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THE UNIVERSITY OF MICHIGAN

VOL. XVIII, No. 12, pp. 197–204 (1 pl.) OCTOBER 4, 1963

CYRTINA HAMILTONENSIS (HALL) AND A NEW SPECIES OF THIS BRACHIOPOD GENUS FROM NEW YORK

BY

GEORGE M. EHLERS

FROM THE

EDWARD PULTENEY WRIGHT MEMORIAL VOLUME

Publication of this paper is made possible by the Federal-Mogul-Bower Bearings, Inc. Paleontology Research Fund

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CONTENTS

INTRODUCTION

IN THIS PAPER a lectotype is designated for the brachiopod species *Cyrtina hamiltonensis* (Hall), and a new species of *Cyrtina* from New York State is described. The lectotype of *Cyrtina hamiltonensis* (Hall) and the holotype of *Cyrtina darienensis,* sp. nov., are in the collection of the American Museum of Natural History, New York City.

ACKNOWLEDGMENTS

I wish to thank the people who aided me in the preparation of this paper. Dr. Donald Squires, when engaged as Curator of Fossil Invertebrates in the American Museum of Natural History, made available for study James Hall's types of *Cyrtina hamiltonensis* and gave information pertaining to the history of these specimens. Dr. Roger L. Batten, Associate Curator of Fossil Invertebrates in the American Museum, sent the lectotype of *Cyrtina hamiltonensis* to me for further examination. Dr. G. Arthur Cooper, Head Curator, Department of Geology, Smithsonian Institution, gave helpful comments bearing on the stratigraphic occurrences of the types and on *Spinocyrtina* Fredericks, the type species of which is *Cyrtina hamiltonensis*. Doctors L. B. Kellum, C. A. Arnold, and R. V. Kesling of the Museum of Paleontology, The University of Michigan, critically read the manuscript. Mr. Karoly Kutasi also of the Museum of Paleontology very materially assisted with the photography. Mrs. Helen Mysyk did the typing.

SYSTEMATIC DESCRIPTIONS

Phylum BRACHIOPODA
Class ARTICULATA
Order TELOTREMATA
Superfamily Punctospiracea
Family Spiriferinidae Davidson 1884
Subfamily Cyrtininae Schuchert and Le Vene 1929
Genus *Cyrtina* Davidson 1858

Cyrtina Davidson, 1858, pp. 66–68; Whidborne, 1893, pp. 111–112.
Spinocyrtina Fredericks, 1916, p. 18, and 1926, p. 413—type species *Cyrtina hamiltonensis* (Hall), Middle Devonian Hamilton group, New York.

Type species of Cyrtina.—Calceola heteroclita Defrance, 1824, Vol. 32, p. 306, Pl. 80, Figs. 3, 3*a*, 3*b*, by designation of Dall, 1877, p. 24.

Cyrtina hamiltonensis (Hall)

(Pl. I, Figs. 1–12)

Cyrtia hamiltonensis Hall, 1857, p. 166, 4 Figs.
Cyrtina hamiltonensis Hall, 1867, pp. 268–69, Pl. 44, Fig. 31.
Spinocyrtina hamiltonensis Fredericks, 1916, pp. 18–19; 1926, p. 413.

Description.—Shell of medium size, triangular-subpyramidal; cardinal extremities very slightly extended; width slightly greater than length. Hinge line straight; greatest width along hinge line. Surface of shell lateral to fold and sulcus marked by rounded costae, 7 on each of fold and sulcus. Most costae separated by narrow furrows; furrows adjacent to fold, considerably wider than those between costae. Surfaces of costae, furrows, fold and sulcus covered with spinules. Worn surfaces of shell exhibiting endopunctae. Most growth lines fine and closely spaced; few slightly thicker and widely spaced.

Pedicle valve about 2½ times deeper than brachial valve. Sulcus moderately broad and deep with each bounding costa considerably wider than adjacent one on the lateral slope. Lateral slopes gently curved. Beak prominent and erect. Interarea wider than high, its anterior margin making nearly a right angle with the commissure; surface gently concave, its curvature greater near the beak. Interarea very indistinctly divided into a wide inner, perideltidial area and two narrow outer areas by two very obscure lines diverging from the beak. Inner and outer areas crossed by very fine, horizontal lines of growth; a few less weathered surfaces of inner area with very thin, vertical but interrupted ridges. Delthyrium covered with a convex pseudodeltidium, bearing a relatively large oval foramen near apex.

Brachial valve subrectangular in outline, gently to moderately convex, flat to slightly concave anterior to the cardinal angles. Mesial fold relatively low and convex. Beak small, scarcely rising above hinge line. Interarea linear.

