(8)

# THE BIOLOGY OF THE ISOPODA OF THE REGION OF DOUGLAS LAKE, MICHIGAN (CONTINUATION)

Submitted by:

Stephen P. Hatchett

August 16, 1940

# THE BIOLOGY OF THE ISOPODA OF THE REGION OF DOUGLAS LAKE, MICHIGAN (CONTINUATION)

## General Statement of the Problem:

During the summer of 1938 this study was begun; it was continued during the summer of 1939 and during the present summer of 1940 further work was done on it. This summer there were three primary phases of the study; continuation of collections of local species; size distribution studies made weekly on Cylisticus convexus collected in a definite region; and rearing experiments of certain terrestrial species to determine length of life, number of young, molting, etc. Aquatic Isopods were also reared, and migration studies of terrestrials were also attempted.

## Local Species:

There were 7 different species collected this summer. These are two aquatic species; Asellus communis Say and Mancasellus tenax(Smith), and five terrestrial species; Cylisticus convexus (De Geer), Porcellio scaber Latreille, Porcellio spincicornis Say, Oniscus asellus Linnaeus, and Tracheoniscus rathkei(Brandt).

## Collection Localities:

The following species were collected from the following locations:

Asellus communis Say:
- Carp Creek - at its mouth at Burt Lake
- Boat Slip of UBS - Douglas Lake
- Spring along shore of Straits of Mackinac

**Mancasellus tenax (Smith)**
Nigger Creek at the Iron Bridge
Nigger Creek at its mouth at Mullet Lake
Creek ½ mile South of Cheboygan on U.S.#27
Mouth of Maple River at Burt Lake

**Cylisticus convexus (De Geer)**
West shore of S.Fishtail Bay - Douglas Lake
East Shore of Munro Lake
East Shore of Ocqueoc Lake
Station Grounds
Pismyre Island in Lake Michigan
Hat Island in Lake Michigan
Mackinac Island

**Porcellio scaber Latreille**
Station Grounds
Pismyre Island in Lake Michigan
East Shore of Munro Lake
Field East of Munro Lake & North of Weadock Road
Dry ditch east of Iron Bridge over Nigger Creek

**Oniscus asellus Linnaeus**
Mackinac Island

**Tracheoniscus rathkei (Brandt)**
West shore of S. Fishtail Bay - Douglas Lake
Grapevine Point
Mackinac Island
East Shore of Munro Lake
Field east of Munro Lake and North of Weadock Road
Dry ditch East of Iron Bridge over Nigger Creek

Distribution:

To the situations where collections were made in 1939 ( see paper of 1939) should now be added rocky cliffs of limestone, and abandoned houses in open fields. These being the situations were Porcellio spinicornis was found. One specimen was P. Spinicornis was taken from under a plank lying in the [illegible]s on the floor of the second story of an old abandoned house. Several others were taken at the foot of limestone cliffs around Arch Rock, and under rocks around Skull Cave both on Mackinac Island.

Size Distribution:

Over 4,000 specimens of Cylisticus convexus (De Geer) were measured. About 500 per week for an eight week period. The following graphs show the result of these measurements, as well as the graph showing distribution of the lengths of the 4,130 specimens. The mean lengths of each week were plotted and the curve resulted in a comparable one to that obtained last year.

