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FOSSIL JELLYFISHES FROM KANSAS PENNSYLVANIAN ROCKS AND ELSEWHERE

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ABSTRACT

A new Pennsylvanian genus of jellyfishes, *Crucimedusina*, tentatively is referred to the order Hydroida. New genera of Scyphomedusae include *Duodecimedusina*, established for one new Devonian and two new Pennsylvanian species, and *Quadrimedusina*, for a Jurassic species. A new class of coelenterates, Dipleurozoa, and new order, Dickinsoniida, are established, to include the new family Dickinsoniidae, based on *Dickinsonia* Sprigg, a new species of which also is described.

INTRODUCTION

Fossil jellyfishes, very scarce throughout the whole stratigraphic column, are exceedingly rare in the Upper Paleozoic. A single specimen has been described from the Mississippian of Belgium (van Straelen, 1926) and another mentioned, but not figured or described, from the Pennsylvanian of the Sinai peninsula, Egypt (Couyat & Fritel, 1912). All the other known Upper Paleozoic remains have been discovered in the Pennsylvanian beds of the Midcontinent. They consist of several specimens belonging to three species, distributed in two genera. One of these, collected from the Upper Pennsylvanian of Nebraska, was described by Barbour in 1914 as *Medusina walcotti* Barbour. The other two species, each represented by a single specimen, were collected in Upper Pennsylvanian beds of Kansas and are here described by Ralph H. King for the first time.

PALEOZOIC AND MESOZOIC JELLYFISHES

Three new genera of Paleozoic and Mesozoic jellyfishes from North America, South America, and Europe are here recognized. They are assigned to the subclass Scyphomedusae of the Class Scyphozoa, which is represented by a moderate number of other described fossil genera, mostly not very well preserved and known from relatively few specimens. Rarity of occurrences of jellyfishes in the paleontological record justifies the publication of descriptions of new forms whenever found.

Genus CRUCIMEDUSINA Harrington & Moore, n. gen.

Medusina Walcott, 1898 (type species, *Spatangopsis costata* Torell, 1870; SD Caster, 1945), originally proposed "as a generic term to include all species of fossil medusae whose generic

characters can not be determined" (!), is a synonym of *Spatangopsis* Torell, 1870 (type species, *S. costata* Torell). The Nebraskan specimens, referred to Walcott's "genus" by Barbour, are obviously very different from the Swedish Lower Cambrian genus *Spatangopsis* and, therefore, lack valid generic designation. The name *Crucimedusina* Harrington & Moore, n. gen., is here proposed for these remains.

Diagnosis.—Bell large, pyramidal-conical; subumbrella slightly concave, quadrangular in outline, with interradial rounded angles and perradial concave sides; mouth cruciform, large; exumbrella pyramidal-conical, with four rounded ridges meeting at apex and four slightly concave sides; surface marked by concentric rugae.

Type species.—*Medusina walcotti* Barbour.

Crucimedusina walcotti (Barbour)

Plate 2, fig. 2, 4

Medusina walcotti Barbour, 1914, Medusina walcotti, a Carboniferous jellyfish: Am. Jour. Sci., ser. 4, v. 38, no. 228, p. 505-506, fig. 1a-b.

Medusina walcotti Barbour, 1914, Notice of jelly fishes in the Carboniferous of Nebraska. *Medusina walcotti* sp. nov., Nebraska Geol. Survey, v. 4, No. 13, p. 56-58, 4 fig.

The only known species has the characters of the genus. *C. walcotti* can be compared with the living genus *Bouganvillia* Lesson, 1836, especially as regards the quadrate outline of the subumbrellar surface, cruciform mouth, and perradial position of the sides of the bell. It may, therefore, be tentatively assigned to the family Oceaniidae Eschscholtz, 1829, of the suborder Gymnoblastida, this being one of the very few fossil jellyfishes tentatively referred to the order Hydroida.

Horizon and locality.—Upper Pennsylvanian, Burlington quarries, 2 miles southwest of South Bend, Nebraska.

