isolated stigma. The axial area is of variable width. The raphe is lateral undulate. (Kociolek and Stoermer 1990).

Gomphonema tumens Kociolek and Stoermer 1991

Length:45 µm Width:6.8 µm Striae:12 in 10 µm

Collection 1867 Other images More information

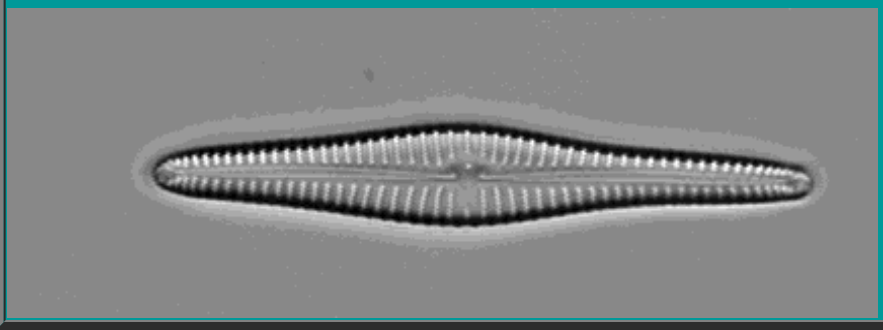


Image of the holotype.

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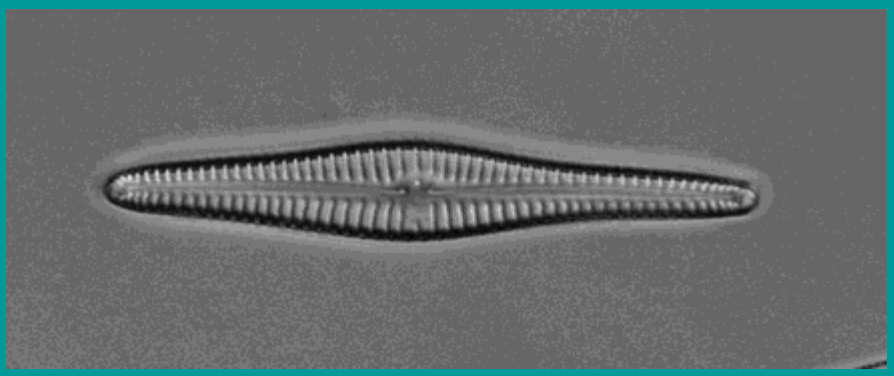
Authority information

Kociolek, J. P. and E. F. Stoermer 1991. Can J. Bot. 69:1559.

Other images



This is a DIF image of the holotype. #GLRD 1867

More information

- Kociolek and Stoermer 1991 (Kociolek and Stoermer 1991) consider *Gomphonema vibrio* (Ehrenb.) Cleve to be a distinct taxon. From this position they construct an argument fo *Gomphonema tumens* Kociolek and Stoermer to be distinct and that *Gomphonema vibrio* is not the initial vlave of *G. tumens* as could be suggested. In the tumid stage, *G. vibrio* is larger than *G. tumens*. As *G. vibrio* decreases in size the outline becomes more straight sided, tapering from the center to the headpole and footpole. *Gomphonema tumens* retains some of the tumid center even in the smaller valves. Kociolek and Stoermer 1991(Kociolek and Stoermer 1991) provide an excellent discussion of the history of *G. vibrio* and various authors interpretations of the taxon.

- **Ecology**

  This taxon grows in deep water, (10 meters) attached to bedrock. The collection from which *G. tumens* was described was collected by divers in Lake Superior (Superior Shoal). (Kociolek and Stoermer 1991).

  Size ranges and morphology

  - Length: 35 to 77 µm (Kociolek and Stoermer 1991).
  - Width: 6 to 10 µm (Kociolek and Stoermer 1991).
  - Striae are punctate, radiate, 10 to 12 in 10 µm at the center and 13 to 15 µm at the ploes (Kociolek and Stoermer 1991).

    - Valves are linear-clavate with a tumid center. The headpole is narrow and the footpole is rounded. Distinctly punctate striae are radiate and strongly radiate at the footpole. The axial area is narrow with a weakly undulate, laterally expanded raphe. The central area is laterally

expanded opposite the stigma. Deflected internal proximal raphe ends are conspicuous. (Kociolek and Stoermer 1990).

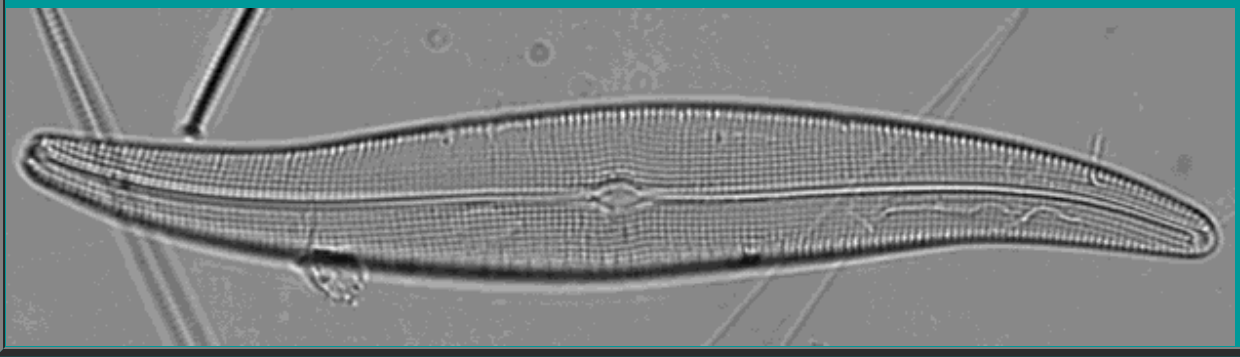
Gyrosigma acuminatum (Kutz.) Rabh.,

Length:94.5 Width :15 Transverse striae:18 Longitudinal striae:24

Collection 1406a

Other images

More information



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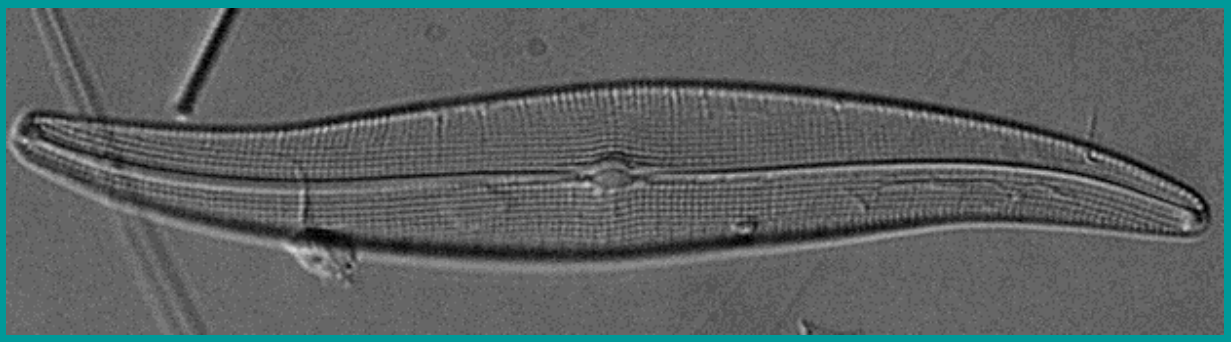
Authority information

Gyrosigma acuminatum (Kutz.) Rabh., Sussw.-Diat., p. 47, pl. 5 fig. 5a. 1853 (Patrick and Reimer 1966).

Other images



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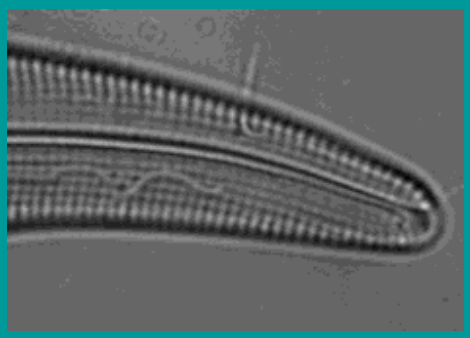
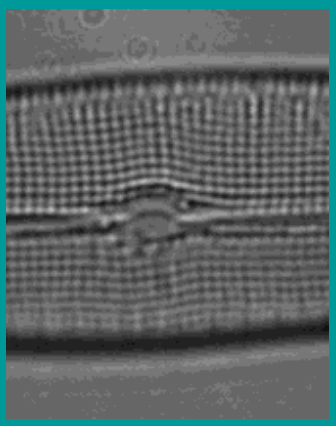


This image is the end of the specimen above.



This image is the central area for the specimen above.

More information

This taxon has a valve which is moderately sigmoid and lanceolate. It gradually tapers to obtusely rounded ends. The axial area and the raphe are sigmoid as well. The proximal ends of the raphe curve in opposite directions and the

central area is longitudinally elliptical. The transverse and longitudinal straie are distinct and the transverse striae are slightly radiate. The longitudinal stria cruve outward to the sides of the central area (Patrick and Reimer 1966).

- **Synonyms**

  Frustulia acuminate Kutz., Linnaea, 8:555, pl. 14, fig. 36. 1833 (Patrick and Reimer 1966).
  *Navicula acuminata*Kutz., Bacill., p. 102, pl. 4, fig. 26; pl. 30, fig. 15. 1844 (Patrick and Reimer 1966).

- **Ecology**

  This taxon prefers fresh water and is eurytopic and alkalibiont (Patrick and Reimer 1966).

Size ranges and morphology

- Length is 60 to 125 micrometers (Patrick and Reimer 1966).
- Width is 12 to 16 micrometers (Patrick and Reimer 1966).
- Transverse striae are 16 to 18 in 10 micrometers (Patrick and Reimer 1966).
- Longitudinal striae are 17 to 20 in 10 micrometers (Patrick and Reimer 1966).

***Gyrosigma nodiferum* (Grun.) Reim.**

Length:162 Width :19 Transverse striae:16-18 Longitudinal striae:18-20

Collection 1388 Other images More information

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Authority information

Gyrosigma nodiferum (Grun.) Reim. comb. nov., var. nodiferum pl. 24, fig. 2(Patrick and Reimer 1966).

Other images

This image was taken using DIC.

More information

This taxon has a slightly sigmoid, linear valve which gradually tapers to obtusely rounded symmetrical ends. The ends sometimes appear scalpelliform. The axial area and the raphe are sigmoid or slightly undulate. The proximal raphe ends curve in opposite directions and are distant. There is a large terminal end that is eccentric and lateral. The central area is oblique. The transverse striae are more distinct that the longitudinal straie with the exception of along the axial area. The longitudinal striae are more distinct there because of the arch of the valve. The longitudianl straie are finer than the transverse striae and they cruve outward to the sides of the central area(Patrick and Reimer 1966).

- **Synonyms**
  Pleurosigma nodiferum Grun. *in* Cl. & Grun., K. Svenska Vet.-Akad. Handl., Ny Foljd, 17(2):59. 1880(Patrick and Reimer 1966).
  Gyrosigma spencerii var *nodifera* (Grun.) Cl., K. Svenska Vet.-Akad. Handl., Ny Foljd, 26(2):117. 1894(Patrick and Reimer 1966).

- **Ecology**
  This taxon prefers fresh to slightly brackish water(Patrick and Reimer 1966).

Size ranges and morphology

- Length is 60 to 150 micrometers (Patrick and Reimer 1966).
- Width is 11 to 14 micrometers (Patrick and Reimer 1966).

Transverse striae are 17 to 20 in 10 micrometers (Patrick and Reimer 1966).
- Longitudinal striae are 22 to 24 in 10 micrometers (Patrick and Reimer 1966).

Gyrosigma spencerii (Quek.) Griff. & Henfr.,

Length:96 Width :12 Transverse striae:18 Longitudinal striae:20+

Collection 1279a Other images More information

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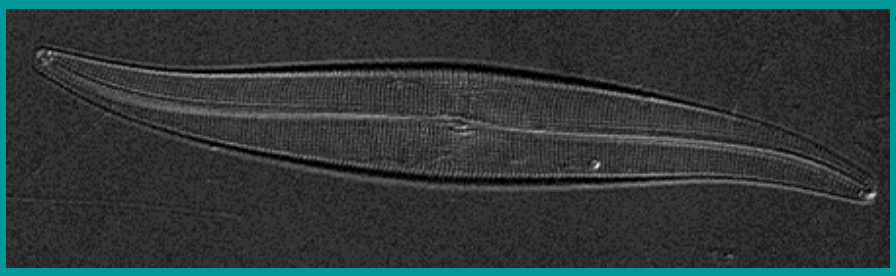
Authority information

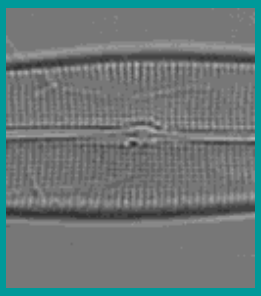
Gyrosigma spencerii(Quek.) Griff. & Henfr., Microgr. Dict., 1st ed., p. 303, pl. 11, fig. 17. 1856 (Patrick and Reimer 1966).

Other images



This image was taken using DIC.

This image is the end of the specimen above.



This image is the central area for the specimen above.

More information

This taxon has a moderately sigmoid and lanceolate valve. The valve tapers to narrow and rounded ends. The axial area and the raphe are slightly undulate and the terminal area is slightly eccentric. This taxons has a small and

longitudinally elliptical central area and the transverse and longitudinal striae are equally distinct (Patrick and Reimer 1966).

- **Synonyms**

  Navicula spencerii Quek., Pract. Treat. Micr., p. 440, pl. 9. 1848 (Patrick and Reimer 1966).
  Pleurosigma spencerii(Quek.) W. Sm., Ann. Mag. Nat. Hist., ser. 2, 9:12, pl. 2. fogs/ 15-16. 1852 (Patrick and Reimer 1966).
  *Pleurosigma kutzingii*Grun., Verh. Zool.-Bot. Ges. Wien, 10:561, pl. 6, fig. 3. 1860 (Patrick and Reimer 1966).
  *Pleurosigma gracilentum*Rabh., Fl. Europaea Alg., sect. 1, p. 240. 1864 (Patrick and Reimer 1966).
  Gyrosigma kutzingii(Grun.) Cl., K. Svenska Vet.-Akad. Handl., Ny Foljd, 26(2):115. 1894 (Patrick and Reimer 1966).

- **Ecology**

  This taxon is common in creeks, rivers and lakes. It is alkaliphil, oligohalobe and can stand some salt concentration(Patrick and Reimer 1966).

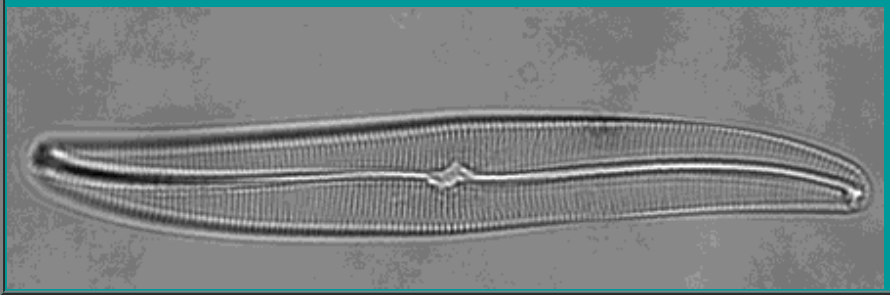
Size ranges and morphology

- Length is 95 to 140 micrometers (Patrick and Reimer 1966).
- Width is 13 to 15 micrometers (Patrick and Reimer 1966).
- Transverse striae are 18 to 20 in 10 micrometers (Patrick and Reimer 1966).
- Longitudinal striae are 22 to 24 in 10 micrometers (Patrick and Reimer 1966).

Gyrosigma spencerii v. *curvula* (Grun.) Reim.

Length:83 Width :11 Transverse striae:20 Longitudinal striae:20+

Collection 1387 Other images More information



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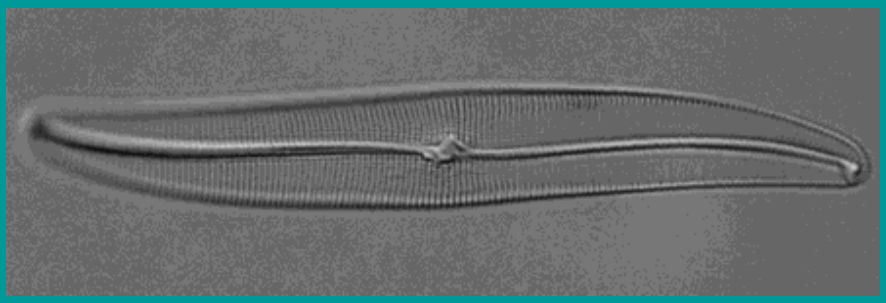
Authority information

*Gyrosigma spencerii*var. *curvula* (Grun.) Reim. comb. nov. pl. 23, fig. 8 (VanLandingham 1969).

Other images



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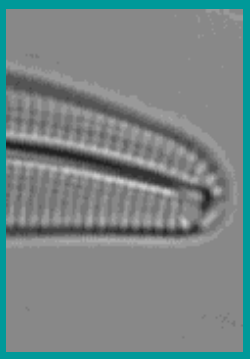
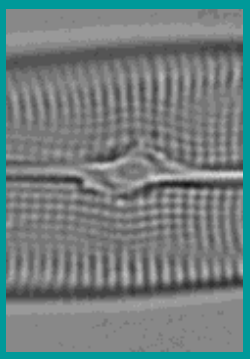


This image is the end of the specimen above.



This image is the central area for the specimen above.

More information

This taxon has a valve that is linear or linear-lanceolate but not lanceolate as in the nominate variety. The ends are more gradually attenuated and are broader in relation to the vavle width in the center. The striae are more numerous than in *spencerii*. The striae, the raphe, the axial area, and the nodules are the same as in the nominate variety (Patrick and Reimer 1966).

- **Synonyms**
  *Pleurosigma spencerii*var. *curvula* Grun. *in*Cl. & Grun., K. Svenska vet-Akad. Handl., Ny Foljd, 17(2):60. 1880(Patrick and Reimer 1966).

- **Ecology**
  This taxon has been reported from brackish water areas and also from fresh water areas (Patrick and Reimer 1966).

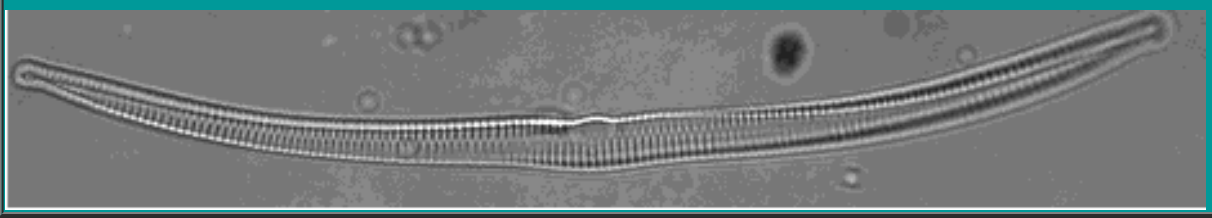
Size ranges and morphology

- Length is 70 to 120 micrometers (Patrick and Reimer 1966).
- Width is 9 to 11 micrometers (Patrick and Reimer 1966).
- Transverse striae are 20 to 22 in 10 micrometers (Patrick and Reimer 1966).
- Longitudinal striae are 24 to 25 in 10 micrometers (Patrick and Reimer 1966).

Hannaea arcus (Ehr.) Patr. comb. nov. 1966

Length: 182 Width: 5 Striae: 15

Collection 1161 Other images More information



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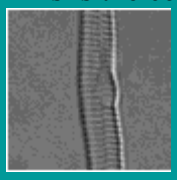
Authority information

(Ehr.) Patrick *in*: Patrick and Reimer, Acad. Nat. Sci. Philadelphia Monogr., 13: 132, pl. 4, fig. 20. 1966

(Stoermer and Yang 1969).

Other images

This is the central area of the specimen.



This is a colorized version of the specimen.

More information

- Typically, this taxon is found in springs and streams (Lowe 1974).

- **Synonyms** (Stoermer and Yang 1969)

  Navicula arcus Ehrenberg, Infusionsthierchen, p. 182, pl. 21, fig. 10. 1838.

- **Ecology**

  This taxon prefers cool, flowing water (Patrick and Reimer 1966).

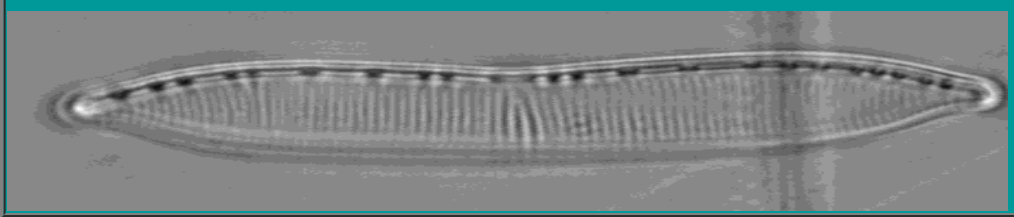
Size ranges and morphology

- Length is 15 to 150 micrometers (Patrick and Reimer 1966).
- Width is 4 to 7 micrometers (Patrick and Reimer 1966).
- Striae are 13 to 14 per 10 micrometers in the center of the valve; they become finer at the ends of the valve with 18 striae in 10 micrometers (Patrick and Reimer 1966).

Hantzschia amphioxys (Ehr.) Grunow in Cleve and Grunow 1880

Length:37 Width:6.5 Keelpunctae:7 Striae:25

Collection 1402 Other images More information



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Authority information

(Ehr.) Grunow *in*: Cleve and Grunow, K. Svenska Vet.-Akad. Handl., Ny Foeljd, 17(2): 103. 1880 (Stoermer and Yang 1969).

Other images

More information

- This taxon is usually found among the periphyton (Lowe 1974).

- **Synonyms** (Stoermer and Yang 1969)
  Eunotia amphioxys Ehrenberg, Abh. Akad. Wiss. Berlin, 1841: 413, pl. 1(1), fig. 26. 1843.

- **Ecology**
  - Water temperature tolerance level of this taxon ranges from 0 to 30 degrees C (Lowe 1974).

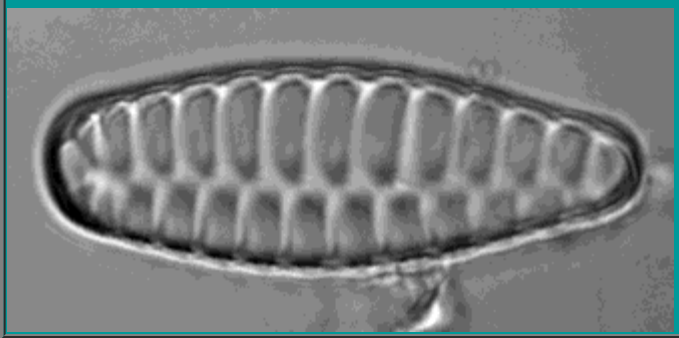
Size ranges and morphology

- Length is 20 to 210 (300) micrometers (Krammer and Lange-Bertalot 1988).
- Width is 5 to 15 (25) micrometers (Krammer and Lange-Bertalot 1988).
- Keelpunctae are 4 to 10 in 10 micrometers (Krammer and Lange-Bertalot 1988).
- Striae are 11 to 28 in 10 micrometers (Krammer and Lange-Bertalot 1988).
  - This taxon has radiate central costae where branching commonly occurs (Mann 1977). In addition, *H. amphioxys* has 2-6 fused sub-raphe costae and an offset central internal raphe (Mann 1977)

Martyana martyi

Length:28 Width: 9 Striae:5

Collection 1141a Other images More information



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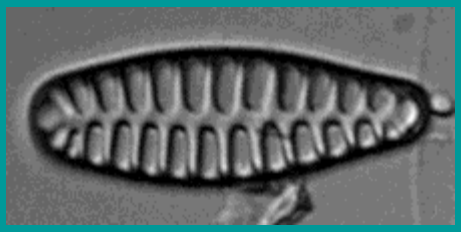
Authority information

Other images



This image was taken utilizing DIC for the specimen above.

More information

The frustules of this taxon are quadrate in a girdle view. They are also slighly narrower at one end than the other. The valve is ovate and has rounded apices with one apex wider thatn thee other. It has a distinctive psuedoraphe valve with broad striae. It is most distinguished by its valve shape and occuring in fresh water (Patrick and Reimer 1966).

- **Type Locality**
  New England States, Middle Atlantic States, Southeastern States, Gulf Coast States, South Central States, East Central States, Lakes States, Plains States, Oregon, California(Patrick and Reimer 1966).

  - **Synonyms**
    Opephora martyi Herib., Diat. Foss. Auvergne, vol. 1, p. 43, pl. 8, fig. 20. 1902 (Patrick and Reimer 1966).
    - **Ecology**
      This taxon may be found in lakes and rivers and is considered to be alkaliphilous to alkalibionic. It is halobin indifferent and prefers a limnophilous current. It is also eutriphic to mesotrophic (Lowe 1974).

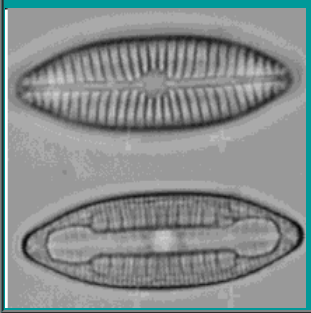
      Size ranges and morphology

      - Length is 5 to 60 micrometers (Patrick and Reimer 1966).
      - Width is 4 to 8 micrometers (Patrick and Reimer 1966).
      - Striae are 4.5 to 8 in 10 micrometers (Patrick and Reimer 1966).

***Mastogloia grevillei* Wm. Smith. 1856.**

Length:27 Width: 9 Loculi: 8 Striae: 11

Collection 803 Other images More information



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Authority information

Wm. Smith in Syn. British Diat., vol. 2, pp. 65-66, pl 62, fig. 389. 1856 (Patrick and Reimer 1966).

Other images

TEM of transapical section through the "H" shaped chromatophore of *Mastogloia grevillei* (Stoermer et. al. 1964).

More information

- **Ecology**
  Littoral form sometimes found in slow moving streams (Patrick and Reimer 1966).

Size ranges and morphology

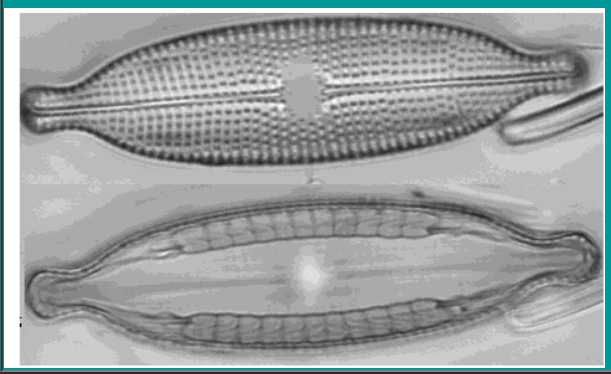
- Length is 30-60 (Patrick and Reimer 1966).
- Breadth is 8-12 (Patrick and Reimer 1966).
- Striae range is 9-10 (Patrick and Reimer 1966).
- Loculi range is 6-8 (Patrick and Reimer 1966).
- Puncate range is 20 (Patrick and Reimer 1966).
    - Other morphological features

        Valve has double row of punctae seperated by thickened costate ribs (Patrick and Reimer 1966).

Mastogloia smithii var. *amphicephala* Grun. 1880

Length:41 Width: 13 Loculi: 6 Striae: 17

Collection 1102a Other images More information



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Authority information

Grun. in V. H., Syn. Diat. Belgique, pl. 4, fig. 27. 1880 (Patrick and Reimer 1966).

Other images

More information

- **Ecology**
  Found in freshwater lakes (Patrick and Reimer 1966).

  Size ranges and morphology

  - Length is 30-45 (Patrick and Reimer 1966).
  - Breadth is 10-14 (Patrick and Reimer 1966).
  - Striae range is 18-19 (Patrick and Reimer 1966).
  - Loculi range is 6-8 (Patrick and Reimer 1966).
  - Puncate range is 14-17 (Patrick and Reimer 1966).
    - Other morphological features
      Valve has distinctly capitate ends (Patrick and Reimer 1966).

Mastogloia smithii var. *lacustris* Grun. 1878

Length:28.6 Width:7.6 Loculi:6 Striae:16

Collection 1407 Other images More information

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Authority information

Grun., in Schneider, Naturw. Beitr. Kenntn. Kaukasuslander, p. 111. 1878 (Patrick and Reimer 1966).

Other images

More information

- **Ecology**
  Common in fresh water lakes (Patrick and Reimer 1966).

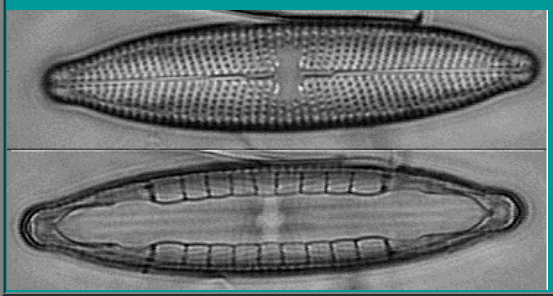
  #### Size ranges and morphology

  - Length is 20-45 (Patrick and Reimer 1966).
  - Breadth is 8-11 (Patrick and Reimer 1966).
  - Striae range is 15-16 (Patrick and Reimer 1966).
  - Loculi range is 6-8 (Patrick and Reimer 1966).

***Mastogloia smithii* Thwaites ex W. Smith 1856**

Length: 27 Width: 11 Striae:16

Collection 1776a Other images More information



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Authority information

Thwaites ex W. Smith, syn. British Diat., vol.2, p. 65, pl. 54, fig. 341. 1856 (Patrick and Reimer 1966).

Other images

More information

- **Ecology**
  Found in fresh and brackish water (Patrick and Reimer 1966).

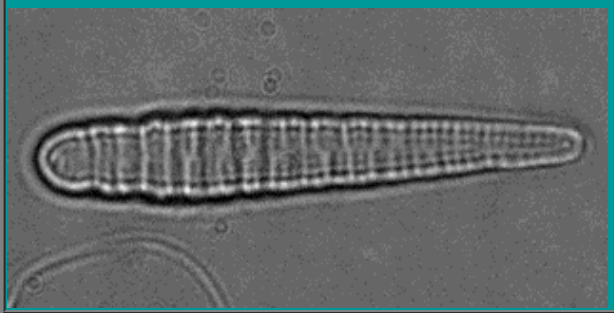
  Size ranges and morphology

  - Length is 20-45 (Patrick and Reimer 1966).
  - Breadth is 8-14 (Patrick and Reimer 1966).
  - Striae range is 18-19 (Patrick and Reimer 1966).
  - Punctae range is 14-17 (Patrick and Reimer 1966).
  - Loculi range is 6-8 (Patrick and Reimer 1966).
    - Other morphological features
      Valve elliptical to elliptical-lanceolate (Patrick and Reimer 1966).

Meridion circulare (Grev.) Ag. 1831

Length: 28 Width: 5 Costae: 5 Striae:

Collection 1348a Other images More information



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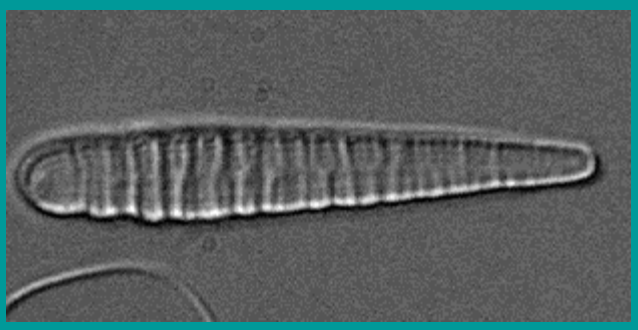
Authority information

(Grev.) Ag., Consp. Crit. Diat., pt. 3, p. 40. 1831 (Patrick and Reimer 1966).

Other images

DIC image



More information

- For the most part, this taxon is found in the periphyton. Occasionally, specimens from shoreline regions have been found in Lake Michigan (Stoemer and Yang 1969).

- **Synonyms** (Patrick and Reimer 1966)
  Echinella circularis Grev., Mem. Wernerian Nat. Hist. Soc., 4:213, pl. 8, fig. 2. 1822.
  Meridion zinkenii Kuetz., Flora, 26:396. 1843.
  Meridion circulare var. *zinkenii* (Kuetz.) Grun., Verh. Zool.-Bot. Ges. Wien, 12:345. 1862.

  - **Ecology**
    This taxon prefers flowing, fresh water (Patrick and Reimer 1966) and a pH range of 6.4 to 9.0 with an optimum at approximately 8 (Lowe 1974).

    Size ranges and morphology

    - Length is 12 to 80 micrometers (Patrick and Reimer 1966).
    - Width is 4 to 8 micrometers (Patrick and Reimer 1966).
    - Costae are 3 to 5 in 10 micrometers (Patrick and Reimer 1966).
    - Striae are 15 to 16 per 10 micrometers between costae (Patrick and Reimer 1966).

Meridion circulare var. *constrictum* (Ralfs) V. H. 1881

Length: 21 Width: 7 Costae: 7 Striae:

Collection 1428a Other images More information

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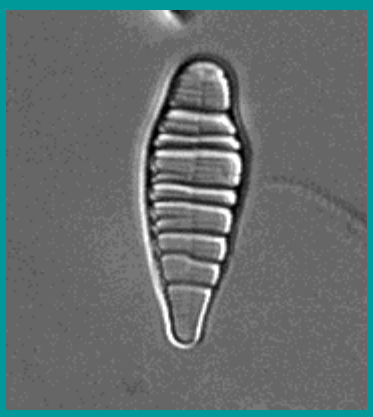
Authority information

(Ralfs) V. H., Syn. Diat. Belgique, pl. 51, figs. 14, 15. 1881 (Patrick and Reimer 1966).

Other images

DIC image



More information

- For the most part, this taxon is found in the periphyton. Occasionally, specimens from shoreline regions have been found in Lake Michigan (Stoemer and Yang 1969).
- **Synonyms** (Patrick and Reimer 1966)
  Meridion constrictum Ralfs, Ann. Mag. Nat. Hist., 12:458, pl. 18, fig. 2. 1843.

- **Ecology**
  Like the nominate variety, this taxon prefers flowing, fresh water and is tolerant to small amounts of salt (Patrick and Reimer 1966).

  Size ranges and morphology

  - Length is 12 to 80 micrometers (Patrick and Reimer 1966).
  - Width is 4 to 8 micrometers (Patrick and Reimer 1966).
  - Costae are 3 to 5 in 10 micrometers (Patrick and Reimer 1966).
  - Striae are 15 to 16 per 10 micrometers between costae (Patrick and Reimer 1966).

***Navicula vulpina* Kutz.**

Length:89 Width :15 Striae:9

Collection 1163 Other images More information

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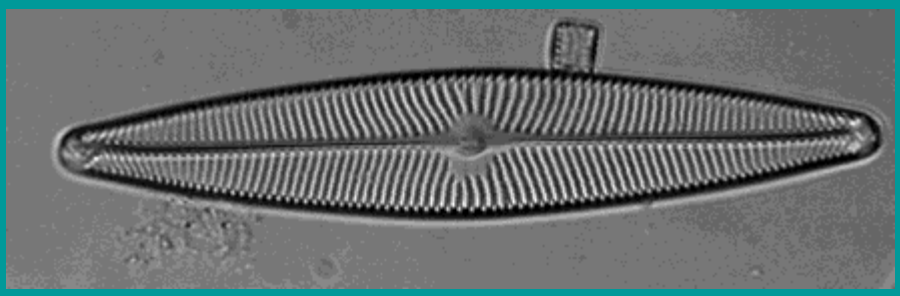
Authority information

Navicula vulpina Kutz., Bacill., p. 92, fig. 43. 1844 (Patrick and Reimer 1966).

Other images



This image was taken using DIC.

More information

This taxon has a linear-lanceolate valve and it tapers into rounded ends. The axial area of this taxon is narrow and it widens toward the central area. The striae are radiate toward the center and convergent at the ends. They are also coarsely linear and sometimes form irregular longitudinal lines. The main characteristics of this taxon are a large central area and large terminal nodules (Patrick and Reimer 1966).

- **Ecology**

  This taxon prefers fresh water and is mesotrophic. It is found in lakes, ponds, springs, streams, lagoons, and thermal springs. The pH it prefers is 4.0 to 6.5 (Patrick and Reimer 1966;Beaver 1981).

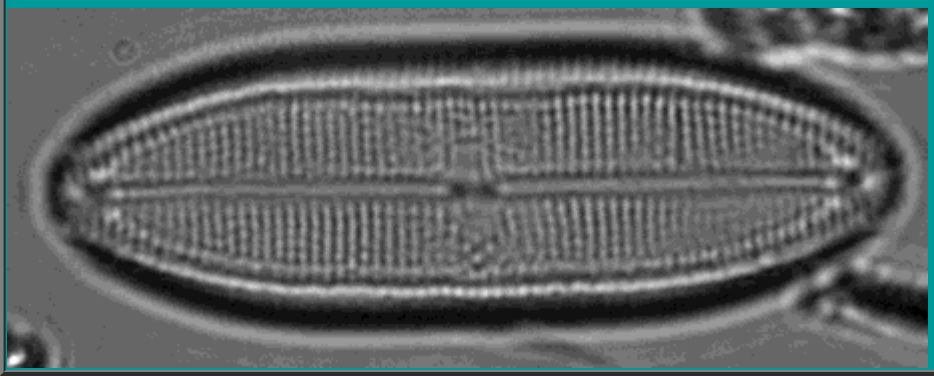
Size ranges and morphology

- Length is 50 to 140 micrometers (Patrick and Reimer 1966).
- Width is 10 to 20 micrometers (Patrick and Reimer 1966).
- Striae are 10 to 12 in 10 micrometers (Patrick and Reimer 1966).

Neidium sp. 2

Length:37 Width:12 Striae:22 Puncta:

Collection 1109a Other images More information



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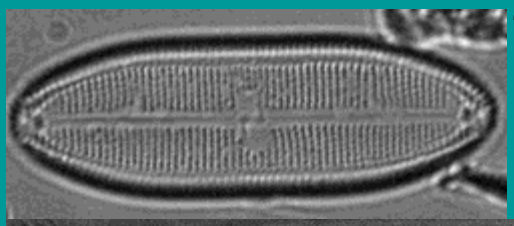
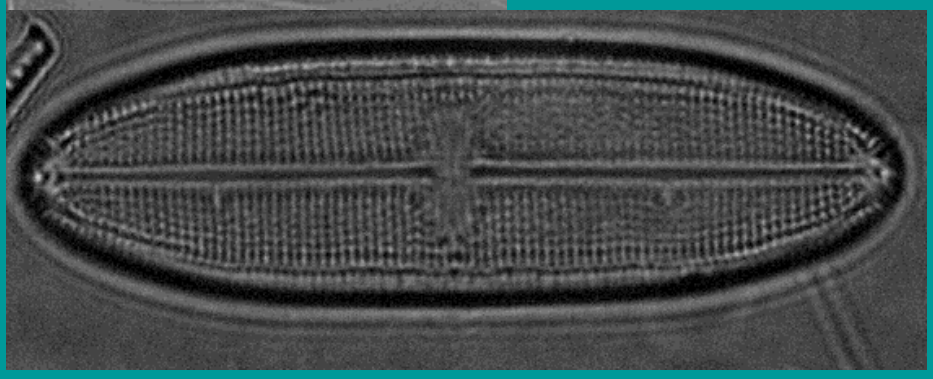
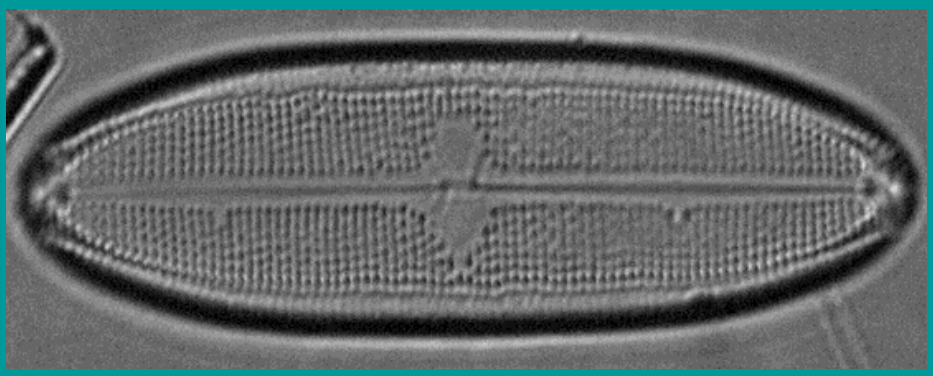
Authority information

Other images



This image was taken utilizing DIC for the specimen above.





These are another specimen of sp 2. One utilizes regular methods of capturing and the other utilizes dic.

More information

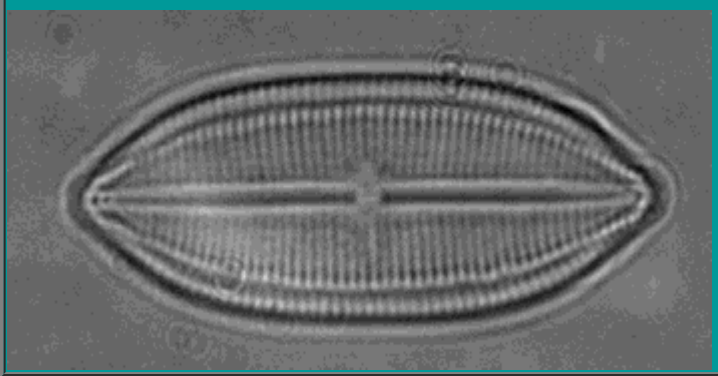
- **Type Locality**
- **Ecology**

Size ranges and morphology

Neidium sp. 3

Length:26 Width:9 Striae:20 Puncta:

Collection 1520 Other images More information



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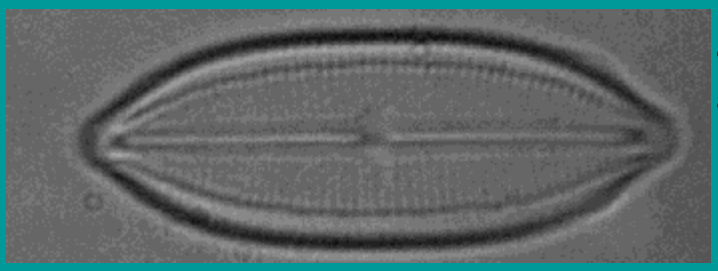
Authority information

Other images



This image was taken utilizing DIC for the specimen above.

More information

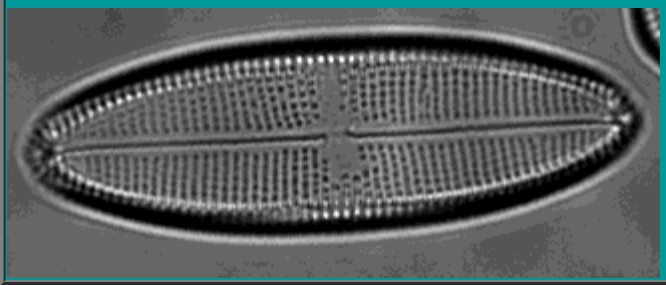
- **Type Locality**
- **Ecology**

Size ranges and morphology

Neidium sp. 6

Length:39 Width:11.5 Striae:16 Puncta:

Collection 1388 Other images More information



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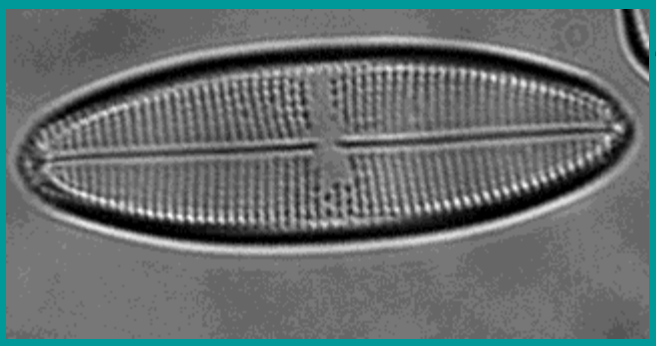
Authority information

Other images



This image was taken utilizing DIC for the specimen above.

More information

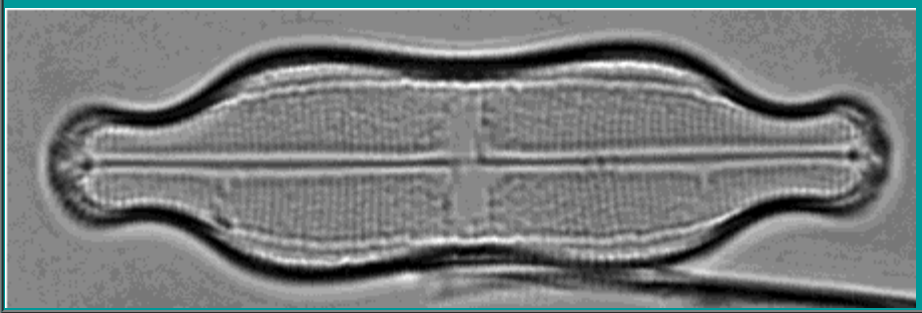
- **Type Locality**
  - **Ecology**

Size ranges and morphology

Neidium sp. 7

Length:38 Width:11 Striae:25 Puncta:

Collection 1788 Other images More information



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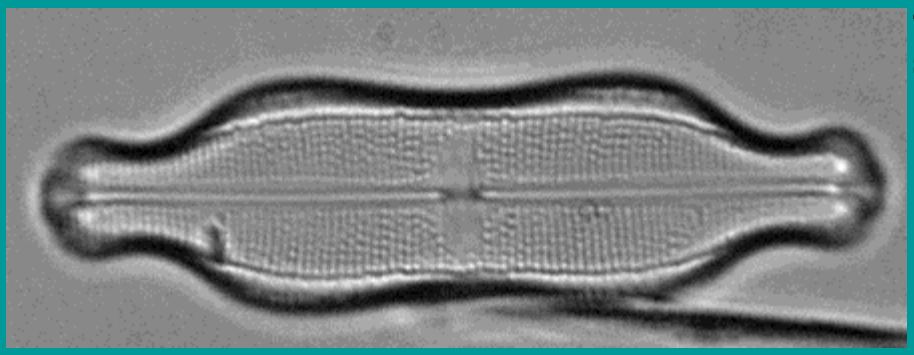
Authority information

Other images



This image was taken utilizing DIC for the specimen above.

More information

This species is found in Lake Superior(E.F. Stoermer collection).

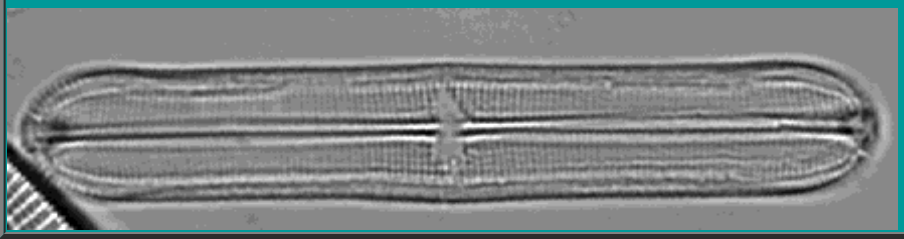
- **Type Locality**
- **Ecology**

Size ranges and morphology

Neidium sp. 8

Length:48 Width:8 Striae:26 Puncta:

Collection 1787 Other images More information



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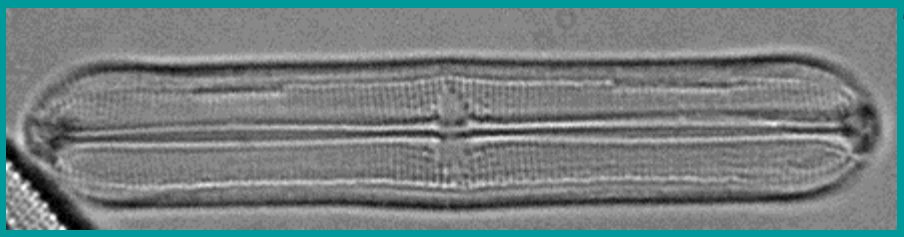
Authority information

Other images



This image was taken utilizing DIC for the specimen above.

More information

This taxon is found in Lake Superior (E.F. Stoermer collection).

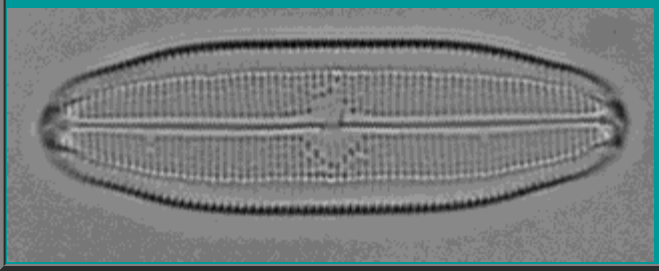
- **Type Locality**
- **Ecology**

Size ranges and morphology

Neidium affine(Ehr.) Pfitz.

Length:37 Width:11 Striae:20 Puncta:

Collection 1788 Other images More information



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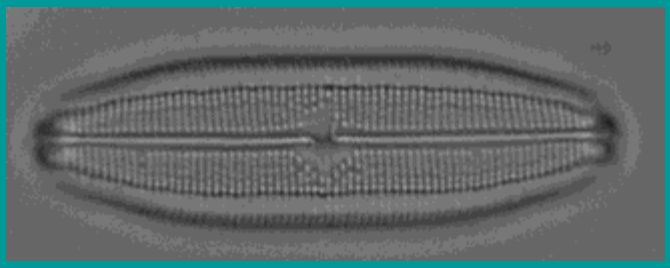
Authority information

(Ehr.) Pfitzer, Bot. Abh. Geb. Morph. Physiol., 1(2):39. 1871 (Stoermer and Yang 1969).

Other images



This image was taken utilizing DIC for the specimen above.

More information

This taxon is consticted centrally. It has a straight raphe valve and is slightly narrower towards the ends. The valve is linear-lanceolate and has rounded ends. The sides are parallel with a straight axial area. The central area is elliptical and the striae are parallel and/or oblique. They become convergent on the ends (Patrick and Reimer 1966).

- **Type Locality**
  USA, Maryland, Montgomery County, Potomac River (Patrick and Reimer 1966).
  - **Synonyms**
    Navicula amphigomphus Ehr. *in* pl. 49, fig. 32. 1877 (Patrick and Reimer 1966).

- **Ecology**
  This taxon may be found in lakes,rivers, springs, streams, ponds, pools and thermal springs. It preferens fresh water and is most common in quiet areas. It is not found in large numbers (Patrick and Reimer 1966; Beaver 1981) and is considered to be alkaliphilous to ph indifferent and oligohalobous (Lowe 1974). (Beaver 1981).

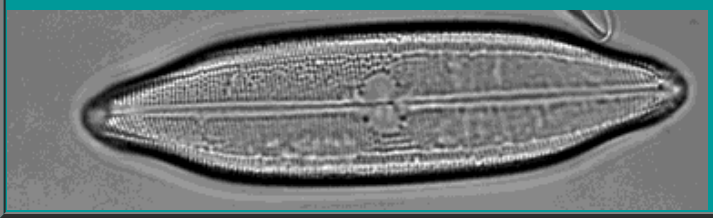
Size ranges and morphology

- Length is 30 to 65 micrometers (Patrick and Reimer 1966).
- Width is 8 to 13 micrometers (Patrick and Reimer 1966).
- Striae are 22 to 24 in 10 micrometers (Patrick and Reimer 1966).
- Puncta are around 24 in 10 micrometers (Patrick and Reimer 1966).

*Neidium affine*var *amphirhynchus* (Ehr.) Cl.

Length:69 Width:17 Striae:20

Collection 1788 Other images More information



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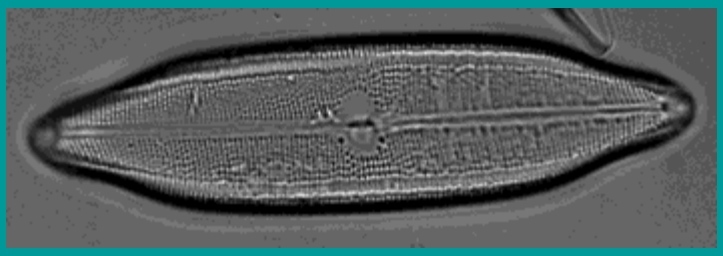
Authority information

Neidium affine var. *amphirynchus* (Ehr.) Cl., K. Svenska Vet.-Akad. Handl., Ny Foljd, 26(2):68. 1894 (Patrick

and Reimer 1966).

Other images



This image was taken utilizing DIC for the specimen above.

More information

The only things that differ from the taxon *affine* are the ends are protracted and slightly narrower (Patrick and Reimer 1966).

- **Synonyms**

  Navicula amphirhynchus Ehr., Abh. Akad. Wiss. Berlin, for 1841:417, pl. 3(1), fig. 10. 1843 (Patrick and Reimer 1966).
  Neidium amphirhynchus (Ehr.) Pfitz., Bot. Abh. Geb. Morph. Physiol., 1(2):186, pl. 4. fig. 1. 1871 (Patrick and Reimer 1966).
  Neidium iridis var. *amphirhynchus* (Ehr.) A. Mayer, Denkschr. Bayer. Botr. Ges. Regensburg, 13(N.F. 7):29, pl.2, fig. 34. 1917 (Patrick and Reimer 1966).

- **Ecology**

  This taxon prefers a pH range of 4.0 to 9.0 and is a bottom form (Lowe 1974;Beaver 1981).

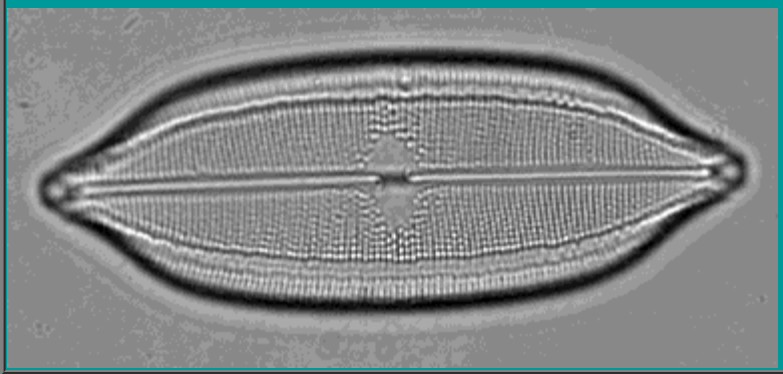
Size ranges and morphology

- Length is 30 to 45 micrometers (Patrick and Reimer 1966).
- Width is 9 to 12 micrometers (Patrick and Reimer 1966).
- Striae are 22 to 24 in 10 micrometers (Patrick and Reimer 1966).

Neidium affine var. *humerus* Reimer 1959

Length:58.5 Width:20 Striae:20 Puncta:

Collection 1165 Other images More information



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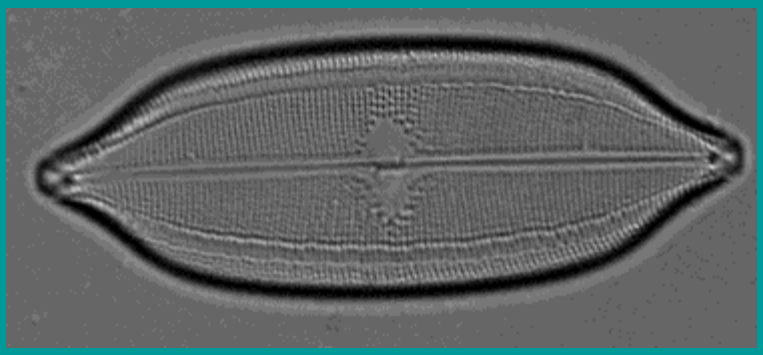
Authority information

Reimer 1959 (Patrick and Reimer 1966).

Other images



This image was taken utilizing DIC for the specimen above.

More information

This taxon is characterized by apiculate ends, a broader valve, and has pointy ends. It sometimes has faint lines extending from the striae in the central area of the diatom. These lines are seen in other taxon of Neidium as well as this one (Patrick and Reimer 1966).

- **Type Locality**
  USA, Maryland, Montgomery County, Potomac River (Patrick and Reimer 1966).
  - **Synonyms**
    Navicula amphigomphus Ehr. *in* pl. 49, fig. 32. 1877 (Patrick and Reimer 1966).

- **Ecology**
  This taxon may be found in lakes and rivers (Patrick and Reimer 1966; Beaver 1981) and is considered to be alkaliphilous and alkalibionic (Beaver 1981).

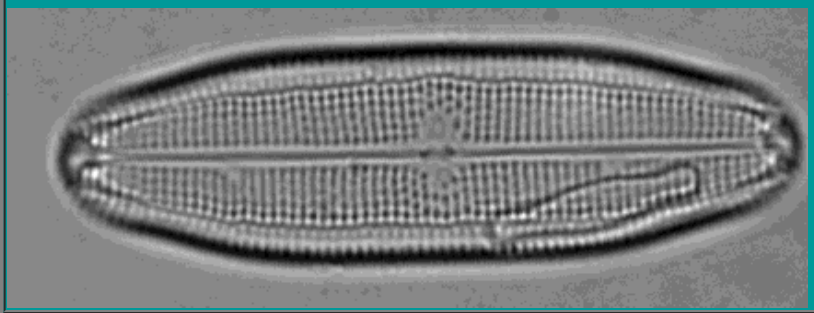
Size ranges and morphology

- Length is 41 to 78 micrometers (Patrick and Reimer 1966).
- Width is 14 to 22 micrometers (Patrick and Reimer 1966).
- Striae are 20 to 22 in 10 micrometers (Patrick and Reimer 1966).
- Puncta are around 22 in 10 micrometers (Patrick and Reimer 1966).

Neidium affine var. *undulatum* (Grun.) Hust.

Length:35 Width:10 Striae:22 Puncta:

Collection 1788 Other images More information



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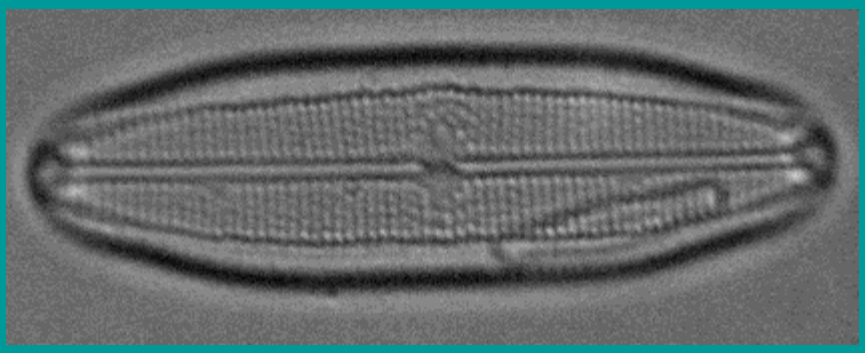
Authority information

(Grun.) Cl., K. Svenska Vet.-Akad. Handl., Ny Foljd, 26(2):68. 1894 (Patrick and Reimer 1966).

Other images



This image was taken utilizing DIC for the specimen above.

More information

This taxon has a valve that has triunduylate margins. The ends are broad and subrostrate The striae are course and is larger than *affine* (Patrick and Reimer 1966). This taxon is found in Lake Superior (E.F. Stoermer collection).

- **Type Locality**
  Wyoming (Patrick and Reimer 1966).

- **Synonyms**
  Navicula affinis var. *undulat* Grun., Verh. Zool.-Bot. Ges. Wien, 10:544, pl. 5, fog/ 6. 1860 (Patrick and Reimer 1966).
  Neidium affine f. *undulatum* (Grun.) Hust. *in* Pasch., sussw.-Fl. Mitteleuropas, Heft 10, Aufl. 2, p.243. 1930 (Patrick and Reimer 1966).
  Neidium amphirhynchus var. *undulatum* (Grun.) Meist., Beitr. Kryptog.-Fl. Schweiz, 4(1), p. 107, pl. 14, fig. 18. 1912 (Patrick and Reimer 1966).

- **Ecology**
  This taxon may be found in lakes (Patrick and Reimer 1966).

Size ranges and morphology

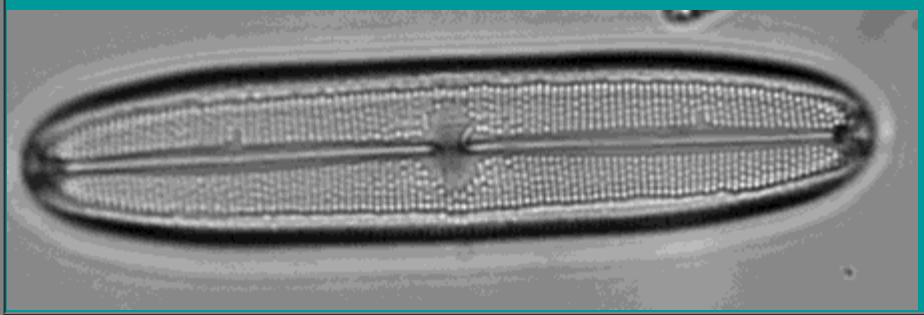
- Length is 55 to 80 micrometers (Patrick and Reimer 1966).

Width is 14 to 17 micrometers (Patrick and Reimer 1966).
- Striae are 20 to 22 in 10 micrometers (Patrick and Reimer 1966).
- Puncta are 20 in 10 micrometers (Patrick and Reimer 1966).

Neidium bisultcatum (Lagerst.) Cl.

Length:35 Width:7 Striae:26 Puncta:

Collection 1788 Other images More information



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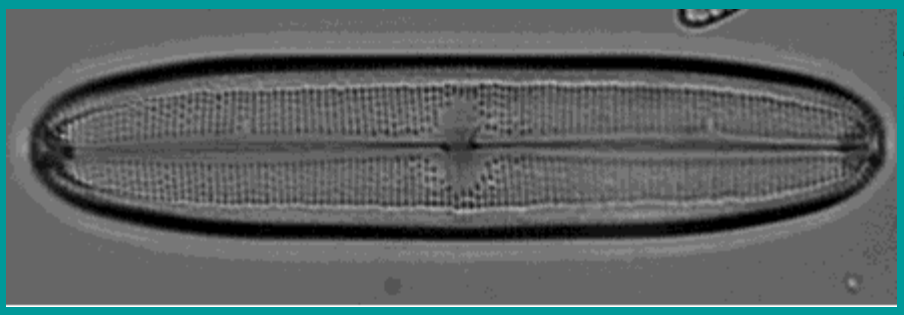
Authority information

(Lagerst.) Cl., K. Svenska Vet.-Akad. Handl., Ny Foljd, 26(2):68. 1894 ().

Other images



This image was taken utilizing DIC for the specimen above.

More information

This takon has a linear valve. The valve has parallel sides and it also has broadly rounded ends. The axial area is straight and it is narrower near the center and the ends. It also has a straight raphe valve which narrows near the ends. The central area of this taxon is diagonnally elliptical. The striae are parallel on either side of the central area and are radiate above and below it. They are also convergent on the ends (Patrick and Reimer 1966).

- **Type Locality**
  uncertain, New England States, Middle Atlantic States, Southeastern States, Tennessee, Indiana, and Nebraska (Patrick and Reimer 1966).
  - **Ecology**
    This taxon in found in lakes and rivers. It has not been found in large quantities in the United States. It is a beta-mesosaprobe with a winter maximum and is ph indifferent (Lowe 1974).

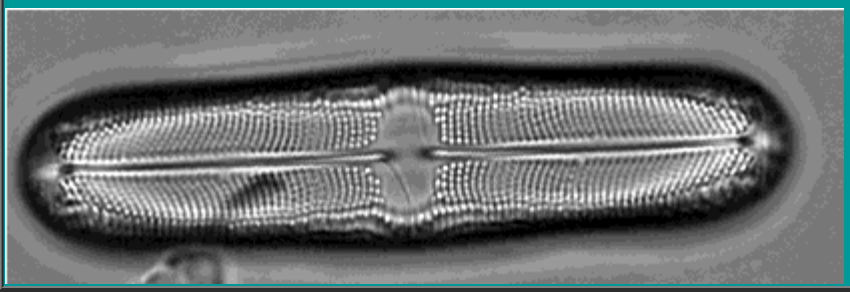
    Size ranges and morphology

    - Length is 35 to 75 micrometers (Patrick and Reimer 1966).
    - Width is 7 to 12 micrometers (Patrick and Reimer 1966).
    - Striae are 26 to 30 in 10 micrometers (Patrick and Reimer 1966).
    - Puncta are around 24 to 28 in 20 micrometers (Patrick and Reimer 1966).

Neidium calvum Ostrup

Length:59 Width:13 Striae:18-20 Puncta:

Collection 1177 Other images More information



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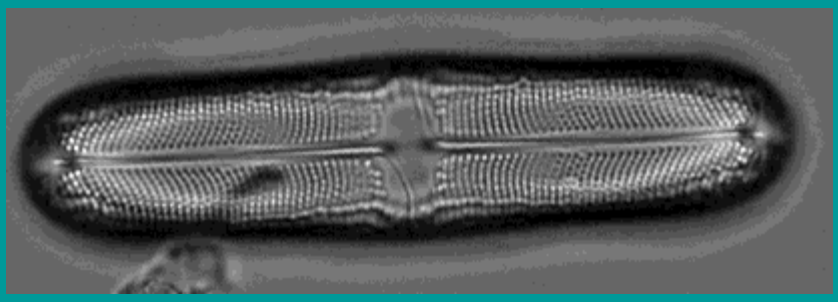
Authority information

Oestrup 1910 (Fig. 101:2-4) (Krammer and Lange-Bertalot 1986).

Other images



This image was taken utilizing DIC for the specimen above.

More information

This taxon has a straight raphe valve and a linear axial area. The central area is elliptical. The ends are bifurcate (Krammer and Lange-Bertalot 1986). This taxon is located in Lake Superior (E.F. Stoermer collection).

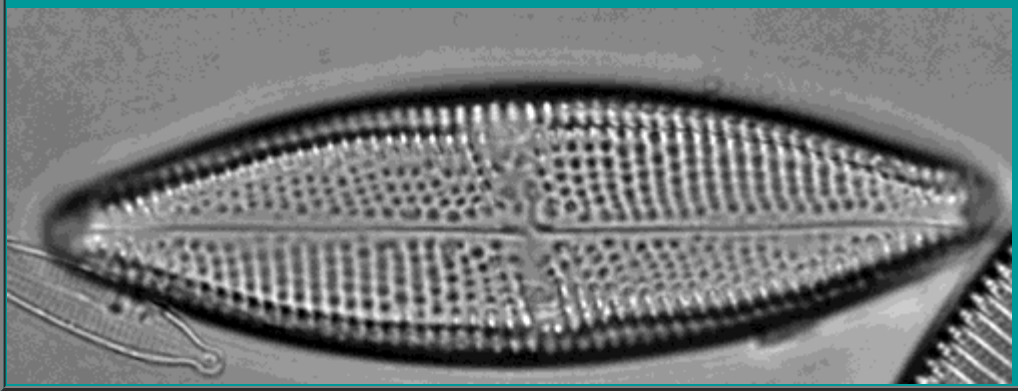
Size ranges and morphology

- Length is 29 to 58 micrometers (Krammer and Lange-Bertalot 1986).
- Width is 8 to 10 micrometers (Krammer and Lange-Bertalot 1986).
- Striae are 16 to18 in 10 micrometers (Krammer and Lange-Bertalot 1986).
- Puncta are around 20 to 25 in 20 micrometers (Krammer and Lange-Bertalot 1986).

Neidium distincte-punctatum Hustedt

Length:56 Width:18 Striae:10-11 Puncta:13

Collection 1792a Other images More information



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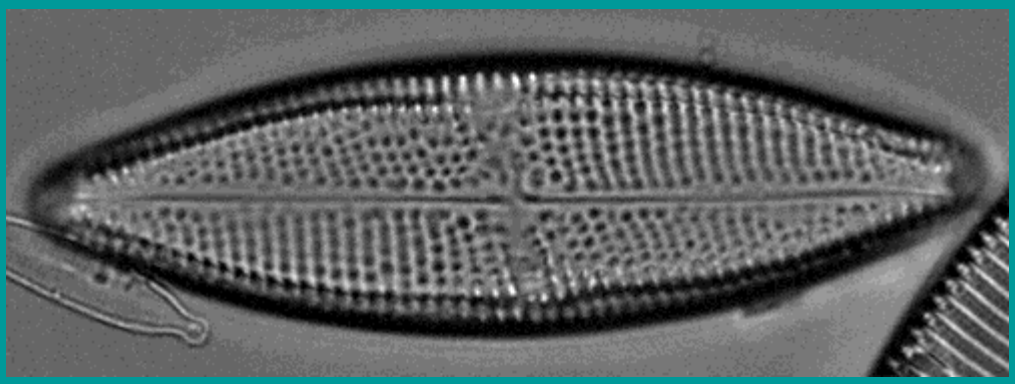
Authority information

Hustedt 1922, p.84 fig. 2 (VanLandingham 1978).

Other images



This image was taken utilizing DIC for the specimen above.

More information

This taxon has broad, bluntly rounded ends which are weakly drawn out. The valve is broadly laceolate. The raphe is filiform. The proximal raphe ends are thin, short hooks. The axial area is narrow and a central area is variously developed. Usually expressed as a diagonal region of poorly developed punctae, the central area sometimes appears to be lacking. The striae are oblique to the raphe and valve margin. The submarginal canal is parallel to the valve margin. There are very distinct punctae (Krammer and Lange-Bertalot 1986). This taxon is occasionally found in collections from all of the Great Lakes. Specimens illustrated are from Lake Superior (E.F. Stoermer collection).

- **Type Locality**
  Lower Lunz Lake, Austria
  - **Holotype**
    BRM NE 1/3 (Hustedt Collection, Lunzer Unter See, Finder 622.4)
    - **Illustrations**
      Simonsen 1987, Pl. 95, Figs. 25-26.
      - **Authentic Material**
        BRM E6274: CANA 38481.
        - **Ecology**
          This taxon is found in lake sediments, usually in deep water, or in shaded microhabitats in shallow water bodies. Krammer and Lange-Bertalot 1986 considered it to most likely be a subfossil, but Hamilton et al. 1996 have found it

widely distributed in shallow Arctic ponds, and we have observed it in bottom sediments from several modern lakes in central North America as well as in post-Pleistocene lake sediments.

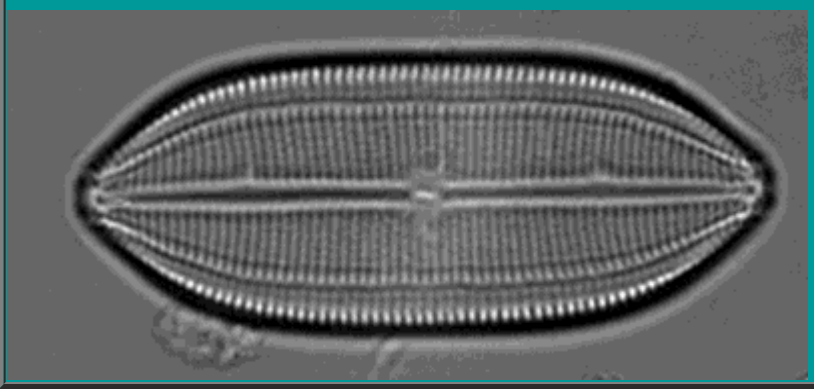
Size ranges and morphology

- Length is 32 to 70 micrometers (Krammer and Lange-Bertalot 1986);(Hamilton et al. 1996).
- Width is12 to 21 micrometers (Krammer and Lange-Bertalot 1986);(Hamilton et al. 1996).
- Striae are 8 to 12 in 10 micrometers (Krammer and Lange-Bertalot 1986); (Hamilton et al. 1996).
- Puncta are around 10 to 15 in 20 micrometers(Krammer and Lange-Bertalot 1986);(Hamilton et al. 1996).

Neidium dubium var. 1

Length:35 Width:13.5 Striae:20 Puncta:

Collection 1175 Other images More information



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Authority information

Other images

This image was taken utilizing DIC for the specimen above.

More information

This species is a variety of dubium. It is only slightly different from dubium. (Patrick and Reimer 1966). It closely follows dubium so the following information is from the genera dubium. The taxon usually has tapered sides and the valve is linear. The ends of the raphe valves are straight and the distal ends are for the most part indistinct. The striae for this taxon is radiate to parallel. It is best distinguished by the straight proximal ends of the raphe valve along with the shallow punta and the striae (Patrick and Reimer 1966).

- **Type Locality** (Patrick and Reimer 1966)
  South America, Surinam, New England States, Massachusetts, Southeastern States, Eastern Central States, Lakes States, Plains States, Oregon, and California

  - **Ecology**
    This taxon may be found in lakes, streams, ponds, rivers, lagoons, pools, and swamps(Patrick and Reimer 1966; Beaver 1981) and is considered to be ph indifferent as well as oligosaprobic. (Beaver 1981).

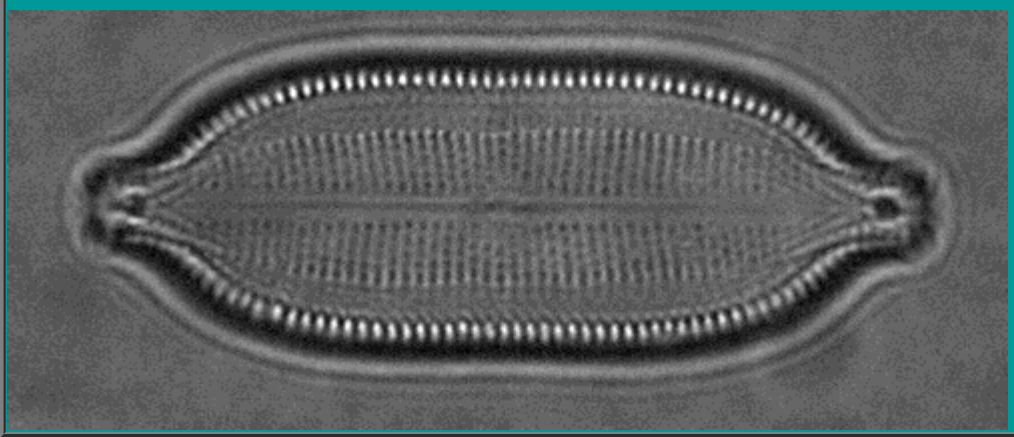
    Size ranges and morphology

    - Length is 30 to 50 micrometers (Patrick and Reimer 1966).
    - Width is 10 to 16 micrometers (Patrick and Reimer 1966).
    - Striae are 18 to 20 in 10 micrometers (Patrick and Reimer 1966).
    - Puncta are around 20 in 10 micrometers (Patrick and Reimer 1966).

Neidium dubium f. *constrictum* Hustedt 1930

Length:37 Width:13.5 Striae:18

Collection 1240 Other images More information



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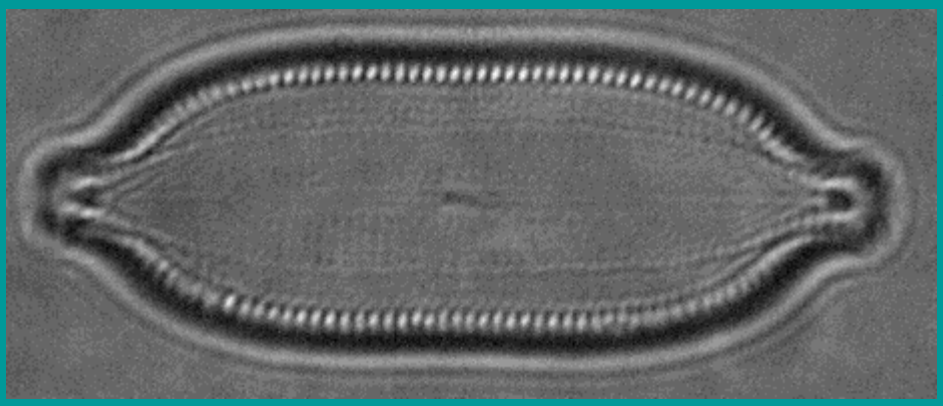
Authority information

Neidium dubium f. *constrictum* Hustedt *in* : Pascher, Suessw.-Fl. Mittleleuropas, Heft 10, Aufl. 2, p. 246, fig.348b. 1930 (Stoermer and Yang 1969).

Other images



This image was taken utilizing DIC for the specimen above.

More information

This species is a variety of dubium. It is only slightly different from dubium. The only difference is that the valve constricts slightly at the center. One other oddity about this taxon is occasionally a type occurs where the margins are flattened slightly halfway between the center and the ends. It closely follows dubium so the following information is from the genera dubium. The taxon usually has tapered sides and the valve is linear. The ends of the raphe valves are straight and the distal ends are for the most part indistinct. The striae for this taxon is radiate to parallel. It is best distinguished by the straight proximal ends of the raphe valve along with the shallow punta and the striae (Patrick and Reimer 1966).

- **Type Locality**
  uncertain, central Europe, New York, Maryland, Iowa, Michigan, and New Mexico (Patrick and Reimer 1966).

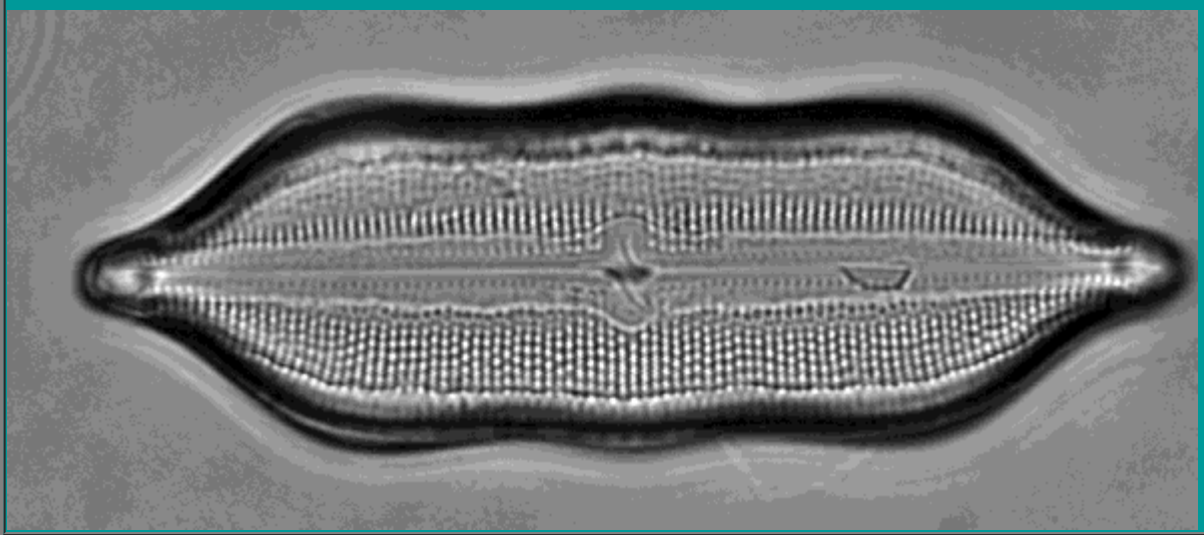
  - **Ecology**
    This taxon is mainly found in lakes, but is sometimes located in rivers (Patrick and Reimer 1966).

Size ranges and morphology

***Neidium hitchcockii* (Ehr.) Cl.**

Length:53 Width:17 Striae:20 Puncta:

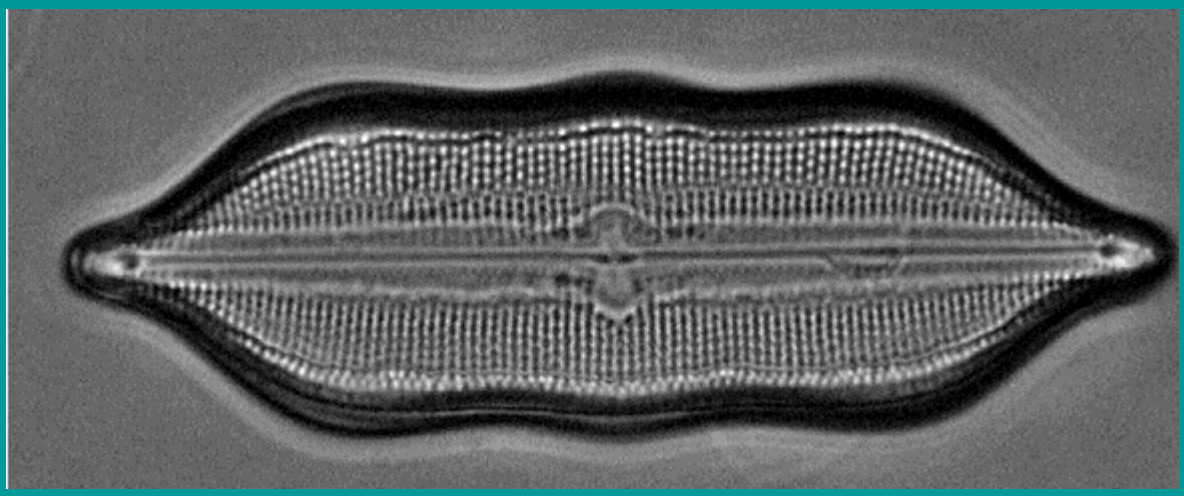
Collection 1782 Other images More information



Authority information

(Ehr.) Cl., K. Svenska Vet.-Akad. Handl.,Ny Foljd, 26(2):69. 1894 ().

Other images



This image was taken utilizing DIC for the specimen above.

More information

The valve of this taxon has triundualte sides. It has a straight raphe valve and the axial area of it is narrow. The ends of the taxon narrow sharply. The proximal ends are curved in opposite directions while the terminal ends are bifurcate. It has a small elliptical central area. The axial and central areas has longitudinal bands on the edges that the striae extend into. In this band the striae become indistinct. The striae are punctuate and are also slightly radiate throughout the entire valve. They are parallel at the ends. The axial bands this taxon has are one of its distinguishing characteristics (Patrick and Reimer 1966). This taxon is found in Lake Superior(E. F. Stoermer collection).

- **Type Locality**
  USA, Bridgewater, Massachusetts, New England States, Middle Atlantic States, East Cental States, Lakes States, South Carolina, Washington, California (Patrick and Reimer 1966).

  - **Ecology**
    This taxon in found mainly in lakes but can occasionally be foundin rivers that drain into lakes. If it is found in rivers it will be in an allochthonous form (Patrick and Reimer 1966).

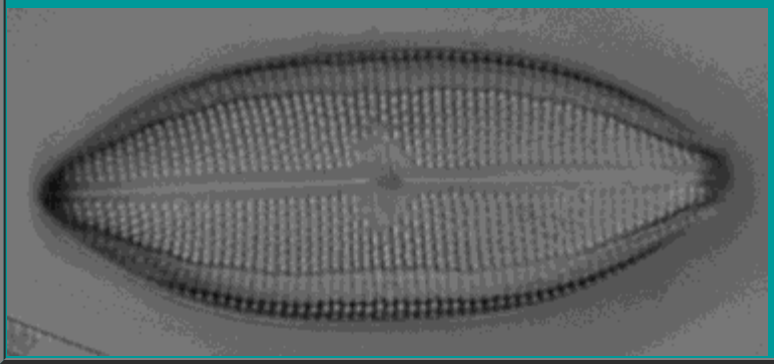
Size ranges and morphology

- Length is 35 to 100 micrometers (Patrick and Reimer 1966).
- Width is 8 to 15 micrometers (Patrick and Reimer 1966).
- Striae are about 20 in 10 micrometers (Patrick and Reimer 1966).
- Puncta are 20 in 10 micrometers (Patrick and Reimer 1966).

Neidium iridis (Ehr.) Cleve

Length:40.5 Width:16 Striae:17 Puncta:

Collection 1426 Other images More information



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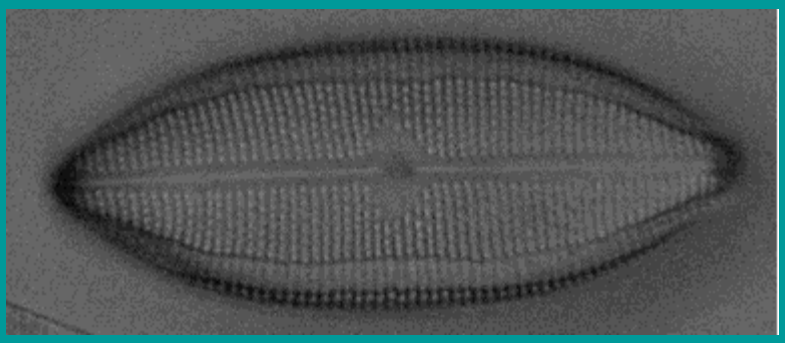
Authority information

(Ehr.) Cleve, K. Svenska Vet.-Akad. Handl., Ny Foljd, 26(2):69. 1894 (Stoermer and Yang 1969).

Other images



This image was taken utilizing DIC for the specimen above.

More information

The valve of this taxon is elongate with convex sides and is tapered to rounded ends. It has a straight raphe valve that narrows at the ends. Its proximal ends curve in opposite directions and the central area of the taxon is elliptical. The striae are punctuate and they are oblique. The striae radiate in the middle of the valve but become parallel at the ends. It is variable in form and structure (Patrick and Reimer 1966).

- **Type Locality**
  USA, New York, West Point, New England, Middle Atlantic States, Southeastern USA, Gulf Coast, South Central States, East Central States, West Central States, Lakes States, Plains States, Wyoming, Washington, Oregon, California (Patrick and Reimer 1966).
  - **Ecology**
    This taxon prefers slow or not moving water. It is found in lakes, ponds, and bogs. It is ph indifferent and is considered to be oligosaprobic (Patrick and Reimer 1966; Lowe 1974).

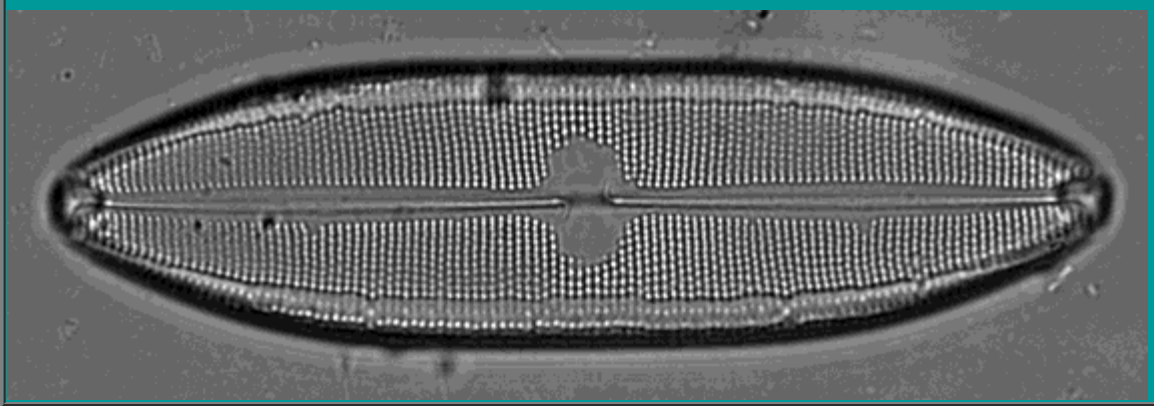
Size ranges and morphology

- Length is 50 to 190 micrometers (Patrick and Reimer 1966).
- Width is 16 to 40 micrometers (Patrick and Reimer 1966).
- Striae are 14 to 18 in 10 micrometers (Patrick and Reimer 1966).
- Puncta are around 13 in 18 micrometers (Patrick and Reimer 1966).

Neidium iridis var. *amphigomphus* (Ehr.) A. Mayer

Length:68 Width:21 Striae:18 Puncta:

Collection 1165 Other images More information



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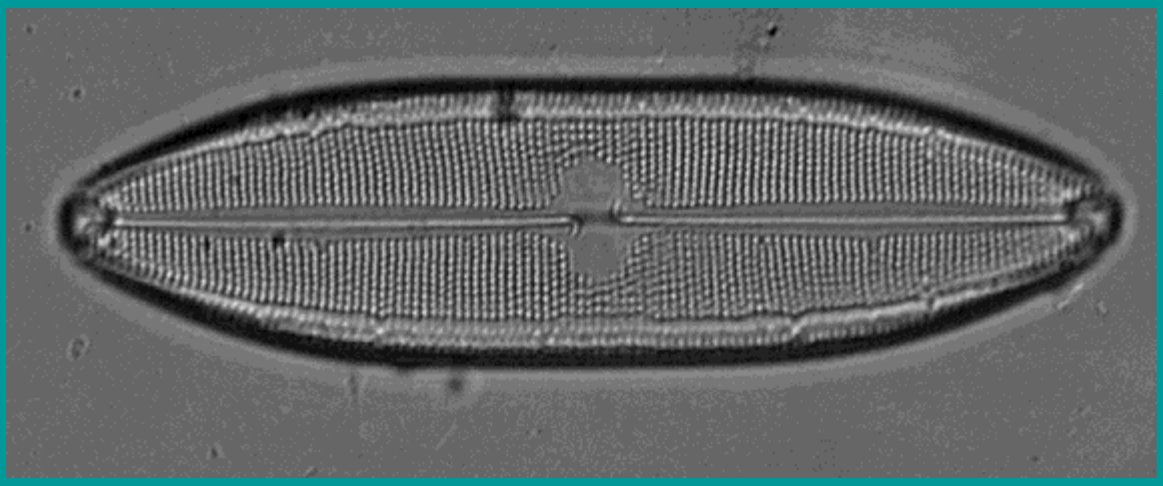
Authority information

(Ehr.) A. Mayer. Denkschr. Bayer. Bot. Ges. Regensburg, 13:30. 1917 (Patrick and Reimer 1966).

Other images



This image was taken utilizing DIC for the specimen above.

More information

This taxon has a broad linear valve and cuneate ends. It is usually a smaller species and the other characteristics are the same as iridis (Patrick and Reimer 1966). This is also located in Lake Superior (E. F. Stoermer collection 1165a).

- **Type Locality**
  Real del monte Mexico, New York, Stratford Connecticut, Andower, Boston, and Bridgewater Massachusetts (Patrick and Reimer 1966).

  - **Ecology**
    This taxon may be found in lakes, ponds, rivers, spring/streams, lagoons, pools, and swamps (Patrick and Reimer 1966; Beaver 1981).

    ### Size ranges and morphology

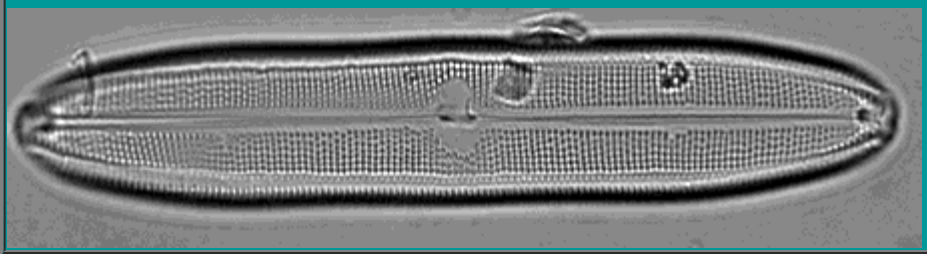
    - Length is 65 to 150 micrometers (Patrick and Reimer 1966).
    - Width is 16 to 40 micrometers (Patrick and Reimer 1966).
    - Striae are 15 to 16 in 10 micrometers (Patrick and Reimer 1966).

Puncta are around 15 in 18 micrometers (Patrick and Reimer 1966).

Neidium iridis f. *vernalis* Reichelt *ex* Hustedt

Length:80 Width:15 Striae:18-19 Puncta:

Collection 1159 Other images More information



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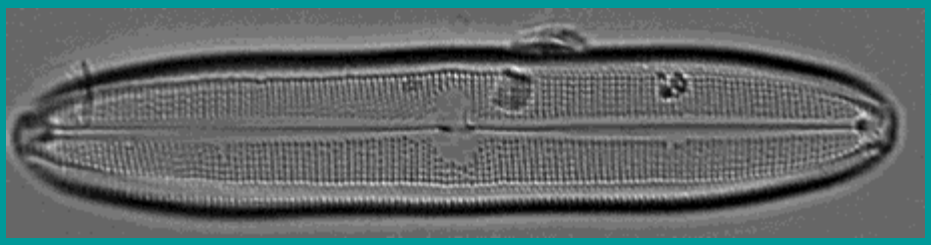
Authority information

Reichelt *ex* Hustedt 1930 (VanLandingham 1978).

Other images



This image was taken utilizing DIC for the specimen above.

More information

This taxon approximates the concept of (Hustedt (1930) in figure 380. There is some question as to the true identity of this taxon because it doesn't have parallel sides. It has slight, weakly developed undulations of the sides. We differ from Krammer and Lange-Bertalot (1985,1986) in that our specimen shows a scythe proximal raphe end instead of a crochet hook end in the marginal character, and the areolae are more finely structured (Hudstedt 1930).

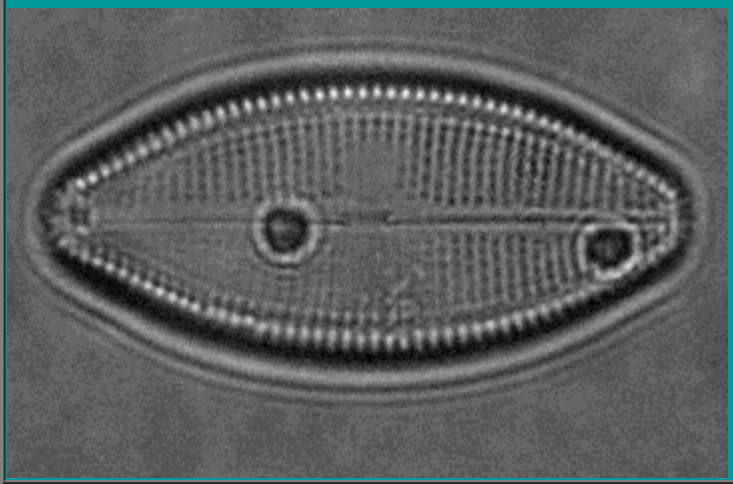
Size ranges and morphology

- Length is 68 to 80 micrometers (Hudstedt 1930).
- Width is 13.5 to 15 micrometers (Hudstedt 1930).
- Striae are 18 to 22 in 10 micrometers (Hudstedt 1930).
- Puncta are around 24 to 28 in 10 micrometers (Hudstedt 1930).