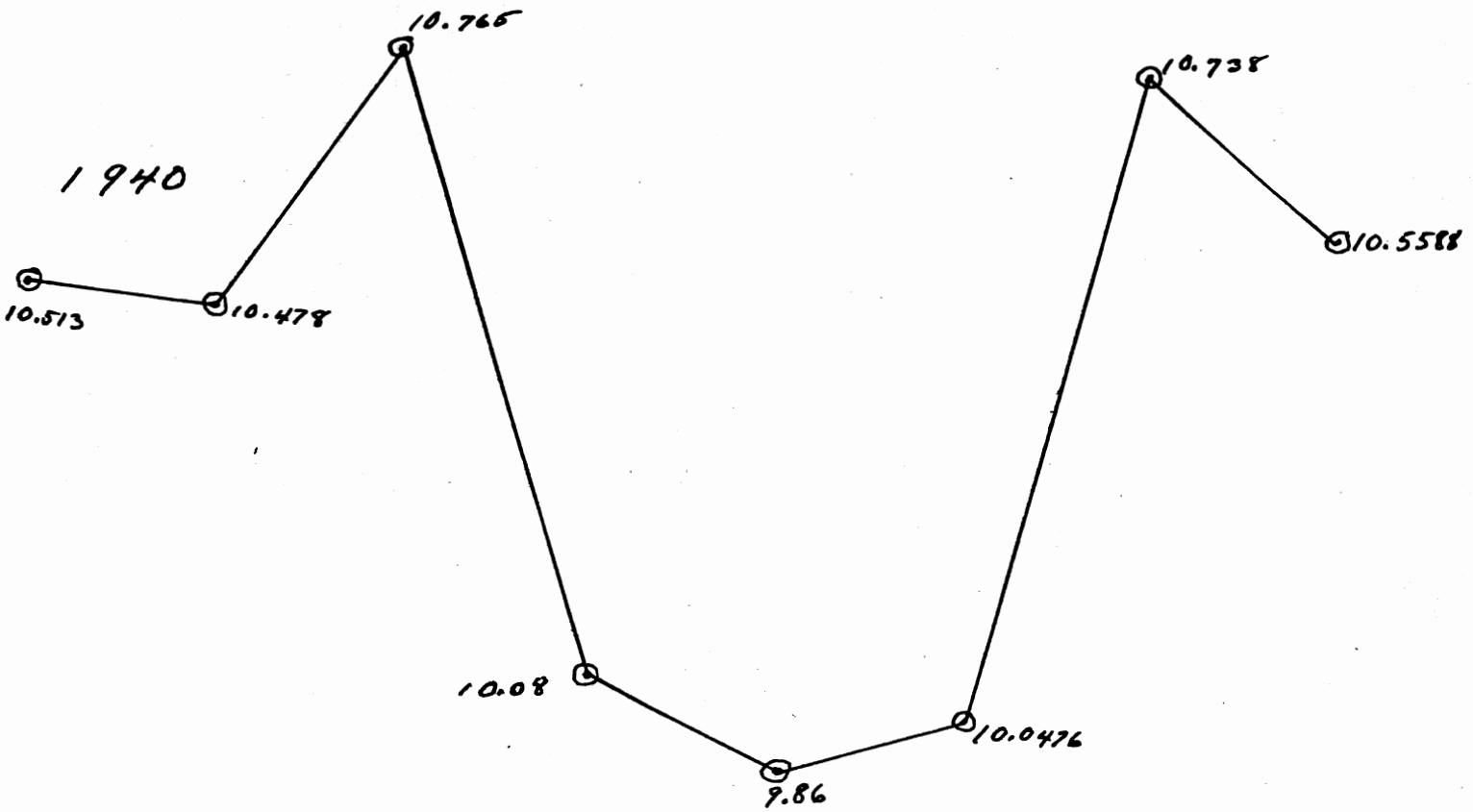
EXPLANATION OF GRAPH I OF PAGE 4

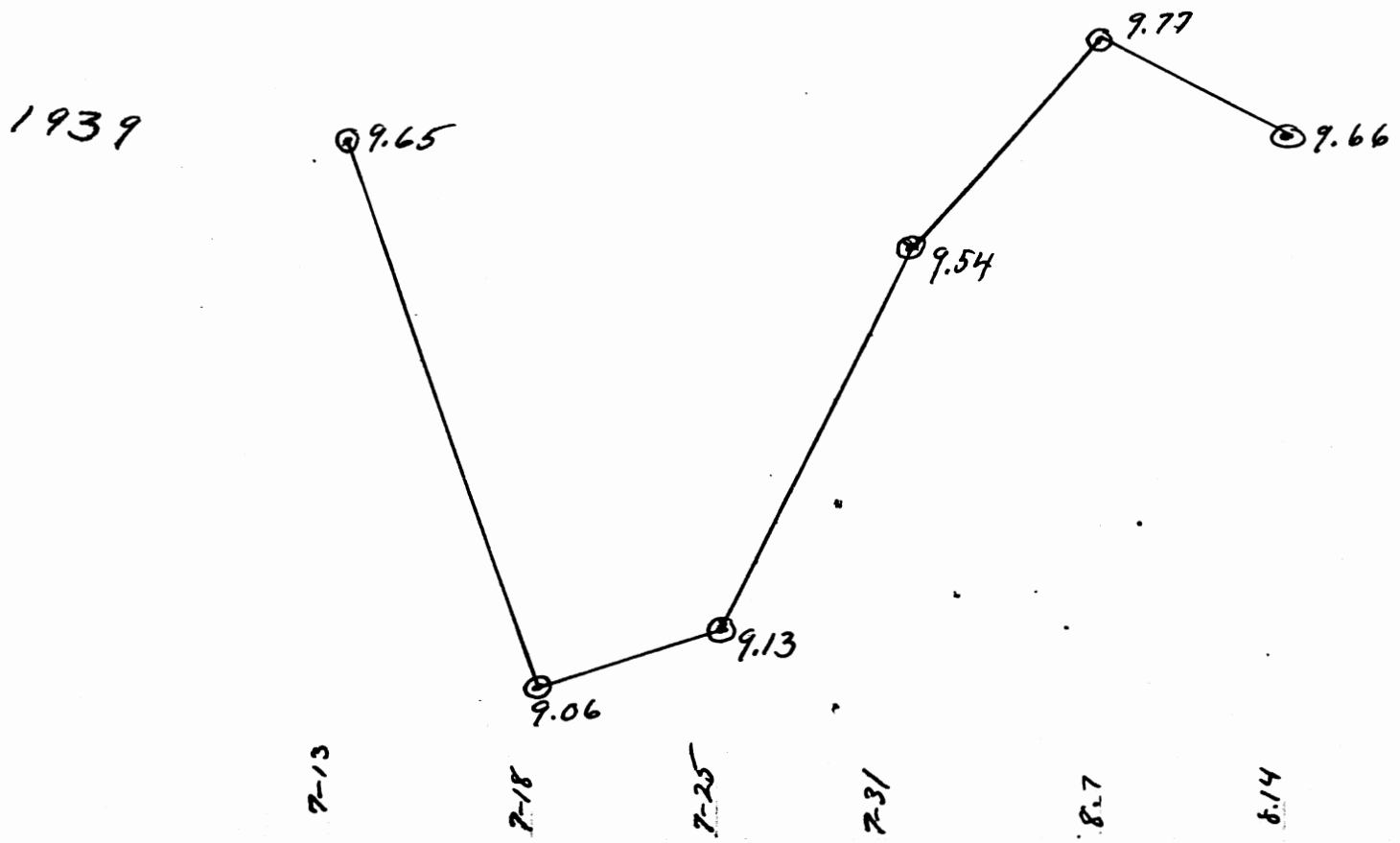
COMPARISON OF MEAN LENGTHS OF CYLISTICUS CONVEXUS (DE GEER)