Genus DUODECIMEDUSINA King, n. gen.

The following description of the jellyfish remains from the Upper Pennsylvanian of Kansas, and of similar fossils from the Lower Devonian of Bolivia, has been prepared by Ralph H. King:

"Two unusual fossils interpreted as medusoids have been collected from shales of Pennsylvanian age at two localities in Kansas. They are subdiscoidal and are characterized by twelve faintly defined lobes, as described in the following pages. Not

only do the fossils themselves have a strange aspect, but each adheres firmly to a subcylindrical or subconical mass of rock consisting of roughly stratified fragments of brachiopod spines, ostracode valves, and other organic remains in a matrix of sand or clay firmly cemented with calcium carbonate. The smaller specimen is marked by longitudinal ridges continuous with the tips of the lobes of the attached fossil, but the larger one shows no such markings. This larger rock mass flares outward about 20 mm from the attached specimen, and this end is roughly concave.

The origin of the rock mass and its relationship to the adhering mold of an organism are unsolved problems. Both specimens were weathered out of the shale, so it is not known whether the fossil rested above or beneath the mass when in place. It is possible that the rock mass represents the filling of a burrow, dug by some other animal, in which the medusoid was trapped and died or into which it was washed soon after death. It is hardly likely that the medusoid itself excavated the burrow. It is also possible that the rock mass is the uneroded portion of an unconsolidated layer on which the medusoid died, the greater resistance of this portion being explainable as a result of the cementing action of the products of decay of the coelenterate itself. The beds from which the fossils were obtained do not now include any rock of such texture and composition. The first explanation seems more probable, and receives some support from the fact that similar rocks masses, but without medusoid casts attached, have been found in rocks of Pennsylvanian age in north-central Texas.

A very similar specimen from the Lower Devonian of Bolivia, described by Ulrich (1893, p. 88) and referred to the Scyphozoa by Kieslinger (1939, p. A 102), is herein assigned to the same genus as the Kansas specimens.

Diagnosis.—Bell subdiscoidal, height about one sixth of the diameter; mid-field faintly elevated or depressed; twelve subequal lobes prominent at margin, disappearing at mid-field; marginal notches between lappets about 1/25 the diameter; lower side unknown.

Type species.—*Duodecimedusina typica* King, n. sp., Upper Pennsylvanian, Kansas.

Other species included in genus.—*D. wycherleyi* King, n. sp., *D. ulrichi* King, n. sp.

Range.—Lower Devonian (Bolivia)—Upper Pennsylvanian (Kansas).

Remarks.—Kieslinger seems to have been justified in referring these forms to the Scyphozoa, and they may be further classified in the subclass Scyphomedusae, but lack of knowledge of diagnostic features, especially of the subumbrella, necessitates listing under Incertae sedis.

DUODECIMEDUSINA TYPICA King, n. sp.

Plate 1, fig. 3, 4

Diameter 28 to 30 mm, height of bell 5 mm; mid-field one third of total diameter, faintly elevated, lacking central depression; lobes distinct to mid-field, subequal; marginal notches between lobes 1 to 1.5 mm; lower side unknown. Preserved as cast composed of macerated shell fragments cemeted with calcium carbonate.

Holotype.—Only known specimen. K.U. No. 11284K1 from Plattsburg formation, (Hickory Creek member) at junction of railroad spurs about ½ mile east of Sunflower Village in SE NE sec. 5, T. 13 S., R. 22 E., Johnson County. Collector: R. H. King.

DUODECIMEDUSINA WYCHERLEYI King, n. sp.

