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OSTRACODS OF THE FAMILY DREPANELLIDAE
FROM THE ARKONA SHALE
OF ONTARIO

BY

ROBERT V. KESLING



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By

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INTRODUCTION

THE ostracods described in this paper are from the Middle Devonian Arkona shale of southern Ontario. All are assigned to the family Drepanellidae, although some differ from the ostracods previously included in this family. The drepanellid ostracods from the Arkona include six genera and seven species, of which three genera and five species are new. Two of the species were described by Turner (1939) from oil wells in southwestern Ontario.

The specimens were obtained from samples collected by Mr. and Mrs. Edward Pulteney Wright of Grosse Pointe Farms, Michigan, to whom the author expresses his sincere appreciation for their interest in paleontology. The author wishes to thank Mrs. Betty Kellett Nadeau for her helpful suggestions regarding classification. He is also grateful to Dr. George M. Ehlers and Dr. Chester A. Arnold for their criticism of this paper.

All specimens are catalogued and deposited in the Museum of Paleontology of the University of Michigan.

REGISTER OF LOCALITIES

LOCALITY

1. Shale, light gray. Shale weathers easily to clay. Fossils pyritized, covered by limonite stain. Sample from a layer 14 feet below the Encrinal limestone. This layer about 1 foot above a layer containing numerous brachiopods of the genus *Leptalosia*. Near the junction of Rock Glen and the Ausable River, on the east bank of the river, Middlesex County, West Williams Township, Ontario, about 1 mile northeast of Arkona. Collected by Mr. and Mrs. E. P. Wright in February, 1952.

2. Shale, light gray. Shale weathers easily to soft clay. Fossils pyritized, covered by limonite stain. Sample from a layer 16 feet below the Encrinal limestone. This layer about 1 foot below a layer containing numerous brachiopods of the genus *Leptalosia*. Near the junction of Rock Glen and the Ausable River, on the east bank of the river, Middlesex County, West Williams Township, Ontario, about 1 mile northeast of Arkona. Collected by Mr. and Mrs. E. P. Wright in February, 1952.

SYSTEMATIC DESCRIPTIONS

Phylum ARTHROPODA

Class CRUSTACEA

Order OSTRACODA

Superfamily Beyrichiacea

Family Drepanellidae Swartz 1936

***Tmemolophus*, gen. nov.**

Genotype.—*Tmemolophus margarotus*, sp. nov.

Description.—Carapace nearly equivalved. Valves subelliptical to subpyriform in lateral view. Hinge line straight. L2 and L3 large nodes in the dorsal part of each valve. S2 a deep sulcus extending from dorsal border to central part of valve. Distinct velate ridge from the anteroventral to the posteroventral part of each valve, terminating abruptly at both ends.

Remarks.—The genus *Tmemolophus* somewhat resembles *Ulrichia*, but differs in having the two dorsal nodes more lobelike and not distinctly set off from the rest of the valve around their peripheries and in having only a short segment of velate ridge along the ventral border. It differs from *Bollia*, in lacking a U-shaped ridge connecting the dorsal nodes and in lacking a complete velate ridge, and from *Dicranella*, in having lobelike nodes. The equal size of the nodes and their position exclude this genus from the family Hollinidae.

The name of this genus is derived from Greek τμημα, n. ("a section") and λοφος, m. ("a ridge") and refers to the short ventral velate ridge.

***Tmemolophus margarotus*, sp. nov.**

(Pl. I, Figs. 1-6)

Description.—Carapace elongate, suboval, posteriorly acuminate in lateral view; lanceolate in ventral view; and lanceolate in end view. Right valve overlapping left. Each valve with strong swing. Hinge line straight.

Anterior border round, ventral border gently round, posteroventral border nearly straight, and posterodorsal border acutely subround.