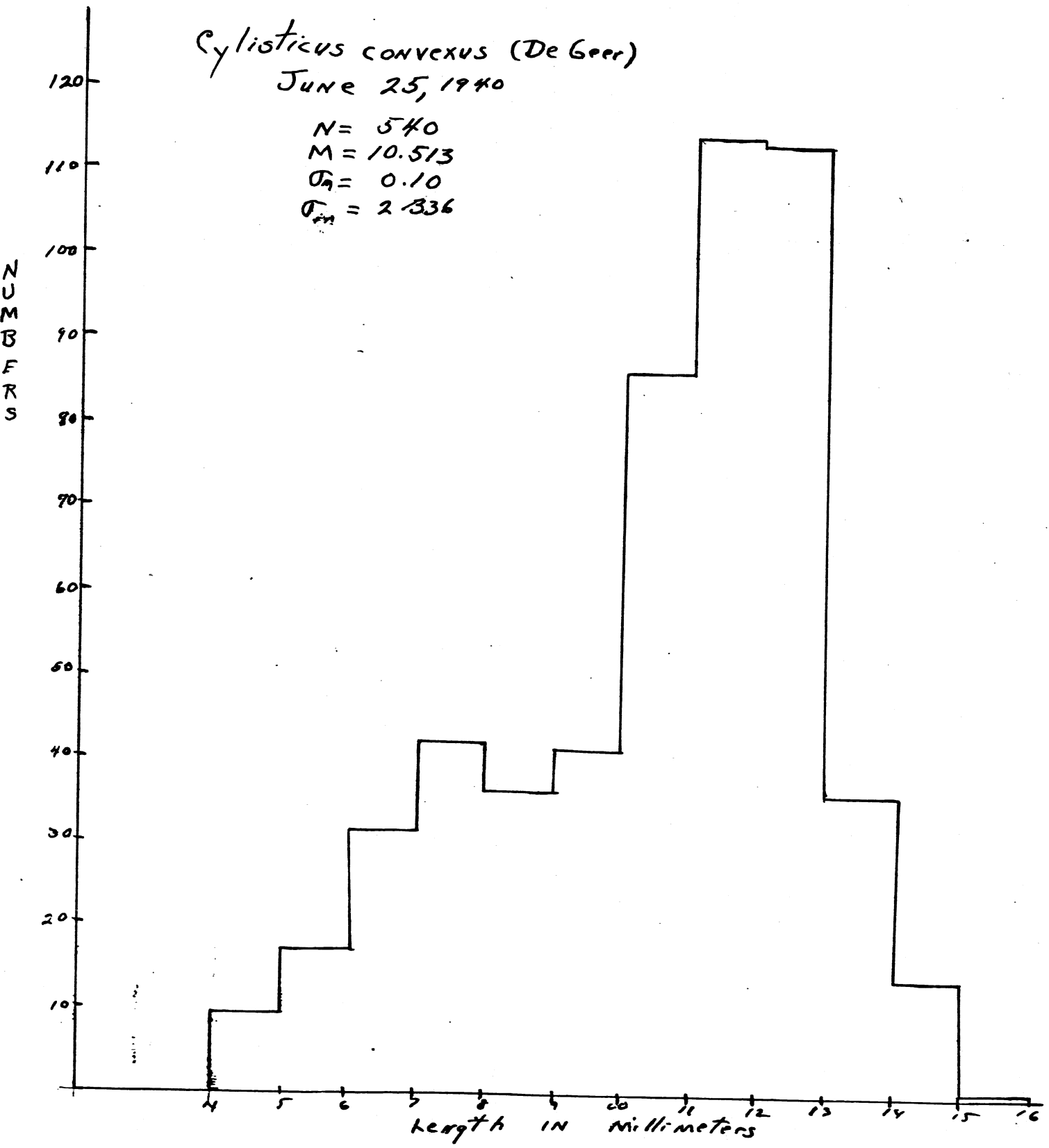
(Taken at weekly intervals from a population along the West shore of the South Fishtail Bay, Douglas Lake. Summers of 1939 and 1940)