Plate 2, fig. 1, 3

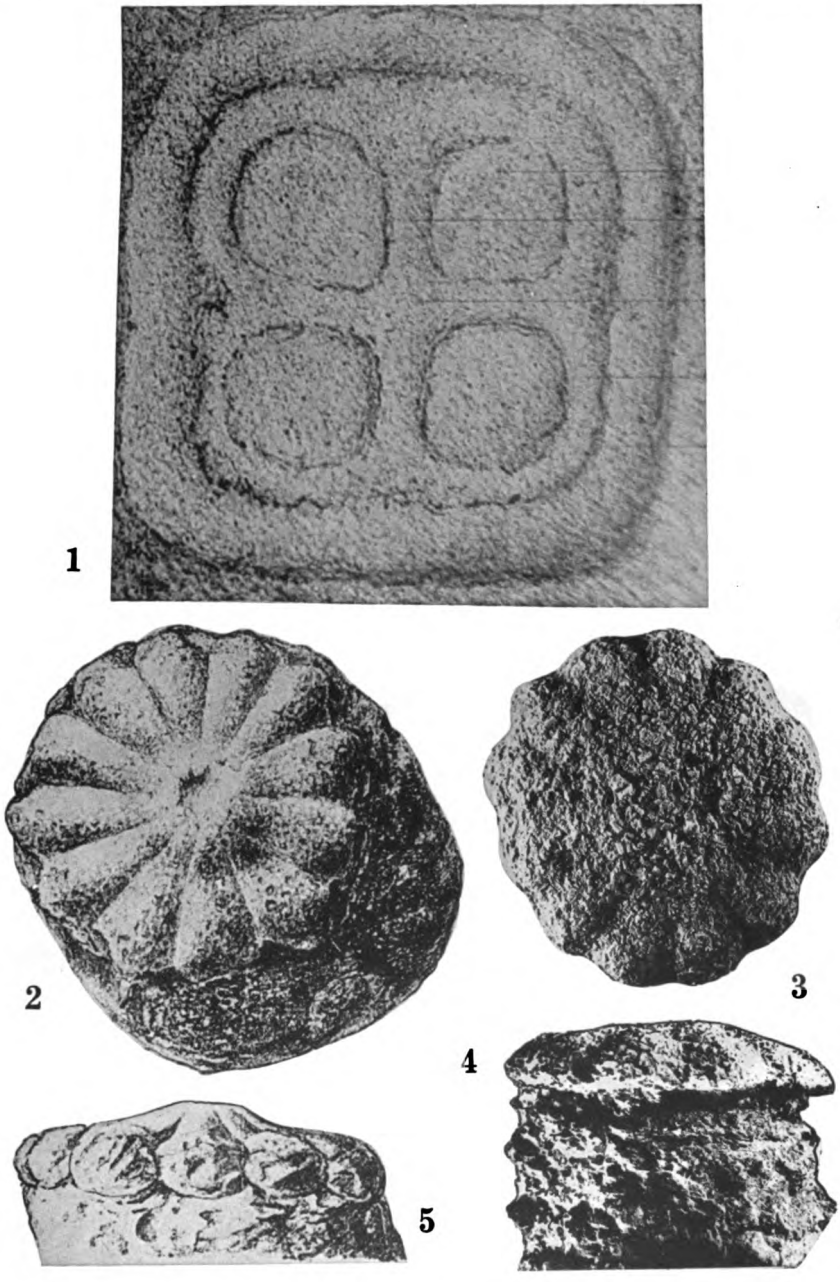
Diameter 10 to 11 mm, height of bell 2 mm; mid-field not distinctly set off, depressed, slight dimple at center; lobes subequal, distinct to central depression, i.e., for about 4 mm; marginal notches between lobes about 0.5 mm; lower side unknown. Preserved as cast composed of sand grains and macerated shell fragments cemented with calcium carbonate.

EXPLANATION OF PLATE 1

Fig. 1: *Quadrimedusina quadrata* (Haeckel). Holotype, X1, (from Haeckel). Upper Jurassic, Solnhofen, Germany.

Fig. 2,5: *Duodecimedusina ulrichi* King. Holotype, X1.4 (from Ulrich); 2, exumbrellar view; 5, side view. Lower Devonian, Bolivia.

Fig. 3, 4: *Duodecimedusina typica* King. Holotype, X1.5; 3, exumbrellar view; 4, side view, showing pedestal. Upper Pennsylvanian, Kansas.



