

CONTRIBUTIONS FROM THE MUSEUM OF PALEONTOLOGY

UNIVERSITY OF MICHIGAN

Vol. XIV, No. 13, pp. 201-206 (1 pl., 2 figs.)

SEPTEMBER 12, 1958

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INFRABASALS IN THE CRINOID  
*OPSIOCRINUS* KIER

BY  
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ANN ARBOR

# CONTRIBUTIONS FROM THE MUSEUM OF PALEONTOLOGY

Director: LEWIS B. KELLUM

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## VOLUME XIV

1. An Upper Cretaceous Crab, *Avitelmessus grapsoides* Rathbun, by Robert V. Kesling and Irving G. Reimann. Pages 1-15, with 4 plates.
2. A Chart Useful for Study of Ostracod Carapaces, by Robert V. Kesling. Pages 17-20, with 2 figures.
3. A New Genus and Species of Ostracod from the Middle Devonian Ludlowville Formation in Western New York, by Robert V. Kesling. Pages 21-26, with 1 plate.
4. A Peel Technique for Ostracod Carapaces, and Structures Revealed therein in *Hibbardia lacrimosa* (Swartz and Oriel), by Robert V. Kesling. Pages 27-40, with 5 plates.
5. The Ontogeny and Ecology of *Welleria aftonensis* Warthin, a Middle Devonian Ostracod from the Gravel Point Formation of Michigan, by Robert V. Kesling and George C. Soronen. Pages 41-55, with 4 plates.
6. Origin of Beyrichiid Ostracods, by Robert V. Kesling. Pages 57-80, with 7 plates and 5 figures.
7. Check List of Fossil Invertebrates Described from the Middle Devonian Rocks of the Thedford-Arkona Region of Southwestern Ontario, by Erwin C. Stumm and Jean D. Wright. Pages 81-132.
8. A New *Tempyskia*, by Chester A. Arnold. Pages 133-142, with 3 plates and 1 figure.
9. A New and Unusual Species of the Ostracod Genus *Herrmannina* from the Middle Silurian Hendricks Dolomite of Michigan, by Robert V. Kesling. Pages 143-148, with 1 plate.
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11. Corals of the Devonian Traverse Group of Michigan. Part V, *Trachypora*, by Erwin C. Stumm and Allen S. Hunt. Pages 167-189, with 4 plates.
12. A Middle Devonian Species of the Ostracod Genus *Antiparaparchites*, by Robert V. Kesling. Pages 191-200, with 1 plate.
13. Infrabasals in the Crinoid *Opsiocrinus* Kier, by Porter M. Kier. Pages 201-206, with 1 plate.

INFRABASALS IN THE CRINOID *OPSIOCRINUS* KIERBY  
PORTER M. KIER

**D**R. G. UBAGHS of the University of Liège has kindly brought to my attention that *Opsiocrinus* Kier (1952, p. 65) is not a monocyclic but a dicyclic genus. In *Opsiocrinus mariana* Kier, the type species, he found five very small infrabasals deeply inserted in the basal circllet and entirely concealed by the stem facet. These small infrabasals have an unusual relationship to the basals. Immediately under the stem facet (Fig. 1a) the junctures between the infrabasals join the periphery of the infrabasal circllet at the angles, so that each plate is triangular. The angles of the infrabasal circllet fit into notches in the basals (Pl. I, Fig. 1). Deeper in the dorsal cup, as revealed by serial surfaces (Fig. 1 b-c), the junctures between the infrabasals join the periphery of the infrabasal circllet between the angles, so that each plate is quadrate. The angles of the infrabasal circllet, at this level, join the junctures between the basals; each side of the circllet fits against the side of the adjacent basal.

Because *Opsiocrinus* has proved to be dicyclic, the taxonomic position of the genus needs to be reconsidered. Furthermore, elimination of the family Opsiocrinidae, erected for it, now seems advisable, inasmuch as the true phylogenetic relationships are unknown. Since *Opsiocrinus* is dicyclic and has its basals directly in contact with the more or less regular interbrachials, it must be placed in the family Rhodocrinitidae. This assignment is only provisional, however, for the obconical dorsal cup, slightly depressed interradian areas, and vertical series of large sagittal plates in the posterior interradius are not characteristic of the Rhodocrinitidae. In these characteristics, *Opsiocrinus*, although far more advanced, is similar to genera of the Reteocrinidae.

*Opsiocrinus* also resembles certain genera of the Dimerocrinitidae. Its obconical dorsal cup, vertical series in the posterior interradius, and arm structure are very much like those typical of *Dimerocrinites*, particularly the species *D. decadactylus* (Phillips) as figured by Bather (1900, p. 199, Fig. 123). Likewise, the posterior interradius is similar to that of *Pterinocrinus quinquenodus* Goldring, another species of the family Dimerocrini-

tidae. The fact that its basals are in contact with the interradial areas, however, excludes *Opsiocrinus* from this family, even though Kirk (1945, p. 351) has questioned the systematic importance of this feature. For the present, it seems best to include *Opsiocrinus* in the Rhodocrinitidae and to regard it as a late offshoot from the Reteocrinidae with features parallel or similar to those of the Dimerocrinitidae.

