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OSTRACODS OF THE FAMILY HOLLINIDAE FROM
THE GENSHAW FORMATION OF MICHIGAN

BY

ROBERT V. KESLING and NORMAN R. TABOR



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INTRODUCTION

THE ostracods of the Family Hollinidae described in this paper are from the Genshaw formation of the Middle Devonian Traverse group of Michigan. The fauna includes sixteen new species, many exhibiting dimorphism in their velate structures.

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

REGISTER OF LOCALITY

All specimens on which the description of these species is based were collected by George M. Ehlers and Robert V. Kesling from an outcrop of dark gray shale containing many brachiopods of the variety *Cyrtina umbonata alpenensis* Hall and Clarke three feet below the black Killian's limestone member, on the west side of Long Lake about one-half mile south of LeRoy's Resort, at the junction of West Long Lake Road and the entrance to Martin's Resort, near the center of the W. $\frac{1}{4}$ sec. 32, T. 33 N., R. 8 E., Presque Isle County, Michigan.

SYSTEMATIC DESCRIPTIONS

Phylum ARTHROPODA

Class CRUSTACEA

Order OSTRACODA

Superfamily Beyrichiacea

Family Hollinidae

Genus *Hollinella* Coryell 1928

Genotype.—By original designation, *Hollinella dentata* Coryell, 1928, pp. 377-78.

Hollinella amplilobata, sp. nov.

(Pl. I, Figs. 9-17)

Description.—Carapace elongate, subovate to subelliptical. Left valve overlapping right valve along the free border. Dorsal border straight, anterior and posterior borders subrounded, and ventral border gently curved. S2 deep, wider at the dorsal border, bifurcating in the ventral part, one branch wide and shallow toward the anteroventral part of the valve, and the other branch converging to a narrow groove under L3, confluent with S3. S1 a very shallow, narrow groove, confluent with S2 at its dorsal and ventral ends, nearly vertical but slightly convex anteriorly, extremely shallow in its middle part. L1 broad, arched, curved gently to the anterior border, nearly confluent with L2 at the anteroventral part of L2, and confluent with the ventral lobe. L2 a small, narrow, low lobe elongate at right angles to the hinge line. L3 a large, hemispherical bulb, extending slightly above the dorsal border, with a spinelike projection extending above the hinge line. S4 inflated near the posterior end, curving gently to the posteroventral border, and confluent with the ventral lobe.

Anterior cardinal angle approximately 120 degrees; posterior cardinal angle about 100 degrees.

Frill narrow at the anterior corner, extending from slightly above the hinge line to the posteroventral part of the valve, wide in the ventral part, slanting outward throughout its length. Entire lateral surface covered by discrete granules or very small papillae. Larger papillae widely scattered over the lateral surface. Marginal tubercles low, partly fused in the anterior part but discrete along the ventral and posterior borders.

Dimensions of a complete carapace, the holotype: length (including frill), 1.44 mm.; height (including frill), .80 mm.; and width, .72 mm.

Remarks.—Specimens differ from those of the male of *Hollinella magnilobata* Kesling and McMillan (1951, p. 60, Pl. I, Figs. 11-13), in being larger, with a proportionately larger knob on S3 and two sizes of surface ornamentation. No dimorphism is known in this species. Only complete carapaces found. Numerous.

The name of this species is derived from Latin *amplus* ("large, spacious") and *lobatus* ("lobed") and refers to the large L1 and L3.

Types.—Holotype, a complete carapace, No. 28056; paratypes, three complete carapaces, Nos. 28057-28059.

Hollinella vegrandis, sp. nov.

(Pl. I, Figs. 23-27)

Description.—Carapace elongate, subovate to subelliptical. Dorsal border straight, anterior border acutely subrounded, posterior border

subrounded, ventral and posteroventral borders gently curved. S2 deep, extending from the dorsal border below the middle of the valve; the bottom part of the sulcus much wider than the middle part, extending under both L2 and L3. S1 narrow, shallow, dorsally confluent with S2. L1 large, gently arched. L1, the ventral lobe, and L4 confluent, forming a broad continuous lobe from the anterior to the posterior end, terminating in a slight inflation and sloping gently to the free border. L2 a small lobe, elongate at right angles to the dorsal border. L3 a large, inflated lobe, elongate parallel to the dorsal border, extending above the hinge line and separated by a shallow groove from L4 and the ventral lobe.

Anterior cardinal angle approximately 110 degrees; posterior cardinal angle about 95 degrees.

Frill very narrow, little more than a velate ridge, extending more than three-fourths of the distance around the free border from the anterior corner. Surface finely granulose. Marginal tubercles low. In ventral view, the frills farthest apart near their posterior ends, gradually approaching each other, and meeting at their anterior ends.

Dimensions of a complete carapace, the holotype: length, 1.00 mm.; height (including L3), .56 mm.; and width, .44 mm.

Remarks.—This species differs from *Hollinella magnilobata* Kesling and McMillan (1951, p. 60, Pl. I, Figs. 11–13) in lacking a spine on L3, in having a much narrower frill, and in having L1 confluent with the ventral lobe. Only complete carapaces were found.