L2 and L3 developed as lobelike nodes, not sharply defined along their ventral borders. L1 confluent with ventral part of valve. L4 an elongate D-shaped area, posterodorsally acuminate, indistinctly separated from ventral part of valve by a slight depression. A small hemispherical protuberance near the ventral part of S2, located between the ventral halves of L2 and L3. S1 a shallow depression extending from the dorsal border less than half the distance to the ventral border. S2 a deep sulcus extending from the dorsal border almost to the middle of the valve, with the small protuberance in its ventral part. S3 a poorly defined curved depression, shallower in its ventral part, extending from the dorsal border and becoming indistinct below L3 near the velate ridge.

Large short velate ridge, from the anteroventral to the posterior parts of each valve, along the free border, slightly thicker at its anterior end. Low indistinct marginal ridge around free edge.

Anterior cardinal angle about 125 degrees. Posterior corner subround in most specimens; posterior cardinal angle about 125 degrees.

Surface ornamented by a low reticulation. Reticulation becoming indistinct near the nodes and in the dorsal part of the valve. Nodes, velate ridge, marginal ridge, and little protuberance smooth.

Dimensions of holotype, No. 28897, a complete carapace: length, .52 mm.; height, .28 mm.; and width, .20 mm.

Remarks.—The unusual little protuberance is interpreted as part of the ornamentation and not part of the lobation. The position of the anterior node suggests that it is L2 and not L1 and that the little protuberance is not one of the four lobes considered in lobation of valves. The reticulation is less elevated and with smaller meshes than that of species of *Ulrichia*.

The name of this species is derived from μαργαριτης, m. ("a pearl") and refers to the hemispherical protuberance in the lower part of S2.

Occurrence.—Localities 1 and 2.

Types.—Holotype, a complete carapace, No. 28897; paratypes, three complete carapaces, Nos. 28896, 28898-28899.

Tetrastorthynx, gen. nov.

Genotype.—*Tetrastorthynx diabolicus*, sp. nov.

Description.—Carapace nearly equivalved. Right valve overlapping left. Valves suboval in lateral view. Hinge line straight. L2 and L3 large nodes or hornlike spines in the dorsal part of each valve. S2 a deep short

sulcus, extending downward from the dorsal border between the two nodes or spines. Distinct velate ridge from anterior corner to posteroventral part of each valve, very low or absent on posterior part of valve.

Remarks.—The genus *Tetrastorthynx* is characterized by an overlap the reverse of that in known genera of the family Hollinidae, although it has a velate ridge in the same position as that of hollinid ostracods. The nodes or spines are superficially like those of *Dicranella*, but apparently consist of L2 and L3, whereas in the genotype of *Dicranella* (*Dicranella bicornis* Ulrich, 1894, p. 665, Pl. 44, Fig. 26) the spines are L1 and L3, with L2 present as a small node on the posteroventral part of L1. The genus resembles *Aechminella* in having two large projections in the dorsal part of each valve, but differs from the genotype of *Aechminella* (*Aechminella trispinosa* Harlton, 1933, p. 20, Pl. 6, Figs. 9a–b.) in the shape of the valves in lateral view and particularly in having a velate ridge. *Tetrastorthynx* has the two projections in each valve spaced farther apart than those of *Ulrichia*, and it has its velate ridge lower and not as well defined as that of *Ulrichia*.

The name of this genus is derived from τετρα (“four”) and σπορθυγξ, m. (“a horn, a prong”) and refers to the four projections on a complete carapace.

***Tetrastorthynx diabolicus*, sp. nov.**

(Pl. I, Figs. 7–10)

Description.—Carapace suboval, posteriorly acuminate in lateral view; oblong in ventral view (exclusive of the dorsal projections); and subquadrate in end view. Right valve overlapping left. Each valve with strong swing. Hinge line straight. Anterior and ventral borders round, posteroventral border nearly straight, and posterodorsal border acutely round.