Neidium ladogense (Cleve) Foged

Length:29 Width:12 Striae:16-18 Puncta:

Collection 1388 Other images More information



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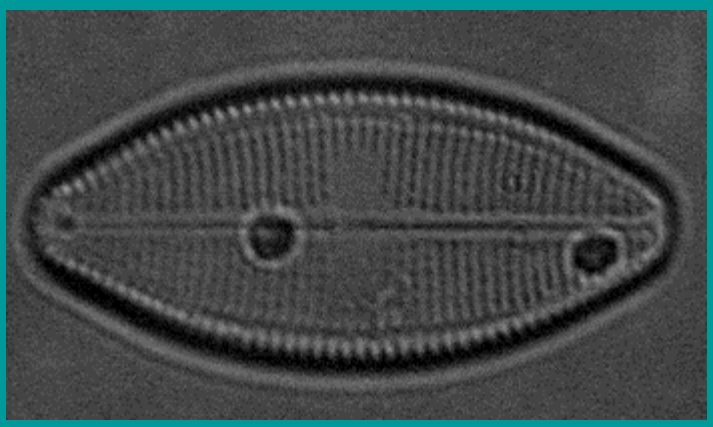
Authority information

(Cleve) Foged 1952 (Fig.100:1,2) (Patrick and Reimer 1966).

Other images



This image was taken utilizing DIC for the specimen above.

More information

The axial area of this taxon is thin and the central area is oval (Patrick and Reimer 1966).

- **Ecology**
  This taxon is considered to be alkaliphilous and acidophilous and is found in lakes, ponds, springs, streams, and pools (Beaver 1981).

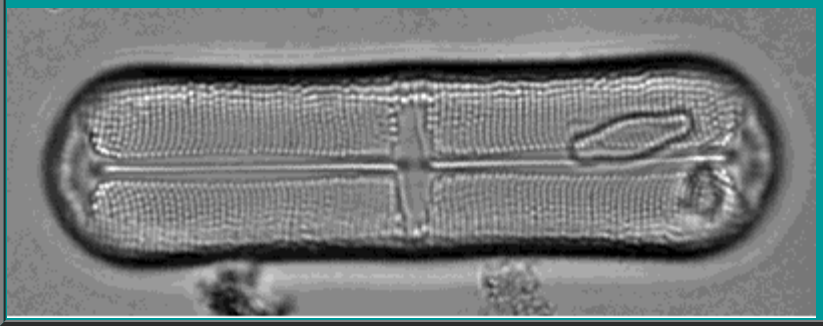
Size ranges and morphology

- Length is19 to 44 micrometers (Patrick and Reimer 1966).
- Width is10 to 17 micrometers (Patrick and Reimer 1966).
- Striae are 14 to 20 in 10 micrometers (Patrick and Reimer 1966).
- Puncta are around 18 to 20 in 20 micrometers (Patrick and Reimer 1966).

***Neidium mirum*Kraske**

Length:48 Width:12 Striae:25 Puncta:

Collection 1790 Other images More information



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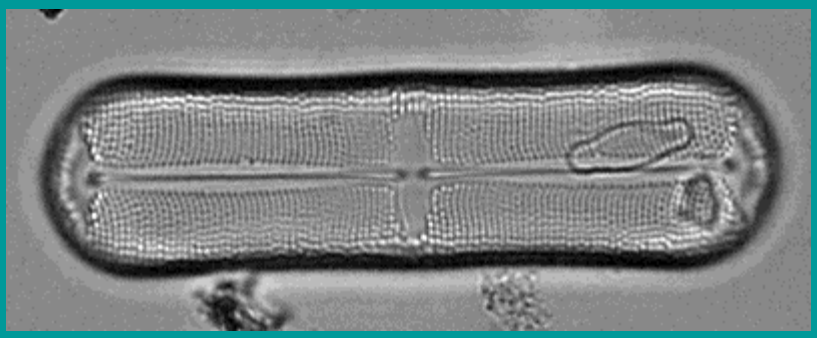
Authority information

Kraske, G.1943. Zur Diatomeenflora Lajplauds. Ber. Deutsch. Bot. Ges. 61(3):81-88

Other images



This image was taken utilizing DIC for the specimen above.

More information

This taxon's valve is linear with broadly rounded ends. The axial area is linear, widening to a rounded central area. It has a straight raphe and the distal ends lying in the axis of the raphe. The proximal ends with long fissures bent toward the opposite sides, almost to the valve margin. The striae of this taxon is coarsely punctate and the longitudinal canals are a short distance from the margin (Krasske 1943).

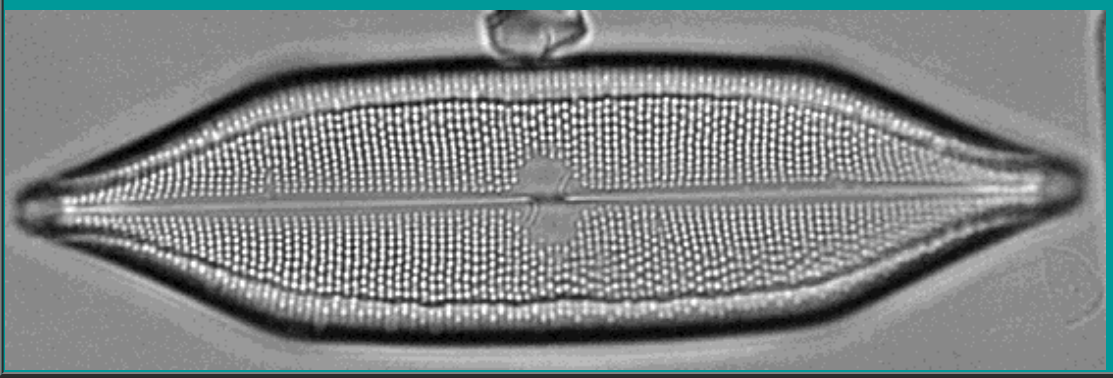
Size ranges and morphology

- Length is 31 micrometers (Patrick and Reimer 1966).
- Width is 8 micrometers (Patrick and Reimer 1966).
- Striae are 18 to 20 in 10 micrometers (Patrick and Reimer 1966).

***Neidium sacoense* Reimer**

Length:40.5 Width:16 Striae:17 Puncta:

Collection 1426 Other images More information



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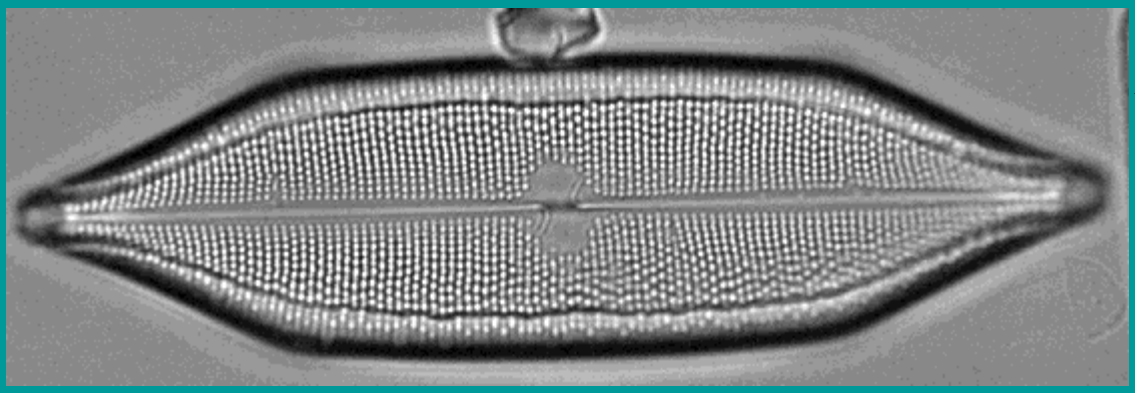
Authority information

Reimer *in* Patrick and Reimer 1966.

Other images



This image was taken utilizing DIC for the specimen above.

More information

The valve of this taxon is linear and narrows. It has rounded ends and a straight axial area that narrows at the ends and center. The raphe is straight and narrows and the ends. The proximal ends curve in oppposite directions and the distal ends are bifurcate. It has a small circular area anda marginal longitudinal band. The longitudinal band is wide and has coarse puncta. The striae are parallel and convergent at the ends (Patrick and Reimer 1966).

- **Type Locality**
  New England States and Middle Atlantic States (Patrick and Reimer 1966).

- **Ecology**
  This taxon is found in lakes and ponds (Patrick and Reimer 1966) .

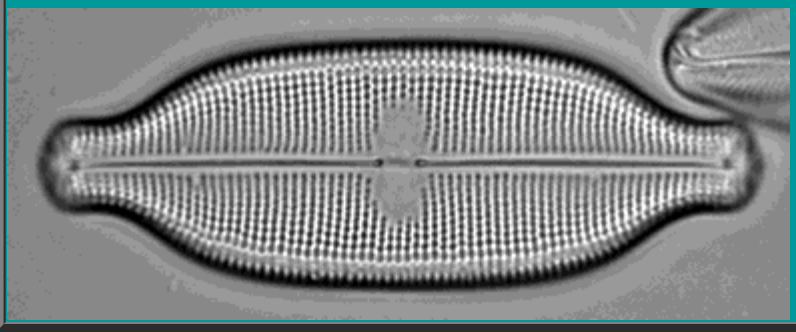
Size ranges and morphology

- Length is 60 to 80 micrometers (Patrick and Reimer 1966).
- Width is 19 to 25 micrometers (Patrick and Reimer 1966).
- Striae are 15 to 16 in 10 micrometers (Patrick and Reimer 1966).
- Puncta are around 18 in 10 micrometers (Patrick and Reimer 1966).

Neidium temperei Reim

Length:52 Width:18 Striae:16-17

Collection 1788 Other images More information



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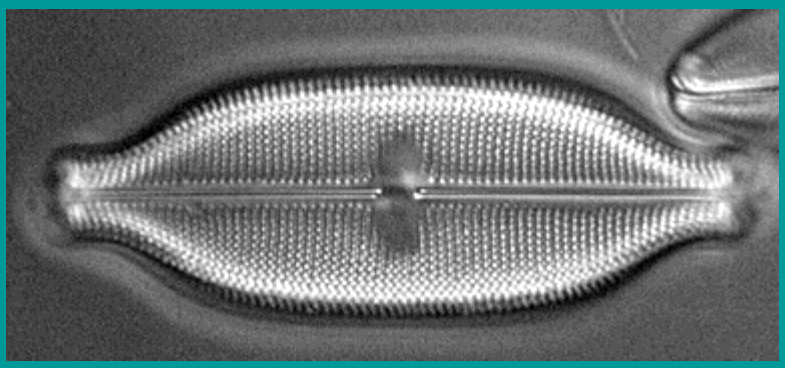
Authority information

Reim., Proc. Acad. Nat. Sci. Philadelphia, 111:33-34, pl. 4, fig. 2. 1959 (Patrick and Reimer 1966).

Other images



This image was taken utilizing DIC for the specimen above.

More information

This taxon has a long, elliptical valve and has flat, rounded, subcapitate ends. There is a straight axial area and a straight Raphe. The proximal ends of the Raphe valve are slightly enlarged and are rounded. The distal ends are bifurcate. This taxon has a dilated central area and there is a submarginal longitudinal band on both sides of the valve. The striae are radiate to convergent at the ends (Patrick and Reimer 1966). This species is found in Lake

Superior (E.F. Stoermer collection).

- **Type Locality**
  New England States (Patrick and Reimer 1966).

- **Ecology**
  This taxon prefers a pH of about 7.5 to 7.9 and also open water (Beaver 1981).

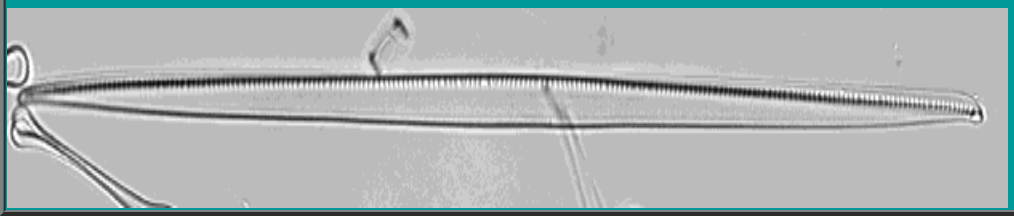
Size ranges and morphology

- Length is 60 to 75 micrometers (Patrick and Reimer 1966).
- Width is 18 to 20 micrometers (Patrick and Reimer 1966).
- Striae are 16 to 17 in 10 micrometers (Patrick and Reimer 1966).
- Puncta are 16 to 18 in 10 micrometers (Patrick and Reimer 1966).

Nitzschia lauenbergiana Hust. 1950

Length:161 Width:6 Keel punctae:12 Striae:22

Collection 1189 Other images More information



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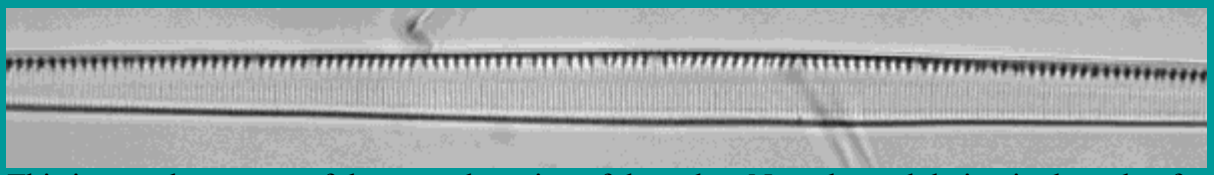
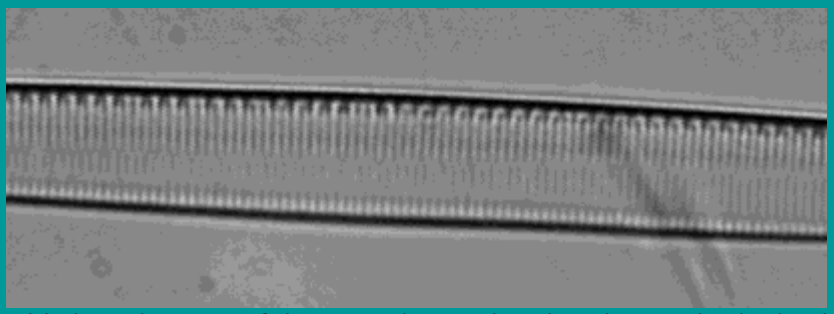
Authority information

Hust., 1950.

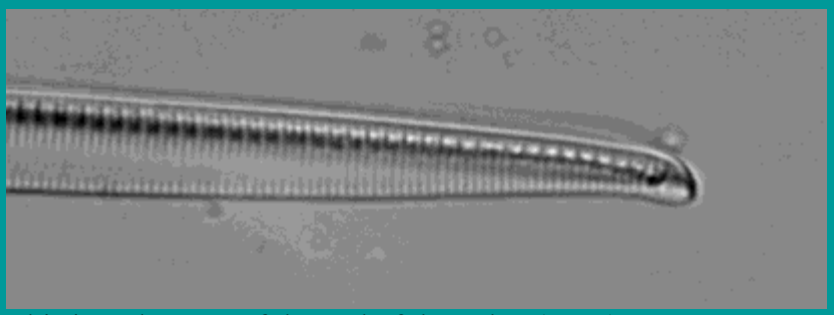
Other images



This is an enlargement of the central portion of the valve. Note the undulation in the valve face.



This is a close-up of the central area showing the gap in the keel punctae and the valve face undulation.



This is a close-up of the end of the valve (1189).

More information

- **Ecology**

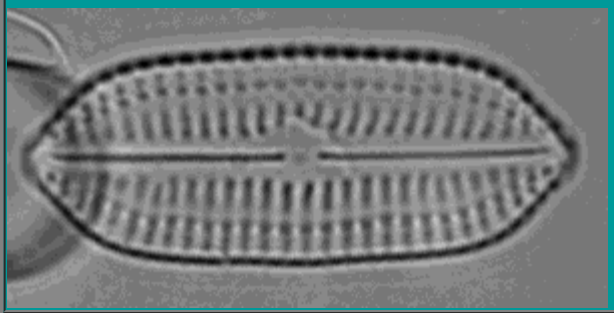
Size ranges and morphology

-
-
-
-

Oestrupia zachariasi (Reichelt) Hustedt 1950

Length: 25 Width: 9 Striae: 10-11

Collection 1354 Other images More information



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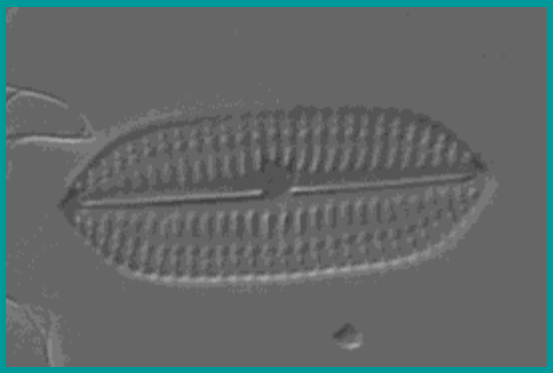
Authority information

fig. 202:6-8 (Krammer and Lange-Bertalot 1986).

Other images

DIC image



More information

Although the genus *Oestrupia* consists of primarily marine forms, this taxon is considered to be strictly a freshwater form (Stoermer 1978).

- **Synonyms** (Krammer and Lange-Bertalot 1986)
  Navicula zachariasi Reichelt 1903.
  Caloneis zachariasi (Reichelt) Hustedt 1930.

- **Ecology**
  This taxon is a littoral form and may be found on bottom sediments (Hustedt 1950).

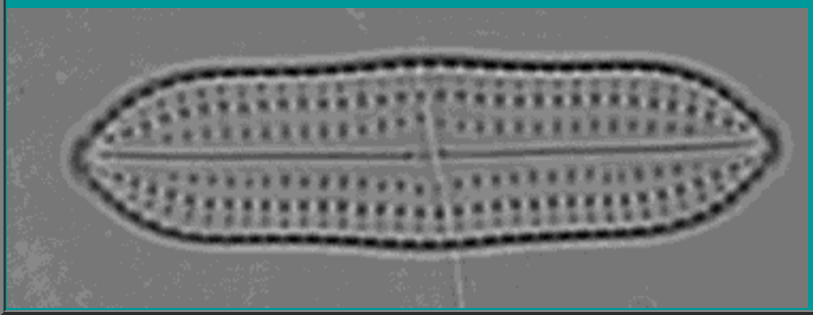
Size ranges and morphology

- Length is 25 to 60 micrometers (Krammer and Lange-Bertalot 1986).
- Width is 7 to 13 micrometers (Krammer and Lange-Bertalot 1986).
- Striae are 9 to 13 per 10 micrometers (Krammer and Lange-Bertalot 1986).

Oestrupia zachariasi var. *undulata* (Schulz) comb. nov. 1969

Length: 30 Width: 9 Striae: 12

Collection 1565a Other images More information



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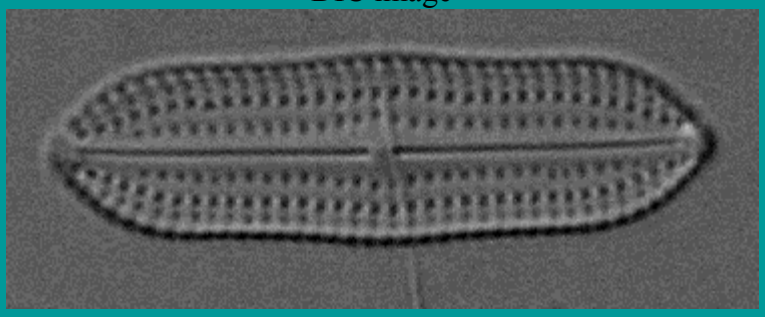
Authority information

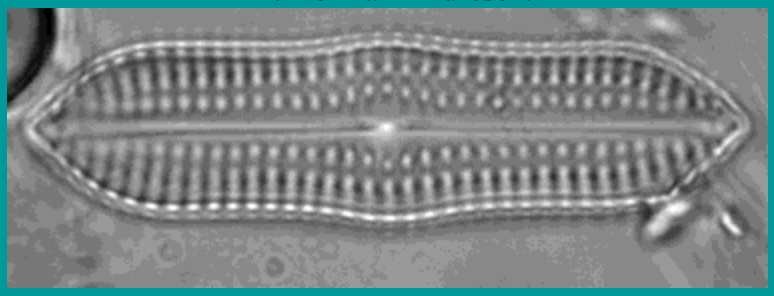
Stoerm. and Yang 1969 (Stoermer and Yang 1969).

Other images

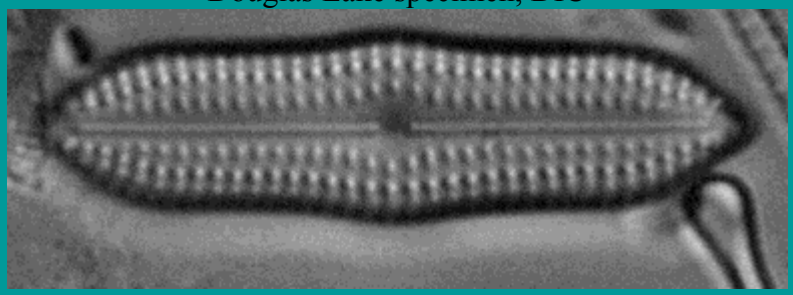
DIC image



This specimen of *Oestrupia zachariasi* var. *undulata* was found in South Fishtail Bay, Douglas Lake, February, 1973 by Dr. Norman Andresen.



Douglas Lake specimen, DIC



More information

Rarely found but more common than the nominate variety, this taxon has a similar distribution in the Great Lakes (Stoermer 1978).

- **Synonyms** (Stoermer and Yang 1969)
  Caloneis baltica var. *undulata* Schulz, Bot. Arch., 13:203, fig. 76. 1926.

- **Ecology**

Size ranges and morphology

Opephora sp 1

Length:10 Width:2 Striae:11

Collection 1285a Other images More information

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Authority information

Other images

 This image was taken utilizing DIC for the specimen above.

More information

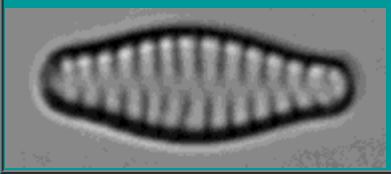
- **Type Locality**
    - **Ecology**

Size ranges and morphology

Opephora sp 2

Length:13.5 Width:5 Striae:11-12

Collection 1264 Other images More information



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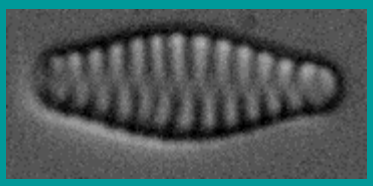
Authority information

Other images



This image was taken utilizing DIC for the specimen above.

More information

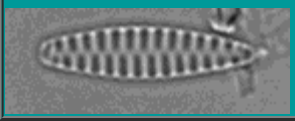
- **Type Locality**
    - **Ecology**

      Size ranges and morphology

Opephora sp 3

Length:15 Width:3 Striae:10

Collection 1565 Other images More information



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Authority information

Other images

 This image was taken utilizing DIC for the specimen above.

More information

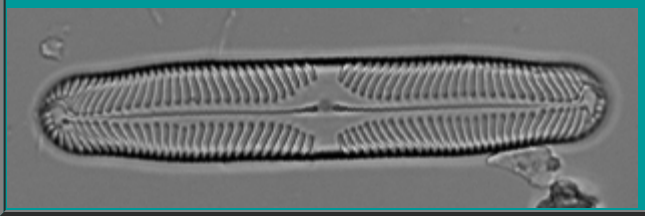
- **Type Locality**
    - **Ecology**

Size ranges and morphology

Pinnularia sp. 1

Length:64 Width:11 Striae:10

Collection 1169 Other images More information



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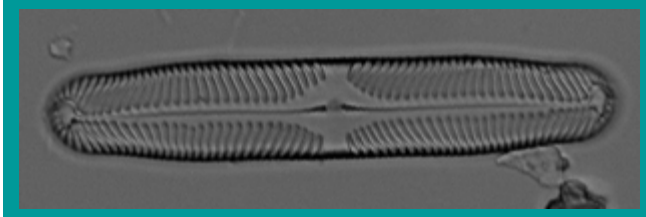
Authority information

Other images



This image was taken utilizing DIC for the specimen above.

More information

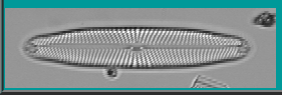
- **Type Locality**
- **Synonyms**
- **Ecology**

Size ranges and morphology

Pinnularia sp. 2

Length:49 Width:8 Striae:13

Collection 1169 More information



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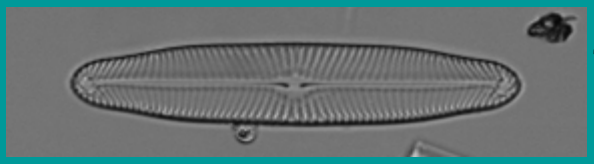
Authority information

Other images



This image was taken utilizing DIC for the specimen above.

More information

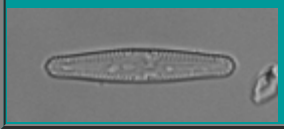
- **Type Locality**
- **Ecology**

Size ranges and morphology

Pinnularia sp. 5

Length:16 Width:3 Striae:24

Collection 1788 Other images More information



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Authority information

Other images

More information

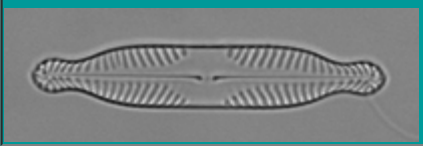
- **Type Locality**
- **Synonyms**
- **Ecology**

Size ranges and morphology

Pinnularia sp. 6

Length:38 Width:7 Striae:12

Collection 1788 Other images More information



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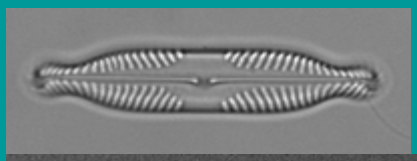
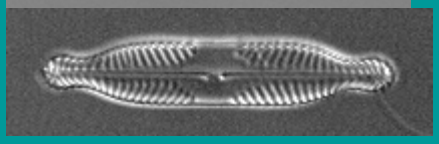
Authority information

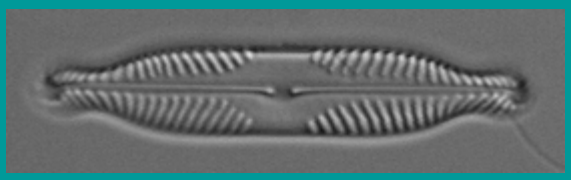
Other images



This image was taken of the specimen above at a different focus depth.



This image was taken utilizing DIC for the specimen above.



This image was taken utilizing DIC at 40% magnification for the specimen above.

More information

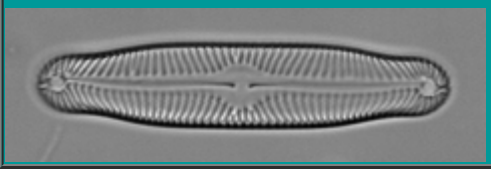
- **Type Locality**
- **Synonyms**
- **Ecology**

Size ranges and morphology

Pinnularia sp. 7

Length:44 Width:9 Striae:12

Collection 1788 Other images More information



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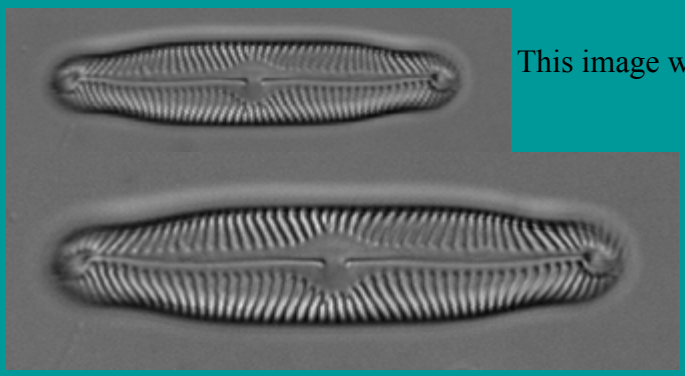
Authority information

Other images



This image was taken utilizing DIC for the specimen above.

This image was taken utilizing DIC at 40% magnification for the specimen above.

More information

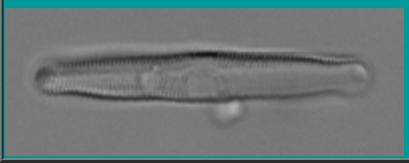
- **Type Locality**
- **Synonyms**
- **Ecology**

Size ranges and morphology

Pinnularia sp. 8

Length:37 Width:6 Striae:24

Collection 1788 Other images More information



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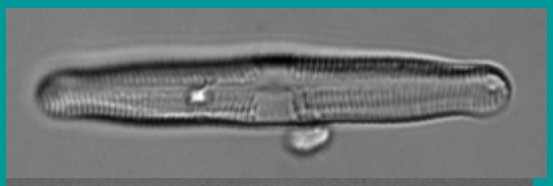
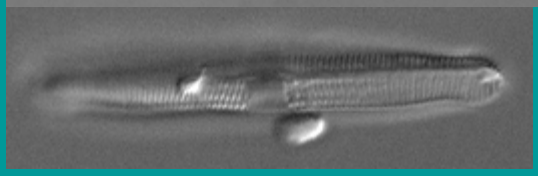
Authority information

Other images



This image is the specimen above at a 40% greater magnification.



This image was taken utilizing DIC at a 40% magnification for the specimen above.

More information

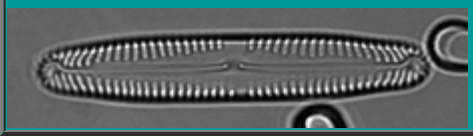
- **Type Locality**
- **Synonyms**
- **Ecology**

Size ranges and morphology

Pinnularia sp. 9

Length:42 Width:7 Striae:12

Collection 1789 More information



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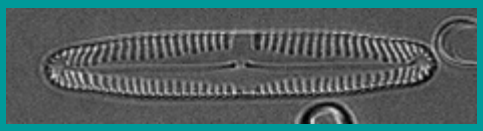
Authority information

Other images


This image was taken utilizing DIC for the specimen above.

More information

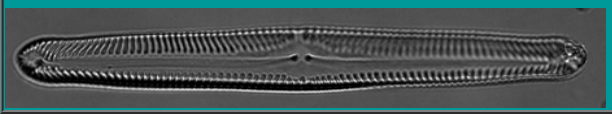
- **Type Locality**
- **Ecology**

Size ranges and morphology

***Pinnularia abaujensis* Ross**

Length:98 Width:12 Striae:9

Collection 1168 Other images More information



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Authority information

Pinnularia abaujensis (Pant.) Ross, Natl. Mus. Canada Bull., No. 97, pt. 2, p. 199, pl. 10, fig. 1. 1947(Patrick and Reimer 1966).

Other images

More information

This taxon has linear-lanceolate valve with swollen, rounded or subcapitate ends(Patrick and Reimer 1966).

- **Type Locality**
  Falaise (Patrick and Reimer 1966)

  - **Ecology**
    Widely distributed in water of low mineral content(Patrick and Reimer 1966). This species in pH indifferent and is found in a wide range of habitats(Beaver 1981).

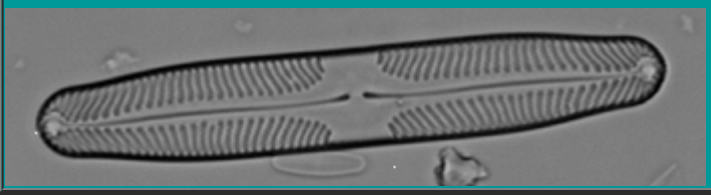
    Size ranges and morphology

    - Length is 50 to 140 micrometers (Patrick and Reimer 1966).
    - Width is 7 to13 micrometers (Patrick and Reimer 1966).
    - Striae are 9 to 13 in 10 micrometers (Patrick and Reimer 1966).

Pinnularia abaujensis v. *rostrata* Patrick

Length:69 Width:12 Striae:10

Collection 1177a Other images More information



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Authority information

Pinnularia abaujensis var. *rostrata* Patrick in: Patrick and Reimer 1966, p. 614. 1966(Patrick and Reimer 1966).

Other images

More information

This taxon has linear valve with rostrate, rounded apices. It differs from *P. abaujensis* by it's rostrate apices that are narrower that the main body of the valve and by the shape of the central area which does not form a transverse fascia (Patrick and Reimer 1966).

- **Type Locality**
  U.S.A., Monroe County, Pocono Lake Preserve, Pocono Lake, Pennsylvania (Patrick and Reimer 1966).

- **Synonyms**
  Pinnularia gibba var. *linearis* Hustedt in: Pascher, Sussw.-F1. Mitteleuropas, Heft 10, Aufl. 2, p. 327, fig. 604. 1930(Patrick and Reimer 1966).

- **Ecology**
  This taxon is found in water of low mineral content which is slightly acidic(Patrick and Reimer 1966; Beaver 1981).

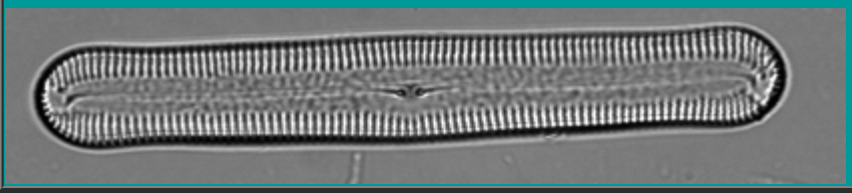
Size ranges and morphology

- Length is 60 to 79 micrometers (Patrick and Reimer 1966).
- Width is 8 to 11 micrometers (Patrick and Reimer 1966).
- Striae are 8 to 11 in 10 micrometers (Patrick and Reimer 1966).

***Pinnularia acrosphaeria*W. Sm.**

Length:82 Width:12 Striae:11

Collection 1168 Other images More information



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Authority information

Pinnularia acrosphaeria W.Sm., Syn. British Diat., vol. 1, p. 58, pl. 19, fig. 183. 1853 (Patrick and Reimer 1966).

Other images

More information

This species has linear valve, swollen in the middle portion; ends rounded, usually somewhat swollen, often almost as wide as the median portion of the valve. . Willam Smith gave the name *Pinnularia acrosphaeria* to this taxon. Rabenhorst, a few months later in 1853, made the combonation *Pinnularia acrosphaeria* for Brebisson's *Frustulia acrosphaeria* which is not this taxon. Dr. Willam Stearns of the British Museum has ascertained that volume one of William Smith's *A Synopsis of the British Diatomaceae* was published in 1853 before Rabenhorst's *Die Susswasser-Diatomaceen* (*Bacillarien*) (Patrick and Reimer 1966).

- **Type Locality**
  Fresh water near Lewes, September 1850, W. Sm(Patrick and Reimer 1966).

- **Synonyms**
  Pinnularia acrosphaeria var. *sandvicensis* A. S., Atlas Diat., pl. 43, figs. 14-15. 1876(Patrick and Reimer 1966).
  Pinnularia acrosphaeria var. *minor* M. Perag. & Herib. *in* Herib., Diat. Auvergne, p. 93. 1893 (Patrick and Reimer 1966).
  Pinnularia acrosphaeria f. *minor* Cl., K. Svenska Vet.-Akad. Handl., Ny Foljd, 27(3):86. 1895(Patrick and Reimer 1966).

- **Ecology**
  This species prefers circumneutral water of low mineral content(Patrick and Reimer 1966).

Size ranges and morphology

- Length is 30 to 180 micrometers (Patrick and Reimer 1966).
- Width is 8 to 20 micrometers (Patrick and Reimer 1966).
- Striae are 6 to 14 in 10 micrometers (Patrick and Reimer 1966).

Pinnularia aff. molaris ***see note***

Length:31.5 Width:6 Striae:16

Collection 1781 Other images More information

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Authority information

Caloneis molaris (Grunow) Krammer 1985 (Fig. 174:16-21)(Krammer and Lange-Bertalot (2/1) 1986).

Other Images

This image was taken utilizing DIC for the specimen above.

More information

This identification is not definite. The description is taken from Krammer for *Caloneis molaris*. Valve linear-lanceolate, sides convex. Ends slightly set off, blunt and flatly rounded. Raphe is somewhat bent, middle lateral. Proximal ends with large, distinct, bent poles. Central facia varying. Striae parallel to varying (Krammer and Lange-Bertalot (2/1) 1986).

- **Ecology**
  Cosmopolitan. Found in plains to moutain. Never abundant(Krammer and Lange-Bertalot (2/1) 1986).

Size ranges and morphology

- Length is 26 to 65 micrometers (Krammer and Lange-Bertalot (2/1) 1986).
- Width is 5 to 10 micrometers (Krammer and Lange-Bertalot (2/1) 1986).
- Striae are 17 to 22 in 10 micrometers (Krammer and Lange-Bertalot (2/1) 1986).

Pinnularia biceps f. *petersenii* Ross

Length:29 Width:6.5 Striae:14

Collection 1404 Other images More information

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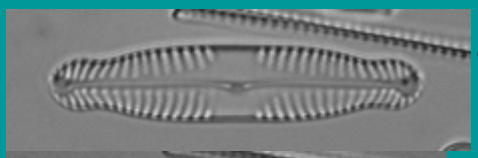
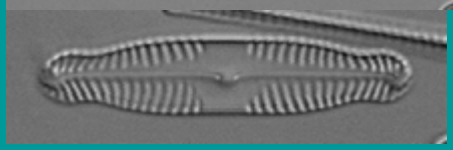
Authority information

Pinnularia biceps f. *petersenii* Ross, Natl. Mus. Canada Bull., No. 97, pt. 2, p. 201; pl. 9, fig. 11? 1947(Patrick and Reimer 1966).

Other images



This image was taken with an additional 40% magnification.



This image was taken with the additional magnification and utilizing DIC.

More information

Valve linear with rostrate to subcapitate apices. Axial area distinct, widening toward teh central area which is a transverse fascia. Striae radiate a the center of the valve, convergent toward the apices. This form is distinguished from the nominate variety by its smaller size and its larger central area in proportion to the length of the valve (Patrick and Reimer 1966).

- **Type Locality**
  Near hot spring, Iceland on ground in front of house (Hlad) Modrn vellir (Kjos) 6/8(Patrick and Reimer 1966).

- **Synonyms**
  Pinnularia interrupta f. *minor* Peters. *in* Bot. Iceland, vol. 2, pt. 2, p. 405, fig. 25. 1928(Patrick and Reimer 1966).

- **Ecology**
  Widely distributed in circumneutral water(Patrick and Reimer 1966).

Size ranges and morphology

- Length is 22 to 30 micrometers (Patrick and Reimer 1966).
- Width is 4.5 to 6 micrometers (Patrick and Reimer 1966).
- Striae are 12 to 14 in 10 micrometers (Patrick and Reimer 1966).

***Pinnularia borealis* Ehr.**

Length:27 Width:7 Striae:5

Collection 1395 More information

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Authority information

Pinnularia borealis Ehr., Phys. Abh. Akad. Wiss. Berlin, for 1841:420, pl. 1(2), fig. 6; pl. 4 (1), fig. 5; pl. 4(5), fig. 4. 1843 (Patrick and Reimer 1966).

More information

Valve broadly linear with rounded ends. Axial area narrow. Median ends of the raphe turned slightly to one side; terminal fissures distinct. Central area rounded, transverse. Striae usually parallel; sometimes slightly radiate toward the center of the valve and slightly convergent near the ends. This species is distinguished by its slightly curved raphe and the shape of the axial and central areas. (Patrick and Reimer 1966).

- **Type Locality**
  Uncertain, Chile(Patrick and Reimer 1966).

- **Synonyms**
  Navicula borealis (Ehr.) Kutz., Bacill., p. 96, pl. 28, figs. 68, 72. 1844(Patrick and Reimer 1966).

- **Ecology**
  Prefers cool water of low mineral content. Often found in river, but also in ponds. Has been found to be largely pH and Halobion indifferent(Patrick and Reimer 1966; Beaver 1981).

Size ranges and morphology

- Length is 28 to 110 micrometers (Patrick and Reimer 1966).
- Width is 7 to 18 micrometers (Patrick and Reimer 1966).
- Striae are 4 to 6 in 10 micrometers (Patrick and Reimer 1966).

***Pinnularia brandelii*Cleve**

Length:57 Width:8 Striae:13

Collection 1783a Other images More information

Return to Top Page | Return to Genera List | Return to Species List

Authority information

Pinnularia brandelii Cleve 1891, p. 26, 1: (8), 9(Krammer 1992a).

More information

Valve linear with straight to weakly concave sides or sometimes the middle is somewhat widened or with wavy wavy sides. Ends without shoulders, broadly rounded, distinctly capitate. Axial area is thin; central is rhomboid. Straie in middle is radial to strongly radial, with ends strongly convergent(Krammer 1992a).

- **Synonyms**
- **Ecology**
  This taxon is widely distributed in water of fairly low mineral content and is considered pH indifferent. It can be found in a wide range of habitats(Krammer 1992a).

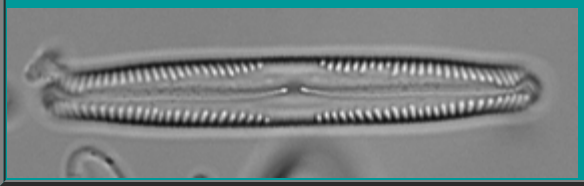
Size ranges and morphology

- Length is 45 to 92 micrometers (Krammer 1992a).
- Width is 7 to 10 micrometers (Krammer 1992a).
- Striae are 12 to 14 in 10 micrometers (Krammer 1992).

Pinnularia braunii v. *amphicephala* (A. Mayer) Hust.

Length:56 Width:7 Striae:11

Collection 1788 Other images More information



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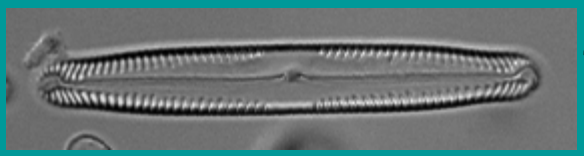
Authority information

Pinnularia braunii v. *amphicephala* (A. Mayer) Hust. *in* Pasch., Sussw.-Fl. Mitteleuropas, Heft 10, Aufl. 2, p. 319, fig. 587. 1930(Patrick and Reimer 1966).

Other images


This image was taken utilizing DIC.

More information

Valve linear or with slightly convex margins; apices rostrate-capitate. Axial area about one-fourth the breadth of the valve; widening toward the central area which is a broad, transverse fascia. Raphe filamentous; terminal fissures and terminal nodules distinct. Striae raditate at the center of the valve, convergent toward the ends(Patrick and Reimer 1966).

- **Type Locality**
  ...aus einem Weiherabfluss bei Holzheim (Oberpfalz bei Klardorf) [Regensburg, Germany](Patrick and Reimer 1966).
  - **Synonyms**
    Pinnularа amphicephala A. Mayer, Dekschr. Bayer. Bot. Ges. Regensburg, 13(N.F. 7):136, pl. 2, figs. 15-16. 1917(Patrick and Reimer 1966).
    - **Ecology**
      Seems to prefer cool water of low mineral content. Found in a wide range of pH enviroments, in various habitats(Patrick and Reimer 1966; Beaver 1981) .

      Size ranges and morphology

      - Length is 48 to 55 micrometers (Patrick and Reimer 1966).
      - Width is 7 to 8 micrometers (Patrick and Reimer 1966).
      - Striae are 11 to 14 in 10 micrometers (Patrick and Reimer 1966).

***Pinnularia brebissonii* (Kutz.) Rabh.**

Length:38 Width:9 Striae:13.5

Collection 811 Other images More information

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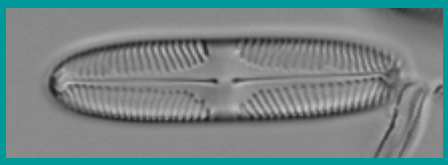
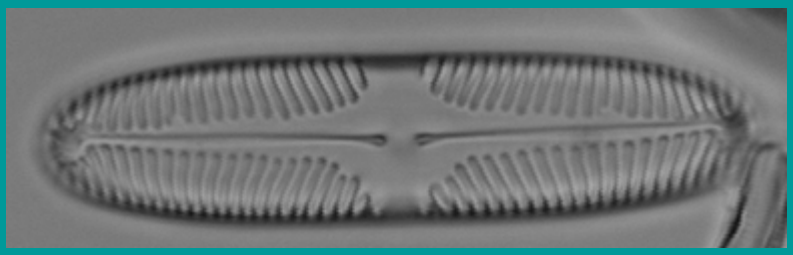
Authority information

Pinnularia brebissonii (Kutz.) Rabh., Fl. Europaea Alg., sect. 1, p. 222. 1864(Patrick and Reimer 1966).

Other images



This image was taken utilizing DIC for the specimen above.



This image is the specimen above at an additional 200% zoom.

More information

Valve linear-elliptical, gradually narrowing to round ends. Axial area narrow, distinct; gradually widening toward the central area which is a transverse fascia. Terminal fissures of the raphe intermediate between "bayonet" and "comma" shapes(Patrick and Reimer 1966).

- **Type Locality**
  In sussem Wasser Falaise: De Brebisson(Patrick and Reimer 1966).

  - **Synonyms**
    Navicula brebissonii Kutz., Bacill., p. 93, pl.3, fig. 49; pl. 30, fig. 39. 1844(Patrick and Reimer 1966).
    Pinnularia stauroneiformis W. Sm., Syn. British Diat., vol. 1, p. 57, pl. 19, fig. 178. 1853(Patrick and Reimer 1966).
    Pinnularia microstauron var. *brebissonii* (Kutz.) Hust. *in* Pasch., Sussw.-Fl. Mittel-europas, Heft 10, Aufl. 2, p. 321, fig. 584. 1930(Patrick and Reimer 1966).
    - **Ecology**
      This taxon seems to prefer cool waters of low mineral content. It is found in a wide range of pH levels, in numerous habitats(Patrick and Reimer 1966; Beaver 1981).

      Size ranges and morphology

      - Length is 40 to 60 micrometers (Patrick and Reimer 1966).
      - Width is 9 to 11 micrometers (Patrick and Reimer 1966).
      - Striae are 10 to 14 in 10 micrometers (Patrick and Reimer 1966).

Pinnularia brebissonii var. *diminuta*(Grun.)Cl.

Length:34 Width:6 Striae:11

Collection 1788 Other images More information

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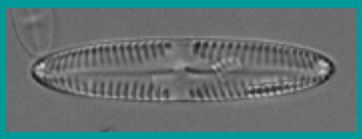
Authority information

Pinnularia brebissonii var. *diminuta* (Grun. *in* V. H.) Cl., K. Svenska Vet.-Akad. Handl., Ny Foljd, 27(3):78. 1895(Patrick and Reimer 1966).

Other images


This image was taken utilizing DIC for the specimen above.

More information

Valve linear-lanceolate, gradually narrowing to rounded ends. This variety differs from the nominate variety in that it is smaller and the striae are not quite as strongly angled (Patrick and Reimer 1966).

- **Type Locality**
  Frahan (Delogne) [Belgium] (Patrick and Reimer 1966)

  - **Synonyms**
    Navicula brebissonii var. *diminuta* Grun. *in* V. H., Syn. Diat. Belgique, pl. 5, fig. 8. 1880(Patrick and Reimer 1966).
    Pinnularia microstauron var. *brebissonii* f. *diminuta* (Grun. *in* V. H.) Hust. *in* Pasch., Sussw.-Fl. Mitteleuropas, Heft 10, Aufl. 2, p. 322, fig. 585. 1930(Patrick and Reimer 1966).

    - **Ecology**

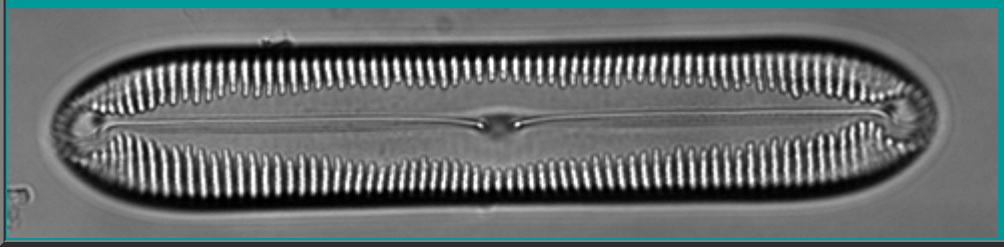
    Size ranges and morphology

    - Length is 20 to 33 micrometers (Patrick and Reimer 1966).
    - Width is 7 to 8 micrometers (Patrick and Reimer 1966).
    - Striae are 10 to 12 in 10 micrometers (Patrick and Reimer 1966).

***Pinnularia brevicostata* Cl.**

Length:84 Width:17 Striae:9

Collection 1790a More information



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Authority information

Pinnularia brevicosata Cl., Acta Soc. Fauna Fl. Fennica, 8(2):25, pl. 1, fig. 5. 1891(Patrick and Reimer 1966).

More information

Valve linear with parallel margins, sometimes slightly swollen at the central nodule; ends broadly rounded. (Patrick and Reimer 1966).

- **Type Locality**
  Uncertian, Finland (Patrick and Reimer 1966).

  - **Synonyms**
    Pinnularia brevicosata var. *leptostauron* Cl., Acta Soc. Fauna Fl. Fennica, 8(2):25. 1891(Patrick and Reimer 1966).

    - **Ecology**
      Prefers cool water of low mineral content. Found in wide pH range(Patrick and Reimer 1966; Beaver 1981).

      Size ranges and morphology

      - Length is 70 to 135 micrometers (Patrick and Reimer 1966).
      - Width is 12 to 20 micrometers (Patrick and Reimer 1966).
      - Striae are 7 to 10 in 10 micrometers (Patrick and Reimer 1966).

***Pinnularia burkii* Patr.**

Length:20 Width:6 Striae:21

Collection 1401a Other images More information

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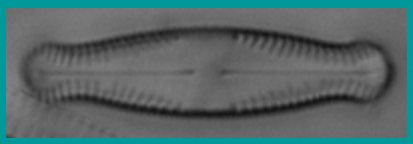
Authority information

Pinnularia burkei Patr., Farlowia, 2(2) :189, pl. 3, fig. 1. 1945(Patrick and Reimer 1966).

Other images



Both images were taken utilizing DIC. The top image was at the standard 1000x magnification, the lower was taken at 1000x plus a 200% zoom.

More information

This species has linear valve with capitate to subcapitate ends. It's axial area is narrow(Patrick and Reimer 1966).

- **Type Locality**
  [U.S.A., Pennsylvania], Pike County, Greeley; (squeezings from *Sphagnum* in swamp) (Patrick and Reimer 1966).

  - **Ecology**
    This taxon is found in acidic water of low mineral content(Patrick and Reimer 1966).

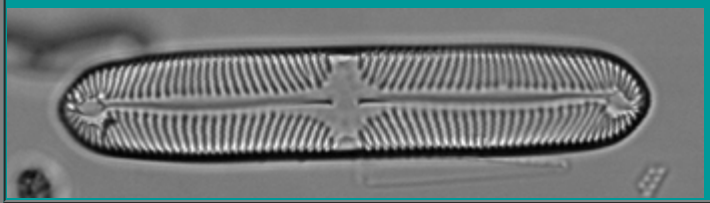
    ### Size ranges and morphology

    - Length is 18 to 22 micrometers (Patrick and Reimer 1966).
    - Width is 3 to 4 micrometers (Patrick and Reimer 1966).
    - Striae are 16 to 18 in 10 micrometers (Patrick and Reimer 1966).

Pinnularia divergens var. *bacillaris* (M. Perag.) Mills

Length:64 Width:11 Striae:10

Collection 1788 Other images More information



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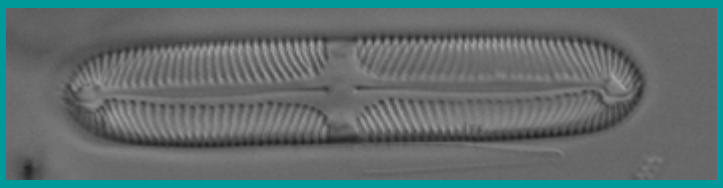
Authority information

Pinnularia divergens var. *bacillaris* (M. Perag. *in* Temp. & Perag.) Mills, Index Diat., pt. 17, p. 1280.

1934(Patrick and Reimer 1966).

Other images



This image was taken utilizing DIC for the specimen above.

More information

Valve linear with slightly convex margins and rounded or slightly swollen ends(Patrick and Reimer 1966).

- **Type Locality**
  Bunnel's Pond, Bristol, Connecticut, [USA] (Patrick and Reimer 1966).

  - **Synonyms**
    Navicula divergens var. *bacillaris* M. Perag. *in* Temp. & Perag., Diat Monde Entier, 2nd ed., p. 58. 1908(Patrick and Reimer 1966).

    - **Ecology**
      This taxon may be found in cool water, mountainous regions(Patrick and Reimer 1966).

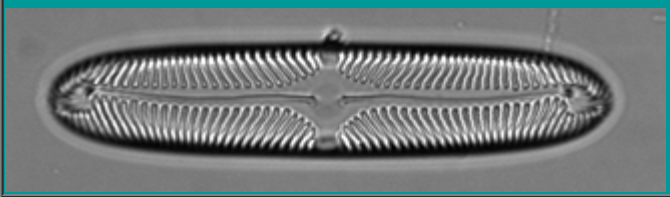
      Size ranges and morphology

      - Length is 67 to 67 micrometers (Patrick and Reimer 1966).
      - Width is 13 to 13 micrometers (Patrick and Reimer 1966).
      - Striae are 10 to 11 in 10 micrometers (Patrick and Reimer 1966).

Pinnularia divergens var. *elliptica* (Grun.) Cl.

Length:60 Width:12 Striae:16

Collection 1788 Other images More information



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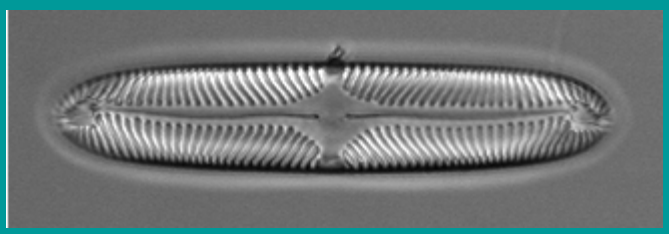
Authority information

Pinnularia divergens var. *elliptica* (Grun.) Cl., K. Svenska Vet.-Akad. Handl., Ny Foljd, 27(3):79. 1895(Patrick

and Reimer 1966).

Other images



This image was taken utilizing DIC for the specimen above.

More information

Valve linear-elliptical, narrowing toward rounded ends. Axial area one-fifth the breadth of the valve, widening into the rhomboid central area on each side of which is the thickening characteristic of *Pinnularia divergens*. Raphe filamentous; terminal fissures "bayonet" shaped. Striae radiate at the center of the valve, convergent troward the ends (Patrick and Reimer 1966).

- **Type Locality**
  Franz Josefs-Land (Patrick and Reimer 1966)
  - **Synonyms**
    Navicula divergens var. *elliptica* Grun., Denkschr. Akad. Wiss. Wien, Math.-Naturw. Cl., 48:98, pl. 1, fig. 19. 1884 (Patrick and Reimer 1966).

    - **Ecology**
      This taxon seems to prefer cool water. It has been found in a wide range of pH enviroments and habitats(Patrick and Reimer 1966; Beaver 1981).

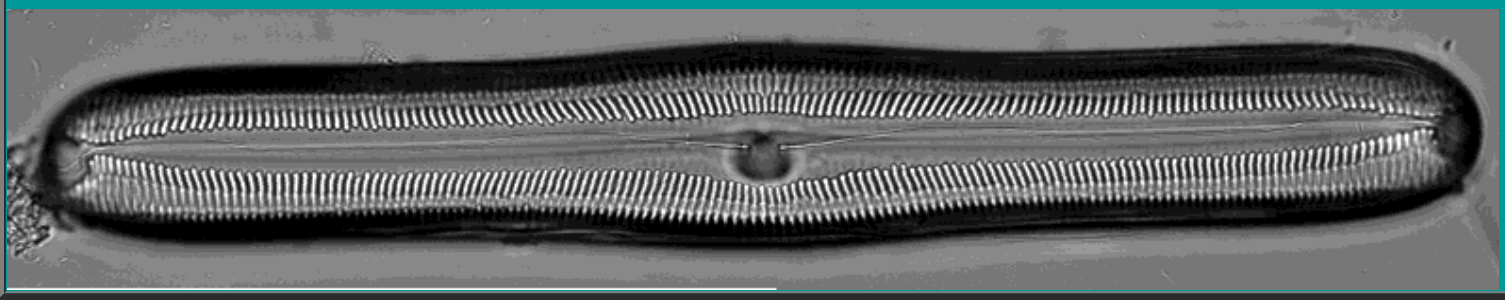
      Size ranges and morphology

      - Length is 50 to 100 micrometers (Patrick and Reimer 1966).
      - Width is 15 to 26 micrometers (Patrick and Reimer 1966).
      - Striae are 7 to 11 in 10 micrometers (Patrick and Reimer 1966).

***Pinnularia gentilis* (Donk.) Cl.**

Length:274 Width :38 Striae:6-7

Collection 1585a Other images More information



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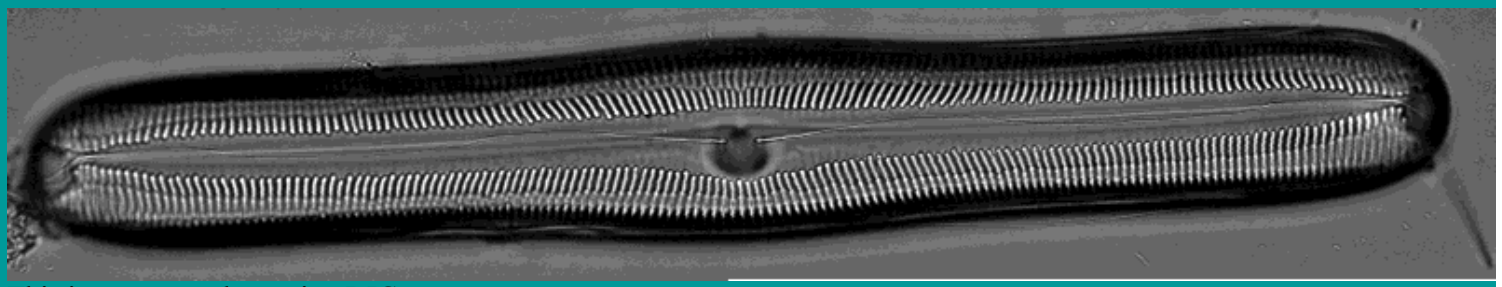
Authority information

Pinnularia gentilis (Donk.) Cl., K. Svenska Vet.-Akad. Handl., Ny Foljd, 27(3):92. 1895 (Patrick and Reimer 1966).

Other images



This image was taken using DIC.

More information

The valve of this taxon is linear and slightly swollen in the middle and at the ends which are rounded. The axial ends are one third of the width of the valve and the central area is large and elliptical. The raphe is complex, there are terminal fissures which are distinct and shaped like a question mark. Ther terminal nodules are large. The striae are radiate in the center and convergent at the ends and crossed by a broad band. (Patrick and Reimer 1966).

- **Synonyms**
  Navicula gentilis Donk., Nat. Hist. British Diat., p. 69, pl. 12, fig. 1. 1870-1873 (Patrick and Reimer 1966).

- **Ecology**
  This taxon prefers lakes, ponds, bogs and water of low mineral content(Patrick and Reimer 1966).

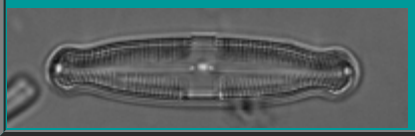
Size ranges and morphology

- Length is 140 to 260 micrometers (Patrick and Reimer 1966).
- Width is 22 to 36 micrometers (Patrick and Reimer 1966).
- Striae are 6 to 7 in 10 micrometers (Patrick and Reimer 1966).

***Pinnularia globiceps* Greg.**

Length:33.5 Width:7 Striae:20

Collection 888 Other images More information



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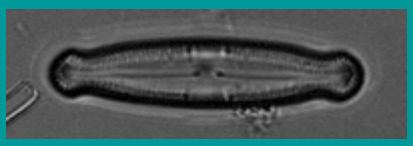
Authority information

Pinnularia globiceps Gregory 1856(Krammer 1992a).

Other images


This image was taken utilizing DIC for the specimen above.

More information

Linear with almost circular ends. Triundulate, ends without shoulders, capitate. Pole broad or slightly smaller then valve middle. Raphe is weakly lateral, not bent in middle. Centeral nodule round and relatively large. Central area rhomboid, widening to broad frascia. (Krammer 1992a).

- **Ecology**

  This taxon is found in oligotrophic waters. Found in the sediment level of water bodies, rarely in water with higher electrolyte content(Krammer 1992a; Beaver 1981).

  Size ranges and morphology

  - Length is 26 to 52 micrometers (Krammer 1992a).
  - Width is 5 to 7.5 micrometers (Krammer 1992a).
  - Striae are 12 to 15 in 10 micrometers (Krammer 1992a).

Pinnularia globiceps v. *krockii* (Grunow)

Length:26 Width:6 Striae:16

Collection 1389 Other images More information

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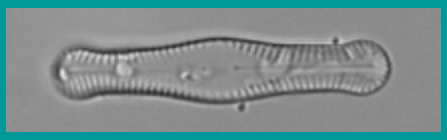
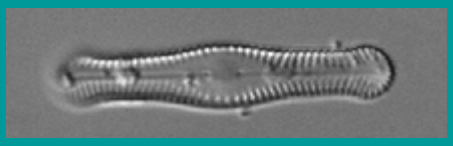
Authority information

Pinnularia globiceps v. *krockii* (Grunow) 1891, p. 30(Krammer 1992b).

Other images



This image was taken with an additional 40% magnification.



This image was taken with the additional magnification and utilizing DIC.

More information

This description is taken from what Krammer calls *Pinnularia krookii*. Outline linear with distinctly triundulate sides. Middle swelling is slightly broader than the swelling at the poles. Ends are capitate, bluntly rounded. Strongly variable, thin to broad, widened at axial area. Area often asymmetrical, almost to the margin of the valve. Raphe philiform and straight, not bent in middle. Central nodule distinct. Shape of ends of raphe hardly visible under a light microscope(Krammer 1992b).

- **Synonym**

  Navicula krockii Grunow 1882, p 155, fig. 30:40 (zur Schreibung des Namens siehe unten)(Krammer 1992b).
  Navicula ignobilis Krasske 1938(Krammer 1992b).
  Pinnularia ignobilis (Krasske) Cleve-Euler 1955(Krammer 1992b).

  - **Ecology**

    Northern alpine regions, in fossil deposits, usually rare in their environment. Found in electolyte poor and oxygen rich waters(Krammer 1992b; Beaver 1981).

    Size ranges and morphology

    - Length is 19 to 28 micrometers (Krammer 1992b).
    - Width is 5.5 to 7 micrometers (Krammer 1992b).
    - Striae are 15 to 17 in 10 micrometers (Krammer 1992b).

Pinnularia intermedia (Lagerst.) Cl.

Length:24 Width:6 Striae:14

Collection 1783 Other images More information

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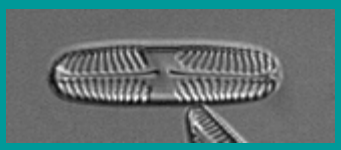
Authority information

Pinnularia intermedia (Lagerst) Cl., K. Svenska Vet.-Akad. Handl., Ny Foljd 27(3):80. 1895(Patrick and Reimer 1966).

Other images


This image was taken utilizing DIC.

More information

Valve linear with slightly narrower, rounded apices. Valve slightly concave in the middle portion. Axial area narrow, becoming a little wider near the central area which is a broad, transverse fascia. Central nodule elongate. Raphe with median ends somewhat distant from each other. Striae radiate in the middle portion of the valve, convergent toward the apices(Patrick and Reimer 1966).

- **Type Locality**
  Spitzbergen, Parry's Island.... (Patrick and Reimer 1966).
  - **Synonyms**
    Navicula intermedia Lagerst., Bih. K. Svenska Vet.-Akad. Handl., 1(14):23, pl. 1, fig. 3. 1873(Patrick and Reimer 1966).
    - **Ecology**
      Prefers cool water of low mineral content, in a wide pH range(Patrick and Reimer 1966; Beaver 1981).

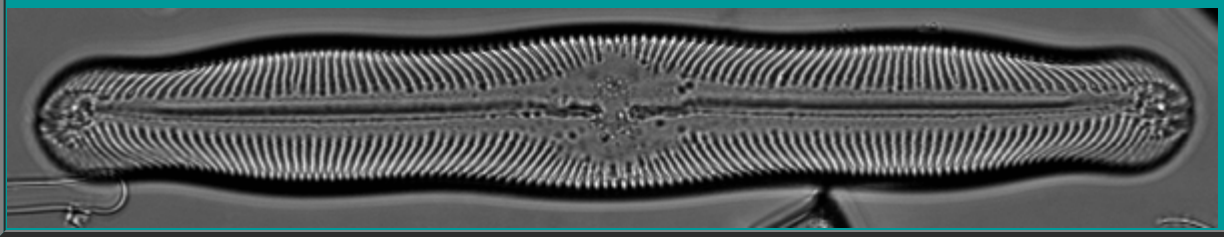
Size ranges and morphology

- Length is 18 to 42 micrometers (Patrick and Reimer 1966).
- Width is 5 to 8 micrometers (Patrick and Reimer 1966).
- Striae are 7 to 10 in 10 micrometers (Patrick and Reimer 1966).

***Pinnularia legumen* Ehr.**

Length:130 Width:21 Striae:9

Collection 1404 Other images More information



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Authority information

Pinnularia legumen (Ehr.) Ehr., Phys. Abh. Akad. Wiss. Berlin, for 1841: pl. 4(1), fig. 7. 1843(Patrick and Reimer 1966).

More information

This species is valve linear to slightly lanceolate with triendulate margins and subrostrate, broadly rounded ends. This species is very similar to *Pinnularia divergens* var. *undulata*, but differs in that the central area does not form a fascia orpossess a thickening on each side of the valve(Patrick and Reimer 1966).

- **Type Locality**
  West Point, New York; fossil [U.S.A] (Patrick and Reimer 1966).

  - **Synonyms**
    Navicula legumen Ehr., Ber. Akad. Wiss. Berlin, for 1841:144. 1841. [In this reference the name is listed, but the taxon is not described.] (Patrick and Reimer 1966).
    - **Ecology**
      This taxon prefers water of low nutrient content and is pH indifferent(Patrick and Reimer 1966; Beaver 1981).

      Size ranges and morphology

      - Length is 60 to 130 micrometers (Patrick and Reimer 1966).
      - Width is 15 to 23 micrometers (Patrick and Reimer 1966).
      - Striae are 8 to 12 in 10 micrometers (Patrick and Reimer 1966).

Pinnularia leptosoma (Grunow) Cleve

Length:25 Width:5 Striae:18

Collection 1550 Other images More information

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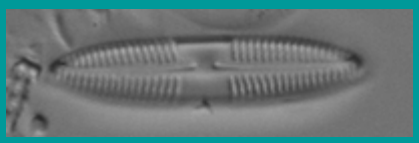
Authority information

Pinnularia leptosoma (Grunow) Cleve 1895 (Krammer and Lange-Bertalot (2/1) 1986).

Other images


This image was taken with an additional 40% magnification.


This image was taken with the additional magnification and utilizing DIC.


This image was taken with same settings as above, at a different focus.

More information

Valve linear with. Broad becoming smaller towards the ends, somewhat rounded. Raphe fissure partially in proximal area, strongly bent. Ends of fissure are large and question mark shaped. Central area asymetrical(Krammer and Lange-Bertalot (2/1) 1986).

- **Synonyms**
  Caloneis leptosoma (Grunow) Krammer 1985 (Krammer and Lange-Bertalot (2/1) 1986).
  Navicula leptosoma Grunow in Van Heurck 1880(Krammer and Lange-Bertalot (2/1) 1986).

- **Ecology**
  Cosmopolitan. Found in tropics, mountain springs. Found in single specimens(Krammer and Lange-Bertalot (2/1) 1986).

Size ranges and morphology

- Length is 22 to 54 micrometers (Krammer and Lange-Bertalot (2/1) 1986).
- Width is 4 to 8 micrometers (Krammer and Lange-Bertalot (2/1) 1986).
- Striae are 14 to 17 in 10 micrometers (Krammer and Lange-Bertalot (2/1) 1986).

Pinnularia leptosoma f. *erlangensis* Mayer Cleve-Euler

Length:27 Width:4.5 Striae:21

Collection 1781a Other images More information

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Authority information

Pinnularia leptosoma fo. *erlangensis* Mayer 1940 D. Erl. S. 28; 1, 7-8(Cleve- Euler, A. 1955).

Other images

This image was taken with an additional 50% magnification.

This image was taken with an additional 100% magnification.

More information

Valves narrowly linear, curved narrow ends, barely cuneate. Central area wide. Striae fine, parallel with possible radial towards the ends (Cleve- Euler, A. 1955).

- **Synonyms**
  Pinnularia leptosoma (Grun.) Cl.(Cleve- Euler, A. 1955).

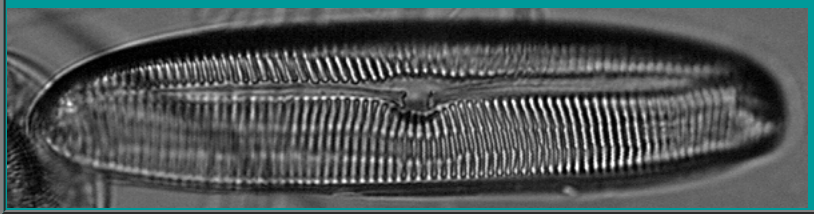
Size ranges and morphology

- Length is 23 to 50 micrometers (Cleve- Euler, A. 1955).
- Width is 4.2 to 8 micrometers (Cleve- Euler, A. 1955).
- Striae are 14 to 20 in 10 micrometers (Cleve- Euler, A. 1955).

***Pinnularia major* Rabh.**

Length:123 Width:30 Striae:5.5

Collection 1552a Other images More information



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Authority information

Pinnularia major (Kutz.) Rabh., Sussw.- Diat., p.42, pl. 6, fig. 5, pl. 10 supp., fig. 4, 1853(Patrick and Reimer

1966).

Other images

More information

This species is a valve linear, swollen in the middle with rounded ends which are often slightly swollen. This taxon is distinguished by the shape of the valve, the axial and central areas, and the angle of the striae(Patrick and Reimer 1966).

- **Type Locality**
  Germany, Halle(Patrick and Reimer 1966)

  - **Synonyms(**
    Frustulia major Kutz., Linnaea, 8:547, pl. 14, fig. 25. 1833(Patrick and Reimer 1966).
    Navicula major (Kutz.) Kutz., Bacill., p. 97, pl. 4, figs. 19-20. 1844(Patrick and Reimer 1966).

    - **Ecology**
      This taxon is widely distributed in water of fairly low mineral content and is considered pH indifferent. It can be found in a wide range of habitats(Patrick and Reimer 1966; Beaver 1981).

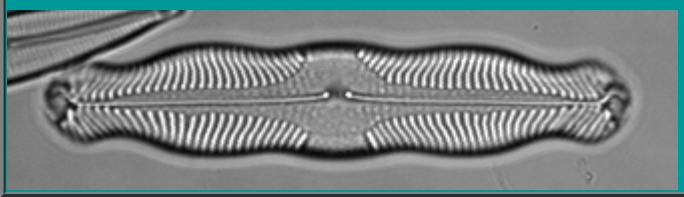
      Size ranges and morphology

      - Length is 140 to 200 micrometers (Patrick and Reimer 1966).
      - Width is 25 to 40 micrometers (Patrick and Reimer 1966).
      - Striae are 5 to 7 in 10 micrometers (Patrick and Reimer 1966).

***Pinnularia mesolepta* (Ehr.) W. Sm.**

Length:63 Width:12 Striae:11

Collection 1787 More information



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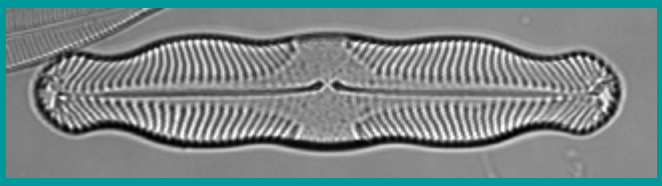
Authority information

Pinnularia mesolepta (Ehr.) W. Sm., Syn. British Diat., vol. 1, p. 58, pl. 19, fig. 182. 1853 (Patrick and Reimer

1966).

Other images



This image was taken utilizing DIC for the specimen above.

More information

Valve linear with triundulate margins, the central inflation narrower than the other two. Striae strongly radiate at the center of the valve, convergent at the ends. This species is closely related to *Pinnularia biceps*. It is distinguished by the distinctly triundulate margins which do not seem to intergrade with the straight margins of *P. biceps*(Patrick and Reimer 1966).

- **Type Locality**
  Labrador, Okak(Patrick and Reimer 1966).

  - **Synonyms**
    Navicula mesolepta Ehr., Phys. Abh. Akad. Wiss. Berlin, for 1841:419, pl. 4(2), fig 4. 1843(Patrick and Reimer 1966).
    Pinnularia mesolepta var. *stauroneiformis* (Grun.) Cl., K. Svenska Vet.-Akad. Handl., Ny Foljd, 27(3):76. 1865 (Patrick and Reimer 1966).

    - **Ecology**
      Prefers fresh water of low mineral content, usually circumneutral to slightly acid. It is found in a wide range of habitats(Patrick and Reimer 1966; Beaver 1981)

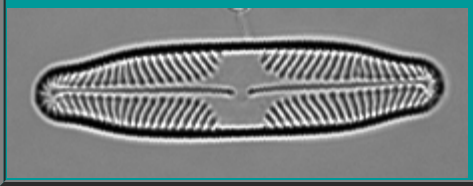
      Size ranges and morphology

      - Length is 30 to 65 micrometers (Patrick and Reimer 1966).
      - Width is 9 to 12 micrometers (Patrick and Reimer 1966).
      - Striae are 10 to 14 in 10 micrometers (Patrick and Reimer 1966).

***Pinnularia microstauron* (Ehr.) Cl.**

Length:45 Width:9 Striae:10

Collection 1782a More information



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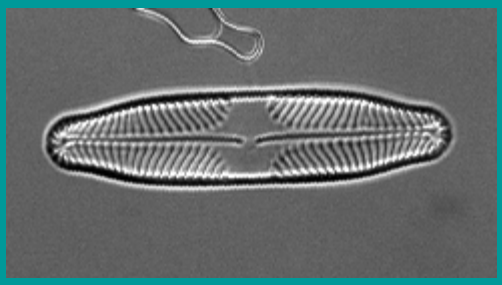
Authority information

Pinnularia microstauron (Ehr.) Cl., Acta Soc. Fauna Fl. Fennica, 8(2):28. 1891(Patrick and Reimer 1966).

Other images



This image was taken utilizing DIC for the specimen above.

More information

Valve linear with usually broadly rostrate ends; occasionally somewhat rounded. This taxon is quite variable and needs a great deal more study to determine if all of the so-called variants really are one taxon(Patrick and Reimer 1966).

- **Type Locality**
  Brazil, from soil on roots of plants from Rio de Janeiro(Patrick and Reimer 1966).

  - **Synonyms**
    Stauroptera microstauron Ehr., Phys. Abh. Akad. Wiss. Berlin, for 1841: 423, pl. 1(4), fig. 1. 1843(Patrick and Reimer 1966).
    Navicula bicapitata var. *hybrida* Grun. *in* V. H., Syn. Diat. Belgique, pl. 6, fig. 9. 1880(Patrick and Reimer 1966).

    - **Ecology**
      Tolerates a wide range of pH and mineral content, but seems to prefer oligotrophic, slightly acid water(Patrick and Reimer 1966; Beaver 1981).

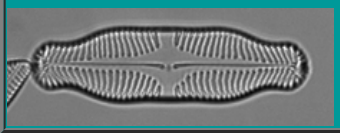
      ### Size ranges and morphology

      - Length is 25 to 90 micrometers (Patrick and Reimer 1966).
      - Width is 7 to 11 micrometers (Patrick and Reimer 1966).
      - Striae are 10 to 13 in 10 micrometers (Patrick and Reimer 1966).

Pinnularia microstauron f. *biundulata* (Muller) Hustedt

Length:40.5 Width:10 Striae:13

Collection 1788 Other images More information



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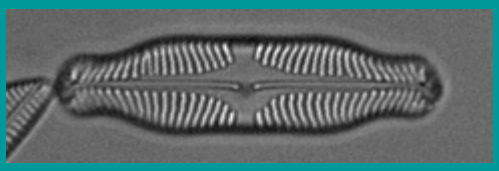
Authority information

Pinnularia microstauron f. *binndulata* (Muller) Hustedt 1930, p. 320, fig. 583(VanLandingham, S. L. 1971).

Other images



This image was taken utilizing DIC.

More information

Valve linear with somewhat rostrate, wedge-shaped ends, or liear-elliptical with rounded ends. Axial area narrow. Central area a broad, transverse fascia. Striae radiate toward the middle of the valve, strongly convergent at the ends(Patrick and Reimer 1966).

- **Type Locality**
- **Synonyms**
- **Ecology**

Size ranges and morphology

- Length is 12 to 22 micrometers (Patrick and Reimer 1966).
- Width is 3 to 5 micrometers (Patrick and Reimer 1966).
- Striae are 13 to 15 in 10 micrometers (Patrick and Reimer 1966).

Pinnularia nodosa (Ehr.) W.Sm.

Length:57 Width:9 Striae:10

Collection 1787 More information

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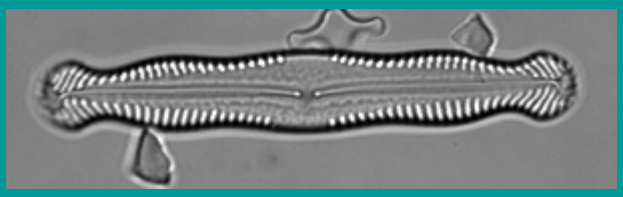
Authority information

Pinnularia nodosa (Ehr.) W. Sm., Syn. British Diat., vol. 2, p. 96. 1856(Patrick and Reimer 1966).

Other images



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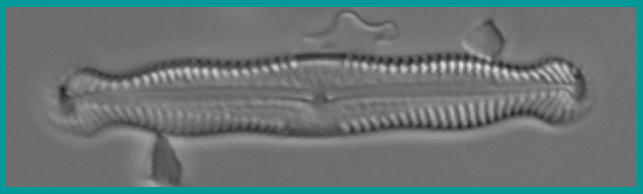

This image was taken utilizing DIC for the specimen above.

More information

Valve linear, triundulate, central inflation broader than the other two; rostrate to rostrate-capitate(Patrick and Reimer 1966).

- **Type Locality**
  Bei Berlin [Germany] (Patrick and Reimer 1966).

  - **Synonyms**
    Navicula nodosa Ehr. Infusionsthierchen, p. 179, pl. 13, fig. 9. 1838(Patrick and Reimer 1966).
    Pinnularia nodosa f. *capitata* Cl., K. Sveniska Vet.-Akad. Handl., Ny Foljd, 27(3): 87. 1895(Patrick and Reimer 1966).

    - **Ecology**
      Prefers cool water and water of low mineral content although sometimes found in other types of water. Found in a wide range of pH and habitats(Patrick and Reimer 1966; Beaver 1981).

      ### Size ranges and morphology

      - Length is 35 to 75 micrometers (Patrick and Reimer 1966).
      - Width is 9 to 18 micrometers (Patrick and Reimer 1966).
      - Striae are 7 to 11 in 10 micrometers (Patrick and Reimer 1966).

Pinnularia obscura Krasske

Length:26 Width:5 Striae:16

Collection 1781a Other images More information

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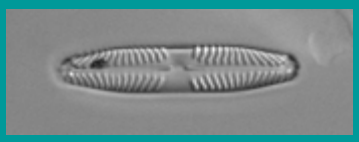
Authority information

Pinnularia obscura Krasske, Hedwigia, 72(3):117, pl. 3, fig. 22. 1932(Patrick and Reimer 1966).

Other images


This image was taken utilizing DIC.

More information

Valve linear with somewhat rostrate, wedge-shaped ends, or liear-elliptical with rounded ends. Axial area narrow. Central area a broad, transverse fascia. Striae radiate toward the middle of the valve, strongly convergent at the ends(Patrick and Reimer 1966).

- **Type Locality**
  Vereinzelt an nassen Felsen an der neuen Autostrasse im Stubachtale [Hohen Tauern, Austrian Alps] (Patrick and Reimer 1966).

  - **Synonyms**
    Navicula gentilis Donk., Nat. Hist. British Diat., p. 69, pl. 12, fig. 1. 1870-1873(Patrick and Reimer 1966).

    - **Ecology**
      Found in a wide variety of fresh waters, often associated with moss.(Patrick and Reimer 1966; Beaver 1981).

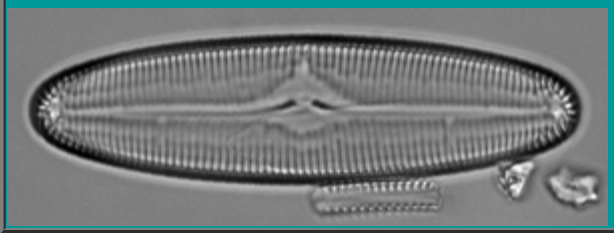
      ### Size ranges and morphology

      - Length is 12 to 22 micrometers (Patrick and Reimer 1966).
      - Width is 3 to 5 micrometers (Patrick and Reimer 1966).
      - Striae are 13 to 15 in 10 micrometers (Patrick and Reimer 1966).

***Pinnularia semicruciata* (A.S.) A. Cleve**

Length:60 Width:15 Striae:13

Collection 1788 Other images More information



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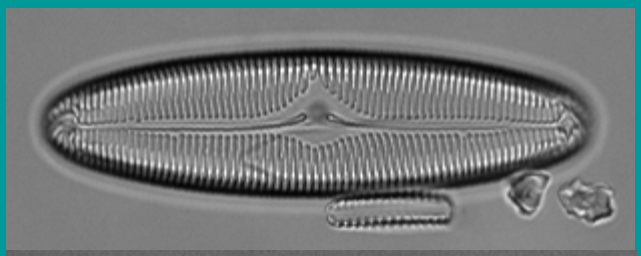
Authority information

Pinnularia semicruciata (A.S.) A. Cleve 1895 Lule Lpm. S. 9; 1934 D. Finn. Lapl. S. 46, Fig. 61(Cleve-Euler 1955).

Other images



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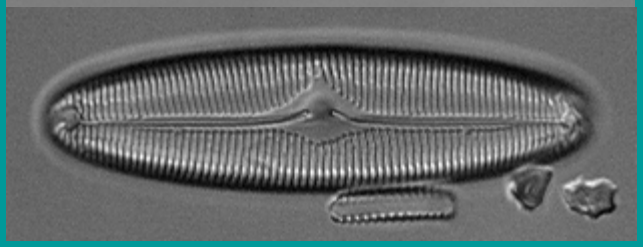

This image was taken utilizing DIC.

More information

Valve elliptic, rounded ends, raphe not complex. Fissures are small and almost semi-circular. Middle usually broad, about 1/2 fascia(Cleve-Euler 1955).

- **Type Locality**

  - **Synonyms**

    Navicula semicruciata (stauroptera) E. Schm. Atl. *44*, 43(Cleve-Euler 1955)
    Navicula viridis v. *semicruciata* Grun. 1882 Foss. D. Ost.-Ung. S. 143(Cleve-Euler 1955)
    Pinnularia viridis v. *semicruciata* Grun., (Cleve-Euler 1955).
    Pinnularia viridis v. *fallax*?(Cleve-Euler 1955)

    - **Ecology**

      Size ranges and morphology

      - Length is 40 to 85 micrometers (Cleve-Euler 1955).
      - Width is 15 to 28 micrometers (Cleve-Euler 1955).
      - Striae are 10 to 14 in 10 micrometers (Cleve-Euler 1955).

***Pinnularia stomatophora* Grun.**

Length:58 Width:8 Striae:14

Collection 1168 Other images More information

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Authority information

Pinnularia stomatophora (Grun. *in* A.S.) Cl., Acta Soc. Fauna Fl. Fennica, 8(2):27. 1891 (Patrick and Reimer 1966).

More information

This species is a valve linear, sometimes with sightly convex sides; ends rounded. This taxon is distinguished by the markings in the central area, the "bayonet" shaped terminal fissures, and the distinctly convergent and radiate striae. It is closely related to *Pinnularia substomatophora* Hust(Patrick and Reimer 1966).

- **Type Locality**
  Pudasjarvi [Finland] (Patrick and Reimer 1966).

  - **Synonyms**
    Navicula stomatophora Grun. *in* A. S., Atlas Diat., pl. 44, figs. 27-29. 1876(Patrick and Reimer 1966)
    .

    - **Ecology**
      This taxon is found in cool water of low mineral content in a wide range of habitats(Patrick and Reimer 1966).

Size ranges and morphology

- Length is 59 to 110 micrometers (Patrick and Reimer 1966).
- Width is 9 to 11 micrometers (Patrick and Reimer 1966).
- Striae are 12 to 14 in 10 micrometers (Patrick and Reimer 1966).

Pinnularia subrostrata Cleve-Euler

Length:35 Width:7 Striae:12

Collection 1788 Other images More information

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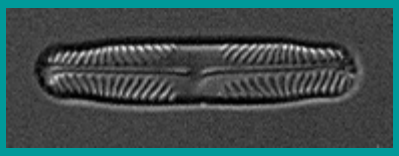
Authority information

Pinnularia subrostrata (A. Cleve) Cleve-Euler 1955 (Krammer 1992a).

Other images


This image was taken utilizing DIC for the specimen above.

More information

Linear, linear-elliptic with weakly convex sides, sometimes almost triundulate. Ends broadly capitate and drawn out, almost without a definite shoulder. Axial area is thin. Central area is fascia. Central striae are strongly radial, end striae slightly to distinctly convergent (Krammer 1992a).

- **Distribution**
  Swedish lapland to Middle Europe (Krammer 1992a).
  - **Ecology**
    This taxon seems to prefer lake waters, particularaly acidophilous ones(Beaver 1981).

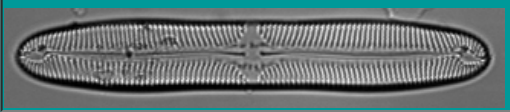
Size ranges and morphology

- Length is 28 to 44 micrometers (Krammer 1992a).
- Width is 5 to 8.5 micrometers (Krammer 1992a).
- Striae are 9 to 12 in 10 micrometers (Krammer 1992a).

***Pinnularia substomatophora* Hust.**

Length:73 Width:11 Striae:12

Collection 1781a Other images More information



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Authority information

Pinnularia substomatophora Hust. in A. S. Atlas Diat., pl. 392, fig. 14. 1934. Arch. Hydrobiol. Suppl., 14:160, pl. 2, fig. 14. 1935(Patrick and Reimer 1966)

Other images

More information

This taxon has linear valve or slightly swollen sides and rounded ends. It is distinguished from P. stomatophora by the lack of the characteristic markings in the central area and the more strongly divergent and convergent striae. . (Patrick and Reimer 1966).

- **Type Locality** (Patrick and Reimer 1966)
  Sumatra, Kieselgur vom Tobasee
  - **Ecology**
    Found in cool, slightly acidic water of low mineral content, in lakes or bogs.(Patrick and Reimer 1966)

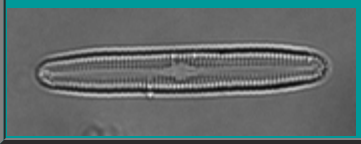
Size ranges and morphology

- Length is 55 to 65 micrometers (Patrick and Reimer 1966).
- Width is 8 to 9 micrometers (Patrick and Reimer 1966).
- Striae are 11 to 13 in 10 micrometers (Patrick and Reimer 1966).

Pinnularia tenuis Greg.

Length:17 Width:4.5 Striae:20

Collection 1781a Other images More information



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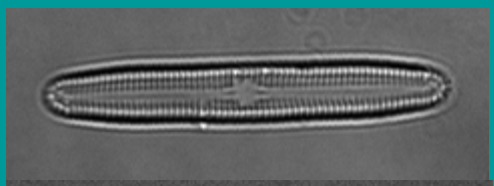
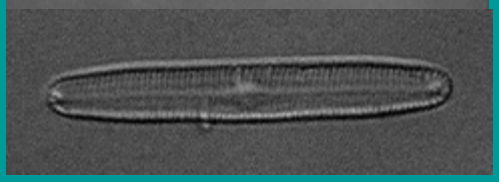
Authority information

Pinnularia tennis Gregory 1854(Krammer, K. and Lange-Bertalot, H. 1986).

Other images



This image was taken with an additional 40% magnification.



This image was taken with the additional magnification and utilizing DIC.

More information

This description is from Krammer's *Caloneis tenuis*, which he has as a synonym to *P. tenuis*. Valve linear to valve-elliptica. Sides parallel to triundulate sides. Ends are slightly distinguishable, bluntly rounded, and slightly capitate. Raphe weakly bent; raphe axis in middle somewhat lateral to philiform, bent at ends. Central nodule is indistinct. End pole nodules are distinctly visible, they are large and bayonet shaped. Axial area is variable, from very thin, linear to very broad, lanceolate-like. Central area variable, from small, circular to large rectangular. Commonly asymmetrical fascia. Striae in the middle are parallel to weakly radial, at the poles are parallel to lightly convergent (Krammer, K. and Lange-Bertalot, H. 1986).

- **Synonyms**

  Caloneis tenuis Krammer 1985; *Pinnularia gracillima* Gregory 1856 (Krammer, K. and Lange-Bertalot, H. 1986).

  - **Ecology**

    Cosmopolitan, especially in the northern alpine areas. Found in standing or flowing water. Oligotrophic water with low to moderate electrolyte content(Krammer, K. and Lange-Bertalot, H. 1986; Beaver 1981).

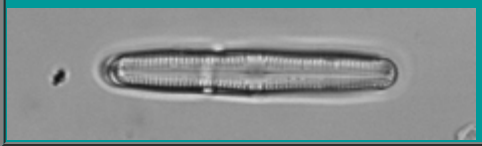
    Size ranges and morphology

    - Length is 20 to 50 micrometers (Krammer, K. and Lange-Bertalot, H. 1986).
    - Width is 4 to 7 micrometers (Krammer, K. and Lange-Bertalot, H. 1986).
    - Striae are 16 to 24 in 10 micrometers (Krammer, K. and Lange-Bertalot, H. 1986).

Pinnularia tenuis v. *interrupta* (Font.) Cleve-Euler

Length:30 Width:4.5 Striae:20

Collection 1784a Other images More information



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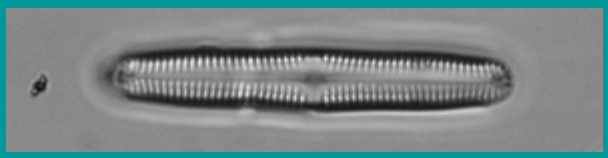
Authority information

Pinnularia tenuis v. *interrupta* (Font.) Cleve-Eulear in *Die Diatomeen von Schweden und Finnland. IV, p. 15*(Cleve- Euler, A. 1955).

Other images



This image was taken with an additional 40% magnification.

More information

Narrowly linear with fine striae. Margin undulate. Ends protracted and slightly capitate. Axial area narrow with no special characteristics. Central area broad from fascia to valve margins, rarely complete fascia. Terminal nodule course. Striae fine, parallel or nearly so(Cleve- Euler, A. 1955).

- **Synonyms**
  Navicula gentilis Donk., Nat. Hist. British Diat., p. 69, pl. 12, fig. 1. 1870-1873.(Cleve- Euler, A. 1955).

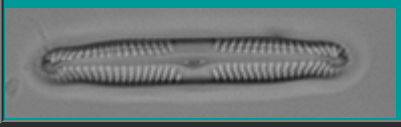
Size ranges and morphology

- Length is 20 to 50micrometers (Cleve- Euler, A. 1955).
- Width is 4 to 6 micrometers (Cleve- Euler, A. 1955).
- Striae are 15 to 25 in 10 micrometers (Cleve- Euler, A. 1955).

***Pinnularia termitina* (Ehr.) Patr.**

Length:34 Width:5 Striae:13

Collection 1781 More information



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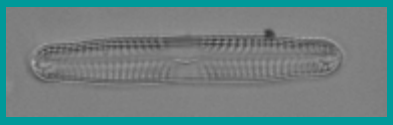
Authority information

Pinnularia termitina (Ehr.) Patr. *in* Patrick and Reimer, p.595, pl.55, fig. 6. 1966 (Patrick and Reimer 1966).

Other images



This image is the specimen above, focused on a different depth.

More information

Valve slender, sometimes the margins slightly undulate, with rostrate-capitate ends(Patrick and Reimer 1966).

- **Type Locality**
  Andamanen-Inseln (Patrick and Reimer 1966).

  - **Synonyms**
    Navicula termitina Ehr., Mikrogeol., p. 159, pl. 33(4), fig. 4. 1854(Patrick and Reimer 1966).

    - **Ecology**
      Prefers acid bogs(Patrick and Reimer 1966; Beaver 1981).