The name of this species is derived from Latin *vegrandis* (“not very large, diminutive”) and refers to the narrow frill.

Types.—Holotype, a complete carapace, No. 28062; paratypes, two complete carapaces, Nos. 28063 and 28064.

***Hollinella cuspidulbata*, sp. nov.**

(Pl. II, Figs. 1–4)

Description.—Carapace large, elongate, subrectangular. Dorsal border straight, anterior border rounded, posterior border subrounded, ventral border gently curved. S2 wide, extending approximately one-half the distance from the dorsal to the ventral border, with a straight anteroventral extension under L2. S1 very shallow, confluent with S2 at its ends, slightly convex anteriorly. S3 wide, shallow, terminating near the middle of the valve. L1 broad, forming about one-fourth the length of the valve, confluent with the ventral lobe, bearing one large and one smaller spine in its dorsal part. L2 low, vertically elongate, bounded anteriorly by an indistinct S1. L3, a medium-sized knob, sharply delineated, terminating dorsally in a

blunt spine. Carapace widest through L3. Greatest height in the anterior one-third of each valve. Frills parallel as seen in ventral view, with a broad channel between each frill and the marginal ridge.

Anterior cardinal angle about 115 degrees; posterior cardinal angle about 105 degrees.

Frill extending more than three-quarters of the distance around the free border, terminating in a short spur projecting laterally, narrow in its anterodorsal part, wide in the rest of its length. Frill strongly striate. Surface covered with discrete granules or very small papillae and a few large papillae.

Dimensions of adult carapace, the holotype: length (including frill), 1.44 mm.; height (including frill), .80 mm.; and width, .60 mm.

Remarks.—This species differs from *Hollinella auroriradiata* Kesling and McMillan (1951, p. 56, Pl. VI, Figs. 3–4), in having only two large spines and one smaller projecting above the dorsal border, a narrower frill, and a uniform outward curvature throughout the length of the frill. The dimorphism is not known.

The name of this species is derived from Latin *cuspis*, f. (“a point”) and *bulbus*, m. (“a bulb”) and refers to the shape of L3.

Types.—Holotype, a complete male carapace, No. 28065; paratypes, two complete carapaces (slightly crushed), Nos. 28066 and 28067.

Hollinella plauta, sp. nov.

(Pl. I, Figs. 18–22)

Description.—Carapace subovate. Dorsal border straight, anterior border subround, ventral border gently curved, and posterior border blunt, slightly curved. S2 sloping slightly toward the anterior, deep, terminating at middle of valve, ventral part broad, extending anteriorly under L2 and posteriorly under L3. S1 and S3 shallow grooves. L1 broad, gently curved, confluent with the ventral lobe, nearly confluent with the frill at the anterior corner, separated from the frill by a groove in the anteroventral part. L2 a low, vertically elongate lobe. Ventral lobe confluent anteriorly with L1 and posteriorly with L4, separated from frill by a groove, strongly arched between S2 and frill. L4 sloping gently to the dorsal and posteroventral borders. L3 inflated, moderately large, terminating dorsally in a low blunt spine.

Anterior cardinal angle about 125 degrees; posterior cardinal angle about 105 degrees.

Frill moderately wide, extending from the anterior corner approximately three-fourths of the distance around the free border, slanting outward

throughout its length; its end sharply flared outward. As seen in ventral view, a broad flat-bottomed channel between a low marginal ridge and frill. Small, closely spaced papillae and a few large papillae on the lateral surface of the valve. Small discrete tubercles on the marginal ridge.

Dimensions of a complete carapace, the holotype: length (including frill), 1.44 mm.; height (including frill), .82 mm.; and width, .70 mm.

Remarks.—This species differs from *Hollinella productilobata* Kesling and McMillan (1951, p. 62, Pl. III, Figs. 4–5), in having L2 less sharply defined, the corners more angular, the ventral lobe confluent with L1 and L4, and a smaller L3.

The name of this species is derived from Latin *plautus* (“flat, broad, flat-footed”) and refers to the width of the ventral part of the carapace.

Types.—Holotype, a complete adult carapace, No. 28061; paratype, a complete adult carapace, No. 28060.

Genus *Ctenobolbina* Ulrich 1890

Genotype.—*Beyrichia ciliata* Emmons, 1855, p. 219, Fig. 74c, by subsequent designation of Ulrich, 1890, p. 108.

Ctenobolbina megalia Kesling and Tabor

(Pl. III, Figs. 18–25)

Ctenobolbina megalia Kesling and Tabor, 1952, pp. 761–62, Pl. 111, Figs. 15–19.

Description of male.—Carapace elongate and subelliptical. Dorsal border straight; anterior and posterior borders subrounded; ventral border gently curved. S2 deep, extending from the dorsal border approximately one-half the distance to the ventral border, the ventral part slightly curved toward the anteroventral border. L1 large, inflated, a very shallow depression in the posterior part. L3 large, inflated, tangent to dorsal border; sloping slightly toward the ventral border, and confluent with the gently curved ventral lobe. Posterior part of valve nearly flat, gently arched.

Anterior cardinal angle approximately 120 degrees; posterior cardinal angle about 115 degrees.