I have taken this opportunity to include three line drawings (Fig. 2) of the dorsal cup of a hypotype of *Opsiocrinus mariana* Kier in the Museum of Paleontology of the University of Michigan. Photographs of this specimen are shown in Plate I.

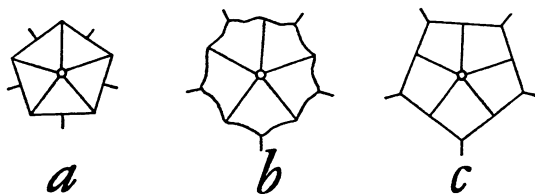


FIG. 1. Infrabasal cirlet in *Opsioocrinus mariana* Kier. a. Basal view, directly under stem facet; angles of infrabasals centered between interbasal sutures. b-c. Deeper in dorsal cup, angles of infrabasals at sutures, revealed by serial surfaces obtained through progressive grinding.  $\times 10$ .

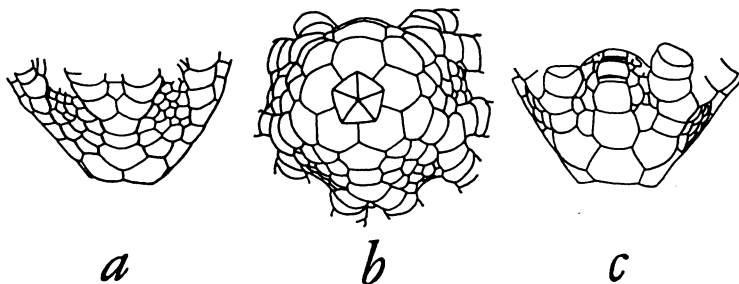


FIG. 2. *Opsioocrinus mariana* Kier. a. Anterior view. b. Basal view, showing the small, deeply inserted infrabasals. c. Posterior view, showing the median line of sagittal plates in the posterior interradius. Camera lucida drawings of hypotype, UMMP No. 33842. Photographs of this specimen are shown in Plate I.  $\times 5$ .

LITERATURE CITED

- BATHER, F. A. 1900. The Crinoidea. In: E. R. Lankester, A Treatise on Zoology, Pt. 3, The Echinoderma, pp. 94-204, Figs. 1-127.
- KIER, P. M. 1952. Echinoderms of the Middle Devonian Silica Formation of Ohio. Contrib. Mus. Paleontol. Univ. Mich., Vol. 10, No. 4, pp. 59-81, 4 pls.
- KIRK, E. 1945. Four New Genera of Camerate Crinoids from the Devonian of North America, France and Spain. Amer. Journ. Sci., Vol. 243, No. 6, pp. 341-55, 1 pl.

Received for publication April 7, 1958

## ADDENDUM

*Photographic technique.*—The problem in photographing echinoderms is how to show suture lines clearly and to indicate the form and configuration of the complete specimen. As some students of crinoids have discovered, good results can be obtained for most specimens by submersing them in xylol, but this method requires selection of proper film, lighting, and exposure time to make the suture lines distinct at several levels. Photographs in which suture lines are accentuated by ink have little more value than line drawings.

Certain data on the procedure used in making the photographs on Plate I may be of interest. Although each crinoid undoubtedly will present a special problem, this information may be useful as a basis for experimentation.

The hypotype of *Opsicrinus mariana* Kier, UMMP No. 33842, is less than 8 mm. in greatest diameter. Since the plates have a waxy luster, many of the sutures are indistinct, particularly in the interradian regions. To overcome this, the type was submersed in xylol and allowed to remain for several minutes, so that the liquid could soak into the soft matrix along the suture lines. The photographs were taken with a vertical camera, while the specimen was still submersed. During exposure, the lights were shifted several times around it, but were held in the upper left position longer than elsewhere to simulate the conventional highlight.

Lens .....	72 mm.
Aperture .....	f/22
Enlargement on negative .....	× 5
Film .....	Contrast Process Ortho
Exposure: lights, time, and distance	
15-watt fluorescent tube .....	15 min., 6 inches
No. 2 Photoflood .....	2 min., 12 inches
Developer .....	DK-50
Development time .....	3½ min.
Enlargement from negative .....	× 2
Paper, Kodabromide:	
Fig. 1 .....	E-3
Fig. 3 .....	E-2
Fig. 5 .....	E-2

—Robert V. Kesling

**PLATE**

## EXPLANATION OF PLATE I

*Opsiocrinus mariana* Kier, hypotype UMMP No. 33842

FIGS. 1-2. Basal views.