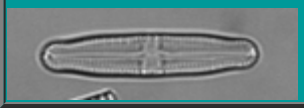
      Size ranges and morphology

      - Length is 38 to 41 micrometers (Patrick and Reimer 1966).
      - Width is 4 to 5 micrometers (Patrick and Reimer 1966).
      - Striae are 12 to 14 in 10 micrometers (Patrick and Reimer 1966).

Pinnularia undulata v. *subundulata* (Greg.) Cleve

Length:23 Width:5 Striae:20

Collection 1788 Other images More information



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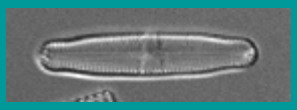
Authority information

Pinnularia undulata v. subundulata Grunow *in* Van Heurck 1880-1885, Type No. 140(VanLandingham, S. L. 1971).

Other images

 This image was taken using DIC.

More information

Valve linear, with triundulate to almost parallel sides. Ends broadly capitate, blunt or flatly rounded. Raphe slightly filiform, small central pores. Ends of fissures distinctly question mark shaped. Axial area narrow and linear. Fascia of varied breadth, small and round. Striae parallel to radial end, slightly to strongly bent, crossed by the marginalband(Krammer and Lange-Bertalot (2/1) 1986).

- **Ecology**
  Found in northern alpine waters, oligotrophic and electrolyte poor(Krammer and Lange-Bertalot (2/1) 1986)).

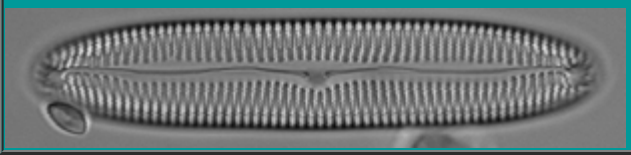
Size ranges and morphology

- Length is 22 to 39 micrometers (Krammer and Lange-Bertalot (2/1) 1986).
- Width is 5 to 7 micrometers (Krammer and Lange-Bertalot (2/1) 1986).
- Striae are 17 to 22 in 10 micrometers (Krammer and Lange-Bertalot (2/1) 1986).

***Pinnularia virdis* Nitz.**

Length:65 Width:12 Striae:10

Collection 1784 Other images More information



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Authority information

Pinnularia virdis (Nitz.) Ehr., Phys. Abh. Akad. Wiss. Berlin, for 1841:305, 385, pl. 1(1), fig. 7; pl. 1(3), fig. 3; pl. 1(4), fig. 3; pl. 2(1), fig. 22; pl. 2(3), fig. 1; pl. 2(5), fig. 2; pl. 2(6), fig. 21; pl. 3(1), figs. 1-2. 1843(Patrick and Reimer 1966).

More information

Valve linear, narrowing toward rounded ends. The nomiate variety of this species is distinguished by the narrow axial area, small central area, and almost parallel striae throughout most of the valve(Patrick and Reimer 1966).

- **Type Locality**
  Germany, Halle(Patrick and Reimer 1966).

  - **Synonyms**
    Navicula virdis (Nitz.) Ehr., Infusionsthierchen, p. 182, pl. 13, fig. 16; pl. 21, fig. 12. 1838(Patrick and Reimer 1966).
    Bacillaria virdis Nitz., Neue Schrift. Naturf. Ges. Halle, 3(1):97, pl. 6, figs. 1-3. 1817(Patrick and Reimer 1966).

    - **Ecology**
      This taxon is found in water of higher mineral content than many of the species belonging to the *Pinnularia*; seems to prefer circumneutral water. The species is found in a wide range of habitats(Patrick and Reimer 1966; Beaver 1981).

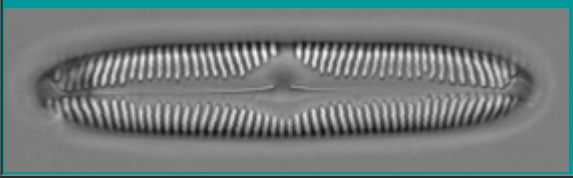
Size ranges and morphology

- Length is 50 to 170 micrometers (Patrick and Reimer 1966).
- Width is 10 to 30 micrometers (Patrick and Reimer 1966).
- Striae are 6 to 9 in 10 micrometers (Patrick and Reimer 1966).

***Pinnularia viridis* v. *commutata*(Grun.) Cl.**

Length:55 Width:11 Striae:11

Collection 1788 Other images More information



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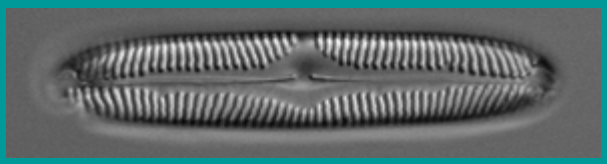
Authority information

Pinnularia viridis var. *commutata* (Grun *in* V. H.) Cl., K. Svenska Vet.-Akad. Handl., Ny Foljd, 27(3):91. 1895(Patrick and Reimer 1966).

Other images



This image was taken utilizing DIC for the specimen above.

More information

Valve linear, narrowing toward rounded ends. Axial area narrow, one-fourth to one-fifth breadth of the valve. Central area variable; small, somewhat elliptical, and usually asymmetrical; or widened unilaterally or bilaterally into a transverse fascia. Raphe complex; terminal fissures small but distinct. Striae slightly parallel throughout most of the valve, almost parallel at the center and parallel to slightly convergent toward the ends; crossed by a band which varies in distinctness. This taxon is distinguished from the nominate variety by its finer striae and central area of variable shape(Patrick and Reimer 1966).

- **Type Locality**
  Uncertain (Patrick and Reimer 1966).

  - **Synonyms**
    Navicula virdis var. *commutata* Grun. *in* V. H., Syn. Diat. Belgique, pl. 5, fig. 6. 1880(Patrick and Reimer 1966).
    Pinnularia virdis var. *fallax* Cl., K. Svenska Vet.-Akad. Handl., Ny Froljd, 27(3):91. 1895(Patrick and Reimer 1966).
    Navicula virdis var. *fallax* (Cl.) Hust., Sussw.-Diat. Deutschlands, p. 47. 1909(Patrick and Reimer 1966).

    - **Ecology**
      This taxon seems to prefer cool water of low mineral content(Patrick and Reimer 1966). It has been found in generally alkalibiontic waters in lakes, estuaries, and terrestrial habitats(Beaver 1981).

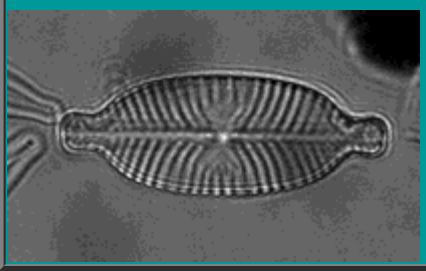
Size ranges and morphology

- Length is 45 to 110 micrometers (Patrick and Reimer 1966).
- Width is 9 to 20 micrometers (Patrick and Reimer 1966).
- Striae are 9 to 12 in 10 micrometers (Patrick and Reimer 1966). 1966).

*Placoneis elginensis*v *lata* Cox

Length:27 Width :10 Striae:14

Collection 1788 Other images More information



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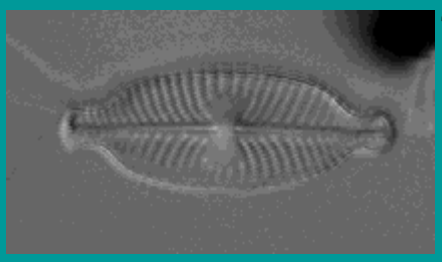
Authority information

*Placoneis elginensis*v. *lata* Cox, E. J. Placoneis Mereschkowsky: The re-evalutation of a diatom genus originally characterized by its chloroplast type. Diatom Res. 2:145-157 (Cox, E. J. 1987).

Other images



This image was taken using DIC.

More information

This taxon has a liear-elliptical to eliptical valve and the ends are rostrate to rostrate-capitate. The central area is a broad, transverse fascia and does not reach the margins of the valve. The striae are distinctly radiateat the center and feebly at the ends. The striae are coursely lineate and are shortened around the central area. This taxon differs from the nominate variety by the larger central area (Patrick and Reimer 1966).

- **Synonyms**
  Navicula dicephala var. *lata* M. Perag. *in* Temp. & Perag., Diat. Monde Entier, 2nd ed., p. 56. 1908 (Patrick and Reimer 1966).

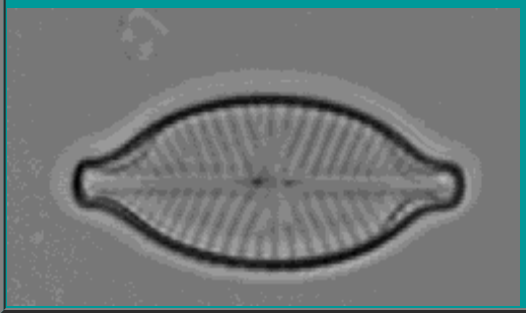
Size ranges and morphology

- Length is around 30 micrometers (Patrick and Reimer 1966).
- Width is around 11 micrometers (Patrick and Reimer 1966).
- Striae are 12 to 14 in 10 micrometers (Patrick and Reimer 1966).

Placoneis exinguav. capitata Cox

Length:16 Width :7.5 Striae:16

Collection 1527 Other images More information



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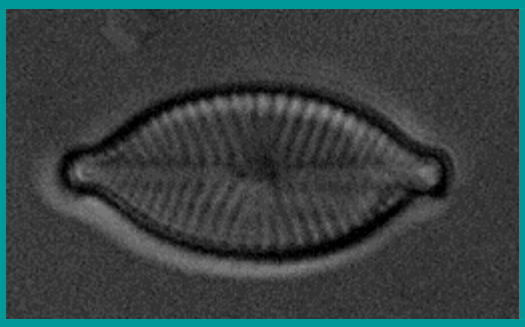
Authority information

*Placoneis exingua*v. *capitata* Cox, E. J. Placoneis Mereschkowsky: The re-evalutation of a diatom genus originally characterized by its chloroplast type. Diatom Res. 2:145-157 (Cox, E. J. 1987).

Other images



This image was taken using DIC.

More information

This taxon has a linear-elliptical valve with rostrate-capitate ends. The irregularly rectangular central area is large and the striae strongly radiate at the center of the valve. The striae are parallel at the ends and are finely lineate. The striae are also irreluglar in lenght at the central area (Patrick and Reimer 1966).

- **Synonyms**

  Navicula exigua var. *capitata* Patr., Farlowia, 2(2):179, pl. 1, fig. 8. 1945 (Patrick and Reimer 1966).

Ecology

This taxon prefers fresh water that is less than 100 p.p.m. hardness (Patrick and Reimer 1966).

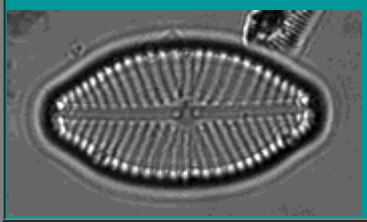
Size ranges and morphology

- Length is 22 to 30 micrometers (Patrick and Reimer 1966).
- Width is 10 to 11 micrometers (Patrick and Reimer 1966).
- Striae are 14 to 16 in 10 micrometers (Patrick and Reimer 1966).

***Placoneis gastrum* Cox**

Length:29 Width :15 Striae:8-9

Collection 813 Other images More information



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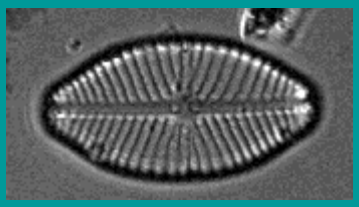
Authority information

Placoneis gastrum Cox, E. J. Placoneis Mereschkowsky: The re-evalutation of a diatom genus originally

characterized by its chloroplast type. Diatom Res. 2:145-157 (Cox, E. J. 1987).

Other images



This image was taken using DIC.

More information

The valve of this taxon is lanceolate to elliptical-lanceolate and the ends are obtuse and slightly protracted. The axial area is narrow and slightly widens toward the center area. The central area is transverse and irregular in shape. The striae are radiate and irregular in length (Patrick and Reimer 1966).

- **Synonyms**

  Pinnularia gastrum Ehr., Phys. Abh. Akad. Wiss. Berlin, for 1841:421, pl. 3(7), fig. 23. 1843 (Patrick and Reimer 1966).
  Navicula gastrum (Ehr.) Kutz., Bacill., p.94, pl.28, fig. 56. 1844 (Patrick and Reimer 1966).
  Navicula varians Greg., Trans. Micr. Soc. London, New ser., 3:11, pl. 2, figs. 27-28(in part). 1855 (Patrick and Reimer 1966).
  Navicula gastrum f. *maxima* Temp. & Perag., Diat. Monde Entier, 2nd ed., p. 194. 1910 (Patrick and Reimer 1966).

- **Ecology**
  This taxon prefers fresh to slightly brackish water (Patrick and Reimer 1966).

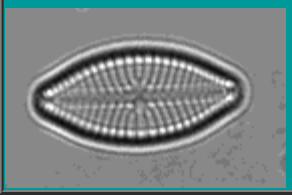
Size ranges and morphology

- Length is 25 to 60 micrometers (Patrick and Reimer 1966).
- Width is 12 to 20 micrometers (Patrick and Reimer 1966).
- Striae at the center of the valve are 8 to 10 in 10 micrometers (Patrick and Reimer 1966).
- Striae at the ends of the valve are 12 in 10 micrometers (Patrick and Reimer 1966).

*Placoneis gastrum*v. *signata* Cox

Length:22.5 Width :10 Striae:12

Collection 1279a Other images More information



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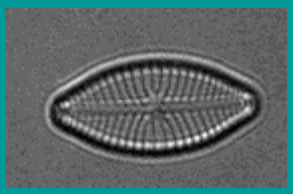
Authority information

*Placoneis gastrum*v. *signata* Cox, E. J. Placoneis Mereschkowsky: The re-evalutation of a diatom genus

originally characterized by its chloroplast type. Diatom Res. 2:145-157(Cox, E. J. 1987).

Other images



This image was taken using DIC.

More information

This taxon has one unilateral stigma in the central area. This taxon and *Placoneis gastrum* are very similar with the difference being this taxon has a stigma and *gastrum* does not (Krammer and Lange-Bertalot 1986).

- **Synonyms**
  Navicula gastrum v. *signata* Hustedt 1936 *in* Schmidt *et al.* 1874-__, 403/27-28 (Vanlandingham 1975).

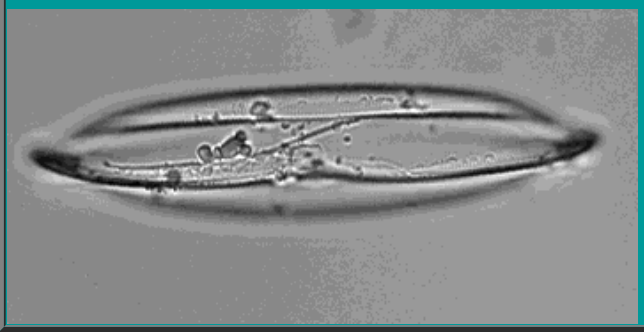
- **Ecology**
  According to Krammer and Lange-Betalot, this taxon does not have a specific ecological preference(Krammer and Lange-Bertalot 1986).

Size ranges and morphology

Plagiotropis lepidoptera v. *probasidea* Cleve 1894

Length:70 Width:17 Striae: Puncta:

Collection 1553 Other images More information



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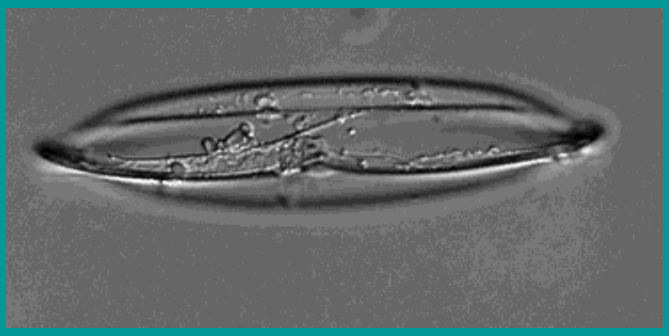
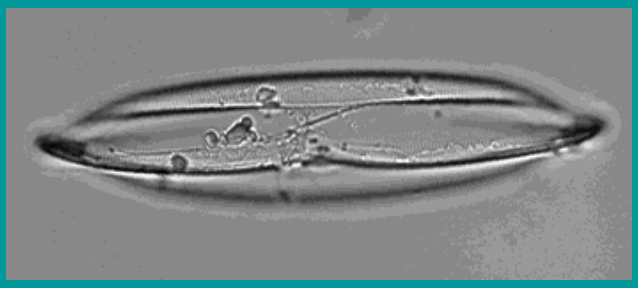
Authority information

(Cleve 1894) M. Peragallo 1903, p. 733 (Paddock 1988).

Other images



This image was taken utilizing DIC for the specimen above.



This is another image taken with slightly different focus. It was taken under brightfield illumination.

More information

The central area of this taxon is round and is clear. The central area ends at the foldline on the greater foldline and extends into the foldline on the lesser face. It has short, fat valves and a longitudinal foldline by most of the face. There is another foldline at each of the poles (Paddock 1988).

- **Synonyms** *Tropidoneis lepidoptera*var. *proboscidea* Cl., K. Svenska Vet.-Akad. Handl., Ny Foljd, 26(2):25. 1894 (Patrick and Reimer 1975).

- **Ecology**
  This taxon prefers freshwater and it likes alkaline and low cloride habitats (Paddock 1988;Patrick and Reimer 1975).

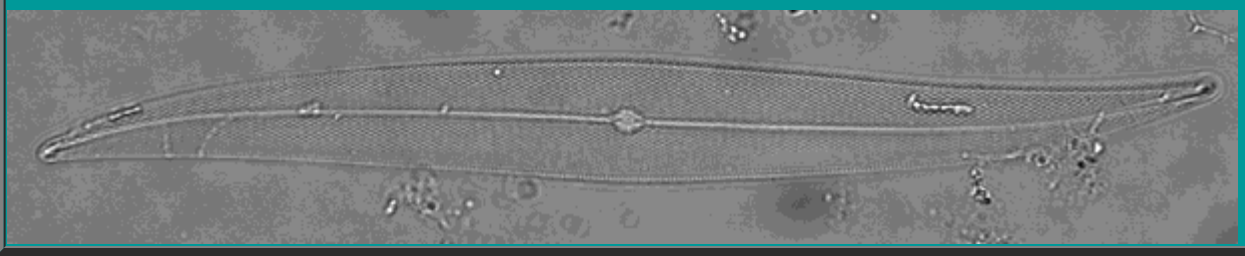
  Size ranges and morphology

  - Length is 75 micrometers (Paddock 1988).
  - Width is 18 micrometers (Paddock 1988) .
  - Striae are 16 in 10 micrometers (Paddock 1988).
  - Puncta are around in 10 micrometers (Paddock 1988).

Pleurosigma delicatulum W. Sm.

Length:130.5 Width:12 Striae:20

Collection 1159a Other images More information



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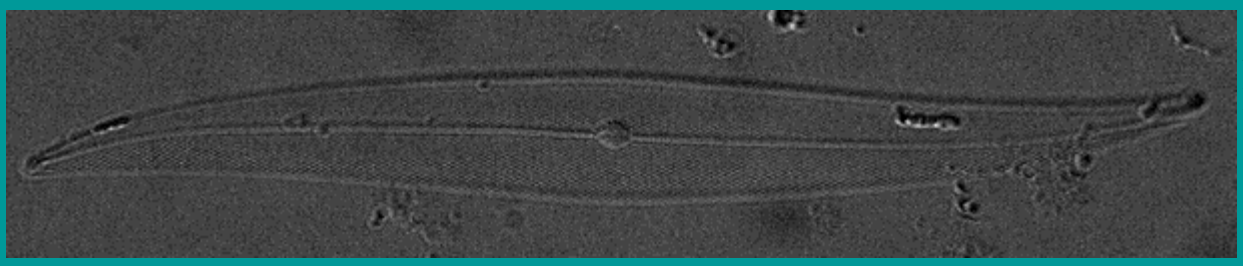
Authority information

Pleurosigma delicatulum W. Sm., Ann. Mag. Nat. Hist., Ser. 2, 9:6, pl. 1, fig. 5. 1852 (Patrick and Reimer 1966).

Other images



This image was taken utilizing DIC for the specimen above.

More information

This taxon has an elliptical central area. The striae are transverse and diagonal and cross each other with an angle of 55 to 60 degrees. The valve is sigmoid and narrow-lanceolate. It tapers to rounded ends (Patrick and Reimer 1966).

- **Synonyms**
  Gyrosigma delicatulum (W. Sm.) Elmore, Univ. Nebraska Stud., 21(1-4):105, pl.13, figs 512-513. 1922 (Patrick and Reimer 1966).

- **Type Locality**
  New England States, Middle Atlantic States, Gulf Coast States, East Central States, West Central States, Plains States, Utah, Arizona, California (Patrick and Reimer 1966).

- **Ecology**
  This taxons prefers fresh water that is hard though it has been found in brackish water (Patrick and Reimer 1966).

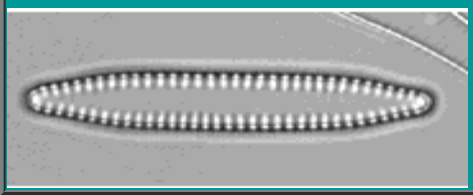
Size ranges and morphology

- Length is 130 to 280 micrometers (Patrick and Reimer 1966).
- Width is 13 to 19 micrometers (Patrick and Reimer 1966).
- Striae are 20 to 23 in 10 micrometers (Patrick and Reimer 1966).

Pseudostaurosira brevistriata (Grun. *in* VanHeurck) Williams and Round 1987

Length: 23 Width: 4 Striae:15

Collection 1398 Other images More information



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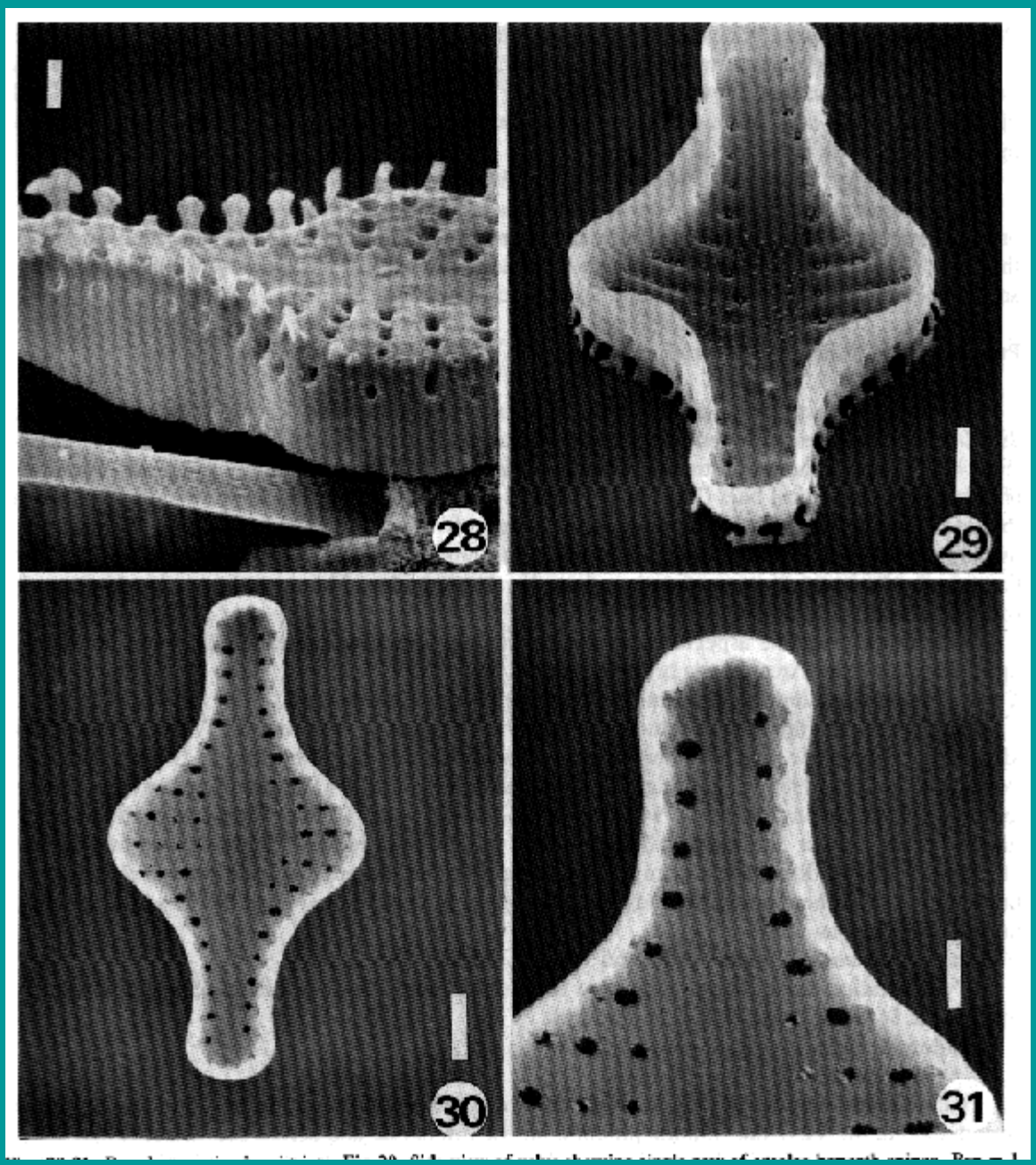
Authority information

Other images

Plate of *Pseudostaurosira brevistriata* SEM's. Fig. 28. Valve side view depicting single row of areolae beneath spines (1 micrometer bar). Figs. 29-31. Inside views where small apical pore fields are evident (4 micrometer bar in Figs. 29 and 30; 1 micrometer bar in Fig. 31). (courtesy of Diatom Research, Biopress, Ltd., Williams and Round 1987)



More information

Originally, the pictured specimen was identified as *Fragilaria brevistriata* as described by Patrick and Reimer 1966 , and the following information refers to this taxon.
This species grows in band-like colonies of varying lengths (Stoermer and Yang 1969).

Synonyms (Patrick and Reimer 1966)

Fragilaria brevistriata Grunow *in* V.H. Syn. Diat. Belgique, p. 157. 1885.

- **Ecology**

  Fragilaria brevistriata is tolerant of a wide range of conductivity in fresh water (Patrick and Reimer 1966). Most records from Lake Michigan are from nearshore areas; however the greatest abundances have been found in smaller mesotrophic to eutrophic lakes (Stoermer and Yang 1969).

Size ranges and morphology

For *Fragilaria brevistriata* :

- Length is 12-28 micrometers (Patrick and Reimer 1966).
- Breadth is 3-5 micrometers (Patrick and Reimer 1966).
- Striae range is 13-17 per 10 micrometers (Patrick and Reimer 1966).

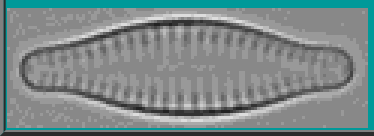
  - Other morphological features

    In the Great Lakes, the range for length is 10-30 micrometers and the breadth is 3-5 micrometers. The striae range is 13-16 striae in 10 micrometers (Stoermer and Yang 1969).

Pseudostaurosira brevistriata var. *inflata* (Pant.) Edlund

Length: 17 Width: 5 Striae:14

Collection 811 Other images More information



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Authority information

For new variety combination, see Edlund (1994). For genera transfer see Williams and Round (1987).

Other images

More information

Originally, the pictured specimen was identified as *Fragilaria brevistriata* var. *inflata* as described by Patrick and Reimer 1966 , and the following information refers to this taxon.

- **Synonyms** (Patrick and Reimer 1966)

  Fragilaria inflata Pant. 1902
  Fragilaria brevistriata var. *inflata* (Pant.) Hust. *in* Pasch., Sussw.-Fl. Mitteleuropas, Heft 10, Aufl. 2, p. 145, fig. 152. 1930.

- **Ecology**

  Fragilaria brevistriata var. *inflata* prefers slightly alkaline waters and moderately high conductivity (Patrick and Reimer 1966).

Size ranges and morphology

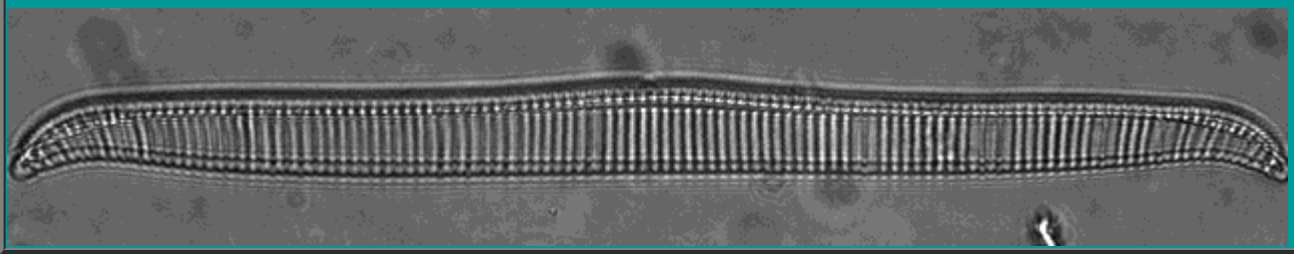
For *Fragilaria brevistriata* var. *inflata* :

- Length is 10-20 micrometers (Patrick and Reimer 1966).
- Breadth is 3.5-11 micrometers (Patrick and Reimer 1966).
- Striae range is 12-16 per 10 micrometers (Patrick and Reimer 1966).

***Rhopalodia gibba* (Ehr.)**

Length: 164 Width:25 Costae: 7 Striae:

Collection 1553 Other images More information



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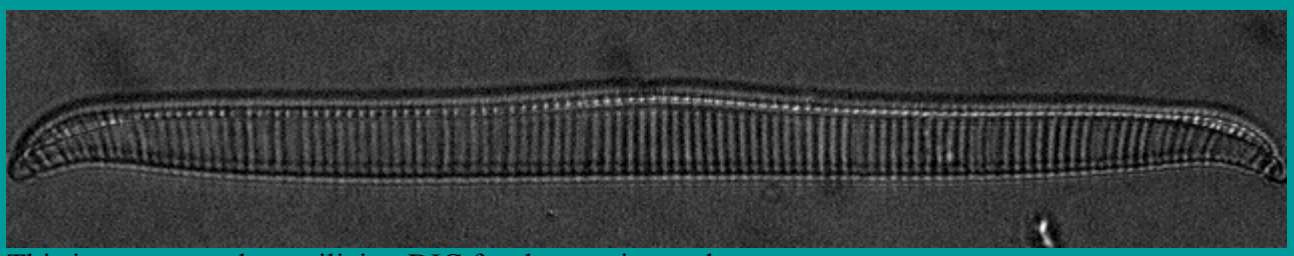
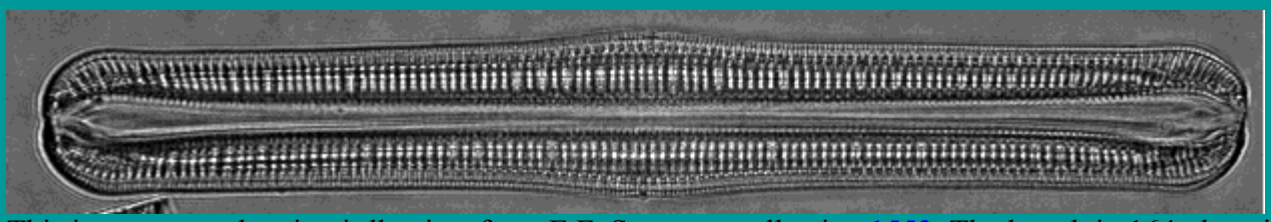
Authority information

(Ehr.) O. Muller, Bot. Jahrb., 22:65, pl. 1, figs. 15-17 (Stoermer and Yang 1969)

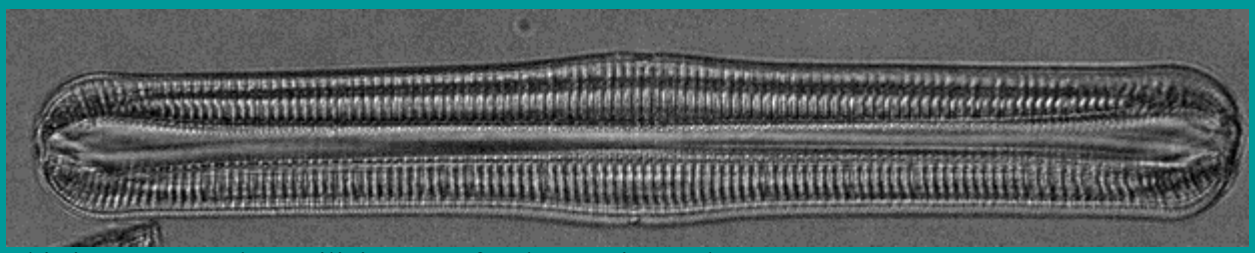
Other images



This image was taken utilizing DIC for the specimen above.



This image was taken in girdle view from E.F. Stoermer collection 1553. The length in 164, the width is 25, and the striae are 7 in 10 micrometers.



This image was taken utilizing DIC for the specimen above.

More information

In the girdle view of this taxon a frustule can be seen. It has a linear frustule with a swollen valve that is notched in the center. The valve ends ben away and the valve itself is bent. It has well developed costae with two or three alveoli between them. The striae of this taxon are single rows of alveoli (Patrick and Reimer 1975).

- **Synonyms**

  Navicula gibba Ehrenberg, Infusionsthierchen, p. 184, pl. 13, fig. 19. 1839 (Stoermer and Yang 1969).
  Epithemia gibba (Ehr.) Kutz., Bacill., p. 35, pl. 4, fig. 22. 1844 (Patrick and Reimer 1975)
  Cystopleura gibba DeT., Syll. Alg., vol. 2, sect. 1, p. 780. 1891 (Patrick and Reimer 1975)

  - **Ecology**

    This taxon prefers water that is conductive and water that is found on plants (Patrick and Reimer 1975;Lowe 1974).

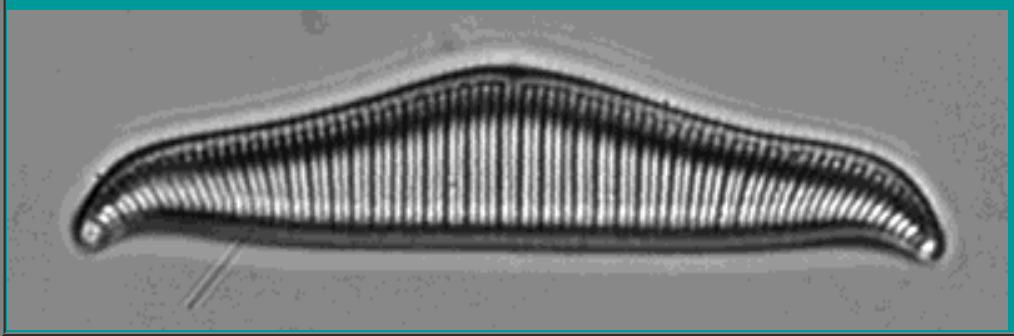
Size ranges and morphology

- Length is 80 to 300 micrometers (Patrick and Reimer 1975).
- Width of the frustule is 18 to 30 micrometers (Patrick and Reimer 1966).
- Width of the valve is 8 to 11 micrometers (Patrick and Reimer 1966).
- Costae are 6 to 8 in 10 micrometers (Patrick and Reimer 1975).
- Rows of alveoli are 12 to 16 in 10 micrometers (Patrick and Reimer 1975).

*Rhopalodia gibba*var. *ventricosa* (Kuetz.) H. Perag. & Perag. 1900

Length: 54 Width:10 Costae: 8 Striae: 15

Collection 1284a Other images More information



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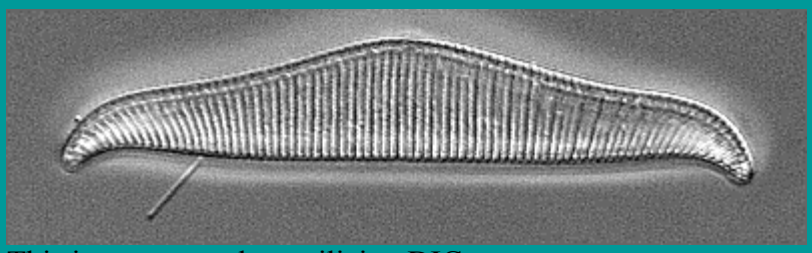
Authority information

(Kuetz.) H. & M. Perag., Diat. Mar. France, pl. 77, figs. 3-5. 1900. Text, p. 302. 1897-1908 (Patrick and Reimer 1975).

Other images



This image was taken utilizing DIC.

More information

Taxonomically (Hustedt 1957) and ecologically, this variety is similar to the nominate taxon with respect to ecology (Cholnoky 1968,Patrick and Reimer 1975). In addition, this taxon occurs maximally at pH 7.2, but is found at pH 7.2 - 8.6 (Hustedt 1938).

- **Type Locality**

  Lectotype-10# British Museum 17841 [designated by R. Patrick from type material in Kutzing collection]. (Patrick and Reimer 1975).

  - **Synonyms**

    Epithemia ventricosa Kuetz., Bacill., p. 35, pl. 30, fig. 9(a, b). 1844 (Patrick and Reimer 1975).
    Epithemia gibba var. ventricosa (Kuetz.) Grun. in V. H., Syn. Diat. Beogique, pl. 32, figs. 4, 5. 1881 (Patrick and Reimer 1975).
    Cystopluera ventricosa (Kuetz.) Kuntze, Revisio Gen. Plant., vol. 2, p. 891. 1891 (Patrick and Reimer 1975).
    Rhopalodia ventricosa (Kuetz.) O. Mull., Bot. Jahrb., 22:65, pl. 1, figs. 20,21. 1895 (Patrick and Reimer 1975).

    - **Ecology**

      This taxon is usually epiphytic and is found in water with moderate to fairly high conductivity (Patrick and Reimer 1975; Beaver 1981).

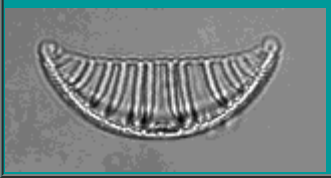
      Size ranges and morphology

- Length is 25 to 100 micrometers (Patrick and Reimer 1975).
- Width is 7 to 10 micrometers (Patrick and Reimer 1966).
- Costae are 5 to 8 in 10 micrometers (Patrick and Reimer 1975).
- Striae are are 12 to 16 in 10 micrometers (Patrick and Reimer 1975).

Rhopalodia gibberula (Ehr.)

Length: 28 Width:9 Costae: 6 Striae:

Collection 1159 Other images More information



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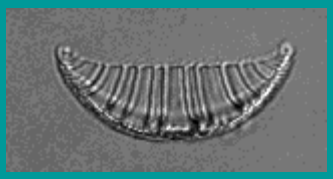
Authority information

(Ehr.) O. Mull (Stoermer and Yang 1969)

Other images



This image was taken utilizing DIC for the specimen above.

More information

This taxon has as leanceolate to linear-elliptic grustule in girdle view. The valve has a convex dorsal margin that is notched in the middle. The ventral margin is straight. The valve is bent as is the apices. The raphe is on the dorsal margin of thevalve. This taxon has radiate costae (Patrick and Reimer 1975).

- **Type Locality**
  New England States, Middle Atlantic Statess, Southeastern States, Gulf Coast States, West Central States, South Central States, lakes States, Plains States, New Mexico, Montana and California (Patrick and Reimer 1975).
  - **Synonyms**
    Eunotia gibberula Ehrenberg, Phys. Abh. Akad. Wiss. Berlin, 1841:126, pl. 3(4), fig. 8. 1843(Stoermer and Yang 1969).
    Epithemia gibberula (Ehr.) Kutz., Bacill., p. 35, pl. 29, fig. 54; pl. 30, fig. 3. 1844 (Patrick and Reimer 1975).
    Cystopleura gibberula (Ehr.) Kuntze, Revisio Gen. Plant., vol. 2, p. 891. 1891 (Patrick and Reimer 1975).
    - **Ecology**
      This taxon is highly tolerant. It prefers water that contains chloride and can also be found in water that is slightly conductive (Patrick and Reimer 1975).

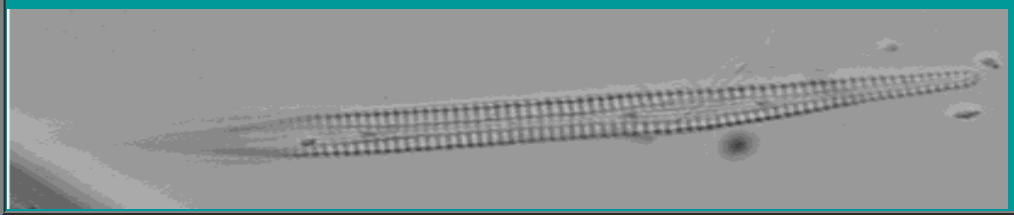
Size ranges and morphology

- Length is 40 to 70 micrometers (Patrick and Reimer 1975).
- Width of frustule is 20 to 40 micrometers (Patrick and Reimer 1966).
- Width of valve is 7 to 14 micrometers (Patrick and Reimer 1966).
- Costae are 3 to 4 in 10 micrometers (Patrick and Reimer 1975).
- Alveoli are 12 to 17 in 10 micrometers (Patrick and Reimer 1975).

Rouxia californica var. *minuta* (Cleve-Euler 1941) Cleve-Euler 1953

Length:58.5 Width:4.5 Striae:16

Collection 1159a Other images More information



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Authority information

(Cleve-Euler 1941) Eleve-Euler 1953, p. 134 (VanLandingham 1978).

Other images

This is a colorized version of the specimen image.

More information

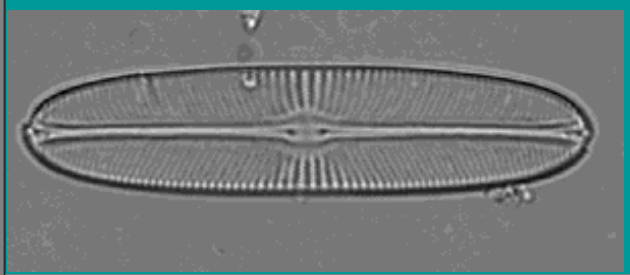
- Scanning electron micrographs and a discussion of valve morphology and the relation of *Rouxia* to *Amphipleura*, *Gomphopleura*, and rhaphidioid taxa may be found in Kociolek and Mahoney 1989.

- **Ecology**

Sellaphora bacillum (Ehrenb.) D. G. Mann

Length:42 Width :8 Striae:24

Collection 1175 Other images More information



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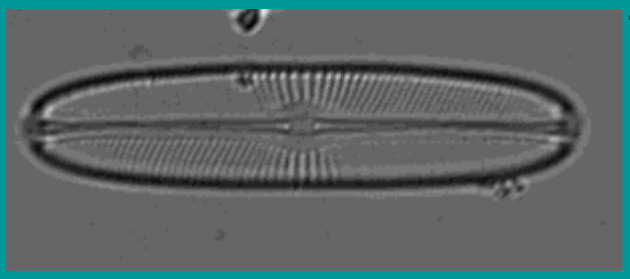
Authority information

Sellaphora bacillum Mann, D. G. The diatom genus Sellaphora: seperation from Navicula. Br. Phycol. J. 24:1-20 (Mann, D. G. 1989.

Other images



This image was taken using DIC.

More information

This taxon has a linear valve with slightly concave sides. The ends are rounded and the axial area is of different thickness than the siliceous thickening of the raphe. The central area is distinctand elliptical. There are clear terminal areas in extension to the sides of the valve. The striae are radiate and are somewhat curved throughout the valve (Patrick and Reimer 1966).

- **Synonyms**

  Navicula bacillum Ehr., Phys. Abh. Akad. Wiss. Berlin, for 1838:130. 1840 (Patrick and Reimer 1966).
  Navicula pseudobacillum Grun. *in* Cl. & Grun., K. Svenska Vet.-Akad. Handl., Ny Foljd, 17(2):45, pl. 2, fig. 52. 1880 (Patrick and Reimer 1966).
  Navicula bastianii Perag. *in* Temp. & Perag., Diat. Monde Entier, 2nd ed., p. 183. 1909 (Patrick and Reimer

1966).

- **Ecology**
  This taxon prefers fresh to slightly brackish water and is an alkaliphil. It is circumneutral pH (Patrick and Reimer 1966).

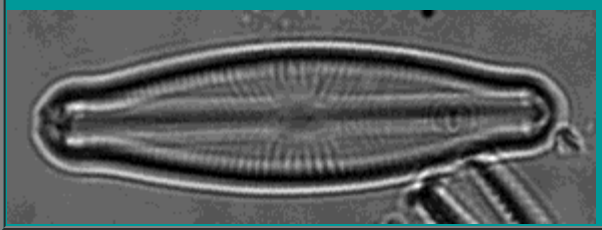
Size ranges and morphology

- Length is 30 to 89 micrometers (Patrick and Reimer 1966).
- Width is 10 to 20 micrometers (Patrick and Reimer 1966).
- Striae are 12 to 14 in 10 micrometers (Patrick and Reimer 1966).

***Sellaphora pupula* Mann**

Length:30 Width :8 Striae:22-24

Collection 802 Other images More information



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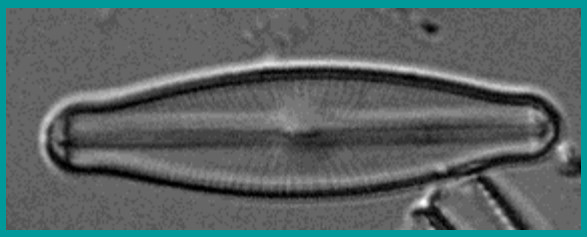
Authority information

Sellaphora pupula Mann, D. G. The diatom genus Sellaphora: seperation from Navicula. Br. Phycol. J. 24:1-20 (Mann, D. G. 1989).

Other images



This image was taken using DIC.

More information

This taxon has a linear-lanceolate valve with broad, rostrate ends. The axia area is narrow and the central area is a transverse fascia that almost reaches the margins of the valve. The terminal nodules transversly widened, and are marked by the end striae which are thicker than the rest. The terminal striae are parallel or slightly radiate and the striae in the center are distinctly radiate. The central area striae are short and irregular in length (Patrick and Reimer 1966).

- **Synonyms**

  Navicula pupula Kutz., Bacill., p. 93, pl. 30, fig. 40. 1844 (Patrick and Reimer 1966).

- **Ecology**

  This taxon prefers fresh, circumneutral water that has a high mineral content. It is halophilous (Patrick and Reimer 1966).

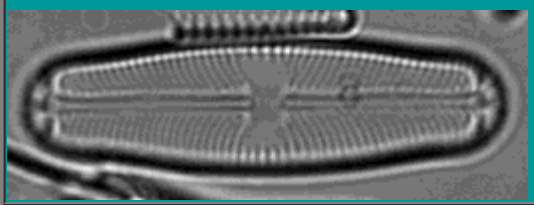
Size ranges and morphology

- Length is 20 to 40 micrometers (Patrick and Reimer 1966).
- Width is 7 to 11 micrometers (Patrick and Reimer 1966).
- Striae are 13 to 17 in 10 micrometers (Patrick and Reimer 1966).

Sellaphora pupulav rectangularis Mann

Length:28 Width :8 Striae:24-26

Collection 1109a Other images More information



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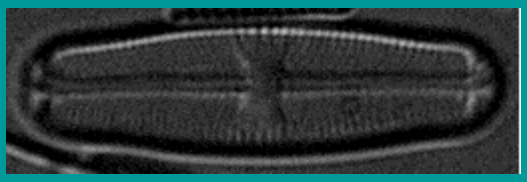
Authority information

*Sellaphora pupula*v. *rectangularis* Mann, D. G. The diatom genus Sellaphora: seperation from Navicula. Br.

Phycol. J. 24:1-20 (Mann, D. G. 1989).

Other images



This image was taken using DIC.

More information

This taxon has a linear valve that is slightly swollen in the middle. The ends are broadly rounded and the striae are the same as in the nominate variety (Patrick and Reimer 1966).

- **Synonyms**
  Stauroneis rectangularis Greg., Quart. Jour. Micr. Sci., 2:99, pl. 4, fig. 17. 1854 (Patrick and Reimer 1966).
  *Navicula pupula*var.*rectangularis* (Greg.) Grun. *in* Cl. & Grun., K. Svenska Vet.-Akad. Handl., Ny Goljd, 17(2):45. 1880 (Patrick and Reimer 1966).
  Navicula pupula var. *bacillaroides* Grun. *in*Cl. & Grun., K. Svenska Vet.-Akad. Handl., Ny Foljd, 17(2):45. 1880 (Patrick and Reimer 1966).

- **Ecology**
  This taxon prefers water with a higher mineral content than the nominate variety does and it has been found in salt bogs (Patrick and Reimer 1966).

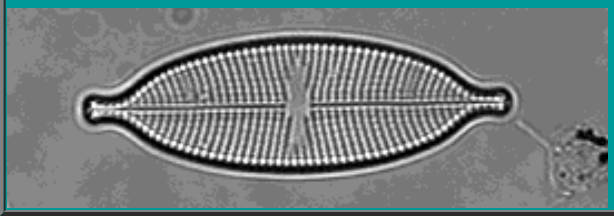
Size ranges and morphology

- Length is 20 to 40 micrometers (Patrick and Reimer 1966).
- Width is 7 to 11 micrometers (Patrick and Reimer 1966).
- Striae are 13 to 17 in 10 micrometers (Patrick and Reimer 1966).

Stauroneis anceps var. *americana* Reim. 1961

Length:49 Width:12 Striae:26-28

Collection 827 Other images More information



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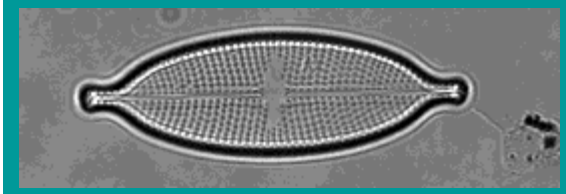
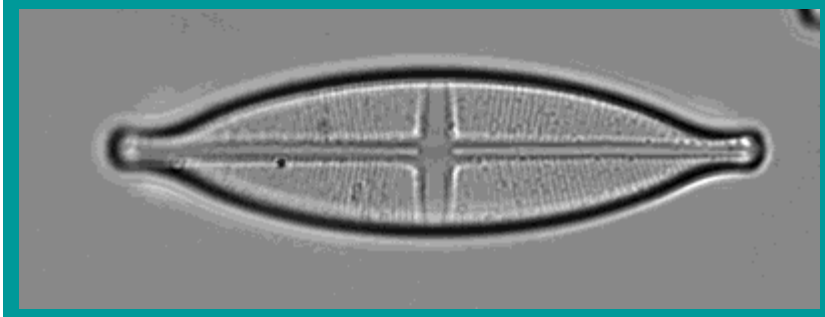
Authority information

Reim., Proc. Acad. Nat. Sci. Philadelphia, 113: 199, pl. 2, fig. 11. 1961. (Patrick and Reimer 1966).

Other images





More information

- **Synonyms** (Patrick and Reimer 1966)
  None

- **Ecology**
  Insufficiently known (Patrick and Reimer 1966).

Size ranges and morphology

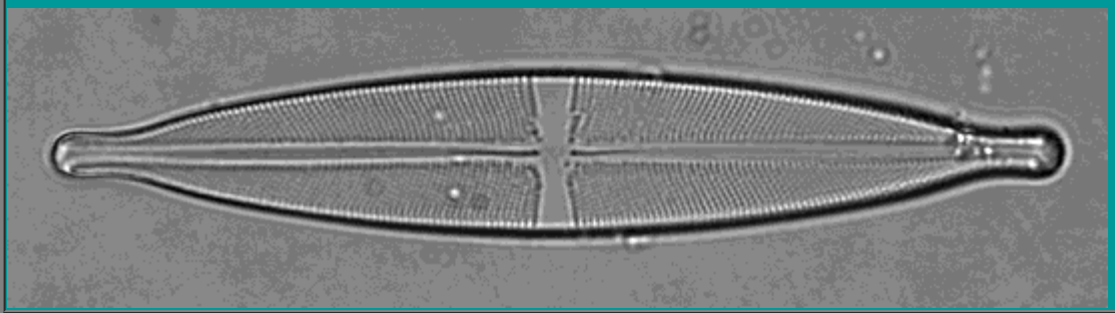
- Length is 48-50 micrometers (Patrick and Reimer 1966).
- Breadth is 12.5 micrometers (Patrick and Reimer 1966).
- Striae range is 26-28 per 10 micrometers (Patrick and Reimer 1966).
- Puncta range is approximately 30 per 10 micrometers (Patrick and Reimer 1966).

- Other morphological features:
  Valve with protracted attenuate-rostrate ends. Stauros linear and bordered by a row of coarse puncta. (Patrick and Reimer 1966).

Stauroneis anceps f. *gracilis* Rabh. 1864

Length:73.5 Width:12 Striae:22

Collection 1174a Other images More information



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Authority information

Ravh., Fl. Europaea Alg., sect. 1, p. 247. 1864. (Patrick and Reimer 1966).

Other images

More information

- **Synonyms** (Patrick and Reimer 1966)
  Stauroneis anceps var. *gracilis* Brun, Diat. Alpes Jura, p. 89, pl. 9, fig. 2. 1880.

- **Ecology**
  Occurs with the nominate variety. (Patrick and Reimer 1966).

  Size ranges and morphology

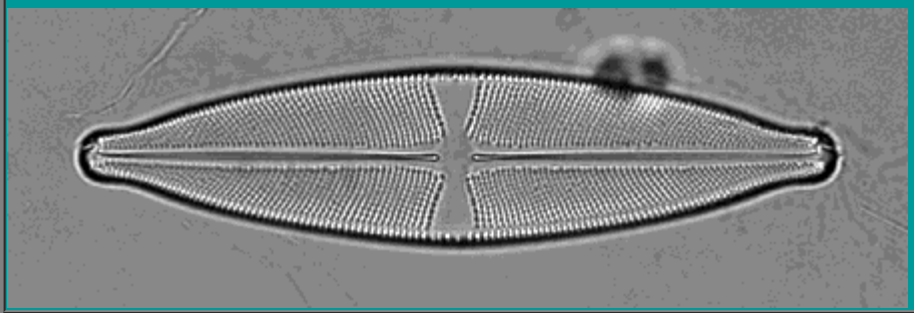
  - Length is 40-55 micrometers (Patrick and Reimer 1966).
  - Breadth is 8-10 micrometers (Patrick and Reimer 1966).
  - Striae usually not coarser than 26 in 10 micrometers (Patrick and Reimer 1966).
  - *Note:* The size ranges given by Patrick and Reimer differ from the measurements of our specimen.

    - Other morphological features:
      Valve elongate, elliptical-lanceolate with extremely narrowed capitate ends; otherwise as variety *anceps*. (Patrick and Reimer 1966).

Stauroneis phoenicenteron (?) (Nitz.) Ehr. 1817.

Length:82 Width:20 Striae:15

Collection 1169 Other images More information



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Authority information

(Nitz.) Ehr., Phys. Abh. Akad. Wiss. Berlin, for 1841:387, pl. 2(5), fig. 1; pl. 3(1), fig. 17. 1843 (Patrick and Reimer 1966).

Other images

More information

- **Synonyms** (Patrick and Reimer 1966)
  Stauroneis lanceolata Kutz., Bacill., p. 104, pl. 30, fig. 24. 1844.
  Stauroneis phoenicenteron var.*lanceolata* (Kutz.) Brun, Diat. Alpes Jura, p.89, pl. 9, fig. 5. 1880.
  Stauroneis phoenicenteron var.*genuina* Cl., K. Svenska Vet.-Akad. Handl., Ny Foljd, 26(2):149. 1894.
  *Stauroneis phoenicenteron*var.*baileyi* (Ehr.) Cl., K. Svenska Vet-Akad. Handl., Ny Foljd, 26 (2): 149. 1894.

- **Ecology**
  Oligohalob, pH "indifferent:; apparently has a wide range of ecological tolerances.(Patrick and Reimer 1966).

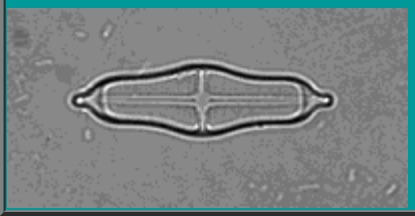
  Size ranges and morphology

  - Length is 70-380 micrometers (Patrick and Reimer 1966).
  - Breadth is 16-53 micrometers (Patrick and Reimer 1966).
  - Striae range is 12-17 per 10 micrometers (Patrick and Reimer 1966).
  - Puncta range is variable. (Patrick and Reimer 1966).

Stauroneis smithii Grun. 1860

Length:27 Width:8 Striae:26

Collection 1175a Other images More information



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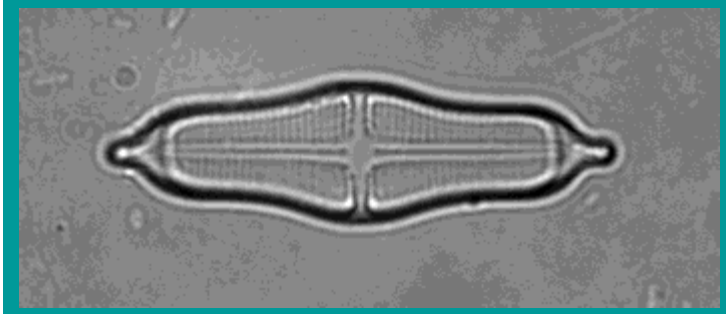
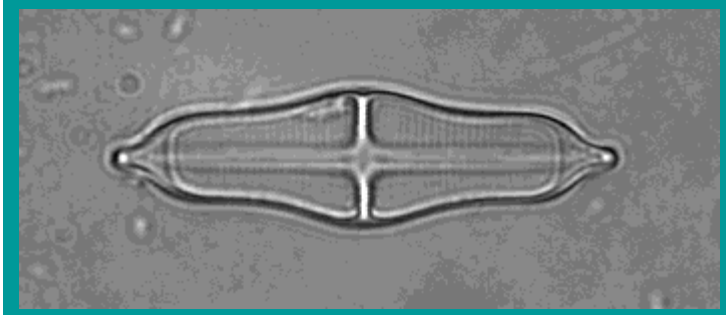
Authority information

Grun., Verh. Zool.-Bot. Ges. Wien, 10:564, pl. 6, fig. 16. 1860. (Patrick and Reimer 1966).

Other images





More information

- **Synonyms** (Patrick and Reimer 1966)
  Stauroneis linearis Ehr.*sensu* W. Sm., Syn. British Diat., vol. 1, p. 60, pl. 19, fig. 193. 1853.

- **Ecology**
  Alkaliphilous, eurytopic. (Patrick and Reimer 1966).

  ### Size ranges and morphology

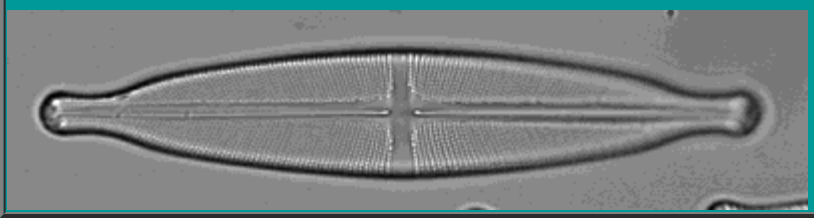
  - Length is 14-40 micrometers (Patrick and Reimer 1966).
  - Breadth is 4-9 micrometers (Patrick and Reimer 1966).
  - Striae range is 26-30 per 10 micrometers (Patrick and Reimer 1966).

    - Other morphological features:
      Characterized by the deep, narrow fascia; triundulate sides; and apiculate ends. (Patrick and Reimer 1966).

Stauroneis sp.1

Length:76.5 Width:12.5 Striae:22

Collection 1404 Other images More information



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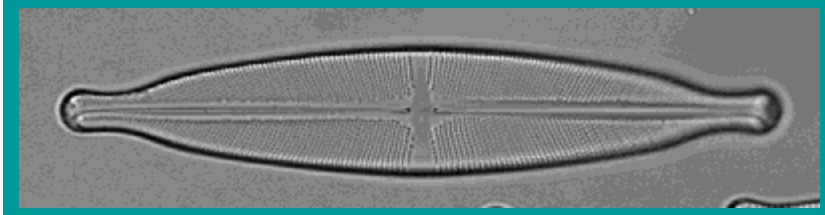
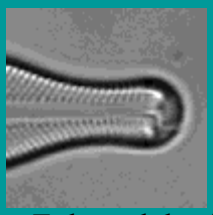
Authority information

Ehr., Ber. Akad. Wiss. Berlin, for 1843: 45. 1843. (Patrick and Reimer 1966).

Other images





- Enlarged detail showing the distal end of the raphe.

More information

- **Synonyms**
- **Ecology**

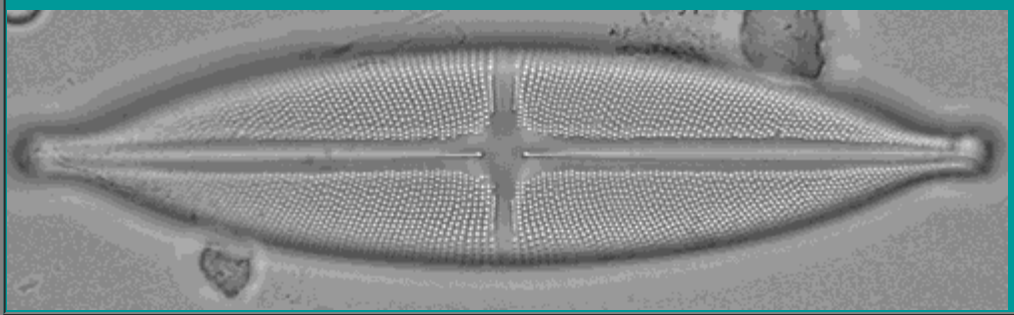
Size ranges and morphology

- Other morphological features:

Stauroneis sp.3

Length:106 Width:24 Striae:14

Collection 1162a Other images More information



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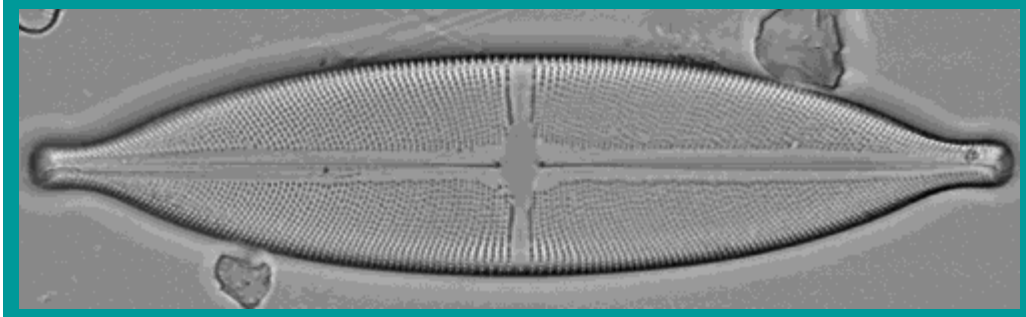
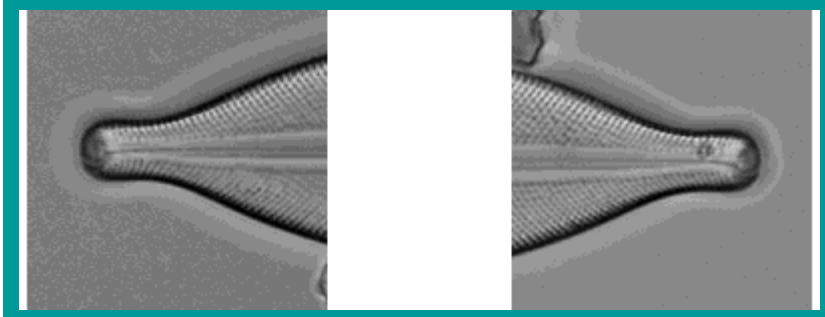
Authority information

Ehr., Ber. Akad. Wiss. Berlin, for 1843: 45. 1843. (Patrick and Reimer 1966).

Other images





- Detail of the distal raphe endings.

More information

- **Synonyms**
- **Ecology**

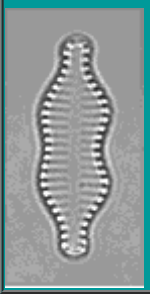
Size ranges and morphology

- Other morphological features:
  Note the unusual "bars" on the edge of the stauros.

*Staurosira construens*var.*binodis* (Ehr.) Hamilton in Hamilton et al.

Length: 18 Width: 4 Striae:15

Collection 1545 Other images More information



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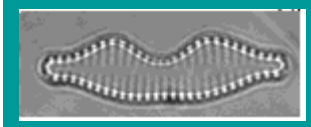
Authority information

For new variety combination, see Hamilton et al. (1992). For genera transfer see Williams and Round (1987).

Other images



From E. F. Stoermer's collection 1417.

More information

- The valves of this species are biundulate with constricted middle portions and protracted, rostrate to capitate ends (Stoermer and Yang 1969).
- **Synonyms** (Patrick and Reimer 1966)

  Fragilaria binodis Ehrenberg, Mikrogeol., pl. 5(2), fig. 26; pl. 6(1), fig. 43; pl. 11, fig. 15. 1854.

  Fragilaria construens var. *binodis*(Ehr.) Grunow 1862.
- **Ecology**

  This species is found in cool fresh water and can tolerate high conductivity(Patrick and Reimer 1966). Asymmetric specimens, with a stronger constriction on one side than the other, are most commonly found in eutrophic waters (see "Other Images" above) (Stoermer and Yang 1969).

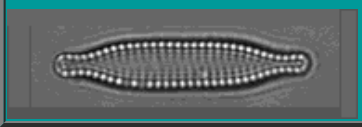
Size ranges and morphology

- Length is 15-35 micrometers (Patrick and Reimer 1966).
- Breadth is 3.5-8 micrometers (Patrick and Reimer 1966).
- Striae range is 14-17 per 10 micrometers (Patrick and Reimer 1966).
- The size range and ornamentation is similar to the nominate variety (Stoermer and Yang 1969).

Staurosira sp. 1

Length: 21 Width: 4 Striae:15

Collection 1274a Other images More information



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Authority information

This variety has been reported as *Fragilaria construens* var. *capitata*(Stoermer and Yang 1969). Based on preliminary observations and genus description of Williams and Round (1987), it may be more appropriate in the genus *Staurosira*.

However, further investigation is necessary before the transfer can be made.

More information

- The valves of this variety are linear to lanceolate in shape with protracted, capitate ends. Often the middle portion of the valve is constricted (Stoermer and Yang 1969). The ornamentation is similar to that of the nominate variety (Stoermer and Yang 1969).
- **Synonyms**

  *Fragilaria construens*var. *capitata* Heribaud 1893.
  - **Ecology**

    Size ranges and morphology

    In Lake Michigan the length ranges from 12-30 micrometers and the breadth is 4-7 micrometers (Stoermer and Yang 1969). The striae number range from 14-16 striae in 10 micrometers (Stoermer and Yang 1969).

Staurosira sp. 2

Length: 5 Width: 2.5 Striae:16

Collection 1565 Other images More information

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Authority information

This variety has been reported as *Fragilaria construens* var. *minuta* Temp.& Perag. (Stoermer and Yang1969). Based on preliminary observations and genus description of Williams and Round (1987), it may be more appropriate in the genus *Staurosira* . However, further investigation is necessary before the transfer can be made.

More information

- This variety is smaller than the nominate. Its valves are elliptical to lanceolate is shape and has finer striae than the nominate (16-20 striae in 10 micrometers)(Stoermer and Yang1969). This variety is most closely related to *Staurosira construens* var. *venter* but does have a narrower valve and finer striae.
- **Synonyms** (Patrick and Reimer 1966)

  Fragilaria construens var. *minuta*Tempere and Peragallo, Diat. Monde Entier, ed. I, no.89. 1889.
  - **Ecology**

    This species is uncommon in modern populations in the Great Lakes. It has been recorded in fossil deposits from the upper Great Lakes(Stoermer and Yang1969).

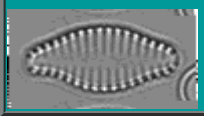
    Size ranges and morphology

    In the Great Lakes:
    - the length ranges from 4-10 micrometers (Stoermer and Yang1969)
    - the breadth ranges from 2-3 micrometers (Stoermer and Yang1969)
    - striae range is 16-20 per 10 micrometers (Stoermer and Yang1969)

Staurosira sp. 3

Length: 12 Width: 6 Striae:14

Collection 1264 Other images More information



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Authority information

This variety has been reported as *Fragilaria construens* var. *pumila* Grun. (Patrick and Reimer 1966); (Stoermer and Yang1969). Based on preliminary observations and genus description of Williams and Round (1987), it may be more

appropriate in the genus *Staurosira* . However, further investigation is necessary before the transfer can be made.

More information

- This variety is distinguished by its elliptical to lanceolate shape with round to rostrate apices (Patrick and Reimer 1966). Its size range and ornamentation are similar to the nominate variety (Stoermer and Yang1969). This variety is most closely related to *Staurosira construens* var. *venter*.
- **Synonyms** (Patrick and Reimer 1966)

  Fragilaria construens var. *pumila*Grun. 1881.
  - **Ecology**

    This species is widely distributed with the nominate variety (Patrick and Reimer 1966).

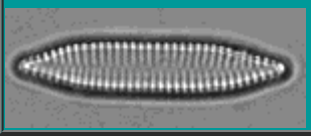
    Size ranges and morphology

    - Length is 10-20 micrometers (Patrick and Reimer 1966).
    - Breadth is 3-5 micrometers (Patrick and Reimer 1966).
    - Striae range is 17-18 per 10 micrometers (Patrick and Reimer 1966).

Staurosira sp. 4

Length:21 Width:4 Striae:18

Collection 1341a Other images More information



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Authority information

Based on preliminary observations and genus description of Williams and Round (1987), this variety may be more appropriate in the genus *Staurosira*. However, further investigation is necessary before the transfer can be made.

More information

Originally, the pictured specimen was identified as *Fragilaria construens* var. *subsalina* Hustedt by Stoermer and Yang (1969) and the following information refers to this taxon. The valves are linear with parallel sides. The larger specimens have somewhat protracted ends. The size and ornamentation are similar to that of the nominate variety (Stoermer and Yang 1969).

- **Synonyms** (Stoermer and Yang 1969)

  Fragilaria construens var. *subsalina* Hustedt Mitt. geogr. Ges., Naturhist. Mus. Lubeck, 2 Reihe 30: 106, figs. 5-8. 1925.

  - **Ecology**

Size ranges and morphology

*Staurosira construens*var.*venter* (Ehr.) Hamilton in Hamilton et al.

Length: 9 Width: 6 Striae:12

Collection 1574 Other images More information

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Authority information

For new variety combination, see Hamilton et al. (1992). For genera transfer see Williams and Round (1987).

Other images

More information

- This variety is an intermediate between *Staurosira construens* var. *construens* and *Staurosira construens* var. *pumila*(Patrick and Reimer 1966).
- **Synonyms** (Patrick and Reimer 1966)
  Fragilaria construens var. *venter*(Ehr.) Grun. *in* V.H., Syn. Diat. Belgique, p. 45, fig. 21b, 22, 23, 24b, 26a-b. 1881.
  Fragilaria venter Ehr. 1854.

- **Ecology**
  This species is widely distributed in waters with low nutrient levels(Patrick and Reimer 1966).

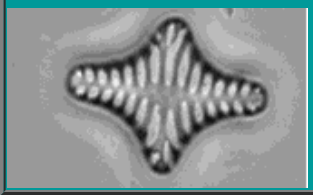
  Size ranges and morphology

  - Length is 5-9 micrometers (Patrick and Reimer 1966).
  - Breadth is 3-6 micrometers (Patrick and Reimer 1966).
  - Striae range is 14-17 per 10 micrometers (Patrick and Reimer 1966).
  - In Lake Michigan samples, the length does not exceed 10 micrometers (Stoermer and Yang 1969).

Staurosirella leptostauron (Ehrenb.) Williams and Round 1987

Length:15 Width:11 Striae: 9

Collection 802 Other images More information



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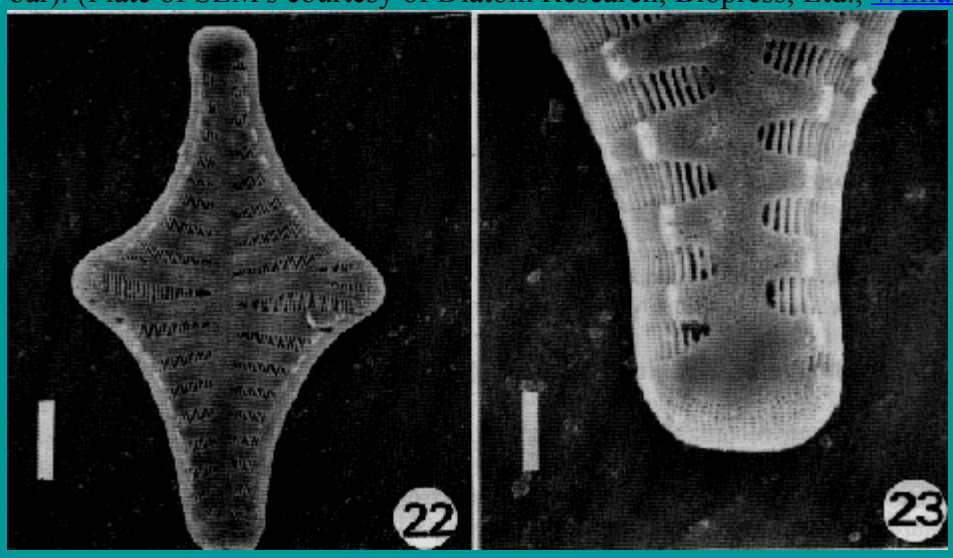
Authority information

(Ehr.) Hust. *in* Rabh., Kryptog.-Fl. Deutschland, vol. 7(2), no. 1, p. 153, fig. 668a-b (Williams and Round 1987).

Other images

Fig. 22. *Staurosirella leptostauron* SEM (6.5 micrometer bar). Fig. 23. SEM of large apical field pore visible on valve apex (2.5 micrometer bar). (Plate of SEM's courtesy of Diatom Research, Biopress, Ltd., Williams and Round 1987)



More information

Originally, the pictured specimen was identified as *Fragilaria leptostauron* as described by Patrick and Reimer 1966 , and the following information refers to this taxon.
Fragilaria leptostauron frustules are attached by valve faces into short, irregular, band-shaped colonies (Stoermer and Yang 1969).

- **Basionym** (Patrick and Reimer 1966)
  Biblarium leptostauron Ehr. 1854
  - **Synonyms**(Patrick and Reimer 1966)
    Fragilaria leptostauron (Ehr.) Hust. *in* Rabh., Kryptog.-Fl. Deutschland, vol. 7(2), no. 1, p. 153, figs. 668a-b. 1931.
    Staurosira pinnata Ehr., Mikrogeol., pl. 5(2), fig. 24. 1854.
    Odontidium? harrisonii W. Sm., Syn. British Diat., vol. 2, p. 18, pl. 60, fig. 373. 1856.
    Fragilaria harrisonii (W. Sm.) Grun., Verh. Zool.-Bot. Ges. Wien, 12: 368. 1862.
    - **Ecology**
      Fragilaria leptostauron is common in freshwater systems. It is usually found in shallow water and often on mud surfaces (Patrick and Reimer 1966).

Size ranges and morphology

For *Fragilaria leptostauron* :
- Length is 15-36 micrometers (Patrick and Reimer 1966).
- Breadth is 10-23 micrometers (in middle of valve) (Patrick and Reimer 1966).
- Striae range is 5-9 per 10 micrometers (Patrick and Reimer 1966).
  - In Lake Michigan, the length of *Fragilaria leptostauron* ranges from 8-30

micrometers. The breadth ranges from 7-18 micrometers and the striae are 5-9 in 10 micrometers. In the Great Lakes samples, this species was highly variable in valve shape and deformed and abnormal specimens were commonly found (Stoermer and Yang 1969).

*Staurosirella leptostauron*var. *dubia* (Grun.) Edlund

Length:18 Width:5 Striae:9

Collection 1341a Other images More information

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Authority information

For new variety combination, see Edlund (1994). For genera transfer see Williams and Round (1987).

Other images

More information

Originally, the pictured specimen was identified as *Fragilaria leptostauron* var. *dubia* by (Stoermer and Yang 1969) and the following information refers to this taxon. *Fragilaria leptostauron* var. *dubia* lacks the expanded central area that is characteristic of the nominate (Patrick and Reimer 1966). The valves have a elliptical-lanceolate shape, although the central area varies in width (Patrick and Reimer 1966)

- **Synonyms**(Patrick and Reimer 1966)

  Fragilaria harrisonii var. *dubia* Grun. 1862.
  Fragilaria leptostauron var. *dubia* (Grun.) Hust. 1931.

  - **Ecology**

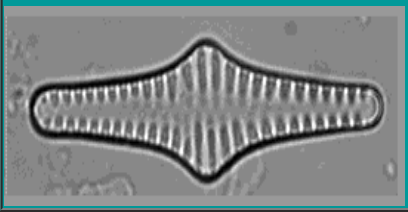
    Size ranges and morphology

    - Length is 10-15 micrometers (Patrick and Reimer 1966).
    - Breadth is 3-7 micrometers (in middle of valve) (Patrick and Reimer 1966).
    - Striae range is 6-11 per 10 micrometers (Patrick and Reimer 1966).

Staurosirella sp. 1

Length: 37 Width: 10 Striae:9

Collection 1158 Other images More information



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Authority information

Based on preliminary observations and genus description of Williams and Round (1987), this variety may be more appropriate in the genus *Staurosirella*. However, further investigation is necessary before the transfer can be made.

More information

Originally, the pictured specimen was identified as *Fragilaria leptostauron* var. *fossilis* (Pant.) Rehakova by Stoermer and Yang (1969) and the following information refers to this taxon. Compared to the nominate variety, this variety's valves are elongated at the apical axis and less strongly swollen at the mid section of the valve (Stoermer and Yang 1969).

- **Synonyms** (Stoermer and Yang 1969)
  Staurosira harrisonii var. *fossilis* Pant. 1902

  Fragilaria leptostauron var. *fossilis* (Pant.) Rehakova, Rozpr. Ustred. Ust. geol. Ceskoslavokia, 32: 37, pl. 11, figs. 17-18. 1965.

  - **Ecology**

  Size ranges and morphology

  The maximum size of this variety exceeds the nominate variety. Specimens in the Great Lakes collections reach 45 micrometers in length (Stoermer and Yang 1969).

Staurosirella pinnata (Ehrenb.) Williams and Round, *comb. nov.* 1987

Length: 9 Width: 4 Striae:10

Collection 1226 Other images More information

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Authority information

Williams and Round 1987

More information

Originally, the pictured specimen was identified as *Fragilaria pinnata* in Patrick and Reimer 1966 , and the following information refers to this taxon.
This species is attached by the valve faces into band-like colonies (Stoermer and Yang 1969).

- **Basionym** (Williams and Round 1987)
  Fragilaria pinnata Ehrenberg 1843b: 415, pl. 3 (6), fig. 8 a-e.
  - **Synonyms** (Patrick and Reimer 1966)
    Fragilaria elliptica Schum. 1867

- **Ecology**
  Fragilaria pinnata is widely distributed in freshwater systems (Patrick and Reimer 1966). In the Great Lakes, specimens of this species were scattered in collections from nearshore areas from Lake Michigan. Occasionally this species was found in low numbers in offshore collections, especially during the fall months (Stoermer and Yang 1969).

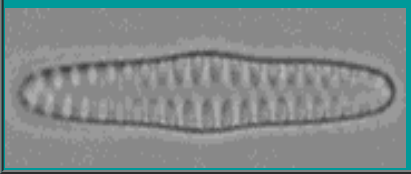
Size ranges and morphology

- For *Fragilaria pinnata* :
- Length is 3-35 micrometers (Patrick and Reimer 1966).
- Breadth is 2-6 micrometers (Patrick and Reimer 1966).
- Striae range is 7-12 per 10 micrometers (Patrick and Reimer 1966).
- In Lake Michigan, the length of *Fragilaria pinnata* ranges from 5-30 micrometers. The breadth ranges from 2-6 micrometers and the striae numbers range from 8-11 striae in 10 micrometers (Stoermer and Yang 1969).

*Staurosirella pinnata*var. *intercedens* (Grun. *in* VanHeurck) Hamilton *in* Hamilton et al. 1994

Length: 24 Width: 4 Striae: 9

Collection 1284a Other images More information



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Authority information

For new variety combination, see Hamilton et al. (1994). For genera transfer see Williams and Round (1987).

More information

Originally, the pictured specimen was identified as *Fragilaria pinnata* var. *intercedens* in Stoermer and Yang (1969)) and the following information refers to this taxon.

- **Synonyms** (Patrick and Reimer 1966)

  Fragilaria pinnata var. *intercedens*(Grun.) Hust.*in* Rabh., vol. 7(2), no. 2, p. 161. 1931
  Odontidium mutabile W. Smith 1856
  Fragilaria mutabile Grunow 1862
  Fragilaria mutabile var. *intercedens* Grunow 1881

- **Ecology**

  Fragilaria pinnata var. *intercedens* is a tolerant, freshwater species (Patrick and Reimer 1966).

Size ranges and morphology

For *Fragilaria pinnata* var. *intercedens* :

- Length is 15-34 micrometers (Patrick and Reimer 1966).
- Breadth is 4-6 micrometers (Patrick and Reimer 1966).
- Striae range is 6-8 per 10 micrometers (Patrick and Reimer 1966).

Staurosirella sp. 1

Length:7 Width:3 Striae:14

Collection 1565 Other images More information

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Authority information

Based on preliminary observations and genus description of Williams and Round (1987), this variety may be more appropriate in the genus *Staurosirella*. However, further investigation is necessary before the transfer can be made.

More information

Originally, the pictured specimen was identified as *Fragilaria pinnata* var. *lancettula* as described by Stoermer and Yang (1969) and the following information refers to this taxon. This variety is distinguished from the nominate by its valve shape. The valves are lanceolate with a swelled midportion and protracted, somewhat asymmetrical ends (Stoermer and Yang 1969). The striae are crossed by lines and often appear granulate (Patrick and Reimer 1966).

- **Synonyms** (Stoermer and Yang 1969)
  Fragilaria lancettula Schumann, 1867.
  Fragilaria pinnata var. *lancettula* (Schum.) Hust. *in* A. Schmidt, Atlas Diat., pl. 297, figs. 51 and 59-64. 1913.

- **Ecology**
  Patrick and Reimer (1966) contend that this species probably overlooked and may have a wider distribution than species records demonstrate. This species is found in fresh water to slightly brackish or high conductivity water (Patrick and Reimer 1966).

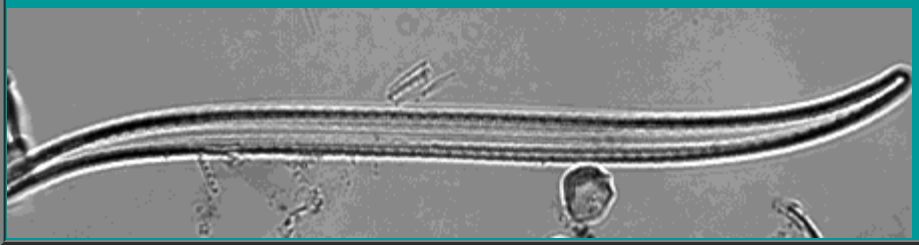
Size ranges and morphology

- The length ranges from 4-12 micrometers with a length-breadth ratio of 2:1 (Patrick and Reimer 1966).
  - The striae are 10-11 in 10 micrometers (Patrick and Reimer 1966).

Stenopterobia intermedia (Lewis) V.H.

Length:95 Width:6 Striae: 20 to 24 Keel Puncta:6 to 7

Collection C-17 Other images More information



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Authority information

Stenopterobia intermedia (Lewis) V.H., Treat. Diat., p. 374. 1896.(Patrick and Freese 1960)

Other images

This image was taken utilizing DIC for the specimen above.

More information

- **Synonyms**
  Surirella intermedia Lewis, Proc. Acad. Sci. Philadelphia, 15: 339, pl. 3, fig. 2 a-b. 1864.(Patrick and Freese 1960)

- **Ecology**
  This taxon prefers fresh water and a pH of around 7.6(Patrick and Freese 1960).

Size ranges and morphology

***Stephanodiscus alpinus* Hustedt**

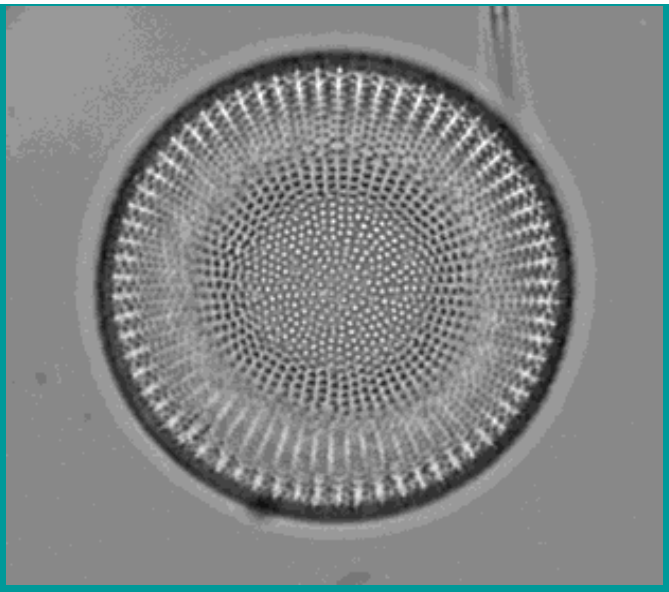
Diameter: 31

Areolae: 7

Collection 1189

Other images

More information



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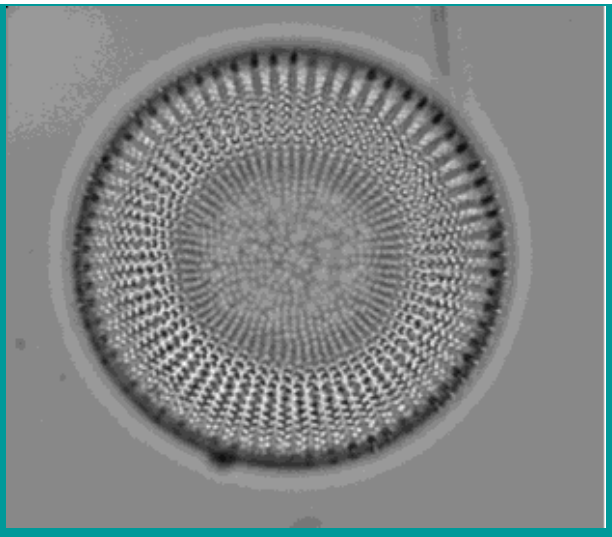
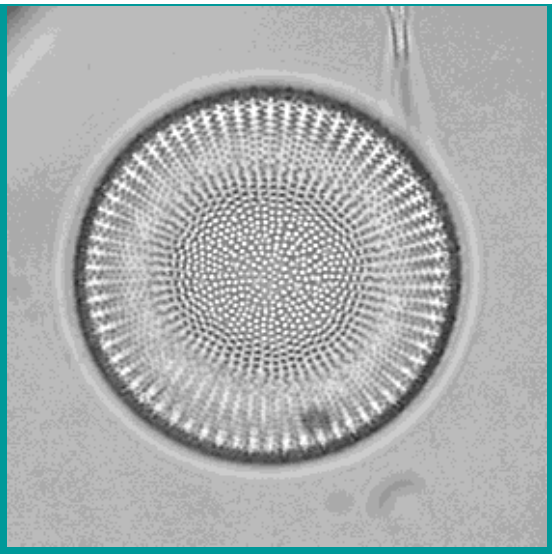
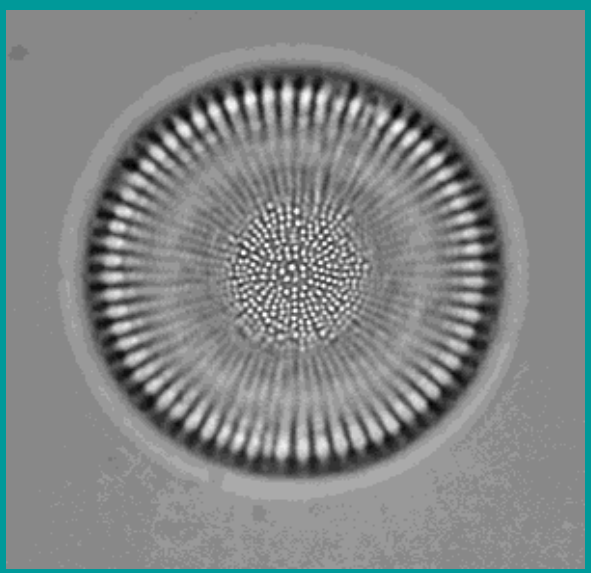
Authority information

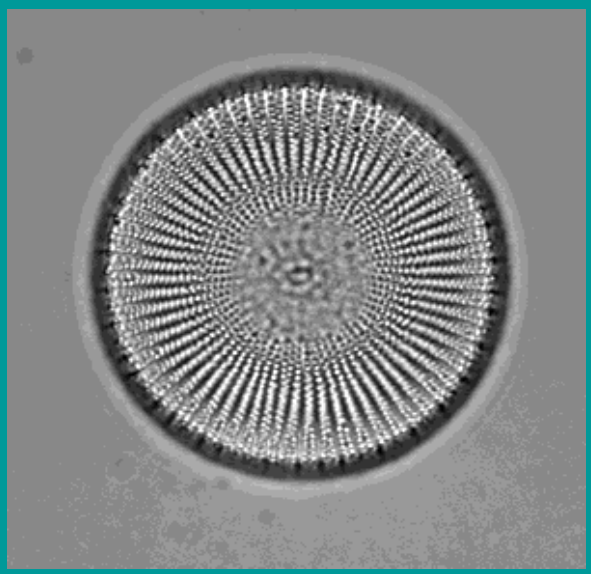
Other images

These two images of the specimen depict different focal planes.









More information

- *Stephanodiscus alpinus* has been investigated by Hakansson and Stoermer (1984). Original material and Great Lakes material have been compared by Hakansson and Stoermer (1984) and Theriot and Stoermer (1982). The Great Lakes material shows greater variability than the type material, however material from the type locality show as much variability as the Great Lakes material (Hakansson and Stoermer 1984). The diameter range is 7-33 um. The striae are for the most part biseriate near the margin however triseriate fasicles are known (see Hakansson and Stoermer 1984, fig. 16). [Specimens from Lake Michigan have been found in which the striae are composed of a single series of areolae for most of the stria until just at the margin the areolae become a double series for one or two areolae.] This should be considered part of the morphological variability present in this taxon. The fascicles are separated by conspicuous interfascicles (sometimes called "ribs" in older literature). Generally spines are located at the margin of each interfascicle. There is some variation in this character. Sometimes spines are broken off while in other cases the spine never developed. It is impossible to differentiate between these conditions at the light microscope level. The valve face is concentrically undulate. Both concave and convex central areas are known.

For SEM's of *Stephanodiscus alpinus* see Gaul et al. 1993.

- **Ecology**

  According to Stoermer and Ladewski (1976) *Stephanodiscus alpinus* appears to prefer temperatures below 2 degrees Celcius however it is present in low numbers throughout the investigated temperature range (up to 24 degrees Celcius). It is a winter dominant in Lake Ontario (Stoermer et al. 1975) and a component of the spring pulse in Lake Erie continuing throughout the year (Hohn 1969). It is present in Lakes Huron and Superior where its abundance is low (Stoermer and Ladewski 1976). Huber-Pestalozzi (1942) states that it is bound to low temperatures and found in the hypolinmion of lakes in the eastern alps. It appears to tolerate slight nutrient enrichment (Stoermer and Yang 1970).