A long narrow frill from the anterior corner to the posteroventral part of valve, becoming slightly wider in the posterior part. The two frills nearly parallel in the ventral view of the complete carapace. Small, discrete papillae on a low marginal ridge from the anterior corner to the posteroventral part of the free edge of each valve. Larger papillae on the posterior border of each valve, parallel to the free border, but not marginal. Lateral surface ornamented with papillae of two sizes; small closely spaced papillae over the lateral surface, and larger scattered papillae. Frill, channel, and marginal ridge finely granulose, nearly smooth.

Description of female.—Surface ornamentation and general lobation

similar to that of the male. L3 larger and more elongate parallel to the dorsal border. In the ventral view of the carapace, the frills closest together in their anteroventral parts and farthest apart below S2; then converging slightly and becoming nearly parallel in their posterior parts. Female carapace wider than that of the male. Channel with same ornamentation as that of the lateral surface.

Dimensions of specimen No. 28094 (Pl. III, Figs. 18-19): length, 1.28 mm.; height, .68 mm.; and width, .68 mm.

Remarks.—This species differs from *Ctenobolbina papillosa* Ulrich (1891, p. 186, Pl. 15, Figs. 8a-c) in having two sizes of papillae, fewer large papillae, narrower frills, a more elongate carapace, and no distinct posterior sulcus. A topotype specimen of *Ctenobolbina papillosa* Ulrich is shown in Pl. III, Figs. 16-17.

Specimens.—Four female carapaces, Nos. 27783, 28094, 28095, and 28097, and two male carapaces, Nos. 27782 and 28096.

Genus *Parabolbina* Swartz 1936

Genotype.—*Ctenobolbina granosa* Ulrich, 1900, p. 183, Pl. 8, Fig. 12, by subsequent designation of Swartz, 1936, p. 570.

Parabolbina hypercala, sp. nov.

(Pl. III, Figs. 1-7)

Description.—Only male valves found. Valves elongate, subovate. Hinge line straight, anterior border subround, ventral border gently rounded, and posterior border subround. S2 having a broad, deep vertical part slightly constricted near the middle, a geniculum in the central region, and a shallow inclined part extending under L2. L1, ventral lobe, and L3 confluent, gently arched. L3 large, inflated, terminating just below the hinge line. L1 low, terminating in the upper dorsocentral region. L2 small, anteroventrally confluent with L1.

Anterior cardinal angle about 110 degrees; posterior cardinal angle about 95 degrees.

Spurs in anteroventral and posteroventral parts of the valve, large, blunt, ends broken; the anterior spurs flat.

Surface finely granular, scattered large tubercles with the greatest concentration along the free border.

Dimensions of the male carapace, the holotype: length, 1.30 mm.; height, .68 mm.; and width, .60 mm.

Remarks.—This species differs from *Parabolbina pulchella* Kesling and McMillan (1951, p. 63, Pl. III, Figs. 6-7) in having two sizes of surface ornamentation, flat anterior spurs, a distinct L2 (unusual in species

of *Parabolbina*), and no tubercles on the free border. This species differs from *Parabolbina ventrispinosa* Swartz (1936, p. 573, Pl. 87, Figs. 5a-c) in having greater elongation, more inflated L3, and two sizes of surface ornamentation.

The name of this species is derived from Greek *ὑπερκαλός* ("very beautiful") and refers to the ornamentation of the valves.

Types.—Holotype, a complete male carapace, No. 28085; paratypes, three complete male carapaces, Nos. 28086–28088.

Parabolbina oxypages, sp. nov.

(Pl. III, Figs. 8–15)

Description.—Only male carapaces found. Carapace elongate, subovate, bilobate. Dorsal border straight. Anterior and posterior borders subround, ventral border gently curved. S2 narrow, deep, terminating above the middle of the valve. L1, ventral lobe, and L3 confluent. Ventral surface narrow, joining the lateral surface along a distinct bend. Slight inflation of posterior part of L1, similar to an L2, inclined anteroventrally. Spurs in ventrocentral and anteroventral parts of each valve. The posterior pair of spurs located near the position of greatest width of the carapace. The anterior pair of spurs small, blunt, close to the free edge.

Anterior cardinal angle about 110 degrees; posterior cardinal angle about 95 degrees.

Surface coarsely granulose, irregularly spaced. Tuberculate marginal structure.

Dimension of male carapace, the holotype: length, 1.10 mm.; height, .64 mm.; and width, .48 mm.

Remarks.—Distinctive characteristics of this species are the size, shape, and position of the posterior spurs. This species differs from *Parabolbina ventrispinosa* Swartz (1936, p. 573, Pl. 87, Figs. 5a-c) in having a sub-elliptical valve outline in the ventral view, with posterior spurs near the position of the greatest width.

The name of this species is derived from Greek *ὀξυπαγής* ("sharp-pointed, prickly") and refers to the ornamentation of the valves.

Types.—Holotype, an adult male carapace No. 28089; paratypes, two adult male carapaces, Nos. 28090 and 28091, and an immature male carapace, No. 28092.

Genus *Winchellatia* Kay 1940

Genotype.—By original designation, *Winchellatia longispina* Kay, 1940, p. 254, Pl. 32, Figs. 1–5.

