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MIDDLE ORDOVICIAN BLACK RIVER OSTRACODS
FROM MICHIGAN

PART IV. SPECIES OF *COLACCHILINA* (NEW GENUS),
LACCOCHILINA, AND *HESPERIDELLA*

BY

ROBERT V. KESLING, DONALD D. HALL, and JAMES C. MELIK



MUSEUM OF PALEONTOLOGY
THE UNIVERSITY OF MICHIGAN
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8. Middle Ordovician Black River Ostracods from Michigan. Part IV. Species of *Colacchilina* (New Genus), *Laccochilina*, and *Hesperidella*, by Robert V. Kesling, Donald D. Hall, and James C. Melik. Pages 205-213, with 2 plates.

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INTRODUCTION

AS POINTED OUT in the first three parts of these papers on Middle Ordovician Black River ostracods from Michigan, the fauna is remarkable for its resemblance to that of northern Europe. In this part, species of *Laccochilina* and *Hesperidella* are reported for the first time from the United States. A new genus, *Colacchilina*, is very closely related to *Laccochilina*.

All specimens described herein are from unit 4 of Hussey's measured section (see Kesling and others, 1960, pp. 295-96). This unit is regarded as Black River in age because it contains *Eoleperditia fabulites* (Conrad), which occurs elsewhere in rocks that are classified as Black River—for instance, in northern Illinois in the Mifflin, upper Magnolia, and Quimby's Mill members of the Platteville formation (Scott, 1951, pp. 321, 325).

The manuscript of this paper was reviewed by Dr. Lewis B. Kellum and Dr. Chester A. Arnold. All specimens described here are catalogued and deposited in the Museum of Paleontology of The University of Michigan.

SYSTEMATIC DESCRIPTIONS

Phylum ARTHROPODA

Class CRUSTACEA

Subclass OSTRACODA

Suborder PALEOCOPA Henningsmoen, 1953

Superfamily Eurychilinaea Ulrich and Bassler, 1923

Family Eurychilinae Ulrich and Bassler, 1923

Subfamily Chilobolbininae Jaanusson, 1957

Colacchilina, gen. nov.

Type species.—*Colacchilina plera*, sp. nov.

Generic description.—Valves strongly convex. As seen laterally, domicilium suboval, truncated by straight dorsal border. L2 small and rounded, adjacent and anterodorsal to muscle spot. Muscle spot a very gently convex area set slightly lower than rest of lateral surface. A shallow depression dorsal to muscle spot and L2, expanded dorsally. Low dorsal ridge present. Muscle spot dorsal to midheight.

Frill extending from anterior to posterior corner. In female, frill strongly convex ventrally for entire width, producing a "sausage-shaped" part or dolon. Remainder of frill concave. Surface of frill distinctly radially striated.

Remarks.—*Colacchilina* is placed in the subfamily Chilobolbininae because the dolon is formed by the entire width of frill. The genus is based upon two specimens, presumably female right valves. The "sausage-shaped" convex frill strongly suggests that these are female valves; however, dimorphism of the genus is not yet known.

This genus most closely resembles *Laccochilina* Hessland, but differs by having S2 developed as a distinct muscle spot with a shallow depression above it, instead of a pit behind L2.

In the type and only known species, the holotype has small parts of the anterior and posterior frill broken off. A part of the anterodorsal border is covered by matrix.

The name of the genus, derived from the Greek words *κολαε*, m. ("flatterer, imitator") and *χειλος*, n. ("lip, brim"), is an obvious anagram of *Laccochilina*, a genus which it closely imitates in the form of the frill.

Colacchilina plera, sp. nov.

(Pl. I, Figs. 1-2)

Description.—Valves strongly convex. As seen laterally, domicilium suboval, truncated by straight dorsal border. Greatest height just posterior

to muscle spot. Greatest length at about midheight. L2 small and round, adjacent and anterodorsal to muscle spot. Muscle spot oval, very gently convex, set slightly below adjacent surface, connected to depression above by a narrow, shallow groove. Shallow depression expanding dorsally, terminating at dorsal ridge.

Low, thin dorsal ridge extending along convex part of valve, terminating short of corners. Muscle spot with finely granulose markings, probably indicating muscle fibers. Lateral surface smooth excepting arc-shaped, very shallow, narrow groove between muscle spot and ventral border of domicilium, extending subparallel to border from anterior to posterior corner. Row of low nodes extending between and parallel to groove and ventral border of domicilium.