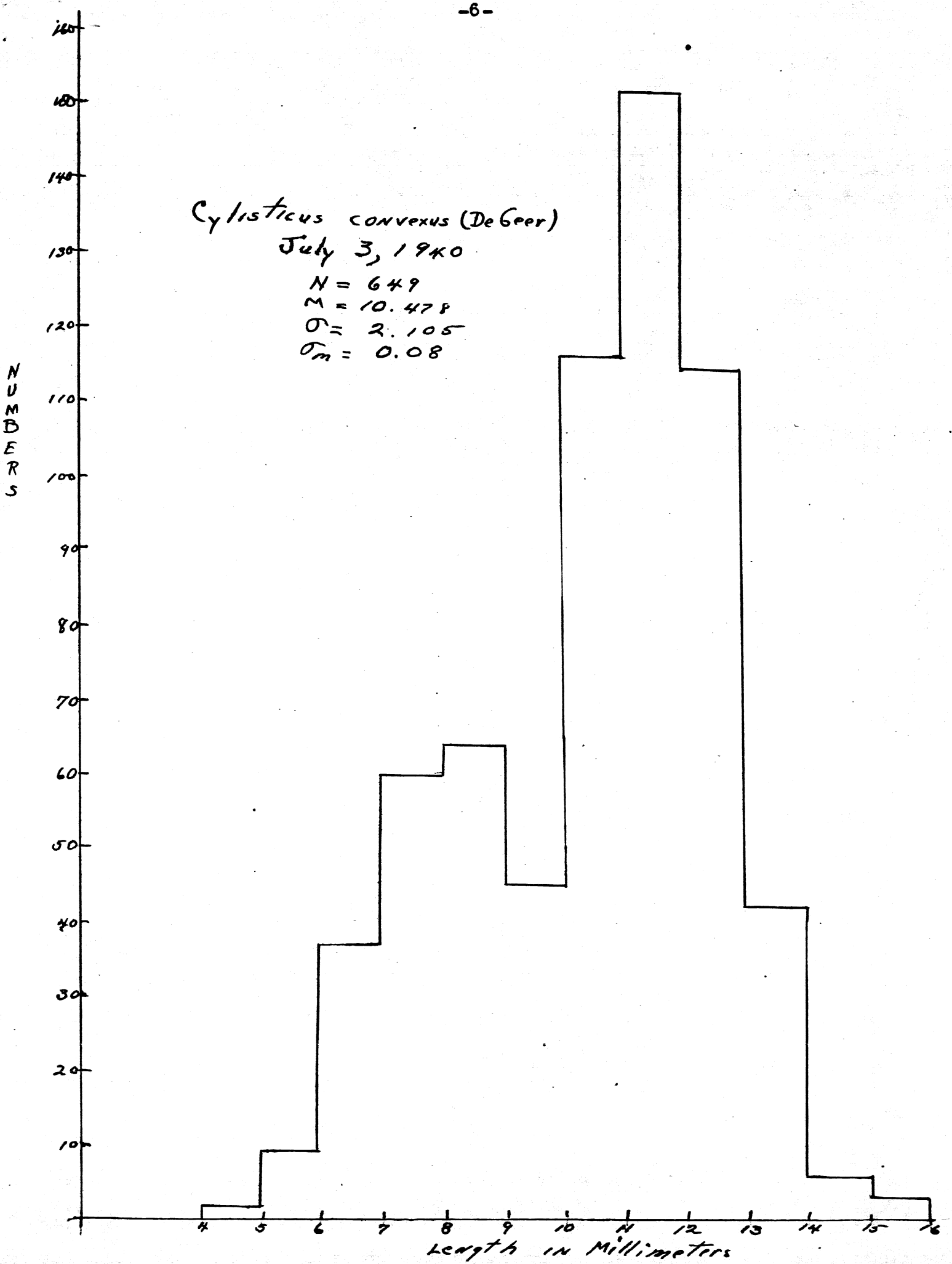
6-25 7-3 7-12 7-17 7-24 7-31 8-7 8-14

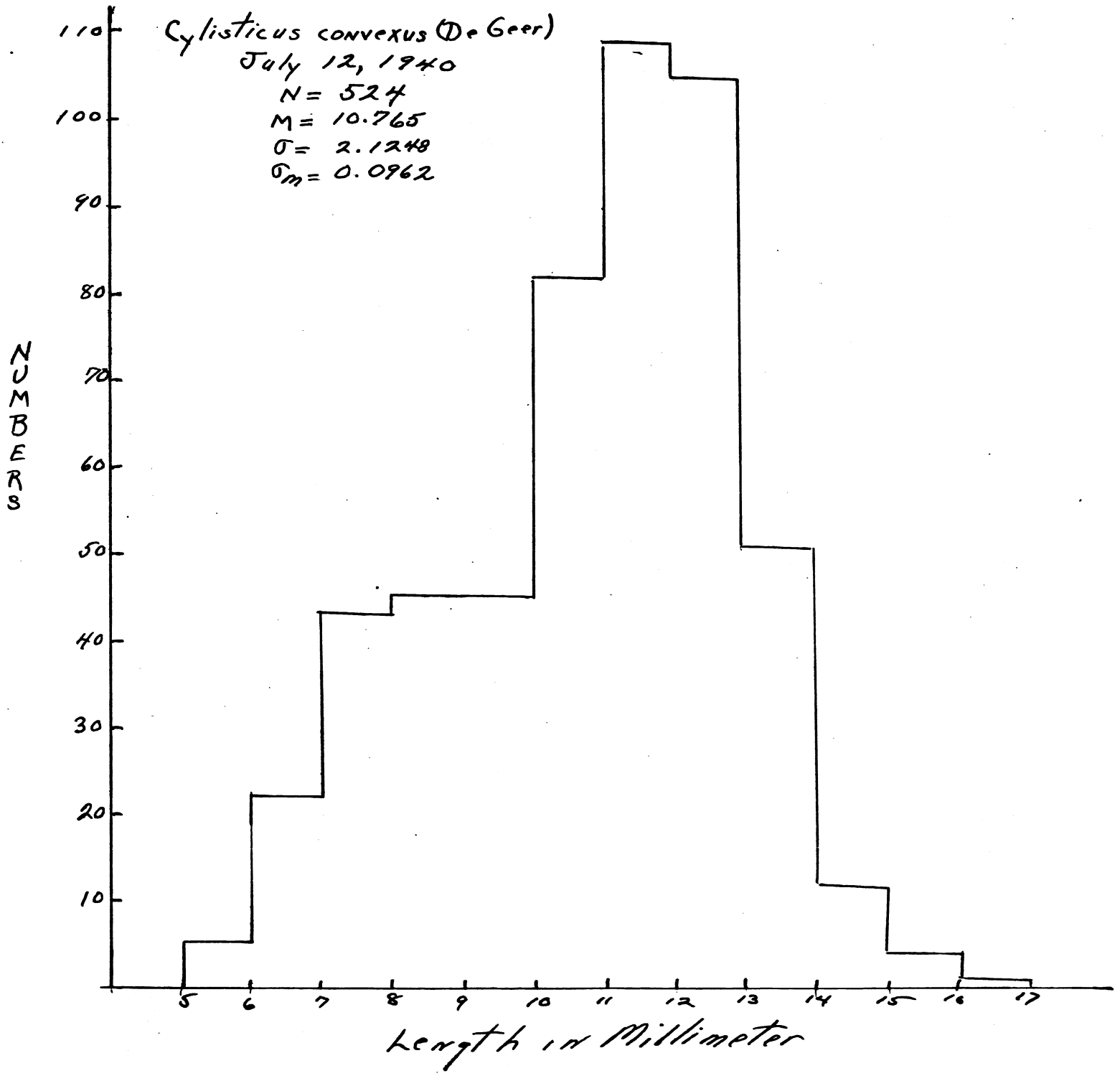
GRAPH I

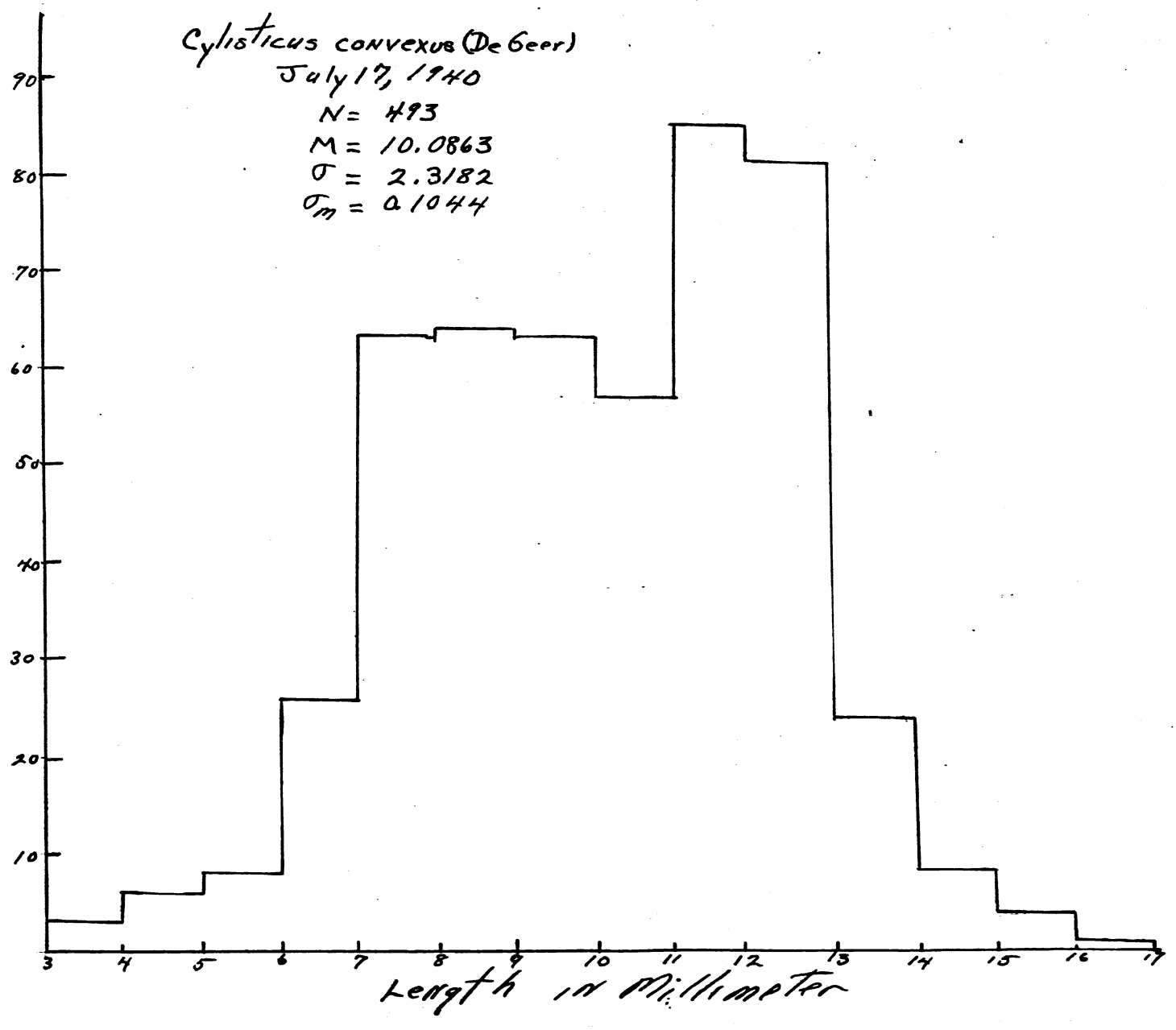


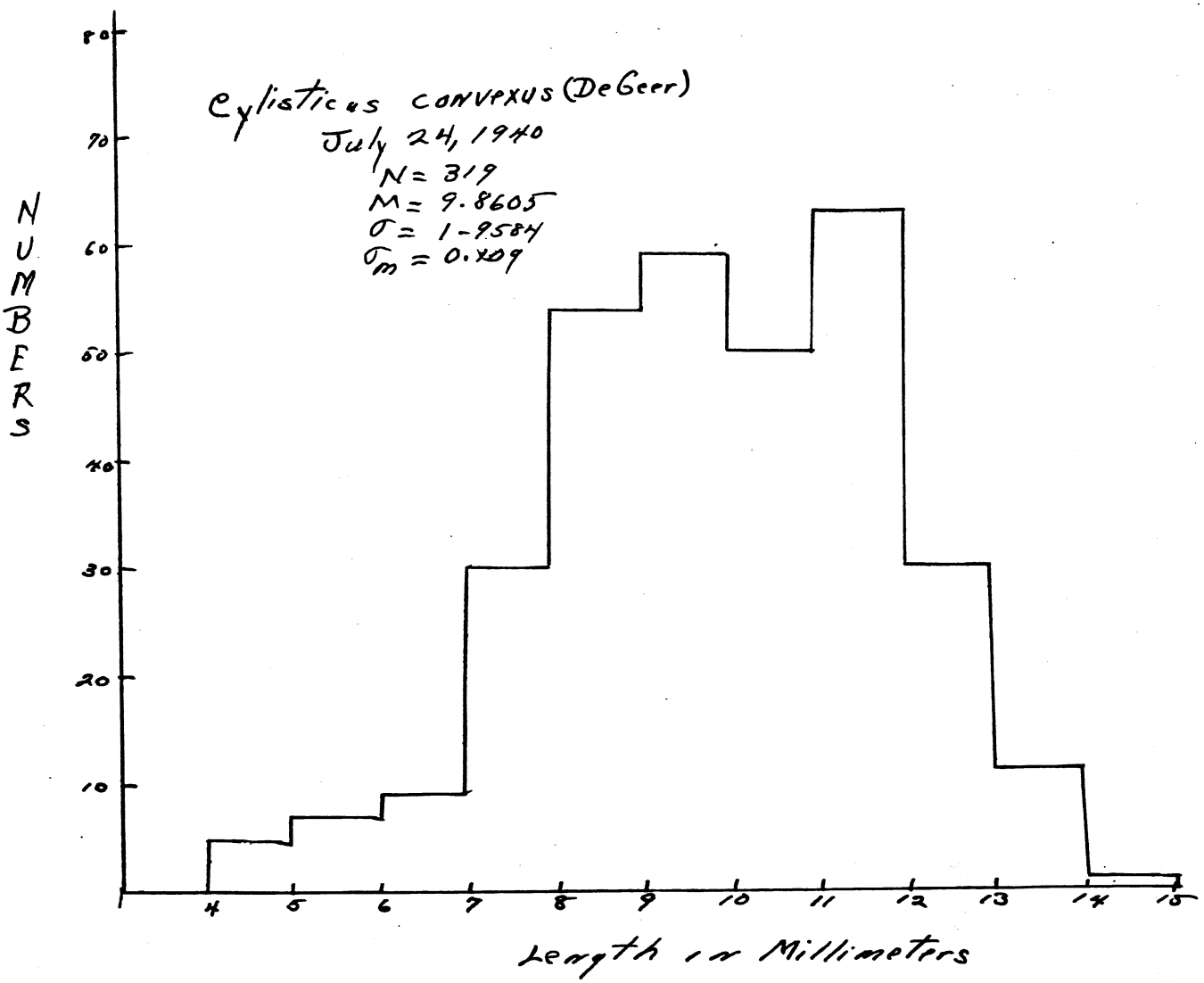