Size ranges and morphology

Stephanodiscus sp. aff. *transilvanicus*

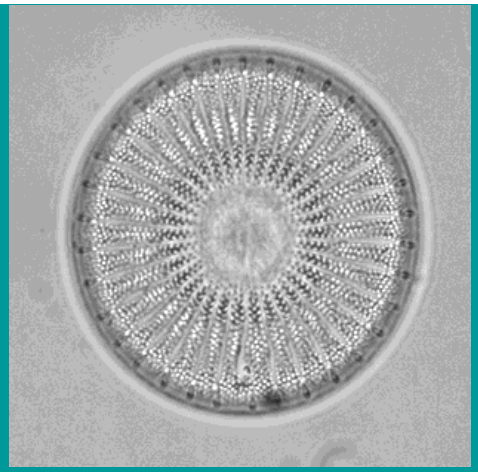
Diameter: 40.75

Areolae: 3

Collection 1189

Other images

More information



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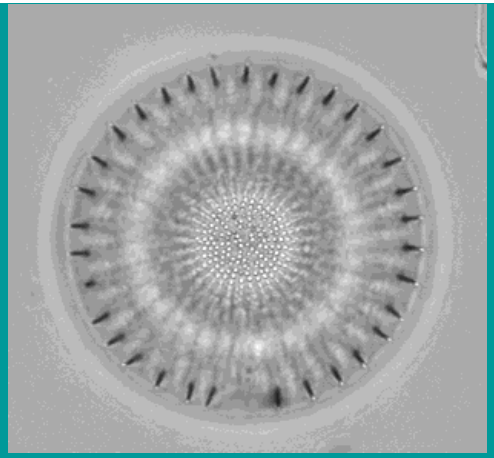
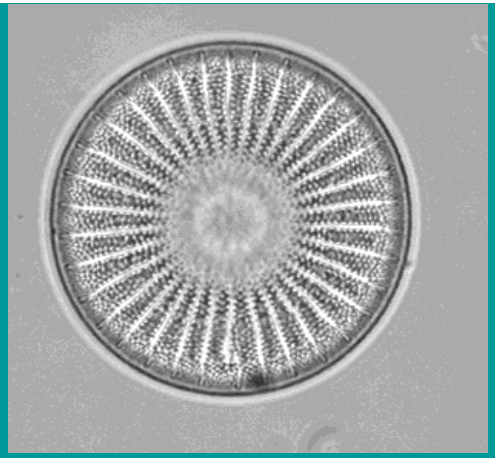
Authority information

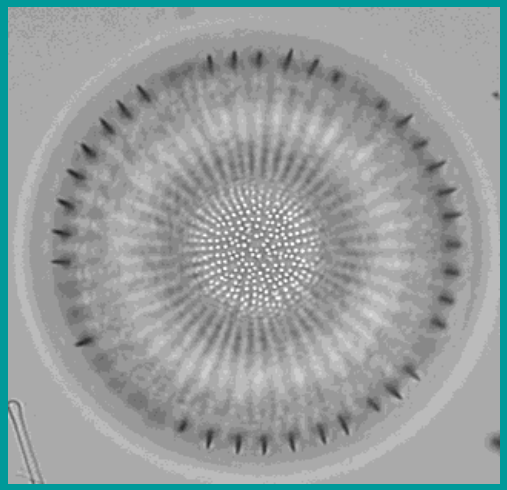
Other images

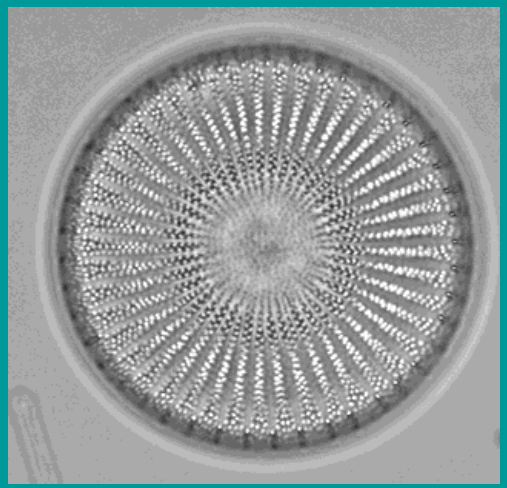
The following images of the specimens depict different focal planes.



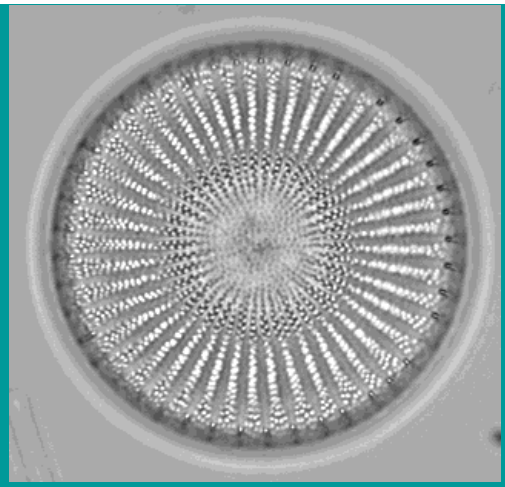


E. F. Stoermer slide collection 1189





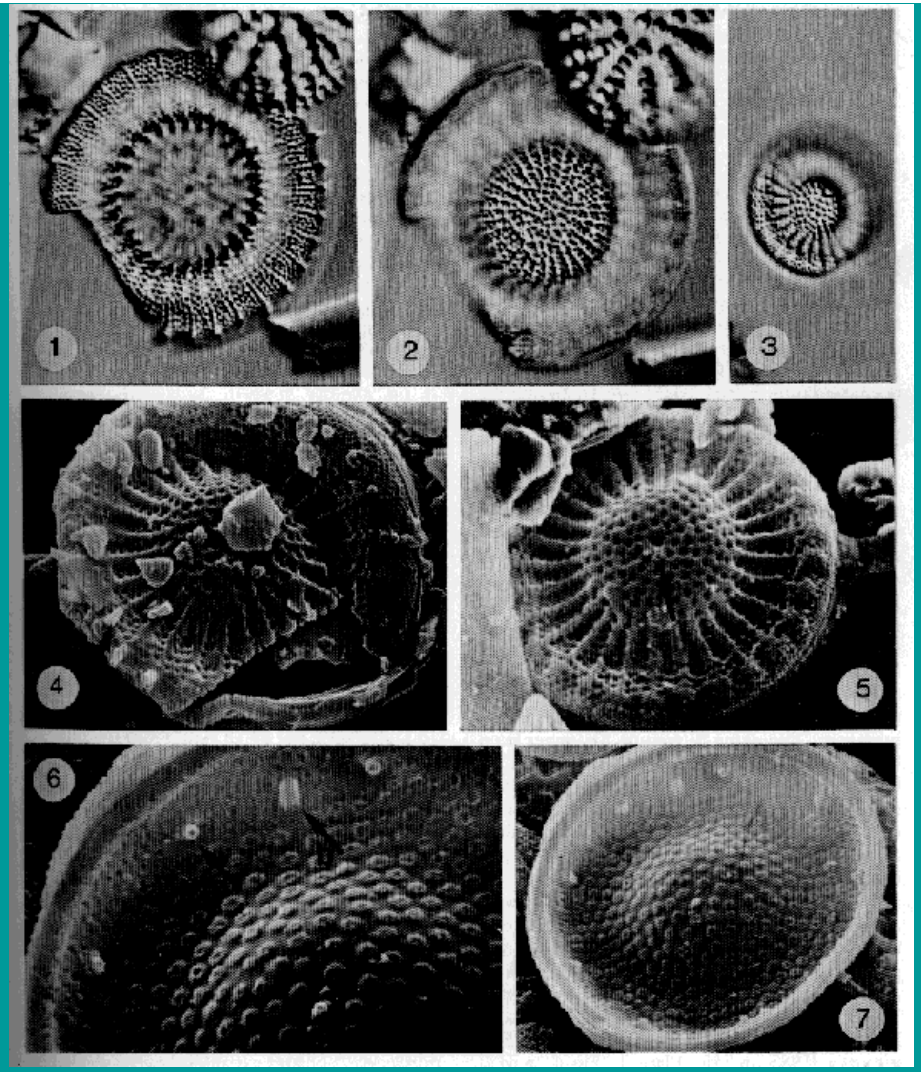
E. F. Stoermer slide collection 1188



More information

- The images presented here are examples of the morphological entity which has been named *Stephanodiscus transilvanicus* in all reports emminating from the Phytoplankton Laboratory of the Great Lakes Research Divison (now the Center for Great Lakes and Aquatic Sciences). All records developed for the United States Environmental Protection Agency, Great Lakes National Program Office from 1981-1988 and reported in Makarewicz (1987 and 1988) refer to the morphological entity pictured here.
Although this taxon is very distinctive there has been considerable taxonomic confusion associated with it. The multiseriate fascicles and the wide interfascicles should distinguish it from other taxa. There appears to be some morphological variability in the number of areolae at the margin which are reported by Stoermer and Yang (1969) to be 4-6. Areolae vary in placement and size giving a range of 14-20 in 10 micrometers. Fascicles and spines are 3-5 in 10 micrometers at the margin. Spines are robust usually with a spine near the margin of each interfascicle. The attachment of the spine is away from the margin. The valve is concentrically undulate with both concave and convex valves known.

Gaul et al. (1993) cite two SEM's of *Stephanodiscus transilvanicus*. The specimen illustrated in Thayer et al. (1983) is not conspecific with the specimens in Hakansson (1986) where *Stephanodiscus transilvanicus* has been typified. Presented here is a scanned image of the type designated by Hakansson in Diatom Research 1(1):29.



The image is used with the permission of BioPress, publisher of Diatom Research.

The true identity of the morphological entity we present is in need of additional taxonomic work.

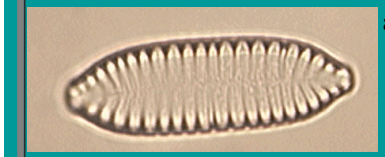
- **Ecology**
  Little can be said concerning the ecology of this taxon because of the taxonomic confusion asssociated with it. The work of Stoermer and Yang (1970) and Stoermer and Ladewski (1976) provide what little is known. It is abundant in the offshore waters of Lake Michigan in the present while historical collections showed it to be abundant in the nearshore areas also. It appears to have its greatest development in oligotrophic waters and tolerates some enrichment. Its apparent temperature preference is approximately 6 degrees Celcius. In Lake Ontario it is apparently absent from the modern flora but is a dominant in the sedimentary flora (Stoermer et al. 1985).

Size ranges and morphology

***Surirella angusta* Kutzing 1844**

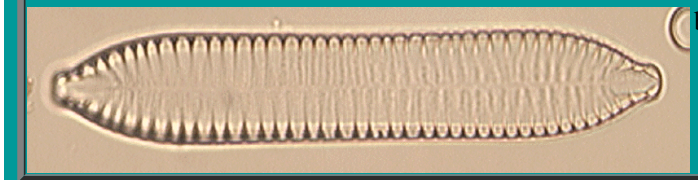
Length (a): 32 Width (a): 10 Keel (a): 6 to 7 Length (b): 87 Width (b): 12 Wing canal (b): 70 ribs in 100

Collection: (a)1223 (b)842 More information



a.

Here are pictures of two *Surirella angustata* that have different lengths.



b.

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Authority information

Surirella angusta Kutzing 1844, p. 61, 30/52 (VanLandingham 1978).

More information

The valve ends are almost the same with only slight variations. The Wing canal is very narrow with indistinct projection. The gurtle view is rectangular, the center sometimes squeesed in. The ends are wedge-shaped or sometimes protracted, often with different structure. Length to width ratio is most often 1 to 3 or 1 to 4, very rarely 1 to 5. (Krammer and Lange-Bertalot 1988), (Hustedt 1930).

Ecological distribution

Found in Lakes, ponds, rivers, springs/ streams, pools, thermal springs, and swamps. pH: Acidobiontic, acidophilous, indifferent, alkailphilous, alkalibiontic. Halobion: Oligohalobous, indifferent, and euryhalobous. Current: Indifferent, rheophilous, and rheobiontic. Special habitat: Tychoplanktonic, and Periphytic. (Beaver 1981).

Synonyms

Surirella ovalis var. *angusta* (Kutzing 1844)Van Heurck 1885, p. 189, (73/13)
*Surirella apiculata*Wm. Smith 1856, p. 88
Surirella angusta var. *apiculata* Grunow 1862, p. 455, 7/8

Surirella ovalis var. *apiculata* Otto Muller 1904, pg. 36, 2/10; Otto Muller 1904 *in* Schmidt *et al.* 1874 -__, 246/14
Surirella nana var. ? *pantocsekii*Cleve-Euler 1939, p. 11, fig. 10
?*Sur1rella angusta*? *sensu* Schmidt 1875 *in* Schmidt *et al.* 1874-__, 23/41
Surirella ovata var. *angusta* (Kutzing 1844) Cleve-Euler 1952, p. 123, fig. 1566 k, l *Surirella ovata* var. *smithii* Cleve-Euler 1952, p. 123, fig. 1566 m (*e. p.*) *Surirella ovata* var. *smithii* f. *producta* Cleve-Euler 1952, p. 123, fig. 1566 1 *Surirella angusta* var. *genuina* Grunow 1862, p. 141 (VanLandingham 1978)

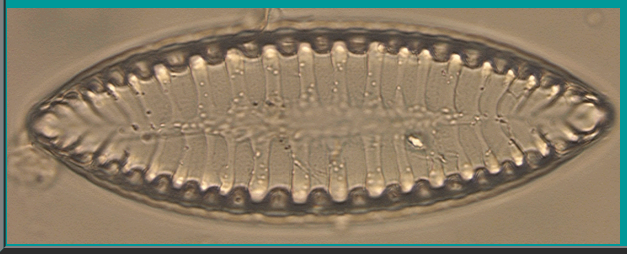
Size ranges and morphology

- Length is 18 to 70 micrometers (Krammer and Lange-Bertalot 1988).
- Width is 6 to 15 micrometers (Krammer and Lange-Bertalot 1988).
- Striae are about 22 to 28 in 10 micrometers (Krammer and Lange-Bertalot 1988).
- Wing canal has 60 to 75 ribs in 100 micrometers (Hustedt 1930).

Surirella biseriata var. *bifrons* (Ehr.) Hust.

Length: 102 Width: 39 Wing canal:20 ribs in 100

Collection 1056a More information



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Authority information

Surirella biseriata var. *bifrons* (Ehrenberg 1833, Ehrenberg 1838) Hustedt 1911, p. 305; Hustedt 1914, p. 123. (VanLandingham 1978).

More information

The valve ends are isopolar to slightly heteropolar. The wing projection is clearly visible. The gurdle view is rectangular or trapazoidal with cuneate and rounded ends. (Krammer and Lange-Bertalot 1988).

Ecological distribution

Found in lakes, ponds, springs/ streams, pools, and thermal springs. pH: Acidophilous, indifferent, alkailphilous, alkalibiontic. (Beaver 1981).

Synonyms

Navicula bifrons Ehrenberg 1833, p. 259; Ehrenberg 1836, p. 53; Ehrenberg 1838, p. 186, 14/2
Surirella bifrons Ehrenberg 1841 (1843), p. 388, 3/5, fig. 5; 4/3, fig. 1
Surirella bifrons var. *intermedia* Otto Muller 1904, pg. 27, 1/1; Otto Muller 1904 *in* Schmidt *et al.* 1874 -__, 245/8
Surirella bifrons var. *tumida* Otto Muller 1904, pg. 27, 1/2; Otto Muller 1904 *in* Schmidt *et al.* 1874 -__, 245/9
Surirella bifrons var. *tumida* f. *minor* Otto Muller 1904, pg. 27, 1/3; Otto Muller 1904 *in* Schmidt *et al.* 1874 -__, 245/10
Sur1rella bifrons var. ? Schmidt 1875 *in* Schmidt *et al.* 1874-__, 22/5
Surirella sp. Schmidt 1875 *in* Schmidt *et al.* 1874-__, 22/6
Surirella biseriata var. *bifrons* f. *typica*Mayer 1916 (1917), p. 65
Surirella biseriata var. *bifrons* f. *tumida* (Otto Muller 1904) Mayer 1918, p128, (4/3)
Surirella brunhesi Heribaud 1908, p. 29, 14/12
*Surirella biseriata*f. *tumida* (Otto Muller 1904) Mayer 1918, 4/3; Cleve-Euler 1952, p. 106, fig. 1528 B r
Surirella biseriata f. *intermedia* (Otto Muller 1904) Hustedt 1911, p. 305
*Surirella bifrons*f. *minor* (Otto Muller 1904), Hustedt,1911 p. 304
(VanLandingham 1978)

Size ranges and morphology

- Length is 76 to 150 micrometers (Krammer and Lange-Bertalot 1988).
- Width is 30 to 60 micrometers (Krammer and Lange-Bertalot 1988).
- Wing canal has 12 to 22 ribs in 100 micrometers (Krammer and Lange-Bertalot 1988).

* Note, In Krammer and Lange-Bertalot This species is listed as *S. bifrons,* a synonym of *S. biseriata* v. *bifrons*

Surirella elegans Ehrenberg 1841

Length: 195

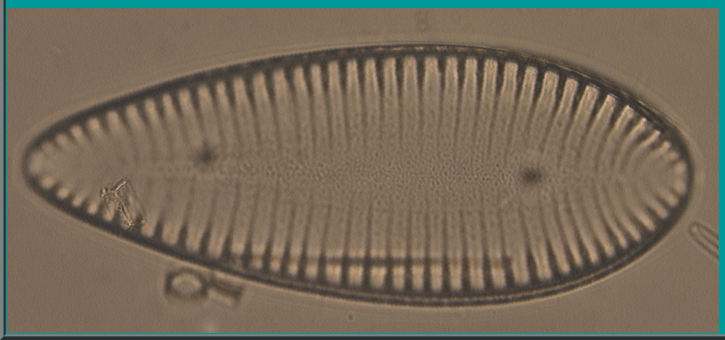
Width: 68

Wing canal: 18 ribs in 100

Striae: fine

Collection 1407a

More information



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Authority information

Surirella elegans Ehrenberg 1841 (1843), p. 424 (136), 3/1, fig. 22 (VanLandingham 1978).

More information

The ends are heteropolar from the valve view and cuneate from the gurtle view. The valve view is an ellipsoid, narrow or wide with bluntly rounded poles. Sometimes in longer indeviduals the ends are cuneately narrowed. The wing is narrow with a somewhat vague projection. (Hustedt 1930).

Ecological distribution

Found in lakes, ponds, rivers, pools, thermal springs, and swamps. pH: Acidophilous, indifferent, alkailphilous, alkalibiontic. Halobion: Oligohalobous and indifferent. Current: Limnobiontic. Special habitat: Periphytic. (Beaver 1981).

Synonyms

Campylodiccus elegans Ralfs *in* Pritchard 1861, p. 803
Surirella subalpina Donkin 1869, p. 292, 18/2
Surirella elegans var. *norvegica* (Eluenstein 1875 *in* Schmidt *et al.* 1874-__) Brun 1888, p. 107, 4/113
Surirella norvegica Eluenstein 1875 *in* Schmidt *et al.* 1874-__ , 21/17
Surirella elegans var. *norvegica* f. *minor* Cleve-Euler 1952, p. 116
Surirella elegans var. *norvegica* f. *typica* Mayer 1913, p. 334, 22/1
Surirella hyyppaei Molder 1939, p. 21, fig. 6
Surirella elegans var. *genuina* Mayer 1913, p. 343, 18/1, 20/3, 5
Surirella elegans var. *subaequalis*Mayer 1913, p. 343, 20/4
(VanLandingham 1978).

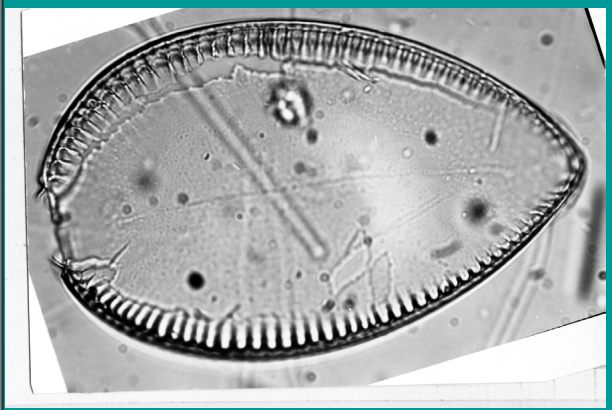
Size ranges and morphology

- Length is 110 to 400 micrometers (Krammer and Lange-Bertalot 1988).
- Width is 35 to 90 micrometers (Krammer and Lange-Bertalot 1988).
- Wing canal has 12 to 21 ribs in 100 micrometers (Krammer and Lange-Bertalot 1988).

Surirella guatimalensis Ehrenberg 1854

Length: 140 Width: 88 Wing canal:35 ribs in 100

Collection 1152a Other images More information



This is a scanned in image from a previous picture of the specimen. The specimen is tilted on the slide and dificult to get a clear picture of, this was the best picture.

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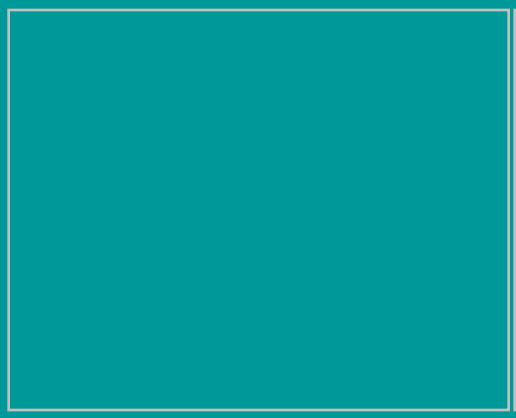
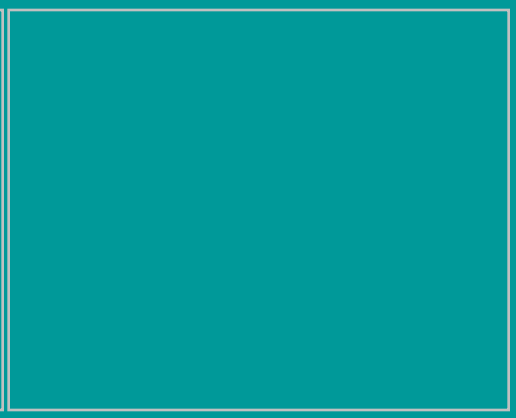
Authority information

Surirella guatimalensis Ehrenberg 1854, 33/6, fig. 7 (VanLandingham 1978).

Other images





These are images taken from a scanning electron microscope. The offer an excellent close up view of the detials of the frustule. Clockwise they show progressively higher magnification of the frustule where there is a wing gap.

More information

The valve has heteropolar ends with a broad head pole and a more narrow foot pole. The wing projection is vague to invisible. The wing at the head pole is not continuous all the way around, rather it is interupted by a broad gap. The ribs are short and the greater part of the valve surface is flat, the wavy part is small and rib-like in appearance. The Frustule is finely striated with fine punctae that are uneven in appearance and form lingitudinal rows. (Huber-Pestalozzi 1942).

Synonyms

Surirella cardinalis Kitton 1868, p. 132, fig. 133
Novilla guatimalensis (Ehrenberg 1854) according to F. W. Mills 1934, p. 1245

(VanLandingham 1978).

Size ranges and morphology

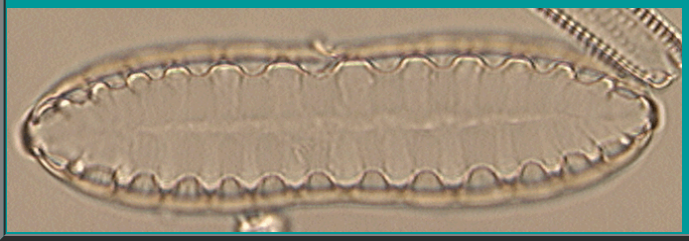
- Length is 100 to 240 micrometers (Huber-Pestalozzi 1942).
- Width is 60 to 110 micrometers (Huber-Pestalozzi 1942).
- Wing canal has 25 to 35 ribs in 10 micrometers (Huber-Pestalozzi 1942).

Surirella linearis var. *constricta* Grunow

Length: 61 Width: 17 Wing canal:20 to 30 ribs in 100

Collection
1159

More information



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Authority information

Surirella linearis var. *constricta* Grunow 1862, p. 455 (VanLandingham 1978).

More information

The valve view shows isopolar ends, they are blunt, circular and sometimes slightly cuneately. The middle is pinched is. The valve view is rectangular with curved ends. The wing is narrow but more or less definite. (Hustedt 1930).

Ecological distribution

Found in lakes, ponds, rivers, lagoons, springs/ streams, pools, swamps, and terrestrially. pH: Acidobiontic, acidophilous, indifferent, alkailphilous, alkalibiontic. (Beaver 1981).

Synonyms

Surirella linearis Wm. smith 1853, 8/58 a" (*non* 8/58 a, a)
Surirella tenella var. *cinstricta* Woodhead *et* Tweed 1960, p. 145
Surirella constricta Schumann 1862, p. 185, 8/19 ( )
Surirella linearis f. *constricta*(Grunow 1862) Hustedt 1957, p. 360
(VanLandingham 1978)

Surirella linearis var. *helvetica*(Brun) Meister 1912

Length: 96 Width: 31 Wing canal:20 ribs in 100

Collection 841 More information

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Authority information

Surirella linearis var. *helvetica*(Brun 1880) Meister 1912, p. 223, 41/6 (VanLandingham 1978).

More information

The valve is flatly constructed with numerous small relatively long spines. Sometimes they are highly concentrated near the undelations. They are eratic and spread out over the valve face. The Wing projection is very pronounced, like the nominant variety. (HREF="../../references/references.html#Krammer and Lange-Bertalot (2/2) 1988">Krammer and Lange-Bertalot 1988).

Ecological distribution

Found in lakes, ponds, rivers, springs/ streams, lagoons, swamps, and terrestrially. pH: Acidobiontic, acidophilous, indifferent, alkailphilous, alkalibiontic. (Beaver 1981).

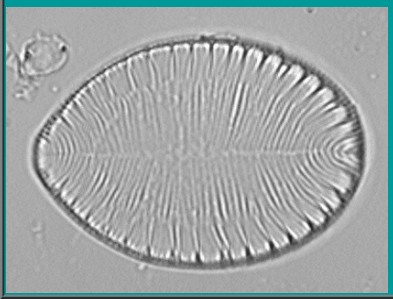
Synonyms

*Surirella helvetica*Burn 1880, p. 100, 2/4, 9/28
Surirella turgida var. *lanceolata*Wislouch *et* Kolbe 1916, p. 264, 3/4, tab. nostr. 2/34; Kolbe 1927, p. 105, 2/34
*Surirella vanwildereniana*Krenner 1926, p. 117, 12/91-92 (e. p.)
(VanLandingham 1978).

Surirella ovata Kutzing

Length: 34	Width: 23	Striae: 20	Wing canal: 5 to 6 ribs in 100

Collection 1157	Other images	More information



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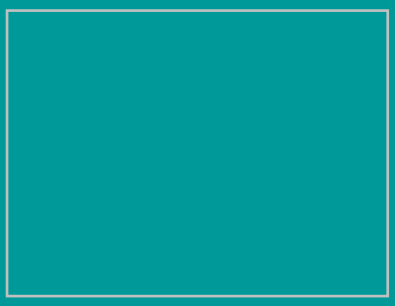
Authority information

Surirella ovata Kutzing 1844, p. 62, 7/1-3 (7/4) (VanLandingham 1978).

Other images



More information

The valve is heteropolar, narrow to wider ovoid dith bluntly curved ends. The gurtle view is slightly cuneate. The wing is barely developed with almost no wing projection. (Hustedt 1930).

Ecological distribution

Found in lakes, ponds, rivers, springs/ streams, lagoons, pools, thermal springs, swamps, and terrestrially. pH: Acidobiontic, acidophilous, indifferent, alkailphilous, alkalibiontic. Halobion: beta range, indifferent, and halophobous. Current: Renophilous. (Beaver 1981).

Synonyms

Novilla ovata (Kutzing 1844) Heiberg 1863, p. 101
Podosphenia oculata Hassall 1845, p. 425
Licmophora oculata(Hassall 1845) De Toni 1892, p. 739
Surirella ovalis var. *ovata* (Kutzing 1844) Van Heurck 1880-1885, p. 188, (73/5-7)
Surirella ovata f. *geunina* Kirchner 1878, p. 201
*Surirella baltica*Shuumann 1867, p. 52, 1/7
Surirella ovalis var. *baltica* (Schumann 1867) Cleve-Euler 1952, p. 121, fig. 1565 k-m
Sur1rella signata Pantocsek 1892, 39/544; Pantocsek 1905, p. 101 *Surirella ovalis* var. *signata* (Pantocsek 1892) Cleve-Euler *in* Backman *et* Cleve-Euler 1922, p. 39; Cleve-Euler 1932, p. 54, fig. 285
Surirella ovata var. *typica* Cleve-Euler 1952, p. 122, fig. 1566 a-c
Surirella ovata var. Kutzing 1844, p. 62, 7/4
Surirella ovata var. *aequalis*Cleve-Euler 1952, p. 122, fig. 1566 e (*e. p.*)
Surirella ovata var. *genuina*(Kirchner 1878) Schell 1883 (according to Hollerbakh *et* Krasavina 1971, p. 544); Gutwinski 1891, p. 101
Surirella ovalis var. *minuta* f. *ovata*(Kutzing 1844) Mayer 1913, p. 336, 17/18; Mayer 1919, p. 211
(VanLandingham 1978)

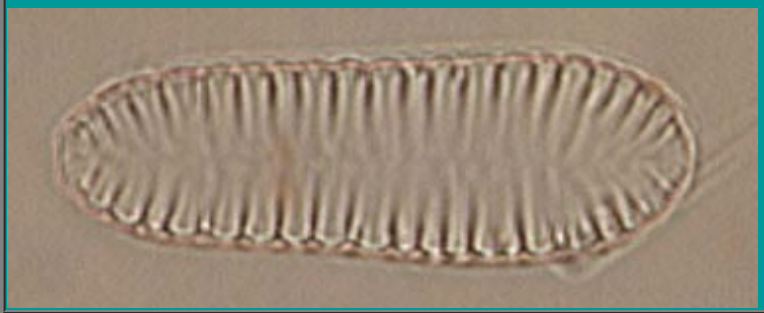
Size ranges and morphology

- Length is 15 to 70 micrometers (Hustedt 1930)
- Width is 8 to 23 micrometers (Hustedt 1930)
- Wing canal has 40 to 70 ribs in 100 micrometers (Hustedt 1930).
- Striae are 16 to 20 10 micrometers (Hustedt 1930).

Surirella ovata var. *pinnata* (Ehr.) Hust.

Length: 102 Width: 39 Striae: 100 Costae: 20

Collection 1236 More information



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Authority information

Surirella ovata var. *pinnata* (Wm. Smith 1853) Brun 1880, p. 98, 2/5 (VanLandingham 1978).

More information

This variaty is probably the same as Surirella ovata except smaller. It has a linear ovoid valve with almost straight sides. (Hustedt 1930)

Ecological distribution

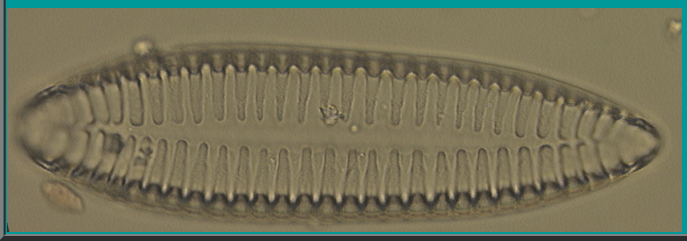
Found in lakes, ponds, rivers, springs/ streams, pools, and swamps. pH: Acidobiontic, acidophilous, indifferent, alkailphilous, alkalibiontic. (Beaver 1981).

Synonyms *Surirella pinnata* Wm. Smith 1853, p. 33, 30/258
(VanLandingham 1978)

Surirella robusta var. *splendida* (Ehrenberg) Van Heurck 1885

Length: 170 Width: 46 Wing canal: 17 ribs in 100

Collection 1157a More information



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Authority information

Surirella robusta var. *splendida* (Ehrenberg 1832, Ehrenberg 1838) Van Heurck 1885, p. 187 (VanLandingham 1978).

More information

In all cases this variety is smaller and more delicate than the nominant but overlaa it's combinations and specific characteristics are sufficient to keep it seperate from the nominant. (The nominant is heteropolar with apical ends, ovoid to ellipsoid with blunt circular ends. The gurtle view is wedge-shaped with blunt circular ends. The wing is strongly developed with an outright wing projection.) (Hustedt 1930).

Ecological distribution

Found in lakes, ponds, springs/ streams, and pools pH: Acidophilous, indifferent, and alkailphilous. (Beaver 1981).

Synonyms

Navicula splendida Ehrenberg 1831 (1832), p. 81; Ehrenberg 1833, p. 259; Ehrenberg 1838, p. 186, 14/1
Novilla splendida (Ehrenberg1832) Cleve 1868, p. 232
Surirella splendida (Ehrenberg 1832),Kutzing 1844, p. 62 7/9
Surirella ovalis var. *fissilis*M. Peragallo *in* Heribaud *et al.* 1920, p. 96, 3/6
Surirella robusta var. *splendida* f. *typica* Cleve-Euler 1952, p. 104, fig. 1524 h
Surirella splendida var. *genuina*Mayer 1912, p. 338, 19/1, 20/1, 2
(VanLandingham 1978).

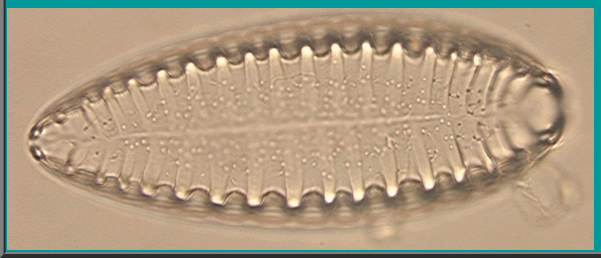
Size ranges and morphology

- Length is 75 to 250 micrometers (Hustedt 1930).
- Width is 40 to 60 micrometers (Hustedt 1930).
- Wing canal is12 to 25 ribs in 100 micrometers(Hustedt 1930).

Surirella sp. 1

Length: 89 Width: 34 Wing canal:22 in 100

Collection 1404 More information



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More information

The valve is somewhat heteropolar with rounded ends. The wing is easily visible and a random peppering of small

spines, more concentrated near the center is present.

Surirella Sp. 2

Length: 35 Width: 5 Striae: 8-9 Costae: 15

Collection 1157a More information

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More information

The valve is angular with somewhat capitate ends. It is wider in the center and narrower near the ends.

***Surirella suecica* Grun.**

Length: 21 Width: 7.5

Collection ? More information

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Authority information

Surirella suecica Grunow *in* Van Heurck 1881, 73/19 (VanLandingham 1978).

More information

The valve is strongly heteropolar, outright oval with sides slightly convex to nearly straight. One pole is wide the other is narrow and peaked roundly. The gurtle view is blunt and rounded on one side and flattened on the other. The wing canal is outright and easily visible. (Krammer and Lange-Bertalot 1988).

Synonyms

*Surirella suecica*v. *grunowi*Cleve-Euler 1952, p. 113, fig. 1543 a
*Surirella suecica*v. *grunowi*f. *pusilla* Cleve-Euler 1952, p. 113, fig. 1543 b

(VanLandingham 1978)

Size ranges and morphology

- Length is 22 to 38 to 150 micrometers (Krammer and Lange-Bertalot 1988).
- Width is 8 to 12 micrometers (Krammer and Lange-Bertalot 1988).
- Striae 32 to 37 in 10 micrometers (Krammer and Lange-Bertalot 1988).
- Wing canal 85 to 100 ribs in 100 micrometers (Krammer and Lange-Bertalot 1988).

Synedra delicatissima v. *angustissima* Grun.

Length:320 Width :5 Striae:13

Collection 841 Other images More information

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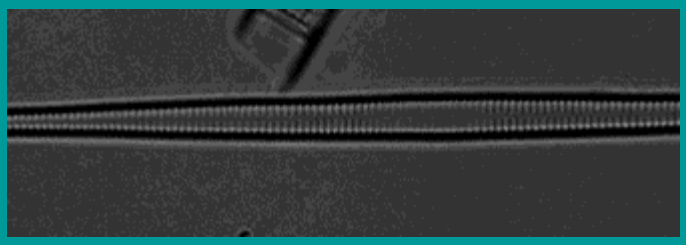
Authority information

Synedra delicatissima var. *angustissima* Grun *in* V. H., Syn. Diat. Belgique, pl. 39, fig. 10. 1881 (Patrick and Reimer 1966).

Other images

This image is the end of the specimen above.



This image is the central area for the specimen above.

More information

This taxon has a long and narrow valve that usually appears sinuous. The pseudoraphe is very narrow. The central area is longer than it is broad. The straie are parallel (Patrick and Reimer 1966).

- **Synonyms**
  Synedra acus var. *angustissima* (Grun.) V. H., Syn. Diat. Belgique, p. 151. 1885 (Patrick and Reimer 1966.

- **Ecology**
  This taxon prefers slow moving water with low conductivity (Patrick and Reimer 1966.

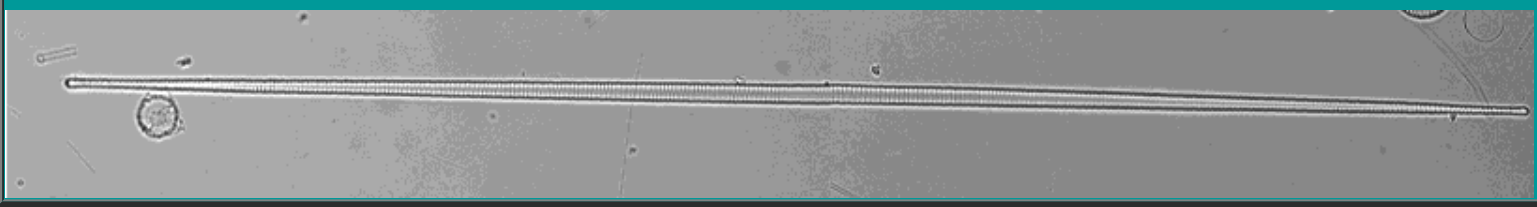
Size ranges and morphology

- Length is 30 to 162 micrometers (Patrick and Reimer 1966).
- Width is 1.2 to 5 micrometers (Patrick and Reimer 1966).
- Striae are 23 to 28 in 10 micrometers (Patrick and Reimer 1966).

Synedra ulna v. *longissima* (W. Sm.) Brun.

Length:430 Width :6 Striae:12

Collection 1522 Other images More information



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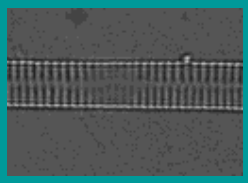
Authority information

Synedra ulna var. *longissima*(W. Sm.) Brun, Diat. Alpes Jura, p. 126, pl. 4, fig. 21. 1880(Patrick and Reimer 1966).

Other images

This image is the end of the specimen above taken in DIC.



This image is the central area for the specimen above taken in DIC.

More information

This taxon has frustules and a curved valve. The valve is linear and narrowed toward swollen rounded ends. The pseudoraphe is narrow and indistinct and there is usually no central area (Patrick and Reimer 1966).

- **Synonyms**
  Synedra biceps Kutz., Bacill., p. 66, pl. 14(18); pl. 14(21), fig. 1. 1844 (Patrick and Reimer 1966).
  Synedralongissima W. Sm., Syn. British Diat., vol. 1, p. 72, pl. 12, fig. 95. 1853 (Patrick and Reimer 1966).
  Synedra ulna var.*biceps* (Kutz.) Schonf., Diat. Germaniae, p. 106. 1907 (Patrick and Reimer 1966).

  - **Ecology**
    This taxon prefers cool, fresh water (Patrick and Reimer 1966).

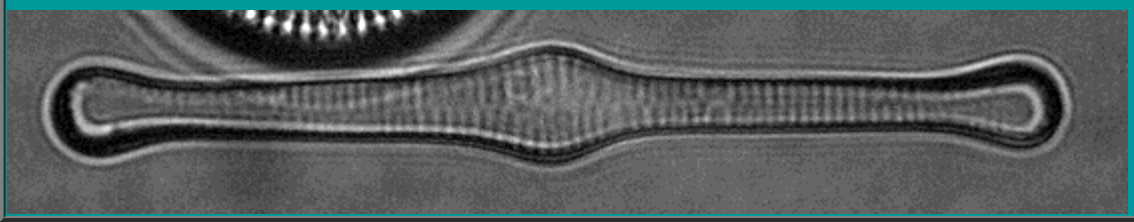
    Size ranges and morphology

    - Length is 200 to 600 micrometers (Patrick and Reimer 1966).
    - Width is 5 to 7 micrometers (Patrick and Reimer 1966).
    - Striae are 8 to 12 in 10 micrometers (Patrick and Reimer 1966).

Tabellaria fenestrata(Lyngb.) Kutz.

Length: 51 Width: 6 Striae:16-18

Collection 804 Other images More information



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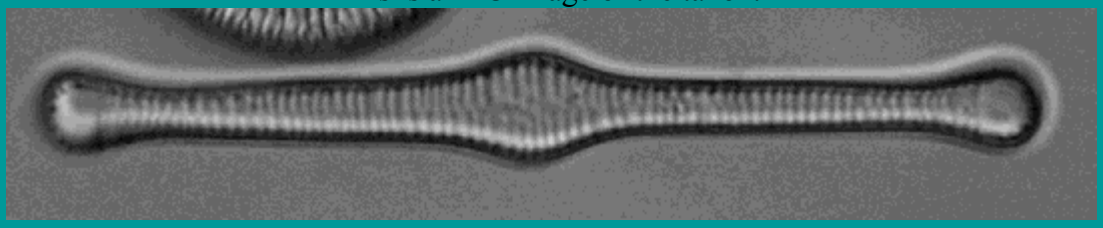
Authority information

(Lyngb.) Kutzing, Bacill., p. 127, pl. 18, fig. 2. 1844. (Stoermer and Yang 1969).

Other images

This is a DIC image of the taxon.



More information

- This taxon has four or less septa. They tend to bend away from the valve. The valve is swollen at the center and rounded ends that sometimes bulge outward. The valves and the ends are the same width. There is a jelly pore in the center of the median inflation. It has a distinct pseudoraphe which forms a small central area. This taxon also lacks rudimentary septa(Patrick and Reimer 1966).

- **Synonyms**

  Diatoma fenestratum Lyngbye, Tent. Hydropht. Danicae, p. 180, pl. 61, fig. E(3). 1819.

  - **Ecology**

    This taxon prefers mesotrophic to eutrophic lakes and ponds. It is usually found in shallow water and seems to prefer approximately neutral water(Patrick and Reimer 1966).

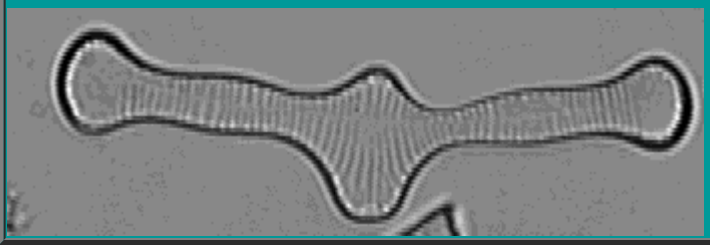
    ### Size ranges and morphology

    - Length is 25-116 micrometers (Patrick and Reimer 1966).
    - Breadth is 5-10 micrometers (Patrick and Reimer 1966).
    - Striae range is 14-18 per 10 micrometer (Patrick and Reimer 1966).

Tabellaria fenestrata var. *geniculata* A. Cleve 1899

Length: 40 Width: 11 Striae:18

Collection 1192 Other images More information



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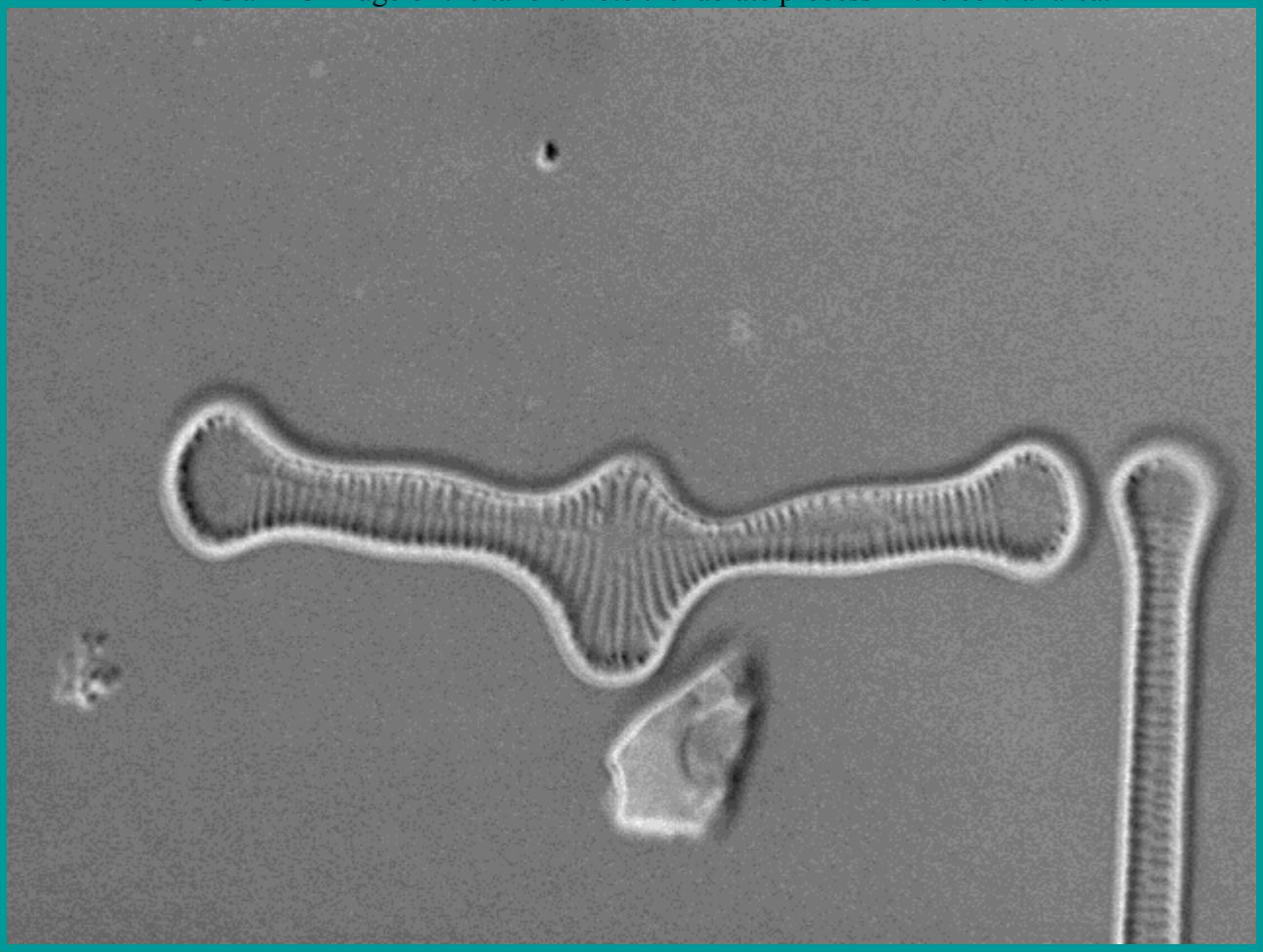
Authority information

A. Cleve 1899, p. 831, fig. 1-5. (VanLandingham 1978).

Other images

This is a DIC image of the taxon. Note the labiate process in the central area.



More information

- This species is rarely found in starform colonies, but is commonly found in zig-zag colonies. It is abundant between March and April. This species is also found in Northern Europe from Finnland to Norway (Huber-Pestalozzi 1942).
- **Ecology**

  This species lives in mesotrophic and eutrophic waters. (Huber-Pestalozzi 1942).

Size ranges and morphology

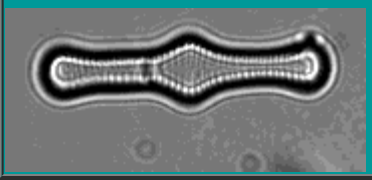
- Length is 24-134 micrometers (Stoermer and Yang 1969).
- Breadth is 4-8 micrometers (Stoermer and Yang 1969).

- Striae range is 18-22 per 10 micrometer (Stoermer and Yang 1969).

***Tabellaria flocculosa*(Roth) Kutz.**

Length: Width: Striae:

Collection 804 Other images More information



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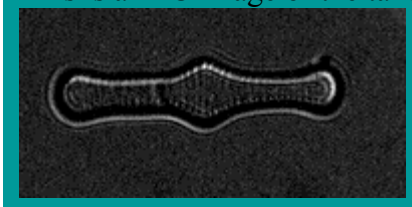
Authority information

(Roth) Kutzing, Bacill., p. 127, pl. 17, fig. 21. 1844. (Stoermer and Yang 1969).

Other images

This is a DIC image of the taxon.



More information

- This taxon does not have a central area but it swells outward in shape. It usually has more than four septa and they aren't straight. There are rudimentary septa and the valve is asymmetrical. This taxon has a narrow pseudoraphe.(Patrick and Reimer 1966)(Koppen. 1975).

- **Synonyms**

  Conferva flocculosa Roth, Catalecta Bot., Fasc. 1, p. 192 pl. 4,; pl. 5, fig. 6. 1798.

  - **Ecology**

    This taxon has a pH range of 4.2-9.0 and it prefers mesotrophic to dystrphic water. It likes limnobiontic currents and ponds. It is an alpha-mesosaprobic to saproxenous saprobien.(Lowe 1974).

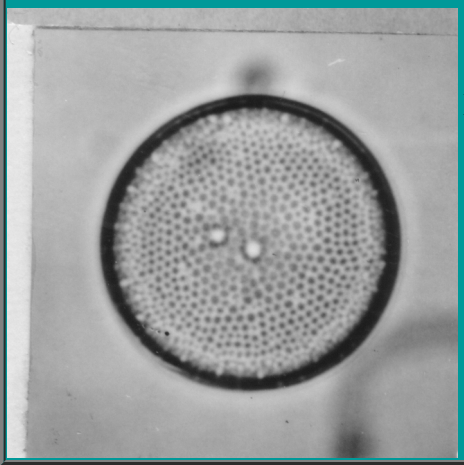
    Size ranges and morphology

    - Length is approximately 80-130 micrometers (Patrick and Reimer 1966).
    - Striae range is 14-18 per 10 micrometer (Patrick and Reimer 1966).

Thalassiosira levanderi Van Goor

Diameter: 17

Collection 1197 More information



This is a scanned in image from a previous picture of the specimen. The slide was missing so no new pictures could be taken.

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Authority information

Thalassiosira levanderi Van Goor 1924, p. 322, fig. 11 (VanLandingham VII 1978).

More information

The valve view is cilindrical with a slightly convex surface. The areolae are irregularly arranged, more dense near the center of the valve. At the margin there are spines and slime pours near the center of the valve. (Stoermer and Yang 1969).

Synonyms

Coscinodiscus levanderi(Van Goor 1924) Cleve-Euler 1951, p. 75, fig. 128 (VanLandingham VII 1978).

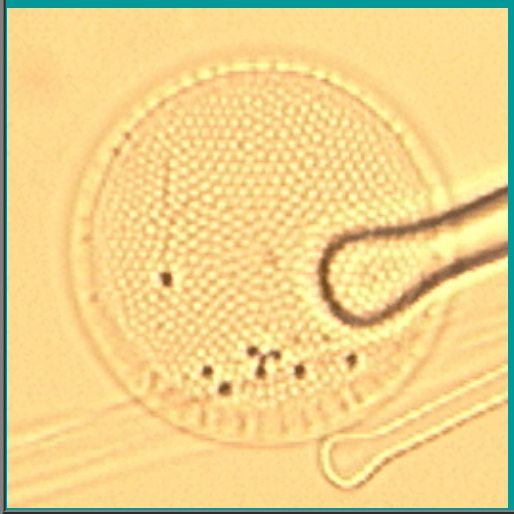
Size ranges and morphology

- Diameter is 8 to 19 micrometers(Stoermer and Yang 1969).
- Areolae are 20 to 22 in 10 micrometers (Stoermer and Yang 1969).
- Spines are about 10 in 10 micrometers (Stoermer and Yang 1969).

***Thalassiosira visurgis* Hustedt**

Diameter: 18 Punctae: 16 Spines: 15

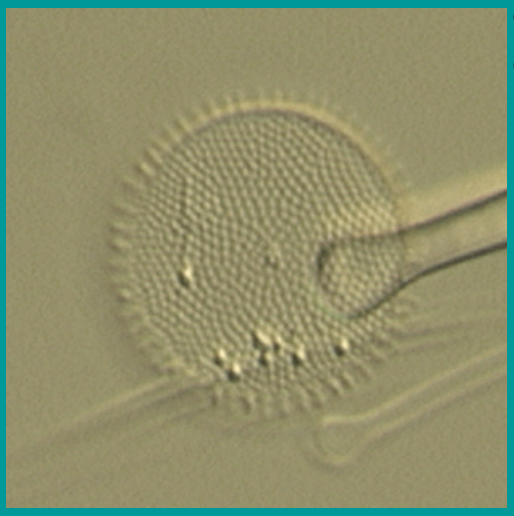
Collection 1317 Other images More information



Authority information

Thalassiosira visurgis Hustedt 1957, p. 207, 1/1-4 (VanLandingham VII 1978).

Other images



The image of this specimen was captured using DIC. It helps to distinguish fine detail.

More information

The valve is cilindrical with a slightly convex face. Areolae are aranged in radial patterns, more concentrated near the center of the valve. There is a submarcinal carona of spines and two (or rarely 1 or 4) large spinesjust inside the circle of smaller spines. A single slime poor is usually near the geometric center of the valve. (Stoermer and Yang 1969).

Ecological distribution

This species has been found to be in inland waters with high dissolved solids content and in bracish water. (Stoermer and Yang 1969).

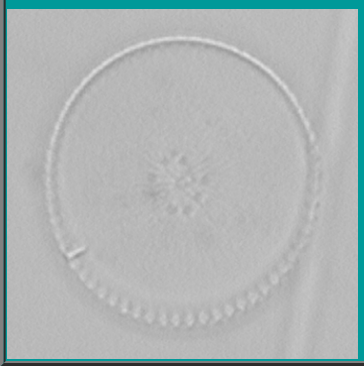
Size ranges and morphology

- Diameter is 14 to 23 micrometers (Stoermer and Yang 1969).
- Areolae are 16 in 10 micrometers (Stoermer and Yang 1969).
- Spines are about 14 to 15 in 10 micrometers (Stoermer and Yang 1969).

***Thalassiosira weissflogii* Fryxell & Hasle**

Diameter: 13.5

Collection 1522 Other images More information



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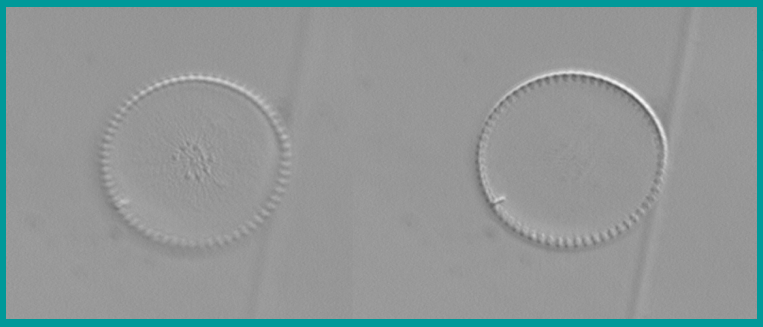
Authority information

Thalassiosira weissflogii (Grunow) Fryxle & Hasle (Fig. 77:3, 4) (VanLandingham 1978).

Other images



The image of this specimen was captured using DIC. It helps to distinguish fine detail. Two images wete taken in high and low focus so different details can be seen.

More information

The cells are short and cilindrical. They have either concave or convex valve faces. Fine areolae are arranged in sinuous rows of differing lengths. There is a carona of submarginal spines and a single larger spine (or rarely 2 or 3) is just inside the carona. Normally there are 2 to 5 fairly obvious slime poors are arranged around the center of the valve. (Stoermer and Yang 1969).

Ecological distribution

This species has been found to be a halophilous fresh water form, widely distributed. It has been found ocasionally in water from Lake Michigan subjected to chloride contamination. (Stoermer and Yang 1969).

Synonyms

Thalassiosira fluviatilis Grunow in van Heurck 1883
Micropodiscus weissflogii Hustedt 1926
Coscinodiscus fallax (Meunier 1910) Cleve-Euler 1951, p. 74, fig 126

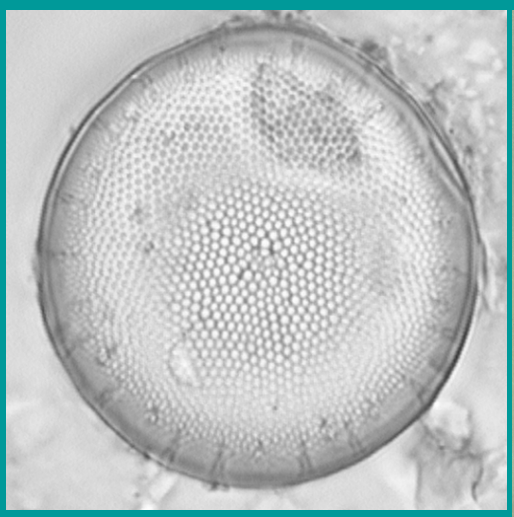
(Krammer and Lange-Bertalot 1988).(VanLandingham 1978).

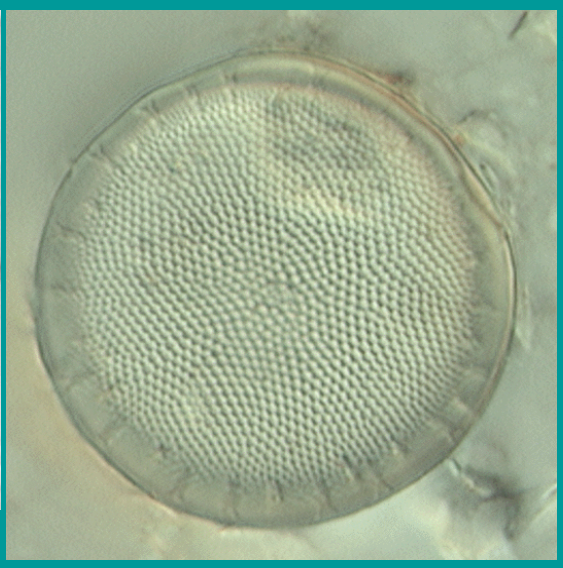
Size ranges and morphology

- Diameter is 12 to 27 micrometers (Stoermer and Yang 1969).
- Spines are 14 in 10 micrometers (Stoermer and Yang 1969).

As a frame of refrence here is some information on a different Thalassiosira species which is not found in the Great Lakes.

Collection Lo-1d





Here are two pictures, one was taken using differential interference contrast

Authority information

Thalassiosira baltica (Grunow *in* Cleve *et* Grunow 1880) Ostenfeld 1901, p. 290 (VanLandingham VII 1978).

More information

This species has a rectangular gurdle view, a slightly slanted mantle and a flat valve face. The face is smaller near the margin and has radial rows of areolae. The mantle has areolae as well but they are smaller than those on the valve face. The mantle has a serrated rim. This species is often found in fairly long chains. (Hasle 1978).

Ecological distribution

It has been found that salinity is important to this species so it is found only in bracish water. (Hasle 1978).

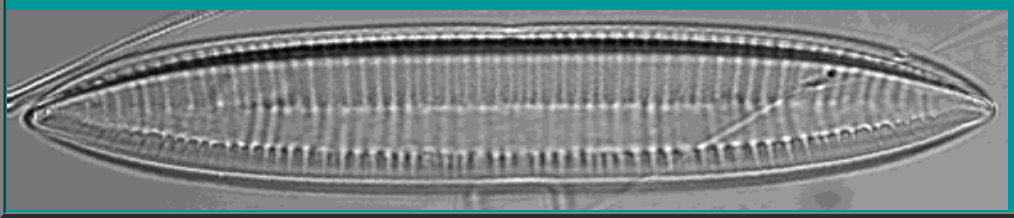
Size ranges and morphology

- Diameter is 20 to 120 micrometers (Hasle 1978).
- Areolar are 10 to 24 in 10 micrometers (Hasle 1978).

Tryblionella gracilis W. Sm. 1853

Length: 97 Width: 28 Keel punctae: 6 Striae: 7

Collection 1552 Other images More information



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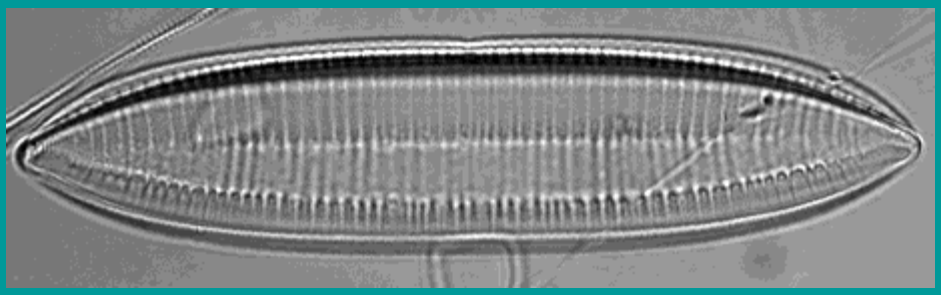
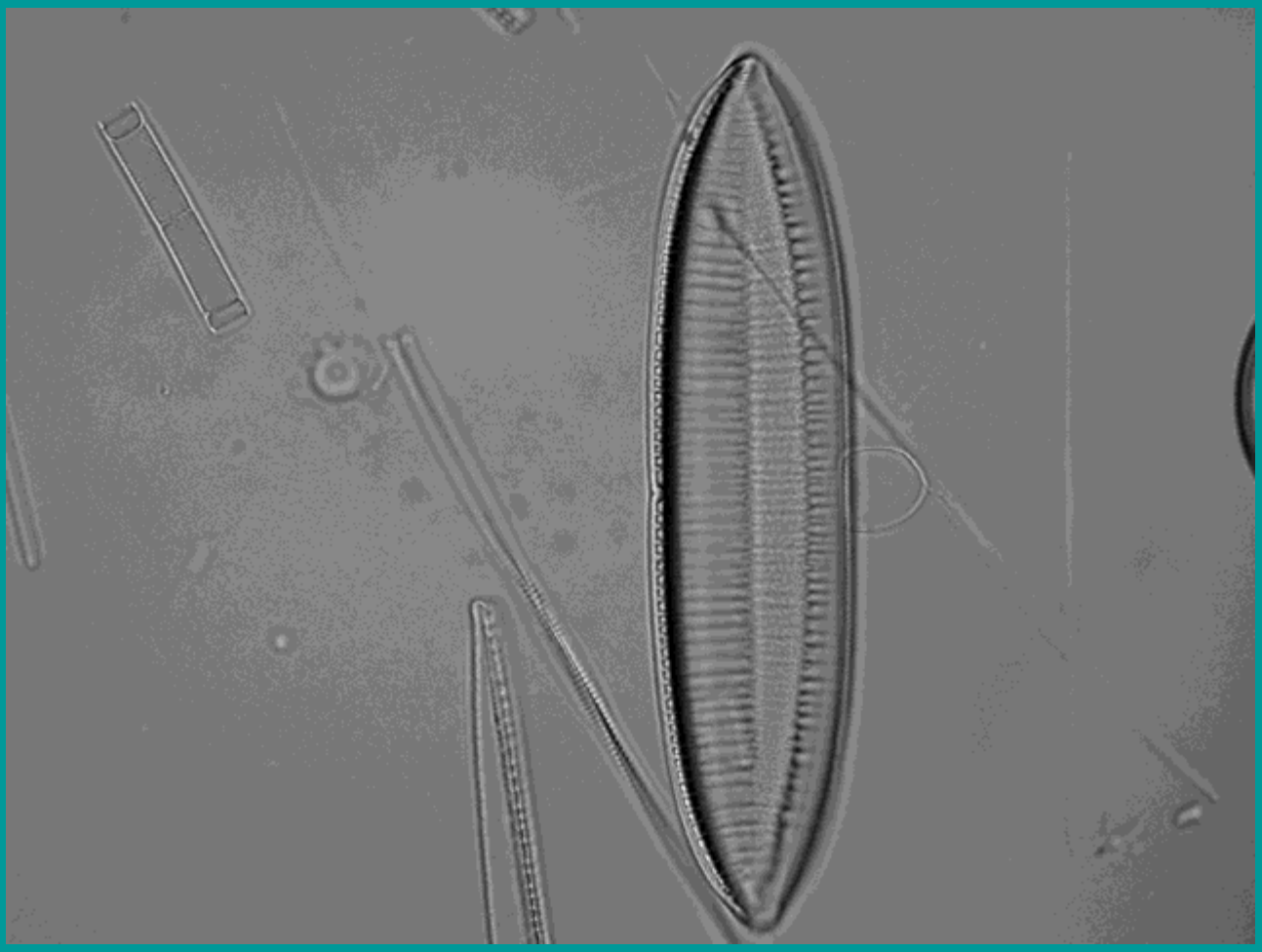
Authority information

W. Smith, Type material, near Lewes, England, Coll. Van Heurck VI-47-C8 (Krammer and Lange-Bertalot 1988)

Other images





More information

- This taxon is usually found among the periphyton (Lowe 1974).

- **Synonyms** (Stoermer and Yang 1969)
  Nitzschia tryblionella Hantzsch *ex* Rabenhorst, Alg. Sachsens resp. Mitleleuropas Exsicc., No. 984. 1860.

  - **Ecology**
    Taxa from the genus *Tryblionella* are tolerant of slightly brackish waters (Lowe 1974).

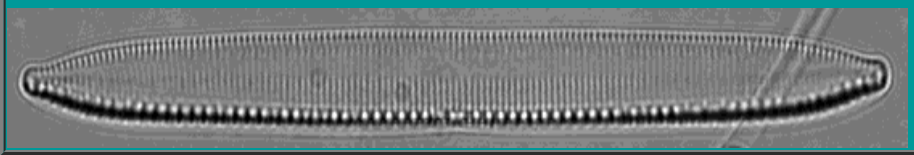
    Size ranges and morphology

    - Length is 60 to 150 micrometers (Hustedt 1930).
    - Width is 16 to 35 micrometers (Hustedt 1930).
    - Keelpunctae are 7 to 9 in 10 micrometers (Hustedt 1930).
    - Transapical ribs are 5 to 8 in 10 micrometers interspersed with fine transapical punctated striae (Hustedt 1930).

Tryblionella hungarica (Grun.) D. G. Mann

Length:82 Width: 7 Keel punctae: 9-10 Striae: 15-16

Collection 1264 Other images More information



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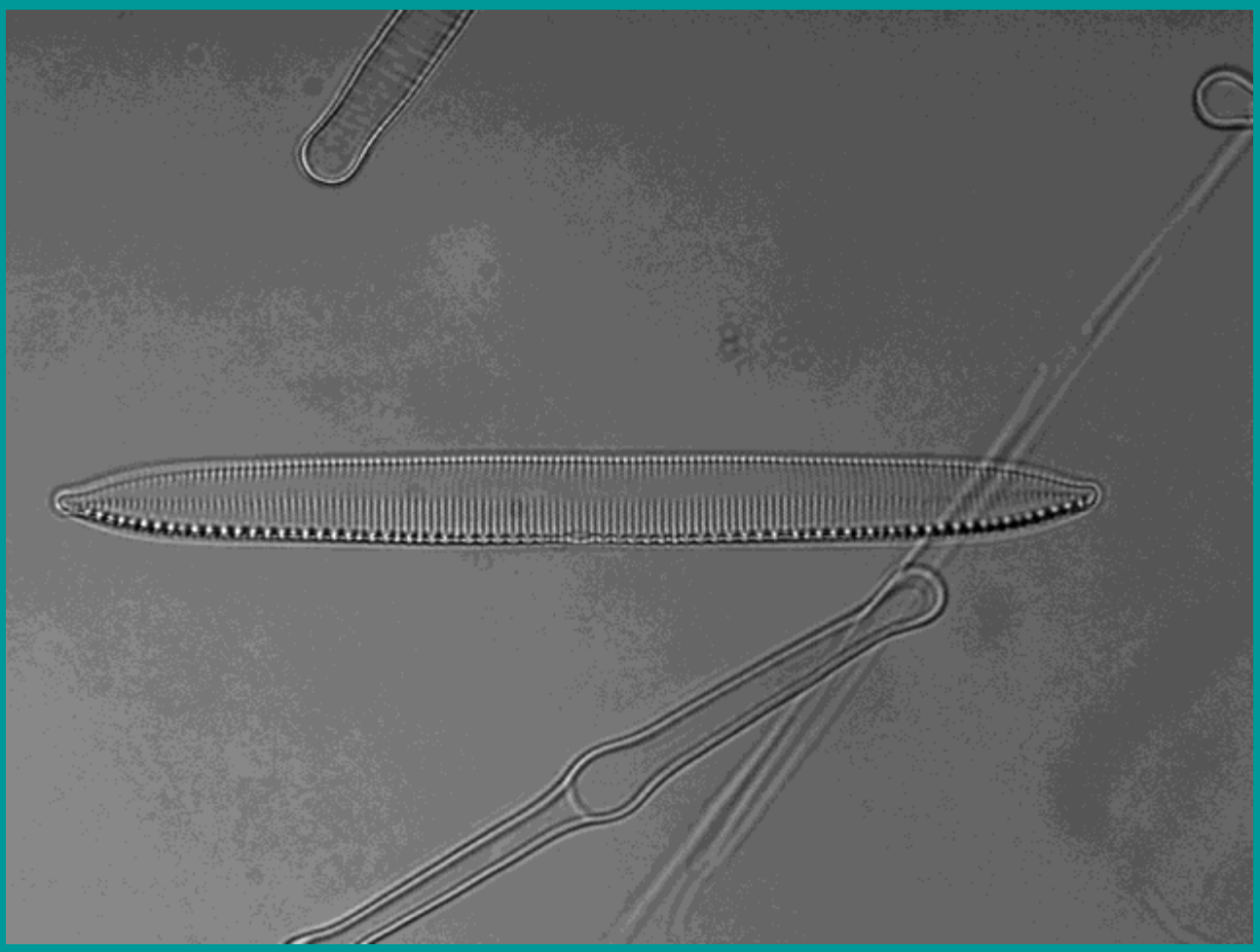
Authority information

D. G. Mann

Other images



More information

- This taxon is usually found among the periphyton (Lowe 1974).

- **Synonyms** (Stoermer and Yang 1969)
  Nitzschia hungarica (Wm. Smith) Grunow, Verh. Zool.-Bot. Ges. Wien, 12: 568, pl. 18, figs. 31a-b. 1862.

  - **Ecology**
    This taxon is considered to be a brackish water form and is mainly found in flowing waters with a pH of 7 (Lowe 1974).

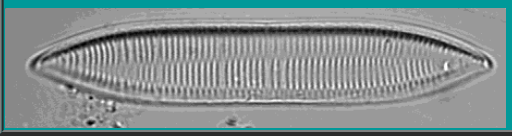
    Size ranges and morphology

- Keelpunctae are 8 in 10 micrometers (Hustedt 1930).

Tryblionella levidensis W. Sm. 1856

Length: 46 Width: Keel punctae: 9 Striae: 16-18

Collection 1159a Other images More information



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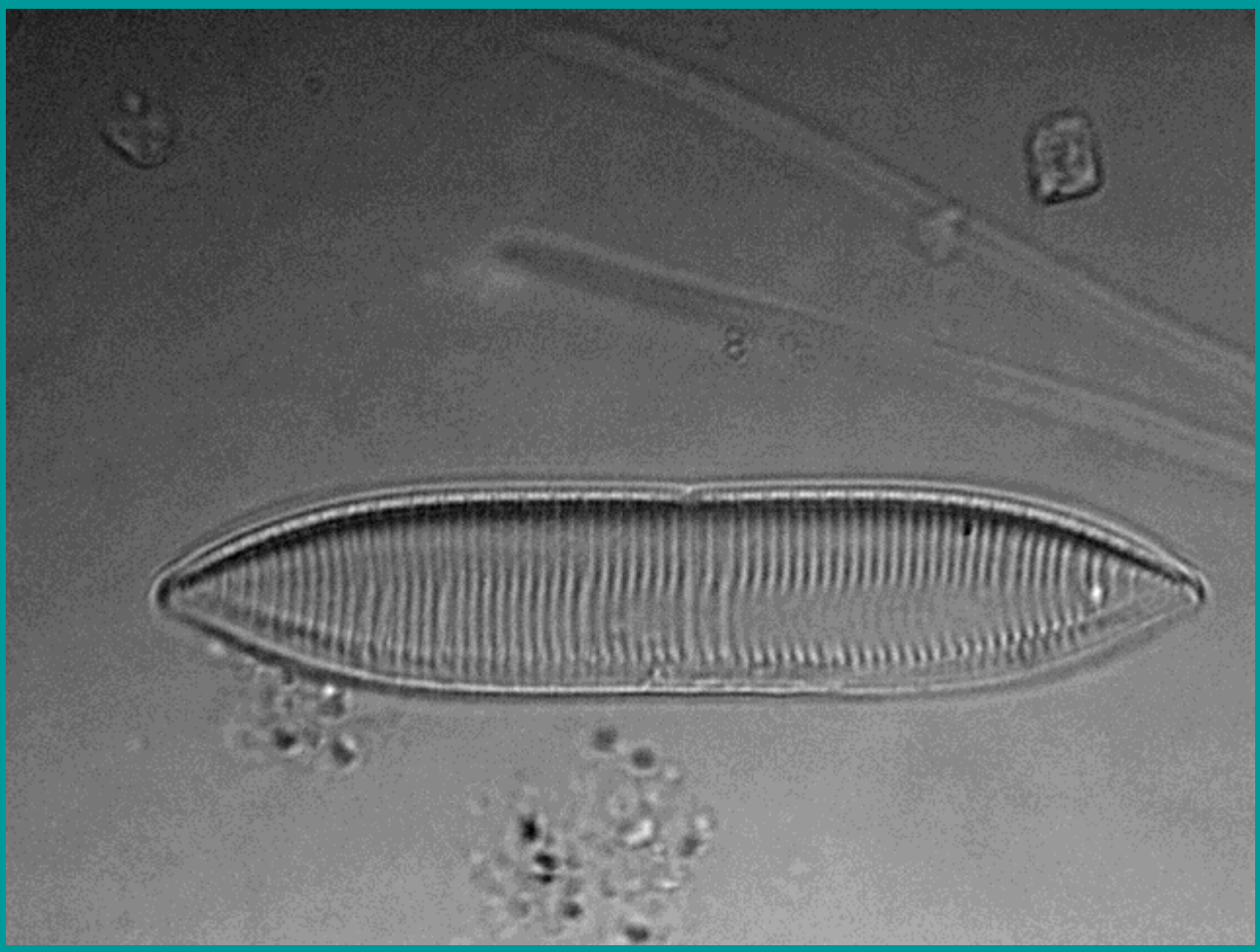
Authority information

Wm. Smith, Syn. British Diat., Vol. 2, p. 89. 1856.

Other images



More information

- This taxon is usually found among the periphyton (Lowe 1974).

- **Synonyms** (Stoermer and Yang 1969)
  Nitzschia tryblionella var. *levidensis* (Wm. Smith) Grunow *in* : Cleve and Grunow, K. Svenska Vet.-Akad. Handl., Ny Foeljd, 17(2): 70. 1880.

  - **Ecology**
    Taxa from the genus *Tryblionella* are tolerant of slightly brackish waters (Lowe 1974).

    Size ranges and morphology

Length is 18 to 54 micrometers (Hustedt 1930).
- Width is 9 to 14 micrometers (Hustedt 1930).
- Keelpunctae are 12 in 10 micrometers (Hustedt 1930).
- Transapical ribs are 9 to 13 in 10 micrometers (Hustedt 1930).

COLLECTIONS: EUGENE F. STOERMER (#6)

1096. Plankton, Petoskey Harbor, Sec. 31, R5W, T35N, Emmet County, Michigan. Rhizosolenia bloom. Coll: E. F. Stoermer, 23 June 1966.

1097. Detritus floating on surface, Petoskey Harbor, Sec. 31, R5W, T35N, Emmet County, Michigan. Primarily Oscillatoria and Spirogyra. Coll: E. F. Stoermer, 23 June 1966.

1098. Rock scrape, rocks near shore, Petoskey Harbor. Sec. 31, R5W, T35N, Emmet County, Michigan. Ulothrix, Stigeoclonium and many diatoms. Coll: E. F. Stoermer, 23 June 1966.

NOTE: There is an apparent discrepancy in numbers in this section... 1097 - 1105???? (Stoermer's note)

1099. Scrape from rocks in ship channel, Charlevoix, Sec. 27, R8W, T34N, Charlevoix County, Michigan. Ulothrix and Diatoma vulgare. Coll: E. F. Stoermer, 23 June 1966.

1100. Plankton ship channel, Charlevoix. Sec. 27, R8W, T34N, Charlevoix County, Michigan. Varied flora - much from attached environments. Coll: E. F. Stoermer, 23 June 1966.

1105?

1101. "Algae Balls" floating on surface of Charlevoix ship channel. Sec. 27, R8W, T34N, Charlevoix County, Michigan. Ulothrix sp., Gomphoneis herculeanum and Cymbella prostrata most common. Coll: E. F. Stoermer, 23 June 1966.

1101?

1102. Plankton, Lake Charlevoix, Charlevoix City Dock. Sec. 26, R8W, T34S, Charlevoix County, Michigan. Mostly Tabellaria. Coll: E. F. Stoermer, 23 June 1965. 1102?

1103. Scrape from dock piling, Torch Lake. Sec. 24, R9W, T31N, Antrim County, Michigan, near town of Torch Lake. Rich and varied diatom flora. Coll: E. F. Stoermer, 23 June 1966.

1103?

1104. Plankton, Torch Lake, Sec. 24, R9W, T31N, Antrim County, Michigan, near town of Torch Lake. Rather poor - oligotropic flora. Coll: E. F. Stoermer, 23 June 1966.

1104?

1105. Plankton, river side of breakwater, Elk Rapids. Sec. 20, R9W, T29N, Antrim County, Michigan. Very poor flora. Coll: E. F. Stoermer, 23 June 1966.

1106. Rock scrape, river side of breakwater, Elk Rapids. Sec. 20, R9W, T29N, Antrim County, Michigan. Cymbella bloom. Coll: E. F. Stoermer.

1107. Scrape from rocks, harbor of Traverse City. Sec. 6, R10W, T27N, Grand Traverse County, Michigan. Ulothrix and bloom of Diatoma vulgare and D. tenue. Coll: E. F. Stoermer, 23 June 1966.

1108. Shore plankton, harbor of Traverse City. Sec. 6, R10W, T27N, Grand Traverse County, Michigan. Considerable zooplankton. Coll: E. F. Stoermer, 23 June 1966.

1109. Bottom material in shallow water, fishing access site on Platte Lake, Sec. 3, R15W, T26N, Benzie County, Michigan. Diverse diatom flora, good population of Navicula reinhardtii. Coll: E. F. Stoermer, 23 June 1966.

1110. Aufwuchs on plant roots at waters edge, fishing access site on Platte Lake. Sec. 3, R15W, T26N, Benzie County, Michigan. Diverse diatom flora. Coll: E. F. Stoermer, 23 June 1966.

1111. Filamentous algae in shallow water, Platte River near Lake Michigan. Sec. 20, R15W, T27N, Benzie State Park, Benzie County, Michigan. Mostly (?) Zygnema sp. Coll: E. F. Stoermer, 23 June 1966.

1112. Bottom sediment in shallow water, Platte River near Lake Michigan. Sec. 20, R15W, T27N, Benzie State Park, Benzie County, Michigan. Diverse diatom flora. Coll: E. F. Stoermer, 23 June 1966.

1113. Gelatinous mass floating in Platte River near Lake Michigan. Sec. 20, R15W, T27N, Benzie State Park, Benzie County, Michigan. Naviculoid diatoms, many sigmoid Nitzschia. Coll: E. F. Stoermer, 23 June 1966.

1114. Plankton, Lake Michigan, 100 yds from confluence of Platte River. Sec. 20, R15W, T27N, Benzie State Park, Benzie County, Michigan. Rather poor flora, much detritus. Coll: E. F. Stoermer, 23 June 1966.

1115. Bottom material from small pool, 10 yds from Lake Michigan beach, near Platte River confluence, Sec. 20, R15W, T27N, Benzie State Park, Benzie County, Michigan. Very poor flora. Coll: E. F. Stoermer, 23 June 1966.

1116. Plankton, Platte River, at confluence with Lake Michigan. Sec. 20, R15W, T27N, Benzie State Park, Benzie County, Michigan. Poor flora, some large Surirella. Coll: E. F. Stoermer, 23 June 1966.

1117. Shore plankton, Crystal Lake. Sec. 6, R15W, T26N, Benzie County, Michigan. Rather poor flora, mostly Synedra sp., much detritus. Coll: E. F. Stoermer, 24 June 1966.

1118. Scrape from rocks near shore, Crystal Lake. Sec. 6, R15W, T26N, Benzie County, Michigan. Ulothrix and large quantities of Gomphonema. Coll: E. F. Stoermer, 24 June 1966.

1119. Rock scrape inside breakwater, Frankfort. Sec. 28, R16W, T26N, Benzie County, Michigan. Mostly Ulothrix. Coll: E. F. Stoermer, 24 June 1966.

1120. Rock scrape outside breakwater, Frankfort. Sec. 28, R16W, T26N, Benzie County, Michigan. Very poor flora, mostly depauperate Ulothrix. Coll: E. F. Stoermer, 24 June 1966.

1121. Plankton, Lake Michigan just outside Frankfort break-water. Sec. 28, R16W, T26N, Benzie County, Michigan. Normal lake flora plus Diatoma tenue and Nitzschia holsatica. Coll: E. F. Stoermer, 24 June 1966.

1122. Plankton, Frankfort Harbor, just inside breakwater. Sec. 28, R16W, T26N, Benzie County, Michigan. Some normal lake flora plus "pollution" indicators (Stephanodiscus huntzschii (?), Melosira binderiana, Nitzschia helsatica, Diatoma tenue). Coll: E. F. Stoermer, 24 June 1966.

1123. Blue-green algae growing on bubblers, Frankfort "Mineral Spring." Sec. 27, R16W, T26N, in town of Frankfort, Benzie County, Michigan. Almost entirely Phormidium. Coll: E. F. Stoermer, 24 June 1966.

1124. Scrape from pier, just outside harbor, Manistee. Sec. 3, R17W, T21N, Manistee County, Michigan. Rich diatom flora. Coll: E. F. Stoermer, 24 June 1966.

1125. Plankton just outside breakwater, Manistee. Sec. 3, R17W, T21N, Manistee County, Michigan. "Normal" lake flora plus Diatoma tenue. Coll: E. F. Stoermer, 24 June 1966.

1126. Plankton just inside breakwater, Manistee, Sec. 3, R17W, T21N, Manistee County, Michigan. Melosira dominant. Coll: E. F. Stoermer, 24 June 1966.

1127. Scrape from sheet piling, inside breakwater, Manistee, Sec. 3, R17W, T21N, Manistee County, Michigan. Ulothrix, Diatoma vulgare, Gomphoneis herculeanum dominant. Coll: E. F. Stoermer, 24 June 1966.

1128. Plankton inside harbor, Ludington. Sec. 16, R18W, T18N, Mason County, Michigan. Evident phytoplankton

bloom associated with alewife kill. Melosira dominant, also Nitzschia holsatica, Diatoma tenue, Actinastrum hantschii var. fluvealale, Stephanodiscus hantzschii. Coll: E. F. Stoermer, 24 June 1966.

1129. Rock scrape from inside breakwater, Ludington, Sec. 16, R18W, T18N, Mason County, Michigan. Cladophora sp. and Diatoma vulgare in almost pure stand. Coll: E. F. Stoermer, 24 June 1966.

1130. Plankton just outside harbor, Ludington. Sec. 16, R18W, T18N, Mason County, Michigan. Flora much the same as in sample 152. Coll: E. F. Stoermer, 24 June 1965.

1131. Rock scrape outside breakwater, Ludington. Sec. 16, R18W, T18N, Mason County, Michigan. Ulothrix zonata, and Diatoma vulgare. Coll: E. F. Stoermer, 24 June 1966.

1132. Shore plankton, shallow water in Muskegon Lake, pier across from State Park office. Sec. 22, R17W, T10N, Muskegon State Park, Muskegon County, Michigan. Very poor flora. Coll: E. F. Stoermer, 25 June 1966.

1133. Algae and Lemma trishucata in shallow water, Muskegon Lake, pier across from State Park office. Sec. 22, R17W, T10N, Muskegon County, Michigan. Mostly Spirogyra. Coll: E. F. Stoermer, 25 June 1966.

1134. Rock scrape from shallow pool, Muskegon Lake, just inside ship channel, Sec. 28, R17W, T10N, Muskegon County, Michigan. Primarily Phormidium. Coll: E. F. Stoermer, 25 June 1966.

1135. Plankton, Muskegon Lake, just inside ship channel, Sec. 28, R17W, T10N, Muskegon County, Michigan. Massive bloom of Diatoma tenue and Aphanizominon. Coll: E. F. Stoermer, 25 June 1966.

1136. Filamentous algae at waterline, ship channel. Sec. 28, R17W, T10N, Muskegon County, Michigan. Almost pure stand of Ulothrix zonata. Coll: E. F. Stoermer, 25 June 1966.

1137. Filamentous algae 12" below water line, ship channel. Sec. 28, R17W, T10N, Muskegon County, Michigan. Almost pure stand of Cladophora. Coll: E. F. Stoermer, 25 June 1966.

1138. Rock scrape inside Muskegon north pier, Sec. 29, R17W, T10N, Muskegon County, Michigan. Almost pure stand of Ulothrix zonata. Coll: E. F. Stoermer, 25 June 1966.

1139. Plankton, inside Muskegon north piers. Sec. 29, R17W, T10N, Muskegon County, Michigan. Massive eutrophic type bloom. Coll: E. F. Stoermer, 25 June 1966.

1140. Rock scrape, outside of Muskegon north pier, Sec. 29, R17W, T10N, Muskegon County, Michigan. Mostly Ulothrix. Coll: E. F. Stoermer, 25 June 1966.

1141. Plankton, outside Muskegon north pier, Sec. 29, R17W, T10N, Muskegon County, Michigan. Diverse flora. Coll: E. F. Stoermer, 25 June 1966.

1142. Plankton, 10 yds off campground beach, Muskegon State Park. Sec. 17, R17W, T10N, Muskegon County, Michigan. Very rich and varied flora - many volvocine algae. 23°C. Coll: E. F. Stoermer.

1143. Plankton 100 yds off campground beach, Muskegon State Park. Sec. 17, R17W, T10N, Muskegon County, Michigan. Massive flagellate bloom. Much different from sample 192. Coll: E. F. Stoermer, 25 June 1966.

1144. Surface #20 net tow, Lake Michigan. Station GA-1a. 41°38.4'N; 87°19.0'W. Coll: A. Strong. 19 May 1966.

1145. Surface #20 net tow, Lake Michigan. Station GA-1b. 41°38.4'N; 87°19.0'W. Coll: A. Strong. 19 May 1966.

1146. Ground water seepage area near Buena Vista Lagoon, San Diego County, Calif. Coll: W. Alley. 17 July 1966.

1147. Material from salt crystals in ground water seepage area, Buena Vista Lagoon, San Diego County, Calif. Coll: W. Alley. 13 July 1966.

1148. Rock scrape from bed of Buena Vista Creek, near Buena Vista Lagoon, San Diego County, Calif. Coll: W. Alley. 13 July 1966.

1149. #20 net plankton tow, Buena Vista Creek, near Buena Vista Lagoon, San Diego County, Calif. Coll: W. Alley. 14 July 1966.

1150. Rock scrape from Buena Vista Lagoon near bridge on South Hill Street, San Diego County, Calif. Coll: W. Alley. 19 July 1966.

1151. Plankton - #20 net tow from Buena Vista Lagoon near bridge on South Hill Street, San Diego County, Calif. Coll: W. Alley. 19 July 1966.

1152. #20 net tow from King Harbor, Hermosa Beach, Los Angeles County, Calif. Coll: W. Alley. 15 July 1966.

1153. Rock scrape from tidal interface, King Harbor, Hermosa Beach, Los Angeles County, Calif. Coll: W. Alley. 15 July 1966.

1154. #20 net plankton tow, Bicksby Slough, near Long Beach, Calif. Coll: W. Alley. 15 July 1966.

1155. Bottom material in shallow water, Bicksby Slough, near Long Beach, Calif. Coll: W. Alley. 15 July 1966.

1156. Dredge sample from 200 ft depth, Whitefish Bay, Lake Superior. Coll: Wm. Marshall. 15 Jan. 1966.

1157. Material on rocks at 21 ft depth. Diving Station #25, near South Fox Island, Lake Michigan. Coll: Robert Anderson. 17 June 1966. (contains Batrachospermum sp.)

1158. Material on rocks at 40 ft depth. Diving Station #3, near South Fox Island, Lake Michigan. Coll: Robert Anderson. 17 June 1966.

1159. Detritus on bottom 120 ft depth. Diving Station #3, near South Fox Island, Lake Michigan. Coll: Robert Anderson. 16 June 1966.

1160. Rock scrape from 40 ft depth. Diving Station #3, near South Fox Island, Lake Michigan. Coll: Robert Anderson. 16 June 1966.

1161. Rock scrape from 10 ft depth. Diving Station #3, near South Fox Island, Lake Michigan. Coll: Robert Anderson. 16 June 1966.

1162. Rock scrape, 46 ft depth. Diving Station #21, near South Fox Island, Lake Michigan. Coll: Robert Anderson. 20 June 1966.

1163. Rock scrape from 25 ft depth. Diving Station #8, near South Fox Island, Lake Michigan. Coll: Robert Anderson. 20 June 1966.

1164. Vertical #20 net tow, 55 ft depth. Sleeping Bear Bay, Lake Michigan. Coll: Robert Anderson. 21 June 1966.

1165. Bottom sediments from 3-4 meters, Biological Station beach, Douglas Lake, Sec. 33, R3W, T37N, Cheboygan County, Michigan. Coll: E. F. Stoermer. 23 June 1966.

1166. Strippings from aquatic plants from 2 meters, Biological Station beach, Douglas Lake, Sec. 33, R3W, T37N, Cheboygan County, Michigan. Coll: E. F. Stoermer. 23 June 1966.

1167. Material filtered from water by living mussels from 3-4 meters depth, Biological Station beach, Douglas Lake, Sec. 33, R3W, T37N, Cheboygan County, Michigan. Coll: E. F. Stoermer. 23 June 1966.

1168. Apparent mass of blue-green algae; pool in Sphagnum mat, Mud Lake, Sec. 7, R2W, T37N, Cheboygan County, Michigan. Coll: E. F. Stoermer. 23 June 1966.

1169. Bottom sediments from open pool in bog mat. Mud Lake, Sec. 7, R2W, T37N, Cheboygan County, Michigan. Coll: E. F. Stoermer. 23 June 1966.

1170. Algal mat on interface between open water and bog mat. Mud Lake, Sec. 7, R2W, T37N, Cheboygan County, Michigan. Coll: E. F. Stoermer. 23 June 1966.

1171. Squeezing from water saturated Sphagnum, Mud Lake, Sec. 7, R2W, T37N, Cheboygan County, Michigan. Coll: E. F. Stoermer. 23 June 1966.

1172. Squeezing from nearly dry Sphagnum, Mud Lake, Sec. 7, R2W, T37N, Cheboygan County, Michigan. Coll: E. F. Stoermer. 23 June 1966.

1173. Bottom material, edge of mat, Bryant's Bog. Sec. 29, R3W, T37N, Cheboygan County, Michigan. Coll: E. F. Stoermer. 23 June 1966.

1174. Plankton, Bryant's Bog, Sec. 29, R3W, T37N, Cheboygan County, Michigan. Coll: E. F. Stoermer. 23 June 1966.

1175. Bottom sediment in slow water, East Branch, Maple River at Pellston Road, Sec. 36, R4W, T37N, Emmet County, Michigan. Coll: E. F. Stoermer. 23 June 1966.

1176. Plankton, East Branch, Maple River at Pellston Road, Sec. 36, R4W, T37N, Cheboygan County, Michigan. Coll: E. F. Stoermer. 23 June 1966.

1177. Psammon, Biological Station beach, Douglas Lake, Sec. 33, R3W, T37N, Cheboygan County, Michigan. Coll: E. F. Stoermer. 23 June 1966.

1178. Shore plankton, Biological Station beach, Douglas Lake, Sec. 33, R3W, T37N, Cheboygan County, Michigan. Coll: E. F. Stoermer. 23 June 1966. Huron?

1179. Vertical #20 net tow. Station HU-1. 45°49.0'N; 84°48.1'W. Lake Michigan. Coll: E. F. Stoermer. 12 August 1966.

1180. Vertical #20 net tow. Station HU-3. 45°25.8'N; 83°31.2'W. Lake Huron. Coll: E. F. Stoermer. 13 August 1966.

1181. Vertical #20 net tow. Station HU-5. 45°27.9'N; 82°56.8W. Lake Huron. Coll: E. F. Stoermer. 13 August 1966.

1182. Vertical #20 net tow. Station HU-8. 45°31.5'N; 82°16.5'W. Lake Huron. Coll: E. F. Stoermer. 14 August 1966.

1183. Vertical #20 net tow. Station HU-10 (deepest sounding). 45°01.0'N; 82°01.0'W. Lake Huron. More eutrophic appearing flora than previous samples from Lake Huron. Melosira sp. dominant. Coll: E. F. Stoermer. 15 August 1966.

1184. Vertical #20 net tow. Station HU-11. Detour Passage (2.0 miles, 345° true, detour light). Lake Huron. Coll: E. F. Stoermer. 16 August 1966.

1185. Vertical #20 net tow. Station SU-1. 46°35.6'N; 84°49.5'W. Lake Superior. Coll: E. F. Stoermer. 17 August 1966.

1186. Vertical #20 net tow. Station SU-2. 46°45.8'N; 85°31.3'W. Lake Superior. Unusual amount of Cymbella sp. Coll: E. F. Stoermer. 17 August 1966.

1187. Vertical #20 net tow. Station SU-4. 46°44.0'N; 86°32.8'W. Lake Superior. Considerable colonial Synedra (aff. S. Cunningtonii). Coll: E. F. Stoermer. 19 August 1966.

1188. Vertical #20 net tow. Station SU-7. 47°10'30"N 86°16'45" (1160 ft.) Lake Superior. Coll: E. F. Stoermer. 19 August 1966.

1189. Vertical #20 net tow. Station SU-8. 47°37.9'N; 85°49.0'W. Lake Superior. Coll: E. F. Stoermer. 20 August 1966.

1190. Surface #20 net tow. Station SM-1. 46°09'25"N; 84°03'12"W. St. Mary's River. Coll: E. F. Stoermer. 21 August 1966.

1191. Surface #20 net tow. Station SM-2. 46°04'06"N; 86°55'39"W. St. Mary's River. Coll: E. F. Stoermer. 21 August 1966.

1192. Surface #20 net tow. Station PM-1. 45°46'30"N; 85°08'45"W. Lake Michigan. Coll: E. F. Stoermer. 21 Sept. 1966.

1193. Surface #20 net tow. Station PM-2. 45°24.0'N; 85°15.0'W. Lake Michigan. Mostly zooplankton. Coll: E. F. Stoermer. 21 August 1966.

1194. Surface #20 net tow. Station PM-3. 45°17.2'N; 85°55.0'W. Lake Michigan. Mostly Botryococcus and zooplankton. Coll: E. F. Stoermer. 21 August 1966.