Remarks.—*Cyrtina hamiltonensis* (Hall) was made the type species of *Spinocyrtina* by G. Fredericks (1916, p. 18, and 1926, p. 413). Apparently, Fredericks' main reason for proposing the genus *Spinocyrtina* was the occurrence of spinules on the surface of cyrtiniform shells like *Cyrtina hamiltonensis* (*Hall*). According to G. F. Whidborne (1893, p. 112) the type species of *Cyrtina, C. heteroclita* Defrance, contains shells whose surfaces are covered with microscopic tubercles. Unless it can be shown that *Cyrtina hamiltonensis* has generic characters that distinguish it from those of the type species, the author agrees with Ivanova (1962, pp. 109–10) in believing that *C. hamiltonensis* and *C. heteroclita* are congeneric and that *Spinocyrtina* is a synonym of *Cyrtina.*

Whidborne (1893, p. 112) thought that *Cyrtina hamiltonensis* was a synonym of *C. heteroclita* but recognized that shells of this species had more costae than those of *C. heteroclita.* In addition to the difference in number of costae, there are other differences in the shell sufficient to indicate that *C. hamiltonensis* and *C. heteroclita* are distinct species.

Many specimens from the Devonian strata of North America erroneously identified as *Cyrtina hamiltonensis* (Hall) belong to undescribed species. The selection and description of a lectotype, the first specimen of the species illustrated by Hall, will be very helpful in the proper identification of many shells now incorrectly assigned to *Cyrtina hamiltonensis.*

Occurrence.—The lectotype was found at Moscow, New York, and most probably was obtained from the Moscow formation of the Middle Devonian Hamilton group of New York State. In a communication to the author, Dr. G. Arthur Cooper of the Smithsonian Institution of Washington, D. C., states that "it [the lectotype]is almost certainly from the Moscow formation, but it would be difficult to say whether or not it is from the Kashong or Windom [shale members of Moscow formation]. My guess would be the latter."

Type.—The lectotype is in the American Museum of Natural History, New York City. It bears an orange-colored sticker label with the number $\frac{5191}{1}$ and a diamond-shaped green sticker label which indicates that the specimen is a primary type. It also bears a small white label with the letters, MOS, which with little doubt is an abbreviation of the name of the town Moscow. R. P. Whitfield and E. O. Hovey (1899, p. 216) assigned the number $\frac{4557}{2}$ to the specimen.

Cyrtina darienensis, sp. nov.

(Pl. I, Figs. 13–24)

Cyrtia hamiltonensis Hall, 1857, p. 166. (Probably one of Hall's syntypes.)
Cyrtina hamiltonensis Hall, 1867, pp. 268–69, Pl. 44, Figs. 26–30.
Spinocyrtina hamiltonensis Fredericks, 1916, pp. 18–19; 1926, p. 413.

Description.—The following description is based on a specimen that very probably is one of the syntypes of *Cyrtina hamiltonensis,* which Hall (1857, p. 166) first designated as *Cyrtina hamiltonensis.*

Shell of median size, triangular-subpyramidal; cardinal extremities very slightly extended; width slightly greater than length. Hinge line straight; greatest width about midway between anterior and posterior extremities of shell but only little greater than width along hinge line. Surface of shell lateral to fold and sulcus marked by rounded costae, 7 to 8 on sides of fold and sulcus. Most costae separated by narrow furrows; furrows adjacent to fold considerably wider than those between costae. Surfaces of costae, furrows, fold, and sulcus much worn but showing remnants of spinules. Worn surfaces of shell exhibiting endopunctae. Most growth lines fine and closely spaced; few slightly thicker and widely spaced.

Pedicle valve about 2½ times deeper than brachial valve. Sulcus relatively broad and shallow with each bounding costa wider than adjacent one on the lateral slope. Sulcus with narrow, prominent median depression and two other very shallow, indistinct depressions, each of which is adjacent to one of the bounding costae of the sulcus; surface of sulcus between each shallow, indistinct depression and the median depression is a broad, low, convex ridge. Lateral slopes convex, flat to slightly concave near cardinal extremities. Beak slightly incurved. Interarea wider than high, its anterior margin making nearly a right angle with the commissure; surface gently concave, its curvature greatest near beak. Interarea divided into a wide inner, perideltidial area and two narrow outer areas by two lines diverging from the beak. Inner and outer areas crossed by very fine, horizontal lines of growth; a few less-weathered parts of inner area with very thin, vertical, but interrupted, ridges. Delthyrium covered with a convex pseudodeltidium, bearing a relatively large oval foramen near apex.

Brachial valve subrectangular in outline. Fold broad, low, and gently convex; bounding furrow on each side wider than intercostal furrows of lateral slopes. Fold with a median depression that is narrow in the umbonal region and becomes wider and shallower toward the anterior edge of the valve. Lateral slopes moderately convex but flat to slightly concave near cardinal extremities. Beak small, very slightly incurved. Interarea linear.

