FIELDIANA · GEOLOGY

Published by
FIELD MUSEUM OF NATURAL HISTORY

Volume 16 | DECEMBER 16, 1968 | No. 11

On the Nature of the Holotype of *Nipterella paradoxica* (Billings)

MATTHEW H. NITECKI
ASSISTANT CURATOR, FOSSIL INVERTEBRATES

ABSTRACT

The holotype of *Nipterella paradoxica* (Billings), based on *Calathium paradoxicum* Billings, 1865, is not a sponge but a cherty concretion. The name *Nipterella paradoxica* is thus a *nomen nudum* and should be rejected.

The genus *Nipterella* was based by Hinde (1889) on the genus *Calathium* of Billings (1865).

The genus *Calathium* was named by Billings (1865, p. 208), who considered it to resemble in external characters certain Mesozoic sponges. He included sponges, as was customary in his time, among Protozoa.

Billings (1865, pp. 358–359) based *Calathium ? paradoxicum* on two specimens. The specimen described on page 358 and illustrated in his figure 345 is now housed with the collections of the Canadian Geological Survey. The whereabouts of the second specimen described on page 359 is unknown.

Billings assigned this species to *Calathium* with hesitation, but did not doubt that the specimens were truly fossils. He considered that the illustrated specimen was a fragment of an individual, but did not observe any "structure except an obscure concentric lamellar arrangement near the outside," and "a number of somewhat prominent rounded longitudinal ridges." Billings' figure 345 is reproduced in our figure 1.

Miller (1877, p. 43; 1889, p. 155) listed the species in his catalogs.

Library of Congress Catalog Card Number: 68–59376

Hinde (1889, pp. 144–145) redescribed Billings' figured specimens and erected a new genus *Nipterella* with *C. paradoxicum* as the type species. He noted traces of canals, and illustrated lithistid spicules, and selected the illustrated fragment as the type specimen.

Ulrich (1890, p. 235) listed the species in his list of American Paleozoic sponges.

Rauff (1894, pl. 1, fig. 11) published an illustration modified from Billings, which he reversed, and made to appear more sponge-like. His illustration is reproduced in figure 2. He based his definition of genus and species on Hinde's (1889) description and illustration. He assigned the genus to the family Rhizomorinidae, tribe Tetracladinidae, suborder Lithistina, order Tetractinellida.

Head (1895, p. 3) listed *Nipterella paradoxica* as the only recognized sponge among the species of *Calathium*, and rejected all species of *Calathium* as either "doubtful species" or erroneously referred to sponges.

Twenhofel (1938, p. 37) believed that the holotype was lost, reprinted the original description of Billings, and considered that *Nipterella* might possibly be a cryptozoan. He further stated that "the fact that irregularly-shaped bodies of chert are present in the Romaine formation leads to the suspicion that the shapes have no significance and that no organisms are represented."

Laubenfels (1955) noted the range of the genus *Nipterella* as Cambrian to Ordovician. He assigned the genus to an uncertain family of the suborder Rhizomorina within the order Lithistida.

Bolton (1960, p. 9) cataloged as a holotype the specimen illustrated by Billings.

Sokolov (1962, p. 64) listed *Nipterella* as a non-Soviet genus within Rhizomorina *incertae sedis*. He considered Rhizomorina a tribe in the suborder Poikilorhabdina, order Cornacuspongiida.

Finks (1967, p. 1145) considered *Nipterella* a probable "anthaspidellid allied to *Archaeoscyphia*."

In the process of the work on the *Calathium* complex the loan of the holotype of *Nipterella paradoxica* was arranged. The type is illustrated in figures 3 and 4.

The examination of the holotype reveals that it is a typical chert fragment riddled with dendrites of pyrolusite. No organic structures are present. The specimen is weathered and fractured, and there is residual clay present. The weathered layer, partly recrystallized, is

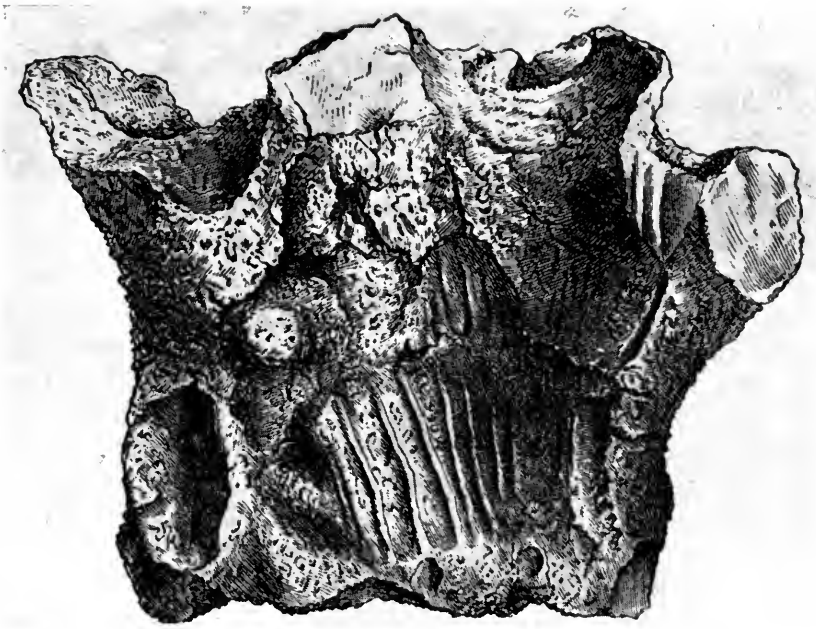

FIG. 1. Billings' (1865) illustration of *Calathium ? paradoxicum*.