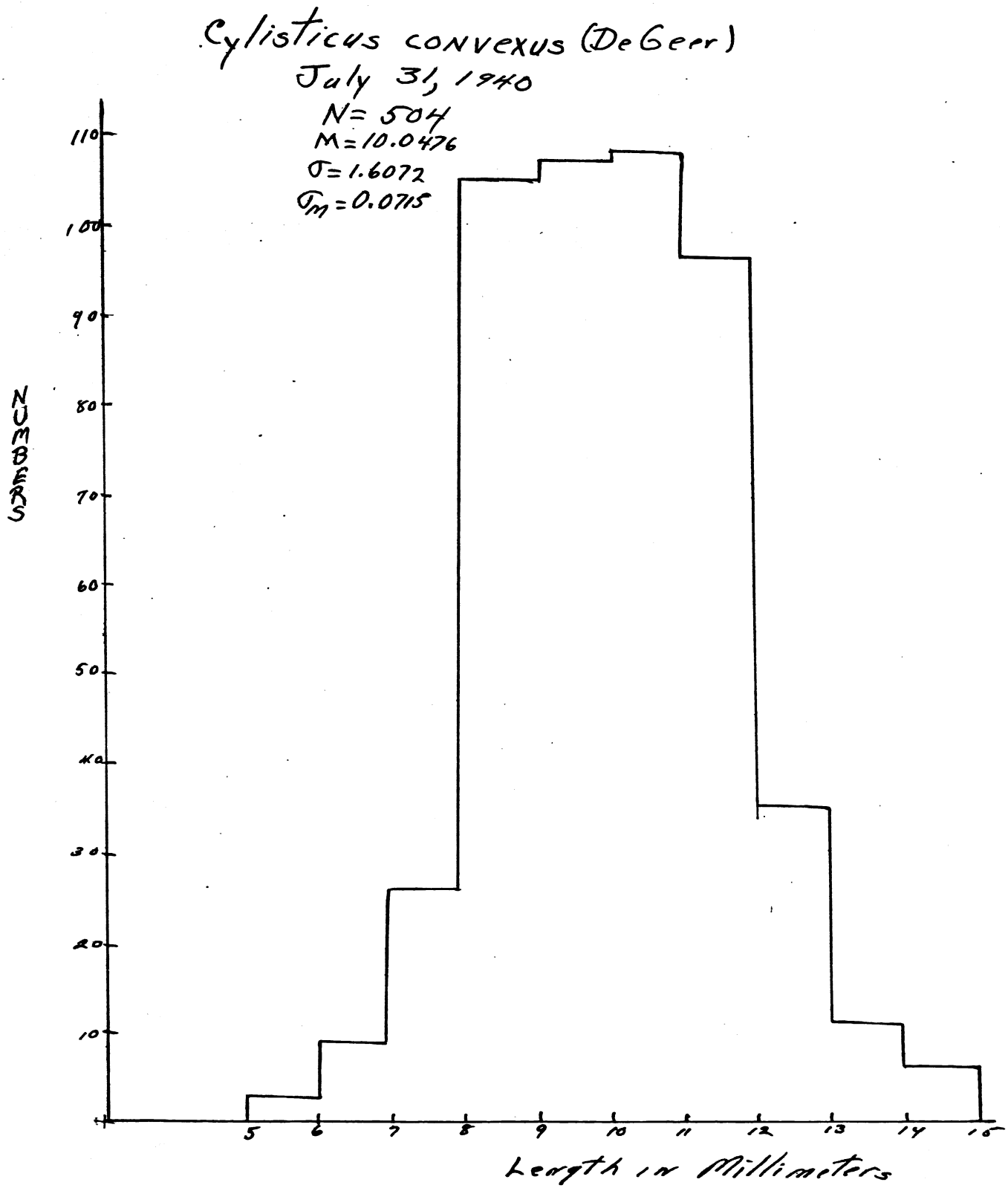

Cylisticus convexus (De Geer)
June 25, 1940
N= 540
M = 10.513
σ = 0.10
σ_m = 2.336
NUMBERS
120
110
100
90
80
70
60
50
40
30
20
10
4
5
6
7
8
9
10
11
12
13
14
15
16
Length IN Millimeters