Winchellatia teleutaea Kesling and Tabor

(Pl. II, Figs. 30-35)

Winchellatia teleutaea Kesling and Tabor, 1952, p. 762, Pl. 111, Figs. 20-23.

Description of male.—Carapace equivalved, subpyriform in lateral view. Hinge line straight, anterior border subround, ventral border and posteroventral borders gently curved, posterior border acutely subround. S2 deep, extending about one-half the distance from the dorsal border to the ventral border, curving slightly toward the anteroventral part of the valve. L1 very large, gently arched, and confluent with L3 and the ventral lobe. L3 large, inflated, extending slightly above the hinge line, separated from the ventral lobe by a broad, shallow depression. L4 gently arched, extending to the posteroventral and ventral borders. Ventral lobe broad, strongly arched, and terminating in a prominent posteroventral projection at the posterior part of the lobe.

Anterior and posterior cardinal angles about 135 degrees in the allotype.

A small velate ridge from the anterior corner of the valve to the tip of the posteroventral projection. In the ventral view this ridge curves sharply onto the projection, following the outer edge of the projection to its tip. Ventral surface flat. A low marginal ridge along the free edge. The surface finely granulose to smooth.

Dimensions of allotype, a male right valve: length, 1.58 mm.; height, .87 mm.; and width, .43 mm.

Description of female.—General lobation and surface ornamentation similar to that of the male. The velate structure a frill instead of a ridge as in the male valve. In the ventral view, configuration of the frill similar to that of the male velate ridge. Channel smooth, deepest in the anteroventral part.

Dimensions of a female right valve: length, 1.40 mm.; height, .87 mm.; and width, .43 mm.

Remarks.—This species is similar in lobation and character of dimorphism to the Ordovician species described by Kay (1940, pp. 253-55).

Specimens.—Male left valve, No. 28084; male right valve, No. 27784; female left valve, No. 27785; female right valve, No. 28082; and immature carapace, No. 28083.

Winchellatia deliquiata, sp. nov.

(Pl. II, Figs. 24-29)

Description.—No dimorphism apparent. Valves medium in size, subpyriform to subelliptical in the lateral view. Hinge line straight. Anterior border subround, ventral and posterior borders gently curved. Anterior

lobe large, gently arched, confluent at the anteroventral side of L2. L4 large, gently arched, confluent with the ventral lobe, and confluent with the the ventral part of L3. L3 sharply arched, and extending to the dorsal border. S2 nearly S-shaped, extending from the dorsal to the ventral border, its dorsal half deep and concave anteriorly, its ventral half narrow, shallow, and convex anteriorly. In ventral view, the ventral part of S2 appearing as a notch in the outline of the valve. S1 short, shallow, and inclined toward the central anterior part. L3 convex toward the posterior part of the valve, extending from the dorsal border about one-fifth of the distance toward the ventral border. Ventral lobe terminates in a posteroventral projection parallel to the hinge line. In the ventral view, the widest part of the valve at the end of the projection.

Anterior cardinal angle about 110 degrees; posterior cardinal angle about 95 degrees.

Surface finely granulose.

Dimensions of carapace, the holotype: length, .98 mm.; height, .60 mm.; and width, .52 mm.

Remarks.—Distinctive characteristics of this species are the complex lobation and the shape of S2.

The name of this species is derived from Latin *deliquia*, f. ("a gutter") and refers to the form of the lower part of S2.

Types.—Holotype, a complete carapace, No. 28081; paratypes Nos. 28079 and 28080.

Winchellatia deminuta, sp. nov.

(Pl. II, Figs. 20-23)

Description.—No dimorphism known. Carapace small, subpyriform in lateral view. Hinge line straight, anterior border rounded, ventral and the posterior borders gently rounded. L1 gently arched, confluent with the ventral lobe and L2. L2 a high elongate node below the dorsal border. Ventral lobe strongly arched from ventral border, terminating in a short, blunt posteroventral projection. L3 strongly arched, elliptical, parallel to and projecting above the hinge line. L4 low. S2 broad, deep, bifurcating near the center of the valve with extensions under L1 and under L3.

Anterior end rounded; posterior cardinal angle about 90 degrees.

Surface finely granulose.

Dimensions of holotype, a complete carapace: length, .82 mm.; height, .48 mm.; and width, .32 mm.

Remarks.—This species differs from those described by Kay (1940, pp. 253-55) in having a large L3 and a bifurcating sulcus.

The name of this species is derived from Latin *deminutus* ("small") and refers to the size of the carapace.

Types.—Holotype, a complete carapace (slightly crushed), No. 28077; paratype, a complete carapace (slightly crushed), No. 28078.

Genus *Falsipollex* Kesling and McMillan 1951

Genotype.—By original designation, *Falsipollex altituberculatus* Kesling and McMillan, 1951, p. 68, Pl. III, Figs. 1–3.