1195. Surface #20 net tow. Station PM-4. 45°01'18"N; 85°55'00"W. Lake Michigan. Coll: E. F. Stoermer. 22 August 1966.

1196. Vertical #20 net tow. Station M.P-2. 44°57'48"N; 86°03'06"W. Lake Michigan. Coll: E. F. Stoermer. 22 August 1966.

1197. Vertical #20 net tow. Station AEC-1. 42°36.0'N; 86°59.0'W. Lake Michigan. Coll: E. F. Stoermer. 19 September 1966.

1198. Vertical #20 net tow. Station AEC-2. 42°46.5'N; 87°02.5'W. Lake Michigan. Coll: E. F. Stoermer 19 September 1966. (Synedra sp. dominant!)

1199. Vertical #20 net tow. Station AEC-3. 43°18.5'N; 86°42.5'W. Lake Michigan. Coll: E. F. Stoermer. 20 September 1966. (Synedra sp. dominant!)

1200. Vertical #20 net tow. Station AEC-4. 43°54.4'N; 86°49.0'W. Lake Michigan. Coll: E. F. Stoermer. 20 September 1966. (Synedra sp. dominant!)

1201. Vertical #20 net tow. Station AEC-5. 44°08.7'N; 86°42.6'W. Lake Michigan. Coll: E. F. Stoermer. 21 September 1966.

1202. Vertical #20 net tow. Station AEC-6. 44°20.0'N; 86°43.1'W. Lake Michigan. Coll: E. F. Stoermer. 21 September 1966.

1203. Vertical #20 net tow. Station AEC-7. 44°28.7'N; 86°43.1'W. Lake Michigan. Coll: E. F. Stoermer. 21 September 1966.

1204. Vertical #20 net haul, Station A-1, 42°06'30"N; 86°32'00"W, Lake Michigan. Coll: J. Ayers. 26 Sept. 1966.

1205. Vertical #20 net haul, Station A-2, 42°06'00"N; 86°37'00"W, Lake Michigan. Coll: J. Ayers. 26 Sept. 1966.

1206. Vertical #20 net haul, Station A-3, 42°05'30"N; 86°43'00"W, Lake Michigan. Coll: J. Ayers. 27 Sept. 1966.

1207. Vertical #20 net haul, Station A-4, 42°03'30"N; 87°06' 30"W, Lake Michigan. Coll: J. Ayers. 27 Sept. 1966. Heavy population of Ceratium.

1208. Vertical #20 net haul, Station A-5, 41°57'00"N; 87°18 ' 30"W, Lake Michigan. Coll: J. Ayers. 27 Sept. 1966.

1209. Vertical #20 net haul, Station A-6, 41°52'00"N; 87°27'00"W, Lake Michigan. Coll: J. Ayers. 27 Sept. 1966.

1210. Vertical #20 net haul, Station C-1, 42°49'40"N; 86°14'50"W, Lake Michigan. Coll: J. Ayers. 26 Sept. 1966.

1211. Vertical #20 net haul, Station C-2, 42°49'40"N; 86°18'25"W, Lake Michigan. Coll: J. Ayers. 26 Sept. 1966.

1212. Vertical #20 net haul, Station C-3, 42°49'10"N; 86°28'25"W, Lake Michigan. Coll: J. Ayers. 26 Sept. 1966. (Extremely sparse phytoplankton.)

1213. Vertical #20 net haul, Station C-4, 42°48'50"N; 86°41'30"W, Lake Michigan. Coll: J. Ayers. 28 Sept. 1966.

1214. Vertical #20 net haul, Station C-5, 42°49'00"N; 86°50'00"W, Lake Michigan. Coll: J. Ayers. 28 Sept. 1966.

1215. Vertical #20 net haul, Station C-6, 42°47'40"N; 87°26'50"W, Lake Michigan. Coll: J. Ayers. 28 Sept. 1966.

1216. Vertical #20 net haul, Station C-7, 42°47'30"N; 87°34'30"W, Lake Michigan. Coll: J. Ayers. 28 Sept. 1966.

1217. Vertical #20 net haul, Station E-1, 44°37'30"N; 86°18'12"W, Lake Michigan. Coll: J. Ayers. 2 October 1966.

1218. Vertical #20 net haul, Station E-2, 44°37'00"N; 86°21'42"W, Lake Michigan. Coll: J. Ayers. 2 October 1966.

1219. Vertical #20 net haul, Station E-3, 44°34'00"N; 86°40'00"W, Lake Michigan. Coll: J. Ayers. 2 October 1966.

1220. Vertical #20 net haul, Station E-4, 44°30'18"N; 86°55' 18"W, Lake Michigan. Coll: J. Ayers. 2 October 1966.

1221. Vertical #20 net haul, Station E-5, 44°25'30"N; 87°10'18"W, Lake Michigan. Coll: J. Ayers. 1 October 1966.

1222. Vertical #20 net haul, Station E-6, 44°27'48"N; 87°26'25"W, Lake Michigan. Coll: J. Ayers. 1 October 1966.

1223. #20 net sample, Vertical haul, 83 m, Station B-3. 42°24'00"N; 86°35'30"W. Coll: C. F. Powers, 18 May 1964.

1224. #20 net sample, Vertical haul, 141 m, Station B-4. 42°23'30"N; 87°01'30"W. Coll: C. F. Powers, 18 May 1964.

1225. #20 net sample, Vertical haul, Station C-6. 42°47'40"N; 87°26'50"W. Coll: C. F. Powers, 15 May 1964.

1226. #20 net sample, Vertical haul, Station C-7. 42°47'30"N; 87°34'30"W. Coll: C. F. Powers, 16 May 1964.

1227. #20 net sample, Vertical haul, Station C'-2. 43°12'00"N; 86°31'00"W. Coll: C. F. Powers, 13 May 1964.

1228. #20 net sample, Vertical haul, Station D-2. 43°56'00"N; 86°39'30"W. Coll: C. F. Powers, 14 May 1964.

1229. #20 net sample, Vertical haul, Station D-5. 43°38'40"N; 87°31'00"W. Coll: C. F. Powers, 14 May 1964.

1230. #20 net sample, Vertical haul, Station E-2. 44°37'00"N; 86°21'42"W. Coll: C. F. Powers, 16 May 1964.

1231. #20 net sample, Vertical haul, Station E-3. 44°34'00"N; 86°40'00"W. Coll: C. F. Powers, 16 May 1964.

1232. #20 net sample, Vertical haul, Station E-5. 44°25'30"N; 87°10'18"W. Coll: C. F. Powers, 16 May 1964.

1233. #20 net sample, Vertical haul,Station B-3. 42°24'00"N; 86°35'30"W. Coll: C. F. Powers, 5 June 1964.

1234. #20 net sample, Vertical haul, Station B-3. 42°24'00"N; 86°35'30"W. Coll: C. F. Powers, 18 June 1964.

1235. #20 net sample, Vertical haul, Station C-7. 42°47'30"N; 87°34'30"W. Coll: C. F. Powers, 16 June 1964.

1236. #20 net sample, Vertical haul, Station C'-1. 43°08'00"N; 86°23'00"W. Coll: C. F. Powers, 8 June 1964.

1237. #20 net sample, Vertical haul, Station C'-2. 43°12'00"N; 86°31'00"W. Coll: C. F. Powers, 8 June 1964. 51°30°W?

1238. #20 net sample, Vertical haul, Station D-3. 43°54'00"N; 86°51'30"W. Coll: C. F. Powers, 11 June 1964.

1239. #20 net sample, Vertical haul, Station D-4. 43°48'00"N; 87°03'00"W. Coll: C. F. Powers, 11 June 1964.

1240. #20 net sample, Vertical haul, Station D-6. 43°44'00"N; 87°38'00"W. Coll: C. F. Powers, 10 June 1964.

1241. #20 net sample, Vertical haul, Station E-2. 44°37'00"N; 86°21'42"W. Coll: C. F. Powers, 13 June 1964.

1242. #20 net sample, Vertical haul, Station E-3. 44°34'00"N; 86°40'00"W. Coll: C. F. Powers, 13 June 1964.

1243. #20 net sample, Vertical haul, Station E-6. 44°27'48"N; 87°26'25"W. Coll: C. F. Powers, 13 June 1964.

1244. #20 net sample, Vertical haul, Station F-1. 45°21'45"N; 85°19'45"W. Coll: C. F. Powers, 11 June 1964.

1245. #20 net sample, Vertical haul, Station F-2. 45°28'30"N; 85°26'00"W. Coll: C. F. Powers, 11 June 1964.

1246. #20 net sample, Vertical haul, Station F-3. 45°33'40"N; 85°30'45"W. Coll: C. F. Powers, 11 June 1964.

1247. #20 net sample, Vertical haul, Station B-3. 42°24'00"N; 86°35'30"W. Coll: C. F. Powers, 14 July 1964.

1248. #20 net sample, Vertical haul, Station B-3. 42°24'00"N; 86°35'30"W. Coll: C. F. Powers, 24 July 1964.

1249. #20 net sample, Vertical haul, Station C-3. 42°49'10"N; 86°28'25"W. Coll: C. F. Powers, 8 July 1964.

1250. #20 net sample, Vertical haul, Station C-6. 42°47'40"N; 87°26'50"W. Coll: C. F. Powers, 10 July 1964.

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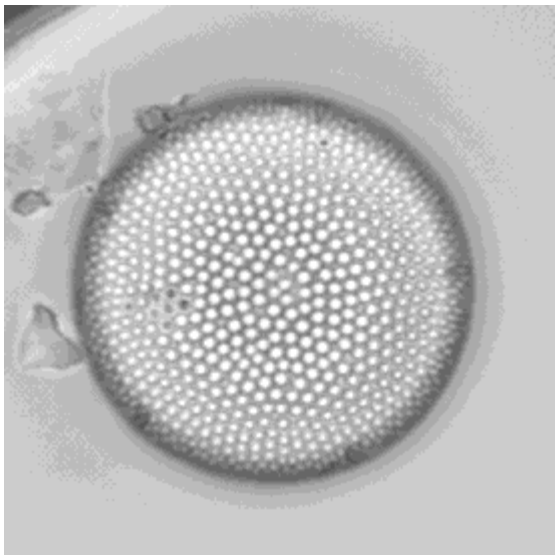

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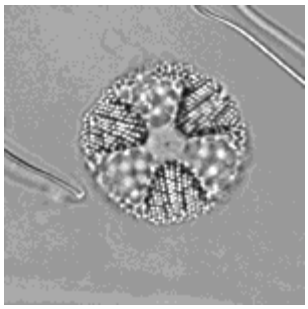

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COLLECTIONS: EUGENE F. STOERMER (#8)

1451. Vertical #20 net tow. Sta. C-7, 42°47'30"N, 87°34'30"W. Lake Michigan. Coll: E. Dunster. 16 July 1967.

1452. Vertical #20 net tow. Sta. E-2, 44°37'00"N, 86°21'42"W. Lake Michigan. Coll: E. Dunster. 14 July 1967.

1453. Vertical #20 net tow. Sta. E-3, 44°34'00"N, 86°40'00"W. Lake Michigan. Coll: E. Dunster. 15 July 1967.

1454. Vertical #20 net tow. Sta. E-5, 44°25'30"N, 87°10'18"W. Lake Michigan. Coll: E. Dunster. 15 July 1967.

1455. Surface #20 net tow. CH-1, Chicago, Ill. Lake Michigan Coll: E. Dunster. 10 July 1967.

1456. Surface #20 net tow. Cheboygan, Mich. Lake Huron. Coll: E. Dunster. 21 July 1967.

1457. Surface #20 net tow. Calcite, Mich. Lake Huron. Coll: E. Dunster. 22 July 1967.

1458. Surface #20 net tow. South Baymouth, Canada. Lake Huron. Coll: E. Dunster. 23 July 1967.

1459. Surface #20 net tow. Alpena, Mich. Lake Huron. Coll: E. Dunster. 25 July 1967.

1460. Surface #20 net tow. Harbor Beach, Mich. Lake Huron. Coll: E. Dunster. 27 July 1967.

1461. Vertical #20 net tow. Sta. HU-1, 45°49.0'N, 84°48.1'W. Straits of Lake Michigan. Coll: E. Dunster. 21 July 1967.

1462. Vertical #20 net tow. Sta. HU-3, 45°25.8'N, 83°31.2'W. Lake Huron. Coll: E. Dunster. 22 July 1967.

1463. Vertical #20 net tow. Sta. HU-5, 45°27.9'N, 82°56.8'W. Lake Huron. Coll: E. Dunster. 23 July 1967.

1464. Vertical #20 net tow. Sta. HU-8, 45°31.5'N, 82°16.5'W. Lake Huron. Coll: E. Dunster. 23 July 1967.

1465. Vertical #20 net tow. Sta. HU-10, 45°01.0'N, 82°01.0'W. Lake Huron. Coll: E. Dunster. 25 July 1967.

1466. Vertical #20 net tow. Sta. HU-13, 45°00.5'N, 82°34.5'W. Lake Huron. Coll: E. Dunster. 25 July 1967.

1467. Vertical #20 net tow. Sta. HU-15, 44°21.8'N, 82°54.2'W. Lake Huron. Coll: E. Dunster. 27 July 1967.

1468. Vertical #20 net tow. Sta. HU-16, 44°05.3'N, 82°44.8'W. Lake Huron. Coll: E. Dunster. 27 July 1967.

1469. Vertical #20 net tow. Sta. HU-18, 43°51.2'N, 82°27.7'W. Lake Huron. Coll: E. Dunster. 27 July 1967.

1470. Surface #20 net tow. Sta. GS-67-23, 42°58.4'N, 82°25.1'W. St. Claire River. Coll: E. F. Stoermer. 29 July 1967.

1471. Surface #20 net tow. Sta. GS-67-24, 42°32.2'N, 82°37.8'W. St. Clair River. Coll: E. F. Stoermer. 29 July 1967.

1472. Surface #20 net tow. Sta. GS-67-25, 42°21.7'N, 82°54.4'W. St. Clair River. Coll: E. F. Stoermer. 29 July 1967.

1473. Surface #20 net tow. Sta. GS-67-26, 42°14.8'N, 83°05.65'W. Detroit River. Coll: E. F. Stoermer. 29 July 1967.

1474. Surface #20 net tow. Sta. GS-67-27, 41°47.2'N, 83°08.15'W. Lake Erie. Coll: E. F. Stoermer. 29 July 1967.

1475. Vertical #20 net tow. Sta. HU-20, 43°52.0'N, 82°06.2'W. Lake Huron. Coll: E. F. Stoermer. 28 July 1967.

1476. Vertical #20 net tow. Sta. HU-23, 43°18.7'N, 82°14.7'W. Lake Huron. Coll: E. F. Stoermer. 28 July 1967.

1477. Surface #20 net tow. Leamington, Ontario. Lake Erie. Coll: E. F. Stoermer. 29 July 1967.

1478. Surface #20 net tow. Port Stanley, Ontario. Lake Erie. Coll: E. F. Stoermer. 30 July 1967.

1479. Surface #20 net tow. Erie, Pa. Lake Erie. Coll: E. F. Stoermer. 30 July 1967.

1480. Surface #20 net tow. Cleveland, Ohio. Lake Erie. Coll: E. F. Stoermer. 1 August 1967.

1481. Surface #20 net tow. Monroe, Mich. Lake Erie. Coll: E. F. Stoermer. 2 August 1967.

1482. Surface #20 net tow. St. Ignace, Mich. Straits of Mackinac. Coll: E. F. Stoermer. 4 August 1967.

1483. Vertical #20 net tow. Sta. ER-1, 41°56.1'N, 83°04.3'W. Lake Erie. Coll: E. F. Stoermer. 29 July 1967.

1484. Vertical #20 net tow. Sta. ER-2, 41°33.1'N, 82°40.4'W. Lake Erie. Coll: E. F. Stoermer. 29 July 1967.

1485. Vertical #20 net tow. Sta. ER-3, 41°53.0'N, 82°18.3'W. Lake Erie. Coll: E. F. Stoermer. 30 July 1967.

1486. Vertical #20 net tow. Sta. ER-5, 42°05.7'N, 81°51.0'W. Lake Erie. Coll: E. F. Stoermer. 30 July 1967.

1487. Vertical #20 net tow. Sta. ER-7, 42°18.0'N, 81°23.0'W. Lake Erie. Coll: E. F. Stoermer. 30 July 1967.

1488. Vertical #20 net tow. Sta. ER-8, 42°28.1'N, 81°18.1'W. Lake Erie. Coll: E. F. Stoermer. 30 July 1967.

1489. Vertical #20 net tow. Sta. ER-9, 42°35.5'N, 81°05.2'W. Lake Erie. Coll: E. F. Stoermer. 30 July 1967.

1490. Vertical #20 net tow. Sta. ER-10, 42°28.1'N, 80°52.8'W. Lake Erie. Coll: E. F. Stoermer. 31 July 1967.

1491. Vertical #20 net tow. Sta. ER-1l, 42°21.1'N, 80°39.1'W. Lake Erie. Coll: E. F. Stoermer. 31 July 1967.

1492. Vertical #20 net tow. Sta. ER-13, 42°26.8'N, 80°14.1'W. Lake Erie. Coll: E. F. Stoermer. 31 July 1967.

1493. Vertical #20 net tow. Sta. ER-15, 42°31.0'N, 79°53.8'W. Lake Erie. Coll: E. F. Stoermer. 31 July 1967.

1494. Vertical #20 net tow. Sta. ER-18, 42°14.4'N, 80°12.7'W. Lake Erie. Coll: E. F. Stoermer. 1 August 1967.

1495. Vertical #20 net tow. Sta. ER-20, 42°02.8'N, 80°46.1'W. Lake Erie. Coll: E. F. Stoermer. 1 August 1967.

1496. Vertical #20 net tow. Sta. ER-22, 41°51.3'N, 81°20.8'W. Lake Erie. Coll: E. F. Stoermer. 1 August 1967.

1497. Vertical #20 net tow. Sta. ER-24, 41°38.7'N, 81°40.5'W. Lake Erie. Coll: E. F. Stoermer. 1 August 1967.

1498. Vertical #20 net tow. Sta. ER-25, 41°42.2'N, 81°53.7'W. Lake Erie. Coll: E. F. Stoermer. 2 August 1967.

1499. Vertical #20 net tow. Sta. ER-26, 41°38.2'N, 82°15.0'W. Lake Erie. Coll: E. F. Stoermer. 2 August 1967.

1500. Vertical #20 net tow. Sta. ER-27, 41°34.5'N, 82°36.9'W. Lake Erie. Coll: E. F. Stoermer. 2 August 1967.

1501. Vertical #20 net tow. Sta. ER-28, 41°34.5'N, 82°36.9'W. Lake Erie. Coll: E. F. Stoermer. 2 August 1967.

1502. Vertical #20 net tow. Sta. ER-29, 41°48.2'N, 83°06.0'W. Lake Erie. Coll: E. F. Stoermer. 2 August 1967.

1503. Rock scrape. Sta. ER-9, 42°35.5'N; 81°05.2'W. Lake Erie. Coll: E. F. Stoermer. 30 July 1967.

1504. Vertical #20 net tow. Sta. A-3, 42°05'30"N; 86°43'00"W. Lake Michigan. Coll: E. Dunster. 28 August 1967.

1505. Vertical #20 net tow. Sta. A-4, 42°03'30"N; 87°06'30"W. Lake Michigan. Coll: E. Dunster. 28 August 1967.

1506. Vertical #20 net tow. Sta. A-6, 41°52'00"N; 87°27'00"W. Lake Michigan. Coll: E. Dunster. 29 August 1967.

1507. Rock scrape. Sta. A-6, 41°52'00"N; 87°27'00"W. Lake Michigan. Coll: E. Dunster. 29 August 1967.

1508. Vertical #20 net tow. Sta. C-3, 42°49'10"N; 86°28'25"W. Lake Michigan. Coll: E. Dunster. 2 September 1967.

1509. Vertical #20 net tow. Sta. C-5, 42°49'00"N; 86°50'00"W. Lake Michigan. Coll: E. Dunster. 2 September 1967.

1510. Vertical #20 net tow. Sta. C-7, 42°47'30"N; 87°34'30"W. Lake Michigan. Coll: E. Dunster. 29 August 1967.

1511. Vertical #20 net tow. Sta. E-2, 44°37'00"N; 86°21'42"W. Lake Michigan. Coll: E. Dunster. 1 September 1967.

NOTE: 1511 slide dropped, coverslip recovered and remounted, coordinates previously recorded are now inaccurate.

1512. Vertical #20 net tow. Sta. E-3, 44°34'00"N; 86°40'00"W. Lake Michigan. Coll: E. Dunster. 1 September 1967.

1513. Vertical #20 net tow. Sta. E-5, 44°25'30"N; 87°10'18"W. Lake Michigan. Coll: E. Dunster. 31 August 1967.

1514. Rock scrappings, rocks gathered by divers on Mid-Lake High (140 ft. depth). 43°20'30"N; 87°09'00"W. Lake Michigan. Coll: L. Somers and R. Anderson. 22 June 1967.

1515. Rock scrappings, rock gathered by divers on Mid-Lake High (140 ft. depth).
43°20'30"N; 87°09'00"W. Lake Michigan. Coll: L. Somers and R. Anderson. 22 June 1967.

1516. Rock scrappings, rocks gathered by STAR II, GLRD dive #137 (275 ft. depth). 43°03'50"N; 87°25'00"W. Lake Michigan. Coll: D. Brandon. 21 June 1967.

1517. Rock scrappings, rock gathered by STAR II, GLRD dive #132 (260 ft. depth). 43°01'00"N; 87°21'00"W. Lake Michigan. Coll: L. Somers. 20 June 1967.

1518. Rock scrappings. Sta. HU-1, 45°49.0'N; 84°48.1'W. Straits of Lake Michigan. Coll: E. Dunster. 21 July 1967.

1519. Periphyton growing on plastic current meter rotors, GLRD Meteorology Tower - 7 ft. depth, 5500 ft. offshore. Mona Lake inlet. Lake Michigan. Coll: F. Elder. 20 September 1967.

1520. Surface #20 net tow. Holland, Michigan. Lake Michigan. HO = 42°46.4°N, 86°12.9°W. Coll: J. Ayers. 18 September 1967.

1521. Surface #20 net tow. South Haven, Michigan. Lake Michigan. SH = 42°24.0°N, 86°17.3°W. Coll: J. Ayers. 18 September 1967.

1522. Surface #20 net tow. Benton Harbor, Michigan. Lake Michigan. BH = 42°06.9°N, 86°29.7°W. Coll: J. Ayers. 18 September 1967.

1523. Surface #20 net tow. Racine, Wisconsin. Lake Michigan. RA = 42°44.1°N, 87°46.3°W. Coll: J. Ayers. 19 September 1967.

1524. Surface #20 net tow. Milwaukee, Wisconsin. Lake Michigan. MI = 43°01.6°N, 87°52.9°W. Coll: J. Ayers. 20 September 1967.

1525. Surface #20 net tow. Port Washington, Wisconsin. Lake Michigan. PW = 43°23.2°N, 87°51.7°W. Coll: J. Ayers. 20 September 1967.

1526. Surface #20 net tow. Manitowoc, Wisconsin. Lake Michigan. MO = 44°05.6°N, 87°38.6°W. Coll: J. Ayers. 20 September 1967.

1527. Surface #20 net tow. Two Rivers, Wisconsin. Lake Michigan. TR = 44°08.6'N, 87°33.6'W. Coll: J. Ayers. 20 September 1967.

1528. Surface #20 net tow. Sheboygan, Wisconsin. Lake Michigan. SB = 43°45.0'N, 87°41.5'W. Coll: J. Ayers. 20 September 1967.

1529. Surface #20 net tow. Kewaunee, Wisconsin. Lake Michigan. KW = 44°27.5'N, 87°29.6'W. Coll: J. Ayers. 20 September 1967.

1530. Surface #20 net tow. Frankfort, Michigan. Lake Michigan. FR = 44°37.8'N, 86°15.0'W. Coll: J. Ayers. 24 September 1967.

1531. Surface #20 net tow. Grand Haven, Michigan. Lake Michigan. GH = 43°03.5'N, 86°15.4'W. Coll: J. Ayers. 25 September 1967.

1532. Vertical #20 net tow. Sta. A-3, 42°05'30"N; 86°43'00"W. Lake Michigan. Coll: J. Ayers. 18 September 1967.

1533. Vertical #20 net tow. Sta. A-4, 42°03'30"N; 87°06'30"W. Lake Michigan. Coll: J. Ayers. 19 September 1967.

1534. Vertical #20 net tow. Sta. A-6, 41°52'00"N; 87°27'00"W. Lake Michigan. Coll: J. Ayers. 19 September 1967.

1535. Vertical #20 net tow. Sta. C-7, 42°47'30"N; 87°34'30"~. Lake Michigan. Coll: J. Ayers. 20 September 1967.

1536. Vertical #20 net tow. Sta. E-2, 44°37'00"N; 86°21'42"W. Lake Michigan. Coll: J. Ayers. 24 September 1967.

1537. Vertical #20 net tow. Sta. E-3, 44°34'00"N; 86°40'00"W. Lake Michigan. Coll: J. Ayers. 24 September 1967.

1538. Vertical #20 net tow. Sta. E-5, 44°25'30"N; 87°10'18"W. Lake Michigan. Coll: J. Ayers. 23 September 1967.

1539. Vertical #20 net tow. Sta. C-3, 42°49'10"N; 86°28'25"W. Lake Michigan. Coll: C. F. Powers. 4 October 1967.

1540. Vertical #20 net tow. Sta. C-5, 42°49'00"N; 86°50'00"W. Lake Michigan. Coll: C. F. Powers. 4 October 1967.

1541. Vertical #20 net tow. Sta. E-2, 44°37'00"N; 86°21'42"W. Lake Michigan. Coll: E. F. Stoermer. 11 October 1967.

1542. Vertical #20 net tow. Sta. E-3, 44°34'00"N; 86°40'00"W. Lake Michigan. Coll: E. F. Stoermer. 11 October 1967.

1543. Vertical #20 net tow. Sta. E-5, 44°25'30"N; 87°10'18"W. Lake Michigan. Coll: E. F. Stoermer. 10 October 1967.

1544. Surface #20 net tow. Muskegon, Michigan. Lake Michigan. MU = 43°13.5'N, 86°20.8'W. Coll: E. F. Stoermer. 2 October 1967.

1545. Surface #20 net tow. White Lake, Michigan. Lake Michigan. WL = 43°22.5'N, 86°25.3'W. Coll: E. F. Stoermer. 2 October 1967.

1546. Surface #20 net tow. Ludington, Michigan. Lake Michigan. LU = 43°57.2'N, 86°27.8'W. Coll: E. F. Stoermer. 2 October 1967.

1547. Surface #20 net tow. Manistee, Michigan. Lake Michigan. MS = 44°15.1'N, 86°20.8'W. Coll: E. F. Stoermer. 2 October 1967.

1548. Surface #20 net tow. Charlevoix, Michigan. Lake Michigan. CA = 45°19.3'N, 85°15.9'W. Coll: E. F. Stoermer. 3 October 1967.

1549. Surface #20 net tow. Manistique, Michigan. Lake Michigan. MQ = 45°56.7'N, 86°14.8'W. Coll: E. F. Stoermer. 4 October 1967.

1550. Surface #20 net tow. Marinette, Wis., and Menominee, Michigan. Green Bay. MR = 45°05.8'N, 87°35.1'W. Coll: E. F. Stoermer. 5 October 1967.

1551. Surface #20 net tow. Escanaba, Michigan. Little Bay De Noc. ES = 45°44.7'N, 87°02.2'W. Coll: E. F. Stoermer. 5 October 1967.

1552. Surface #20 net tow. Sturgeon Bay, Wisconsin. Lake Michigan. SM = 44°47.5'N, 87°18.6'W. Coll: E. F. Stoermer. 6 October 1967.

1553. Surface #20 net tow. Sturgeon Bay, Wisconsin. Green Bay. SG = 44°50.1'N, 87°22.9'W. Coll: E. F. Stoermer. 6 October 1967.

1554. Vertical #20 net tow. Sta. GS-1A, 44°46.9'N; 86°13.7 W. Lake Michigan. Coll: E. F. Stoermer. 3 October 1967.

1555. Vertical #20 net tow. Sta. GS-2A, 45°00.6'N; 85°56.5 W. Lake Michigan. Coll: E. F. Stoermer. 3 October 1967.

1556. Vertical #20 net tow. Sta. GS-3A, 45°04.4 N; 85°26.6 W. Lake Michigan. Coll.: E. F. Stoermer. 3 October 1967.

1557. Vertical #20 net tow. Sta. GS-4A, 45°25.2 N; 85°19.0 W. Lake Michigan. Coll.: E. F. Stoermer. 3 October 1967.

1558. Vertical #20 net tow. Sta. GS-5A, 45°30.5 N; 85°23.5 W. Lake Michigan. Coll.: E. F. Stoermer. 4 October 1967.

1559. Vertical #20 net tow. Sta. GS-7A, 45°34.5 N; 85°41.2 W. Lake Michigan. Coll.: E. F. Stoermer. 4 October 1967.

1560. Vertical #20 net tow. Sta. GS-8A, 45°44.7 N; 85°46.5 W. Lake Michigan. Coll.: E. F. Stoermer. 4 October 1967.

1561. Vertical #20 net tow. Sta. GS-9A, 45°54.6 N; 86°11.5 W. Lake Michigan. Coll.: E. F. Stoermer. 4 October 1967.

1562. Vertical #20 net tow. Sta. GS-10A, 45°34.0 N; 86°25.7 W. Lake Michigan. Coll.: E. F. Stoermer. 5 October 1967.

1563. Vertical #20 net tow. Sta. GS-11A 45°31.7 N; 86°41.4 W. Lake Michigan. Coll.: E. F. Stoermer. 5 October 1967.

1564. Vertical #20 net tow. Sta. GS-12A 45°47.1 N; 86°36.1 W. Lake Michigan. Coll.: E. F. Stoermer. 5 October 1967.

1565. Vertical #20 net tow. Sta. GS-13A 45°43.8 N; 86°41.6 W. Lake Michigan. Coll.: E. F. Stoermer. 5 October 1967.

1566. Vertical #20 net tow. Sta. GS-14A 45°40.5 N; 86°48.8 W. Green Bay. Coll.: E. F. Stoermer. 5 October 1967.

1567. Vertical #20 net tow. Sta. GS-15A 45°36.2 N; 86°58.5 W. Green Bay. Coll.: E. F. Stoermer. 5 October 1967.

1568. Vertical #20 net tow. Sta. GS-16A 45°47.4 N; 87°02.2 W. Little Bay De Noc. Coll.: E. F. Stoermer. 5 October 1967.

1569. Vertical #20 net tow. Sta. GS-17A 45°34.0 N; 87°09.0 W. Green Bay. Coll.: E. F. Stoermer. 5 October 1967.

1570. Vertical #20 net tow. Sta. GS-18A 45°23.5 N; 87°17.5 W. Green Bay. Coll.: E. F. Stoermer. 5 October 1967.

1571. Vertical #20 net tow. Sta. GS-19A 45°05.1 N; 87°32.3 W. Green Bay. Coll.: E. F. Stoermer. 6 October 1967.

1572. Vertical #20 net tow. Sta. GS-20A 44°40.2 N; 87°52.9 W. Green Bay. Coll.: E. F. Stoermer. 6 October 1967.

1573. Vertical #20 net tow. Sta. GS-21A 44°55.3 N; 87°26.0 W. Green Bay. Coll.: E. F. Stoermer. 6 October 1967.

1574. Vertical #20 net tow. Sta. GS-22A 44°46.6 N; 87°17.2 W. Lake Michigan. Coll.: E. F. Stoermer. 6 October 1967.

1575. Vertical #20 net tow. Sta. GS-28A 44°52.2 N; 87°39.0 W. Green Bay. Coll.: E. F. Stoermer. 6 October 1967.

1576. Algal mat on bottom of concrete swimming pool, by meteorology cottage. North shore of Mona Lake Inlet, Michigan. Coll.: E. F. Stoermer. 1 October 1967.

1577. Material from wave washed rocks. Outside edge of East Pier, Harbor of Manistique, Michigan. Coll.: E. F. Stoermer. 4 October 1967.

1578. Material from rocks under water. Outside edge of East Pier, Harbor of Manistique, Michigan. Coll.: E. F. Stoermer. 4 October 1967.

1579. Periphyton growing on plastic current meter rotors, GLRD Meteorology Tower - 7 ft. depth. 5500 ft. offshore, Mona Lake Inlet, Lake Michigan. Coll: F. Elder. 28 Oct. 1967.

1580. Surface #20 net tow. Indiana Harbor, Indiana, Lake Mich. Coll: J. Ayers. 8 Nov. 1967.

1581. Surface #20 net tow. Gary, Indiana, Lake Mich. Coll: J. Ayers. 8 Nov. 1967.

1582. Surface #20 net tow. Calumet Harbor, Indiana, Lake Mich. Coll: J. Ayers. 10 Nov. 1967.

1583. Surface #20 net tow. Michigan City Harbor, Indiana, Lake Mich. Coll: J. Ayers. 10 Nov. 1967.

1584. Surface #20 net tow. Chicago Harbor, Illinois, Lake Mich. Coll: J. Ayers. 10 Nov. 1967.

1585. Bottom material from Tiplady Bog, Corner of Tiplady and Silver Hill Rds., SW 1/4, Sec. 33, R4E, TWPIN, Livingston Co. Mich. Coll: Sam Mazzer. 7 Feb. 1968.

1586. Composite of living material from Tiplady Bog, Corner of Tiplady and Silver Hill Rds., SW 1/4, Sec. 33, R4E, TWPIN, Livingston Co. Mich. Coll: Sam Mazzer. 19 March 1968.

1587. Composite of bottom material from Tiplady Bog, Corner of Tiplady and Silver Hill Rds., SW 1/4, Sec. 33, R4E, TWPIN, Livingston Co. Mich. Coll: Sam Mazzer. 22 March 1968.

1588. Squeeze from Sphagnum from Tiplady Bog, Corner of Tiplady and Silver Hill Rds., SW 1/4, Sec. 33, R4E, TWPIN, Livingston Co. Mich. Coll: Sam Mazzer. 22 March 1968.

1589. Vertical #20 net tow. 1/4 mi. west of GH pierhead. Lake Michigan. Coll: E. Dunster. 19 March 1968.

1590. Vertical #20 net tow. 2.8 mi. N GH pierhead, 3/4 mi. from shore. Lake Michigan. Coll: E. Dunster. 19 March 1968.

1591. Vertical #20 net tow. Open water area in center of ice flow 1 1/4 mi. from shore. Lake Michigan. Coll: E. Dunster. 19 March 1968.

1592. Vertical #20 net tow. Sta. C-1, 42°49'40" N; 86°14'50" W. Lake Michigan. Coll: E. Dunster. 26 March 1968.

1593. Vertical #20 net tow. Sta. C-2, 42°49'40" N; 86°18'25" W. Lake Michigan. Coll: E. Dunster. 26 March 1968.

1594. Vertical #20 net tow. Sta. C-3, 42°49'10" N; 86°28'25" W. Michigan. coll: Edward Dunster. 26 March 1968.

1595. Vertical #20 net tow. Sta. A-l, 42°06'30" N; 86°32'00" W. Michigan. Coll: Edward Dunster. 5 April 1968.

1596. Vertical #20 net tow. Sta. A-l, 42°06'30" N; 86°32'00" W. Michigan. Coll: Edward Dunster. 16 April 1968.

1597. Vertical #20 net tow. Sta. A-2, 42°06'00" N; 86°37'00" W. Michigan. Coll: Edward Dunster. 5 April 1968.

1598. Vertical #20 net tow. Sta. A-2, 42°06'00" N; 86°37'00" W. Michigan. Coll: Edward Dunster. 16 April 1968.

1599. Vertical #20 net tow. Sta. A-3, 42°05'30" N; 86°43'00" W. Michigan. Coll: Edward Dunster. 5 April 1968.

1600. Vertical #20 net tow. Sta. A-3, 42°05'30" N; 86°43'00" W. Michigan. Coll: Edward Dunster. 16 April 1968.

1601. Vertical #20 net tow. Sta. A-4, 42°03'30" N; 87°06'30" W. Michigan. Coll: Edward Dunster. 5 April 1968.

1602. Vertical #20 net tow. Sta. A-4, 42°03'30" N; 87°06'30" W. Michigan. Coll: Edward Dunster. 17 April 1968.

1603. Vertical #20 net tow. Sta. A-5, 41°57'00" N; 87°18'30" W. Michigan. Coll: Edward Dunster. 3 April 1968.

1604. Vertical #20 net tow. Sta. A-5, 41°57'00" N; 87°18'30" W. Michigan. Coll: Edward Dunster. 17 April 1968

1605. Vertical #20 net tow. Sta. A-6, 41°52'00" N; 87°27'00" W. Michigan. Coll: Edward Dunster. 3 April 1968.

1606. Vertical #20 net tow. Sta. A-6, 41°52'00" N; 87°27'00" W. Michigan. Coll: John C. Ayers. 13 June 1967.

1607. Vertical #20 net tow. Sta. A-6, 41°52'00" N; 87°27'00" W. Michigan. Coll: Edward Dunster. 17 April 1968.

1608. Vertical #20 net tow. Sta. C-l, 42°49'40" N; 86°14'50" W. Michigan. Coll: Edward Dunster. 16 April 1968.

1609. Vertical #20 net tow. Sta. C-2, 42°49'40" N; 86°18'25" W. Michigan. Coll: Edward Dunster. 16 April 1968.

1610. Vertical #20 net tow. Sta. C-3, 42°49'10" N; 86°28'25" W. Michigan. Coll: Edward Dunster. 16 April 1968

1611. Vertical #20 net tow. Sta. C-4, 42°48'50" N; 86°41'30" W. Michigan. Coll: Edward Dunster. 2 April 1968.

1612. Vertical #20 net tow. Sta. C-4, 42°48'50" N; 86°41'30" W. Michigan. Coll: Edward Dunster. 16 April 1968

1613. Vertical #20 net tow. Sta. C-5, 42°49'00" N; 86°50'00" W. Michigan. Coll: Edward Dunster. 2 April 1968.

1614. Vertical #20 net tow. Sta. C-5, 42°49'00" N; 86°50'00" W. Michigan. Coll: Edward Dunster. 16 April 1968

1615. Vertical #20 net tow. Sta. C-6, 42°47'40" N; 87°26'50" W. Michigan. Coll: Edward Dunster. 2 April 1968.

1616. Vertical #20 net tow. Sta. C-6, 42°47'40" N; 87°26'50" W. Michigan. Coll: Edward Dunster. 17 April 1968

1617. Vertical #20 net tow. Sta. C-7, 42°47'30" N; 87°34'30" W. Michigan. Coll: Edward Dunster. 2 April 1968.

1618. Vertical #20 net tow. Sta. C-7, 42°47'30" N; 87°34'30" W. Michigan. Coll: Edward Dunster. 17 April 1968

1619. Vertical #20 net tow. Sta. E-l, 44°37'30" N; 86°18'12" W. Michigan. Coll: Edward Dunster. 22 April 1968

1620. Vertical #20 net tow. Sta. E-2, 44°37'00" N; 86°21'42" W. Michigan. Coll: Edward Dunster. 22 April 1968

1621. Vertical #20 net tow. Sta. E-3, 44°34'00" N; 86°40'00" W. Michigan. Coll: Edward Dunster. 22 April 1968

1622. Vertical #20 net tow. Sta. E-4, 44°30'18" N; 86°55'18" W. Michigan. Coll: Edward Dunster. 22 April 1968

1623. Vertical #20 net tow. Sta. E-5, 44°25'30" N; 87°10'18" W. Michigan. Coll: Edward Dunster. 21 April 1968

1624. Vertical #20 net tow. Sta. E-6, 44°27'48" N; 87°26'25" W. Michigan. Coll: Edward Dunster. 21 April 1968

1625. One minute surface #20 net tow 1 mile from Grand Haven, Michigan pierheads bearing 260°. Sta. 1. Lake Michigan. Coll: E. F. Stoermer. 7 May 1968.

1626. One minute surface #20 net tow 2 miles offshore from Grand Haven, Michigan pierheads bearing 260°. Sta. 2. Lake Michigan. Coll: E. F. Stoermer. 7 May 1968.

1627. One minute surface #20 net tow 3 miles offshore from Grand Haven, Michigan pierheads bearing 260°. Sta. 3. Lake Michigan. Coll: E. F. Stoermer. 7 May 1968.

1628. One minute surface #20 net tow 4 miles offshore from Grand Haven, Michigan pierheads bearing 260°. Sta. 4. Lake Michigan. Coll: E. F. Stoermer. 7 May 1968.

1629. One minute surface #20 net tow 5 miles from Grand Haven, Michigan pierheads bearing 260°. Sta. 5. Lake Michigan. Coll: E. F. Stoermer. 7 May 1968.

1630v. Surface #20 net tow in Port Sheldon thermal discharge. Coll: E. F. Stoermer. 7 May 1968.

1631. Surface #20 net tow in Muskegon, Michigan plume 1/2 mile from pierheads. Coll: E. F. Stoermer. 7 May 1968.

1632. Vertical #20 net tow. Sta. A-l, 42°06'30" N; 86°32'00" W. Michigan. Coll: Edward Dunster. 13 May 1968.

1633. Vertical #20 net tow. Sta. A-2, 42°06'00" N; 86°37'00" W. Michigan. Coll: Edward Dunster. 13 May 1968.

1634. Vertical #20 net tow. Sta. A-3, 42°05'30" N; 86°43'00" W. Michigan. Coll: Edward Dunster. 13 May 1968.

1635. Vertical #20 net tow. Sta. A-4, 42°03'30" N; 87°06'30" W. Michigan. Coll: Edward Dunster. 14 May 1968.

1636. Vertical #20 net tow. Sta. A-5, 41°57'00" N; 87°18'30" W. Michigan. Coll: Edward Dunster. 14 May 1968

1637. Vertical #20 net tow. Sta. A-6, 41°52'00" N; 87°27'00" W. Michigan. Coll: Edward Dunster. 14 May 1968.

1638. Vertical #20 net tow. Sta. C-l, 42°49'40" N; 86°14'50" W. Michigan. Coll: Edward Dunster. 13 May 1968.

1639. Vertical #20 net tow. Sta. C-l, 42°49'40" N; 86°14'50" W. Michigan. Coll: Edward Dunster. 27 May 1968.

1640. Vertical #20 net tow. Sta. C-2, 42°49'40" N, 86°18'25" W. Michigan. Coll: Edward Dunster. 13 May 1968.

1641. Vertical #20 net tow. Sta. C-2, 42°49'40" N; 86°18'25" W. Michigan. Coll: Edward Dunster. 27 May 1968.

1642. Vertical #20 net tow. Sta. C-3, 42°49'10" N; 86°28'25" W. Michigan. Coll: Edward Dunster. 13 May 1968.

1643. Vertical #20 net tow. Sta. C-3, 42°49'10" N; 86°28'25" W. Michigan. Coll: Edward Dunster. 27 May 1968.

1644. Vertical #20 net tow. Sta. C-4, 42°48'50" N: 86°41'30" W. Michigan. Coll: Edward Dunster. 13 May 1968.

1645. Vertical #20 net tow. Sta. C-5, 42°49'00" N; 86°50'00" W. Michigan. Coll: Edward Dunster. 13 May 1968.

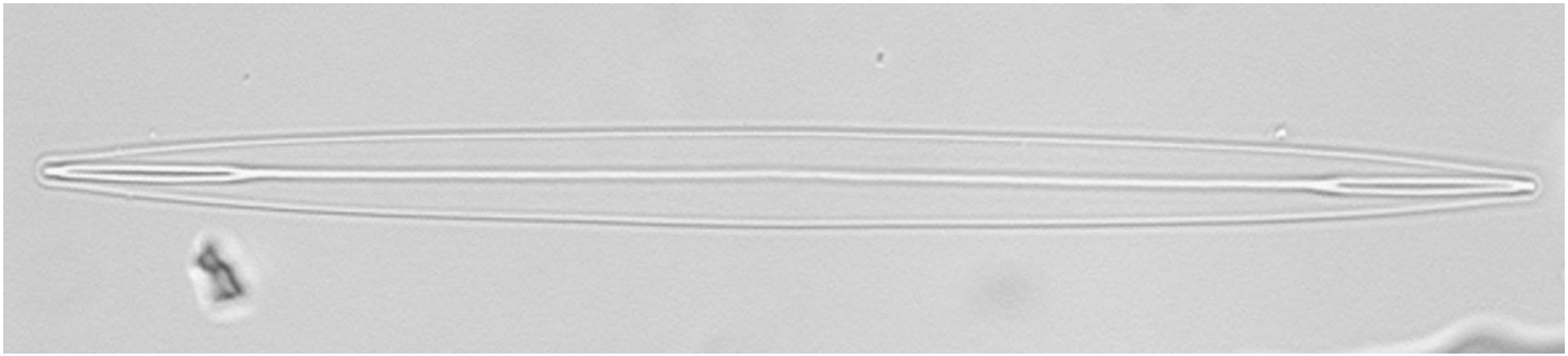
1646. Vertical #20 net tow. Sta. C-5, 42°49'00" N; 86°50'00" W. Michigan. Coll: Edward Dunster. 27 May 1968.

1647. Vertical #20 net tow. Sta. C-6, 42°47'40" N; 87°26'50" W. Michigan. Coll: Edward Dunster. 14 May 1968.

1648. Vertical #20 net tow. Sta. C-6, 42°47'40" N; 87°26'50" W. Michigan. Coll: Edward Dunster. 27 May 1968.

1649. Vertical #20 net tow. Sta. C-7, 42°47'30" N; 87°34'30" W. Michigan. Coll: Edward Dunster. 14 May 1968.

1650. Vertical #20 net tow. Sta. C-7, 42°47'30" N; 87°34'30" W. Michigan. Coll: Edward Dunster. 27 May 1968.



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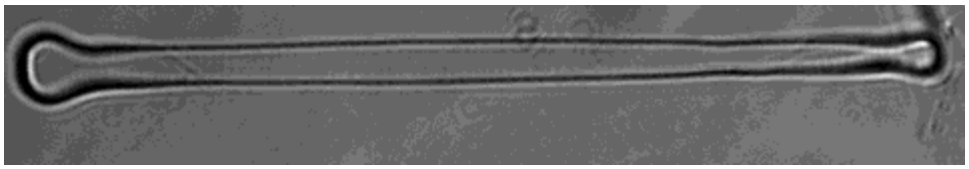


COLLECTIONS: EUGENE F. STOERMER (#4)

Vials of sediment apparently not worked up. Suspected from a Lake Superior core. Vial numbers are questionable as the COLLECTION RECORDS do not record these numbers as sediment samples. Boxed separately from COLLECTION.

667 S-9-62 2B
668 S-9-62 1B
674 S-9-62 1B
681 S-9-62 3B
685 S-9-62 5B
690 S-9-62 5B
706 S-9-62 7B
711 S-9-62 8B
bottom S-9-62 8B
mid S-9-62 6B
1053 S-8-62 top 1B
1055 S-8-62 1B
1058 S-8-62 1B
1067 S-8-62 2B
1067 S-8-62 3B
1070 S-8-62 3B
1073 S-8-62 4B
1076 S-8-62 4B
1080 S-8-62 6B
1085 S-8-62 7B
1088 S-8-62 7B
top S-8-62 5B
bottom S-8-62 2B
Collection

801. Scraping from rock under ? 10 cm water. Beach directly under south end of Mackinac Bridge, Michigan. Coll: E. F. Stoermer. 27 Sept. 1965. Contains: Rhizoclonium sp., Cosmarium sp. (rare), Agnemellium sp., Pediastrum sp., and numerous diatoms; Cymbella spp., Navicula spp., Synedra spp., Gomphoneis sp., Cymatopleura sp., Cyclotella sp., Nitzschia spp.

802. Chara sp. plants growing between rocks on beach directly under south end of Mackinac Bridge, Michigan. Coll: E. F. Stoermer. 27 Sept. 1965. Contains: Chara sp., Phormidium sp., Pediastrum sp., and numerous diatoms; Pinnularia sp., Cymbella spp. (w/auxospore!), Navicula spp., Cyclotella spp., Nitzschia spp., Fragilaria sp.

803. Bottom debris from shallow pool on Lake Michigan beach near entrance to Wilderness St. Park, Michigan. Coll: E. F. Stoermer. 28 Sept. 1965. Contains: Oscillatoria spp., Navicula spp., Surirella sp.

804. Shore plankton from beach near entrance to Wilderness St. Park, Michigan. Coll: E. F. Stoermer. 28 Sept. 1965. Contains: Oocystis sp., Ceratium sp., Gomphosphaeria sp., Botrycoccus (?) sp., Fragilaria spp., Asterionella sp., Tabellaria sp.

805. Scrape from rock on jetty near Waugoschance Point, Michigan;. Coll: E. F. Stoermer. 28 Sept. 1965. Contains: Calothrix sp. Tabellaria sp., few naviculoid diatoms.

806. Scrape from rock on beach northeast of Waugoschance Point, Wilderness St. Park, Michigan. Coll: E. F. Stoermer. 28 Sept. 1965. Contains: Calothrix sp., Rhizoclonium sp., Pediastrum sp., Scenedesmus sp., Oscillatoria spp., Navicula spp., Cymbella spp., Cyclotella spp., Synedra spp., Tabellaria sp.

807. Scrape from rock on beach northeast of Waugoschance Point, Wilderness St. Park, Michigan. Coll: E. F. Stoermer. 28 Sept. 1965. Contains: Rhizoclonium sp., Pediastrum sp., Calothrix sp., Oscillatoria sp., Navicula spp., Cymbella spp., Rhopalodia sp., Synedra spp., Fragilaria sp., Cyclotella spp., Tabellaria sp., Nitzschia sp.

808. Cladophora sp. taken from rocks on north side of Mackinaw City, Michigan. Coll: E. F. Stoermer. 28 Sept. 1965. Contains: Cladophora sp., Cosmarium sp., Cocconeis spp., Cymbella spp., Navicula spp., Gomphonema spp., Meridion sp.

809. Scrape from rock on north side of Mackinaw City Public Dock, Mackinaw City, Michigan. Coll: E. F. Stoermer. 28 Sept. 1965. Contains: Ulothrix sp., Cymbella spp., Fragilaria spp., Navicula spp., Cyclotella spp.

810. Surface plankton from north side of Mackinaw City Public Dock, Mackinaw City, Michigan. Coll: E. F. Stoermer. 28 Sept. 1965. Contains: Dictyosphaerium sp., Oocystis sp., Pediastrum spp., Ceratium sp., Dinobryon sp., Fragilaria spp., Tabellaria sp., Cyclotella spp., Asterionella sp., Pinnularia sp., Synedra spp., Navicula spp., Gomphoneis sp.

811. Old Cladophora on rocks 1/2 mile east of City Dock, Harbor Springs, Michigan. Coll: E. F. Stoermer. 28 Sept. 1965. Contains: Cladophora sp., Diatoma sp., Cocconeis sp., Gomphonema spp., Cymbella spp., Rhiocosphenia sp., Neidium sp., Gompheneis sp.

812. Blue green algae on rocks 1/2 mile east of City Dock, Harbor Springs, Michigan. Coll: E. F. Stoermer. 28 Sept. 1965. Contains: Oscillatoria sp., Pediastrum sp., Scenedesmus sp., Navicula spp., Diatoma sp., Cymbella spp., Gomphoneis sp., Synedra spp., Cocconeis sp., Gomphonema sp.

813. From bottom sand at 30 cm. on shore at Harbor Springs City Park, Harbor Springs, Michigan. Coll: E. F. Stoermer. 28 Sept. 1965. Contains: Oscillatoria sp., Spirogyra sp., Navicula sp., Melosira sp., Cymatopleura sp. (also many Amoebae and Ciliates).

814. Red flocculent material from hole in rock above water line on beach between Good Hart and Cross Village, Michigan. Coll: E. F. Stoermer. 28 Sept. 1965. Contains: Haematococcus sp., Oscillatoria sp., Pediastrum sp., Navicula spp., Cymbella spp., Denticula sp.

815. Scrape from rock at water line, beach between Good Hart and Cross Village, Michigan. Coll: E. F. Stoermer. 28 Sept. 1965. Contains: Ulothrix spp., Gomphonema spp., Navicula spp., Cymbella spp. , Synedra spp., Amphora sp.

816. Green flocculent material in hole in rock above water line, beach between Good Hart and Cross Village, Michigan. Coll: E. F. Stoermer: 28 Sept. 1965. Contains: Chroococcus sp., Haematococcus sp., Cymbella spp., Cyclotella spp., Navicula spp., Rhopalodia sp., Nitzschia spp., Amphora sp.

817. Bottom sediments from small pool on sand beach of Lake Michigan at Cross Village, Michigan. Coll: E. F. Stoermer. 28 Sept. 1965. Contains: Nitzschia spp. (massive pops), Cymbella spp., Navicula spp.

818. Cladophora on log in breakwater at Cross Village, Michigan. Coll: E. F. Stoermer. 28 Sept. 1965. Contains: Cladophora sp., Diatoma sp., Cocconeis sp., Cymbella sp., Gomphonema sp.

819. Scrape from rock on beach at Petoskey-Bay View city limit, Petoskey, Michigan. Coll: E. F. Stoermer. 29 Sept. 1965. Contains: Calothrix sp., Ulothrix sp., Cymbella spp., Diatoma sp., Pinnularia sp., Navicula spp., Cocconeis sp.

820. Cladophora on rocks inside breakwater, Petoskey, Michigan. Coll: E. F. Stoermer. 29 Sept. 1965. Contains: Cladophora sp., Ulothrix sp., Diatoma sp., Cocconeis sp., Tabellaria sp.

821. Scrape from concrete 6 cm above water line, inside breakwater, Petoskey, Michigan. Coll: E. F. Stoermer. 29 Sept. 1965. Contains: Ulothrix sp.

822. Cladophora on rocks inside breakwater, Charlevoix, Michigan. Coll: E, F. Stoermer. 29 Sept. 1965. Contains: Cladophora sp., Cocconeis sp., Diatoma sp., Gomphonema sp., Cymbella sp., Gomphoneis sp.

823. From dock piling of public dock for town of Torch Lake, Torch Lake, Michigan. Coll: E. F. Stoermer. 29 Sept. 1965. Contains: Cymbella spp., Synedra spp., Navicula spp., Gomphonema spp.

824. From rocks on river side of breakwater, Elk River, Michigan. Coll: E. F. Stoermer. 29 Sept. 1965. Contains: Diatoma sp., Cymbella spp., Synedra spp., Navicula spp.

825. From rocks on Lake Michigan side of breakwater, Elk River, Michigan. Coll: E. F. Stoermer. 29 Sept. 1965. Contains: Ulothrix sp., Diatoma sp., Gomphoneis sp., Gomphonema spp., Cymbella spp., Synedra spp., Navicula spp.

826. Surface plankton from river side of breakwater, Elk River. Coll: E. F. Stoermer. 29 Sept. 1965. Contains: Dinobryon sp., Gomphosphaeria sp., Ulothrix sp., Ceratium sp., Asterionella sp., Rhizosolenia sp., Fragilaria spp., Diatoma sp.

827. Surface Plankton from Lake Michigan side of breakwater, Elk River, Michigan. Coll: E. F. Stoermer. 29 Sept. 1965. Contains: Gomphosphaeria sp., Dinobryon sp., Kirchneriella sp., Oocystis sp., Asterionella sp., Fragilaria sp., Rhizosolenia sp., Diatoma sp., Cyclotella sp.

828. Chaetophora incrassata in small pool by Artesian well near south city limits of Traverse City, Michigan. Coll: E. F. Stoermer. 29 Sept. 1965. Contains: Chaetophora sp., Navicula spp., Nitzschia spp., Asterionella sp.

829. Rock scrape from inside boat slip, Suttons Bay, Michigan. Coll: E. F. Stoermer. 29 Sept. 1965. Contains: Ulothrix sp., Diatoma sp., Cymbella spp., Achnanthes spp., Gomphoneis sp., Gomphonema spp., Synedra spp.

830. Scrape from rock in small pool on tip of Leelanau Peninsula near Grand Traverse Light House, Michigan. Coll: E. F. Stoermer. 29 Sept. 1965. Contains: Calothrix sp., Tolypothrix sp., Gomphosphaeria sp., Chroococcus sp., Synedra spp., Navicula spp., Cymbella spp.

831. Bottom detritus from small rocky pool on tip of Leelanau Peninsula near Grand Traverse Light Station, Michigan. Coll: E. F. Stoermer. 29 Sept. 1965. Contains: Calothrix sp., Navicula sp., Nitzschia sp., Cymbella sp.

832. Bottom material from small pool in sand near mouth of Platte River in Benzie State Park, Michigan. Coll: E. F. Stoermer. 30 Sept. 1965. Contains: Ulothrix sp., Pediastrum sp., Rhizoclonium sp., Haematococcus sp., Navicula spp., Nitzschia spp., Cymbella spp., Fragilaria sp., Synedra spp., Neidium spp., Pinnularia spp.

833. Scrape from board submerged in harbor, Frankfort, Michigan. Coll: E. F. Stoermer. 30 Sept. 1965. Contains: Stigeoclonium sp., Closterium sp., Cymbella spp., Melosira sp., Navicula spp., Fragilaria spp., Diatoma sp., Gomphonema spp., Gomphoneis spp., Synedra spp., Rhiocosphenia sp., Amphora sp., Epithemia sp.

834. Chara on sand near shore, Lower Herring Lake, south of Elberta, Michigan. Coll: E. F. Stoermer. 30 Sept. 1965. Contains: Chara sp., Gomphosphaeria sp., Calothrix sp., Cymbella spp., Navicula spp., Gomphonema spp., Fragilaria sp., Tabellaria sp., Melosira sp., Asterionella sp.

835. Scraping from concrete pier, Lower Herring Lake, south of Elberta, Michigan. Coll: E. F. Stoermer, 30 Sept. 1965. Contains: Bulbocheatae sp., Oscillatoria sp., Scenedesmus sp., Rhizoclonium sp., Synedra spp., Cymbella spp., Diatoma sp., Navicula spp., Gomphonema spp., Cocconeis sp., Amphora sp.

836. Scraping from concrete ramp, harbor at town of Arcadia, Michigan. Coll: E. F. Stoermer. 30 Sept. 1965. Contains: Oscillatoria sp., Scenedesmus sp., Melosira sp., Navicula spp., Amphora sp., Nitzschia spp., Cocconeis sp., Fragilaria, Cymbella spp.

837. Scraping from wood dock piling, harbor at town of Arcadia, Michigan. Coll: E. F. Stoermer. 30 Sept. 1965. Contains: Oscillatoria sp., Oocystis sp., Scenedesmus sp., Melosira Navicula spp., Cymbella spp.

838. Flocculent mat in shallow pool on beach. North point, between Portage Lake and Lake Michigan, 12 miles north of Manistee, Michigan. Coll: E. F. Stoermer. 30 Sept. 1965. Contains: Dictyosphaerium sp., Scenedesmus sp.,

Kirchneriella sp., Anabaena sp., Mallomonas sp., Cosmarium sp., Pandorina sp., Cylindrocystis (?) sp., Gomphosphaeria sp., Merismopedia sp., Fragilaria spp., Rhizosolenia sp., Cymbella spp., Melosira spp., Navicula spp., Tabellaria sp., Stephanodiscus sp., Nitzschia spp., Synedra spp.

839. Scraping from breakwater, north point between Portage Lake and Lake Michigan, 12 miles north of Manistee, Michigan. Coll: E. F. Stoermer. 30 Sept. 1965. Contains: Ulothrix spp. Scenedesmus sp., Melosira spp., Synedra spp., Nitzschia spp., Diatoma spp. (?), Navicula spp., Cymbella spp., Stephanodiscus sp.

840. Scraping from board in water, "Snug Harbor" marina, Pentwater, Michigan. Coll: E. F. Stoermer. 30 Sept. 1965. Contains: Diatoma sp., Synedra spp., Cymbella spp., Nitzschia spp., Melosira sp.

841. Surface plankton, Muskegon Lake, Michigan, near harbor entrance. Coll: E. F. Stoermer. 4 Oct. 1965. Contains: Botryococcus sp. (?), Scenedesmus sp., Pediastrum sp., Staurastrum sp., Melosira spp. (including spiral forms), Asterionella sp., Stephanodiscus sp., Fragilaria spp.

842. Surface plankton, Lake Michigan, 7 mi at 210° from White Lake, Michigan, inlet, 9 mi 300° from Muskegon, Michigan, inlet. Coll: E. F. Stoermer. 5 Oct. 1965. Contains: Dictyosphaerium sp., Coelastrum sp., Staurastrum sp., Anabaena sp., Gomphosphaeria sp., Cosmarium sp., Oocystis sp., Dinobryon sp., Ceratium sp., Fragilaria spp., Tabellaria sp., Melosira sp., Stephanodiscus sp., Gyrosigma sp., Asterionella sp., Nitzschia sp., Diatoma sp., Nitzschia sp., Amphiprora sp., Synedra sp., Cymatopleura sp.

843. Rocks and gravel dredge from station A-6. Coll: David Bos. 16 July 1965. (only cleaned material)

844. Plankton, Surface, Station A-3. 42°05'30"N; 86°43'00"W. Coll: E. F. Stoermer, 12 Nov. 1965, (500 ml).

845. Plankton, 5 meters, Station A-3. 42°05'30"N; 86°43'00"W. Coll: E. F. Stoermer, 12 Nov. 1965, (500 ml).

846. Plankton, 15 meters, Station A-3. 42°05'30"N; 86°43'00"W. Coll: E. F. Stoermer, 12 Nov. 1965, (500 ml).

847. Plankton, Surface, Station A-4. 42°03'30"N; 87°06'30"W. Coll: E. F. Stoermer, 12 Nov. 1965, (500 ml).

848. Plankton, 5 meters, Station A-4. 42°03'30"N; 87°06'30"W. Coll: E. F. Stoermer, 12 Nov. 1965, (500 ml).

849. Plankton, 15 meters, Station A-4. 42°03'30"N; 87°06'30"W. Coll: E. F. Stoermer, 12 Nov. 1965, (500 ml).

850. Plankton, Surface, Station A-6. 41°52'00"N; 87°27'00"W. Coll: E. F. Stoermer, 12 Nov. 1965, (500 ml).

851. Plankton, 5 meters, Station A-6. 41°52'00"N; 87°27'00"W. Coll: E. F. Stoermer, 12 Nov. 1965, (500 ml).

852. Plankton, 15 meters, Station A-6. 41°52'00"N; 87°27'00"W. Coll: E. F. Stoermer, 12 Nov. 1965, (500 ml).

853. Plankton, Surface, Station C-3. 42°49'10"N; 86°28'25"W. Coll: E. F. Stoermer, 12 Nov. 1965, (500 ml).

854. Plankton, 5 meters, Station C-3. 42°49'10"N; 86°28'25"W. Coll: E. F. Stoermer, 12 Nov. 1965, (500 ml).

855. Plankton, 15 meters, Station C-3. 42°49'10"N; 86°28'25"W. Coll: E. F. Stoermer, 12 Nov. 1965, (500 ml).

856. Plankton, Surface, Station C-5. 42°49'00"N; 86°50'00"W. Coll: E. F. Stoermer, 12 Nov. 1965, (500 ml).

857. Plankton, 5 meters, Station C-5. 42°49'00"N; 86°50'00"W. Coll: E. F. Stoermer, 12 Nov. 1965, (500 ml).

858. Plankton, 15 meters, Station C-5. 42°49'00"N; 86°50'00"W. Coll: E. F. Stoermer, 12 Nov. 1965, (500 ml).

859. Plankton, Surface, Station C-7. 42°47'30"N; 87°34'30"W. Coll: E. F. Stoermer, 12 Nov. 1965, (500 ml).

860. Plankton, 5 meters, Station C-7. 42°47'30"N; 87°34'30"W. Coll: E. F. Stoermer, 12 Nov. 1965, (500 ml).

861. Plankton, 15 meters, Station C-7. 42°47'30"N; 87°34'30"W. Coll: E. F. Stoermer, 12 Nov. 1965, (500 ml).

862. Plankton, Surface, Station D-2. 43°56'00"N; 86°39'30"W. Coll: E. F. Stoermer, 12 Nov. 1965, (500 ml).

863. Plankton, 5 meters, Station D-2. 43°56'00"N; 86°39'30"W. Coll: E. F. Stoermer, 12 Nov. 1965, (500 ml).

864. Plankton, 15 meters, Station D-2, 43°56'00"N; 86°39'30"W. Coll: E. F. Stoermer, 12 Nov. 1965, (500 ml).

865. Plankton, Surface, Station D-4. 43°48'00"N; 87°03'00"W. Coll: E. F. Stoermer, 12 Nov. 1965, (500 ml).

866. Plankton, 5 meters, Station D-4. 43°48'00"; 87°03'00"W. Coll: E. F. Stoermer, 12 Nov. 1965, (500 ml).

867. Plankton, 15 meters, Station D-4. 43°48'00"N; 87°03'00"W. Coll: E. F. Stoermer, 12 Nov. 1965, (500 ml).

868. Plankton, Surface, Station D-5. 43°38'40"N; 87°31'00"W. Coll: E. F. Stoermer, 12 Nov. 1965, (500 ml).

869. Plankton, 5 meters, Station D-5. 43°38'40"N; 87°31'00"W. Coll: E. F. Stoermer, 12 Nov. 1965, (500 ml).

870. Plankton, 15 meters, Station D-5. 43°38'40"N; 87°31'00"W. Coll: E. F. Stoermer, 12 Nov. 1965, (500 ml).

871. Plankton, Surface, Station E-2. 44°37'00"N; 86°21'42"W. Coll: E. F. Stoermer, 12 Nov. 1965, (500 mll.

872. Plankton, 5 meters, Station E-2. 44°37'00"N; 86°21'42"W. Coll: E. F. Stoermer, 12 Nov. 1965, (500 ml).

873. Plankton, 15 meters, Station E-2. 44°37'00"N; 86°21'42"W. Coll: E. F. Stoermer, 12 Nov.,1965, (500 ml).

874. Plankton, Surface, Station E-3. 44°34'00"N; 86°40'00"W. Coll: E. F. Stoermer, 12 Nov. 1965, (500 ml).

875. Plankton, 5 meters, Station E-3. 44°34'00"N; 86°40'00"W. Coll: E. F. Stoermer, 12 Nov. 1965, (500 ml).

876. Plankton, 15-meters, Station E-3. 44°34'00"N; 86°40'00"W. Coll: E. F. Stoermer, 12 Nov. 1965, (500 ml).

877. Plankton, Surface, Station E-5. 44°25'30"N; 87°10'18"W. Coll: E. F. Stoermer, 12 Nov. 1965, (500 ml).

878. Plankton, 5 meters, Station E-5. 44°25'30"N; 87°10'18"W. Coll: E. F. Stoermer, 12 Nov. 1965, (500 ml).

879. Plankton, 15 meters, Station E-5. 44°25'30"N; 87°10'18"W. Coll: E. F. Stoermer, 12 Nov. 1965, (500 ml).

880. #25 net shore plankton, Barton Pond, 1/2 mile above dam SW 1/4, SECT 17 R6E TWP 2S Washtenaw County, Michigan. Coll: E. F. Stoermer, 6 Jan. 1966.

881. #25 net shore plankton, Barton Pond at Country Club Ave. bridge NW 1/4 SECT 12 R5E TWP 2S Washtenaw County, Michigan. Coll: E. F. Stoermer, 6 Jan. 1966.

882. #25 net surface plankton, outlet of Big Portage Lake SE 1/4 SECT 1R4E TWP 1S Washtenaw County, Michigan. Coll: E. F. Stoermer, 6 Jan. 1966.

883. #25 net surface plankton, 8 mi. at 269° off Grand Haven, Michigan. Coll: E. F. Stoermer, 12 Jan. 1966.

884. Settled plankton, St. Lawrence River. Coll: C. I. Weber. Sept. 1965. Melosira binderiana.

885. Bottom material containing large, gelatinous masses of stalked rotifers with zoochlorallae, Big Silver Lake, Sec. 4 R. 4E TWP 1S, Washtenaw County, Michigan. Contained quantities of sigmoid Nitzschia and Achnanthes. Coll: E. F. Stoermer, 2 April 1966.

886. Bottom material from Big Silver Lake, Sec. 4 R. 4E TWP 1S, Washtenaw County, Michigan. Coll: E. F. Stoermer,

2 April 1966.

887. Coccochloris mass from shore of Crooked Lake, Sec. 5 R. 4E TWP 1S, Washtenaw County, Michigan. Coll: E. F. Stoermer, 2 April 1966.

888. Material collected from dead Ulothrix and Spirogyra mat, on shore of Crooked Lake, Sec. 5 R. 4E TWP 1S, Washtenaw County, Michigan. Apparent saprophytic diatom community. Coll: E. F. Stoermer, 2 April 1966.

889. Bottom material collected from swamp on the southeast side of the town of Hell, Michigan. Sec. 32 R. 4E TWP 1N, Livingston County, Michigan. Coll: E. F. Stoermer, 2 April 1966.

890. Bottom material collected just above dam in Hell, Michigan. Sec. 32 R. 4E TWP 1N, Livingston County, Michigan. Coll: E. F. Stoermer, 2 April 1966.

891. Material scraped from rock in dredge sample from 70 ft. depth, station AG-a, Lake Michigan. Coll: Robert Ogle, 28 March 1966.

892. Material from moss mat growing in washout in breakwater of Waukegon, Illinois harbor. Coll: E. F. Stoermer, 28 March 1966.

893. Bottom sediment from station E-3, Lake Michigan. 44° 30' 00" N 86° 40' QO" W. Coll: E. F. Stoermer, 30 March 1966.

894. Bottom sediment from station E-4, Lake Michigan. 44° 30' 18" N 86° 55' 18" W. Coll: E. F. Stoermer, 30 March 1966.

895. Diatoms growing on Elodea in shallow pool near Bonner's Marina in town of Spring Lake, Ottawa County, Michigan. Coll: E. F. Stoermer, 13 April 1966.

896. Plankton from Grand River in town of Spring Lake, Ottawa County, Michigan. Coll: E. F. Stoermer, 13 April 1966.

897. Green algae (Cladophora) in #5 net hauls from station B-3, Lake Michigan. 42° 24' 00" N 86° 35' 30" W. Coll: E. F. Stoermer, 15 April 1966.

898. Plankton, Surface, Station A-3. 42°05'30"N; 86°43'00"W. Coll: E. F. Stoermer, 28 March 1966, (500 ml).

899. Plankton, 5 meters, Station A-3. 42°05'30"N; 86°43'00"W. Coll: E. F. Stoermer, 28 March 1966, (500 ml).

900. Plankton, 15 meters, Station A-3. 42°05'30"N; 86°43'00"W. Coll: E. F. Stoermer, 28 March 1966, (500 ml).

901. Plankton, Surface, Station A-4. 42°03'30"N; 87°06'30"W. Coll: E. F. Stoermer, 28 March 1966, (500 ml).

902. Plankton, 5 meters, Station A-4. 42°03'30"N; 87°06'30"W. Coll: E. F. Stoermer, 28 March 1966, (500 ml).

903. Plankton, 15 meters, Station A-4. 42°03'30"N; 87°06'30"W. Coll: E. F. Stoermer, 28 March 1966, (500 ml).

904. Plankton, Surface, Station A-6. 41°52'00"N; 87°27'00"W. Coll: E. F. Stoermer, 28 March 1966, (500 ml).

905. Plankton, 5 meters, Station A-6. 41°52'00"N; 87°27'00"W. Coll: E. F. Stoermer, 28 March 1966, (500 ml).

906. Plankton, 15 meters, Station A-6. 41°52'00"N; 87°27'00"W. Coll: E. F. Stoermer, 28 March 1966, (500 ml).

907. Plankton, Surface, Station C-3. 42°49'10"N; 86°28'25"W. Coll: E. F. Stoermer, 20 March 1966,- (500 ml).

908. Plankton, 5 meters, Station C-3. 42°49'10"N; 86°28'25"W. Coll: E. F. Stoermer, 20 March 1966, (500 ml).

909. Plankton, 15 meters, Station C-3. 42°49'10"N; 86°28'25"W. Coll: E. F. Stoermer, 20 March 1966, (500 ml).

910. Plankton, Surface, Station C-5. 42°49'00"N; 86°50'00"W. Coll: E. F. Stoermer, 20 March 1966, (500 ml).

911. Plankton, 5 meters, Station C-5. 42°49'00"N; 86°50'00"W. Coll: E. F. Stoermer, 20 March 1966, (500 ml).

912. Plankton, 15 meters, Station C-5. 42°49'00"N; 86°50'00"W. Coll: E. F. Stoermer, 20 March 1966, (500 ml).

913. Plankton, Surface, Station C-7. 42°47'30"N; 87°34'30"W. Coll: E. F. Stoermer, 20 March 1966, (500 ml).

914. Plankton, 5 meters, Station C-7. 42°47'30"N; 87°34'30"W. Coll: E. F. Stoermer, 20 March 1966, (500 ml).

915. Plankton, 15 meters, Station C-7. 42°47'30"N; 87°34'30"W. Coll: E. F. Stoermer, 20 March 1966, (500 ml).

916. Plankton, Surface, Station D-2. 43°56'00"N; 86°39'30"W. Coll: E. F. Stoermer, 3 April 1966, (500 ml).

917. Plankton, 5 meters, Station D-2. 43°56'00"N; 86°39'30"W. Coll: E. F. Stoermer, 3 April 1966, (500 ml).

918. Plankton, 15 meters, Station D-2, 43°56'00"N; 86°39'30"W. Coll: E. F. Stoermer, 3 April 1966, (500 ml).

919. Plankton, Surface, Station D-4. 43°48'00"N; 87°03'00"W. Coll: E. F. Stoermer, 3 April 1966, (500 ml).

920. Plankton, 5 meters, Station D-4. 43°48'00"; 87°03'00"W. Coll: E. F. Stoermer, 3 April 1966, (500 ml).

921. Plankton, 15 meters, Station D-4. 43°48'00"N; 87°03'00"W. Coll: E. F. Stoermer, 3 April 1966, (500 ml).

922. Plankton, Surface, Station D-5. 43°38'40"N; 87°31'00"W. Coll: E. F. Stoermer, 3 April 1966, (500 ml).

923. Plankton, 5 meters, Station D-5. 43°38'40"N; 87°31'00"W. Coll: E. F. Stoermer, 3 April 1966, (500 ml).

924. Plankton, 15 meters, Station D-5. 43°38'40"N; 87°31'00"W. Coll: E. F. Stoermer, 3 April 1966, (500 ml).

925. Plankton, Surface, Station E-2. 44°37'00"N; 86°21'42"W. Coll: E. F. Stoermer, 6 April 1966, (500 ml).

926. Plankton, 5 meters, Station E-2. 44°37'00"N; 86°21'42"W. Coll: E. F. Stoermer, 6 April 1966, (500 ml).

927. Plankton, 15 meters, Station E-2. 44°37'00"N; 86°21'42"W. Coll: E. F. Stoermer, 6 April 1966, (500 ml).

928. Plankton, Surface, Station E-3. 44°34'00"N; 86°40'00"W. Coll: E. F. Stoermer, 6 April 1966, (500 ml).

929. Plankton, 5 meters, Station E-3. 44°34'00"N; 86°40'00"W. Coll: E. F. Stoermer, 6 April 1966, (500 ml).

930. Plankton, 15 meters, Station E-3. 44°34'00"N; 86°40'00"W. Coll: E. F. Stoermer, 6 April 1966, (500 ml).

931. Plankton, Surface, Station E-5. 44°25'30"N; 87°10'18"W. Coll: E. F. Stoermer, 6 April 1966, (500 ml).

932. Plankton, 5 meters, Station E-5. 44°25'30"N; 87°10'18"W. Coll: E. F. Stoermer, 6 April 1966, (500 ml).

933. Plankton, 15 meters, Station E-5. 44°25'30"N; 87°10'18"W. Coll: E. F. Stoermer, 6 April 1966, (500 ml).

934. Bottom material in shallow water. Mill Creek in Village of Dexter, Sec. 31, R5E, Twp. 1S, Washtenaw County, Michigan. Coll: E. F. Stoermer, 2 June 1966.

935. Bottom material in shallow water. Mill Creek in Village of Dexter, Sec. 31, R5E, Twp. 1S, Washtenaw County, Michigan. Coll: E. F. Stoermer, 2 June 1966.

936. Material from rock brought up in dredge, Station A-6, Lake Michigan. Coll: Wayne Alley, 10 June 1966.

937. Material brought up in dredge from 7 meter depth. Station GAC-ll, Lake Michigan. Coll: Wayne Alley, 10 June 1966.

938. Plankton, Surface, Station A-3. 42°05'30"N; 86°43'00"W. Coll: E. F. Stoermer, 26 April 1966, (500 ml).

939. Plankton, 5 meters, Station A-3. 42°05'30"N; 86°43'00"W. Coll: E. F. Stoermer, 26 April 1966, (500 ml).

940. Plankton, 15 meters, Station A-3. 42°05'30"N; 86°43'00"W. Coll: E. F. Stoermer, 26 April 1966, (500 ml).

941. Plankton, Surface, Station A-4. 42°03'30"N; 87°06'30"W. Coll: E. F. Stoermer, 26 April 1966, (500 ml).

942. Plankton, 5 meters, Station A-4. 42°03'30"N; 87°06'30"W. Coll: E. F. Stoermer, 26 April 1966, (500 ml).

943. Plankton, 15 meters, Station A-4. 42°03'30"N; 87°06'30"W. Coll: E. F. Stoermer, 26 April 1966, (500 ml).

944. Plankton, Surface, Station A-6. 41°52'00"N; 87°27'00"W. Coll: E. F. Stoermer, 26 April 1966, (500 ml).

945. Plankton, 5 meters, Station A-6. 41°52'00"N; 87°27'00"W. Coll: E. F. Stoermer, 26 April 1966, (500 ml).

946. Plankton, 15 meters, Station A-6. 41°52'00"N; 87°27'00"W. Coll: E. F. Stoermer, 26 April 1966, (500 ml).

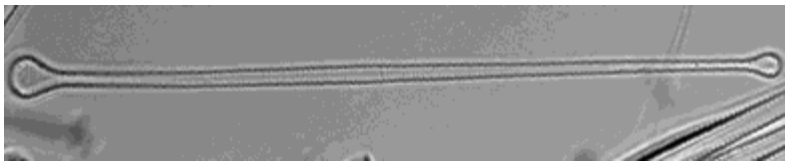
947. Plankton, Surface, Station B-3. 42°24'00"N; 86°35'20"W. Coll: C. F. Powers, 25 April 1966, (500 ml).

948. Plankton, 5 meters, Station B-3. 42°24'00"N; 86°35'20"W. Coll: C. F. Powers, 25 April 1966, (500 ml).

949. Plankton, 15 meters, Station B-3. 42°24'00"N; 86°35'20"W. Coll: C. F. Powers, 25 April 1966, (500 ml).

950. Plankton, Surface, Station B-4. 42°23'30"N; 87°01'30"W. Coll: C. F. Powers, 25 April 1966, (500 ml).

Astform826.gif 390×78 pixels



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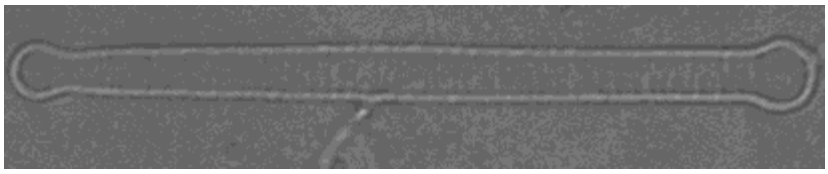

COLLECTIONS: EUGENE F. STOERMER (#7)

1251. #20 net sample, Vertical haul, Station C-7. 42°47'30"N; 87°34'30"W. Coll: C. F. Powers, 16 July 1964.

1252. #20 net sample, Vertical haul, Station C'-1. 43°08'00"N; 86°23'00"W. Coll: C. F. Powers, 16 July 1964.

1253. #20 net sample, Vertical haul, Station C'-2. 43°12'00"N; 86°31'00"W. Coll: C. F. Powers, 16 July 1964.

1254. #20 net sample, Vertical haul, Station D-2. 43°56'00"N; 86°39'30"W. Coll: C. F. Powers, 15 July 1964.

1255. #20 net sample, Vertical haul, Station D-5. 43°38'40"N; 87°31'00"W. Coll: C. F. Powers, 15 July 1964.

1256. #20 net sample, Vertical haul, Station E-2. 44°37'00"N; 86°21'42"W. Coll: C. F. Powers, 14 July 1964.

1257. #20 net sample, Vertical haul, Station E-3. 44°34'00"N; 86°40'00"W. Coll: C. F. Powers, 14 July 1964.

1258. #20 net sample, Vertical haul, Station F-1. 45°21'45"N; 85°19'45"W. Coll: C. F. Powers, 6 July 1964.

1259. #20 net sample, Vertical haul, Station F-2. 45°28'30"N; 85°26'00"W. Coll: C. F. Powers, 6 July 1964.

1260. #20 net sample, Vertical haul, Station F-3. 45°33'40"N; 85°30'45"W. Coll: C. F. Powers, 6 July 1964.

1261. #20 net sample, Vertical haul, Station B-3. 42°24'00"N; 86°35'30"W. Coll: C. F. Powers, 2 August 1964.

1262. #20 net sample, Vertical haul, Station B-3. 42°24'00"N; 86°35'30"W. Coll: C. F. Powers, 17 August 1964.

1263. #20 net sample, Vertical haul, Station C-7. 42°47'30"N; 87°34'30"W. Coll: C. F. Powers, 15 August 1964.

1264. #20 net sample, Vertical haul, Station C'-1. 43°08'00"N; 86°23'00"W. Coll: C. F. Powers, 10 August 1964.

1265. #20 net sample, Vertical haul, Station C'-2. 43°12'00"N; 86°31'00"W. Coll: C. F. Powers, 10 August 1964.

1266. #20 net sample, Vertical haul, Station D-3. 43°54'00"N; 86°51'30"W. Coll: C. F. Powers, 18 August 1964.

1267. #20 net sample, Vertical haul, Station D-6. 43°44'00"N; 87°38'00"W. Coll: C. F. Powers, 18 August 1964.

1268. #20 net sample, Vertical haul, Station E-2. 44°37'00"N; 86°21'42"W. Coll: C. F. Powers, 15 August 1964.

1269. #20 net sample, Vertical haul, Station E-3. 44°34'00"N; 86°40'00"W. Coll: C. F. Powers, 15 August 1964.

1270. #20 net sample, Vertical haul, Station F-1. 45°21'45"N; 85°19'45"W. Coll: C. F. Powers, 10 August 1964.

1271. #20 net sample, Vertical haul, Station C-7. 42°47'30"N; 87°34'30"W. Coll: C. F. Powers, 22 September 1964.

1272. #20 net sample, Vertical haul, Station C'-1. 43°08'00"N; 86°23'00"W. Coll: C. F. Powers, 10 September 1964.

1273. #20 net sample, Vertical haul, Station C'-2. 43°12'00"N; 86°31'00"W. Coll: C. F. Powers, 10 September 1964.

1274. #20 net sample, Vertical haul, Station D-1. 43°57'00"N; 86°33'00"W. Coll: C. F. Powers, 17 September 1964.

1275. #20 net sample, Vertical haul, Station D-2. 43°56'00"N; 86°39'30"W. Coll: C. F. Powers, 17 September 1964.

1276. #20 net sample, Vertical haul, Station D-3. 43°54'00"N; 86°51'30"W. Coll: C. F. Powers, 18 September 1964.

1277. #20 net sample, Vertical haul, Station D-4. 43°48'00"N; 87°03'00"W. Coll: C. F. Powers, 18 September 1964.

1278. #20 net sample, Vertical haul, Station D-6. 43°44'00"N; 87°38'00"W. Coll: C. F. Powers, 18 September 1964.

1279. #20 net sample, Vertical haul, Station E-1. 44°37'30"N; 86°18'12"W. Coll: C. F. Powers, 16 September 1964.

1280. #20 net sample, Vertical haul, Station E-2. 44°37'00"N; 86°21'42"W. Coll: C. F. Powers, 16 September 1964.

1281. #20 net sample, Vertical haul, Station E-3. 44°34'00"N; 86°40'00"W. Coll: C. F. Powers, 16 September 1964.

1282. #20 net sample, Vertical haul, Station E-4. 44°30'18"N; 86°55'18"W. Coll: C. F. Powers, 16 September 1964.

1283. #20 net sample, Vertical haul, Station E-5. 44°25'30"N; 87°10'18"W. Coll: C. F. Powers, 16 September 1964.

1284. #20 net sample, Vertical haul, Station E-6. 44°27'48"N; 87°26'25"W. Coll: C. F. Powers, 17 September 1964.

1285. #20 net sample, Vertical haul, Station F-1. 45°21'45"N; 85°19'45"W. Coll: C. F. Powers, 15 September 1964.

1286. #20 net sample, Vertical haul, Station F-2. 45°28'30"N; 85°26'00"W. Coll: C. F. Powers, 15 September 1964.

1287. 1120 net sample, Vertical haul, Station F-3. 45°33'40"N; 85°30'45"W. Coll: C. F. Powers, 15 September 1964.

1288. #20 net sample, Vertical haul, Station B-3. 42°24'00"N; 86°35'30"W. Coll: C. F. Powers, 15 Oct. 1964.

1289. #20 net sample, Vertical haul, Station C-7. 42°47'30"N; 87°34'30"W. Coll: C. F. Powers, 14 Oct. 1964.

1290. #20 net sample, Vertical haul, Station C'-1. 43°08'00"N; 86°23'00"W. Coll: C. F. Powers, 16 Oct. 1964.

1291. #20 net sample, Vertical haul, Station C'-2. 43°12'00"N; 86°31'00"W. Coll: C. F. Powers, 16 Oct. 1964.

1292. #20 net sample, Vertical haul, Station D-1. 43°57'00"N; 86°33'00"W. Coll: C. F. Powers, 15 Oct. 1964.

1293. #20 net sample, Vertical haul, Station D-2. 43°56'00"N; 86°39'30"W. Coll: C. F. Powers, 15 Oct. 1964.

1294. #20 net sample, Vertical haul, Station D-3. 43°54'00"N; 86°51'30"W. Coll: C. F. Powers, 15 Oct. 1964.

1295. #20 net sample, Vertical haul, Station D-4. 43°48'00"N; 87°03'00"W. Coll: C. F. Powers, 15 Oct. 1964.

1296. #20 net sample, Vertical haul, Station D-5. 43°38'40"N; 87°31'00"W. Coll: C. F. Powers, 14 Oct. 1964.

1297. #20 net sample, Vertical haul, Station D-6. 43°44'00"N; 87°38'00"W. Coll: C. F. Powers, 14 Oct. 1964.

1298. #20 net sample, Vertical haul, Station E-1. 44°37'30"N; 86°18'12"W. Coll: C. F. Powers, 12 Oct. 1964.

1299. #20 net sample, Vertical haul, Station E-2. 44°37'00"N; 86°21'42"W. Coll: C. F. Powers, 12 Oct. 1964.

1300. #20 net sample, Vertical haul, Station E-3. 44°34'00"N; 86°40'00"W. Coll: C. F. Powers, 13 Oct. 1964.

1301. #20 net sample, Vertical haul, Station E-4. 44°30'18"N; 86°55'18"W. Coll: C. F. Powers, 13 Oct. 1964.

1302. #20 net sample, Vertical haul, Station E-5. 44°25'30"N; 87°10'18"W. Coll: C. F. Powers, 13 Oct. 1964.

1303. #20 net sample, Vertical haul, Station E-6. 44°27'48"N; 87°26'25"W. Coll: C. F. Powers, 13 Oct. 1964.

1304. #20 net sample, Vertical haul, Station F-1. 45°21'45"N; 85°19'45"W. Coll: C. F. Powers, 11 Oct. 1964.

1305. #20 net sample, Vertical haul, Station F-2. 45°28'30"N; 85°26'00"W. Coll: C. F. Powers, 11 Oct. 1964.

1306. #20 net sample, Vertical haul, Station F-3. 45°33'40"N; 85°30'45"W. Coll: C. F. Powers, 11 Oct. 1964.

1307. #20 net sample, Vertical haul, Station B-6. 42°22'30"N; 87°30'00"W. Coll: C. F. Powers, probably Nov. 1964.

1308. #20 net sample, Vertical haul, Station C-7. 42°47'30"N; 87°34'30"W. Coll: C. F. Powers, 6 Nov. 1964.

1309. #20 net sample, Vertical haul, Station C'-1. 43°08'00"N; 86°23'00"W. Coll: C. F. Powers, 10 Nov. 1964.

1310. #20 net sample, Vertical haul, Station C'-2. 43°12'00"N; 86°31'00"W. Coll: C. F. Powers, 10 Nov. 1964.

1311. #20 net sample, Vertical haul, Station D-1. 43°57'00"N; 86°33'00"W. Coll: C. F. Powers, 8 Nov. 1964.

1312. #20 net sample, Vertical haul, Station D-2. 43°56'00"N; 86°39'30"W. Coll: C. F. Powers, 8 Nov. 1964.

1313. #20 net sample, Vertical haul, Station D-3. 43°54'0"N; 86°51'30"W. Coll: C. F. Powers, 9 Nov. 1964.

1314. #20 net sample, Vertical haul, Station D-4. 43°48'00"N; 87°03'00"W. Coll: C. F. Powers, 9 Nov. 1964.

1315. #20 net sample, Vertical haul, Station D-5. 43°38'40"N; 87°31'00"W. Coll: C. F. Powers, 9 Nov. 1964.

1316. #20 net sample, Vertical haul, Station D-6. 43°44'00"N; 87°38'00"W. Coll: C. F. Powers, 9 Nov. 1964.

1317. #20 net sample, Vertical haul, Station E-1. 44°37'30"N; 86°18'12"W. Coll: C. F. Powers, 6 Nov. 1964.

1318. #20 net sample, Vertical haul, Station E-2. 44°37'00"N; 86°21'42"W. Coll: C. F. Powers, 7 Nov. 1964.

1319. #20 net sample, Vertical haul, Station E-3. 44°34'00"N; 86°40'00"W. Coll: C. F. Powers, 7 Nov. 1964.

1320. #20 net sample, Vertical haul, Station E-4. 44°30'18"N; 86°55'18"W. Coll: C. F. Powers, 7 Nov. 1964.

1321. #20 net sample, Vertical haul, Station E-5. 44°25'30"N; 87°10'18"W. Coll: C. F. Powers, 7 Nov. 1964.

1322. #20 net sample, Vertical haul, Station E-6. 44°27'48"N; 87°26'25"W. Coll: C. F. Powers, 7 Nov. 1964.

1323. #20 net sample, Vertical haul, Station F-1. 45°21'45"N; 85°19'45"W. Coll: C. F. Powers, 6 Nov. 1964.

1324. #20 net sample, Vertical haul, Station F-2. 45°28'30"N; 85°26'00"W. Coll: C. F. Powers, 6 Nov. 1964.
1325. #20 net sample, Vertical haul, Station F-3. 45°33'40"N; 85°30'45"W. Coll: C. F. Powers, 6 Nov. 1964.

July '65, March '67, April '67 1326-1330 corrected according to ship log - 9/8/77 ... see copy orig pg 55

1326. Rock scrape, 21 ft depth. ARB-E-1, 43°55'0"N, 87°42'4"W, Lake Michigan. Coll: F. R. Bellaire. 8 Oct. 1966.

1327. Rock scrape, 38 ft depth. ARB-E-3, 43°55'0"N, 87°41'8"W, Lake Michigan. Coll: F. R. Bellaire. 8 Oct. 1966.

1328. Rock scrape, 58 ft depth. ARB-E-6, 43°55'0"N, 87°40'9"W, Lake Michigan. Coll: F. R. Bellaire. 8 Oct. 1966.

1329. Rock scrape, 62 ft depth. ARB-E-8, 43°55'0"N, 87°40'3"W, Lake Michigan. Coll: F. R. Bellaire. 8 Oct. 1966.

1330. Rock scrape, 85 ft depth. ARB-E-10, 43°55'0"N, 87°39'6"W, Lake Michigan. Coll: F. R. Bellaire. 8 Oct. 1966.

1331. Plankton, #20 net vertical haul. Sta. MIL-1-D. Milwaukee, Wisconsin. Coll: J. Ayers. 21 July 1965.

1332. Vertical #20 net haul. Sta. MHKE-16. Milwaukee, Wisconsin. Lake Mich. Coll: J. Ayers. 23 July 1965.

1333. Oblique #20 net haul. Sta. MIL-KE. Milwaukee, Wisconsin. Lake Michigan. Coll: J. Ayers. 24 July 1965.

1334. Oblique #20 net haul. Sta. MIL-35. Milwaukee, Wisconsin. Lake Mich. Coll: J. Ayers. 27 July 1965.

1335. #20 net oblique haul. Sta. MH-29. Milwaukee, Wisconsin. Lake Mich. Coll: J. Ayers. 28 July 1965.