L2 developed as a large knoblike node, tangent to the dorsal border, separated from the anterior border by a distance equal to about its own diameter. L3 a very large, slightly flattened short spine curving outward and backward from the posterodorsal part of the valve. S2 large, deep, extending from the dorsal border about one-third the distance to the ventral border. Ventral part of valve arched outward, sloping gently toward the dorsal part of the valve.

Distinct velate ridge from the anterior corner to the posteroventral part of the free border, becoming indistinct in posterior part of valve. Low indistinct marginal ridge.

Anterior cardinal angle about 110 degrees. Posterior corner subround. Surface slightly granulose. Node, spine, and velate ridge smooth.

Dimensions of holotype, No. 28900, a complete carapace: length, .37 mm.; height, .26 mm.; and width, .24 mm. (.15 mm., exclusive of L2's and L3's).

Remarks.—The tips of the L3's are rather sharply pointed, as can be seen in the holotype photographed without a coating of ammonium chloride (Pl. I, Fig. 10). The bases of the L2's are subconical.

The name of this species is derived from δῖαβόλιος (“devilish”) and refers not only to the curved, hornlike spines but also to the difficulty in classification of this unusual species.

Occurrence.—Locality 1.

Type.—Holotype, a complete carapace, No. 28900.

Genus *Boursella* Turner 1939

Genotype.—By original designation, *Boursella trilobata* Turner, 1939, pp. 14–15, Pl. I, Fig. 4.

Boursella trilobata Turner

(Pl. I, Figs. 11–16)

Boursella trilobata Turner, 1939, pp. 14–15, Pl. I, Fig. 4.

Remarks.—In the specimens of *Boursella* from the Arkona shale the S3 is curved nearly parallel to the posterior border and is not as straight nor as nearly vertical as that illustrated by Turner. The tiny tips on the L3 are larger and more pointed on some specimens than on others.

Occurrence.—Localities 1 and 2.

Types.—Hypotypes, three carapaces, Nos. 28901–28903.

Xystinotus, gen. nov.

Genotype.—*Xystinotus wrightorum*, sp. nov.

Description.—Carapace nearly equivalved. Valves suboval to elongate in lateral view. Hinge line straight. L2 and L3 only slightly raised above rest of surface, or indistinct in many specimens. S2 extending from dorsal border nearly to middle of the valve, indistinct in the dorsal part, deepest at its ventral end. Distinct velate ridge from anterior corner to posterior corner, its posterior part parallel to the posterior border but separated from it by slightly more than its own width. Marginal structure present. Surface reticulate. Ornamentation indistinct in the dorsal part of the valve. Velate ridge smooth.

Remarks.—The genus *Xystinotus* is very similar to *Ulrichia*; it differs from the genotype of *Ulrichia* (*Ulrichia conradi* Jones, 1890, p. 544, Fig. 2) and from the other described species of that genus in lacking a prom-

inent L2 and L3 in each valve and in having the dorsal part of each valve almost smooth. It is not known whether this smooth dorsal area was produced by abrasion with sand or silt during the animal's existence or was secreted in this form. No matter whether the smooth area is a feature of form or one of environment, it was the same in each of about one hundred specimens studied and is considered to be of generic significance.

The name of this genus is derived from $\xi\upsilon\sigma\tau\omicron\varsigma$ ("scraped, made smooth") and $\nu\omega\tau\omicron\varsigma$, m. ("the back") and refers to the nearly smooth dorsal part of the carapace.

Xystinotus wrightorum, sp. nov.

(Pl. I, Figs. 17-21)

Description.—Carapace suboval in lateral view; elongate, subquadrate with bluntly acuminate ends in ventral view; and sublanceolate to subquadrate in end view. Greatest height anterior. Greatest length median. Greatest width in anteroventral part of carapace. Hinge line straight. Anterior border subround, ventral border very gently curved, and posterior border subround.

L2 and L3 only slightly raised if present, indistinct. S2 narrow, nearly vertical, extending from dorsal border to about the middle of the valve, its dorsal part ill defined.

