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# UPPER TRIASSIC FOSSILS FROM THE BURMO-SIAMESE FRONTIER.—A NEW DASYCLADACEA, *Holosporella siamensis* NOV. GEN., NOV. SP., WITH A DESCRIPTION OF THE ALLIED GENUS *Aciculella* PIA.

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AMONG some palæontological material sent by Prof. J. W. Gregory to my friend Dr. F. Trauth for comparison with types preserved at Vienna there was a slide containing a few puzzling fossils. Dr. Trauth presumed they might be algæ and showed them to me. They proved to belong to an interesting new genus of Dasycladaceæ. Our scanty knowledge of other Triassic members of this family from Eastern Asia is summarized in my paper on Dasycladaceæ from the Moluccas (Pia, 1924).

The slide transmitted by Prof. Gregory and a rock-fragment, from which it had been obtained were labelled as follows:—

K 21·415, g Kamawkala Limestone. Thaungyin (Thoungyeng) River, Frontier of Burma and Siam, N. of Myawadi (ca. NE of mouth of Salwin River). Siamese bank, s. of 629 height in sheet 517 SW/3, Burma Forest Survey (B-18-12-21). Opposite the hill Lewa Taung.

Prof. Gregory and Dr. Trauth agreed in presuming that the age of the rock is Upper Triassic, though the scarcity and bad preservation of the fossil animals in it prevented a sure determination. The fossil alga described below furnishes no evidence bearing on the stratigraphical question, as it belongs to a genus hitherto unknown to science. As will be shown later, all the species susceptible of close comparison with our new fossil are of Triassic age, so that at any rate the result of the palæobotanical investigation is not opposed to the conclusions drawn from the other fossils.

The general shape of the fossil is cylindrical, with a rather thick wall and an axial perforation piercing the cylinder from end to end (or nearly so at least). The wall consists of a single layer of globules. They were originally hollow, with a thin membrane of calcium carbonate. At present some of them are filled with transparent calcite crystals, some with darkish sediment. Obviously the later were already opened, when they were imbedded in the

rock. More worn spheres are reduced to hemispherical depressions on the outer side of the cylinder. The walls of the globules often coalesce, but in some instances one can easily see a dark line separating them from each other.

*Measurements.*

| | | |
|---|---|---|
| Outer diameter of cylinder | about | 0·4 mm. |
| Diameter of central perforation | „ | 0·15 mm. |
| Diameter of globules | „ | 0·12 mm. |
| Thickness of membrane | „ | 0·01 mm. |
| Number of globules to be seen on a cross-section | „ | 10. |

It would be practically impossible to determine the systematic position of this fossil without the knowledge of a single small rock-specimen preserved in the Geological Collection of Munich and containing *Diplopora phanerospora*. I have given a thorough description of this alga in 1920 and a new reconstruction of it in 1926. (*See* also Hirmer's Text-book of Palæobotany, 1927, pp. 72-73). For our present purpose it is sufficient to copy three of my former figures (Pl. 4, figs. 10-12 of this paper) and to draw attention to the following peculiarities. Inside the normal skeleton of *Diplopora phanerospora* enshrouding the axial cell and the proximal parts of the branches there is another tube of calcium carbonate, built up of hollow spheres, just as in our fossil. Its contour is undulating, not straight, but this is certainly only a specific character. I have shown that these globules must be interpreted as the sporangia situated in the axial cell of the alga. This is a primitive condition not observable in recent Dasycladaceæ, but quite general among Palæozoic and early Mesozoic genera.

From a comparison with *Diplopora phanerospora* it becomes obvious, that the Siamese fossil is the sporangial tube of a Dasycladacea otherwise devoid of calcification. Whether this was a *Diplopora* it is not possible to say. For we may safely assume, that very different genera had the same arrangement of the sporangia. Nor is it possible to decide, whether the organs contained in the globules were cysts or free gametes. The living Dasycladaceæ do not behave uniformly in this respect.

The exact age of *Diplopora phanerospora* is not known, though it is probably Triassic.

There is one other fossil alga to be compared with our new species. It is not sufficient in itself to explain the homologies