1336. Vertical #20 net haul. Sta. C-3, 42°49'10"N, 86°28'25"W, Lake Mich. Coll: C. F. Powers. 27 Jan. 1967.

1337. Vertical #20 net haul. Sta. C-3, 42°49'10"N, 86°28'25"W, Lake Mich. Coll: C. F. Powers. 2 March 1967.

1338. Vertical #20 net haul. Sta. C-3, 42°49'10"N, 86°28'25"W, Lake Mich. Coll: C. F. Powers. 28 March 1967.

1339. Vertical #20 net haul. Sta. C-5. 42°49'00"N, 86°50'00"W. Lake Mich. Coll: C. F. Powers. 28 March 1967.

1340. Vertical #20 net haul. Sta. C-7. 42°47'30"N, 87°34'30"W. Lake Michigan. Coll: C. F. Powers. 28 March 1967.

1341. Vertical #20 net haul. Sta. A-3-A, 42°05'30"N, 86°43'00"W. Lake Mich. Coll: E. Dunster. 19 April 1967.

1342. Vertical #20 net haul. Sta. A-4-A, 42°03'30"N, 87°06'30"W. Lake Mich. Coll: E. Dunster. 19 April 1967.

1343. Vertical #20 net haul. Sta. A-6-A, 41°52'00"N, 87°27'00"W. Lake Mich. Coll: E. Dunster. 19 April 1967.

1344. Vertical #20 net haul. Sta. C-3-E, 42°49'10"N, 86°28'25"W. Lake Mich. Coll: E. Dunster. 25 April 1967.

1345. Vertical #20 net haul. Sta. C-5-E, 42°49'00"N, 86°50'00"W. Lake Mich. Coll: E. Dunster. 25 April 1967.

1346. Vertical #20 net haul. Sta. C-7-E, 42°47'30"N, 87°34'30"W. Lake Mich. Coll: E. Dunster. 21 April 1967.

1347. Vertical #20 net haul. Sta. E-2-E, 44°37'00"N, 86°21'40"W. Lake Mich. Coll: E. Dunster. 23 April 1967.

1348. Vertical #20 net haul. Sta. E-5-E, 44°25'30"N, 87°10'18"W. Lake Mich. Coll: E. Dunster. 23 April 1967.

1349. Vertical #20 net haul. Off Chicago - Pierhead, Illinois. CI = 41°53.3°N, 87°35.4°W. Lake Mich. Coll: E. Dunster. 19 April 1967.

1350. Surface #20 net tow. Benton Harbor, Michigan. BH = 42°06.9°N, 86°29.7°W. Lake Mich. Coll: E. Dunster. 19 April 1967.

1351. Surface #20 net tow. Milwaukee entrance, Wisconsin. MI = 43°01.6°N, 87°52.9°W. Lake Mich. Coll: E. Dunster. 21 April 1967.

1352. Surface #20 net tow. Kewaunee Harbor entrance, Wisconsin. KW = 44°27.5°N, 87°29.6°W. Lake Mich. Coll: E. Dunster. 21 April 1967.

1353. Surface #20 net tow. Frankfort - off piers, Michigan. FR = 44°37.8°N, 86°15.0°W. Lake Michigan. Coll: E. Dunster. 23 April 1967.

1354. Surface #20 net tow. Outside Grand Haven pierheads, Michigan. GH = 43°03.5°N, 86°15.4°W. Lake Mich. Coll: E. Dunster. 25 April 1967.

1355. Vertical #20 net tow. Sta. #l, off Grand Haven, 43°08.6'N; 86°19.6'W. Lake Michigan. Coll: V. E. Noble. 28 April 1967.

1356. Vertical #20 net tow. Sta. #2, off Grand Haven, 43°08.6'N; 86°19.8'W. Lake Michigan. Coll: V. E. Noble. 28 April 1967.

1357. Vertical #20 net tow. Sta. #3, off Grand Haven, 43°03.8'N; 86°20.0'W. Lake Michigan. Coll: V. Noble. 28 April 1967.

1358. Vertical #20 net tow. Sta. #4, off Grand Haven, 43 03.8'N; 86 19.5'W. Lake Michigan. Coll: V. Noble. 29

April 1967.

1359. Vertical #20 net tow. Sta. #5, off Grand Haven, 43°03.7'N; 86°18.9'W. Lake Michigan. Coll: V. Noble. 29 April 1967.

1360. Vertical #20 net tow. Sta. #6, off Grand Haven, 43°03.7'N; 86°15.9'W. Lake Michigan. Coll: V; Noble. 29 April 1967.

1361. Vertical #20 net tow. Sta. #7, off Grand Haven, 43°01.9'N; 86°16.6'W, Lake Michigan. Coll: V. Noble. 30 April 1967.

1362. Vertical #20 net tow. Sta. #8, off Grand Haven, 43°02.1'N; 86°16.3'W. Lake Michigan. Coll: V. Noble. 30 April 1967.

1363. Vertical #20 net tow. Sta. #9, off Grand Haven, 43°02.6'N; 86°16.0'W. Lake Michigan. Coll: V. Noble. 30 April 1967.

1364. Vertical #20 net tow. Sta. #10, off Grand Haven, 43°02.6'N; 86°15.4'W. Lake Michigan. Coll: V. Noble. 30 April 1967.

1365. Vertical #20 net tow. Sta. #11, off Grand Haven, 43°02.5'N; 86°18.0'W. Lake Michigan. Coll: V. Nobler 30 April 1967.

1366. Vertical #20 net tow. Inside Grand Haven Piers -A, Mich. Lake Mich. Coll: V. Noble. 29 April 1967.

1367. Vertical #20 net tow. Inside Grand Haven Piers -B, Mich. Lake Mich. Coll: V. Noble. 29 April 1967.

1368. Vertical #20 net haul. Sta. A-3-E, 42°05'30" N, 86°43'00" W. Lake Mich. Coll: E. F. Stoermer, 4 May 1967.

1369. Vertical #20 net haul. Sta. A-4-E, 42°03'30" N, 87°06'30" W. Lake Mich. Coll: E. F. Stoermer, 4 May 1967.

1370. Vertical #20 net haul. Sta. A-6-E, 41°52'00" N, 87°27'00" W. Lake Mich. Coll: E. F. Stoermer, 3 May 1967.

1371. Vertical #20 net haul. Sta. C-3-E, 42°49'10" N, 86°28'25" W. Lake Mich. Coll: E. F. Stoermer, 4 May 1967.

1372. Vertical #20 net haul. Sta. C-5-E, 42°49'00" N, 86°50'0Q" W. Lake Mich. Coll: E. F. Stoermer, 5 May 1967.

1373. Vertical #20 net haul. Sta. C-7-E, 42°47'30" N, 87°34'30" W. Lake Mich. Coll: E. F. Stoermer, 5 May 1967.

1374. Vertical #20 net haul. Sta. E-2-E, 44°37'00" N, 86°21'42" W. Lake Mich. Coll: E. F. Stoermer, 7 May 1967.

1375. Vertical #20 net haul. Sta. E-3-E, 44°34'00" N, 86°40'00" W. Lake Mich. Coll: E. F. Stoermer, 7 May 1967.

1376. Vertical #20 net haul. Sta. E-5-E, 44°25'30" N, 87°10'18" W. Lake Mich. Coll: E. F. Stoermer, 6 May 1967.

1377. Vertical #20 net haul. Sta. Gs-67-1, 44°46.9 N, 86°13.7 W. Lake Mich. Coll: E. F. Stoermer, 9 May 1967.

1378. Vertical #20 net haul. Sta. GS-67-2, 45°00.6 N, 85°56.5 W. Lake Mich. Coll: E. F. Stoermer, 9 May 1967.

1379. Vertical #20 net haul. Sta. GS-67-3, 45°04.4 N, 85°26.6 W. Lake Mich. Coll: E. F. Stoermer, 9 May 1967.

1380. Vertical #20 net haul. Sta. GS-67-4, 45°25.2 N, 85°19.0 W. Lake Mich. Coll: E. F. Stoermer, 9 May 1967.

1381. Vertical #20 net haul. Sta. GS-67-5, 45°30.5 N, 85°23.5 W. Lake Mich. Coll: E. F. Stoermer, 10 May 1967.

1382. Vertical #20 net haul. Sta. GS-67-6, 45°33.0 N, 85°34.5 W. Lake Mich. Coll: E. F. Stoermer, 10 May 1967.

1383. Vertical #20 net haul. Sta. GS-67-7, 45°34.5 N, 85°41.2 W. Lake Mich. Coll: E. F. Stoermer, 10 May 1967.

1384. Vertical #20 net haul. Sta. GS-67-8, 45°44.7 N, 85°46.5 W. Lake Mich. Coll: E. F. Stoermer, 10 May 1967.

1385. Vertical #20 net haul. Sta. GS-67-9, 45°54.6 N, 86°11.5 W. Lake Mich. Coll: E. F. Stoermer, 10 May 1967.

1386. Vertical #20 net haul. Sta. GS-67-10, 45°34.0 N, 86°25.7 W. Lake Mich. Coll: E. F. Stoermer, 12 May 1967.

1387. Vertical #20 net haul. Sta. GS-67-11, 45°31.7 N, 86°41.4 W. Lake Mich. Coll: E. F. Stoermer, 12 May 1967.

1388. Vertical #20 net haul. Sta. Gs-67-12, 45°47.1 N, 86°36.1 W. Lake Mich. Coll: E. F. Stoermer, 12 May 1967.

1389. Vertical #20 net haul. Sta. GS-67-13, 45°43.8 N, 86°41.6 W. Lake Mich. Coll: E. F. Stoermer, 12 May 1967.

1390. Vertical #20 net haul. Sta. GS-67-14, 45°40.5 N, 86°48.8 W. Lake Mich. Coll: E. F. Stoermer, 12 May 1967.

1391. Vertical #20 net haul. Sta. GS-67-15, 45°36.2 N, 86°58.5 W. Lake Mich. Coll: E. F. Stoermer, 12 May 1967.

1392. Vertical #20 net haul. Sta. GS-67-16, 45°47.4 N, 87°02.2 W. Lake Mich. Coll: E. F. Stoermer, 12 May 1967.

1393. Vertical #20 net haul. Sta. GS-67-17, 45°34.0 N, 87°09.0 W. Lake Mich. Coll: E. F. Stoermer, 13 May 1967.

1394. Vertical #20 net haul. Sta. GS-67-18, 45°23.5 N, 87°17.5 W. Lake Mich. Coll: E. F. Stoermer, 13 May 1967.

1395. Vertical #20 net haul. Sta. GS-67-19, 45°05.0 N, 87°32.3 W. Lake Mich. Coll: E. F. Stoermer, 13 May 1967.

1396. Vertical #20 net haul. Sta. GS-67-20, 44°40.2 N, 87°52.8 W. Lake Mich. Coll: E. F. Stoermer, 13 May 1967.

1397. Vertical #20 net haul. Sta. GS-67-21, 44°54.7 N, 87°25.8 W. Lake Mich. Coll: E. F. Stoermer, 13 May 1967.

1398. Vertical #20 net haul. Sta. GS-67-22, 44°46.6 N, 87°17.4 W. Lake Mich. Coll: E. F. Stoermer, 14 May 1967.

1399. Surface #20 net tow. Harbor entrance, Port Washington, Wisconsin. PW = 43°23.2°N, 87°51.7°W. Coll: E. F. Stoermer, 5 May 1967.

1400. Surface #20 net tow. Harbor entrance, Sheboygan, Wisconsin, Lake Mich. SB= 43°45.0°N, 87°41.5°W. Coll: E. F. Stoermer, 6 May 1967.

1401. Surface #20 net tow. Harbor entrance, Manitowoc, Wisconsin, Lake Mich. MO= 44°05.6°N, 87°38.6°W. Coll: E. F. Stoermer, 6 May 1967.

1402. Surface #20 net tow. Harbor entrance, Two Rivers, Wisconsin, Lake Mich. TR = 44°08.6°N, 87°33.6°W. Coll: E. F. Stoermer, 6 May 1967.

1403. Surface #20 net tow. Harbor entrance, Charlevoix, Michigan, Lake Mich. CA = 45°19.3°N, 85°15.9°W. Coll: E. F. Stoermer, 10 May 1967.

1404. Surface #20 net tow. Harbor entrance, Manistique, Michigan, Lake Mich. MQ = 45°56.7°N, 86°14.8°W. Coll: E. F. Stoermer, 10 May 1967.

1405. Surface #20 net tow. Harbor entrance, Escanaba, Michigan, Lake Mich. ES = 45°44.7°N, 87°02.2°W. Coll: E. F. Stoermer, 12 May 1967.

1406. Surface #20 net tow. Harbor entrance, Green Bay, Wisconsin, Lake Mich. GB = 44°39.2°N, 87°54.1°W.

Coll: E. F. Stoermer, 13 May 1967.

1407. Surface #20 net tow. Harbor entrance, Sturgeon Bay, Wisconsin, Lake Mich. SM = 44°47.5'N, 87°18.6'W. Coll: E. F. Stoermer, 14 May 1967.

1409. Vertical #20 net haul. Sta. A-4-E, 42°03'30" N, 87°06'30" W. Lake Mich. Coll: E. Dunster, 23 May 1967.

1410. Vertical #20 net haul. Sta. A-6-E, 41°52'00" N, 87°27'00" W. Lake Mich. Coll: E. Dunster, 24 May 1967.

1411. Vertical #20 net haul. Sta. C-3-E, 42°49'10" N, 86°28'25" W. Lake Mich. Coll: E. Dunster, 31 May 1967.

1412. Vertical #20 net haul. Sta. C-5-E. 42°49'00" N, 86°50'00" W. Lake Mich. Coll: E. Dunster, 31 May 1967.

1413. Vertical #20 net haul. Sta. C-7-E, 42°47'30" N, 87°34'30" W. Lake Mich. Coll: E. Dunster, 25 May 1967.

1414. Vertical #20 net haul. Sta. E-2-E, 44°37'00" N, 86°21'42" W. Lake Mich. Coll: E. Dunster, 28 May 1967.

1415. Vertical #20 net haul. Sta. E-3-E, 44°34'00" N, 86°40'00" W. Lake Mich. Coll: E. Dunster, 28 May 1967.

1416. Vertical #20 net haul. Sta. E-5-E, 44°25'30" N, 87°10'18" W. Lake Mich. Coll: E. Dunster, 28 May 1967.

1417. Surface #20 net tow. Harbor entrance, Holland, Michigan, Lake Mich. HO = 42°46.4'N, 86°12.9'W. Coll: E. Dunster, 22 May 1967.

1418. Surface #20 net tow. Harbor entrance, South Haven, Michigan, Lake Mich. SH = 42°24.0'N, 86°17.3'W. Coll: E. Dunster, 22 May 1967.

1419. Surface #20 net tow. Harbor entrance, Buffington, Indiana, Lake Mich. BU = 41°38.8'N, 87°24.6'W. Coll: E. Dunster, 23 May 1967.

1420. Surface #20 net tow. Harbor entrance, Indiana Harbor, Indiana, Lake Mich. IH = 41°40.9'N, 87°26.5'W. Coll: E. Dunster, 23 May 1967.

1421. Surface #20 net tow. Harbor entrance, Calumet Harbor, Indiana, Lake Mich. CH = 41°43.5'N, 87°29.6'W. Coll: E. Dunster, 23 May 1967.

1422. Surface #20 net tow. Harbor entrance, Gary, Indiana, Lake Mich. GA = 41°37.5'N, 87°19.4'W. Coll: E. Dunster, 23 May 1967.

1423. Surface #20 net tow. Harbor entrance, Waukegan, Illinois, Lake Mich. WA = 42°21.7'N, 87°48.8'W. Coll: E. Dunster, 25 May 1967.

1424. Surface #20 net tow. Harbor entrance, Kenosha, Wisconsin, Lake Mich. KN = 42°35.7'N, 87°48.5'W. Coll: E. Dunster, 25 May 1967.

1425. Surface #20 net tow. Harbor entrance, Racine, Wisconsin, Lake Mich. RA = 42°44.1'N, 87°46.3'W. Coll: E. Dunster, 25 May 1967.

1426. Surface #20 net tow. Harbor entrance, Manistee, Michigan, Lake Mich. MS = 44°15.1'N, 86°20.8'W. Coll: E. Dunster, 29 May 1967.

1427. Surface #20 net tow. Harbor entrance, Ludington, Michigan, Lake Mich. LU = 43°57.2'N, 86°27.8'W. Coll: E. Dunster, 29 May 1967.

1428. Surface #20 net tow. Harbor entrance, Muskegon, Michigan, Lake Mich. MU = 43°13.5'N, 86°20.8'W. Coll: E. Dunster, 29 May 1967.

1429. Surface #20 net tow. Harbor entrance, White Lake, Michigan, Lake Mich. WL = 43°22.5'N, 86°25.3'W. Coll: E. Dunster, 29 May 1967.

1430. Surface #20 net tow. Michigan City, Indiana, Lake Mich. MC = 41°43.7'N, 87°54.7'W. Coll: J. Ayers, 12 June 1967.

1431. Vertical #20 net tow. Sta. A-3-E, 42°05'30" N, 86°43'00" W. Lake Mich. Coll: J. Ayers, 12 June 1967.

1432. Vertical #20 net tow. Sta. A-4-E, 42°03'30" N, 87°06'30" W. Lake Mich. Coll: J. Ayers, 13 June 1967.

1433. Vertical #20 net tow. Sta. C-3-E, 42°49'10" N, 86°28'25" W. Lake Mich. Coll: J. Ayers, 17 June 1967.

1434. Vertical #20 net tow. Sta. C-5-E, 42°49'00" N, 86°50'00" W. Lake Mich. Coll: J. Ayers, 17 June 1967.

1435. Vertical #20 net tow. Sta. C-7-E, 42°47'30" N, 87°34'30" W. Lake Mich. Coll: J. Ayers, 13 June 1967.

1436. Vertical #20 net tow. Sta. E-2-E, 44°37'00" N, 86°21'42" W. Lake Mich. Coll: J. Ayers, 15 June 1967.

1437. Vertical #20 net tow. Sta. E-3-E, 44°34'00" N, 86°40'00" W. Lake Mich. Coll: J. Ayers, 15 June 1967.

1438. Vertical #20 net tow. Sta. E-5-E, 44°25'30" N, 87°10'18" W. Lake Mich. Coll: J. Ayers, 14 June 1967.

1439. Vertical #20 net tow. Sta. B-6, 42°22'30"N, 87°30'00"W. Lake Michigan. Coll: C. F. Powers. 5 June 1964.

1440. Vertical #20 net tow. Sta. B-6, 42°22'30"N, 87°30'00"W. Lake Michigan. Coll: C. F. Powers. 11 July 1964.

1441. Vertical #20 net tow. Sta. B-6, 42°22' 30"N, 87°30'00"W. Lake Michigan. Coll: C. F. Powers. 24 July 1964.

1442. Vertical #20 net tow. Sta. B-6, 42°22'30"N, 87°30'00"W. Lake Michigan. Coll: C. F. Powers. 2 August 1964.

1443. Vertical #20 net tow. Sta. B-6, 42°22'30"N, 87°30'00"W. Lake Michigan. Coll: C. F. Powers. 16 August 1964.

1444. Vertical #20 net tow. Sta. B-6, 42°22'30"N, 87°30'00"W. Lake Michigan. Coll: C. F. Powers. 19 September 1964.

1445. Vertical #20 net tow. Sta. B-6, 42°22'30"N, 87°30'00"W. Lake Michigan. Coll: C. F. Powers. 14 October 1964.

1446. Vertical #20 net tow. Sta. A-3, 42°05'30"N, 86°43'00"W. Lake Michigan. Coll: E. Dunster. 11 July 1967.

1447. Vertical #20 net tow. Sta. A-4, 42°03'30"N, 87°06'30"W. Lake Michigan. Coll: E. Dunster. 11 July 1967.

1448. Vertical #20 net tow. Sta. A-6, 41°52'00"N, 87°27'00"W. Lake Michigan. Coll: E. Dunster. 10 July 1967.

1449. Vertical #20 net tow. Sta. C-3, 42°49'10"N, 86°28'25"W. Lake Michigan. Coll: E. Dunster. 16 July 1967.

1450. Vertical #20 net tow. Sta. C-5, 42°49'00"N, 86°50'00"W. Lake Michigan. Coll: E. Dunster. 16 July 1967.

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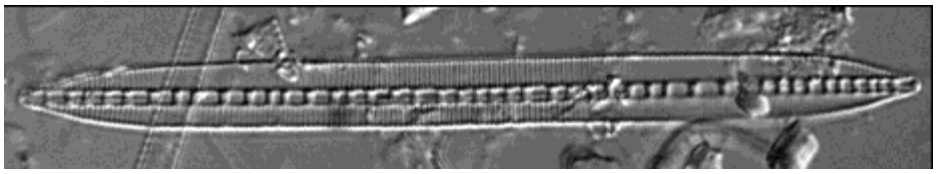

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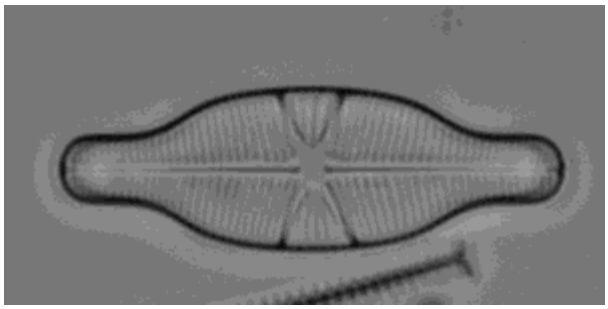

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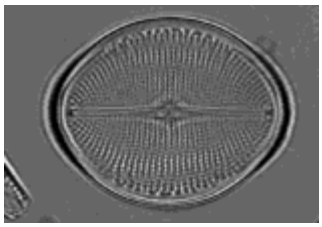

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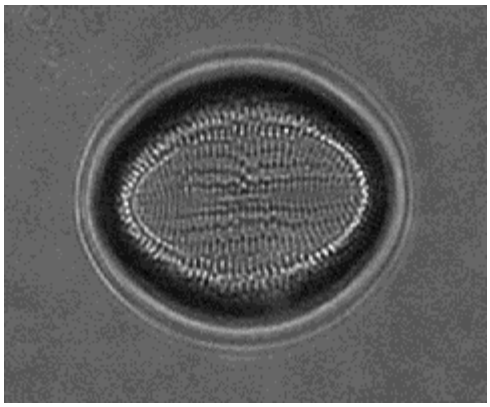

COLLECTIONS: EUGENE F. STOERMER (#21)

3787. Lake Michigan. City of Leland, Lelanau Co., Michigan. 44°30.00'N; 85°45.00'W. Shallow water a beach-water interface, north of marina dock. Large amounts of dark brown slime (some like string of beads). contains Gomphoneis herculeanum. BURN MOUNTS. Coll. E.F. Stoermer 10-6-76. #40.

3788. Lake Michigan. City of Leland, Lelanau Co., Michigan. 44°30.00'N; 85°45.00'W. Shallow water at water-beach interface, north of marina dock. Large amounts of dark brown slime (some like string of beads). contains Gomphoneis herculeanum. CLEANED. Duplicates slides: see 3789 and 3790 also + burn mounts. Coll. E.F. Stoermer 10-6-76. #40.

3789. Lake Michigan. City of Leland, Lelanau Co., Michigan. 44°30.00'N; 85°45.00'W. Shallow water at water-beach interface, north of marina dock. Large amounts of dark brown slime (some like string of beads). contains Gomphoneis herculeanum. CLEANED. Coll. E.F. Stoermer. 10-6-76. #40.

3790. Lake Michigan. City of Leland, Lelanau Co., Michigan. 44°30.00'N; 85°45.00'W. Shallow water at water-beach interface, north of marina dock. Large amounts of dark brown slime (some like string of beads). contains Gomphoneis herculeanum. CLEANED. Coll. E.F. Stoermer 10-6-76. #40.

3791. Lake Huron. Town of Harrisville, Alcona Co., Michigan. 44°40.00'N; 83°20.00'W. Diatom crust inside jetty wall. contains Gomphoneis herculeanum. Coll. E.F. Stoermer 10-8-76 #70.

3792. Lake Huron. Mackinac Island, Michigan. Dried material from Dr. Locker of C.G. Ehrenberg. "Collected by J.W. Bailey from a submerged tree which was covered by a waving filamentous mass of Gomphonema vi July" "Recent infusoria from Island of Mackinaw in the Straits of Michilmackinac at the outlet of Lake Michigan." #1754 of Ehrenberg. contains Gomphoneis herculeanum . See Ehrenberg, 1845. Duplicates: see 3793 also.

3793. Lake Huron. Mackinac Island, Michigan. Dried material from Dr. Locker of C.G. Ehrenberg. "Collected by J.W. Bailey from a submerged tree which was covered by a waving filamentous mass of Gomphonema vi July" "Recent infusoria from Island of Mackinaw in the Straits of Michilmackinac at the outlet of Lake Michigan." #1754 of Ehrenberg. contains Gomphoneis herculeanum. See Ehrenberg, 1845.

3794. Minter Springs. Tamu, Brazos Co., Texas. From glass slide rack, #62. Coll. Richard J. Wahrer, April, 1980.

3795. Tonkawa Springs. Nacugdoches Co., Texas. From glass slide rack, #66. Coll. Richard J. Wahrer, May, 1980. Contains Eunotia, Stenopterobia, Frustulia.

3796. Minter Springs. Tamu, Brazos Co., Texas. Scrape from wall of outflow pipe. Coll. E.F. Stoermer, April, 1981.

3797. Saginaw Bay. Caseville, Michigan. From Cladophora filaments, cleaned. Contains Thalassiosira. Coll. E. F. Stoermer, 1 July 1981.

3798. Saginaw Bay. Quanicassee, Michigan. Plankton net tow from shore, cleaned. Coll. E. F. Stoermer, 1 July 1981.

3799. Lake Huron. Plankton from open lake near Port Huron, Mich. Coll. R. Lowe. Oct. 1974. DNR 20. Contains populations of Cyclotella comensis one of the first times observed in Lake Huron. Slide broken then coverslip remounted Oct. 22, 1982 RGK.

3801. Frains Lake, Washtenaw Co., Michigan. Profundal sediment core 4. Coll. H. Carney. May 1980.4 cm (FL4-4cm)

3802. Frains Lake, Washtenaw Co., Michigan. Profundal sediment core 4. Coll. H. Carney. May 1980.4 cm (FL4-4cm)

3803. Frains Lake, Washtenaw Co., Michigan. Profundal sediment core 4. Coll. H. Carney. May 1980.30 cm (FL4-30cm)

3804. Frains Lake, Washtenaw Co., Michigan. Profundal sediment core 4. Coll. H. Carney. May 1980.30 cm (FL4-30cm)

3805. Frains Lake, Washtenaw Co., Michigan. Profundal sediment core 4. Coll. H. Carney. May 1980.60 cm (FL4-60cm)

3806. Frains Lake, Washtenaw Co., Michigan. Profundal sediment core 4. Coll. H. Carney. May 1980.60 cm (FL4-60cm)

3807. Frains Lake, Washtenaw Co., Michigan. Profundal sediment core 4. Coll. H. Carney. May 1980.90 cm (FL4-90cm)

3808. Frains Lake, Washtenaw Co., Michigan. Profundal sediment core 4. Coll. H. Carney. May 1980.90 cm (FL4-90cm)

3809. Frains Lake, Washtenaw Co., Michigan. Profundal sediment core 4. Coll. H. Carney. May 1980.120 cm (FL4-120cm)

3810. Frains Lake, Washtenaw Co., Michigan. Profundal sediment core 4. Coll. H. Carney. May 1980.120 cm (FL4-120cm)

3811. Frains Lake, Washtenaw Co., Michigan. Profundal sediment core 4. Coll. H. Carney. May 1980.170 cm (FL4-170cm)

3812. Frains Lake, Washtenaw Co., Michigan. Profundal sediment core 4. Coll. H. Carney. May 1980.170 cm (FL4-170cm)

3813. Frains Lake, Washtenaw Co., Michigan. Profundal sediment core 4. Coll. H. Carney. May 1980.200 cm (FL4-200cm)

3814. Frains Lake, Washtenaw Co., Michigan. Profundal sediment core 4. Coll. H. Carney. May 1980.200 cm (FL4-200cm)

3815. Frains Lake, Washtenaw Co., Michigan. Profundal sediment core 4. Coll. H. Carney. May 1980.230 cm (FL4-230cm)

3816. Frains Lake, Washtenaw Co., Michigan. Profundal sediment core 4. Coll. H. Carney. May 1980.230 cm (FL4-230cm)

3817. Frains Lake, Washtenaw Co., Michigan. Profundal sediment core 4. Coll. H. Carney. May 1980.260 cm (FL4-260cm)

3818. Frains Lake, Washtenaw Co., Michigan. Profundal sediment core 4. Coll. H. Carney. May 1980.260 cm (FL4-260cm)

3819. Frains Lake, Washtenaw Co., Michigan. Profundal sediment core 4. Coll. H. Carney. May 1980.280 cm (FL4-280cm)

3820. Frains Lake, Washtenaw Co., Michigan. Profundal sediment core 4. Coll. H. Carney. May 1980.280 cm (FL4-280cm)

3821. Frains Lake, Washtenaw Co., Michigan. Profundal sediment core 4. Coll. H. Carney. May 1980.340 cm (FL4-340cm)

3822. Frains Lake, Washtenaw Co., Michigan. Profundal sediment core 4. Coll. H. Carney. May 1980.340 cm (FL4-340cm)

3823. Frains Lake, Washtenaw Co., Michigan. Profundal sediment core 4. Coll. H. Carney. May 1980.400 cm (FL4-400cm)

3824. Frains Lake, Washtenaw Co., Michigan. Profundal sediment core 4. Coll. H. Carney. May 1980.400 cm (FL4-400cm)

3825. Frains Lake, Washtenaw Co., Michigan. Profundal sediment core 4. Coll. H. Carney. May 1980.405 cm (FL4-405cm)

3826. Frains Lake, Washtenaw Co., Michigan. Profundal sediment core 4. Coll. H. Carney. May 1980.405 cm (FL4-405cm)

3827. Frains Lake, Washtenaw Co., Michigan. Profundal sediment core 4. Coll. H. Carney. May 1980.415 cm (FL4-415cm)

3828. Frains Lake, Washtenaw Co., Michigan. Profundal sediment core 4. Coll. H. Carney. May 1980.435 cm (FL4-435cm)

3829. Frains Lake, Washtenaw Co., Michigan. Profundal sediment core 4. Coll. H. Carney. May 1980.435 cm (FL4-435cm)

3830. Frains Lake, Washtenaw Co., Michigan. Profundal sediment core 4. Coll. H. Carney. May 1980.465 cm (FL4-465cm)

3831. Frains Lake, Washtenaw Co., Michigan. Profundal sediment core 4. Coll. H. Carney. May 1980.465 cm (FL4-465cm)

3832 Frains Lake, Washtenaw Co., Michigan. Profundal sediment core 4. Coll. H. Carney. May 1980.495 cm (FL4-495cm)

3833. Frains Lake, Washtenaw Co., Michigan. Profundal sediment core 4. Coll. H. Carney. May 1980.495 cm (FL4-495cm)

3834. Frains Lake, Washtenaw Co., Michigan. Profundal sediment core 4. Coll. H. Carney. May 1980.525 cm (FL4-525cm)

3835. Frains Lake, Washtenaw Co., Michigan. Profundal sediment core 4. Coll. H. Carney. May 1980.525 cm (FL4-525cm)

3836. Frains Lake, Washtenaw Co., Michigan. Profundal sediment core 4. Coll. H. Carney. May 1980.620 cm (FL4-620cm)

3837. Frains Lake, Washtenaw Co., Michigan. Profundal sediment core 4. Coll. H. Carney. May 1980.740 cm (FL4-740cm)

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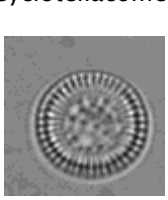

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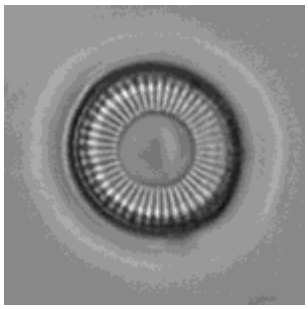

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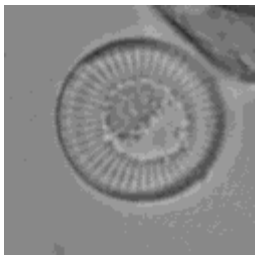

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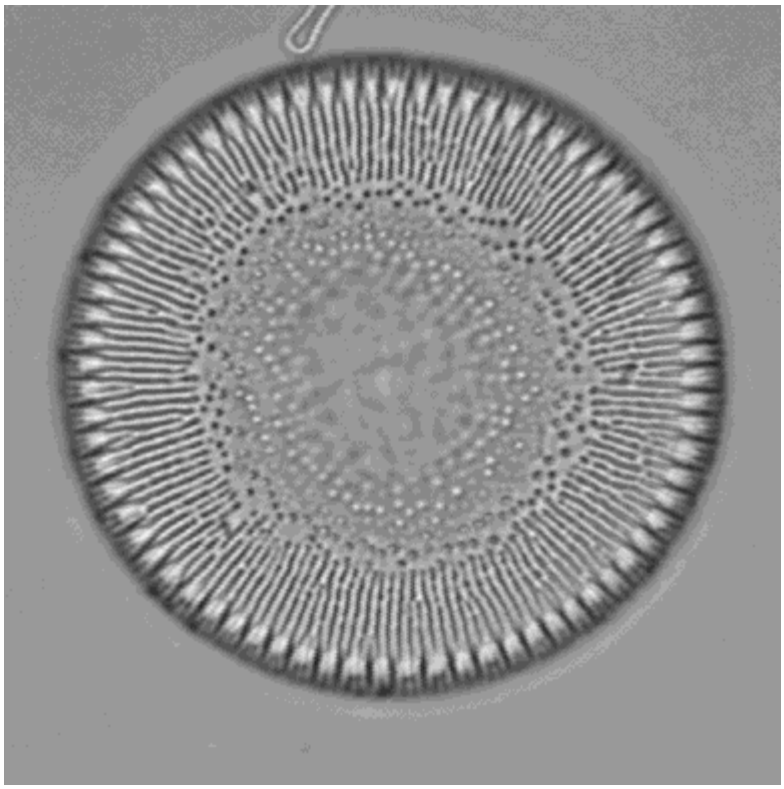

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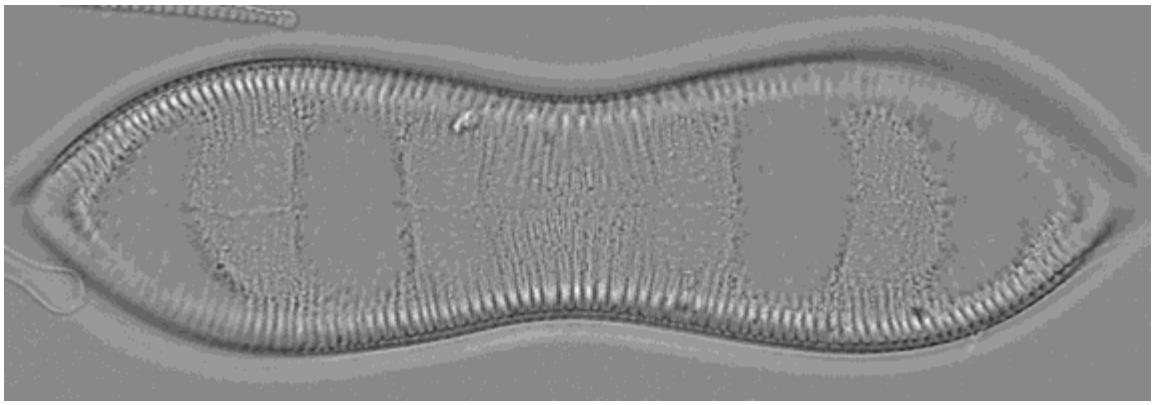

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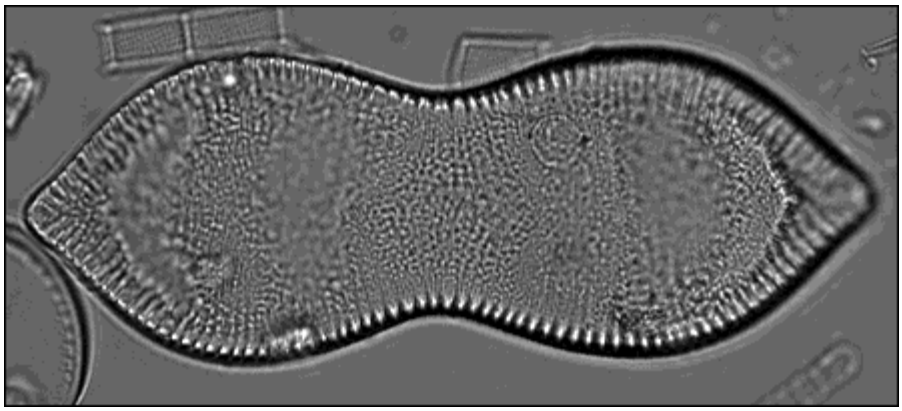

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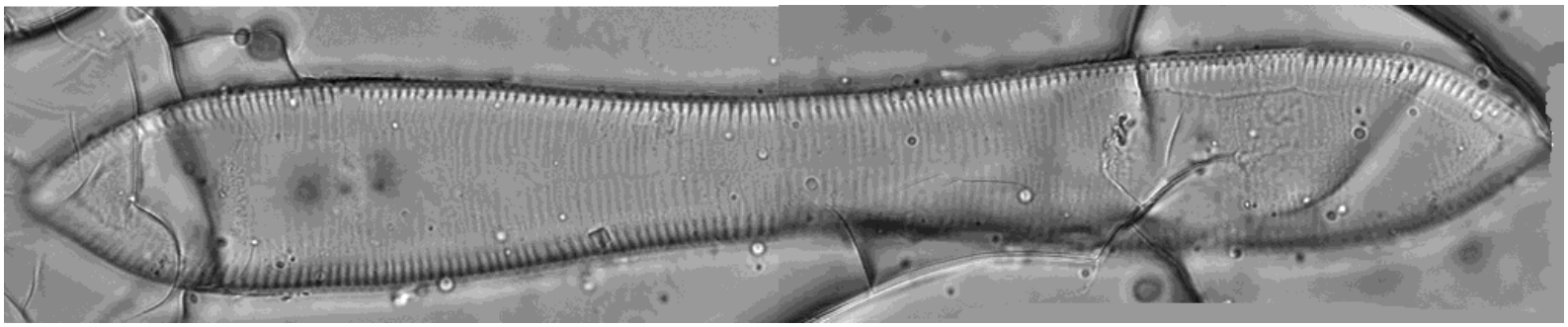


COLLECTIONS: EUGENE F. STOERMER (C)

C-1. North shore material, 1960-1965, Coll: E. F. Stoermer.

C-2. North shore material, 1960-1965, Coll: E. F. Stoermer.

C-3. North shore material, 1960-1965, Coll: E. F. Stoermer.

C-4. North shore material, 1960-1965, Coll: E. F. Stoermer.

C-5. North shore material, 1960-1965, Coll: E. F. Stoermer.

C-6. North shore material, 1960-1965, Coll: E. F. Stoermer.

C-7. North shore material, 1960-1965, Coll: E. F. Stoermer.

C-8. North shore material, 1960-1965, Coll: E. F. Stoermer.

C-9. North shore material, 1960-1965, Coll: E. F. Stoermer.

C-10. North shore material, 1960-1965, Coll: E. F. Stoermer.

C-11. North shore material, 1960-1965, Coll: E. F. Stoermer.

C-12. North shore material, 1960-1965, Coll: E. F. Stoermer.

C-13. North shore material, 1960-1965, Coll: E. F. Stoermer.

C-14. North shore material, 1960-1965, Coll: E. F. Stoermer.

C-15. North shore material, 1960-1965, Coll: E. F. Stoermer.

C-16. North shore material, 1960-1965, Coll: E. F. Stoermer.

C-17. North shore material, 1960-1965, Coll: E. F. Stoermer.

C-18. North shore material, 1960-1965, Coll: E. F. Stoermer.

C-19. North shore material, 1960-1965, Coll: E. F. Stoermer.

C-20. North shore material, 1960-1965, Coll: E. F. Stoermer.

C-21. North shore material, 1960-1965, Coll: E. F. Stoermer.

C-22. North shore material, 1960-1965, Coll: E. F. Stoermer.

C-23. North shore material, 1960-1965, Coll: E. F. Stoermer.

C-24. North shore material, 1960-1965, Coll: E. F. Stoermer.

C-25. North shore material, 1960-1965, Coll: E. F. Stoermer.

C-26. North shore material, 1960-1965, Coll: E. F. Stoermer.

C-27. North shore material, 1960-1965, Coll: E. F. Stoermer.

C-28. North shore material, 1960-1965, Coll: E. F. Stoermer.

C-29. North shore material, 1960-1965, Coll: E. F. Stoermer.

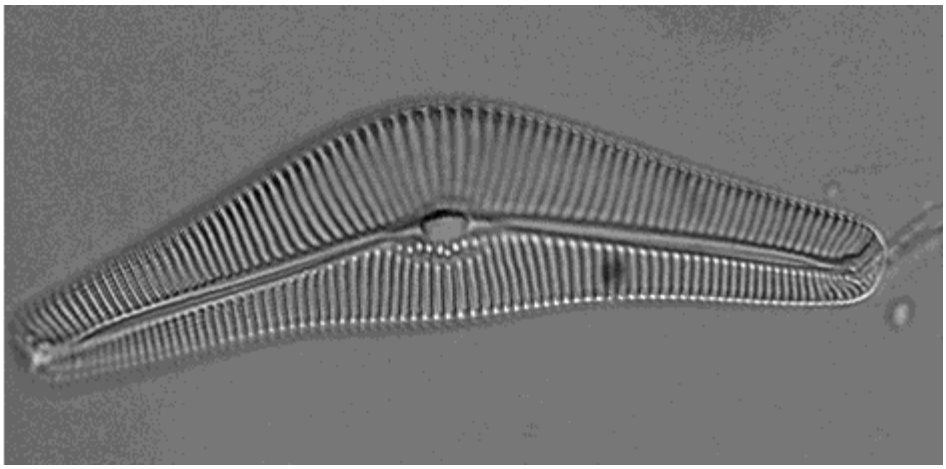
C-30. North shore material, 1960-1965, Coll: E. F. Stoermer.

C-31. North shore material, 1960-1965, Coll: E. F. Stoermer.

C-32. North shore material, 1960-1965, Coll: E. F. Stoermer.

DC-0. Southern Lake Michigan, D. C. Cook Plant, 9 Apr 79, 15:1 dilution, Coll. E. Dunster.

Cymbellacistvgibb1158.gif 470×230 pixels



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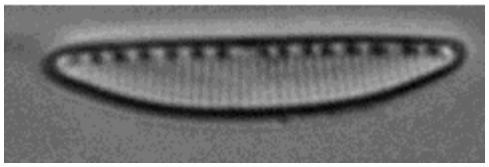
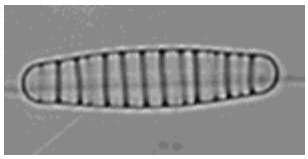


lauta.gif 150×100 pixels

diatomaehrenbergii1.gif 150×75 pixels



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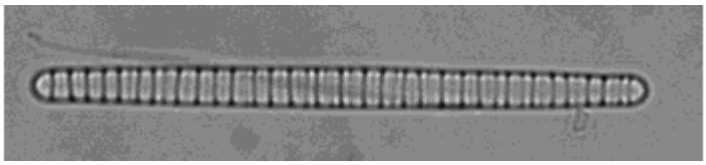

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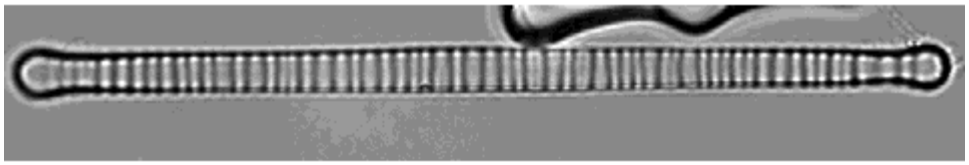

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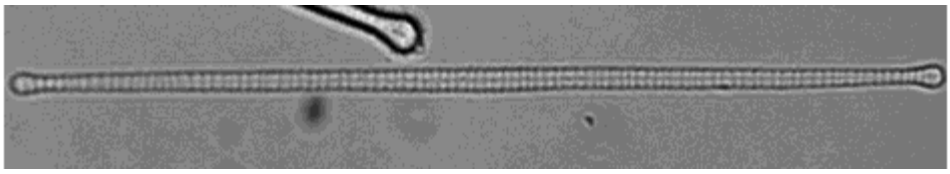

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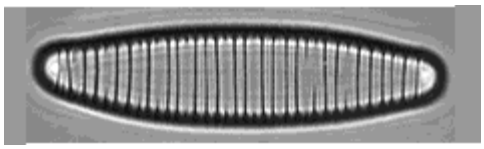

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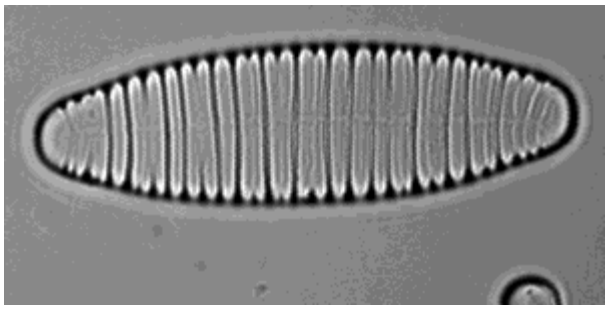

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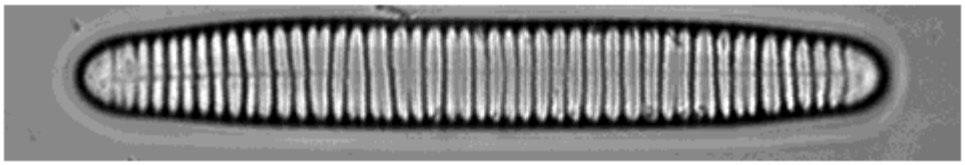

COLLECTIONS: EUGENE F. STOERMER (#9)

1651. Vertical #20 net tow. Sta. E-1, 44°37'30" N; 86°18'12" W. Michigan. Coll: Edward Dunster. 15 May 1968.

1652. Vertical #20 net tow. Sta. E-2, 44°37'00" N; 86°21'42" W. Michigan. Coll: Edward Dunster. 15 May 1968.

1653. Vertical #20 net tow. Sta. E-3, 44°34'00" N; 86°40'00" W. Michigan. Coll: Edward Dunster. 15 May 1968.

1654. Vertical #20 net tow. Sta. E-4, 44°30'18" N; 86°55'18" W. Michigan. Coll: Edward Dunster. 15 May 1968.

1655. Vertical #20 net tow. Sta. E-5, 44°25'30" N; 87°10'18" W. Michigan. Coll: Edward Dunster. 15 May 1968.

1656. Vertical #20 net tow. Sta. E-6, 44°27'48" N; 87°26'25" W. Michigan. Coll: Edward Dunster. 15 May 1968.

1657. Vertical #20 net tow. Sta. A-l, 42°06'30" N; 86°32'00" W. Michigan. Coll: Edward Dunster. 15 July 1968.

1658. Vertical #20 net tow. Sta. A-2, 42°06'00" N; 86°37'00" W. Michigan. Coll: Edward Dunster. 15 July 1968.

1659. Vertical #20 net tow. Sta. A-3, 42°05'30" N; 86°43'00" W. Michigan. Coll: Edward Dunster. 15 July 1968.

1660. Vertical #20 net tow. Sta. A-4, 42°03'30" N; 87°06'30" W. Michigan. Coll: Edward Dunster. 16 July 1968.

1661. Vertical #20 net tow. Sta. A-5, 41°57'00" N; 87°18'30" W. Michigan. Coll: Edward Dunster. 16 July 1968.

1662. Vertical #20 net tow. Sta. A-6, 41°52'00" N; 87°27'00" W. Michigan. Coll: Edward Dunster. 16 July 1968.

1663. Vertical #20 net tow. Sta. C-l, 42°49'40" N; 86°14'50" W. Michigan. Coll: Edward Dunster. 15 July 1968.

1664. Vertical #20 net tow. Sta. C-2, 42°49'40" N; 86°18'25" W. Michigan. Coll: Edward Dunster. 15 July 1968.

1665. Vertical #20 net tow. Sta. C-3, 42°49'10" N; 86°28'25" W. Michigan. Coll: Edward Dunster. 15 July 1968.

1666. Vertical #20 net tow. Sta. C-4, 42°48'50" N: 86°41'30" W. Michigan. Coll: Edward Dunster. 15 July 1968.

1667. Vertical #20 net tow. Sta. C-5, 42°49'00" N; 86°50'00" W. Michigan. Coll: Edward Dunster. 15 July 1968.

1668. Vertical #20 net tow. Sta. C-6, 42°47'50" N; 87°26'50" W. Michigan. Coll: Edward Dunster. 16 July 1968.

1669. Vertical #20 net tow. Sta. C-7, 42°47'30" N; 87°34'30" W. Michigan. Coll: Edward Dunster. 16 July 1968.

1670. Vertical #20 net tow. Sta. E-l, 44°37'30" N; 86°18'12" W. Michigan. Coll: Edward Dunster. 18 July 1968.

1671. Vertical #20 net tow. Sta. E-2, 44°37'00" N; 86°21'42" W. Michigan. Coll: Edward Dunster. 18 July 1968.

1672. Vertical #20 net tow. Sta. E-3, 44°34'00" N; 86°40'00" W. Michigan. Coll: Edward Dunster. 17 July 1968.

1673. Vertical #20 net tow. Sta. E-4, 44°30'18" N; 86°55'18" W. Michigan. Coll: Edward Dunster. 17 July 1968.

1674. Vertical #20 net tow. Sta. E-5, 44°25'30" N; 87°10'18" W. Michigan. Coll: Edward Dunster. 17 July 1968.

1675. Vertical #20 net tow. Sta. E-6, 44°27'48" N; 87°26'25" W. Michigan. Coll: Edward Dunster. 17 July 1968.

1676. Vertical #20 net tow. Sta. A-l, 42°06'30" N; 86°32'00" W. Michigan. Coll: Edward Dunster. 6 August 1968.

1677. Vertical #20 net tow. Sta. A-2, 42°06'00" N; 86°37'00" W. Michigan. Coll: Edward Dunster. 6 August 1968.

1678. Vertical #20 net tow. Sta. A-3, 42°05'30" N; 86°43'00" W. Michigan. Coll: Edward Dunster. 6 August 1968.

1679. Vertical #20 net tow. Sta. A-4, 42°03'30" N; 87°06'30" W. Michigan. Coll: Edward Dunster. 7 August 1968.

1680. Vertical #20 net tow. Sta. A-5, 41°57'00" N; 87°18'30" W. Michigan. Coll: Edward Dunster. 7 August 1968.

1681. Vertical #20 net tow. Sta. A-6, 41°52'00" N; 87°27'00" W. Michigan. Coll: Edward Dunster. 7 August 1968.

1682. Vertical #20 net tow. Sta. C-l, 42°49'40" N; 86°14'50" W. Michigan. Coll: Edward Dunster. 6 August 1968.

1683. Vertical #20 net tow. Sta. C-2, 42°49'40" N; 86°18'25" W. Michigan. Coll: Edward Dunster. 6 August 1968.

1684. Vertical #20 net tow. Sta. C-3, 42°49'10" N; 86°28'25" W. Michigan. Coll: Edward Dunster. 6 August 1968.

1685. Vertical #20 net tow. Sta. C-4, 42°48'50" N; 86°41'30" W. Michigan. Coll: Edward Dunster. 6 August 1968.

1686. Vertical #20 net tow. Sta. C-5, 42°49'00" N; 86°50'00" W. Michigan. Coll: Edward Dunster. 6 August 1968.

1687. Vertical #20 net tow. Sta. C-6, 42°47'40" N; 87°26'50" W. Michigan. Coll: Edward Dunster. 8 August 1968.

1688. Vertical #20 net tow. Sta. C-7, 42°47'30" N; 87°34'30" W. Michigan. Coll: Edward Dunster. 8 August 1968.

1689. Vertical #20 net tow. Sta. E-3, 44°34'00" N; 86°40'00" W. Michigan. Coll: Edward Dunster. 9 August 1968.

1690. Vertical #20 net tow. Sta. E-4, 44°30'18" N; 86°55'18" W. Michigan. Coll: Edward Dunster. 9 August 1968.

1691. Vertical #20 net tow. Sta. E-5, 44°25'30" N; 87°10'18" W. Michigan. Coll: Edward Dunster. 9 August 1968.

1692. Vertical #20 net tow. Sta. E-6, 44°27'48" N; 87°26'25" W. Michigan. Coll: Edward Dunster. 9 August 1968.

1693. Vertical #20 net tow. Sta. A-l, 42°06'30" N; 86°32'00" W. Michigan. Coll: Edward Dunster. 12 September 1968.

1694. Vertical #20 net tow. Sta. A-2, 42°06'00" N; 86°37'00" W. Michigan. Coll: Edward Dunster. 12 September 1968.

1695. Vertical #20 net tow. Sta. A-3, 42°05'30" N; 86°43'00" W. Michigan. Coll: Edward Dunster. 12 Septernber 1968.

1696. Vertical #20 net tow. Sta. A-4, 42°03'30" N; 87°06'30" W. Michigan. Coll: Edward Dunster. 13 September 1968.

1697. Vertical #20 net tow. Sta. A-5, 41°57'00" N; 87°18'30" W. Michigan. Coll: Edward Dunster. 13 September 1968.

1698. Vertical #20 net tow. Sta. A-6, 41°52'00" N; 87°27'00" W. Michigan. Coll: Edward Dunster. 13 September 1968.

1699. Vertical #20 net tow. Sta. C-l, 42°49'40" N; 86°14'50" W. Michigan. Coll: Edward Dunster. 11 September 1968.

1700. Vertical #20 net tow. Sta. C-2, 42°49'40" N; 86°18'25" W. Michigan. Coll: Edward Dunster. 11 September 1968.

1701. Vertical #20 net tow. Sta. C-3, 42°49'10" N; 86°28'25" W. Michigan. Coll: Edward Dunster. 12 September 1968.

1702. Vertical #20 net tow. Sta. C-4, 42°48'50" N; 86°41'30" W. Michigan. Coll: Edward Dunster. 12 September 1968.

1703. Vertical #20 net tow. Sta. C-5, 42°49'00" N; 86°50'00" W. Michigan. Coll: Edward Dunster. 12 September 1968.

1704. Vertical #20 net tow. Sta. C-6, 42°47'40" N; 87°26'50" W. Michigan. Coll: Edward Dunster. 13 September 1968.

1705. Vertical #20 net tow. Sta. C-7, 42°47'30" N; 87°34'30" W. Michigan. Coll: Edward Dunster. 13 September 1968.

1706. Vertical #20 net tow. Sta. E-l, 44°37'30" N; 86°18'12" W. Michigan. Coll: Edward Dunster. 14 September 1968.

1707. Vertical #20 net tow. Sta. E-2, 44°37'00" N; 86°21'42" W. Michigan. Coll: Edward Dunster. 14 September 1968.

1708. Vertical #20 net tow. Sta. E-3, 44°34'00" N; 86°40'00" W. Michigan. Coll: Edward Dunster. 14 September 1968.

1709. Vertical #20 net tow. Sta. E-4, 44°30'18" N; 86°55'18" W. Michigan. Coll: Edward Dunster. 14 September 1968.

1710. Vertical #20 net tow. Sta. E-5, 44°25'30" N; 87°10'18" W. Michigan. Coll: Edward Dunster. 14 September 1968.

1711. Vertical #20 net tow. Sta. E-6, 44°27'48" N; 87°26'25" W. Lake Michigan. Coll: Edward Dunster. 14 September 1968.

1712. Vertical #20 net tow. Sta. A-l, 42°06'30" N; 86°32'00" W. Michigan. Coll: E. F. Stoermer. 7 October 1968.

1713. Vertical #20 net tow. Sta. A-2, 42°06'00" N; 86°37'00" W. Michigan. Coll: E. F. Stoermer. 7 October 1968.

1714. Vertical #20 net tow. Sta. A-3, 42°05'30" N; 86°43'00" W. Michigan. Coll: E. F. Stoermer. 7 October 1968.

1715. Vertical #20 net tow. Sta. A-4, 42°03'30" N; 87°06'30" W. Michigan. Coll: E. F. Stoermer. 8 October 1968.

1716. Vertical #20 net tow. Sta. A-5, 41°57'00" N; 87°18'30" W. Michigan. Coll: E. F. Stoermer. 8 October 1968.

1717. Vertical #20 net tow. Sta. A-6, 41°52'00" N; 87°27'00" W. Michigan. Coll: E. F. Stoermer. 8 October 1968.

1718. Vertical #20 net tow. Sta. C-l, 42°49'40" N; 86°14'50" W. Michigan. Coll: E. F. Stoermer. 7 October 1968.

1719. Vertical #20 net tow. Sta. C-2, 42°49'40" N; 86°18'25" W. Michigan. Coll: E. F. Stoermer. 7 October 1968.

1720. Vertical #20 net tow. Sta. C-3, 42°49'10" N; 86°28'25" W. Michigan. Coll: E. F. Stoermer. 7 October 1968.

1721. Vertical #20 net tow. Sta. C-4, 42°48'50" N; 86°41'30" W. Michigan. Coll: E. F. Stoermer. 7 October 1968.

1722. Vertical #20 net tow. Sta. C-5, 42°49'00" N; 86°50'00" W. Michigan. Coll: E. F. Stoermer. 7 October 1968.

1723. Vertical #20 net tow. Sta. C-6, 42°47'40" N; 87°26'50" W. Michigan. Coll: E. F. Stoermer. 8 October 1968.

1724. Vertical #20 net tow. Sta. C-7, 42°47'30" N; 87°34'30" W. Michigan. Coll: E. F. Stoermer. 8 October 1968.

1725. Vertical #20 net tow. Sta. E-l, 44°37'30" N; 86°18'12° W. Michigan. Coll: E. F. Stoermer. 11 October 1968.

1726. Vertical #20 net tow. Sta. E-2, 44°37'00" N; 86°21'42" W. Michigan. Coll: E. F. Stoermer. 11 October 1968.

1727. Vertical #20 net tow. Sta. E-3, 44°34'00" N; 86°40'00" W. Michigan. Coll: E. F. Stoermer. 11 October 1968.

1728. Vertical #20 net tow. Sta. E-4, 44°30'18" N; 86°55'18" W. Michigan. Coll: E. F. Stoermer. 11 October 1968.

1729. Vertical #20 net tow. Sta. E-5, 44°25'30" N; 87°10'18" W. Michigan. Coll: E. F. Stoermer. 11 October 1968.

1730. Vertical #20 net tow. Sta. E-6, 44°27'48" N; 87°26'25" W. Michigan. Coll: E. F. Stoermer. 10 October 1968.

1731. Vertical #20 net tow. Sta. A-3, 42°05'30" N; 86°43'00" W. Michigan. Coll: E. Dunster. 8 November 1968.

1732. Vertical #20 net tow. Sta. A-4, 42°03'30" N; 87°06'30" W. Michigan. Coll: E. Dunster. 13 November 1968.

1733. Vertical #20 net tow. Sta. A-6, 41°52'00" N; 87°27'00" W. Michigan. Coll: E. Dunster. 13 November 1968.

1734. Vertical #20 net tow. Sta. C-l, 42°49'40" N; 86°14'50" W. Michigan. Coll: E. Dunster. 10 November 1968.

1735. Vertical #20 net tow. Sta. C-2, 42°49'40" Nt 86°18'25" W. Michigan. Coll: E. Dunster. 10 November 1968.

1736. Vertical #20 net tow. Sta. C-3, 42°49'10" N; 86°28'25" W. Michigan. Coll: E. Dunster. 10 November 1968.

1737. Vertical #20 net tow. Sta. C-4, 42°48'50" N; 86°41'30" W. Michigan. Coll: E. Dunster. 10 November 1968.

1738. Vertical #20 net tow. Sta. C-5, 42°49'00" N; 86°50'00" W. Michigan. Coll: E. Dunster. 10 November 1968.

1739. Vertical #20 net tow. Sta. C-6, 42°47'40" N; 87°26'50" W. Michigan. Coll: E. Dunster. 10 November 1968.

1740. Vertical #20 net tow. Sta. C-7, 42°47'30" N; 87°34'30" W. Michigan. Coll: E. Dunster. 10 November 1968.

1741. Vertical #20 net tow. Sta. E-l, 44°37'30" N; 86°18'12" W. Michigan. Coll: E. Dunster. 9 November 1968.

1742. Vertical #20 net tow. Sta. E-2, 44°37'00" N; 86°21'42" W. Michigan. Coll: E. Dunster. 9 November 1968.

1743. Vertical #20 net tow. Sta. E-3, 44°34'00" N; 86°40'00" W. Michigan. Coll: E. Dunster. 9 November 1968.

1744. Vertical #20 net tow. Sta. E-4, 44°30'18" N; 86°55'18" W. Michigan. Coll: E. Dunster. 9 November 1968.

1745. No sample.

1746. Vertical #20 net tow. Sta. E-6, 44°27'48" N; 87°26'25" W. Michigan. Coll: E. Dunster. 9 November 1968.

1747. Vertical #20 net tow. Sta.SU 68-1, 46°41.0' N; 84°47.1' W. Superior. Coll: E. F. Stoermer. 13 August 1968.

1748. Vertical #20 net tow. Sta.SU 68-2, 46°53.1' N; 84°44.4' W. Superior. Coll: E. F. Stoermer. 13 August 1968.

1749. Vertical #20 net tow. Sta.SU 68-3, 46°54.5' N; 84°35.2' W. Superior. Coll: E. F. Stoermer. 13 August 1968.

1750. Vertical #20 net tow. Sta.SU 68-4, 46°50.0' N; 84°26.3' W. Superior. Coll: E. F. Stoermer. no sample.

1751. Vertical #20 net tow. Sta.SU 68-5, 47°10.3' N; 85°07.0 W. Superior. Coll: E. F. Stoermer. 15 August 1968.

1752. Vertical #20 net tow. Sta.SU 68-6, 47°25.6' N; 87°13.5' W. Superior. Coll: E. F. Stoermer. 15 August 1968.

1753. Vertical #20 net tow. Sta.SU 68-7, 47°40.0' N; 85°24.2' W. Superior. Coll: E. F. Stoermer. 15 August 1968.

1754. Vertical #20 net tow. Sta. SU 68-8, 47°57.4' N; 84°54.1' W. Lake Superior. Coll: E. F. Stoermer. 15 August 1968.

1755. Vertical #20 net tow. Sta. SU 68-9, 47°42.8' N; 85°46.8' W. Quebec Harbor, Michipicton Island. Lake Superior. Coll: E. F. Stoermer. 16 August 1968.

1756. Vertical #20 net tow. Sta. SU 68-10, 47°52.4' N; 86°32.0' W. Lake Superior. Coll: E. F. Stoermer. 18 August 1968.

1757. Vertical #20 net tow. Sta. SU 68-11, 48°06.5' N; 88°00.0' W. Lake Superior. Coll: E. F. Stoermer. 18 August 1968.

1758. Vertical #20 net tow. Sta. SU 68-12, 48°07.2' N; 88°31.5' W. Lake Superior. Coll: E. F. Stoermer. 19 August 1968.

1759. Vertical #20 net tow. Sta. SU 68-13, 48°09.8' N; 88°30.9' W. Five Fingers, Isle Royale. Lake Superior. Coll: E. F. Stoermer. 19 August 1968.

1760. Vertical #20 net tow. Sta. SU 68-14, 47°53.1' N; 89°14.4' W. Lake Superior. Coll: E. F. Stoermer. 19 August 1968.

1761. Vertical #20 net tow. Sta. SU 68-15, 47°44.0' N; 88°59.0' W. Lake Superior. Coll: E. F. Stoermer. 20 August 1968.

1762. Vertical #20 net tow. Sta. SU 68-16, 47°04.2' N; 88°29.4' W. Portage Lake, Hancock-Houghton, Michigan. Lake Superior. Coll: E. F. Stoermer. 21 August 1968.

1763. Vertical #20 net tow. Sta. SU 68-17, 46°57.4' N; 88°16.7' W. Lake Superior. Coll: E. F. Stoermer. 21 August 1968.

1764. Vertical #20 net tow. Sta. SU 68-18, 46°46.4' N; 87°19.5' W. Lake Superior. Coll: E. F. Stoermer. 21 August 1968.

1765. Vertical #20 net tow. Sta. SU 68-19, 46°34.5' N; 86°50.0' W. Lake Superior. Coll: E. F. Stoermer. 21 August 1968.

1766. Vertical #20 net tow. Sta. SU 68-20, 46°25.0' N; 86°39.0' W. Munising, Michigan Harbor. Lake Superior. Coll: E. F. Stoermer. 22 August 1968.

1767. Vertical #20 net tow. Sta. SU 68-21, 46°53.5' N; 86°34.5' W. Lake Superior. Coll: E. F. Stoermer. 22 August 1968.

1768. Vertical #20 net tow. Sta. SU 68-22, 47°00.8' N; 86°23.8' W. Lake Superior. Coll: E. F. Stoermer. 22 August 1968.

1769. Vertical #20 net tow. Sta. HU 68-1, 45°37.6' N; 81°52.6' W. South Bay. Lake Huron. Coll: E. F. Stoermer. 24 August 1968.

1770. Vertical #20 net tow. Sta. HU 68-2, 45°17.0' N; 81°29.2' W. Manitoulin Island, Ontario. Lake Huron. Coll: E. F. Stoermer. 26 August 1968.

1771. Vertical #20 net tow. Sta. HU 68-3, 45°15.6' N; 81°40.2' W. Tobermory Harbor, Ontario. Lake Huron. Coll: E. F. Stoermer. 27 August 1968.

1772. Vertical #20 net tow. Sta. HU 68-4, 45°00.7' N; 82°01.0' W. Lake Huron. Coll: E. F. Stoermer. 27 August

1968.

1773. Vertical #20 net tow. Sta. HU 68-5, 45°23.2' N; 82°37.5' W. Lake Huron. Coll: E. F. Stoermer. 27 August 1968.

1774. Vertical #20 net tow. Sta. HU 68-6, 45°27.7' N; 83°06.0' W. Lake Huron. Coll: E. F. Stoermer. 27 August 1968.

1775. Vertical #20 net tow. Sta. ML 68-1, 43°13.4' N; 86°17.7' W. Muskegon Lake. Coll: E. F. Stoermer. 29 August 1968.

1776. Material from rocks in Rock dredge sample from 8.5 m depth, Station S-3-12, Mille Coquin's Reef, 45°58.6' N; 86°27.2' W. Lake Michigan. Coll: T. Callender. 24 July 1968.

1777. Material from rocks in Rock dredge sample from 8.5 m depth, Station S-3-13, Fagan Reef, 45°57.3' N, 85°18.2' W. Lake Michigan. Coll: T. Callender. 24 July 1968.

1778. Material from rocks in Rock dredge sample from 7.6 m depth, Station S-3-14, Simmons Reef, 45°54.8' N; 85°11.3' W, Lake Michigan. Coll: T. Callender. 24 July 1968.

1779. Material from rocks in Rock dredge sample from 21.0° m depth, Station S-3-15, Hog Island Reef, 45°42.9' N; 85°19.5' W. Lake Michigan. Coll: T. Callender. 24 July 1968.

1780. Diatoms growing on rocks 6 inches below waterline. Quebec Harbor, Michipicoten, Ontario, Canada. Coll: E. F. Stoermer. 16 August 1968.

1781. Pool in igneous rock on shoreliner Quebec Harbor, Michipicoten Island, Ontario, Canada. Coll: E. F. Stoermer. 16 August 1968.

1782. Material growing in Potomogeton sp. at 1.5 m depth, Quebec Harbor, Michipicoten Island, Ontario, Canada. Coll: E. F. Stoermer. 16 August 1968.

1783. Material growing on rocks at 1 meter depth, Southeast shore of Quebec Harbor, Michipicoten Island, Ontario, Canada. Coll: E. F. Stoermer. 16 August 1968.

1784. Material in shore pool, Quebec Harbor, Michipicoten Island, Ontario, Canada. Coll: E. F. Stoermer. 16 August 1968.

1785. Composite sample, Michipicoten River, near mouth into Quebec Harbor, Michipicoten Island, Ontario, Canada. Coll: E. F. Stoermer. 16 August 1968.

1786. Ulothrix sp. and diatoms growing on rocks at waterline. Quebec Harbor, Michipicoten Island, Ontario, Canada. Coll: E. F. Stoermer. 16 August 1968.

1787. Periphyton (Ing. Tetraspora from planks and beaver house built in wreck of old steam tug run ashore, southeast end of Quebec Harbor, Michipicoten Island, Ontario, Canada. Coll: E. F. Stoermer. 16 August 1968.

1788. Material on sandy bottom in 18 inches water depth, north side of Quebec Harbor, Michipicoten Island, Ontario, Canada. Coll: E. F. Stoermer. 16 August 1968.

1789. .eriphyton on emergent Scirpus sp. in 8 inches of water, north side of Quebec Harbor, Michipicoten Island, Ontario, Canada. Coll: E. F. Stoermer. 16 August 1968.

1790. Material from bottom sand in 18 inches water, sand flat at east end of Quebec Harbor, Michipicoten Island, Ontario, Canada. Coll: E. F. Stoermer. 16 August 1968.

1791. Periphyton on submergent Ceratophyllum sp. Michipicoten River, near mouth into Quebec Harbor, Michipicoten Island, Ontario, Canada. Coll: E. F. Stoermer. 16 August 1968.

1792. Material on rocks near waterline, Quebec Harbor, Michipicoten Island, Ontario, Canada. Coll: E. F. Stoermer. 16 August 1968.

1793. Periphyton scraped from hull timbers of wrecked ships, east end of Quebec Harbor, Michipicoten Island, Ontario, Canada. Coll: E. F. Stoermer. 16 August 1968.

1794. Chara sp. growing on bottom at 35 ft. depth, north end of Quebec Harbor, Michipicoten Island, Ontario, Canada. Coll: E. F. Stoermer. 16 August 1968.

1795. Periphyton growing on dock piling at 1 meter depth, Government Pier, Batchawana Bay, Ontario, Canada. Coll: E. F. Stoermer. 14 August 1968.

1796. Material growing on sandy bottom at 14 ft. depth, near Government Pier, Batchawana Bay, Ontario, Canada. Coll: E. F. Stoermer. 14 August 1968.

1797. Chara sp. growing on mud bottom at 36 ft. depth, middle of McKim Bay of South Bay, Manitoulin Island, Ontario, Canada. Coll: E. F. Stoermer. 24 August 1968. 45°34.9N; 82°00.3W.

1798. Periphyton growing on dock camel, Big Tub, Tobermory, Ontario, Canada. Coll: E. F. Stoermer. 26 August 1968. 45°13.0N; 82°20.0W.

1799. Periphyton growing on dock camel, Big Tub, Tobermory, Ontario, Canada. Coll: E. F. Stoermer. 26 August 1968.

1800. Vertical #20 net tow. Sta. E-l, 44°37'30" N; 86°18'12" W. Lake Michigan. Coll: E. Dunster. 9 August 1968.

1801. Vertical #20 net tow. Sta. E-2, 44°37'00" N; 86°21'42" W. Michigan. Coll: E. Dunster. 9 August 1968.

1802. Vertical #20 net tow. Sta. A-l, 42°06'30" N; 86°32'00" W. Michigan. Coll: J. Ayers. 24 April 1969.

1803. Vertical #20 net tow. Sta. A-2, 42°06'00" N; 86°37'00" W. Michigan. Coll: J. Ayers. 25 April 1969.

1804. Vertical #20 net tow. Sta. A-3, 42°05'30" N, 86°43'00" W. Michigan. Coll: J. Ayers. 25 April 1969.

1805. Vertical #20 net tow. Sta. A-4, 42°03'30" N; 87°06'30" W. Michigan. Coll: J. Ayers. 25 April 1969.

1806. Vertical #20 net tow. Sta. A-5, 41°57'00" N; 87°18'30" W. Michigan. Coll: J. Ayers. 25 April 1963.

1807. Vertical #20 net tow. Sta. A-6, 41°52'00" N; 87°27'00" W. Michigan. Coll: J, Ayers. 25 April 1969.

1808. Vertical #20 net tow. Sta. C-l, 42°49'40" N; 86°14'50" W. Michigan. Coll: J. Ayers. 23 April 1969.

1809. Vertical #20 net tow. Sta. C-2, 42°49'40" N; 86°18'25" W. Michigan. Coll: J. Ayers. 23 April 1969.

1810. Vertical #20 net tow. Sta. C-3, 42°49'10" N; 86°28'25" W. Michigan. Coll: J. Ayers. 23 April 1969.

1811. Vertical #20 net tow. Sta. C-6, 42°47'40" N; 87°26'50" W. Michigan. Coll: J, Ayers. 26 April 1969.

1812. Vertical #20 net tow. Sta. C-7, 42°47'30" N; 87°34'30" W. Michigan. Coll: J. Ayers. 26 April 1969.

1813. Vertical #20 net tow. Sta. E-l, 44°37'30" N; 86°18'12" W. Michigan. Coll: J. Ayers. 27 April 1969.

1814. Vertical #20 net tow. Sta. E-2, 44°37'00" N; 86°21'42" W. Michigan. Coll: J. Ayers. 27 April 1969.

1815. Vertical #20 net tow. Sta. E-3, 44°34'00" N; 86°40'00" W. Michigan. Coll: J. Ayers. 27 April 1969.

1816. Vertical #20 net tow. Sta. E-4, 44°30'18" N; 86°55'18" W. Michigan. Coll: J. Ayers. 27 April 1969.

1817. Vertical #20 net tow. Sta. E-5, 44°25'30" N; 87°10'18" W. Lake Michigan. Coll: J. Ayers. 27 April 1969.

1818. Vertical #20 net tow. Sta. E-6, 44°27'48" N; 87°26'25" W. Michigan. Coll: J. Ayers. 27 April 1969.

1819. Material growing on glacial boulders at 60 ft. depth, near Cecil Bay, 45°46.0'N; 84°49.1'W, Lake Michigan. Coll: E. F. Stoermer, 4 Aug. 1969.

**Checked coordinate in ship log; close trip; didn't get to Hammond Bay, NLH.... RGK

1820. Material growing on glacial boulders at 60 ft. depth, near Cecil Bay, 45°46.0'N; 84°49.1'W, Lake Michigan. Coll: E. F. Stoermer, 4 Aug. 1969.

1821. Material growing on limestone bedrock at about 40 ft. depth, shoal NE of Mackinac Island, 45°53.0'N; 84°35.4'W, Lake Huron. Coll: E. F. Stoermer, 4 Aug. 1969.

1822. Material growing on cobbles at 2 meter depth in Lake Michigan, north side of Waugochance Point, N.W. 1/4 Sect. 23, R6W, Twp. 39N, Emmet County, Michigan. Coll: E. F. Stoermer, 13 August 1969.

1823. Diatom scum on surface of beach pool, north side of Waugochance Point, N.E. 1/4 Sec. 23, R6N, Twp. 39N, Emmet County, Michigan. Call: E. F. Stoermer, 13 Aug. 1969.

1824. Material growing on aquatic plants in beach pool, north side of Waugochance Point, N.E. 1/4 Sec. 23, R6W, Twp. 39 N, Emmet County, Michigan. Coll: E. F. Stoermer, 13 August 1969.

1825. Material growing on rocks in fast flowing water, Sturgeon River near Highway M-35 Bridge, S.E. 1/4 Sec. 28, R34W, Twp. 51N, Baraga County, Michigan. Coll: E. F. Stoermer, 25 September 1969.

1826. Material on rocks in flowing water, falls in Silver River near Highway 26, N.W. 1/2 Sec. 35, R30W; Twp. 59N, Keweenaw County, Michigan. Coll: E. F. Stoermer, 26 Sept. 1969.

1827. Material on rocks in flowing water, falls in Silver River near Highway 26, N.W. 1/2 Sec. 35, R30W; Twp. 59N, Keweenaw County, Michigan. Coll: E. F. Stoermer, 26 Sept. 1969.

1828. Material from sediments 20 cm below modern surface. Core GLRD SU-69-44, 360 ft depth, 46°35.8'N; 84°46.2'W, Whitefish Bay, Superior. Coll: Carol Dell, 9 July 1969.

1829. Material from sediments 20 cm below modern surface retained on 270 mesh (53°) screen. Core GLRD SU-69-44, 360 ft depth, 46°35.8'N; 84°46.2'W, Whitefish Bay, Lake Superior. Coll: Carol Dell, 9 July 1969.

1830. Material from sediments 124 cm below modern surface. Core GLRD SU-69-44, 360 ft depth, 46°35.8'N; 84°46.2'W, Whitefish Bay, Lake Superior. Coll: Carol Dell, 9 July 1969.

1831. Material from sediments 124 cm below modern surface retained on 270 mesh (53°) screen. Core GLRD SU-69-44, 360 ft depth, 46°35.8'N; 84°46.2'W, Whitefish Bay, Lake Superior. Coll: Carol Dell, 9 July 1969.

1832. Material from sediments 230 cm below modern surface. Core GLRD SU-69-44, 360 ft depth, 46°35.8'N; 84°46.2'W, Whitefish Bay, Lake Superior. Coll: Carol Dell, 9 July 1969.

1833. Material from sediments 230 cm below modern surface retained on 270 mesh (53°) screen. Core GLRD SU-69-44, 360 ft depth, 46°35.81N; 84°46.2'W, Whitefish Bay, Lake Superior. Coll: Carol Dell, 9 July 1969.

1834. Material scraped from rock at 88 ft. depth. Sta. AEC-70-1. 45°23.3'N, 85°86.7'W. Coll: E. F. Stoermer. 19

May 1970. Cladophora and Bryozoa apparent.

1835. Material from rocks on inner end of Rennie Oil Dock. Traverse City, Michigan. Coll: E. F. Stoermer. 20 May 1970.

1836. Material from sand-gravel bottom. Sta. GS-70-1. 45°23.3'N, 85°86.7'W. Coll: E. F. Stoermer. 21 May 1970.

1837. Flocculent bottom. Material from hand at 50 ft. depth. Sta. GS-70-1. 45°23.3'N, 85°86.7'W. Coll: E. F. Stoermer. 21 May 1970.

1838. Material scraped from cobbles at 50 ft. depth. Sta. GS-70-1. 45°23.3'N, 85°86.7'W. Coll: E. F. Stoermer. 21 May 1970.

1839. Material scraped from rocks at °30 ft. depth. Sta. AEC-70-14. 45°26.3'N, 85°21.6'W. Coll: J. Krezoski. 22 May 1970. Gomphonema.

1840. Flocculent bottom. Material from °30 ft. depth. Sta. AEC-70-14. 45°26.3'N, 85°21.6'W. Coll: J. Krezoski. 22 May 1970.

1841. Algae crust scraped from rocks at °30 ft. depth. Sta. AEC-70-14. 45°26.3'N, 85°21.6'W. Coll: J. Krezoski. 22 May 1970.

1842. Material scraped from rocks at °30 ft. depth. Sta. AEC-70-14. 45°26.3'N, 85°21.6'W. Coll: J. Krezoski. 22 May 1970. Gomphonema.

1843. Material scraped from rocks at °30 ft. depth by dredge. Sta. AEC-70-14. 45°26.3'N, 85°21.6'W. Coll: E. F. Stoermer. 22 May 1970.

1844. Material scraped from piling at end of city dock, Harbor Spring, Michigan. Coll: G. Tompkins. 23 May 1970.

1845. Rex Lowe 11-5-67 RLL. Material ex Rex Lowe - no duplicate or extra material. Coll: R. Lowe. 5 Nov. 1967.

1846. Waldo Lake Oregon, plankton haul ex Charles F. Powers. NERP 45015A. Coll: C. Powers. 4 Nov. 1969.

1847. Waldo Lake, Oregon, plankton haul ex Charles F. Powers. NERP 32001A. Coll: C. Powers. 5 Aug. 1969.

1848. Cultured material of Stephonodiscus tenuis Hust. from Lake Ontario ex Ruth Holland Beeton ex Czesia Nalewajko Sparling.

1849. Cultured material of Stephanodiscus astraea from English Lake District ex Ruth Holland Beeton ex J.W.G. Lund.

1850. Diatoms growing on volcanic rocks along the shore of Santiago Bay below the Indian village of Santiago Atitlan. Feb. 10, 1970, Lake Atitlan, ex E. J. Fee.

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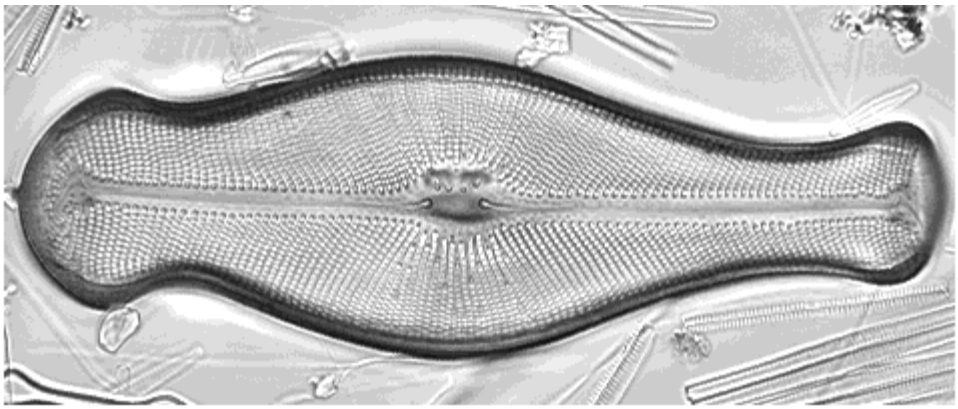

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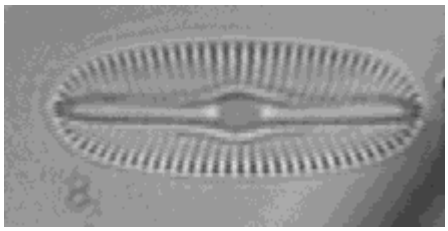

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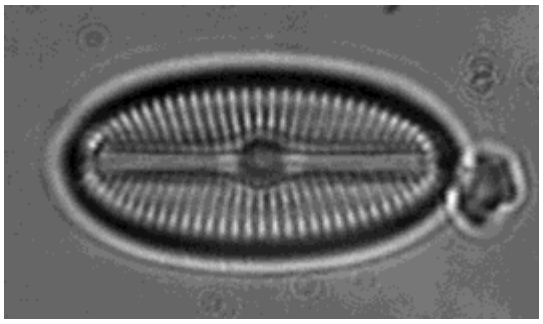

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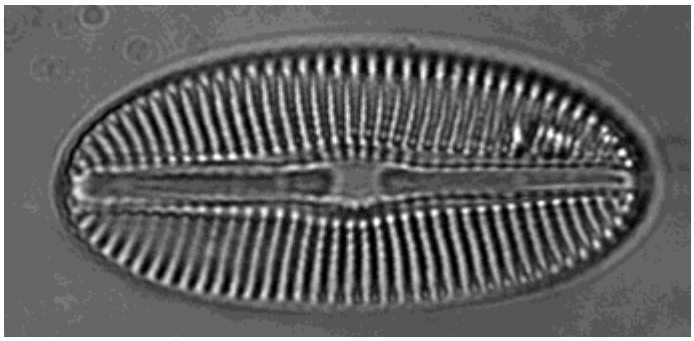

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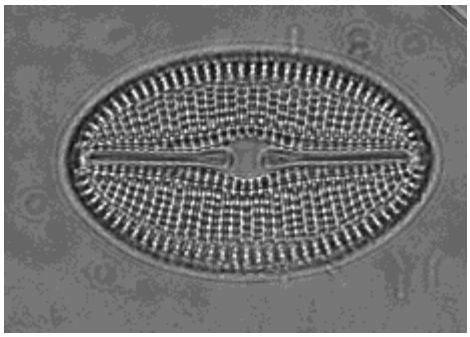

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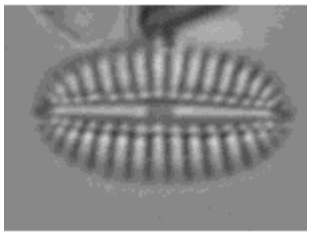

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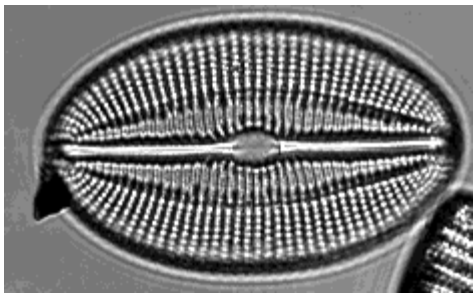

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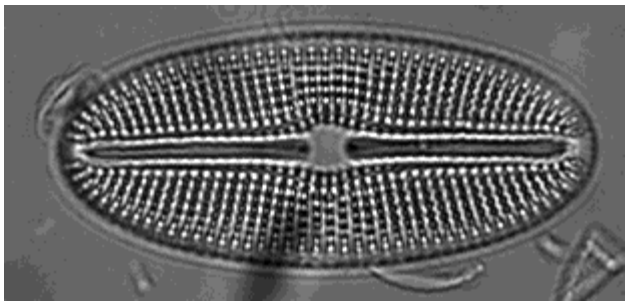

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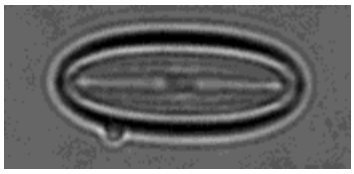

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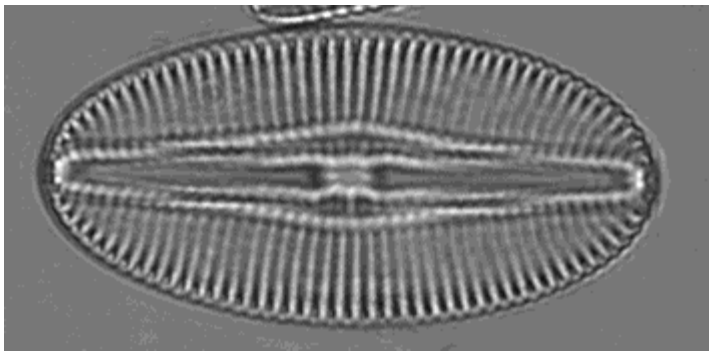

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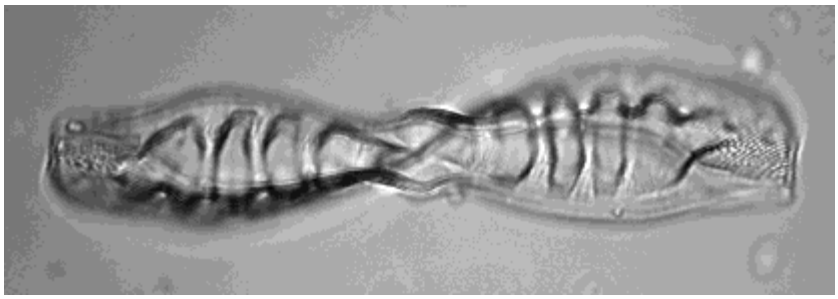

COLLECTIONS: EUGENE F. STOERMER (#5)

951. Plankton, 5 meters, Station B-4. 42°23'30"N; 87°01'30"W. Coll: C. F. Powers, 25 April 1966, (500 ml).

952. Plankton, 15 meters, Station B-4. 42°23'30"N; 87°01'30"W. Coll: C. F. Powers, 25 April 1966, (500 ml).

953. Plankton, Surface, Station B-6. 42°22'30"N; 87°30'00"W. Coll: C. F. Powers, 25 April 1966, (500 ml).

954. Plankton, 5 meters, Station B-6. 42°22'30"N; 87°30'00"W. Coll: C. F. Powers, 25 April 1966, (500 ml).

955. Plankton, 15 meters, Station B-6. 42°22'30"N; 87°30'00"W. Coll: C. F. Powers, 25 April 1966, (500 ml).

956. Plankton, Surface, Station C-3. 42°49'10"N; 86°28'25"W. Coll: E. F. Stoermer, 28 April 1966, (500 ml).

957. Plankton, 5 meters, Station C-3. 42°49'10"N; 86°28'25"W. Coll: E. F. Stoermer, 28 April 1966, (500 ml).

958. Plankton, 15 meters, Station C-3. 42°49'10"N; 86°28'25"W. Coll: E. F. Stoermer, 28 April 1966, (500 ml).

959. Plankton, Surface, Station C-5. 42°49'00"N; 86°50'00"W. Coll: E. F. Stoermer, 28 April 1966, (500 ml).

960. Plankton, 5 meters, Station C-5. 42°49'00"N; 86°50'00"W. Coll: E. F. Stoermer, 28 April 1966, (500 ml).

961. Plankton, 15 meters, Station C-5. 42°49'00"N; 86°50'00"W. Coll: E. F. Stoermer, 28 April 1966, (500 ml).

962. Plankton, Surface, Station C-7. 42°47'30"N; 87°34'30"W. Coll: E. F. Stoermer, 28 April 1966, (500 ml).

963. Plankton, 5 meters, Stat on C-7. 42°47'30"N; 87°34'30"W. Coll: E. F. Stoermer, 28 April 1966, (500 ml).

964. Plankton, 15 meters, Station C-7. 42°47'30"N; 87°34'30"W. Coll: E. F. Stoermer, 28 April 1966, (500 ml).

965. Plankton, Surface, Station D-2. 43°56'00"N; 86°39'30"W. Coll: E. F. Stoermer, 28 April 1966, (500 ml).

966. Plankton, 5 meters, Station D-2. 43°56'00"N; 86°39'30"W. Coll: E. F. Stoermer, 28

967. Plankton, 15 meters, Station D-2, 43°56'00"N; 86°39'30"W. Coll: E. F. Stoermer, 28 April 1966, (500 ml).

968. Plankton, Surface, Station D-4. 43°48'00"N; 87°03'00"W. Coll: E. F. Stoermer, 28 April 1966, (500 ml).

969. Plankton, 5 meters, Station D-4. 43°48'00"N; 87°03'00"W. Coll: E. F. Stoermer, 28 April 1966, (500 ml).

970. Plankton, 15 meters, Station D-4. 43°48'00"N; 87°03'00"W. Coll: E. F. Stoermer, 28 April 1966, (500 ml).

971. Plankton, Surface, Station D-5. 43°38'40"N; 87°31'00"W. Coll: E. F. Stoermer, 28 April 1966, (500 ml).

972. Plankton, 5 meters, Station D-5. 43°38'40"N; 87°31'00"W. Coll: E. F. Stoermer, 28 April 1966, (500 ml).

973. Plankton, 15 meters, Station D-5. 43°38'40"N; 87°31'00"W. Coll: E. F. Stoermer, 28 April 1966, (500 ml).

974. Plankton, Surface, Station E-2. 44°37'00"N; 86°21'42"W. Coll: E. F. Stoermer, 26 April 1966, (500 ml).

975. Plankton, 5 meters, Station E-2. 44°37'00"N; 86°21'42"W. Coll: E. F. Stoermer, 26 April 1966, (500 ml).

976. Plankton, 15 meters, Station E-2. 44°37'00"N; 86°21'42"W. Coll: E. F. Stoermer, 26 April 1966, (500 ml).

977. Plankton, Surface, Station E-3. 44°34'00"N; 86°40'00"W. Coll: E. F. Stoermer, 26 April 1966, (500 ml).

978. Plankton, 5 meters, Station E-3. 44°34'00"N, 86°40'00"W. Coll: E. F. Stoermer, 26 April 1966, (500 ml).

979. Plankton, 15 meters, Station E-3. 44°34'00"N; 86°40'00"W. Coll: E. F. Stoermer, 26 April 1966, (500 ml).

980. Plankton, Surface, Station E-5. 44°25'30"N; 87°10'18"W. Coll: E. F. Stoermer, 26 April 1966, (500 ml).

981. Plankton, 5 meters, Station E-5. 44°25'30"N; 87°10'18"W. Coll: E. F. Stoermer, 26 April 1966, (500 ml).

982. Plankton, 15 meters, Station E-5. 44°25'30"N; 87°10'18"W. Coll: E. F. Stoermer, 26 April 1966, (500 ml).

983. Plankton, Surface, Station A-3. 42°05'30"N; 86°43'00"W. Coll: E. F. Stoermer, 15 May 1966, (500 ml).

984. Plankton, 5 meters, Station A-3. 42°05'30"N; 86°43'00"W. Coll: E. F. Stoermer, 15 May 1966, (500 ml).

985. Plankton, 15 meters, Station A-3. 42°05'30"N; 86°43'00"W. Coll: E. F. Stoermer, 15 May 1966, (500 ml).

986. Plankton, Surface, Station A-4. 42°03'30"N; 87°06'30"W. Coll: E. F. Stoermer, 15 May 1966, (500 ml).

987. Plankton, 5 meters, Station A-4. 42°03'30"N; 87°06'30"W. Coll: E. F. Stoermer, 15 May 1966, (500 ml).

988. Plankton, 15 meters, Station A-4. 42°03'30"N; 87°06'30"W. Coll: E. F. Stoermer, 15 May 1966, (500 ml).

989. Plankton, Surface, Station A-6. 41°52'00"N; 87°27'00"W. Coll: E. F. Stoermer, 15 May 1966, (500 ml).

990. Plankton, 5 meters, Station A-6. 41°52'00"N; 87°27'00"W. Coll: E. F. Stoermer, 15 May 1966, (500 ml).

991. Plankton, 15 meters, Station A-6. 41°52'00"N; 87°27'00"W. Coll: E. F. Stoermer, 15 May 1966, (500 ml).

992. Plankton, Surface, Station B-3. 42°24'00"N; 86°35'20"W. Coll: C. F. Powers, 16 May 1966, (500 ml).

993. Plankton, 5 meters, Station B-3. 42°24'00"N; 86°35'20"W. Coll: C. F. Powers, 16 May 1966, (500 ml).

994. Plankton, 15 meters, Station B-3. 42°24'00"N; 86°35'20"W. Coll: C. F. Powers, 16 May 1966, (500 ml).

995. Plankton, Surface, Station B-4. 42°23'30"N; 87°01'30"W. Coll: C. F. Powers, 16 May 1966, (500 ml).

996. Plankton, 5 meters, Station B-4. 42°23'30"N; 87°01'30"W. Coll: C. F. Powers, 16 May 1966, (500 ml).

997. Plankton, 15 meters, Station B-4. 42°23'30"N; 87°01'30"W. Coll: C. F. Powers, 16 May 1966, (500 ml).

998. Plankton, Surface, Station B-6. 42°22'30"N; 87°30'00"W. Coll: C. F. Powers, 16 May 1966, (500 ml).

999. Plankton, 5 meters, Station B-6. 42°22'30"N; 87°30'00"W. Coll: C. F. Powers, 16 May 1966, (500 ml).

1000. Plankton, 15 meters, Station B-6. 42°22'30"N; 87°30'00"W. Coll: C. F. Powers, 16 May 1966, (500 ml).

1001. Plankton, Surface, Station C-3. 42°49'10"N; 86°28'25"W. Coll: E. F. Stoermer, 16 May 1966, (500 ml).

1002. Plankton, 5 meters, Station C-3. 42°49'10" N; 86°28'25"W. Coll: E. F. Stoermer, 16 May 1966, (500 ml).

1003. Plankton, 15 meters, Station C-3. 42°49'10"N; 86°28'25"W. Coll: E. F. Stoermer, 16 May 1966, (500 ml).

1004. Plankton, Surface, Station C-5. 42°49'00"N; 86°50'00"W. Coll: E. F. Stoermer, 16 May 1966, (500 ml).

1005. Plankton, 5 meters, Station C-5. 42°49'00"N; 86°50'00"W. Coll: E. F. Stoermer, 16 May 1966, (500 ml).

1006. Plankton, 15 meters, Station C-5. 42°49'00"N; 86°50'00"W. Coll: E. F. Stoermer, 16 May 1966, (500 ml).

1007. Plankton, Surface, Station C-7. 42 °47'30"N; 87°34'30"W. Coll: E. F. Stoermer, 16 May 1966, (500 ml).

1008. Plankton, 5 meters, Station C-7. 42°47'30"N; 87°34'30"W. Coll: E. F. Stoermer, 16 May 1966, (500 ml).

1009. Plankton, 15 meters, Station C-7. 42°47'30"N; 87°34'30"W. Coll: E. F. Stoermer, 16 May 1966, (500 ml).

1010. Plankton, Surface, Station D-2. 43°56'00"N; 86°39'30"W. Coll: E. F. Stoermer, 17 May 1966, (500 ml).

1011. Plankton, 5 meters, Station D-2. 43°56'00"N; 86°39'30"W. Coll: E. F. Stoermer, 17 May 1966, (500 ml).

1012. Plankton, 15 meters, Station D-2. 43°56'00"N; 86°39'30"W. Coll: E. F. Stoermer, 17 May 1966, (500 ml).

1013. Plankton, Surface, Station D-4. 43°48'00"N; 87°03'00"W. Coll: E. F. Stoermer, 17 May 1966, (500 ml).

1014. Plankton, 5 meters, Station D-4. 43°48'00"N; 87°03'00"W. Coll: E. F. Stoermer, 17 May 1966, (500 ml).

1015. Plankton, 15 meters, Station D-4. 43°48'00"N; 87°03'00"W. Coll: E. F. Stoermer, 17 May 1966, (500 ml).

1016. Plankton, Surface, Station D-5. 43°38'40"N; 87°31'00"W. Coll: E. F. Stoermer, 17 May 1966, (500 ml).

1017. Plankton, 5 meters, Station D-5. 43°38'40"N; 87°31'00"W. Coll: E. F. Stoermer, 17 May 1966, (500 ml).

1018. Plankton, 15 meters, Station D-5. 43°38'40"N; 87°31'00"W. Coll: E. F. Stoermer, 17 May 1966, (500 ml).

1019. Plankton, Surface, Station E-2. 44°37'00"N; 86°21'42"W. Coll: E. F. Stoermer, 20 May 1966, (500 ml).

1020. Plankton, 5 meters, Station E-2. 44°37'00"N: 86°21'42"W. Coll: E. F. Stoermer, 20 May 1966, (500 ml).

1021. Plankton, 15 meters, Station E-2. 44°37'00"N; 86°21'42"W. Coll: E. F. Stoermer, 20 May 1966, (500 ml).

1022. Plankton, Surface, Station E-3. 44°34'00"N; 86°40'00"W. Coll: E. F. Stoermer, 20 May 1966, (500 ml).

1023. Plankton, 5 meters, Station E-3. 44°34'00"N; 86°40'00"W. Coll: E. F. Stoermer, 20 May 1966, (500 ml).

1024. Plankton, 15 meters, Station E-3. 44°34'00"N; 86°40'00"W. Coll: E. F. Stoermer, 20 May 1966, (500 ml).

1025. Plankton, Surface, Station E-5. 44°25'30"N; 87°10'18"W. Coll: E. F. Stoermer, 20 May 1966, (500 ml).

1026. Plankton, 5 meters, Station E-5. 44°25'30"N; 87°10'18"W. Coll: E. F. Stoermer, 20 May 1966, (500 ml).

1027. Plankton, 15 meters, Station E-5. 44°25'30"N; 87°10'18"W. Coll: E. F. Stoermer, 20 May 1966, (500 ml).

1028. Material scraped from rock brought up in dredge from 114 ft. Station E-6, Lake Michigan, 44°27'48"N; 87°26'25"W. No apparent flora - some Bryozoa. Coll: E. F. Stoermer, 30 April 1966.