Frill extending from anterior to posterior corner, maintaining a constant width of about one-fourth the height of domicilium. Ventral part of frill strongly convex for entire width, forming a "sausage-shaped" section or dolon. Convex part terminated abruptly posteroventrally and slightly below midheight anteroventrally. Remainder of frill slightly concave. Surfaces of frill distinctly radially striated, with about 20 striae per mm along free edge.

Dimensions of holotype: length, including frill (measured to estimated extent of frill before breakage), 1.57 mm; length of domicilium, 1.28 mm; height, including frill, 0.97 mm; and height of domicilium, 0.78 mm.

Remarks.—The male of this species has not been found. The name of the species is derived from the Greek word πλήρης ("full, solid"), and refers to the muscle spot nearly filling S2.

Types.—Holotype, a female right valve, UMMP 37221. Paratype, a female right valve UMMP 37222.

Genus *Laccochilina* Hessland, 1949

Type species.—*Eurychilina estonula* Öpik, 1935.

Diagnosis.—Unisulcate, with a well-developed pit for S2. Male valve with a moderately broad concave frill of more-or-less uniform width along its development; female with the anteroventral and ventral parts of the frill strongly convex to form a well-defined dolon. The velar structure may be entire or represented posteriorly by a row of spines (from Jaanusson, 1957, p. 241).

Subgenus *Laccochilina* (*Laccochilina*) Hessland, 1949

Type species.—*Eurychilina estonula* Öpik, 1935.

Diagnosis.—"Velar frill reaching posteriorly up to the posterior cardi-

nal corner without any considerable decrease in width. Preadductorial node [L2] comparatively prominent" (Jaanusson, 1957, p. 243).

Laccochilina (Laccochilina) phracta, sp. nov.

(Pl. I, Figs. 3-4)

Description.—Valves moderately convex. Domicilium suboval as seen laterally. Greatest height at midlength, anterior and posterior parts of carapace of same height (amplete). Hinge line straight, concealed by dorsal plica. S2 developed as deep adductorial pit at midlength, and a separate shallow, flared depression above. Pit entirely bordered by a low crest, especially prominent between pit and depression. L2 an indistinct low rounded node, adjacent and anterodorsal to S2.

Dorsal plica protruding above hinge line, its anterior and posterior ends not attaining corners, but instead turned ventrally, diminishing in height and terminating at about one-tenth the height of the domicilium from dorsal border. Slight depression in central dorsal area expanded dorsally, terminating at dorsal plica.

Surface smooth, with exception of arc between sulcus and border of domicilium, expressed as a very shallow narrow groove extending subparallel to border from anterior to posterior corner. Row of low, rounded nodes between and parallel to groove and ventral border of domicilium.

Frill extending from anterior to posterior corners, narrowing slightly near corners, concave, slightly undulating along ventral border, there about one-sixth the height of domicilium. Certain undulations more closely defined, raised as broad ribs.

Dimensions of the holotype: length, including frill, 1.65 mm; length of domicilium, 1.50 mm; height, including frill, 1.12 mm; and height of domicilium, 0.95 mm.

Immature instar.—Represented by male-type left valve (Pl. I, Fig. 3). Frill concave but narrower than in adult. Dorsal plica indistinct and ends not perceptibly turned ventrally. Sulcus suboval to lacrimiform. Similar in other respects to adult male.

Remarks.—Only the holotype and an immature instar are known. The frills of the type specimens are concave rather than convex, more nearly like those of males in other species of *Laccochilina*. Dimorphism in the species, however, has not yet been established.

Laccochilina (L.) phracta differs from other congeneric species with a dorsal plica mainly by the presence of the narrow ventral groove, the poor definition of the preadductorial node (L2), the nearly midlength position of S2, and the distinctive crest or rim around the pit. The name of this

species is derived from the Greek adjective φρακτος ("fenced in") and refers to the crest around the pit.

Types.—Holotype, an adult male left valve, UMMP 37227. Paratype, an immature left valve, UMMP 37274.

Laccochilina (Laccochilina) sp.