***Falsipollex minimus*, sp. nov.**

(Pl. II, Figs. 5–10)

Description of female.—Carapace subpyriform to subovate. Hinge line straight. Anterior border nearly subrounded, ventral border gently rounded, and posterior border definitely rounded. S2 fairly shallow, with an extension under L2, connected to S3 by a shallow groove below L3. S1 confluent dorsally with S2. Ventral lobe a subelliptical ridge parallel to the free border. L1 nodelike, its anteroventral part confluent with the ventral lobe. L2 a small node, joined to L1 by a narrow ridge. L3 a small bulb. L4 a node, similar to L1, and confluent with posterior part of the ventral lobe. In the ventral view, sides flat, greatest width through the L3's.

Corners rounded.

Frill wide, extending from the anterior end approximately two-thirds of the distance along the free border, forming a channel between the frill and the free edge. Valves covered by small low papillae of various sizes.

Dimensions of carapace, the allotype: length (including frill), .96 mm.; height (including frill), .56 mm.; and width, .42 mm.

Description of male.—Carapace subpyriform with a definite swing. Dorsal border subrounded, ventral and posterior borders gently rounded. Lobation and sulcation similar to those of the female. L3 extending above the hinge line, larger than the female L3. Spurs in anteroventral and ventral parts of the valve, large, flat, curved posteriorly, and dorsally confluent with the lateral surface. Surface, including the spurs, covered with small tubercles.

Dimensions of carapace, the holotype: length, .88 mm.; height, .48 mm.; and width, .36 mm.

Remarks.—The female of this species differs from the genotype in having less swing, a more gently rounded anterior border, and no confluence of L3 and the ventral lobe, and the male of this species differs in having a subrounded dorsal border. This species differs from *Falsipollex bulbosus*, sp. nov., in having a smaller median lobe.

The name of this species is derived from Latin *minimus* ("smallest") and refers to the size of the carapace.

Occurrence.—Few specimens.

Types.—Holotype, a slightly crushed adult male carapace, No. 28069; allotype, an adult female carapace, No. 28068; paratype, an adult female carapace, No. 28070.

***Falsipollex bulbosus*, sp. nov.**

(Pl. II, Figs. 11–17)

Description.—Only male carapaces found. Carapace subpyriform to subovate in lateral view. Dorsal border straight. Anterior border rounded, ventral and posterior borders more gently rounded. Posteroventral part of valve with a swing below L3. S2 fairly deep, bifurcating in ventral part with a shallow posterior extension and a shallow ventral extension to the ventral border. S1 shallow, with indistinct boundaries. S3 shallow, confluent with S1 below L3. L1 elongate, with dorsal prominence extending above hinge line, confluent with anterior part of valve. L2 usually a small node. L3 a very large hemispherical bulb extending above the hinge line. L4 elongate, gently arched, extending parallel to the posteroventral border, confluent with the ventral lobe.

Anterior cardinal angle approximately 115 degrees; posterior cardinal angle 105 degrees.

Surface covered with tubercles. Spurs large, flat, and projecting ventrally and posteriorly. Anterior spur ventral to L1. Posterior spur below front part of L3.

Dimensions of complete male carapace, the holotype: length, .84 mm.; height, .52 mm.; and width, .48 mm.

Remarks.—This species differs from *Falsipollex altituberculatus* Kesling and McMillan (1951, p. 68, Pl. III, Figs. 1–3) in having a larger, more prominent L3, flat spurs, and smaller S2.

The name of this species is derived from Latin *bulbosus* ("having bulbs") and refers to the two L3's of each carapace.

Types.—Holotype, an adult male carapace, No. 28075; paratypes, adult male carapaces, Nos. 28071–28074.

Falsipollex ? sp.

(Pl. II, Figs. 18–19)

Description.—Carapace elongate, subovate. Dorsal border straight, anterior border rounded, ventral and posterior borders more gently rounded. S2 extending from dorsal border to ventral border; the dorsal half deep, inclined posteroventrally, and the ventral half shallow, inclined postero-

ventrally. S1 a narrow groove, inclined anteroventrally, its dorsal half confluent with S2. S3 broad, deep, extending from the dorsal border about one-third the distance to the ventral border. L1 a node in the anteroventral region bounded by dorsal border and S1. L2 a node, ventrally confluent with a distinct ridge, extending from the upper one-third of the valve to the anteroventral region, wider in its ventral part and forming a protuberance, bounded posteriorly by S2. Protuberance in the centroventral region, not confluent with the other lobes. L3 a small hemispherical knob extending slightly above the dorsal border. L4 a vertically elongate lobe rising steeply from S3, and gently rounded to the posterior border.

Cardinal angles approximately 110 degrees each.

Surface coarsely granulose with scattered papillae. Short, widely-spaced marginal spines.

Dimensions of an immature male carapace: length, .76 mm.; height, .48 mm.; and width, .36 mm.

Remarks.—This carapace has the same general outline and lobation as those of *Falsipollex minimus*, sp. nov. (Pl. II, Figs. 5–10). However, no velate structure is present. The central, ventral, and anteroventral inflations suggest an immature male, but no spurs are present.

Specimen.—Carapace, No. 28076.

Genus *Ctenoloculina* Bassler 1941

Genotype.—*Tetradella cicatricosa* Warthin, 1934, Pl. I, Figs. 4–6, by subsequent designation of Bassler, 1941, p. 22.