1029. Mysis collected in vertical zooplankton haul from Station E-3, Lake Michigan, 44°34'00"N; 86°40'00". No apparent flora. Coll: E. F. Stoermer, 30 April 1966.

1030. Bottom material from 37 meters, Station E-6, Lake Michigan, 44°27'48"N;87°26'25"W. Small Nitzschia and some Pinnularia. Coll: E. F. Stoermer, 30 June 1966.

1031. Bottom material from small pool on mud flat, Van's Harbor, Garden Bay, near town of Garden, Delta County, Michigan. Sec. 7, R18W, Twp 39N. (Rhopalodia sp. major dominant. Coll: E. F. Stoermer, 20 June 1966.

1032. Algae from Garden Creek, near outlet in town of Garden, Delta County, Michigan. Sec. 17, R18W, Twp 39N. (Cladophora sp., Spirogyra sp., Cocconeis sp.) Coll: E. F. Stoermer, 20 June 1966.

1033. Plankton (#25 net), Garden Creek, near outlet in town of Garden, Delta County, Michigan. Sec. 17, R18W, Twp 39N. Synedra sp. and Closterium sp. dominant. Coll: E. F. Stoermer, 20 June 1966.

1034. Scrapings from Typha culms, fishing access site near town of Garden, Delta County, Michigan. Sec. 18, R18W, Twp 39N. Very diverse algal population. Coll: E. F. Stoermer, 20 June 1966.

1035. Plankton near shore (#25 net), fishing access site near town of Garden, Delta County, Michigan. Sec. 18, R18W, T39N. Very diverse algal flora. Coll: E. F. Stoermer, 20 June 1966.

1036. Green algae from trough of public well, near entrance to, Fayette State Park, Delta County, Michigan. Sec. 4, R19W, T38N. Mostly Hormidium sp. Coll: E. F. Stoermer, 20 June 1966.

1037. Rock scrapings, rocks along shore, Campground Beach, Fayette State Park, Delta County, Michigan. Sec. 4, R19W, T38N. Mostly Ulothrix sp. Coll: E. F. Stoermer, 20 June 1966.

1038. Rock scrape, offshore, Campground Beach, Fayette State Park, Delta County, Michigan. Sec. 4, R19W, T38N. Mostly small diatoms, some Bulbochaetae. Coll: E. F. Stoermer, 20 June 1966.

1039. Brown, gelatinous incrustations on rocks at water line, Campground Beach, Fayette State Park, Delta County, Michigan. Sec. 4, R19W, T38N. Mostly Calothrix sp. Coll: E. F. Stoermer, 20 June 1966.

1040. Bottom sand at 15 ft. depth, off Campground Beach, Fayette State Park, Delta County, Michigan. Sec. 4, R19W, T38N. Mostly small diatoms. Coll: E. F. Stoermer, 20 June 1966.

1041. Scrape from dock piling, Sack Bay, Delta County, Michigan. Sec. 30, R19W, T38N. Mostly small diatoms. Coll: E. F. Stoermer, 20 June 1966.

1042. Shore plankton (#25 net), Sack Bay, Delta County, Michigan. Sec. 30, R19W, T38N. Tabellaria spp., Asterionella sp., etc. Coll: E. F. Stoermer, 20 June 1966.

1043. Rock scrape, 1 ft. depth, Sand Bay, near Fayette State Park, Delta County, Michigan. Sec. 9, R19W, T38N. Mostly Calothrix sp. and Achnanthes spp. Coll: E. F. Stoermer, 20 June 1966.

1044. Shore plankton (#25 net), Sand Bay, near Fayette State Park, Delta County, Michigan. Sec. 9, R19W, T38N. Tabellaria, Fragilaria, Asterionella, etc. Coll: E. F. Stoermer, 20 June 1966.

1045. Scrape from piling, Fayette Harbor, Fayette State Park, Delta County, Michigan. Sec. 4, R19W, T38N. Mostly (?) Plectonema and small diatoms. Coll: E. F. Stoermer, 20 June 1966.

1046. Shore plankton (#25 net), Fayette Harbor, Fayette State Park, Delta County, Michigan. Sec. 4, R19W, T38N. Anacystis + lake flora. Coll: E. F. Stoermer, 20 June 1966.

1047. Rock scrape, east side of Fayette Harbor, Fayette State Park, Fayette County, Michigan. Sec. 4, R19W, T38N. Mostly Ulothrix (?). Coll: E. F. Stoermer, 20 June 1966.

1048. Rock scrape, Garden Creek at county road 436, Sec. 14, R18W, T39N, Delta County, Michigan. Diverse dystrophic diatom flora. Coll: E. F. Stoermer, 21 June 1966.

1049. Bottom sand in quiet water, Snyder Creek at county road 435. Sec. 12, R17W, T40N, Schoolcraft County, Michigan. Sparse semi-dystrophic flora. Coll: E. F. Stoermer, 21 June 1966.

1050. Blue-green algal mat on log, Snyder Creek at county road 435, Sec. 12, R17W, T40N, Schoolcraft County, Michigan. Mostly Phormidium sp.: many small diatoms. Coll: E. F. Stoermer, 21 June 1966.

1051. Blue-green algal mat on concrete culvert, Southtown Creek at county road 435, Sec. 14, R16W, T41N,

Schoolcraft County, Michigan. Mostly Phormidium sp. Coll: E. F. Stoermer, 21 June 1966.

1052. Bottom detritus, small pool below concrete culvert, Southtown Creek at county road 435, Sec. 14, R16W, T41N, Schoolcraft County, Michigan. Spirogyra and diverse diatom flora. Coll: E. F. Stoermer, 21 June 1966.

1053. Surface scum, small pool below concrete culvert, Southtown Creek at county road 435, Sec. 14, R16W, T41N, Schoolcraft County, Michigan. Diverse flora. Spirogyra and many diatoms. Coll: E. F. Stoermer, 21 June 1966.

1054. Surface scum from small pond near mouth of Southtown Creek. Substrate in area almost 100% wood chips. Sec. 14, R16W, T41N, Schoolcraft County, Michigan. Coll: E. F. Stoermer, 21 June 1966.

1055. Algae growing on bottom of small pond near mouth of Southtown Creek. Substrate in area almost 100% wood chips. Sec. 14, R16W, T41N, Schoolcraft County, Michigan. Coll: E. F. Stoermer, 21 June 1966.

1056. Plankton, Harbor of Manistique, Schoolcraft County, Michigan. Sec. 12, R16W, T41. Considerable wood detritus, depauperate algal flora. Coll: E. F. Stoermer, 21 June 1966.

1057. Plankton, Millecoquins Creek at U.S. Highway 2, West of Naubinway, Mackinac County, Michigan, Sec. 30, R9W, T43N. Coll: E. F. Stoermer, 21 June 1966.

1058. Plankton, Black River at U. S. Highway 2, Sec. 30, R8W, T43N, Mackinac County, Michigan. Sparse flora - not dystrophic. Coll: E. F. Stoermer, 21 June 1966.

1059. Bottom material on sand, Black River at U.S. Highway 2, Sec. 30, R8W, T43N, Mackinac County, Michigan. Diverse semieutrophic flora. Coll: E. F. Stoermer, 21 June 1966.

1060. Plankton - from ferry dock, St. Ignace, Mackinac County, Michigan. Sec. 18, R3W, T40N. Typical lake plankton flora with much Synedra. Coll: E. F. Stoermer, 21 June 1966.

1061. Rock scrape from ferry dock, St. Ignace, Mackinac County, Michigan. Sec. 18, R3W, T40N. Mostly Ulothrix sp. Coll: E. F. Stoermer, 21 June 1966.

1062. Scrape from rocks at about 1 meter depth. Lake Michigan, shore. Sec. 19, R5W, T39N. Emmet County, Michigan, in Wilderness State Park. Sparse flora, mostly Achnanthes spp. and Cymbella spp. Coll: E. F. Stoermer, 21 June 1966.

1063. Chara sp. in small pond on Lake Michigan beach. Sec. 19, R5W, T39N. Emmet County, Michigan, in Wilderness State Park. Diverse diatom flora also present. Coll: E. F. Stoermer, 21 June 1966.

1064. Floating filamentous algae in warm shallow pool on Lake Michigan beach. Sec. 19, R5W, T39N. Emmet County, Michigan, in Wilderness State Park. Mostly Spirogyra sp. Rhopalodia gibba. Coll: E. F. Stoermer, 21 June 1966.

1065. Bottom material, shallow warm pool on Lake Michigan beach. Sec. 19, RSW, T39N. Emmet County, Michigan, in Wilderness State Park. Poor flora - Spirogyra and some naviculoid diatoms. Coll: E. F. Stoermer, 21 June 1966.

1066. Bottom material, small, spring fed pool on Lake Michigan beach. Sec. 19, R5W, T39N, Emmet County, Michigan, in Wilderness State Park. Spirogyra sp. and acidophilic diatoms. Coll: E. F. Stoermer, 21 June 1966.

1067. Filamentous algae floating near campground beach, Wilderness State Park. Sec. 27, R5W, T39N. Emmet County, Michigan. Mostly Ulothrix zonata - some attached diatoms. Coll: E. F. Stoermer, 21 June 1965.

1068. Bottom sand at 1.5 M off campground beach, Wilderness State Park, Sec. 27, R5W, T39N. Emmet County, Michigan. Very rich and diverse flora - mostly diatoms. Coll: E. F. Stoermer, 21 June 1966.

1069. Algal mat on stones in (?) Sucker Creek near Lake Michigan beach east of campground, Wilderness State Park. Sec. 27, R5W, T39N, Emmet County, Michigan. Rich diatom flora. Coll: E. F. Stoermer, 21 June 1966.

1070. Filamentous algae in (?) Sucker Creek, near Lake Michigan beach, east of campground, Wilderness State Park. Sec. 27 R5W, T39N, Emmet County, Michigan. Very rich flora, mostly diatoms. Coll: E. F. Stoermer, 21 June 1966.

1071. Algal crusts on sand in flowing water, (?) Sucker Creek, east of campground, Wilderness State Park. Sec. 27, R5W, T39N, Emmet County, Michigan. Very rich diatom flora. Coll: E. F. Stoermer, 21 June 1966.

1072. Bottom sand at 2 meters off point, Sec. 23, R5W, T39N, east of campground, Wilderness State Park, Emmet County, Michigan. Rich diatom flora. Coll: E. F. Stoermer, 22 June 1966.

1073. Rock scrape from 2 M depth off point, Sec. 23, R5W, T39N, east of campground, Wilderness State Park, Emmet County, Michigan. Fairly rich diatom flora. Coll: E. F. Stoermer, 22 June 1966.

1074. Rock scrape from 1 M depth off point, Sec. 23, R5W, T39N, east of campground, Wilderness State Park, Emmet County, Michigan. Rather poor flora. Coll: E. F. Stoermer, 22 June 1966.

1075. Filamentous algae on surface west side of point, Sec. 23, R5W, T39N, east of campground, Wilderness State Park, Emmet County, Michigan. Mostly Spirogyra sp. Coll: E. F. Stoermer, 22 June 1966.

1076. Bottom sand in shallow water, Lake Michigan, just west of point, Sec. 23, R5W, T39N, east of campground, Wilderness State Park, Emmet County, Michigan. Very rich diatom flora. Coll: E. F. Stoermer, 22 June 1966.

1077. Rock scrape, confluence of (?) Sucker Creek with Lake Michigan, Sec. 27, R5W, T39N, east of campground, Wilderness State Park, Emmet County, Michigan. Good diatom flora. Coll: E. F. Stoermer, 22 June 1966.

1078. Filamentous algae on Scirpus Rhizomes in surf line, west end of campground beach, Sec. 21, R5W, T39N, Wilderness State Park, Emmet County, Michigan. Ulothrix with many diatoms. Coll: E. F. Stoermer, 22 June 1966.

1079. Algal mat on small spring, west end of campground beach, Sec. 21, R5W, T39N, Wilderness State Park, Emmet County, Michigan. Mostly Vaucheria. Coll: E. F. Stoermer, 22 June 1966.

1080. Flocculent bottom material in small stream from spring on west end of campground beach, Sec. 21, R5W, T39N, Wilderness State Park, Emmet County, Michigan. Diverse flora. Coll: E. F. Stoermer, 22 June 1966.

1081. Filamentous algae in shallow, warm pool on beach formed by outflow of spring. Sec. 21, R5W, T39N, Wilderness State Park, Emmet County, Michigan. Very diverse algal flora. Coll: E. F. Stoermer, 22 June 1966.

1082. Bottom material from pond 200 ft from Lake Michigan beach. Waugoshance Point, Sec. 24, R6W, T39N, Wilderness State Park, Emmet County, Michigan. Diverse algal flora. Coll: E. F. Stoermer, 22 June 1966.

1083. Bottom material from pond connected with Lake Michigan. Waugoshance Point, Sec. 24, R6W, T39N, Wilderness State Park, Emmet County, Michigan. Rather poor flora. Coll: E. F. Stoermer, 22 June 1966.

1084. Material from rocks in 1" water flat beach on Waugoshance Point, Sec. 24, R6W, T39N, Wilderness State Park, Emmet County, Michigan. Rather poor flora. Coll: E. F. Stoermer, 22 June 1966.

1085. Brownish crusts on rocks, small pond 100 yds from Lake Michigan beach, north side of Waugoshance Point. Sec. 24, R6W, T39N, Wilderness State Park, Emmet County, Michigan. Mostly Scytonema sp. Coll: E. F. Stoermer, 22 June 1966.

1086. Filamentous algae, pool in middle of Waugoshance Point. Sec. 24, R6W, T39N, Wilderness State Park, Emmet County, Michigan. Spirogyra and diatoms. Coll: E. F. Stoermer, 22 June 1966.

1087. Depauperate Cladophora in back water, Carp Lake River. Sec. 29, R4W, T39N, Emmet County, Michigan. Cladophora and Synedra. Coll: E. F. Stoermer, 22 June 1966.

1088. Bottom material, sand in back water, Carp Lake River. Sec. 29, R4W, T39N, Emmet County, Michigan. Rich diatom flora. Coll: E. F. Stoermer, 22 June 1966.

1089. Shore plankton, Cheboygan, Michigan, harbor. Sec. 27, R1W, T38N, Cheboygan County, Michigan. Rotifer bloom phytoplankton relatively sparse. Coll: E. F. Stoermer, 22 June 1966.

1090. Shore plankton, harbor of Mackinaw City, Michigan. Sec. 18, R3W, T39N, Emmet County, Michigan. Tabellaria bloom. Coll: E. F. Stoermer, 22 June 1966.

1091. Bottom sand from seepage area on Lake Michigan beach, harbor at Cross Village. Sec. 33, R6W, T38N, Emmet County, Michigan. Rich diatom flora, mostly small species attached to sand grains. Coll: E. F. Stoermer, 23 June 1966.

1092. Shore plankton from harbor, Cross Village. Sec. 33, R6W, T38N, Emmet County, Michigan. Rhizosolenia - Synedra bloom. Coll: E. F. Stoermer, 23 June 1966.

1093. Scrape from piling at water line, City Park, Harbor Springs. Sec. 13, R6W, T35N, Emmet County, Michigan. Mostly Ulothrix and diatoms. Coll: E. F. Stoermer, 23 June 1966.

1094. Shore plankton, City Park, Harbor Springs. Sec. 13, R6W, T35N, Emmet County, Michigan. Zooplankton bloom and much pine pollen. Coll: E. F. Stoermer, 23 June 1965.

1095. Shore plankton, tile outlet just east of "Irish Marina." Sec. 18, R5W, T35N, Harbor Springs, Emmet County, Michigan. Zooplankton bloom - scarce phytoplankton. Coll: E. F. Stoermer, 23 June 1966.

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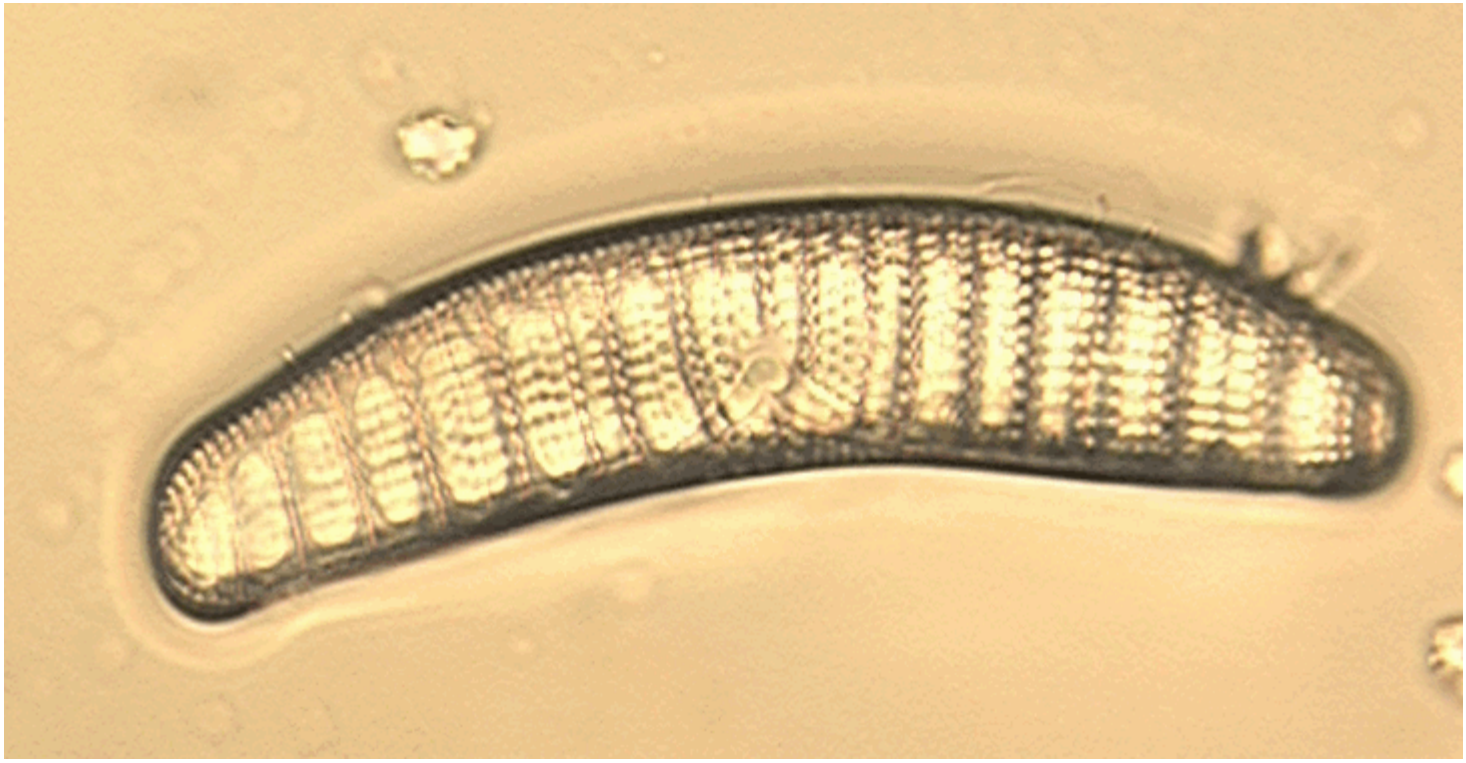

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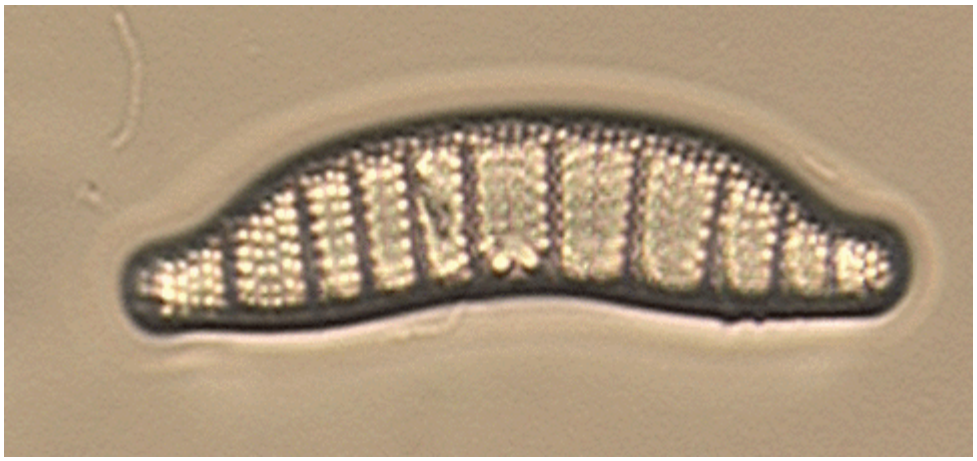

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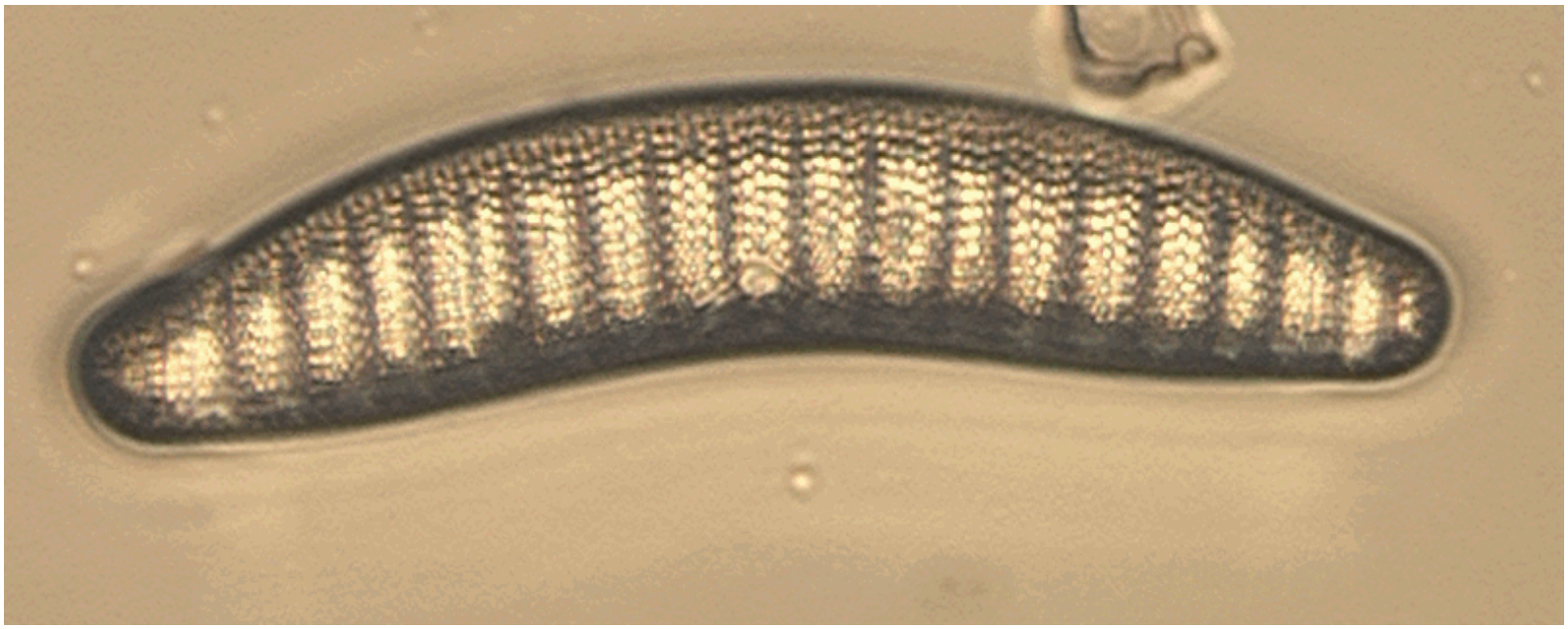

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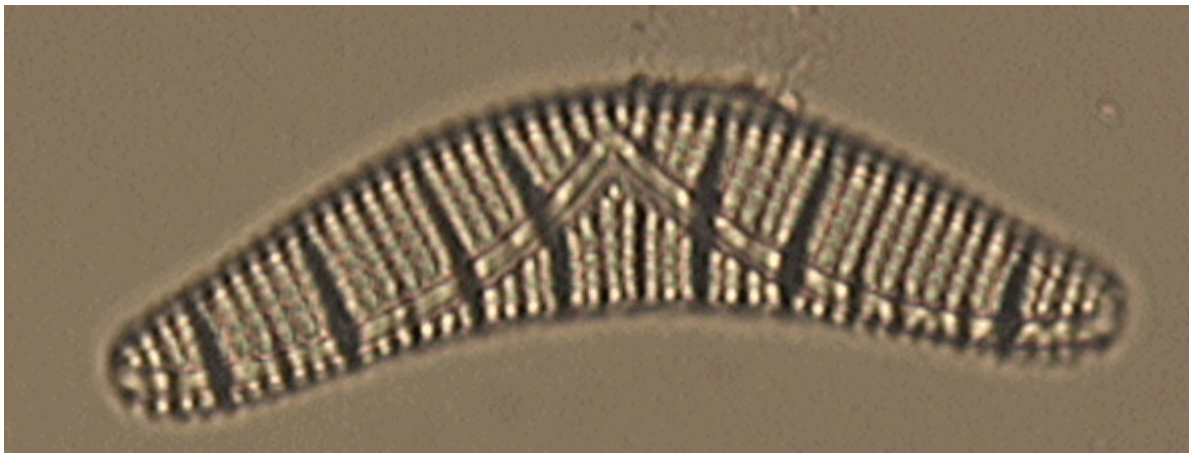

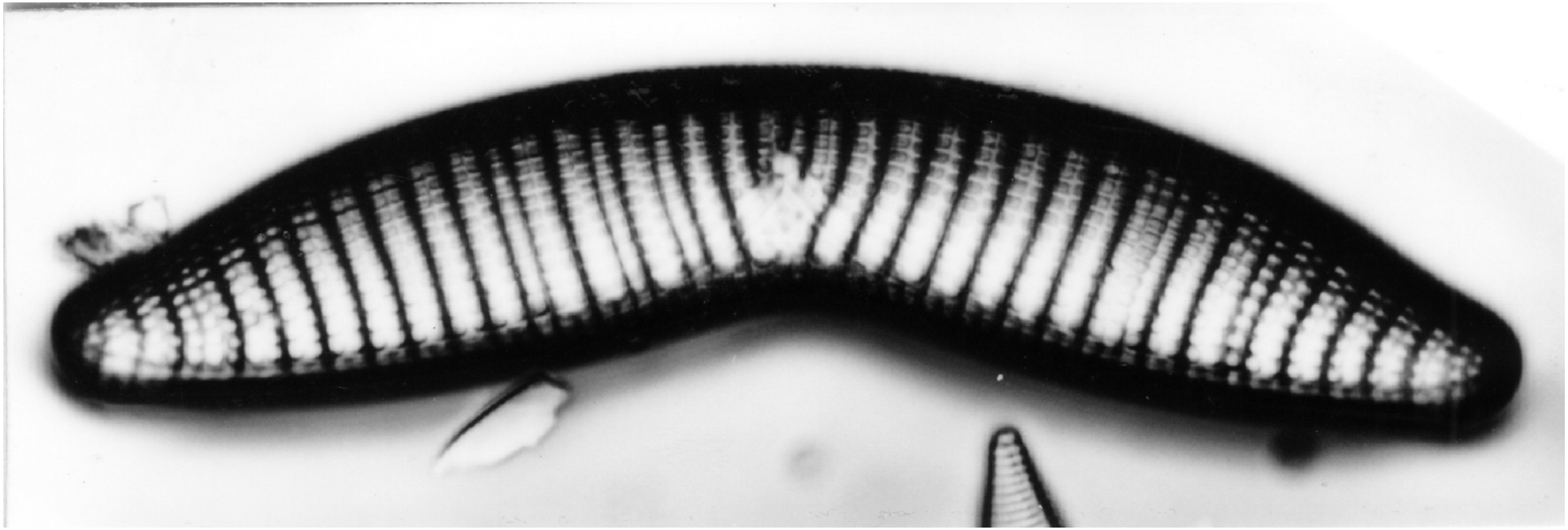

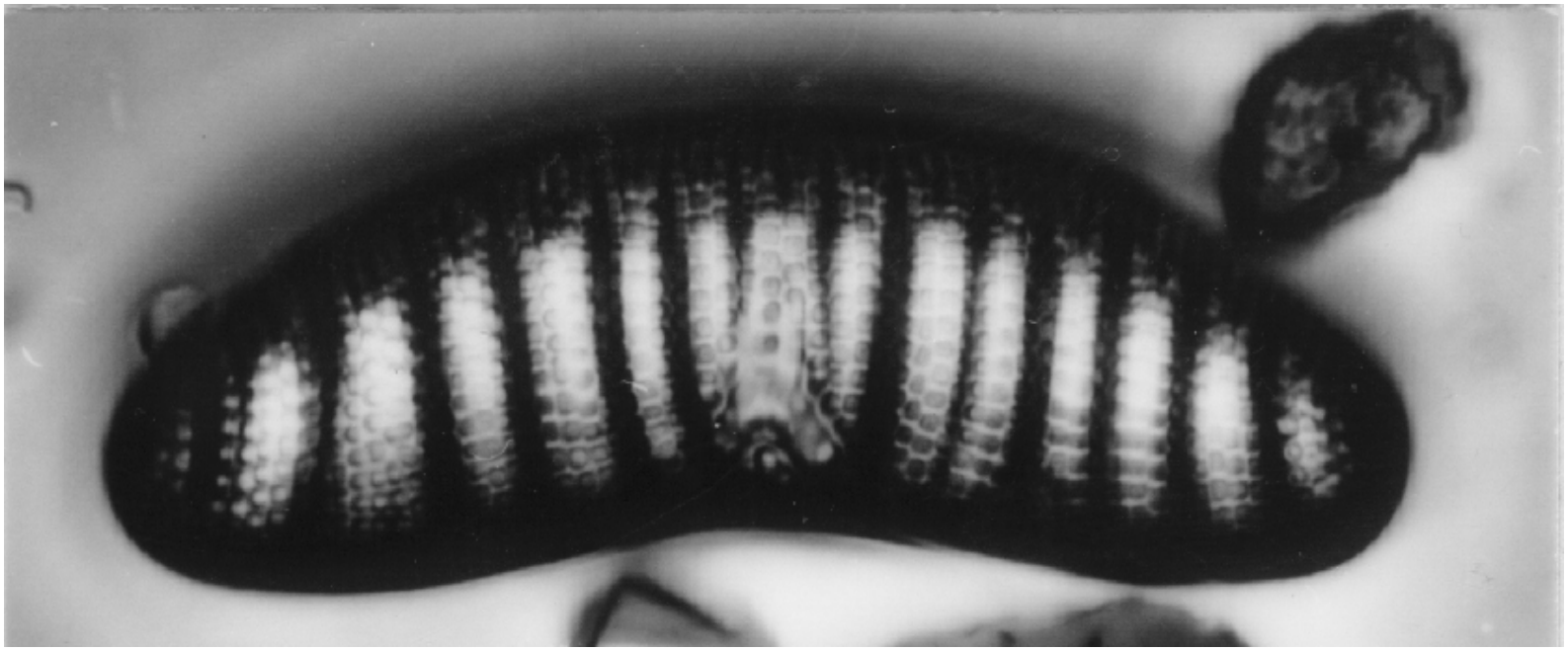

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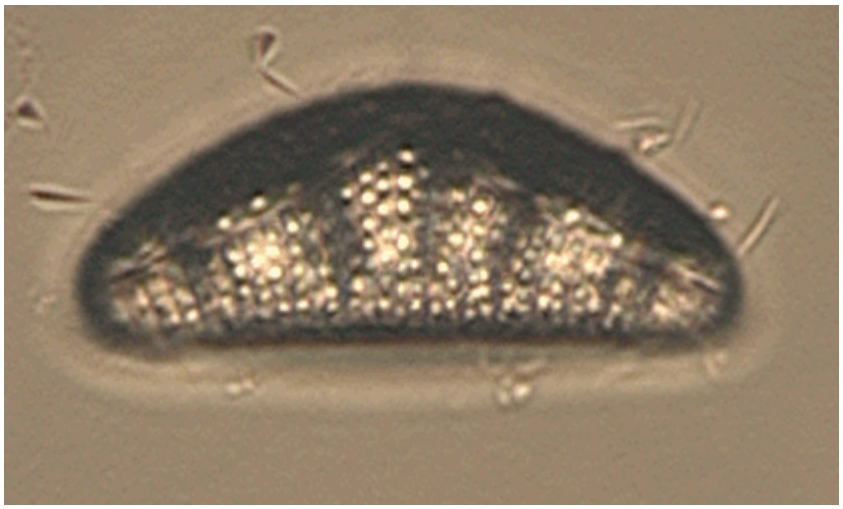

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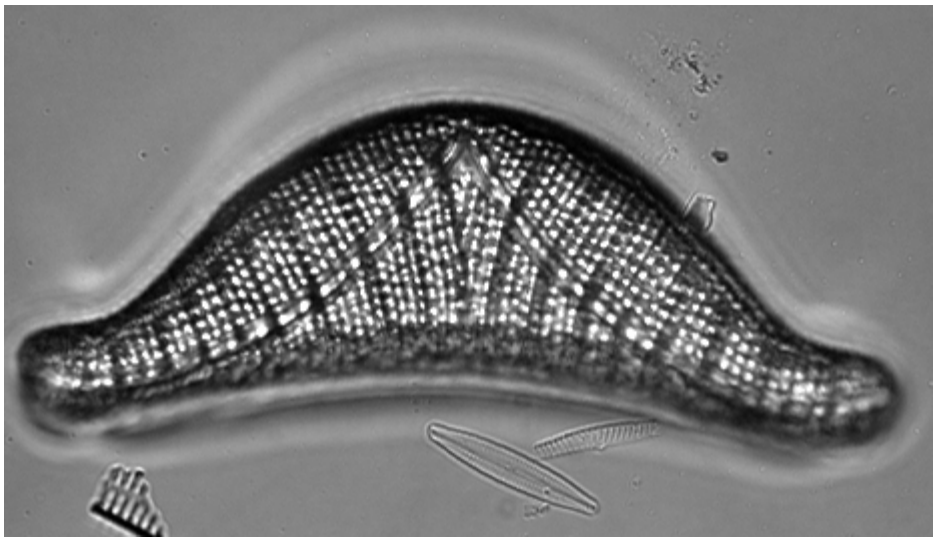

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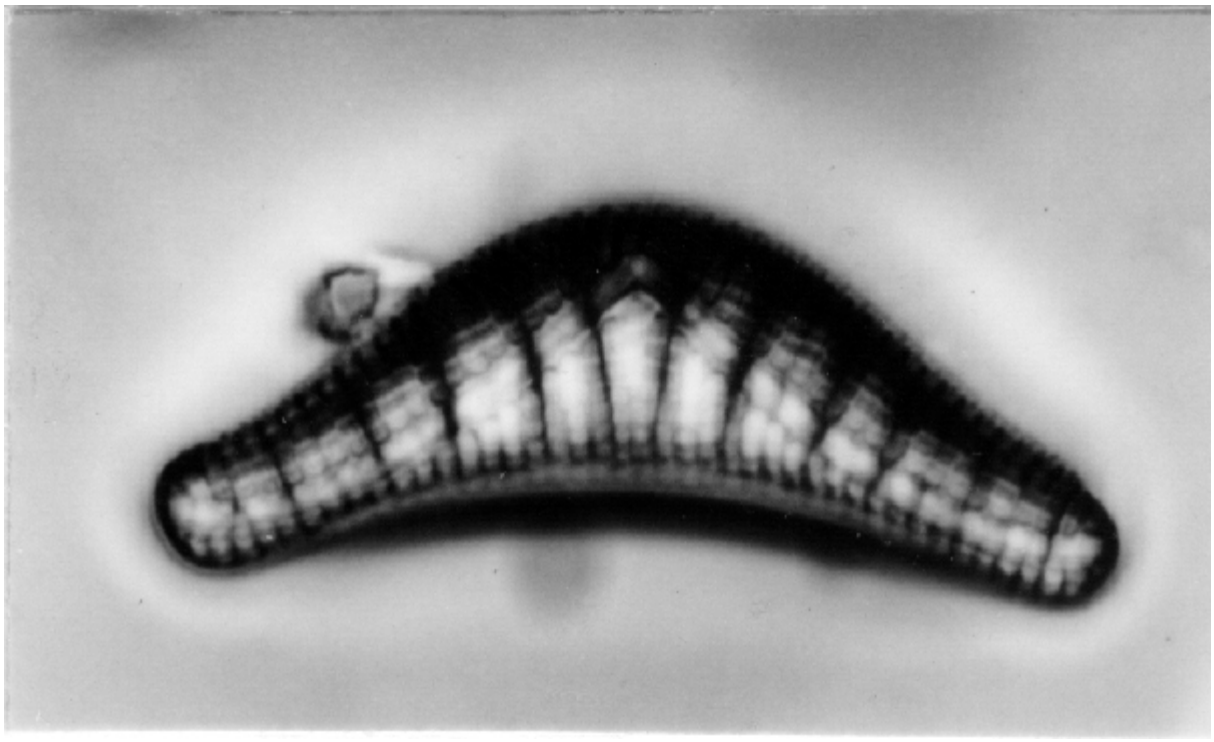

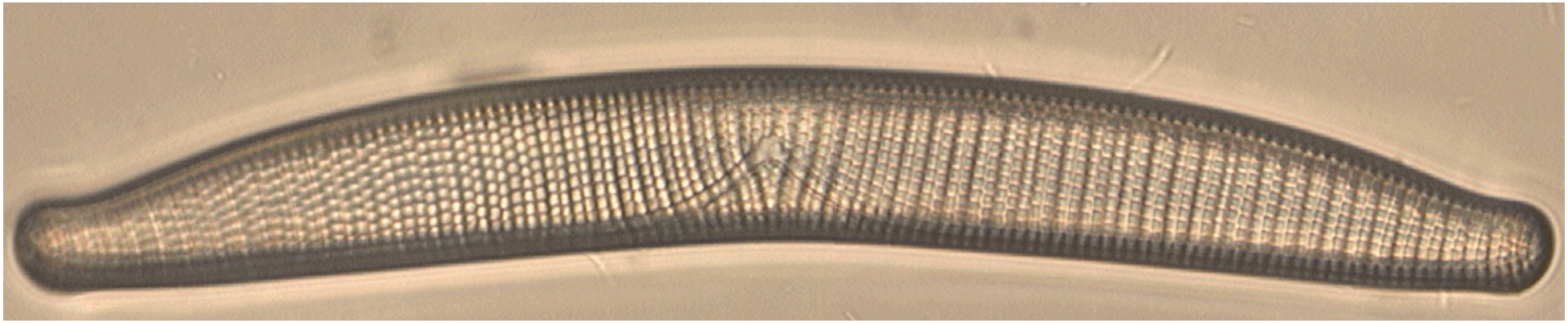

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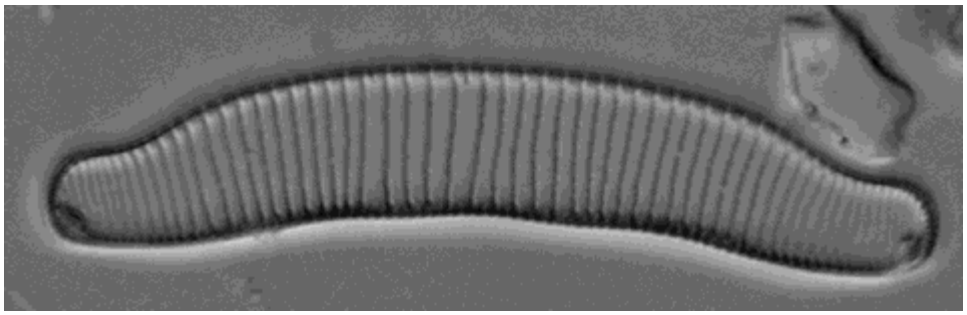

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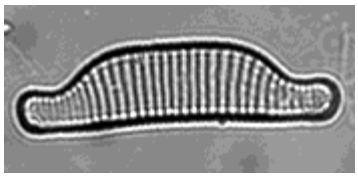

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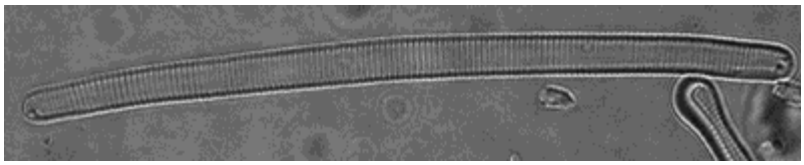

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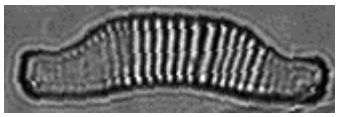

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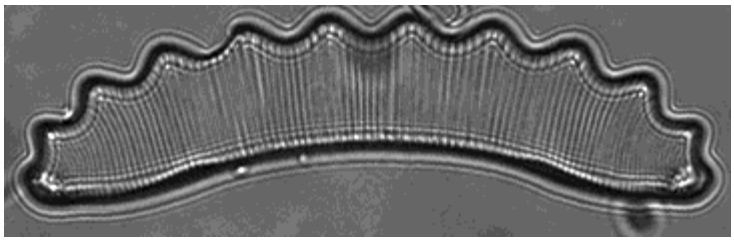

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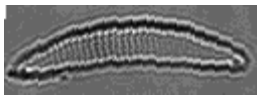

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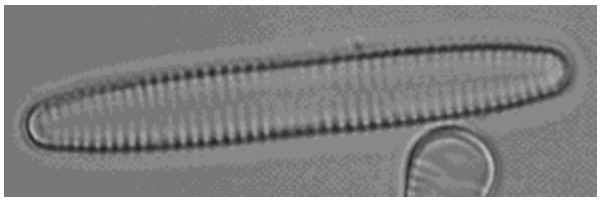
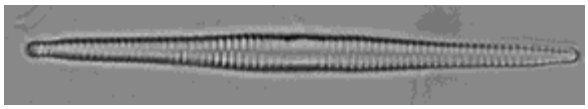
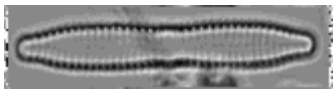


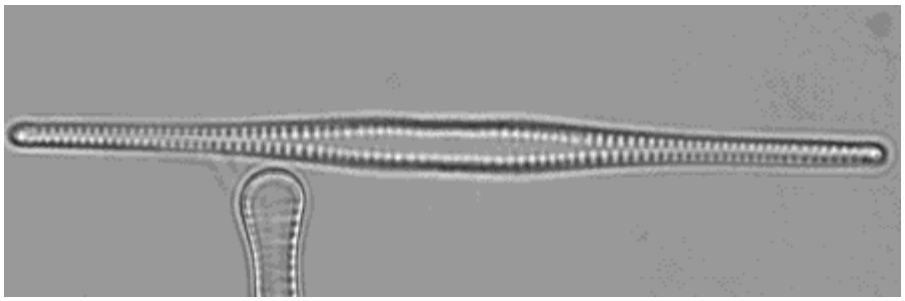
Fcapucinalanceolata.gif 290×50 pixels



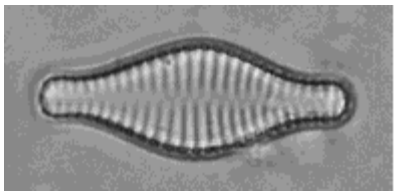
Fragilariacapucinavmesole.gif 164×42 pixels



Fragilariacrotonensis.gif 448×146 pixels

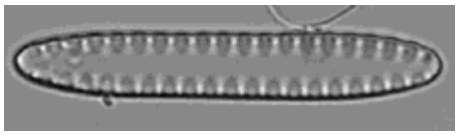


fheidenii.gif 195×93 pixels

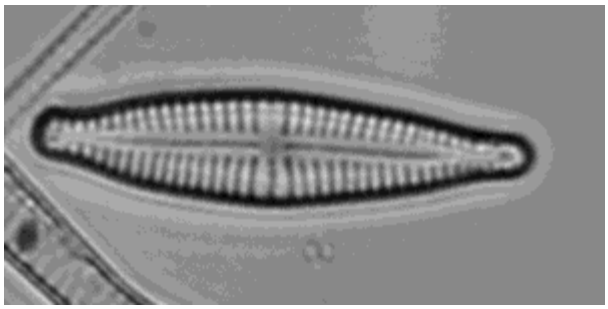


Fragilariaintermedia.gif 267×39 pixels

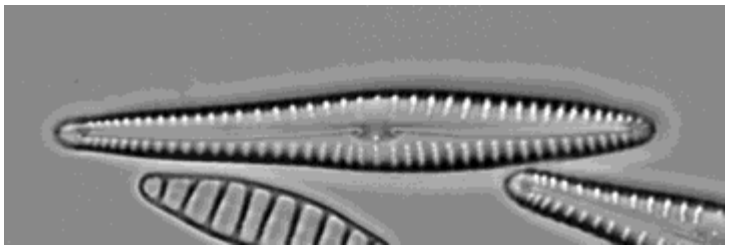
Fragilariaspinosa.gif 225×63 pixels



Gomphocymbellasp1a.gif 300×150 pixels



Gnemagermainii1884b100.gif 360×120 pixels



COLLECTIONS: EUGENE F. STOERMER (#10)

1865. Material scraped from bedrock at 30 ft. depth by divers, Superior Shoal, 48°03.5'N, 87°06.0'W, Lake Superior. Coll: R. Anderson, 18 Sept. 1970.

1866. Material scraped from bedrock at 30 ft. depth by divers, Superior Shoal, 48°03.5'N, 87°06.0'W, Lake Superior. Coll: R. Anderson, 18 Sept. 1970.

1867. Material scraped from bedrock at 30 ft. depth by divers, Superior Shoal, 48°03.5'N, 87°06.0'W, Lake Superior. Coll: R. Anderson, 18 Sept. 1970.

1868. Material scraped from rocks collected by divers at 40 ft. depth, Superior Shoal, 48°03.5'N, 87°06.0'W, Lake Superior. Coll: R. Anderson, 18 Sept. 1970.

1869. Material scraped from rocks at 30 ft. depth by divers, Superior Shoal, 48°03.5'N, 87°06.0'W, Lake Superior. Coll: R. Anderson, 18 Sept. 1970.

1870. Material scraped from rocks at 30 ft. depth by divers, Superior Shoal, 48°03.5'N, 87°06.0'W, Lake Superior. Coll: M. Atkinson, 18 Sept. 1970.

1871. Aquatic moss growing in bedrock crevices at 35 ft. depth, Superior Shoal, 48°03.5'N, 87°06.0'W, Lake Superior. Coll: M. Atkinson, 18 Sept. 1970.

1872. Material scraped from vertical bedrock face at 40 ft. depth by divers, Superior Shoal, 48°03.5'N, 87°06.0'W, Lake Superior. Coll: R. Anderson, 18 Sept. 1970.

1873. Material scraped from vertical bedrock face at 40 ft. depth by divers, Superior Shoal, 48°03.5'N, 87°06.0'W, Lake Superior. Coll: R. Anderson, 18 Sept. 1970.

1874. Material scraped from vertical bedrock face at 40 ft. depth by divers, Superior Shoal, 48°03.5'N, 87°06.0'W, Lake Superior. Coll: R. Anderson, 18 Sept. 1970.

1875. Material scraped from rocks at 40 ft. depth by divers, Superior Shoal, 48°03.5'N, 87°06.0'W, Lake Superior. Coll: R. Anderson, 18 Sept. 1970.

1876. Material scraped from rocks at 40 ft. depth by divers, Superior Shoal, 48°03.51N, 87°06.0'W, Lake Superior. Coll: R. Anderson, 18 Sept. 1970.

1877. Material scraped from rocks at 40 ft. depth by divers, Superior Shoal, 48°03.5'N, 87°06.0'W, Lake Superior. Coll: M. Atkinson, 18 Sept. 1970.

1878. Material scraped from rocks at 40 ft. depth by divers, Superior Shoal, 48°03.5'N, 87°06.0'W, Lake Superior. Coll: M. Atkinson, 18 Sept. 1970.

1879. Material scraped from rocks at 45 ft. depth by divers, Superior Shoal, 48°03.5'N, 87°06.0'W, Lake Superior. Coll: R. Anderson, 18 Sept. 1970.

1880. Material scraped from rocks at 45 ft. depth by divers, Superior Shoal, 48°03.5'N, 87°06.0'W, Lake Superior. Coll: M. Atkinson, 18 Sept. 1970.

1881. Filamentous algae scraped from rocks gathered by divers at 43 ft. depth, Superior Shoal, 48°03.5'N, 87°06.0'W, Lake Superior. Coll: R. Anderson, 19 Sept. 1970.

1882. Material scraped from rocks at 43 ft. depth by divers, Superior Shoal, 48°03.5'N, 87°06.0'W, Lake Superior. Coll: R. Anderson, l9 Sept. 1970.

1883. Material scraped from rocks at 45 ft. depth by divers, Superior Shoal, 48°03.5'N, 87°06.0'W, Lake Superior. Coll: R. Anderson, 19 Sept. 1970.

1884. Material scraped from rocks at 38 ft. depth by divers, Superior Shoal, 48°03.5'N, 87°06.0'W, Lake Superior. Coll: R. Anderson, 19 Sept. 1970.

1885. Material scraped from rocks at 35 ft. depth by divers, Superior Shoal, 48°03.5'N, 87°06.0'W, Lake Superior. Coll: R. Anderson, 19 Sept. 1970.

1886. Material scraped from bedrock by divers at 45 ft. depth, Superior Shoal, 48°03.5'N, 87°06.0'W, Lake Superior. Coll: R. Anderson, 19 Sept. 1970.

1887. Mass of Cladophora sp. growing on bedrock at 40 ft. depth, Superior Shoal, 48°03.5'N, 87°06.0'W, Lake Superior. Coll: R. Anderson, 19 Sept. 1970.

1888. Material scraped from rocks at 18 inch depth in small cove on northern shore of Porter Island, entrance to Copper Harbor, Michigan. Coll: E. F. Stoermer, 20 Sept. 1970.

1889. Phormidium sp. and diatoms encrusting rocks at 1 meter depth, near northeastern shore of Porter Island, entrance to Copper Harbor, Michigan. Coll: E. F. Stoermer, 20 Sept. 1970.

1890. Material scraped from bedrock at 1 meter depth, near southeastern shore of Porter Island, entrance to Copper Harbor, Michigan. Coll: E. F. Stoermer, 20 Sept. 1970.

1891. Material scraped from rocks at water line, southeastern shore of Porter Island, at entrance to Copper Harbor, Michigan. Coll: E. F. Stoermer, 20 Sept. 1970.

1892. Material scraped from cobbles in 18 in. of water at entrance of stream from Fanny Hooe Lake, Copper Harbor, Michigan. Coll: E. F. Stoermer, 21 Sept. 1970.

1893. Material on rocks in fast water below water falls in stream between Lake Fanny Hooe and Copper Harbor, Michigan. Coll: E. F. Stoermer, 21 Sept. 1970.

1894. Aquatic moss growing on face of waterfall in stream between Lake Fanny Hooe and Copper Harbor, Michigan. Coll: E. F. Stoermer, 21 Sept. 1970.

1895. Material scraped from rock at 25 ft. depth, Copper Harbor, Michigan, 47°28.3'N, 87°53.3'W, Lake Superior. Coll: E. F. Stoermer, 22 Sept. 1970.

1896. Chara sp.brought up by dredge from 25 ft. depth, Copper Harbor, Michigan, 47°28.3'N, 87°53.3'W, Lake Superior. Coll: E. F. Stoermer, 22 Sept. 1970.

1897. Chara sp. and sponges taken by grapple from 25 ft. of water, Copper Harbor, Michigan, 47°28.3'N, 87°53.3'W, Lake Superior. Coll: E. F. Stoermer, 22 Sept. 1970.

1898. Beaufort mud, Pivers Island, Cartaret Co., N. Carolina, near Duke University dock. Coll: C. L. Schelske, 23 Feb. 1971.

1899. Beaufort sand, Pivers Island, Cartaret Co., N. Carolina, near Duke University dock. Coll: C. L. Schelske, 23 Feb. 1971.

1900. Bottom sample at 154 ft. depth by diver. SU71-12, 47°10.9'N, 88°52.4'W, Superior. Coll: Lee Somers, 8 August 1971.

1901. Ponar sample. Lake Superior. Coll: Guy Earle, 14 August 1971.

1902. Ponar sample. SU71-17, 47°12.7'N, 88°51.8'W, Lake Superior. Coll: Guy Earle, 15 August 1971.

1903. Ponar sample. SU71-18, 47°lO.9'N, 89°15.1'W, Lake Superior. Coll: Guy Earle, 15 August 1971.

1904. Ponar sample. SU71-19, 47°20.2'N, 88°50.3'W, Lake Superior. Coll: Guy Earle, 15 August 1971.

1905. Ponar sample. SU71-21, 47°47.9'N, 89°14.2'W. Beginning of U. of Wisconsin's CC Profile. Lake Superior. Coll: Guy Earle, 16 August 1971.

1906. Material scraped from FWPCA buoy at AEC69-1, 42°57.8'N, 86°14.6'W, Michigan. Coll: L. Feldt, 18 September 1969.

1907. Vertical #20 net tow. AEC69-4, 42°58.1'N, 86°16.0'W, Lake Michigan. Coll: G. Tompkins, 26 September 1969.

1908. Bottom section of 12 ft. core. AEC70-2, 44°56.4'N, 85°26.9'W. Coll: H. Bekins, 19 May 1970.

1909. Bottom section of core. AEC70-9, 44°54.2'N, 85°35.4'W. Coll: H. Bekins, 20 May 1970.

1910. Vertical #20 net tow. AEC70-1, 45°23.3'N, 85°06.7'W. Coll: E. Wilson, 14 July 1970.

1911. Material scraped from floating plastic periphyton collectors. Station N15A, 15 ft. depth, just north of Cook Power Plant, about 1/4 mi. from shore, 11 mi. south of St. Joseph, Michigan piers. Coll: J. C. Ayers, 9 August 1971.

1912. Material scraped from floating plastic periphyton collectors. Station N30A, 30 ft. depth, just north of Cook Power Plant, about 3/4 mi. from shore, 11 mi. south of St. Joseph, Michigan piers. Coll: J. C. Ayers, 9 August 1971.

1913. Material scraped from floating plastic periphyton collectors. Station S15A, 15 ft. depth, just south of Cook Power Plant, about 1/4 mi. from shore, 11 mi. south of St. Joseph, Michigan piers. Coll: J. C. Ayers, 9 August 1971.

1914. Material scraped from floating plastic periphyton collectors. Station S30A, 30 ft. depth, just south of Cook Power Plant, about 3/4 mi. from shore, 11 mi. south of St. Joseph, Michigan piers. Coll: J. C. Ayers. 9 August 1971.

1915. Vertical #20 net tow. Black River at Cheboygan Marine. Coll: E. F. Stoermer, 23 January 1971.

1916. Vertical #20 net tow. Black River at Cheboygan Marine. Coll: E. F. Stoermer, 23 January 1971.

1917. Plankton and junk, scraps from pilings with net. Indian River in town of Indian River. Coll: E. F. Stoermer, 23 January 1971.

1918. Vertical #20 net tow. Indian River in town of Indian River. Coll: E. F. Stoermer, 23 January 1971.

1919. Plankton - under ice windrow. South Fishtail Bay, Douglas Lake, Pellston, Michigan. Coll: E. F. Stoermer, 23 January 1971.

1920. Vertical #20 net tow. Mid-South Fishtail Bay, Douglas Lake, Pellston, Michigan. Coll: E. F. Stoermer, 23 January 1971.

1921. Vertical #20 net tow. Nearshore, 1.5 m depth. South Fishtail Bay, Douglas Lake, Pellston, Michigan. Coll: E. F. Stoermer, 23 January 1971.

1922. Chara sp. on bottom in 1.5 m depth. South Fishtail Bay, Douglas Lake, Pellston, Michigan. Beach just north of Research Lab at UMBS. Coll: E. F. Stoermer, 23 January 1971.

1923. Blue-green and diatom crust in sand at 1.5 m depth. South Fishtail Bay, Douglas Lake, Pellston, Michigan. Beach

just north of Research Lab, UMBS. Coll: E. F. Stoermer, 23 January 1971.

1924 thru 1932 - Missing descriptions.

1933. Surface #20 net tow, 1 min. Sta. 201, 42°22.0'N; 86°18.0'W. Mich. Coll: E. F. Stoermer. 7 Oct. 1971.

1934. Surface #20 net tow, 1 min. Sta. 202, 42°22.0'N; 86°18.4'W. Mich. Coll: E. F. Stoermer. 7 Oct. 1971.

1935. Surface #20 net tow, 1 min. Sta. 203, 42°22.0'N; 86°18.9'W. Mich. Coll: E. F. Stoermer. 7 Oct. 1971.

1936. Surface #20 net tow, 1 min. Sta. 204, 42°22.0'N; 86°20.1'W. Mich. Coll: E. F. Stoermer. 7 Oct. 1971.

1937. Surface #20 net tow, 1 min. Sta. 205, 42°22.0'N; 86°22.4'W. Mich. Coll: E. F. Stoermer. 7 Oct. 1971.

1938. Surface #20 net tow, 1 min. Sta. 206, 42°22.0'N; 86°27.2'W. Mich. Coll: E. F. Stoermer. 7 Oct. 1971.

1939. Surface #20 net tow, 1 min. Sta. 207, 42°22.0'N; 86°35.5'W. Mich. Coll: E. F. Stoermer. 7 Oct. 1971.

1940. Surface #20 net tow, 1 min. Sta. 208, 42°22.0'N; 86°51.9'W. Mich. Coll: E. F. Stoermer. 9 Oct. 1971.

1941. Surface #20 net tow, 1 min. Sta. 209, 42°22.0'N; 87°12.7'W. Lake Mich. Coll.: E. F. Stoermer. 9 Oct. 1971.

1942. Surface #20 net tow, 1 min. Sta. 210, 42°22.0'N; 87°30.2'W. Lake Mich. Coll.: E. F. Stoermer. 10 Oct. 1971.

1943. Surface #20 net tow, 1 min. Sta. 211, 42°22.0'N; 87°39.6'W. Lake Mich. Coll.: E. F. Stoermer. 10 Oct. 1971.

1944. Surface #20 net tow, 1 min. Sta. 212, 42°22.0'N; 87°44.2'W. Lake Mich. Coll.: E. F. Stoermer. 10 Oct. 1971.

1945. Surface #20 net tow, 1 min. Sta. 213, 42°22.0'N; 87°46.7'W. Lake Mich. Coll.: E. F. Stoermer. 10 Oct. 1971.

1946. Surface #20 net tow, 1 min. Sta. 214, 42°22.0'N; 87°47.8'W. Lake Mich. Coll.: E. F. Stoermer. 10 Oct. 1971.

1947. Surface #20 net tow, 1 min. Sta. 215, 42°22.0'N; 87°48.4'W. Lake Mich. Coll.: E. F. Stoermer. 10 Oct. 1971.

1948. Surface #20 net tow, 1 min. Sta. 216, 42°22.0'N; 87°48.8W. Lake Mich. Coll.: E. F. Stoermer. 10 Oct. 1971.

1949. Surface #20 net tow, 1 min. Sta. 217, 42°00.0'N; 86°33.8'W. Lake Mich. Coll.: E. F. Stoermer. 13 Oct. 1971.

1950. Surface #20 net tow, 1 min. Sta. 218, 42°00.0'N; 86°34.11W. Lake Mich. Coll.: E. F. Stoermer. 13 Oct. 1971.

1951. Surface #20 net tow, 1 min. Sta. 219, 42°00.0'N; 86°34.7'W. Lake Mich. Coll.: E. F. Stoermer. 13 Oct. 1971.

1952. Surface #20 net tow, 1 min. Sta. 220, 42°00.0'N; 86°35.9'W. Lake Mich. Coll.: E. F. Stoermer. 13 Oct. 1971.

1953. Surface #20 net tow, 1 min. Sta. 221, 42°00.0'N; 86°38.3'W. Lake Mich. Coll.: E. F. Stoermer. 13 Oct. 1971.

1954. Surface #20 net tow, 1 min. Sta. 222, 42°00.0'N; 86°42.8'W. Lake Mich. Coll.: E. F. Stoermer. 13 Oct. 1971.

1955. Surface #20 net tow, 1 min. Sta. 223, 42°00.0'N; 86°52.2'W. Lake Mich., Coll.: E. F. Stoermer. 12 Oct. 1971.

1956. Surface #20 net tow, 1 min. Sta. 224, 42°00.0'N; 87°05.0'W. Lake Mich. Coll.: E. F. Stoermer. 12 Oct. 1971.

1957. Surface #20 net two, 1 min. Sta. 225, 42°00.0'N; 87°20.5'W. Lake Mich. Coll.: E. F. Stoermer. 12 Oct. 1971.

1958. Surface #20 net tow, 1 min. Sta. 226, 42°00.0'N; 87°29.8'W. Lake Mich. Coll.: E. F. Stoermer. 12 Oct. 1971.

1959. Surface #20 net tow, 1 min. Sta. 227, 42°00.01N; 87°34.5'W. Lake Mich. Coll.: E. F. Stoermer. 12 Oct. 1971.

1960. Surface #20 net tow, 1 min. Sta. 228, 42°00.01N; 87°36.9'W. Lake Mich. Coll.: E. F. Stoermer. 11 Oct. 1971.

1961. Surface #20 net tow, 1 min. Sta. 229, 42°00.0'N; 87°38.0'W. Lake Mich. Coll.: E. F. Stoermer. 11 Oct. 1971.

1962. Surface #20 net tow, 1 min. Sta. 230, 42°00.0'N; 87°38.8'W. Lake Mich. Coll.: R. F. Stoermer. 12 Oct. 1971.

1963. Surface #20 net tow, 1 min. Sta. 231, 42°00.0'N; 87°39.1'W. Lake Mich. Coll.: E. F. Stoermer. 12 Oct. 1971.

1964. Surface #20 net tow, 1 min. Sta. 232, 41°38.1'N; 87°10.6'W. Lake Mich. Coll.: E. F. Stoermer. 12 Oct. 1971.

1965. Surface #20 net tow, 1 min. Sta. 233, 41°38.3'N; 87°10.6'W. Lake Mich. Coll.: E. F. Stoermer. 14 Oct. 1971.

1966. Surface #20 net tow, 1 min. Sta. 234, 41°38.8'N; 87°10.4'W. Lake Mich. Coll.: E. F. Stoermer. 14 Oct. 1971.

1967. Surface #20 net tow, 1 min. Sta. 235, 41°39.5'N; 87°10.0'W. Lake Mich. Coll.: E. F. Stoermer. 14 Oct. 1971.

1968. Surface #20 net tow, 1 min. Sta. 236, 41°41.2'N; 87°09.3'W. Lake Mich. Coll.: E. F. Stoermer. 14 Oct. 1971.

1969. Surface #20 net tow, 1 min. Sta. 237, 41°44.7'N; 87°08.6'W. Lake Mich. Coll.: E. F. Stoermer. 14 Oct. 1971.

1970. Surface #20 net tow, 1 min. Sta. 238, 41°51.5'N; 87°06.9'W. Lake Mich. Coll.: E. F. Stoermer. 14 Oct. 1971.

1971. Surface #20 net tow, 1 min. Sta. 239, 42°00.0'N; 86°42.8'W. Lake Mich. Coll.: E. F. Stoermer. 29 Oct. 1971.

1972. Vertical #20 net tow. Sta. UM-GB-70#2, 44°54.1'N; 87°29.0'W. Green Bay, Lake Mich. Coll.: E. Callender. 5 May 1970.

1973. Vertical #20 net tow. Sta. UM-GB-70#4, 44°45.0'N; 87°45.0'W. Green Bay, Lake Mich. Coll.: E. Callender. 5 May 1970.

1974. Vertical #20 net tow. Sta. UM-GB-70#5, 44°40.0°N; 87°50.0'W. Green Bay, Lake Mich. Coll.: E. Callender. 5 May 1970.

1975. Vertical #20 net tow. Sta. UM-GB-70#7, 44°50.0N; 87°45.0'W. Green Bay, Lake Mich. Coll.: E. Callender. 5 May 1970

1976. Vertical #20 net tow. Sta. UM-GB-70#10, 44°55.0'N; 87°40.0'W. Green Bay, Lake Mich. Coll.: E. Callender. 5 May 1970.

1977. Vertical #20 net tow. Sta. UM-GB-70#11, 44°57.5'N; 87°30.0'W. Green Bay, Lake Mich. Coll.: E. Callender. 5 May 1970.

1978. Vertical #20 net tow. Sta. UM-GB-70#12, 45°05.0'N; 87°32.5'W. Green Bay, Lake Mich. Coll.: E. Callender. 5 May 1970.

1979. Vertical #20 net tow. Sta. UM-GB-70#14, 45°00.0'N; 87°25.0'W. Green Bay, Lake Mich. Coll: E. Callender. 6 May 1970.

1980. Vertical #20 net tow. Sta. UM-GB-70#18, 45°15.0'N; 87°20.0°W. Green Bay, Lake Mich. Coll: E. Callender. 6 May 1970.

1981. Vertical #20 net tow. Sta. UM-GB-70#21, 45°07.5°N; 87°25.0'W. Green Bay, Lake Mich. Coll: E. Callender. 6 May 1970.

1982. Vertical #20 net tow. Sta. UM-GB-70#24, 45°17.5'N; 87°20.0'W. Green Bay, Lake Mich. Coll: E. Callender. 7

May 1970.

1983. Vertical #20 net tow. Sta. UM-GB-70#26, 45°25.0'N; 87°10.0'W. Green Bay, Lake Mich. Coll: E. Callender. 7 May 1970.

1984. Vertical #20 net tow. Sta. UM-GB-70#29, 45°37.5'N; 87°02.5'W. Green Bay, Lake Mich. Coll: E. Callender. 8 May 1970.

1985. Vertical #20 net tow. Sta. UM-GB-70#30, 45°35.0'N; 87°05.0'W. Green Bay, Lake Mich. Coll: E. Callender. 7 May 1970.

1986. Vertical #20 net tow. Sta. UM-GB-70#32, 45°27.5'N; 86°52.5'W. Green Bay, Lake Mich. Coll: E. Callender. 8 May 1970.

1987. Vertical #20 net tow. Sta. UM-GB-70#35, 45°42.5'N; 86°45.0'W Green Bay, Lake Mich. Coll: E. Callender. 8 May 1970.

1988. Vertical #20 net tow. Sta. UM-GB-70#37, 45°35.0'N; 86°55.0'W Green Bay, Lake Mich. Coll: E. Callender. 8 May 1970.

1989. Vertical #20 net tow. Sta. UM-GB-70#38, 45°27.5'N; 86°40.0'W Green Bay, Lake Mich. Coll: E. Callender. 10 May 1970.

1990. Vertical #20 net tow. Sta. UM-GB-70#39, 45°26.5'N; 85°55.0'W. Green Bay, Lake Mich. Coll: E. Callender. 10 May 1970.

1991. Vertical #20 net tow. Sta. UM-GB-70#40, 45°36.5'N; 85°45.0'W. Green Bay, Lake Mich. Coll: E. Callender. 10 May 1970.

1992. Vertical #20 net tow. Sta. UM-GB-70#42, 45°30.0'N; 85°28.5'W. Green Bay, Lake Mich. Coll: E. Callender. 10 May 1970.

1993. Vertical #20 net tow. Sta. UM-GB-70#46, 45°25.0'N; 85°15.0'W. Green Bay, Lake Mich. Coll: E. Callender. 11 May 1970.

1994. Vertical #20 net tow. Sta. UM-GB-70#53, 45°30.0'N; 85°10.0'W Green Bay, Lake Mich. Coll: E. Callender. 11 May 1970.

1995. Vertical #20 net tow. Sta. UM-GB-70#56, 45°26.4'N; 85°06.3'W. Green Bay, Lake Mich. Coll: E. Callender. 11 May 1970.

1996. Vertical #20 net tow. Sta. SU 71-1, 46° 37.9' N; 84° 47.9' W. Whitefish Bay, Lake Superior. Coll: L. Feldt. 5 August 1971.

1997. Vertical #20 net tow. Sta. SU 71-2, 46° 46.2' N, 85° 03.8' W. Lake Superior. Coll: L. Feldt. 5 August 1971.

1998. Vertical #20 net tow. Sta. SU 71-3, 46° 45.0' N; 85° 33.0' W. Lake Superior. Coll: L. Feldt. 5 August 1971.

1999. Vertical #20 net tow. Sta. SU 71-4, 46° 42.0' N; 86° 02.3' W. Lake Superior. Coll: L. Feldt. 5 August 1971.

2000. Vertical #20 net tow. Sta. SU 71-5, 46° 25.9' N; 86° 38.6' W. Lake Superior. Coll: L. Feldt. 6 August 1971.

2001. Vertical #20 net tow. Sta. SU 71-6, 46° 35.2'N; 86° 52.8' W. Lake Superior. Coll: L. Feldt. 6 August 1971.

2002. Vertical #20 net tow. Sta. SU 71-7, 46° 42.3' N; 87° 11.9' W. Lake Superior. Coll: L. Feldt. 6 August 1971.

2003. Vertical #20 net tow. Sta. SU 71-8, 46° 51.6' N; 87° 37.5' W. Lake Superior. Coll: L. Feldt. 6 August 1971.

2004. Vertical #20 net tow. Sta. SU 71-9, 46° 59.1' N; 88° 03.8' W. Lake Superior. Coll: L. Feldt. 6 August 1971.

2005. Vertical #20 net tow. Sta. SU 71-10, 46° 58.3' N; 88° 17.2' W. Lake Superior. Coll: L. Feldt. 6 August 1971.

2006. Vertical #20 net tow. Sta. SU 71-11, 47° 15.0' N; 88° 38.7' W. Lake Superior. Coll: L. Feldt. 13 August 1971.

2007. Vertical #20 net tow. Sta. SU 71-12, 47° 10.9' N; 88° 52.4' W. Lake Superior. Coll: L. Feldt. 8 August 1971.

2008. Vertical #20 net tow. Sta. SU 71-13, 47° 09.2' N; 88° 51.2' W. Lake Superior. Coll: L. Feldt. 8 August 1971.

2009. Vertical #20 net tow. Sta. SU 71-14, 47° 12.0' N; 88° 51.1' W. Lake Superior. Coll: L. Feldt. 13 August 1971.

2010. Vertical #20 net tow. Sta. SU 71-22, 47° 43.6' N; 89° 20.7' W. Lake Superior. Coll: L. Feldt. 16 August 1971.

2011. Vertical #20 net tow. Sta. SU 71-23, 47° 28.8' N; 89° 50.0' W. Lake Superior. Coll: L. Feldt. 16 August 1971.

2012. Vertical #20 net tow. Sta. SU 71-2,46° 46.2' N; 85° 03.8' W. Lake Superior. Coll: L. Feldt. 20 August 1971.

2013. Vertical #20 net tow. Sta. SU 71-3, 46° 45.0' N, 85° 33.0' W. Lake Superior. Coll: L. Feldt. 20 August 1971.

2014. Vertical #20 net tow. Sta. SU 71-5, 46° 25.9' N; 86° 38.6' W Lake Superior. Coll: L. Feldt. 19 August 1971.

2015. Vertical #20 net tow. Sta. SU 71-7, 46° 42.3' N; 87° 11.9' W Lake Superior. Coll: L. Feldt. 19 August 1971.

2016. Vertical #20 net tow. Sta. SU 71-8, 46° 51.6' N; 87° 37.5' W Lake Superior. Coll: L. Feldt. 19 August 1971.

2017. Vertical #20 net tow. Sta. SU 71-10, 46° 58.3' N; 88° 17.2' Lake Superior. Coll: L. Feldt. 19 August 1971.

2018. Vertical #20 net tow. Sta. LM 70-1, 44° 42.9' N; 86° 16.9' W Lake Michigan. UMBS Limnology Class. Coll: C. L. Schelske. 7 July 1970.

2019. Vertical #20 net tow. Sta. LM 70-2. 44° 54.6' N; 86° 08.7' Lake Michigan. UMBS Limnology Class. Coll: C. L. Schelske. 7 July 1970.

2020. Vertical #20 net tow. Sta. LM 70-3, 45° 00.2' N; 85° 59.4' W Lake Michigan. UMBS Limnology Class. Coll: C. L. Schelske. 7 July 1970.

2021. Vertical #20 net tow. Sta. LM 70-4, 45° 15.3' N; 85° 46.7' W Lake Michigan. UMBS Limnology Class. Coll: C. L. Schelske. 7 July 1970.

2022. Vertical #20 net tow. Sta. LM 70-6, 45° 44.2' N; 85° 26.1' W Lake Michigan. UMBS Limnology Class. Coll: C. L. Schelske. 7 July 1970.

2023. Vertical #20 net tow. Sta. SU 70-1, 46° 41.5' N; 84° 29.0' W Lake Superior. UMBS Limnology Class. Coll: C. L. Schelske. 9 July 1970.

2024. Vertical #20 net tow. Sta. SU 70-2, 46° 40.5' N; 84° 37.5' W Lake Superior. UMBS Limnology Class. Coll: C. L. Schelske. 9 July 1970.

2025. Vertical #20 net tow. Sta. SU 70-3, 46° 47.0' N; 84° 41.0' W Lake Superior. UMBS Limnology Class. Coll: C. L. Schelske. 9 July 1970.

2026. Vertical #20 net tow. Sta. SU 70-4, 46° 52.3' N; 84° 44.7' W Lake Superior. UMBS Limnology Class. Coll: C. L. Schelske. 9 July 1970.

2027. Vertical #20 net tow. Sta. SU 70-5, 47° 00.7' N; 84° 51.0' W Lake Superior. UMBS Limnology Class. Coll: C. L. Schelske. 9 July 1970.

2028. Vertical #20 net tow. Sta. SU 70-6, 47° 00.8' N; 84° 53.3' W. Lake Superior. UMBS Limnology Class. Coll: C. L. Schelske. 9 July 1970.

2029. Vertical #20 net tow. Sta. SU 70-7, 47° 06.7' N; 85° 09.3' W. Lake Superior. UMBS Limnology Class. Coll: C. L. Schelske. 9 July 1970.

2030. Vertical #20 net tow. Sta. SU 70-8?, 47° 21.1' N; 85° 46.4'W. Lake Superior. UMBS Limnology Class. Coll: C. L. Schelske. 9 July 1970.

2031. Vertical #20 net tow. Sta. SU 70-9?, 47° 26.1' N; 85° 47.7' W. Lake Superior. UMBS Limnology Class. Coll: C. L. Schelske. 9 July 1970.

2032. Vertical #20 net tow. Sta. SU 70-10, 47° 39.8' N; 85° 47.9' W. Lake Superior. UMBS Limnology Class. Coll: C. L. Schelske. 9 July 1970.

2033. Vertical #20 net tow. Sta. SU 70-16, 47° 39.3' N; 86° 08.4' W. Lake Superior. UMBS Limnology Class. Coll: C. L. Schelske. 10 July 1970.

2034. Vertical #20 net tow. Sta. SU 70-18, 47° 36.0' N; 86° 44.5' W. Lake Superior. UMBS Limnology Class. Coll: C. L. Schelske. 10 July 1970.

2035. Vertical #20 net tow. Sta. SU 70-19, 47° 34.0' N; 87° 03.0' W. Lake Superior. UMBS Limnology Class. Coll: C. L. Schelske. 10 July 1970.

2036. Vertical #20 net tow. Sta. SU 70-20, 47° 32.5' N; 87° 21.0' W. Lake Superior. UMBS Limnology Class. Coll: C. L. Schelske. 10 July 1970.

2037. Vertical #20 net tow. Sta. SU 70-22, 47° 29.1' N; 87° 49.2' W. Lake Superior. UMBS Limnology Class. Coll: C. L. Schelske. 10 July 1970.

2038. Vertical #20 net tow. Sta. SU 70-23, 47° 23.6' N; 87° 40.9' W. Lake Superior. UMBS Limnology Class. Coll: C. L. Schelske. 11 July 1970.

2039. Vertical #20 net tow. Sta. SU 70-25, 47° 14.4' N; 87° 20.8' W. Lake Superior. UMBS Limnology Class. Coll: C. L. Schelske. 11 July 1970.

2040. Vertical #20 net tow. Sta. SU 70-26, 47° 10.3' N; 87° 13.8' W. Lake Superior. UMBS Limnology Class. Coll: C. L. Schelske. 11 July 1970.

2041. Vertical #20 net tow. Sta. SU 70-28, 46° 54.6' N; 86° 35.8' W. Lake Superior. UMBS Limnology Class. Coll: C. L. Schelske. 11 July 1970.

2042. Vertical #20 net tow. Sta. SU 70-29, 46° 44.8' N; 86° 39.2' W. Lake Superior. UMBS Limnology Class. Coll: C. L. Schelske. 11 July 1970.

2043. Vertical #20 net tow. Sta. SU 70-30, 46° 32.8' N; 86° 43.3' W. Lake Superior. UMBS Limnology Class. Coll: C. L. Schelske. 11 July 1970.

2044. Vertical #20 net tow. Sta. SU 70-31, 46° 25.5' N; 86° 38.3' W. Lake Superior. UMBS Limnology Class. Coll: C. L. Schelske. 11 July 1970.

2045. Vertical #20 net tow. Sta. SU 70-32, 46° 34.0' N; 86° 30.4' W. Lake Superior. UMBS Limnology Class, Coll:

C. L. Schelske. 12 July 1970.

2046. Vertical #20 net tow. Sta. SU 70-34, 46° 34.4' N; 86° 23.3' W. Lake Superior. UMBS Limnology Class. Coll: C. L. Schelske. 12 July 1970.

2047. Vertical #20 net tow. Sta. SU 70-35, 46° 40.6' N; 86° 21.0' W. Lake Superior. UMBS Limnology Class. Coll: C. L. Schelske. 12 July 1970.

2048. Vertical #20 net tow. Sta. SU 70-36, 46° 41.0' N; 86° 09.8' W. Lake Superior. UMBS Limnology Class. Coll: C. L. Schelske. 12 July 1970.

2049. Vertical #20 net tow. Sta. SU 70-37, 46° 44.4' N; 86° 00.0' W. Lake Superior. UMBS Limnology Class. Coll: C. L. Schelske. 12 July 1970.

2050. Vertical #20 net tow. Sta. SU 70-38, 46° 45.0' N; 85° 38.0' W. Lake Superior. UMBS Limnology Class. Coll: C. L. Schelske. 12 July 1970.