Distinct velate ridge from anterior corner to posterior corner, close to the anterior border, next to the ventral border, and separated from the posterior border by a distance slightly more than its width. Marginal ridge with closely spaced little tubercles in its posterior and ventral parts, and with short, slightly irregular denticles on its anterior part.

Anterior and posterior cardinal angles about 120 degrees each.

Surface reticulate in lower two-thirds of each valve, smooth to somewhat granular in dorsal one-third. Velate ridge smooth.

Dimensions of holotype, No. 28904, a complete carapace: length, .57 mm.; height, .31 mm.; and width, .17 mm.

Remarks.—The dorsal region of the carapace shows great variation in the lobation and surface texture. No specimens were found with distinct borders to L2 or L3. The dorsal part of the S2 in many carapaces is so indistinct that its ventral part resembles a pit.

This species is named in honor of Mr. and Mrs. Edward Pulteney Wright, who collected the sample from which the specimens were obtained.

Occurrence.—Locality 1.

Types.—Holotype, a complete carapace, No. 28904; paratypes, two carapaces, Nos. 28905-28906.

Xystinotus subnodatus (Turner)

(Pl. I, Figs. 22-27)

Ulrichia fragilis Warthin, var. *subnodata* Turner, 1939, pp. 11-12, Pl. I, Fig. 2.

Remarks.—Turner's description and choice of name reveal more of the nature of this species than does her diagrammatical drawing of it. None of the specimens from the Arkona shale show more than a poorly defined, low elevation for L2 or for L3. The species is here assigned to *Xystinotus*, gen. nov. It is very similar to the genotype, *Xystinotus wrightorum*, but differs from it in being much more elongate. No specimens found were intermediate in elongation between *X. wrightorum* and *X. subnodatus* and the two are believed to be distinct species.

Occurrence.—Localities 1 and 2.

Types.—Hypotypes, four carapaces, Nos. 28907-28910.

Genus *Ulrichia* Jones 1890

Genotype.—By original designation, *Ulrichia conradi* Jones, 1890, p. 544, Fig. 2.

Ulrichia illinearis, sp. nov.

(Pl. I, Figs. 28-32)

Description.—Carapace subelliptical in lateral view, subquadrate in ventral view, and oblong in end view. Greatest height nearly median, slightly anterior. Hinge line straight. Anterodorsal border gently curved, anteroventral border subround, ventral and posteroventral borders curved, and posterior border round.

L3 a knoblike small node near the middle of the dorsal part of each valve, extending above the hinge line by about half its own diameter. L2 a knoblike small node, smaller than L3, set closer to L3 than to the velate ridge, terminating dorsally below the dorsal border by about half its own diameter. S2 a narrow groove along the rear side of L2, not conspicuous.

Anterior cardinal angle about 115 degrees. Posterior cardinal angle about 120 degrees.

High, round-topped velate ridge from anterior to posterior corner, tangent to the free border, nearly equal in width to the diameter of L2. Very small discrete marginal denticles around free edge.

Surface reticulate, the reticulation extending almost but not quite to the dorsal border. Nodes and velate ridge very smooth.

Dimensions of holotype, No. 28914, a carapace: length, .52 mm.; height (including L3), .33 mm.; and width, .18 mm.

Remarks.—This species differs from *Ulrichia spinifera* Coryell and Malkin (1936, pp. 1-2, Figs. 1, 1a, 2), which it closely resembles, in having the two dorsal nodes at different distances from the hinge line.

The name of this species is derived from Latin *il-* ("not") and *linearis* ("in line, aligned") and refers to the relative positions of the two nodes.

Occurrence.—Locality 1.

Types.—Holotype, a carapace, No. 28914; paratypes, three carapaces, Nos. 28911–28913.

Genus *Cornigella* Warthin 1930

Genotype.—By original designation, *Cornigella minuta* Warthin, 1930, p. 59, Pl. 4, Fig. 7.