(Pl. II, Fig. 4)

Description.—Valves moderately convex. Domicilium subquadrate as seen laterally. Greatest height at midlength, anterior and posterior portions of carapace about same height (amplete). Hinge line straight. S2 developed as deep, dorsoventrally-elongated, crescent-shaped pit, just anterior to midlength, slightly above midheight, and concave toward anterior. L2 consists of high, distinctly developed, round knob, adjacent and anterior to S2. Valve surface granulose, with exception of frill, knob, and bottom of sulcus.

Frill concave, best developed ventrally, becoming obsolete before reaching corners.

Dimensions of holotype: length, about 0.71 mm; height, including frill, about 0.43 mm; and height of domicilium, about 0.39 mm.

Remarks.—Only one specimen is known, presumably a male left valve. It may be immature.

Laccochilina (L.) sp. differs from *L. (L.) phracta*, sp. nov., in lacking a dorsal plica, and by its very high and distinct L2. It differs from other congeneric species by its smaller size, well-developed L2, and comparatively narrower frill which does not extend to the corners.

Illustrated specimen.—Male (or immature) left valve, UMMP 37223.

Family Piretelliidae Öpik, 1937

Subfamily Tvaerenellinae Jaanusson, 1957

Genus *Hesperidella* Öpik, 1937

Type species.—*Primitia esthonica* Bonnema, 1909.

Diagnosis.—Unisulcate, with large, rounded presulcate knob (L2) and a conspicuous crest around the sulcus and the knob. Dorsal plica strongly developed. Velar structure moderately broad, slightly concave in male valve, anteroventral part expanded as a plane to slightly convex dorsally in female (from Jaanusson, 1957, p. 327).

Remarks.—Although the crest is not as prominent as that in the type species, and does not completely encircle S2 and L2, the species described below seem to belong to *Hesperidella*.

Hesperidella sp.

(Pl. II, Fig. 1)

Description.—Domicilium suboval to subquadrate with greatest height slightly anterior of midlength. L2 large, slightly elongated dorsoventrally with its long diameter equal to about two-fifths the height of the domicilium. S2 deep, crescent-shaped, concave toward anterior, slightly expanding dorsally. Low, rounded crest bordering S2 posteriorly, becoming obsolete ventrally, and dorsally merging with dorsal plica. A furrow is developed anterior and dorsal to L2, and thus the knob is entirely surrounded by a distinct depression. Dorsal plica low, posteriorly continuous with frill. Surface of domicilium unornamented.

Frill extending from posterior corner nearly and probably to, anterior corner (anterior corner covered by matrix). Frill concave, becoming plane posteriorly, along ventral border about one-eighth the height of domicilium.

Dimensions of specimen: length, including frill, about 0.58 mm; length of domicilium, about 0.50 mm; height, including frill, about 0.40 mm; and height of domicilium, about 0.31 mm.

Remarks.—Only one specimen is known, presumably a male left valve. Dimorphism in the species has not yet been established. Concavity of the frill, however, like that in *H. estonica*, suggests that the specimen is a male. The anterodorsal portion of the carapace is covered by matrix. The outermost part of L2 is broken off.

Hesperidella sp. differs from *H. estonica* mainly by its lack of surface ornamentation and by its much smaller size. It is about 0.58 mm in length, whereas *H. estonica* has an average length of about one millimeter or more.

Illustrated specimen.—A male (or immature) left valve, UMMP 37224.

***Hesperidella michiganensis*, sp. nov.**

(Pl. II, Figs. 2-3)

Description.—Domicilium suboval to subquadrate with greatest height anterior to midlength (Pl. II, Fig. 3). L2 large, elongated dorsoventrally, with its long diameter equal to about one-half the height of the domicilium, extending slightly above domicilium. S2 deep, crescent-shaped, concave toward anterior, expanding dorsally to edge of dorsal plica. Very low rounded crest bordering S2 posteroventrally, becoming indistinct ventrally. A furrow, expanding dorsally, developed anterodorsal to L2. Domicilium is separated from dorsal plica by a groove gently arched ventrally and continuous with groove separating frill from domicilium. Surface of domicilium finely granulose.

Dorsal plica high, about one-third the height of the domicilium, continuous both anteriorly and posteriorly with frill. Rounded, low, bluntly subconical dorsal projection formed at intersection of frill with dorsal plica.