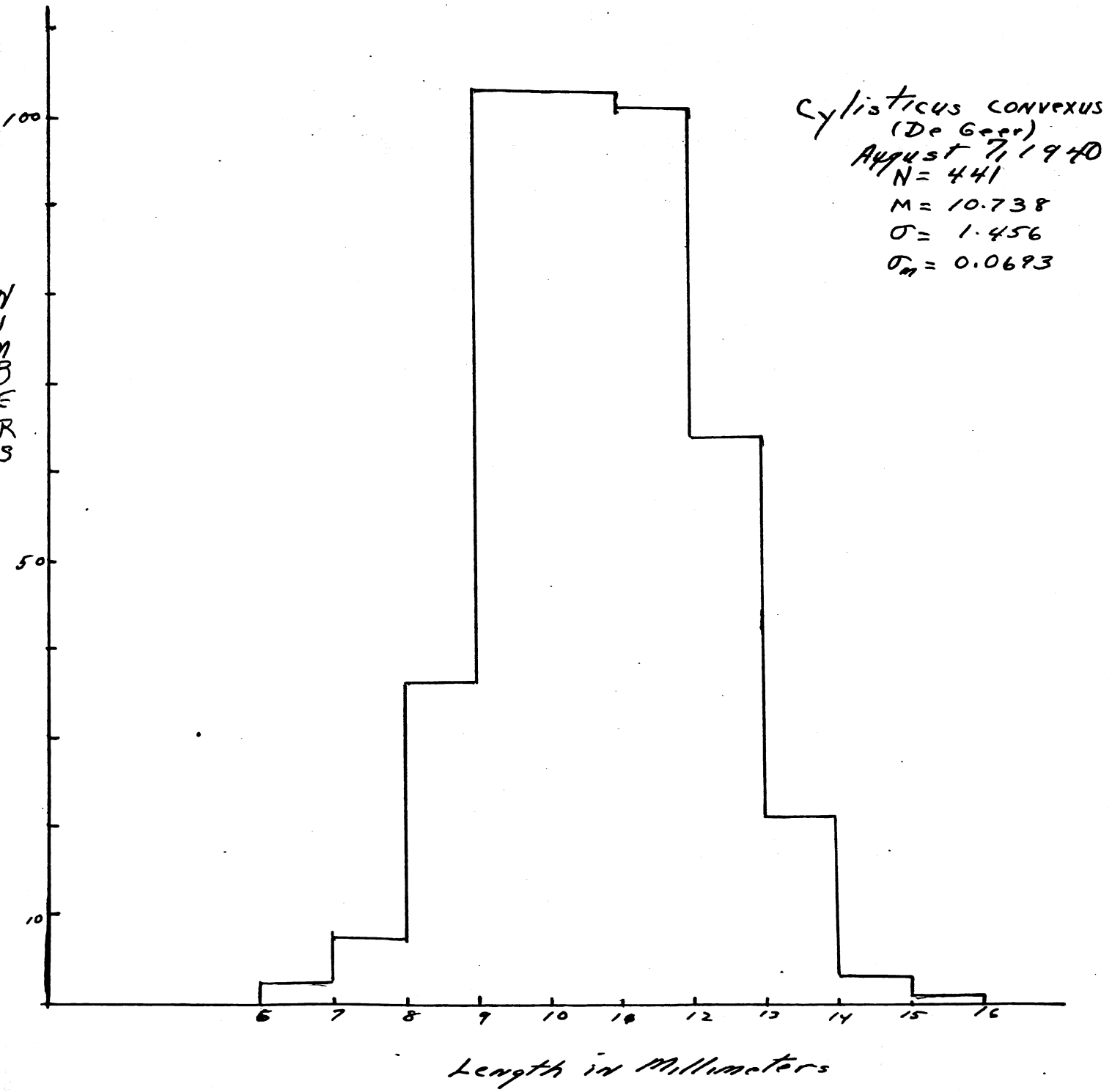

Cylisticus convexus (De Geer)
July 3, 1940
N = 649
M = 10.478
σ = 2.105
σm = 0.08
NUMBERS
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
4
5
6
7
8
9
10
11
12
13
14
15
16
Length in Millimeters