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1

2

4

3

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Comparisons.—Differs from *D. typica* in absence of distinct mid-field, presence of depression in center, and much smaller size.

Holotype.—Only known specimen. K.U. No. 11285K1 from Calhoun shale, at center N line sec. 14, T. 27 S., R. 11 E. Greenwood County. .Collector: W. Wycherley.

DUODECIMEDUSINA ULRICHI King, n. sp.

Plate 1, fig. 2, 5

Problematicum Ulrich, 1893, Palaeozoische versteinerungen aus Bolivien, Neues Jahrb. f. Min., etc., Beilage-Band 8, p. 88, pl. 5, fig. 23a-b.
Problematicum Kieslinger, 1939, Scyphozoa: in Schindewolf, O. H., Handb. der Paläozoologie, Band 2A, Lief 5, p. A102, fig. 36.

Diameter 33 to 34 mm, height of bell 6 mm; mid-field one third of total diameter, elevated, and set off by a shallow circumferential depression, distinct pit in center about 3 mm in diameter; lobes subequal, distinct from margin to depression around mid-field, faint or unmarked across mid-field to pit; marginal notches between lobes 1 to 2 mm; lower side unknown.

Comparisons.—Differs from *D. typica* in having central pit, lobation faint though distinct into mid-field; from *D. wycherleyi* in having elevated mid-field, much larger size.

Holotype.—Only known specimen, described but unnamed by Ulrich from Lower Devonian Icla shale between Chalhuani and Oconi, Bolivia. Collector: G. Steinmann. (This specimen, like those from Kansas, is a cast cemented to a ?subconical rock mass)."

Genus QUADRIMEDUSINA Harrington & Moore, n. gen.

The preparation of the section on fossil medusoids for the Treatise on Invertebrate Paleontology, edited by R. C. Moore, has led the writers to distinguish as a new genus the specimen described by Haeckel in 1869 from the Upper Jurassic of Soln-

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EXPLANATION OF PLATE 2

Fig. 1, 3: *Duodecimedusina wycherleyi* King. Holotype, X4; 1, exumbrellar view; 3, side view, showing pedestal. Upper Pennsylvanian, Kansas.

Fig. 2, 4: *Crucimedusina walcotti* (Barbour). Holotype, X0.4 (from Barbour); 2, subumbrellar view; 4, exumbrellar view. Upper Pennsylvanian, Nebraska.

hofen, Germany, under the name *Medusites quadratus* Haeckel. *Medusites* Germar, 1825 (type species *M. capillaris*) was originally proposed for some problematic bodies now regarded as worm coprolites having no resemblance to medusoid remains, and it must be clear that the medusoid forms referred to *Medusites* are incorrectly assigned to this genus and have no valid generic designation.

Diagnosis.—Subumbrellar impression of square outline, with rounded angles; margin entire; submarginal groove present (?ring canal); central area with four radial grooves (?perradial canals) reaching submarginal groove at mid-distance between angles; resulting quadrants with single, large, subcircular marking.

Type species.—*Medusites quadratus* Haeckel.

QUADRIMEDUSINA QUADRATA (Haeckel)

Plate 1, fig. 1

Medusites quadratus Haeckel, 1869, Über die fossilen Medusen der Jurazeit. Zeitschr. f. wiss. Zoologie, Band. 19, p. 558, pl. 42, fig. 1.
Medusina quadrata Kieslinger, 1939, Scyphozoa: in Schindewolf, O. H., Handb. der Paläozoologie, Band 2A, Lief 5, p. A 85, fig. 9.

The only known species has the characters of the genus. As already pointed out by Kieslinger, the quadrate subumbrellar outline with perradial sides suggests that *Q. quadrata* probably belongs in the order Carybdeida Gegenbaur, 1856 of the subclass Scyphomedusae.

Horizon and locality.—Upper Jurassic, Solnhofen, Germany.