Frill extending from anterior to posterior corner, continuous with dorsal plica and becoming narrower along posterior border. Frill convex, about one-fourth the height of the domicilium along the ventral border, its surface finely granulose and faintly radially striate.

Immature instar.—Right valve, presumably of a female (Pl. II, Fig. 2). Frill narrower than in adult. Dorsal projection formed at intersection of frill with dorsal plica not as prominent as that in adult. Similar in other respects to adult.

Remarks.—Only the holotype and one immature instar are known. The frills of both specimens are convex, greatly resembling the female *H. estonica*. The posterior part of the frill, and the posterodorsal part of the dorsal plica are broken off of the holotype. On both specimens the outermost part of L2 is broken off.

Hesperidella michiganensis, sp. nov., can be distinguished from *H. estonica* by its smaller size, and its much higher dorsal plica. Its frill is also proportionately wider than that of *H. estonica*. It differs from *H.* sp. from the same formation by its higher dorsal plica, wider frill, and presence of surface ornamentation.

Types.—Holotype, a female left valve, UMMP 37372; paratype, an immature female right valve, UMMP 37225.

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- SCOTT, H. W. 1951. Instars and Shell Morphology of *Eoleperditia fabulites*. Journ. Paleontol., Vol. 25, No. 3, pp. 321-26, Pl. 51, 3 figs.

Submitted for publication August 29, 1961.

EXPLANATION OF PLATE I

(All figures x 30)

	PAGE
<i>Colacchilina plera</i> , sp. nov.	206
FIG. 1. Stereogram of female right valve in matrix. Paratype UMMP 37222. Posterior end of valve missing.	
FIG. 2. Stereogram of female right valve in matrix. Holotype UMMP 37221. Specimen remarkably complete.	
<i>Laccochilina (Laccochilina) phracta</i> , sp. nov.	208
FIG. 3. Stereogram of immature left valve in matrix. Paratype UMMP 37274. Edge of frill broken off.	
FIG. 4. Stereogram of adult male left valve in matrix. Holotype UMMP 37227. Frill probably not complete.	