Cornigella immotipedata, sp. nov.

(Pl. I, Figs. 33–45)

Description.—Carapace elongate, subelliptical to subpyriform in lateral view, many specimens sharply acuminate near the posterior corner; narrowly lanceolate, except for nodes, in ventral view; and sublanceolate in end view. Hinge line long and straight. Anterior and anteroventral borders subround, posteroventral border nearly straight or slightly curved, and posterodorsal border subround to bluntly pointed.

Four very prominent nodes on each valve, of various shapes in different specimens, but always at the positions of the corners of a square. L2 and L3 form the dorsal pair of these nodes, about equal in size; each of these nodes in some specimens subovate (Pl. I, Fig. 41), and in some knoblike (Pl. I, Fig. 42), in some hemispheroidal with its distal part abruptly produced into a tiny hemispherical tip (Pl. I, Fig. 38), and in some subconical with hemispheroidal base constricting and tapering gradually into a short terete section ending in a hemispherical tip (Pl. I, Fig. 43). Anteroventral and posteroventral nodes form the ventral pair of the four nodes, located directly below L2 and L3, respectively, about the same size and shape in each specimen; each node in some specimens knoblike (Pl. I, Fig. 36), in some conical, low, rapidly constricting, with a produced rounded tip (Pl. I, Fig. 33), in some subconical (Pl. I, Fig. 43), and in some mushroom-shaped with a long, gently tapering base and a small boss at the distal end (Pl. I, Fig. 38). L2 and L3 directed upward; the two ventral nodes directed outward and downward. L1 a low ridge along the anterior border, highest in its central part and tapering toward both ends. L4 a distinct ridge, in some specimens short and extending backward and downward from the dorsal border about half way to the ventral border (Pl. I, Figs. 33, 38, and 43); in others nearly vertical, tapering downward, reaching all the way to the ventral border (Pl. I, Figs. 41–42). S2 shallow in most specimens, confined to the area between L2 and L3.

No velate ridge. Very small, sometimes inconspicuous marginal ridge.

Anterior cardinal angle in some specimens about 100 degrees. Anterior corner rounded in some specimens. Posterior corner subround.

Surface reticulate except on nodes and ridges which are very smooth.

Dimensions of holotype, No. 28917, a complete carapace: length, .53 mm.; height, .30 mm.; distance from hinge line to free edge, .26 mm.; width, .22 mm.; and distance between the two lateral surfaces, .12 mm.

Remarks.—Although the form of the nodes varies greatly from one specimen to the next, the arrangement of the nodes is remarkably constant for a species of this genus. The regularity in position and size of the ventral nodes, as well as the absence of a velate ridge (unless the ridges here called L1 and L4 are to be interpreted as parts of such a ridge), does not fit this genus and species into the family Drepanellidae very well. But the form of L2 is distinctly different from that in species of the family Hollinidae. The author, therefore, here assigns the new species to the Drepanellidae because of the sizes and positions of L2 and L3 and because the valves have a reticulate surface like that in *Ulrichia*.

The name of this unusual species is derived from Latin *immutus* ("immovable") and *pedatus* ("provided with feet") and refers to the superficial resemblance of the four ventral nodes on a complete carapace to mammalian feet, but they are solid throughout and immovable.

Occurrence.—Localities 1 and 2.

Types.—Holotype, a carapace, No. 28917; paratypes, five carapaces, Nos. 28915–28916 and 28918–28920.