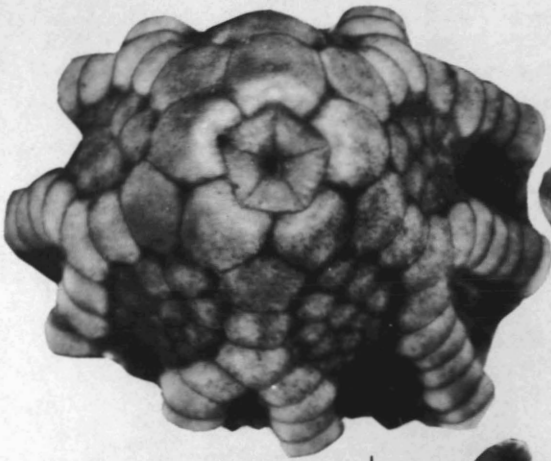
FIGS. 3-4. Posterior views.

FIGS. 5-6. Anterior views.

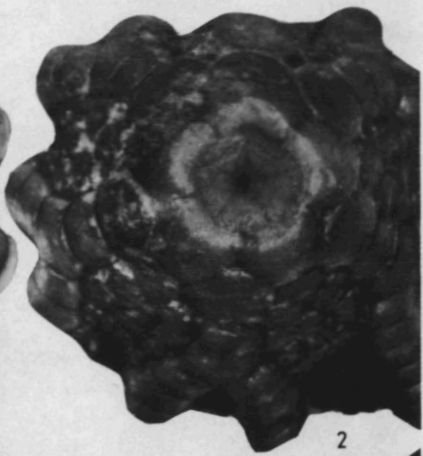
Figures on the left (1, 3, 5) were photographed while submersed in xylol; those on the right (2, 4, 6) without treatment of any kind in order to show the natural waxy luster. A few distracting highlights have been retouched. Photographs by Robert V. Kesling.



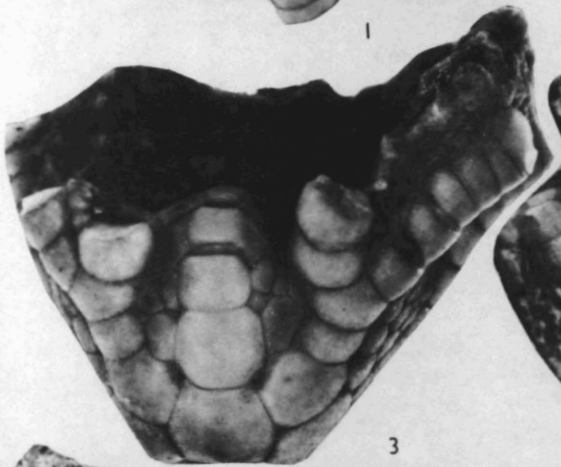
PLATE I



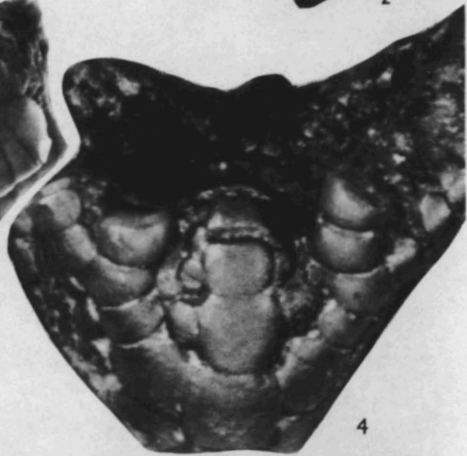
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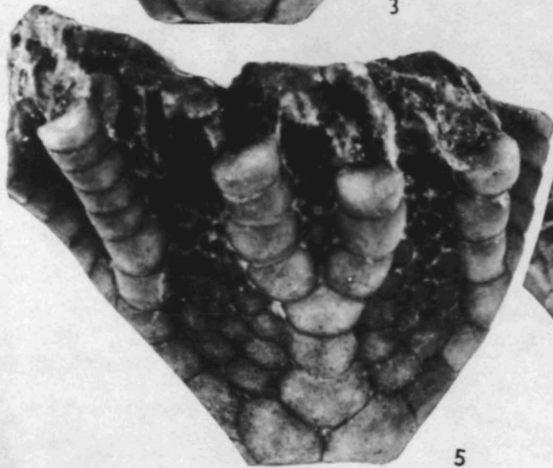
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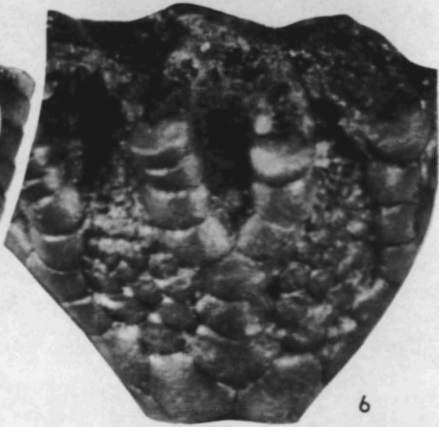
3



4



5



6