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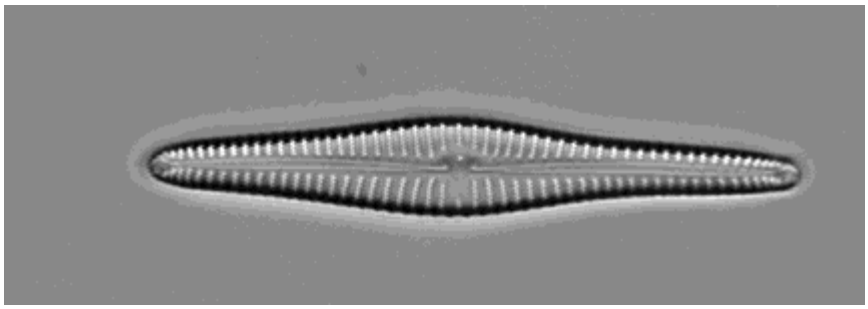

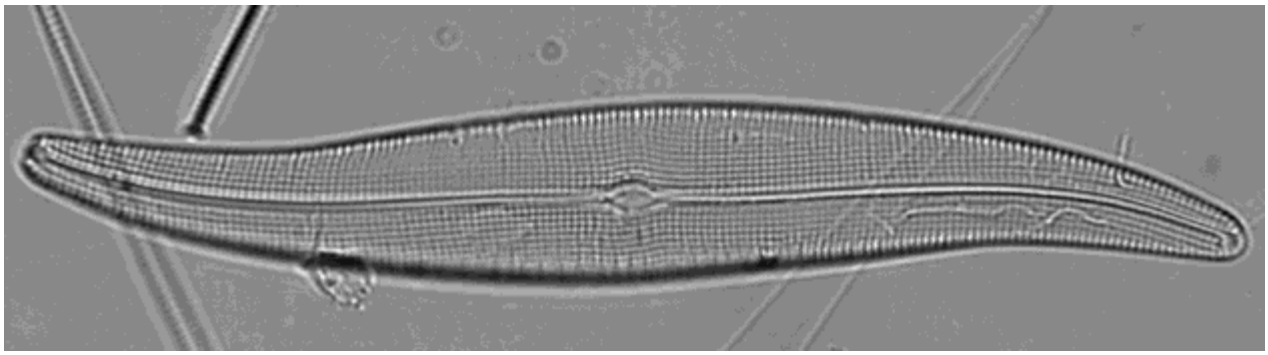

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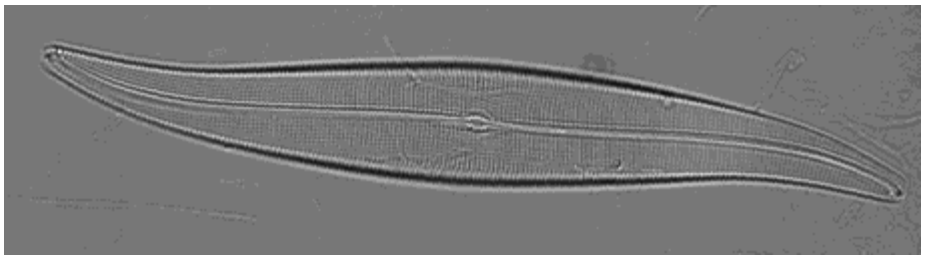

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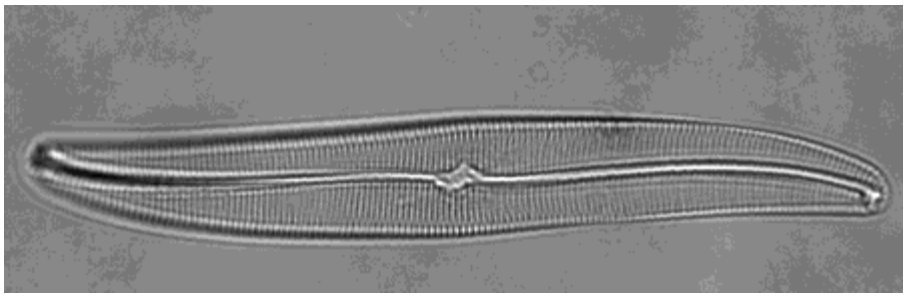

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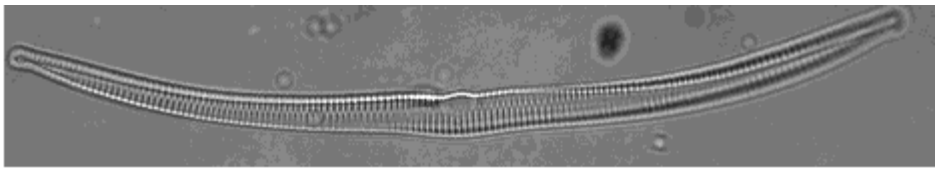

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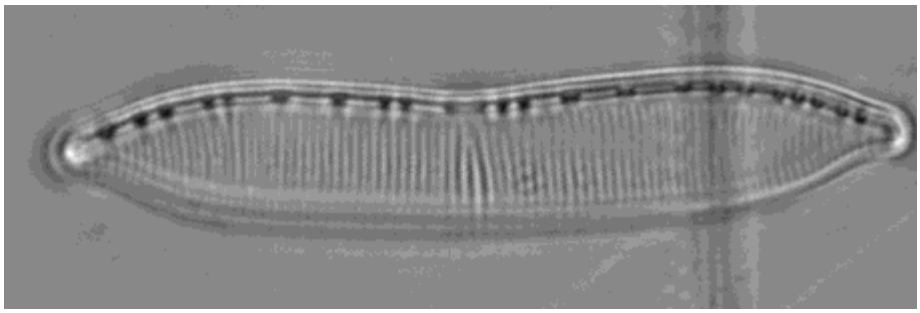

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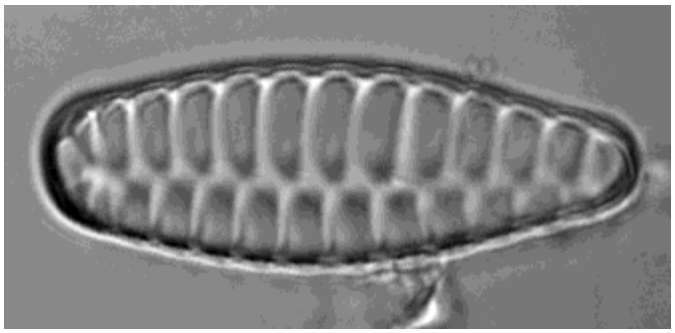

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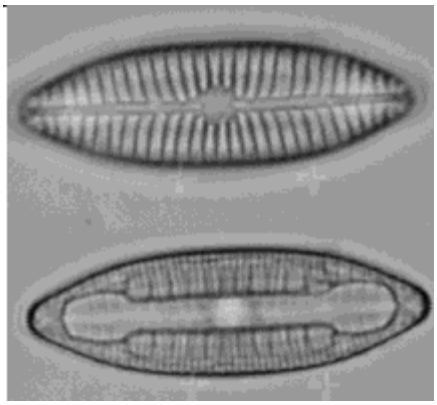

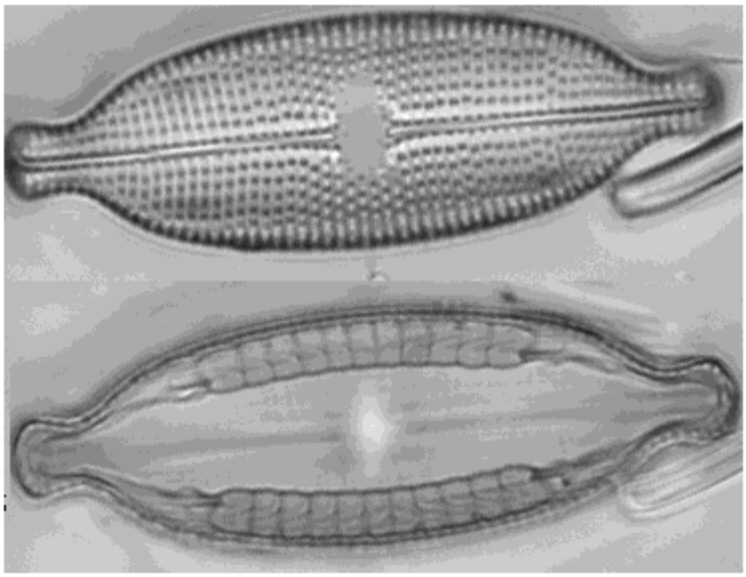

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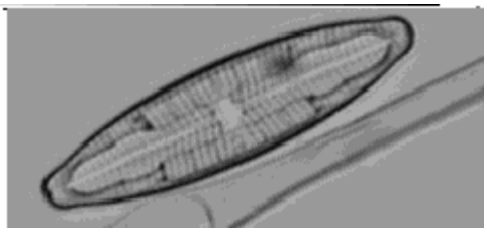

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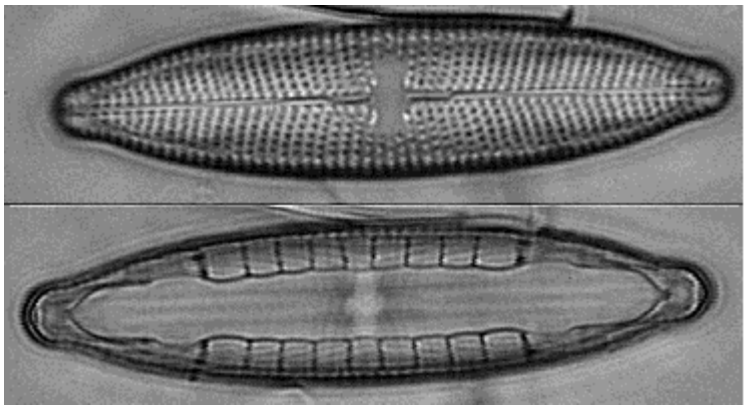

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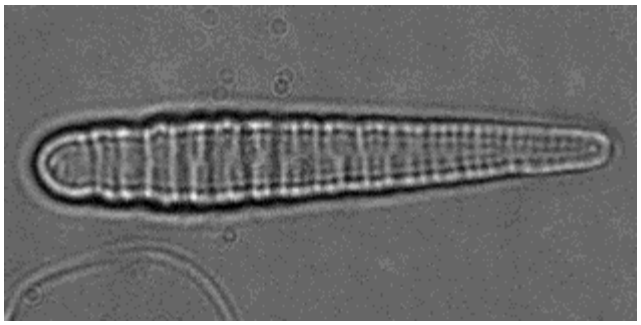

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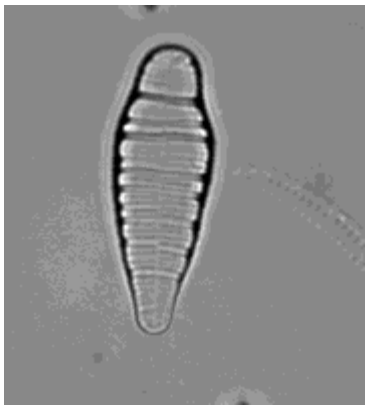

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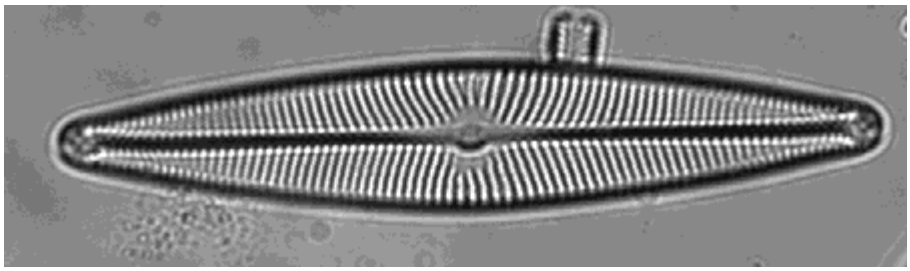

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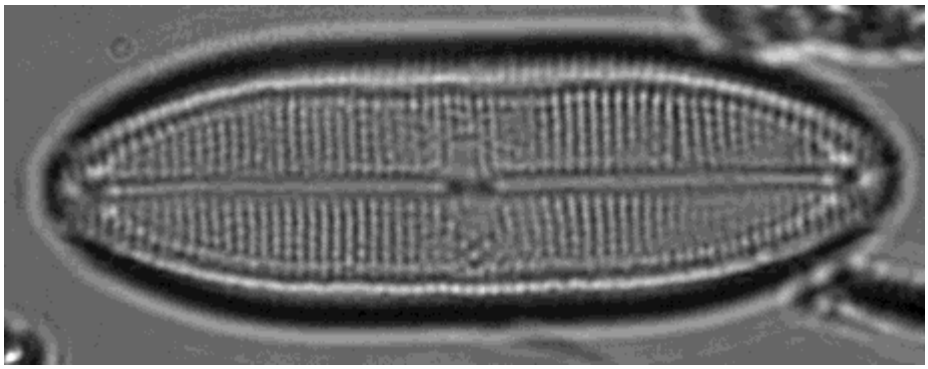

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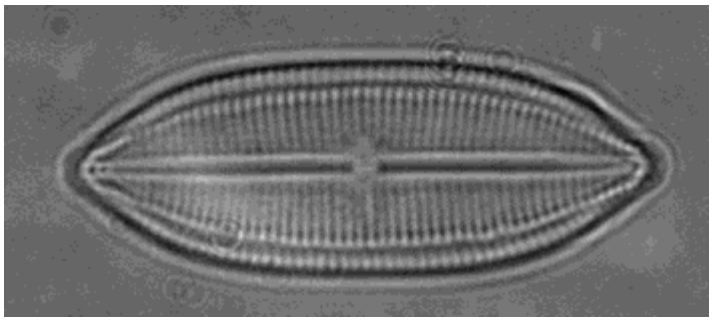

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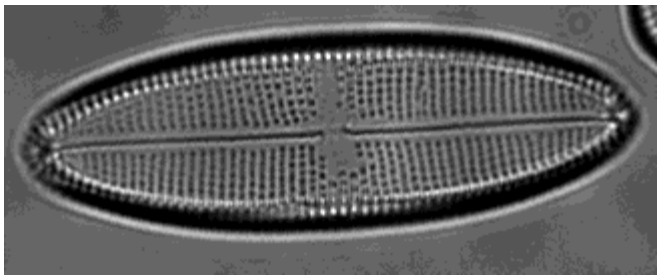

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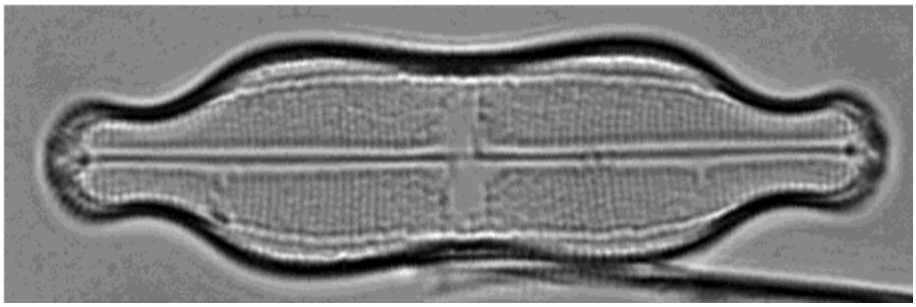

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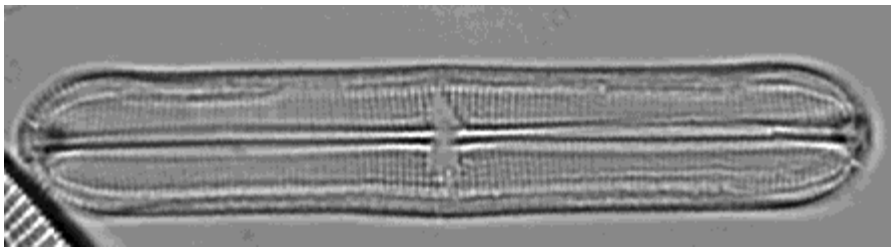

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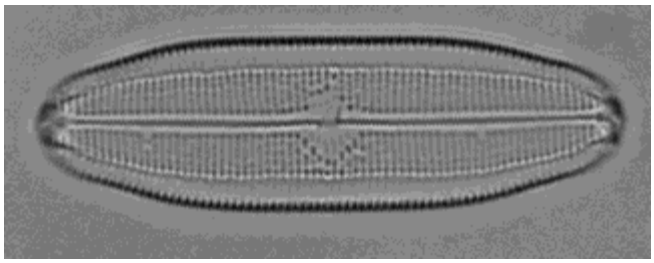

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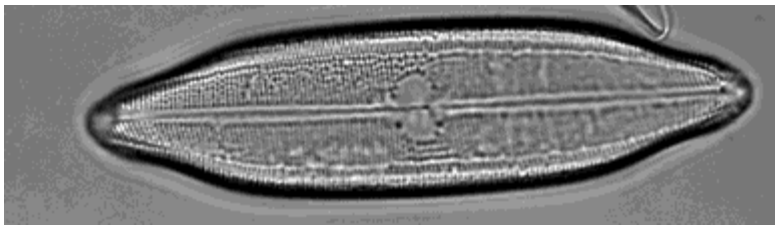

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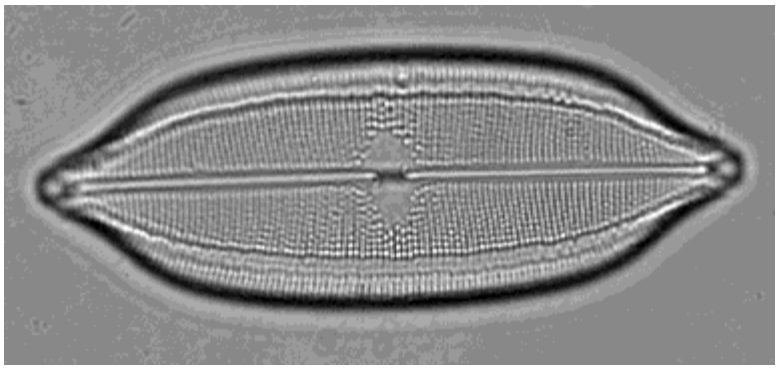

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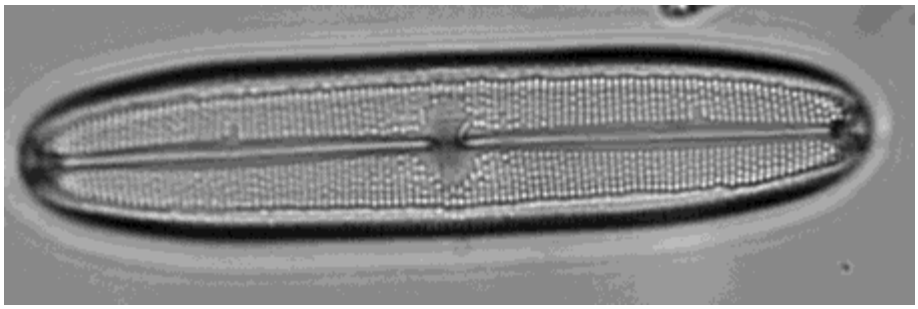

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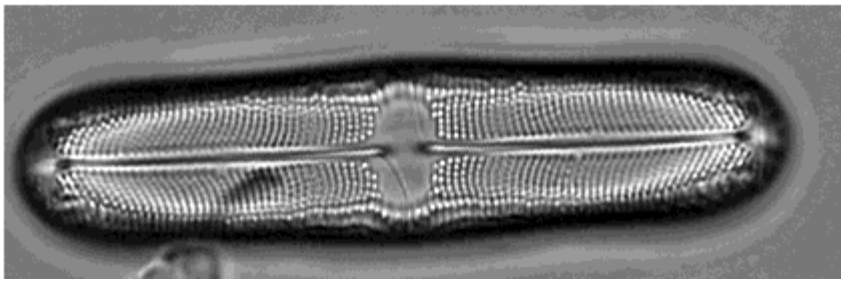

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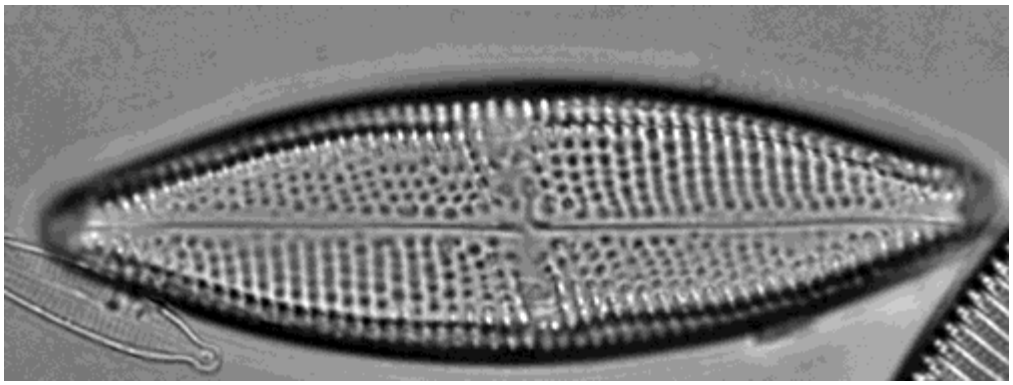

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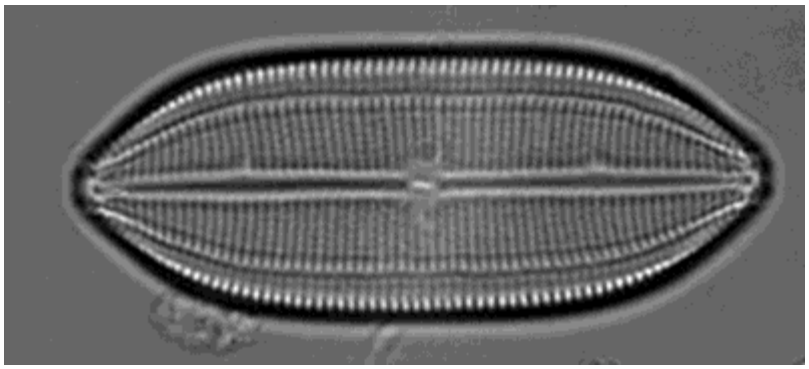

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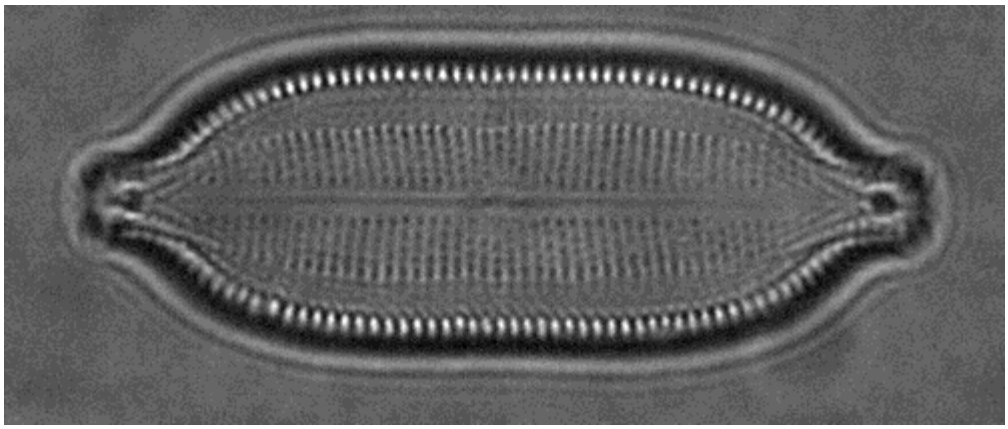

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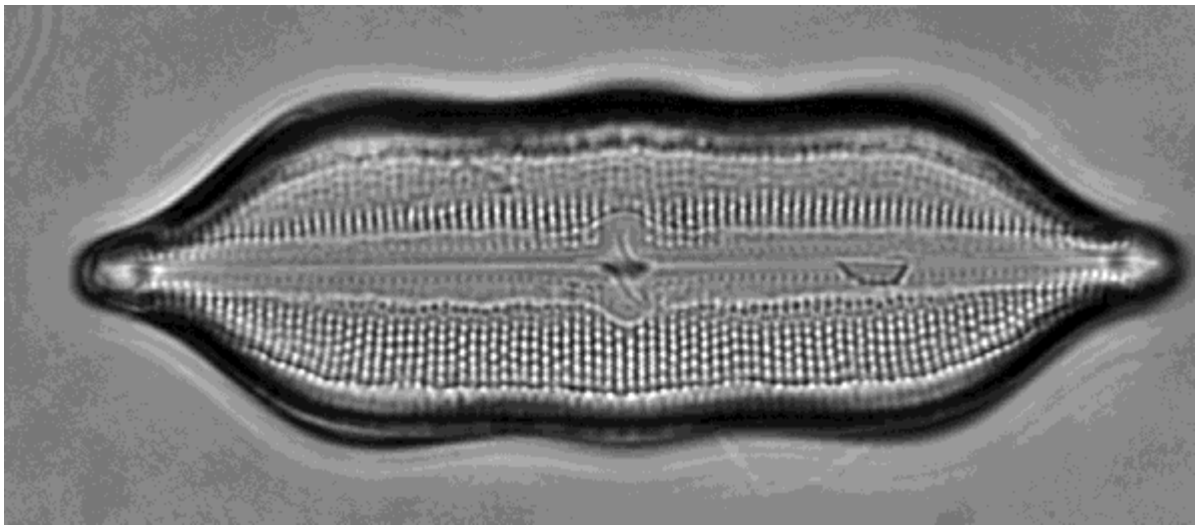

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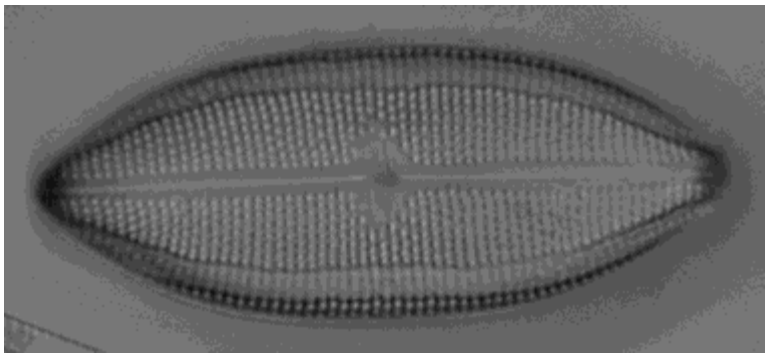

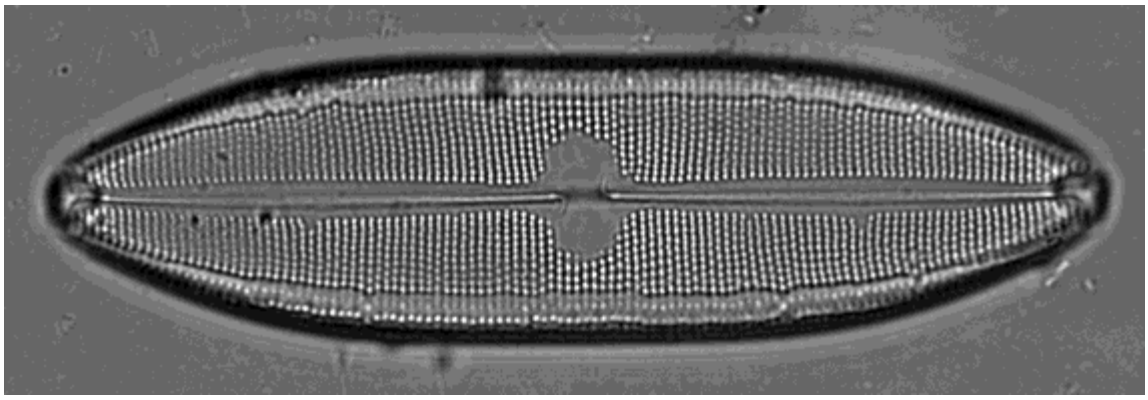

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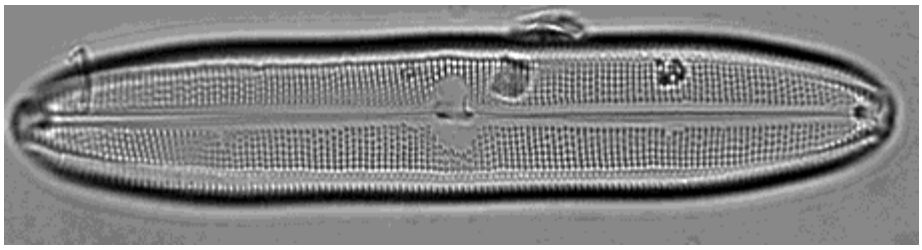

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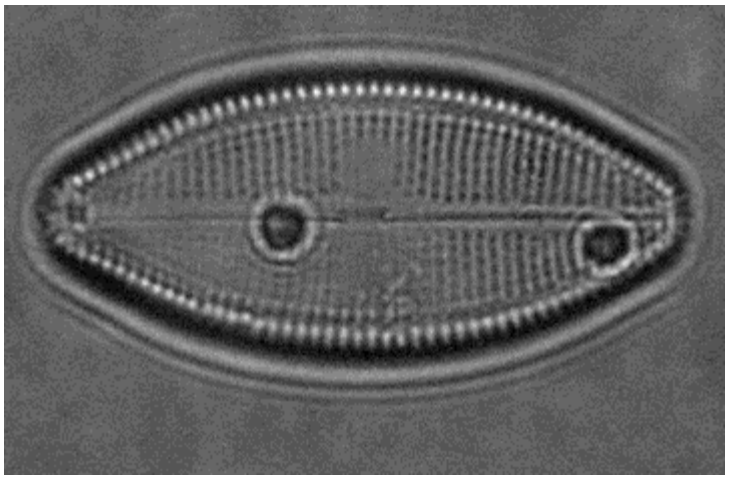

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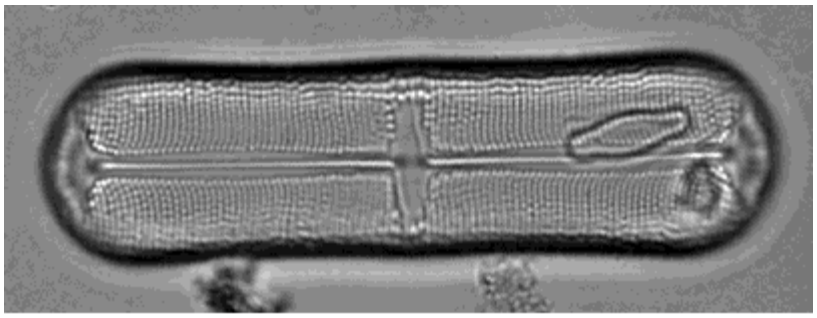

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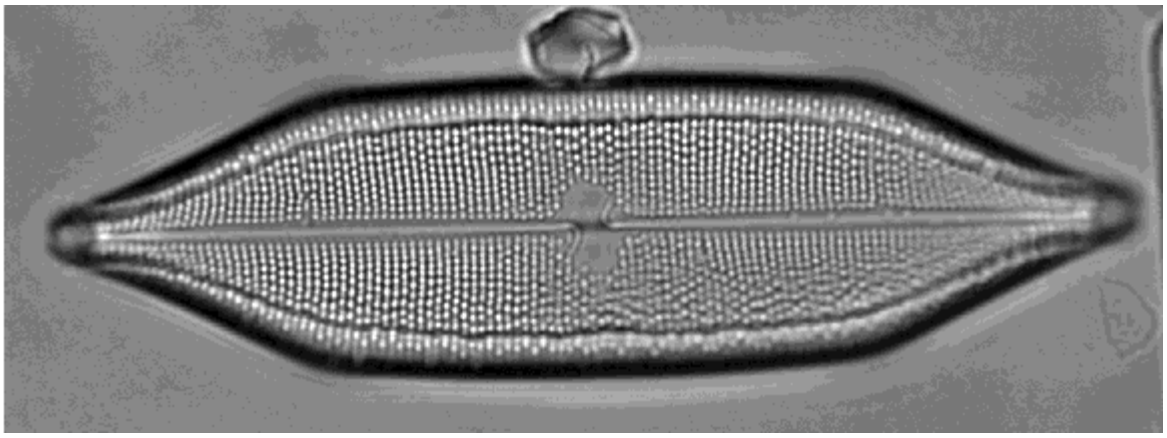

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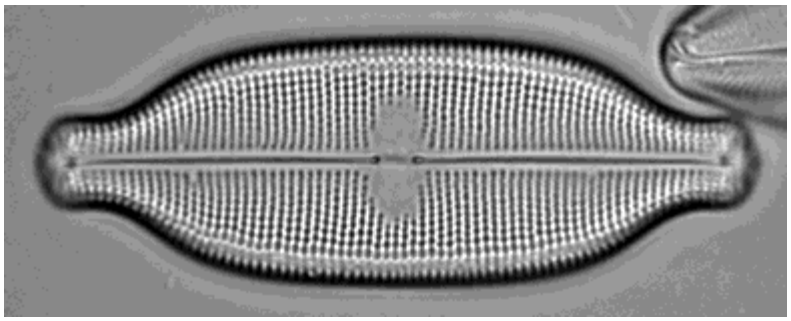

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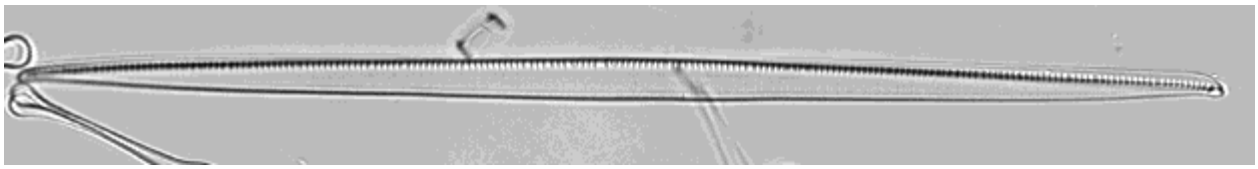

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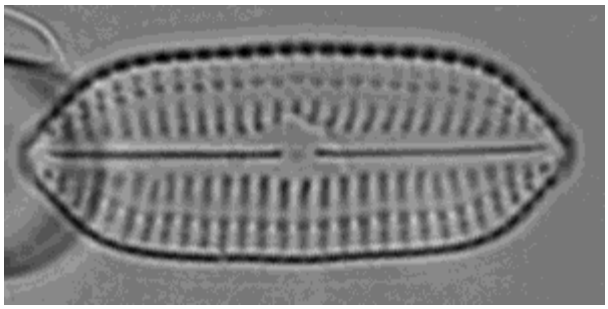

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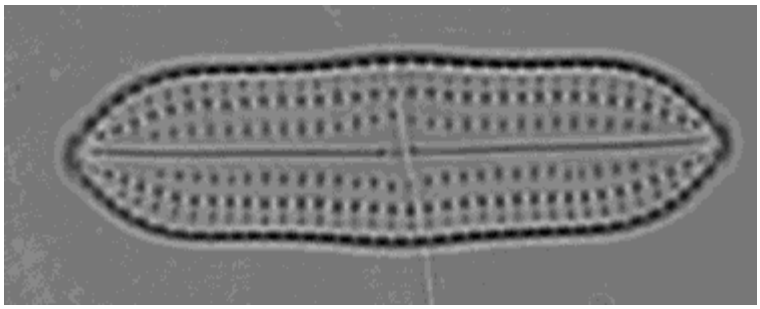
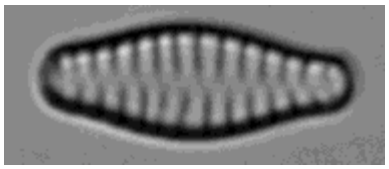
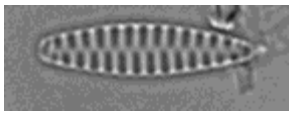


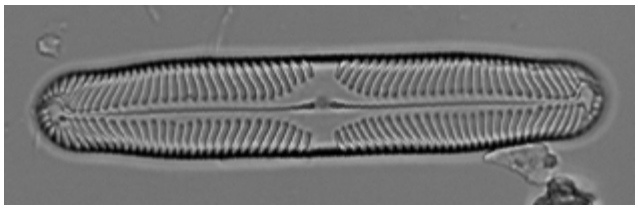
Opephorasp21240.gif 190×80 pixels



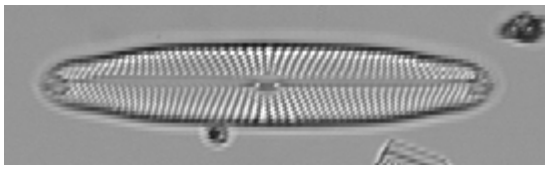
Opephorasp31565.gif 142×53 pixels



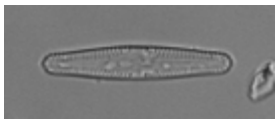
PinnulariaspONE1.gif 315×100 pixels



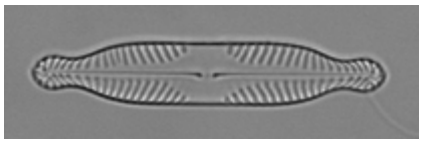
PinnulariaSp21.gif 270×80 pixels



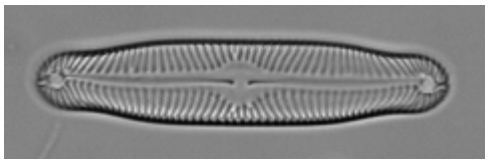
PinnulariaSpFIVE.gif 135×57 pixels



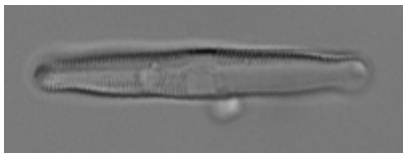
PinnulariaSpSIX1.gif 207×67 pixels



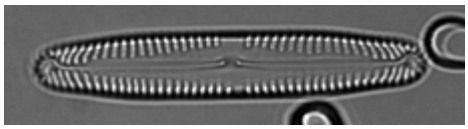
PinnulariaSpSEVEN1.gif 240×77 pixels



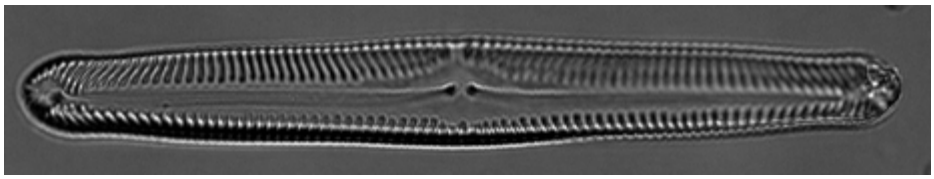
PinnulariaSpEIGHT1.gif 199×74 pixels



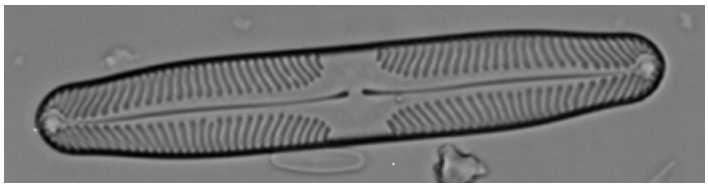
Pinnulariasp91.gif 230×60 pixels



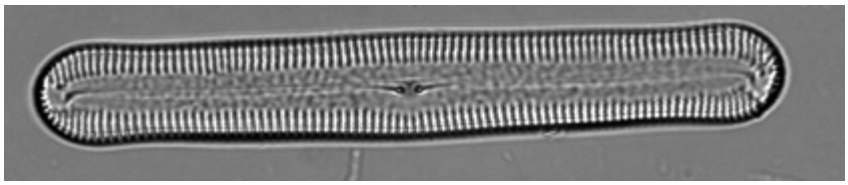
Pinnulariaabaujensis.gif 463×85 pixels



Pinnulariaabaujensisrost.gif 350×89 pixels

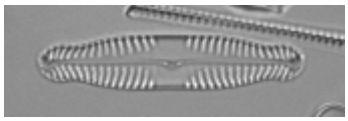


Pinnulariaacrosphaeria.gif 420×88 pixels



PinnulariaAff1.gif 170×55 pixels

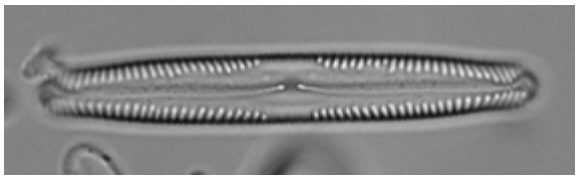
Pinnulariabicepspeter1.gif 170×56 pixels



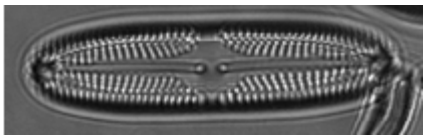
Pinnulariaborealis.gif 170×60 pixels

Pinnulariabrandelii.gif 285×55 pixels

Pinnulariabrauniiamphice1.gif 285×85 pixels

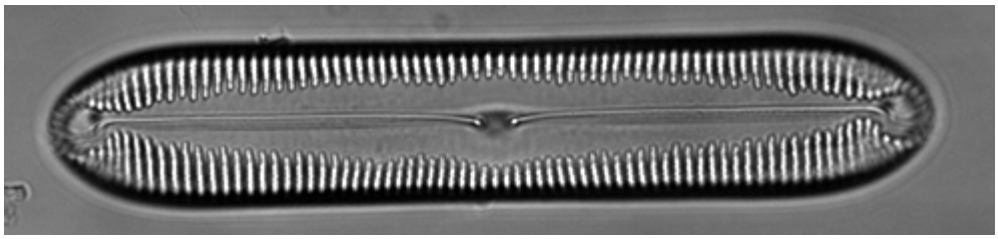


Pinnulariabrebissonii.gif 210×65 pixels

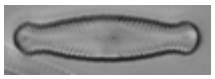


Pinnulariabrebissoniidimin1.gif 175×62 pixels

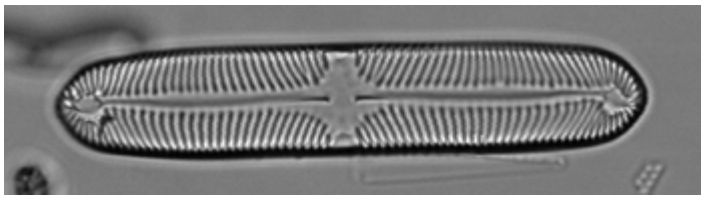
Pinnulariabrevicostata.gif 495×115 pixels



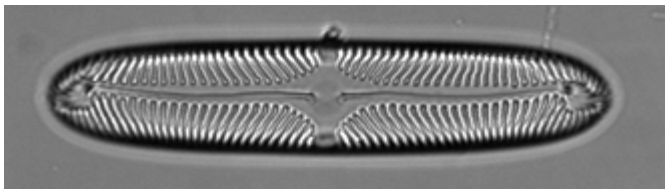
Pinnulariaburkii1.gif 103×35 pixels

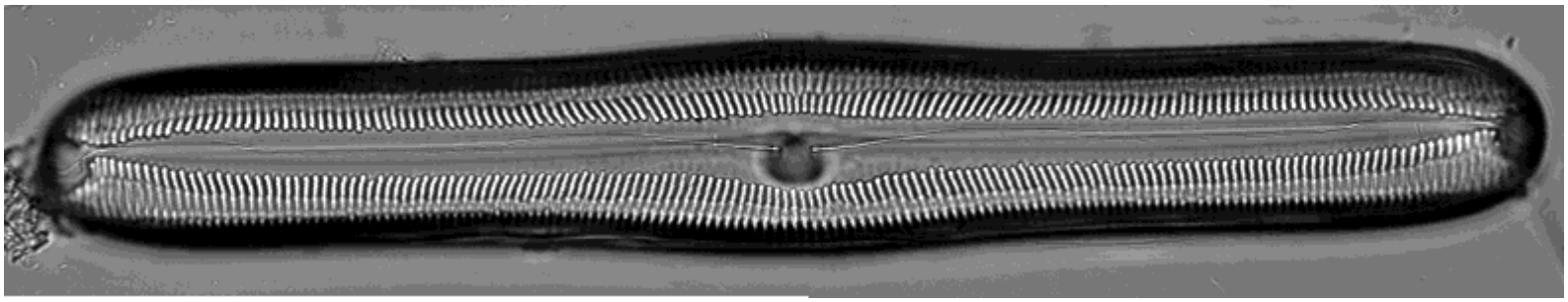


Pinnulariadivergensbacil1.gif 348×95 pixels

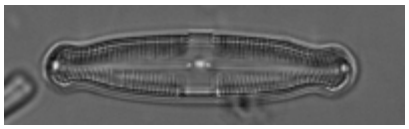


Pinnulariadivergensellip1.gif 330×92 pixels





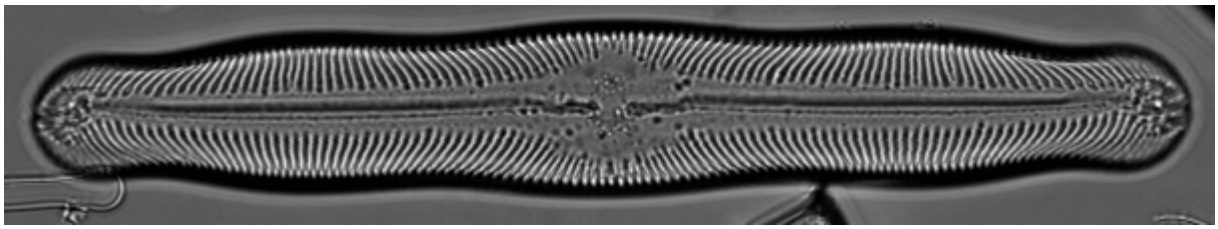
Pinnulariaglobiceps.gif 200×60 pixels



Pinnulariaglobicepskrockii1.gif 154×50 pixels

Pinnulariaintermedia1.gif 152×61 pixels

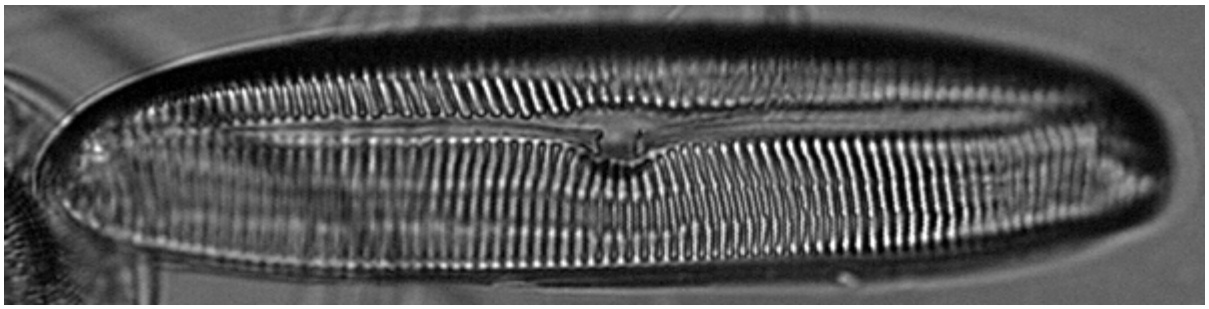
Pinnularialegumen.gif 605×110 pixels



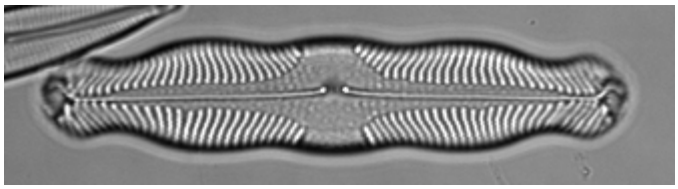
Pinnularialeptosoma1.gif 152×47 pixels

Pinnularialeptosomaenl1.gif 150×55 pixels

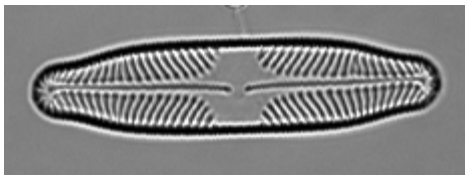
Pinnulariamajor.gif 600×150 pixels



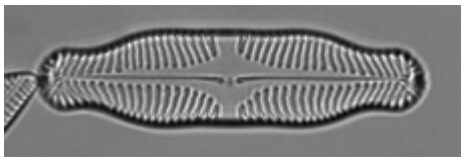
Pinnulariamesolepta.gif 335×90 pixels



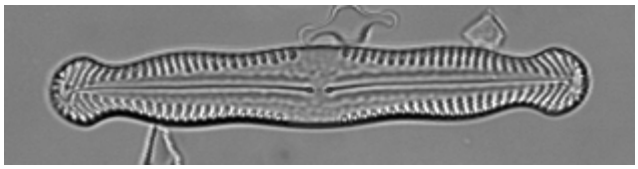
Pinnulariamicrostauron.gif 230×85 pixels



Pinnulariamicrostauronbinn1.gif 228×76 pixels

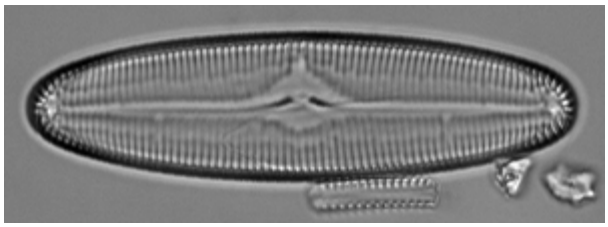


Pinnularianodosa1.gif 315×80 pixels

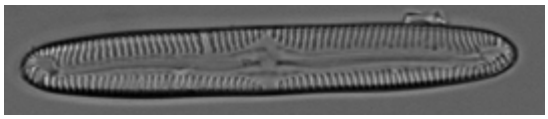


Pinnulariaobscura1.gif 163×59 pixels

Pinnulariasemicruciata1.gif 300×109 pixels

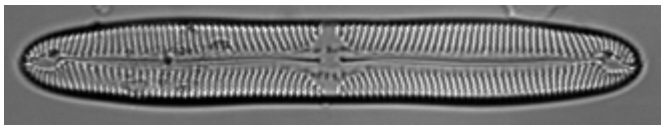


Pinnulariastomatophora1.gif 270×55 pixels

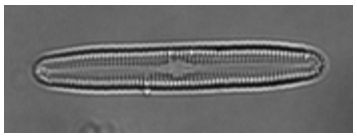


Pinnulariasubrostrata1.gif 196×64 pixels

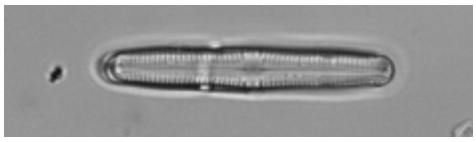
Pinnulariasubstomatophora.gif 328×60 pixels



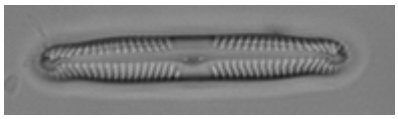
Pinnulariatenuis1.gif 174×64 pixels



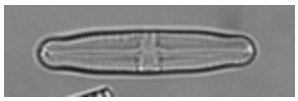
Pinnulariatenuisinterrup1.gif 234×66 pixels



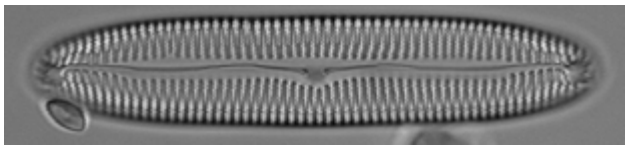
Pinnulariatermitina1.gif 195×55 pixels



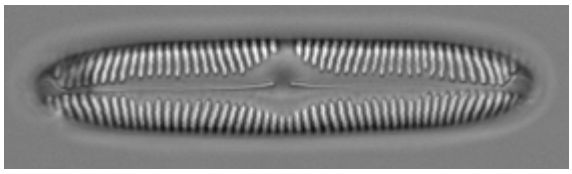
Pinnulariaundulatasubund1.gif 145×46 pixels



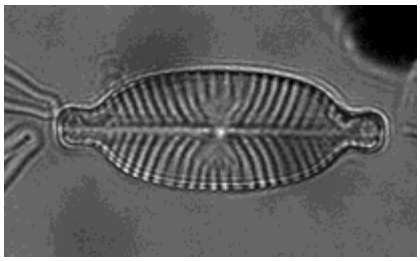
Pinnulariaviridis.gif 310×70 pixels



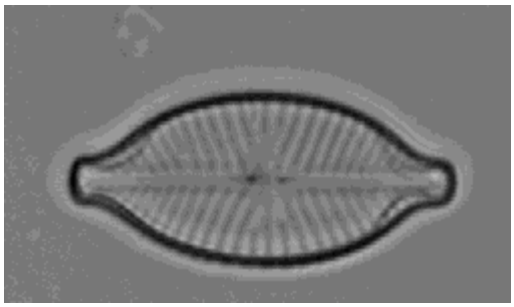
Pinnulariaviridiscommutata1.gif 282×82 pixels



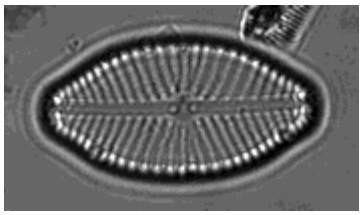
Placoneiselginesvlata1788.gif 206×126 pixels



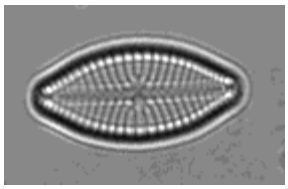
Placoneisexiguavacpita152.gif 253×149 pixels



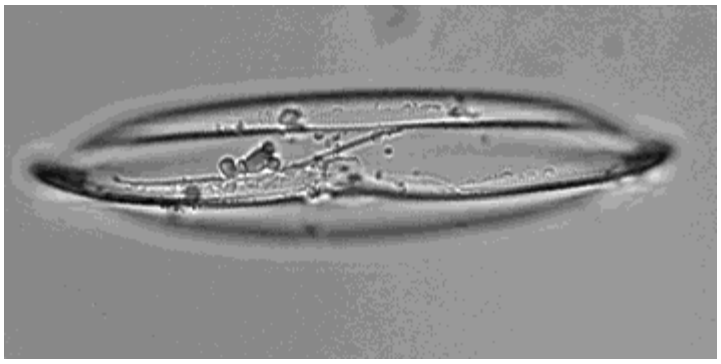
Placoneisgastrum813.gif 177×103 pixels



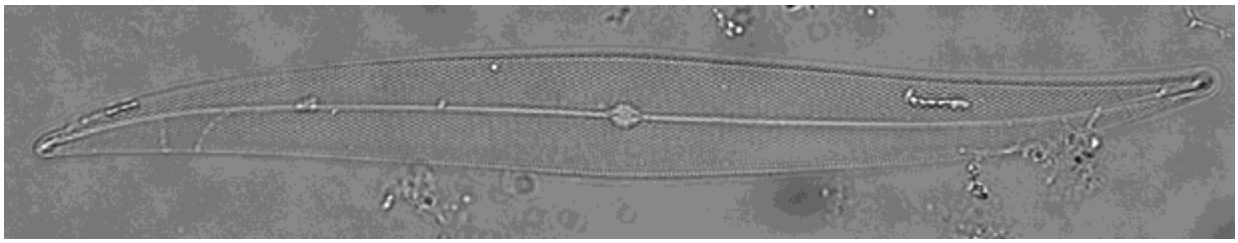
Placoneisgastrumvsign1279.gif 140×90 pixels



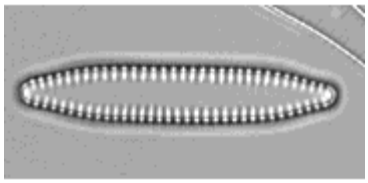
Plagiotropislepidvprob1553.gif 356×177 pixels



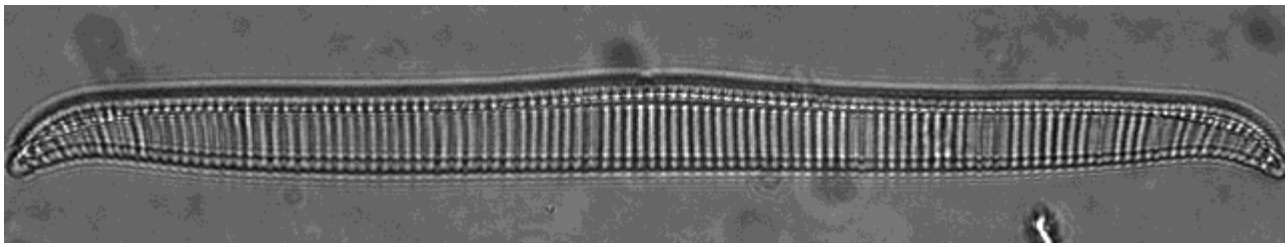
Pleurosigmadelicatulu1159.gif 615×117 pixels



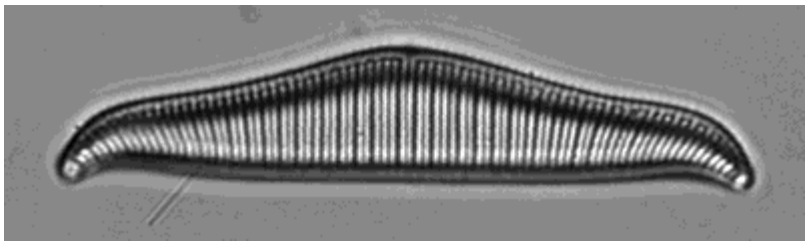
Pseudostaurosirabrevi.gif 180×90 pixels



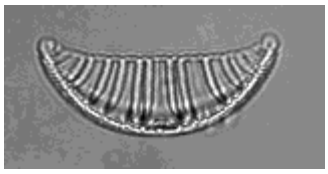
Pseudostaurosirabrevivin.gif 120×40 pixels



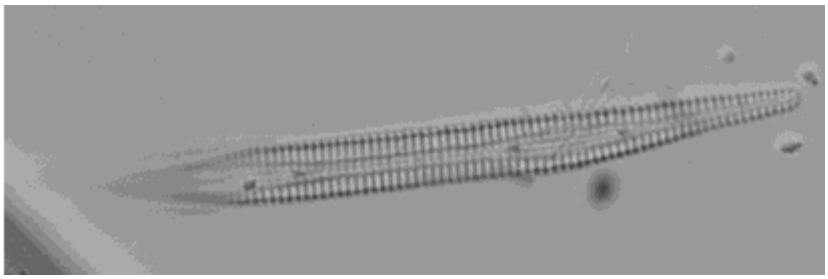
rhopalodia.gibba.v.gif 400×118 pixels



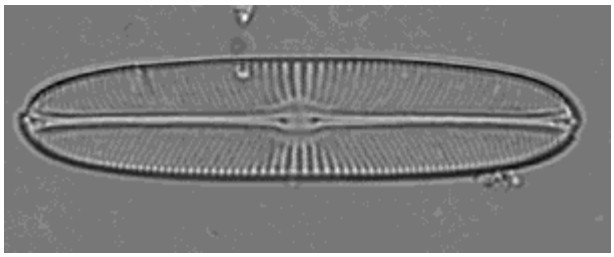
Rhopalodiagibberula1159.gif 160×82 pixels



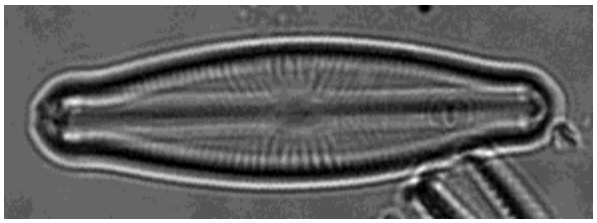
Rouxiacalifornicavmin4.gif 411×135 pixels



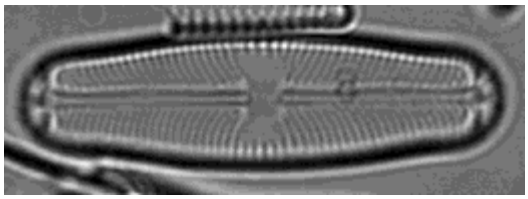
Sellaphorabacillum1175.gif 303×124 pixels



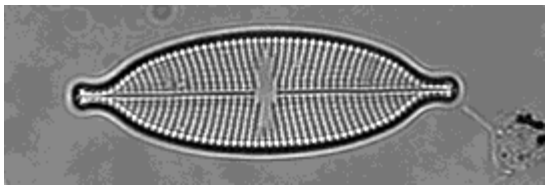
Sellaphorapupula802.gif 294×107 pixels



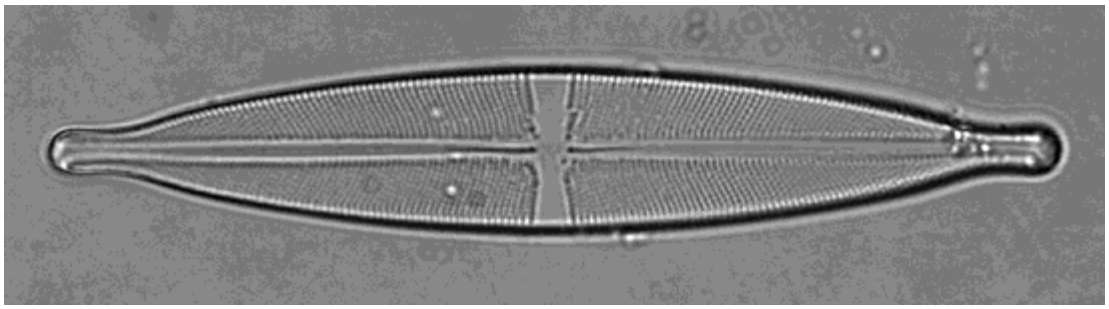
Sellaphorapupulavrect1109a.gif 260×95 pixels



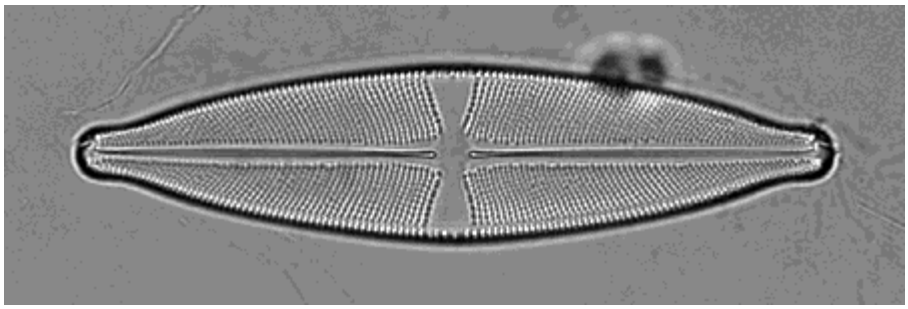
ancepsvamericana.gif 270×90 pixels



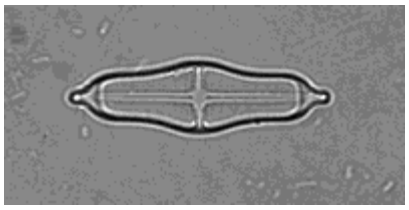
ancepsfgracilis.gif 550×150 pixels



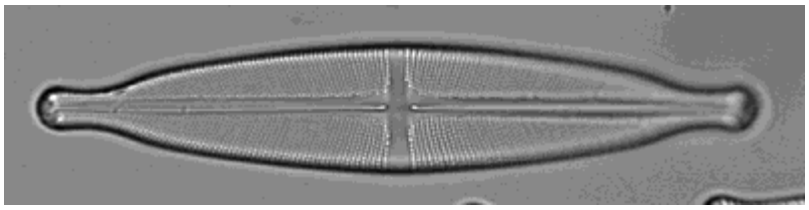
phoenicenteron.gif 450×150 pixels



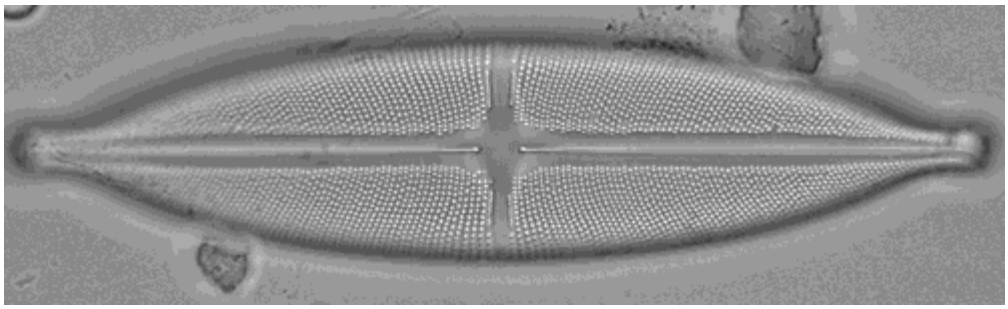
smithii.gif 200×100 pixels



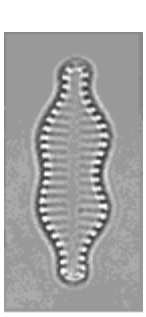
sp1.gif 400×100 pixels



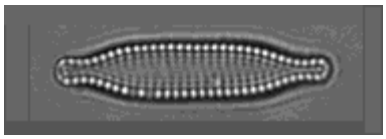
sp3.gif 500×150 pixels



Staurosiraconstruensvbino.gif 69×141 pixels

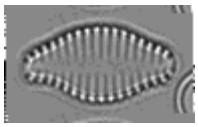


Staurosiraconstruensvcapi.gif 189×65 pixels

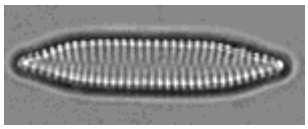


Staurosiraconstruensvmin.gif 80×60 pixels

Staurosiraconstruensvpumi.gif 95×59 pixels

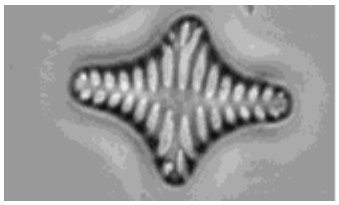


Staurosiraconstruevsubsal.gif 150×60 pixels

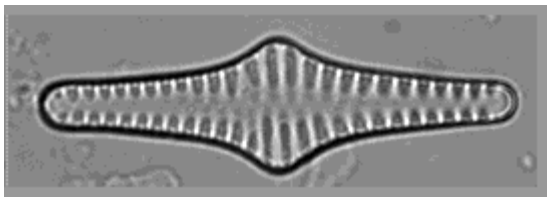


Staurosiraconstruensvvent.gif 76×56 pixels

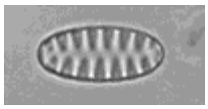
Staurosirellalepto.gif 166×98 pixels



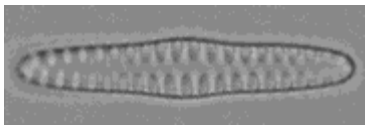
Staurosirleptostauronvf1.gif 271×96 pixels



Staurosirellapinnata.gif 100×50 pixels

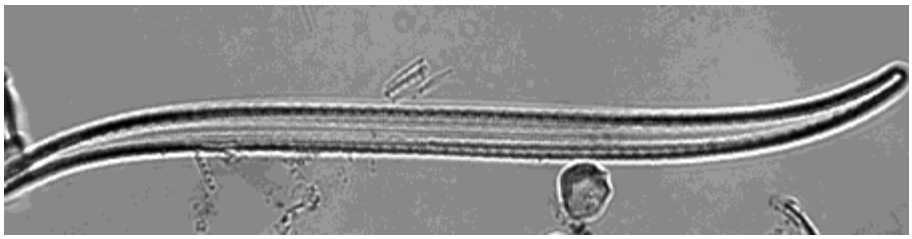


StaurosirellapinnVinte.gif 180×60 pixels

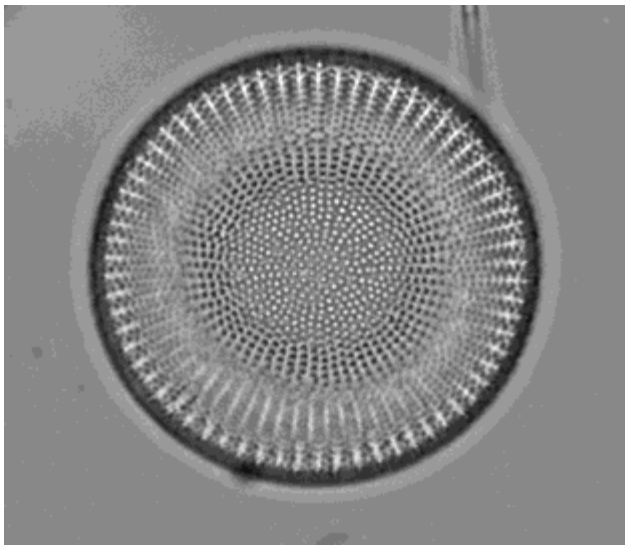


spinnatavlancettula.gif 67×51 pixels

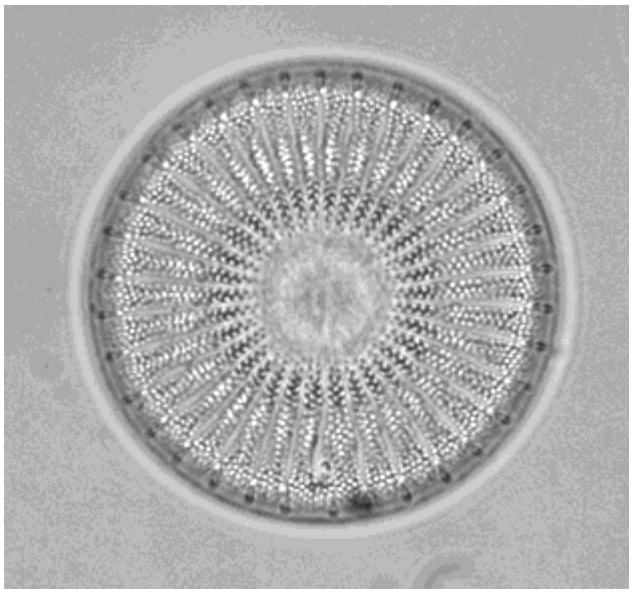
Stenopterobiaintermedc-17.gif 452×115 pixels



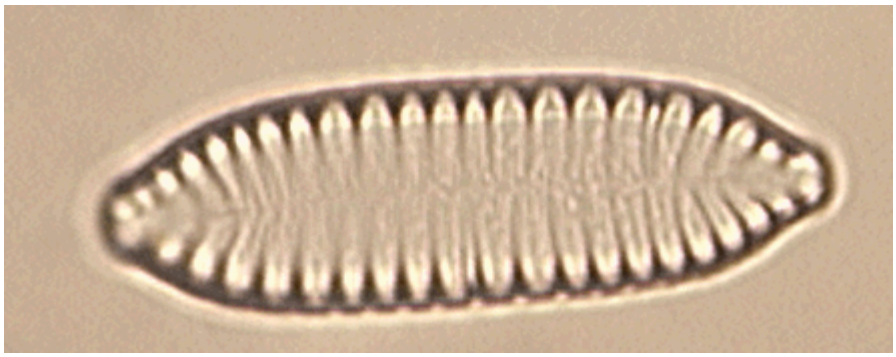
Stephalpinus1189-1.1.gif 310×270 pixels

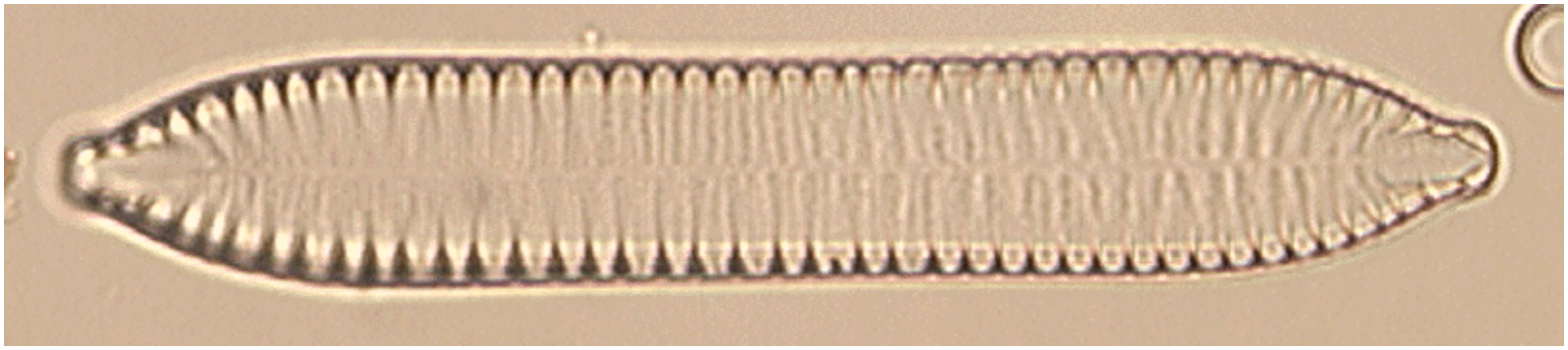


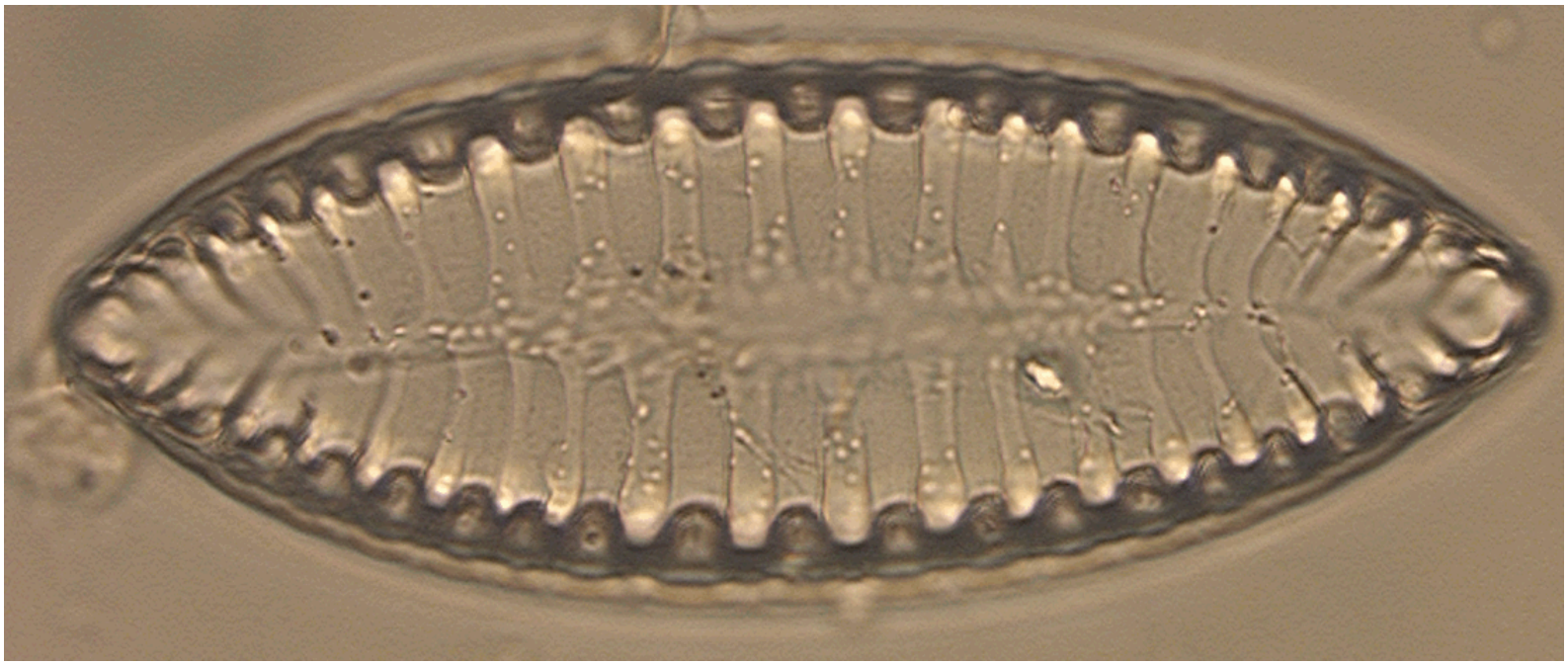
Stephtransi1189-1.1.gif 312×292 pixels

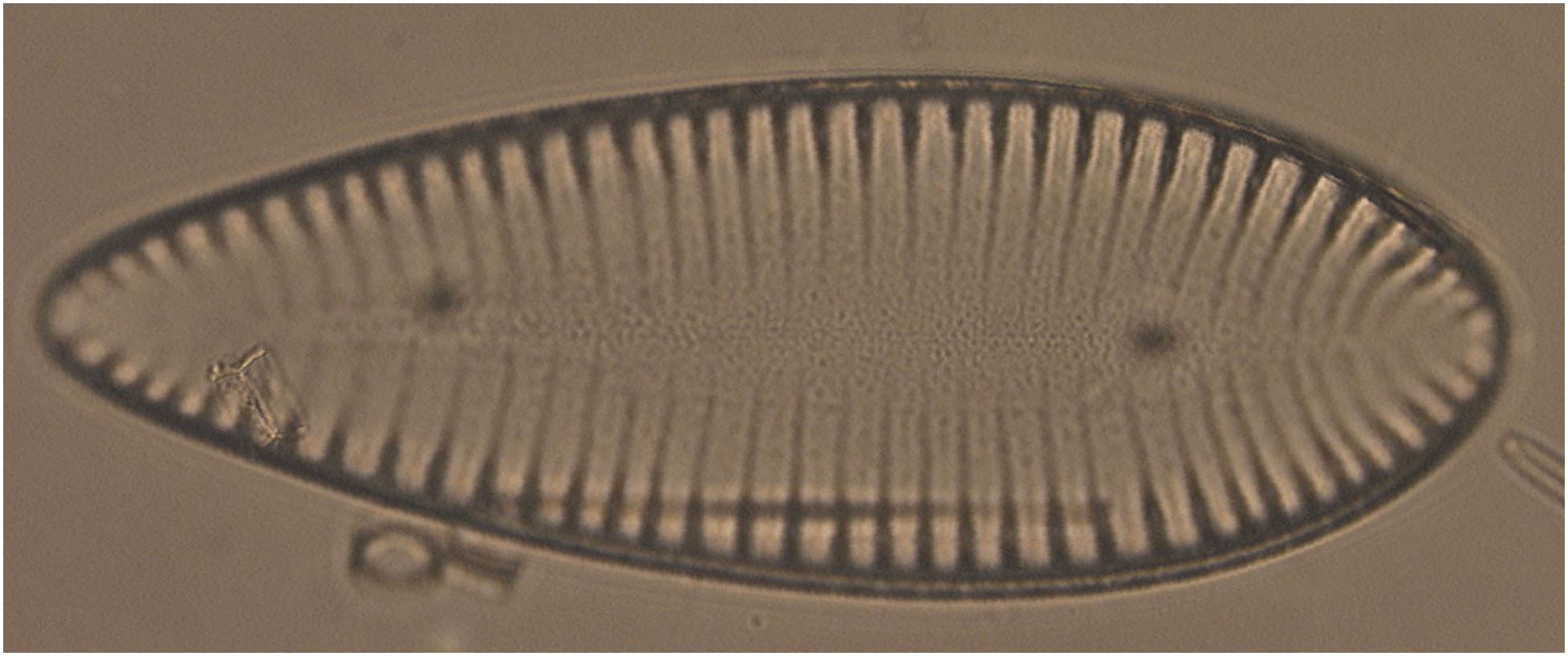


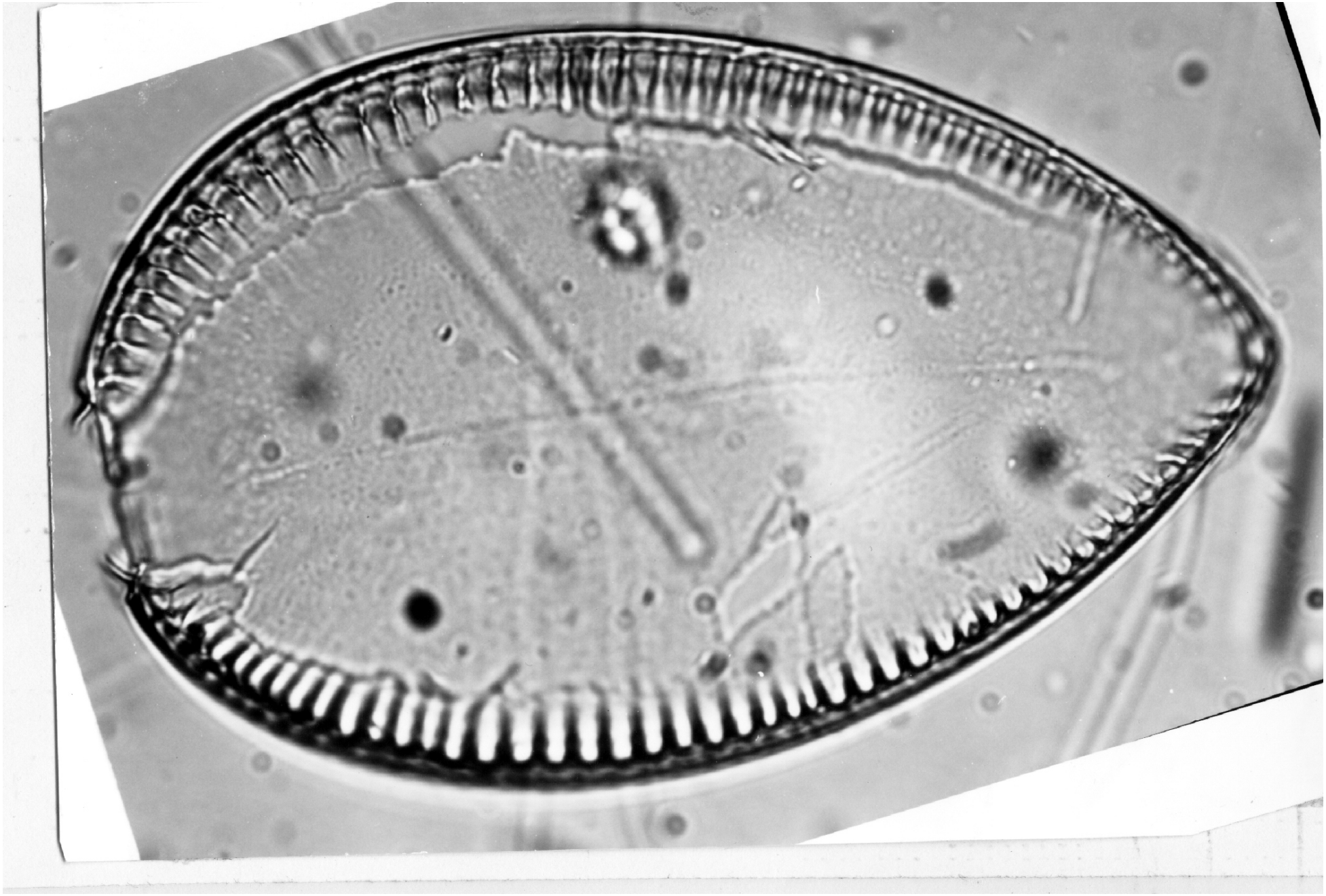
Surang2.gif 444×174 pixels



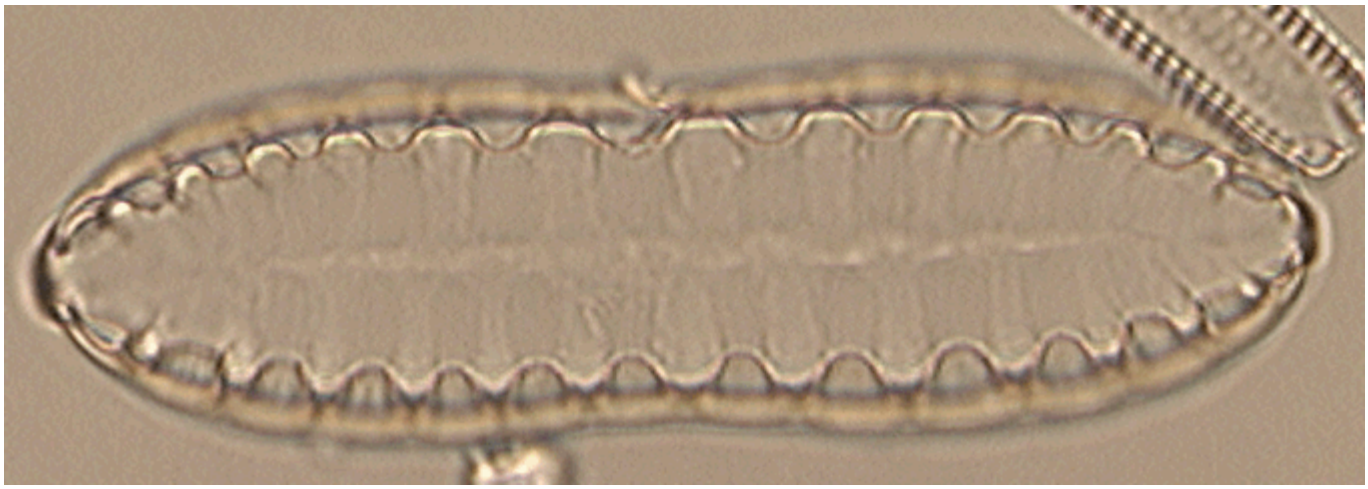




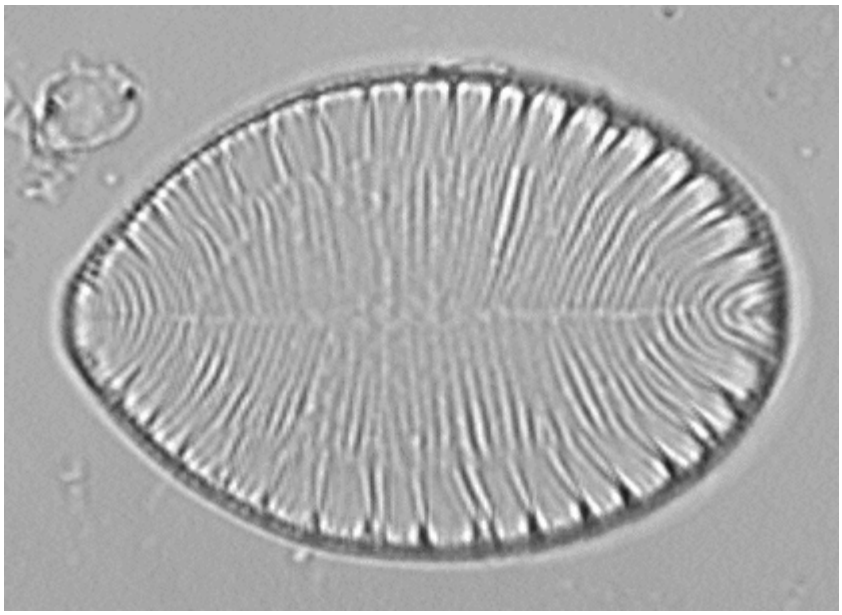




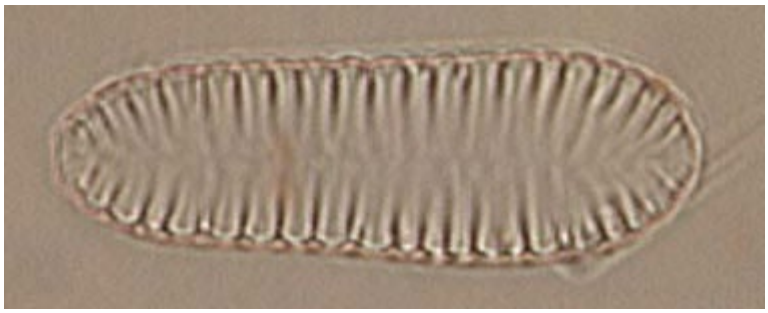
Surlinvconcbox.gif 680×240 pixels

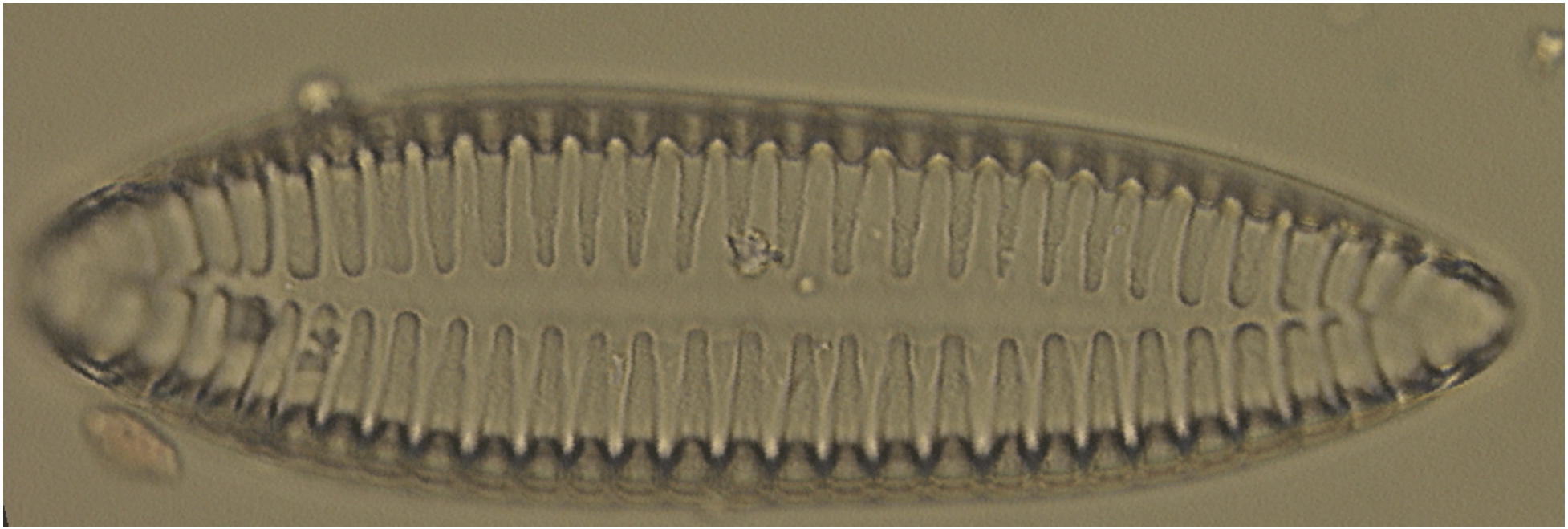


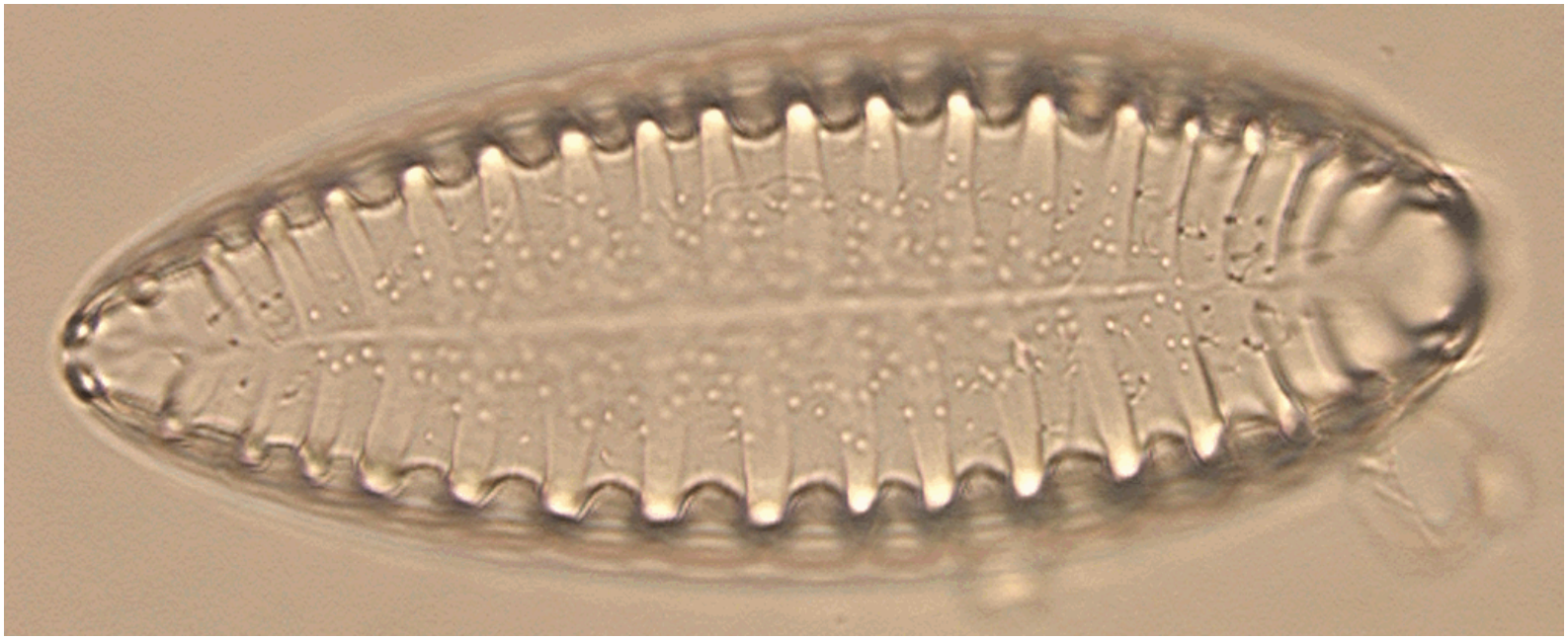
Surovcbox.gif 417×303 pixels



Surovvpincbox.gif 380×152 pixels



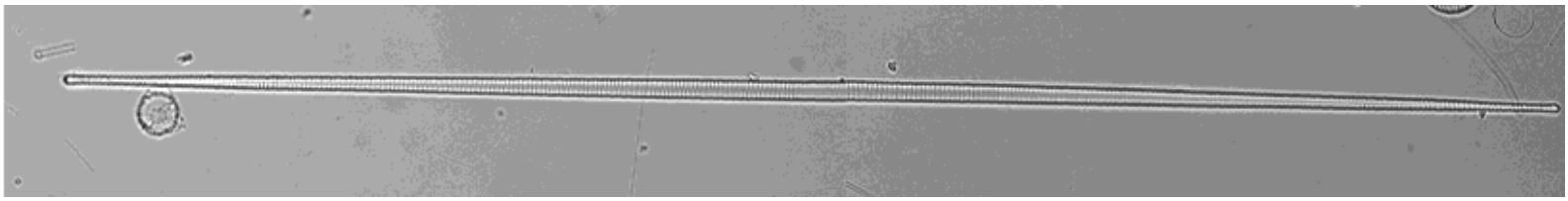




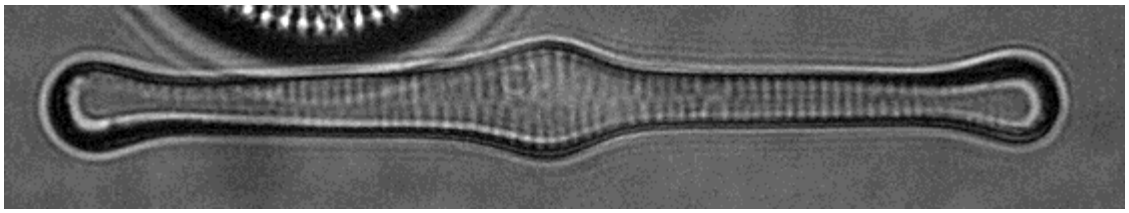
Surirellasuecicabf.gif 607×309 pixels

Synedradelicatissimvang84.gif 600×42 pixels

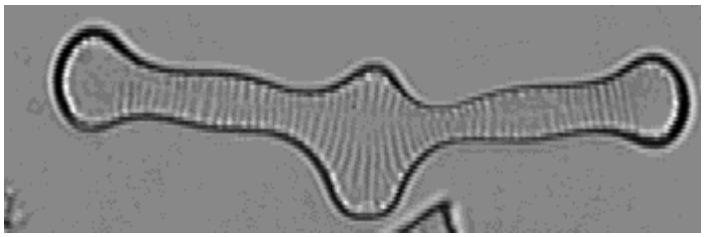
Synedraulnavlongiss15240x.gif 815×100 pixels



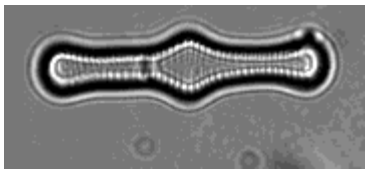
Tabellariafenestrata804.gif 560×102 pixels

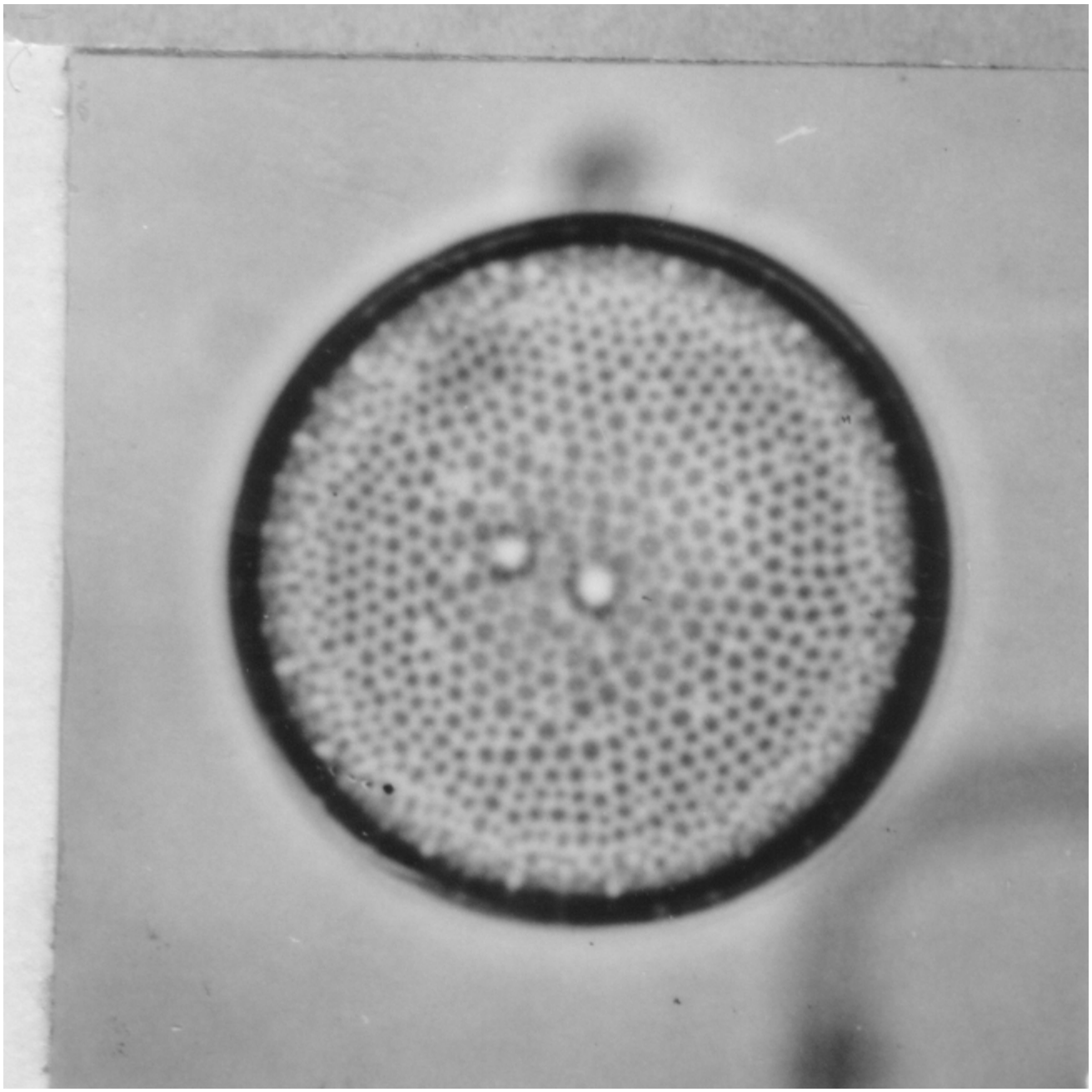


Tito2-pict.gif 348×114 pixels

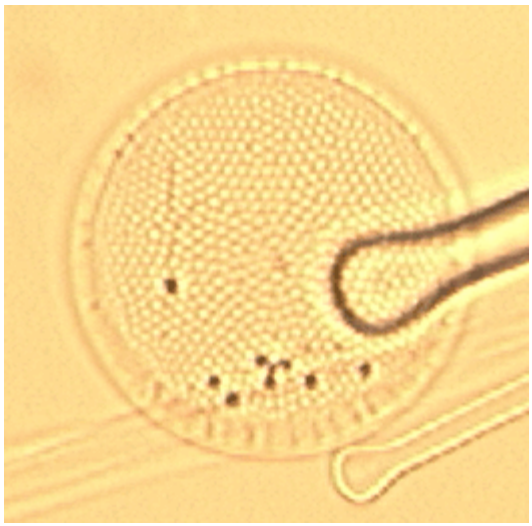


Tabellariaflocculosa1226.gif 180×82 pixels

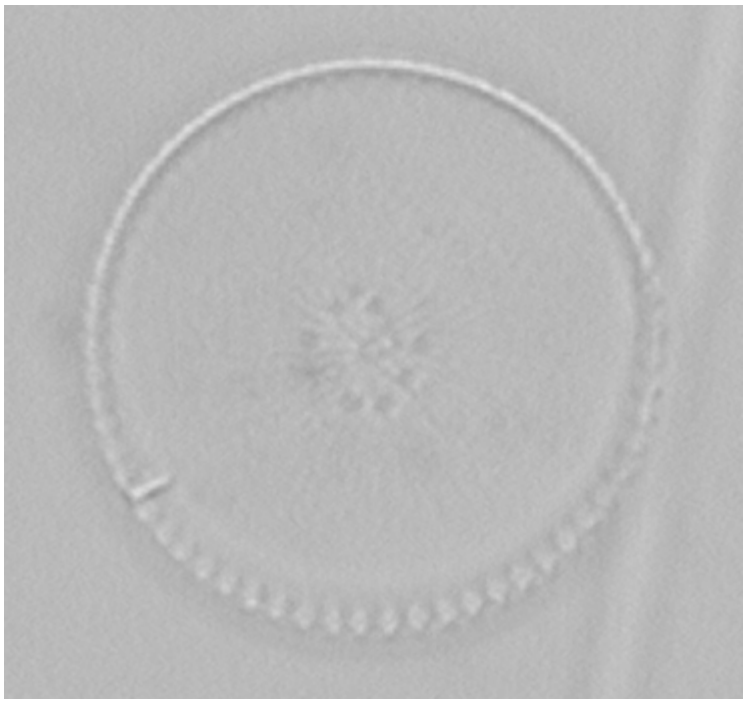




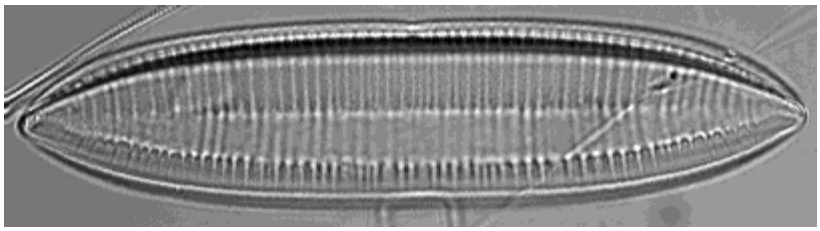
Thalassiosira1.gif 262×259 pixels



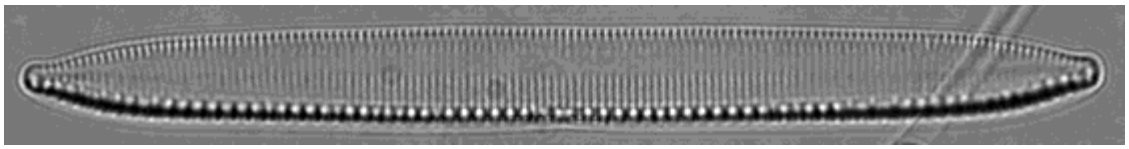
thalweis1.gif 369×347 pixels



Tryblionella1552-1a.gif 406×111 pixels



Tryblionellahungar1a.gif 560×70 pixels



Tryblionellalevi2a.gif 460×125 pixels