FIG. 2. Rauff's (1894) illustration of *Nipterella paradoxica*.

very thin. The "pores" are weathering phenomena perhaps induced by lichens. No spicules are to be seen.

There is a small area of the chert specimen that was cut and partially polished. It shows no structure other than casts of rhombic crystals. There are cherty agates in the collections of Field Museum that possess all the structures seen in this holotype.

The chert nodule has been broken. The "holotype" seems to represent half of the original specimen with one fractured surface. The causes of this breakage are unknown: they may have been natural, chemical or mechanical, or may have been simply caused by man. Thus, the resulting two sides of the fragment are not the same. It is this difference of appearance of the sides that probably is responsible for the error of identification of the specimen. The splitting occurred relatively recently as the broken surface (fig. 4) is smooth and without noticeable effects of weathering or solution. The outer surface (fig. 3) shows the effects of extensive weathering and exposure to the action of solution and chemical changes. It is impossible to say whether this alteration occurred under a soil cover, or whether the chert was loose and exposed to prolonged action of subaerial destruction. The shape of the fragment, and the grooving and pitting upon the surface, however, imply some mechanical wear and perhaps solution by moss or lichens.

The photographs of the "holotype" (figs. 3 and 4) differ from Billings' (1865) illustration. They are even more unlike Rauff's (1894) figure. It appears that Rauff based his diagnosis upon Billings' and Hinde's (1889) publications without examination of original specimens. Thus, the authority of Rauff's illustration in his otherwise excellent work was convincing to later workers, who accepted his interpretation.

It is concluded that *Nipterella paradoxica* (Billings) is a name given to an inorganic fragment of chert and, therefore, should be rejected as a *nomen nudum*.

Material.—Geological Survey of Canada no. 451.

Stratigraphic position.—Lower Ordovician; Beekmantown Group; Romaine Formation.

Locality.—Mingan Islands, Quebec, Canada. Collected by Logan and Richardson in 1856.

FIG. 3. Holotype of *Nipterella paradoxica*. Canad. Geol. Surv., no. 451. "Outer view."

FIG. 4. Holotype of *Nipterella paradoxica*. Canad. Geol. Surv., no. 451. "Inner view."

SYNONYMY

1865. *Calathium ? paradoxicum*
BILLINGS, Palaeozoic Fossils, vol. 1, pp. 358–359, text fig. 345. Mingan Islands; Calciferous formations.

1877. *Calathium paradoxicum*
MILLER, American Palaeozoic Fossils, p. 43.

1889. *Nipterella*
HINDE, Quart. Jour. Geol. Soc., London, **45**, pp. 144–145. Calciferous Formation of the Mingan Islands, Lower St. Lawrence.

1889. *Nipterella paradoxica*
HINDE, Quart. Jour. Geol. Soc., London, **45**, pp. 144–145, pl. 5, fig. 15. Calciferous Formation of the Mingan Islands, Lower St. Lawrence.

1889. *Calathium paradoxicum*
MILLER, N. Amer. Geol. Palaeontol., p. 155. Calciferous group.

1889. *Nipterella paradoxica*
MILLER, N. Amer. Geol. Palaeontol., p. 155. Calciferous group.

1890. *Calathium pardoxicum*
ULRICH, Ill. Geol. Surv., **8**, p. 235. Cambrian.

1894. *Nipterella*
RAUFF, Palaeontographica, **40**, p. 241. Uppermost Cambrian, Calciferous group.

1894. *Nipterella paradoxica*
RAUFF, Palaeontographica, **40**, p. 241, pl. 1, figs. 11–14. Uppermost Cambrian, Calciferous shale of the Mingan Islands in the lower St. Lawrence, close to southwest of Labrador.

1895. *Nipterella paradoxica*
HEAD, Palaeozoic sponges of North America, p. 3. Calciferous group, Mingan Islands.

1938. *Nipterella paradoxica*
TWENHOFEL, Geol. Soc. Amer., Special Papers, 11, p. 37. Romaine Formation, Mingan Islands, Quebec.

1955. *Nipterella*
LAUBENFELS, Treatise on Invertebrate Paleontology, part E, p. E49. Cambrian–Ordovician, Eastern Canada.

1955. *Nipterella paradoxica*
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1967. *Nipterella*
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ACKNOWLEDGMENTS

Thomas E. Bolton of the Geological Survey of Canada kindly loaned the holotype of *Nipterella paradoxica* (Billings) for study. The support from the National Science Foundation Research Grant No. GB-7197 is acknowledged.

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