Remarks.—The collection of the American Museum of Natural History

undoubtedly contains many specimens that were in James Hall's possession at the time he described *Cyrtina hamiltonensis*. The specimens were obtained from many localities in New York State (see Hall, 1857, p. 166) where one or more divisions of the Middle Devonian Hamilton group are exposed. Their specific characteristics and stratigraphic occurrences will be inadequately known until these specimens are compared with other conspecific shells obtained from precisely determined stratigraphic positions.

Cyrtina darienensis, sp. nov., resembles the lectotype of *Cyrtina hamiltonensis* in the general shape of the shells. It differs from the latter in having a wider and relatively lower fold that has a median depression. The sulci of the brachial valves of the two species are also different. The sulcus of *C. darienensis* is wider and shallower than that of *C. hamiltonensis*. It bears a prominent medial depression, on each side of which is a broad, low, convex ridge; each ridge merges with a shallow, indistinct depression adjacent to one of the costae bounding the sulcus. The sulcus of *Cyrtina hamiltonensis* is a single trough, the curvature of which is not modified by a medial depression and low lateral convex ridge.

Occurrence.—The holotype was found at or near Darien, Genesee County, in the western part of New York State. It was obtained from a stratum in the Middle Devonian Hamilton group; its exact position in the group depends on the discovery of conspecific specimens in rock whose definite stratigraphic occurrence is known.

Type.—The holotype is preserved in the American Museum of Natural History, New York City. It bears an orange-colored sticker label with the number $\frac{5191}{1}$ and a diamond-shaped, green sticker label which indicates that the specimen is a primary type. R. P. Whitfield and E. O. Hovey (1899, p. 216) assigned the number $\frac{4557}{1}$ to the specimen.

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Manuscript Received April 30, 1963

PLATE

EXPLANATION OF PLATE I

PAGE

Cyrtina hamiltonensis (Hall) .....

FIGS. 1–5. Five views of specimen first illustrated by James Hall and here designated as the lectotype of the species. ×1. Horizon and locality: Middle Devonian (Hamilton group—Moscow formation); Moscow, New York. Lectotype, No. $\frac{4557}{2}$, American Museum of Natural History.

FIGS. 6–10. Enlarged views of lectotype illustrated in Figures 1–5. ×2. Fig. 6, pedicle valve, showing beak width of sulcus, and costae. Fig. 7, brachial valve, exhibiting width of fold and costae. Fig. 8, lateral view, illustrating depth and profile of valves, and relationship of relatively flat interarea of pedicle valve to commissure. Fig. 9, anterior view, showing anterior edge of shell, height of fold and curvature of brachial valve, and depth of sulcus and curvature of pedicle valve. Fig. 10, posterior view, exhibiting interarea, pseudodeltidium with oval foramen, and beak of pedicle valve (see Fig. 12).

FIG. 11. View of parts of sulcus and adjacent costae of lectotype, exhibiting minute spinules. ×10.

FIG. 12. Posterior view, showing much-worn interarea, pseudodeltidium crossed by growth lines, and oval foramen within pseudodeltidium. Divisions of the interarea into a wide, perideltidial area and two narrow outer areas are very poorly indicated; traces of very thin vertical ridges of the perideltidial area are barely visible. ×10.

Cyrtina darienensis, sp. nov. .....

FIGS. 13–17. Five views showing the size and various exterior structures of the holotype. ×1. Horizon and locality: Middle Devonian (Hamilton group—formation unknown); at or near Darien, Genesee County, New York. Holotype, No. $\frac{4557}{1}$, American Museum of Natural History.

FIGS. 18–24. Enlarged views of holotype. ×2. Fig. 18, pedicle valve exhibiting umbonal area deflected to right, sulcus with narrow median depression, costae, and growth lines. Fig. 19, oblique view of pedicle valve, showing median depression and broad, low, convex ridge on each side of depression. Fig. 20, brachial valve and small part of pedicle valve, exhibiting fold with median depression. Fig. 21, oblique view of brachial valve showing increase in width of median depression of fold from umbonal region to anterior edge. Fig. 22, lateral view, illustrating depth and profile of valves, curvature of interarea of pedicle valve, and prominent costae and growth lines. Fig. 23, anterior view, showing edge of shell, low, gently convex fold, broad sulcus, and height and curvature of valves. Fig. 24, posterior view, showing interarea of pedicle valve, pseudodeltidium with oval foramen, and at left, a faint line separating the perideltidial area from one of the outer areas of the interarea. Low convexity of brachial valve also illustrated.

PLATE I