Ctenoloculina eurybathrota Kesling

(Pl. I, Figs. 1–2)

Ctenoloculina eurybathrota Kesling, 1952, pp. 46–48, Pl. I, Figs. 1–9.

Remarks.—Only one specimen, broken and abraded, was found in the Genshaw material but it appears to be conspecific with the numerous specimens of *C. eurybathrota* Kesling which occur in the upper Ferron Point formation of Michigan and the Arkona shale of southern Ontario. Inasmuch as the specimen shows evidence of much wear, it may have been eroded from Ferron Point shales and deposited with Genshaw sediments during that part of the Devonian period.

Types.—Hypotype, an incomplete female carapace, No. 28052.

Genus *Tetrasacculus* Stewart 1936

Genotype.—By original designation, *Tetrasacculus bilobus* Stewart, 1936, pp. 744–45.

Tetrasacculus magnivelatus Kesling and McMillan

(Pl. I, Figs. 5-8)

Tetrasacculus magnivelatus Kesling and McMillan, 1951, p. 51, Pl. I, Figs. 6-7.

Remarks.—In two female carapaces of this species from the *Cyrtina umbonata alpenensis* zone of the Genshaw formation, the left valve slightly overlaps the right valve along the free edge. The anterior cardinal angle is about 120 degrees and the posterior corner is rounded. The surface ornamentation of the specimens from the Genshaw is more granulose than that of the specimens described by Kesling and McMillan (1951, Pl. I, Fig. 6) from the Bell shale. There is a distinct smooth marginal ridge in the Genshaw specimens. No male specimens were found.

Types.—Hypotypes, two adult female carapaces, Nos. 28054 and 28055.

Genus *Subligaculum* Kesling and McMillan 1951

Genotype.—By original designation, *Subligaculum scrobiculatum* Kesling and McMillan, 1951, p. 65, Pl. II, Figs. 1-4; Pl. VII, Figs. 1-8.

Subligaculum proclivisulcatum, sp. nov.

(Pl. I, Figs. 3-4)

Description.—Only one specimen found, a female carapace. Valve subelliptical. Dorsal border straight, anterior and posterior borders subround, ventral border gently rounded. S2 deep, slightly inclined toward posterior border, ventrally bifurcate, the anterior and posterior branches together forming a straight groove covering one-half the length of the valve and inclined toward the anteroventral border of the valve. A deep pit between L1 and the anterodorsal part of a small ridge. L1 a flat lobe, anteroventrally confluent with the ventral lobe. L3 broad and gently arched, slightly inflated in the anterior part, posteriorly confluent with the ventral lobe. A wide flat-bottomed groove around the lobes and parallel to the free border.

Anterior cardinal angle approximately 125 degrees; posterior cardinal angle approximately 105 degrees.

Frill narrow, in lateral view with four indentations, in ventral view scalloped, with four inflations shaped like half spheroids; each forming halves of four chambers when valves are in contact. A small ridge from the anterior corner to the anterodorsal part of the frill. Both frill and lobes covered with small papillae. A distinct marginal ridge, its posterior part forming a border of the wide, flat-bottomed groove.

Dimensions of complete carapace, the holotype: length, .73 mm.; height (including frill), .49 mm.; and width, .25 mm.

Remarks.—The distinctive characteristics of this species are the wide groove around the lobes and the ventral bifurcation of the deep S2, forming a deep, straight groove extending over one-half the length of the valve.

The name of this species is derived from Latin *proclivus* ("sloping, going downward") and *sulcus*, m ("a furrow") and refers to the ventral extensions of S2.

Types.—Holotype, a slightly crushed female carapace, No. 28053.

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Submitted for publication January 23, 1952