LOWER CAMBRIAN JELLYFISHES ASSIGNED TO NEW CLASS AND ORDER

Class DIPLEUROZOA Harrington & Moore, nov.

The class Dipleurozoa is here introduced to accommodate some very distinctive Lower Cambrian fossils from South Australia described by Sprigg in 1947 under the generic name *Dickinsonia.* They are exceptionally neat impressions of small to medium-size discoidal bodies of elliptical outline resembling a medusoid umbrella with radiating segments and marginal tentacles, but characterized by marked bilateral symmetry and differentiated extremities. A short median furrow along the main axis of the elliptical body gives off numerous simple, diverging

lateral segments, shorter and more numerous at one extremity of the ellipse. The margin is scalloped into very short, rounded lappets, each bearing a single tentacle.

Sprigg suggested that the remains could represent a new and extinct class of Coelenterata or that, on account of their bilateral symmetry, they could belong in the Siphonophorida. Though bilateral symmetry is a common feature among the siphonophorids, there is nothing to suggest that the remains under consideration represent the float or pneumatophore of a colonial coelenterate. The impressions indicate that the living animal had a consistent gelatinous body more or less homogeneous in structure, comparable to the bell of the medusae. One specimen shows what are here regarded as tentacles springing from the marginal lappets; these structures were interpreted by Sprigg as chitinous radii but their relation to the marginal lappets makes this view very implausible and strengthens the case for tentacles. These same relations,—each tentacle springing from the mesial part of a lappet—make it improbable that they could represent submarginal dactylozooids of a colonial coelenterate comparable to the living genera *Velella* or *Porpita*.

Diagnosis of class.—Primitive, specialized Coelenterata with bell-shaped body of elliptical outline, displaying marked bilateral symmetry and differentiated extremities; median furrow along main axis of elliptical body giving off numerous flat, simple, diverging lateral segments separated by narrow grooves, reaching periphery; margin scalloped into very short lappets, each bearing simple tentacle.

Range and distribution.—Dipleurozoans seem restricted to the Lower Cambrian and are known exclusively from South Australia.

Order DICKINSONIIDA Harrington & Moore, nov.

Characters of class. *L. Cam.*

Family DICKINSONIIDAE Harrington & Moore, nov.

Body elliptical to ovoid in outline; median longitudinal furrow giving off 70 to 140 simple diverging lateral segments; segments at one extremity (?anterior) of elliptical body more numerous, narrower and less oblique than at opposite (?posterior) end. *L. Cam.*, S. Austral.

Genus DICKINSONIA Sprigg, 1947

DICKINSONIA SPRIGGI Harrington & Moore, n. sp.

Dickinsonia costata Sprigg, 1949 (*partim*), Early Cambrian "jellyfishes" of Ediacara, South Australia, and Mt. John, Kimberley District, Western Australia, Roy. Soc. S. Austral., Trans., v. 73, pt. 1, p. 95, pl. 20, fig. 2 (non coetera).

Description.—Body ovoid, twice as long as wide; median furrow faint, giving rise to about 48 to 50 segments on each side; ?anterior extremity wider than opposite, with less-curved, more-numerous segments; margin scalloped into short, round lappets; a moderately long, stiff tentacle springs from the mid-point of each lappet.

Remarks.—Sprigg interpreted the specimen here referred to *D. spriggi* n. sp. as an individual of *D. costata* Sprigg in which only the proximal parts of the lateral segments have been preserved and suggested that the structures here regarded as tentacles could represent "chitinous rods" of a skeletal nature. There is, however, little to support this view. The relation of the supposed "chitinous rods" to the lappets strongly suggests that they are true marginal tentacles and that, therefore, *D. spriggi* differs from *D. costata* in having a much narrower body.

Holotype.—Specimen No. 2007, Tate Museum Coll., Adelaide Univ., South Australia, illustrated by Sprigg as *Dickinsonia costata* (Sprigg, 1949, pl. 20, fig. 2).

Horizon and locality.—Pound Quartzite, Upper Adelaide Series (Lower Cambrian), Ediacara, South Australia.

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