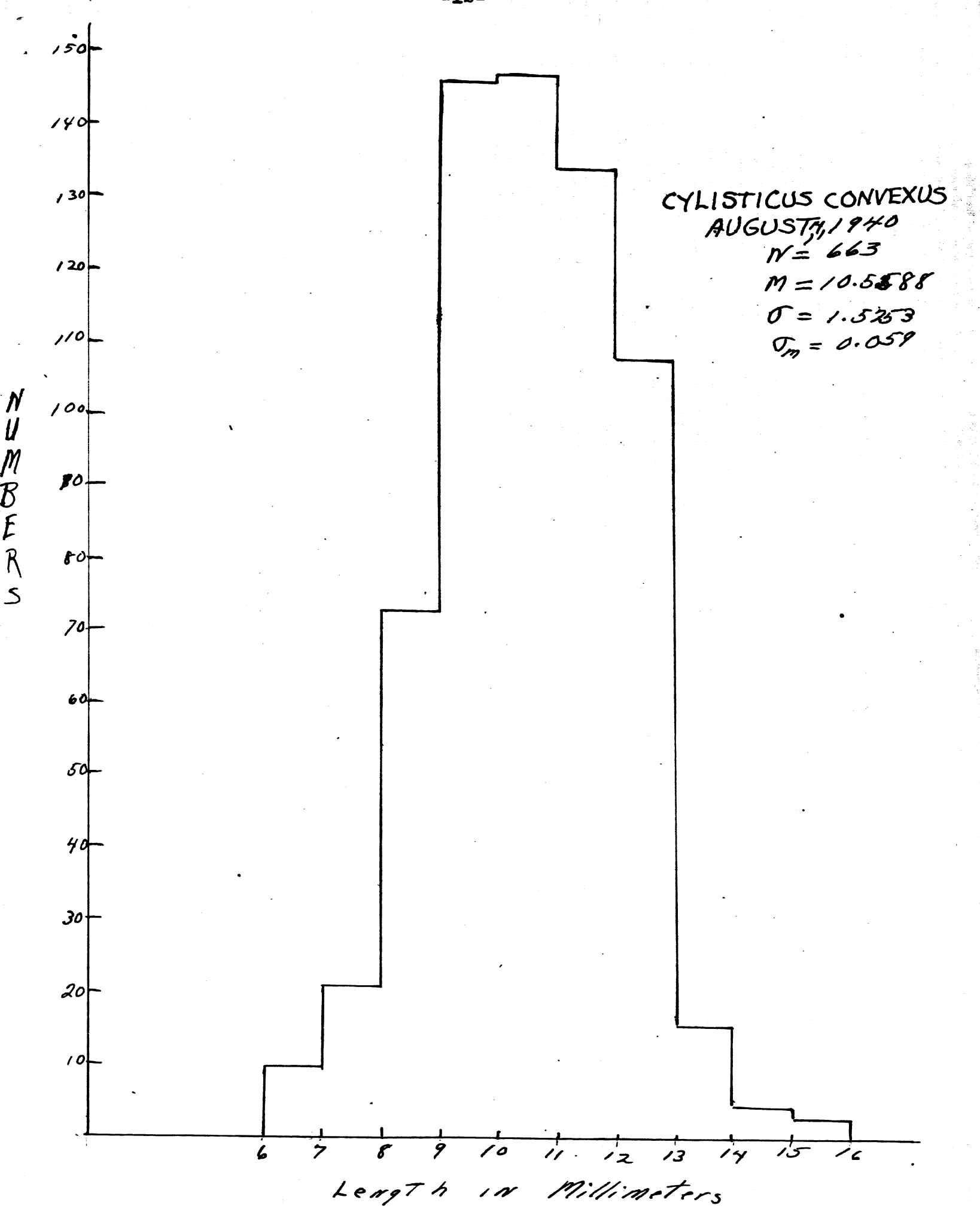

Cylisticus convexus (De Geer)
July 12, 1940
N = 524
M = 10.765
σ = 2.1248
σm = 0.0962
NUMBERS
110
100
90
80
70
60
50
40
30
20
10
5
6
7
8
9
10
11
12
13
14
15
16
17
Length in Millimeter