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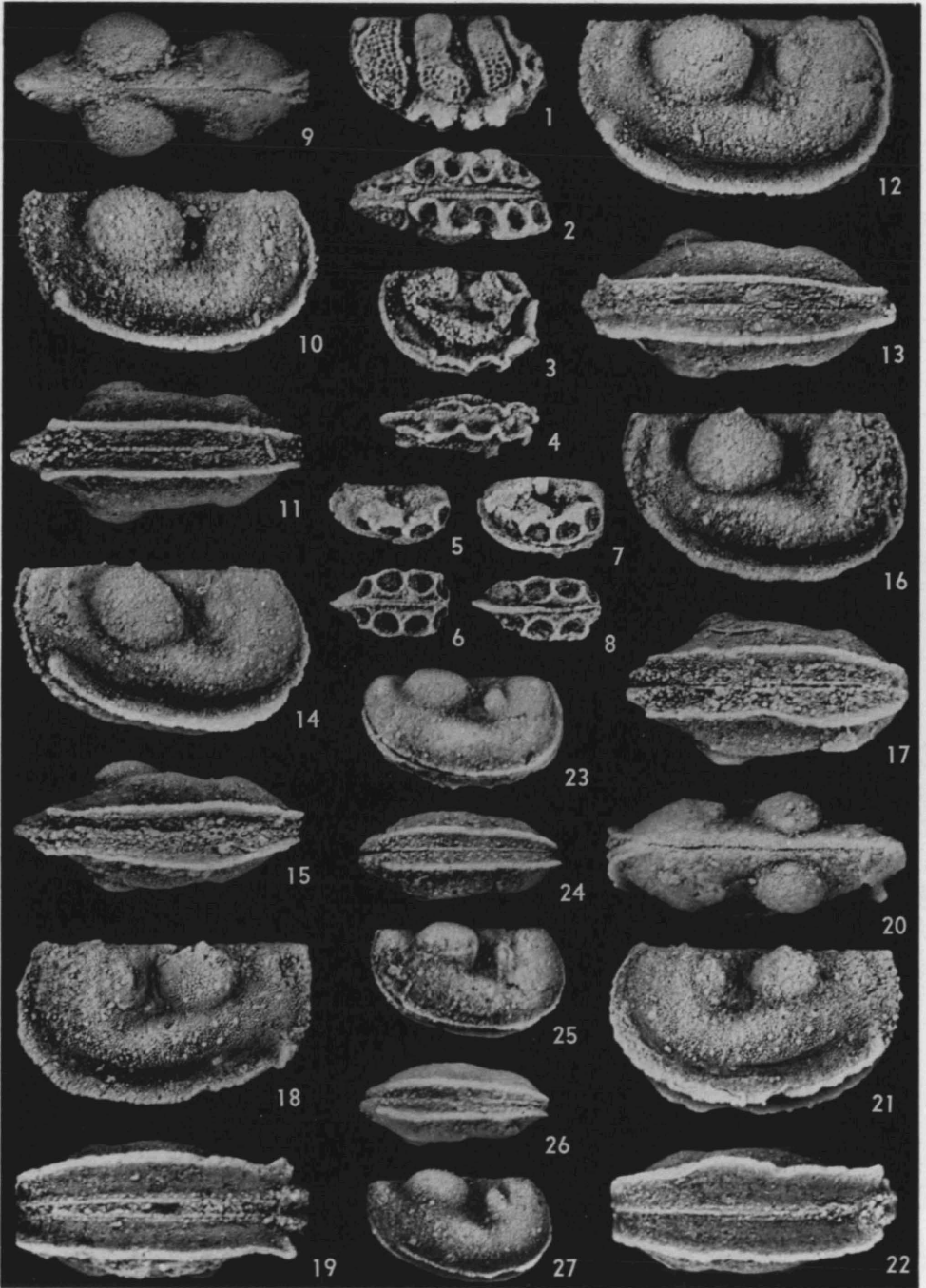
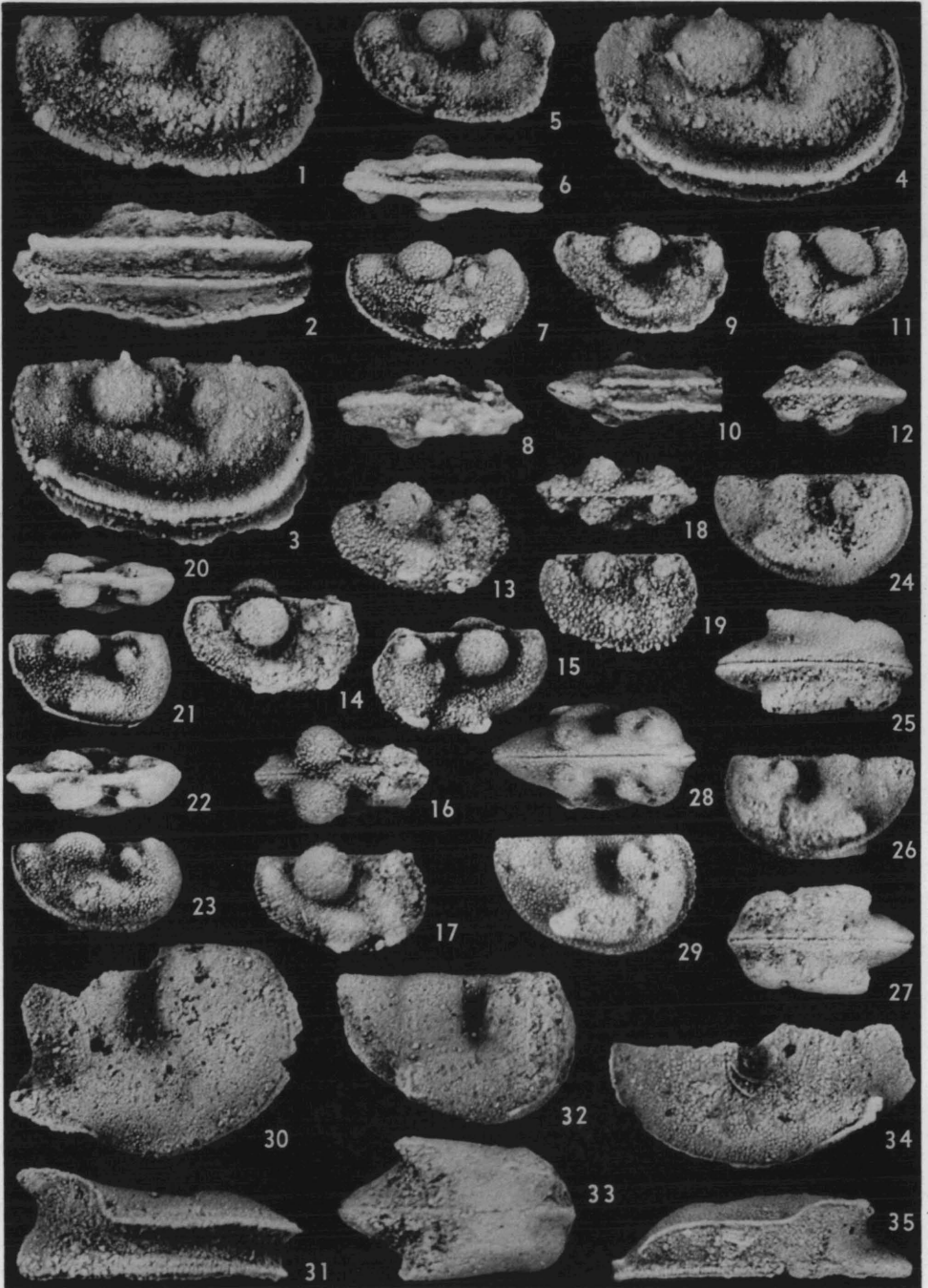