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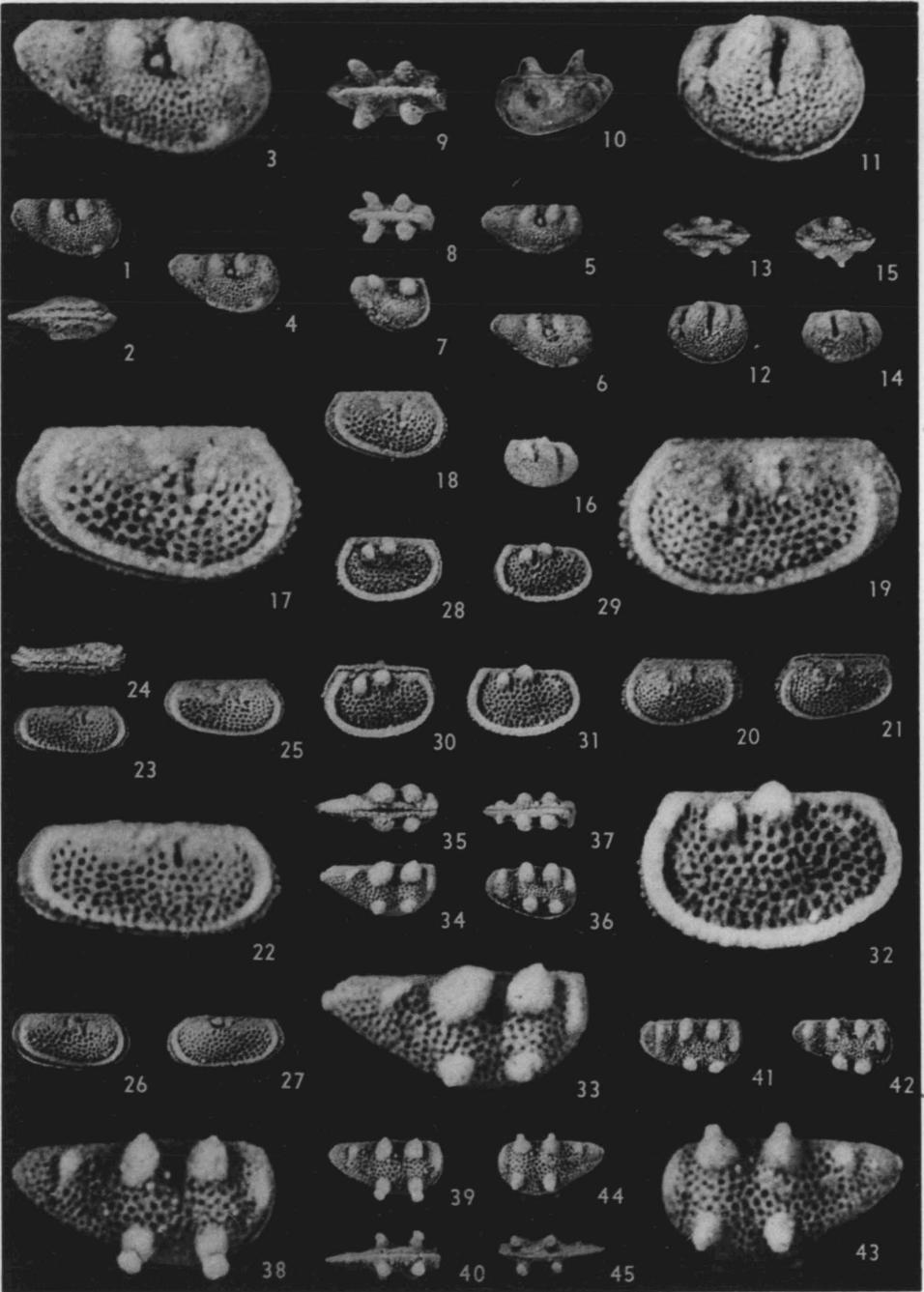
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EXPLANATION OF PLATE I

(Figures \times 30 except as noted)

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VOLUME X

1. Ostracods of the Families Leperditellidae, Drepanellidae, Glyptopleuridae, Kloedenellidae, Bairdiidae, Barychilinidae, and Thlip-suridae from the Genshaw Formation of Michigan, by Robert V. Kesling and John E. Kilgore. Pages 1-19, with 4 plates. Price \$.60.
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