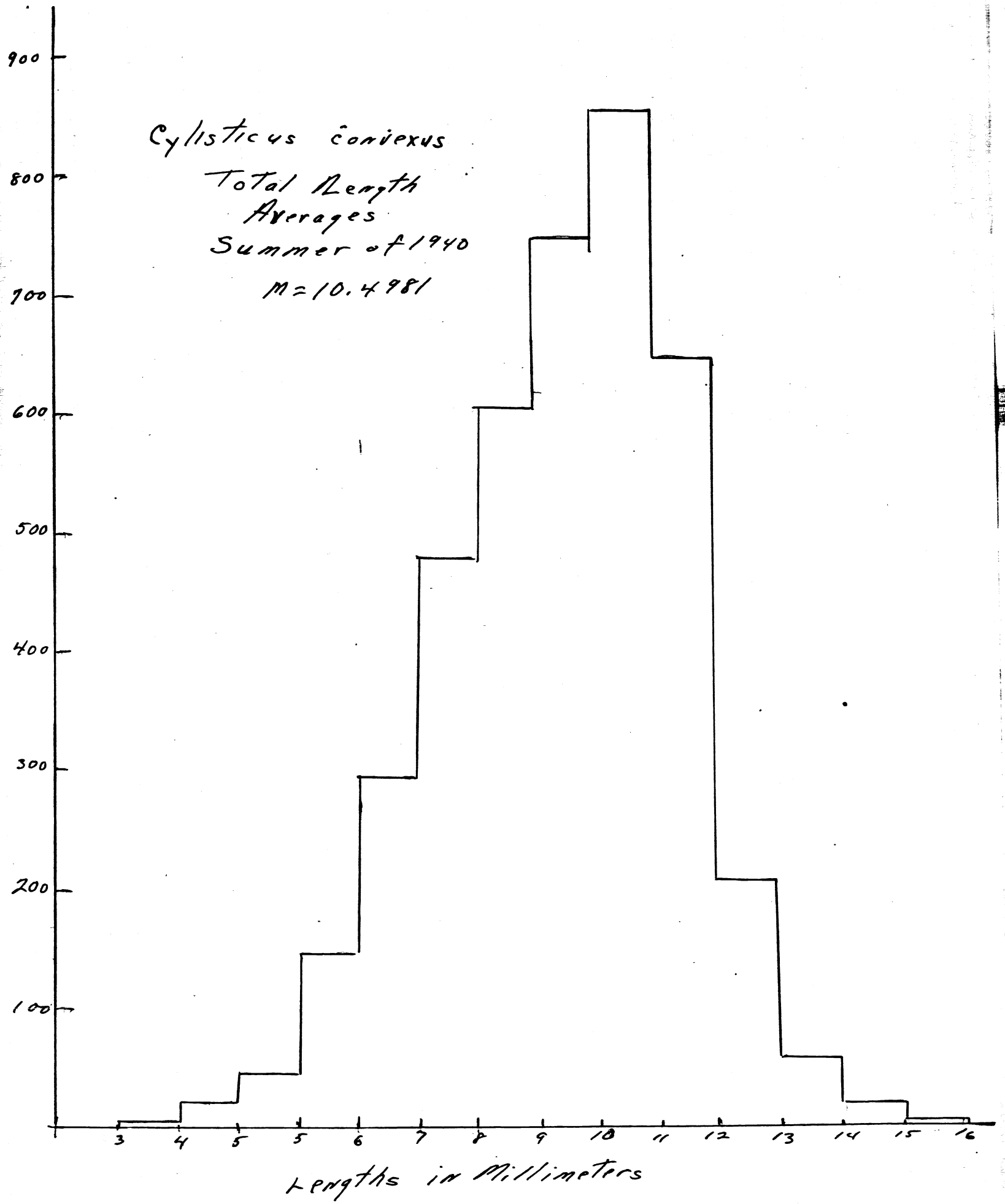

Cylisticus convexus (De Geer)
July 17, 1940
N = 493
M = 10.0863
σ = 2.3182
σm = 0.1044
90
80
70
60
50
40
30
20
10
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
Length in Millimeter


Cylisticus convexus (DeGeer)
July 24, 1940
N = 319
M = 9.8605
σ = 1.9584
σm = 0.109
NUMBERS
80
70
60
50
40
30
20
10
4
5
6
7
8
9
10
11
12
13
14
15
Length in Millimeters


Cylisticus convexus (De Geer)
July 31, 1940
N = 504
M = 10.0476
σ = 1.6072
σm = 0.0715
NUMBERS
110
100
90
80
70
60
50
40
30
20
10
5
6
7
8
9
10
11
12
13
14
15
Length in Millimeters


Cylisticus convexus
(De Geer)
August 7, 1940
N = 441
M = 10.738
σ = 1.456
σm = 0.0693
NUMBERS
100
50
10
6
7
8
9
10
11
12
13
14
15
16
Length in Millimeters


CYLISTICUS CONVEXUS
AUGUST 7, 1940
N = 663
M = 10.5588
σ = 1.5253
σm = 0.059
NUMBERS
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
6
7
8
9
10
11
12
13
14
15
16
Length in Millimeters


Cylisticus convexus
Total Length
Averages
Summer of 1940
M = 10.4981
900
800
700
600
500
400
300
200
100
3
4
5
5
6
7
8
9
10
11
12
13
14
15
16
Lengths in Millimeters

Laboratory Studies:

24 females of Porcellio scaber and Tracheoniscus rathkei were brought up from Ann Arbor in order to determine length of life of these individuals under laboratory conditions. All of them had at least one brood and some two, altho these females had been isolated since the middle of April. Unfortunately about half of these females died due to carelessness on my part. Records were kept of the specimens, which were examined weekly

Migration Studies:

Two areas of ½ square meter were established in comparable situations along the West shore of South Fishtail Bay of Douglas Lake. Both of these areas were covered with old tar paper and leaves on top of that. One was left exposed - nothing around the edges to keep animals out, and the other was enclosed by the "unit area sampler". All Isopods were removed from each area. Then after a period of one week these areas were examined. 19 specimens were taken the first weekly examination from the exposed area, 71 the second week. After this second examination, the previously enclosed area was left exposed and the previously exposed area was left enclosed. 48 specimens were taken from the now exposed area on the third weekly examination and the following week 42 specimens were taken from the exposed area. The first two weeks no specimens were taken from the enclosed area, however when the exposed area was enclosed some very small Isopods were collected in the area on the third and four examinations; having entered thru tunnels made by Rhinoceros beetles which were common in the area where this experiment was run.

- - - - - - - - - - -

KEY TO THE LOCAL SPECIES OF THE ISOPODS OF DOUGLAS LAKE, MICHIGAN

1. Pleopoda not fitted for air breathing, but adapted for aquatic life. Body extremely flattened dorso-ventrally ----------7

1'. Pleopoda fitted for air breathing. All of them exposed; not covered by an operculum figs.1&2.----------2

2. Uropoda short, not extending beyond the terminal abdominal segment which is short and broad. Body vey convex - capable of rolling into a compact ball * -------- ARMADILLIDIUM VULGARE (LATREILLE)

2'. Uropoda long, reaching beyond the terminal segment of the abdomen ---3

3. Flagellum of conspicuous (2nd.Pair) antennae triarticulate (3 divisions) fig 5b. Tracheae absent on the external branches of the pleopoda * ---------- ONISCUS ASELLUS LINNAEUS

3'. Flagellum of second pair of antennae biarticulate (2 divisions) fig 6a. Tracheae present on the exteranl branches of at least the first and second pair of pleopoda. - - ----------4

4. All external branches of the pleopoda furnished with tracheae. Dorsum with low granules or shiny granules do not show plainly with out magnification)----------5

4'. Only first two external branches of the pleopoda furnished with tracheae. Dorsum with conspicuous tubercles ----------6

5. Body convex - contractile into a loose forming ball. Shiny appearance and rather smooth. Longitudional rows of spots on either side with wavy lines between them and the middle of the body. * ---------- CYLISTICUS CONVEXUS (DE GEER)

5'. Body not convex and cannot form a ball. Tending to be rough, not smooth. Usually 3 longitudional lines of whitish spots, or two marginal lines with scattered spots over remainder of body. *---------- TRACHEONISCUS RATHKEI (BRANDT)

6. Body without spots - generally a uniform dark gray to black color, Occasionally with lighter marginal borders. *PORCELLIO SCABER LATREILLE

6'. Body spotted - if living a row of very conspicuous light yellow patches occurs along the middle of the dorsum. With broadly rounded frontal lobes *---------- PORCELLIO SPINICORNIS Sars

7. Lateral margins of head entire. Mandibles with a palp. *---------- ASELLUS COMMUNIS Say

7'. Lateral margins of head not entire. Mandibles without a palp. Last segment (dactylus) of last 6 pair of legs with 2 claws ---------8

8. Uropoda half as long as terminal segment of body. Lateral margins of head with a deep cleft.(fig 3). ***-- MANCASELLUS MACROURUS Garman

8'. Uropoda two-thirds as long as terminal segment of body. Lateral margins of head expanded into an anterior and posterior lobes. (fig4)*---------- MANCASELLUS TENAX (Smith)

7-29-40