PLATE I

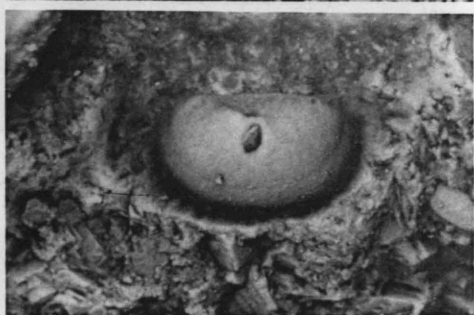
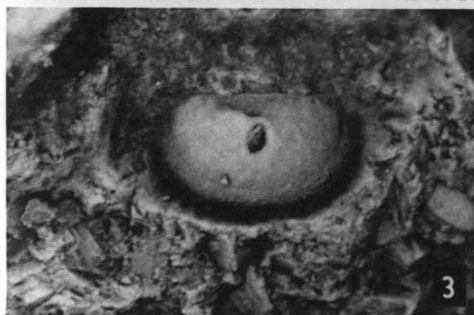
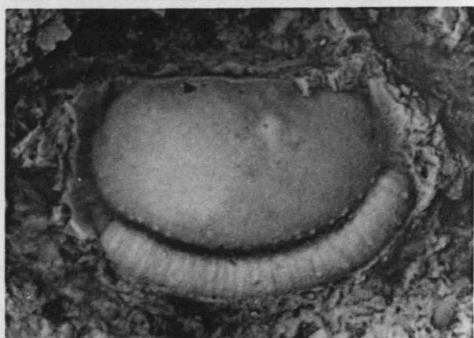
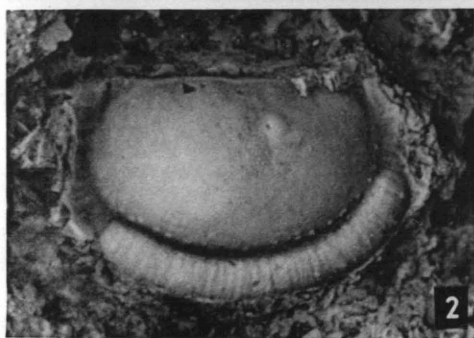
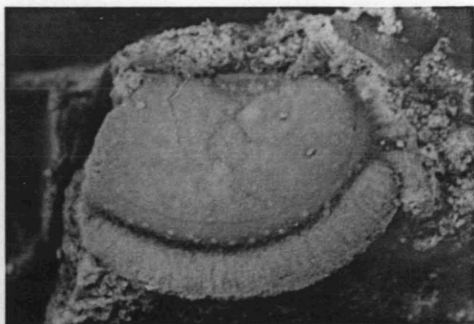
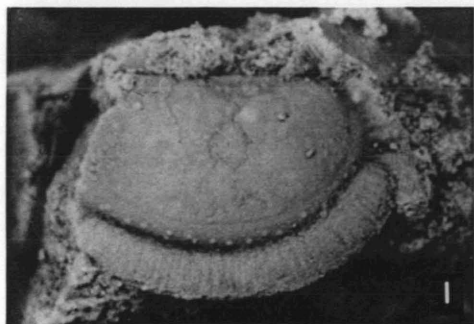
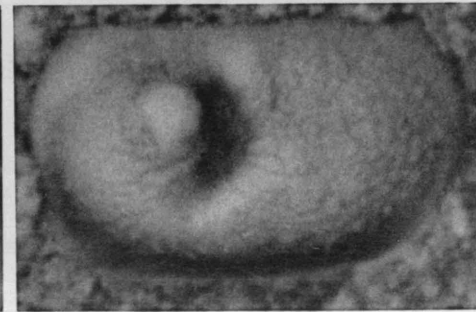
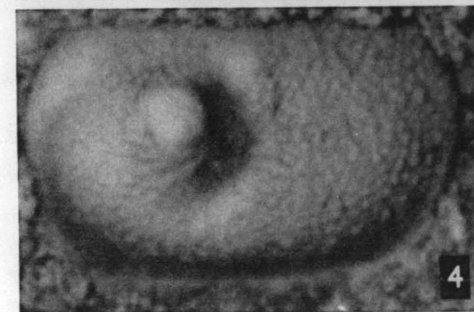
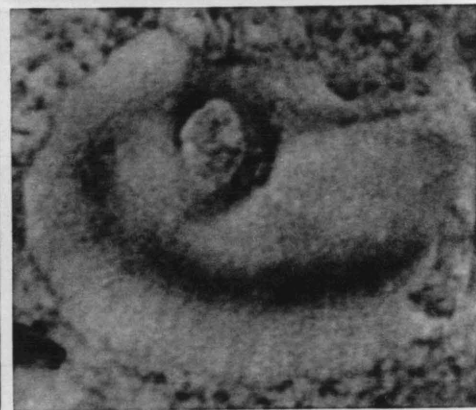
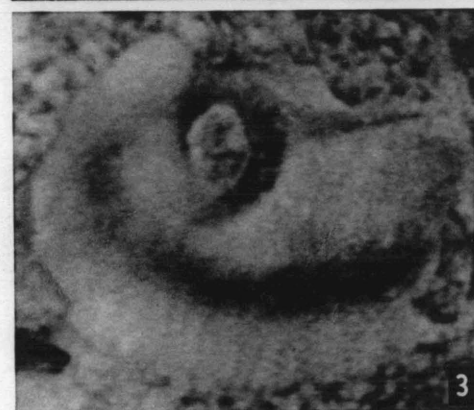


PLATE II



EXPLANATION OF PLATE II

(All figures x 80)

	PAGE
<i>Hesperidella</i> sp.	210
FIG. 1. Stereogram of male (or immature) left valve. UMMP 37224. Tip of L2 broken off, and frill incomplete.	
<i>Hesperidella michiganensis</i> , sp. nov.	210
FIG. 2. Stereogram of immature female right valve. Paratype UMMP 37225. Tip of L2 and part of frill broken off. Female characteristics in subadult size regarded as evidence of precocious maturity.	
FIG. 3. Stereogram of adult female left valve. Holotype UMMP 37372. Posterior part of valve missing, and tip of L2 broken off.	
<i>Laccochilina</i> (<i>Laccochilina</i>) sp.	209
FIG. 4. Stereogram of male (or immature) left valve. UMMP 37223.	

The first part of the document discusses the importance of maintaining accurate records of all transactions. It emphasizes that every entry should be supported by a valid receipt or invoice. This ensures transparency and allows for easy verification of the data.

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