PLATE II



EXPLANATION OF PLATE II

(All figures $\times 27.5$)

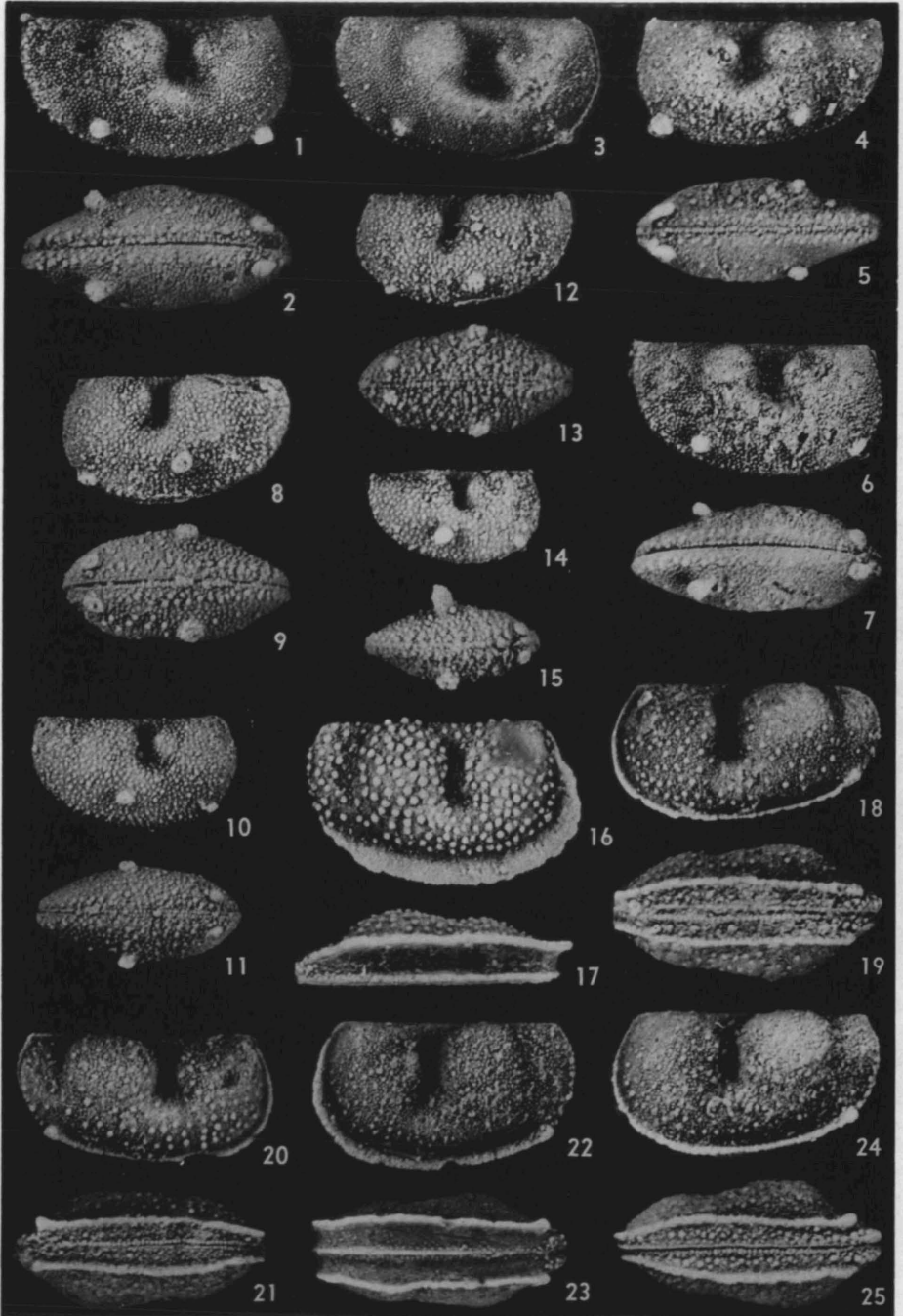
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