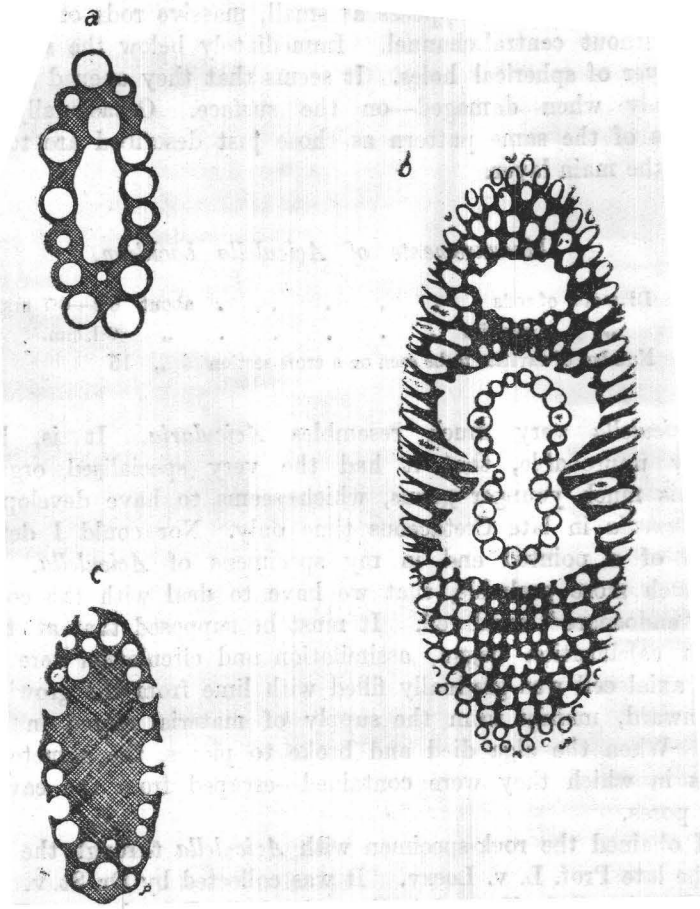


Fig. 1.—Three oblique diagrammatic sections of lime-skeletons, to show the probable homologies.

(*a*) *Holosporella siamensis.* ×~~60~~. 40
(*b*) *Diplopora phanerospora.* ×~~30~~. 15
(*c*) *Aciculella bacillum* ×~~60~~. 30

of the later. But it is of interest to us, because it gives another example of a calcified axial cell-content without outer skeleton, and because its exact stratigraphic position is known. I named this fossil *Aciculella bacillum* in Hirmer's Text-book (p. 86), but no detailed description or figure was given. I take the opportunity to make good this omission.

*Aciculella bacillum* appears as small, massive rods of carbonate of lime, without central channel. Immediately below the surface there is a layer of spherical holes. It seems that they opened originally—not only when damaged—on the surface. Occasionally isolated cavities of the same pattern as those just described are to be seen inside the main layer.

*Measurements of Aciculella bacillum.*

| | |
|---|---|
| Diameter of rods . . . . . | about 0·4—0·7 mm. |
| „ „ cavities . . . . . | „ 0·1 mm. |
| Number of cavities to be seen on a cross-section | „ 15 |

*Aciculella* very much resembles *Acicularia.* It is, however, highly improbable, that it had the very specialised organisation of this much younger genus, which seems to have developed from *Terquemella* in late Cretaceous time only. Nor could I detect any trace of a pointed end in my specimens of *Aciculella.* I deem it much more probable, that we have to deal with the content of an "endospore" axial cell. It must be supposed that at the time when calcification began, assimilation and circulation were stopped. The axial cell was gradually filled with lime from the growing point downward, mainly from the supply of material stored in the root-cell. When the alga died and broke to pieces, the gametes or the cysts in which they were contained—escaped from the cavities by the pores.

I obained the rock-specimen with *Aciculella* through the kindness of the late Prof. L. v. Loczy. It was collected by Dr. St. v. Ferenczi in the so-called Chocs-dolomite of middle Triassic age Pia, 1919 at Vagluha, Inovec Mountains in the Western Carpathians. I determined in the same slides *Diplopora annulata.* The Ladinic age of the rock is therefore absolutely certain.

It might be doubted whether the Siamese alga is generically different from *Aciculella.* However, in my first definition of the later genus I considered the lack of an axial perforation to be an essential character. I should prefer to retain this definition as it stands, unless clear proof can be found showing the close resemblance between the two species with respect to the vegetative organs. For this reason I propose the name *Holosporella siamensis* for the alga from the Thaungyin River.

I have to thank Prof. Gregory and Dr. Trauth for drawing my attention to this interesting specimen of *Holosporella*; and the Hungarian Geological Survey for lending me the specimens of *Aciculella* as well as much other valuable material.

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## EXPLANATION OF PLATE 4.

Each specimen is surrounded in the drawings by a zone of sediment. The skeletons are mostly bright on dark ground.

Figs. 1-6. *Holosporella siamensis* nov. gen., nov. sp. ×35.

1. Nearly longitudinal section. Sporangia and axial perforation filled with calcite.

2. Longitudinal section. Sporangia much damaged. All cavities filled with detritus.

3. Oblique section. Sporangia partly opened; limits between their walls very sharp.

4. Oblique section. Axial cavity filled with calcite, sporangia mostly broken.

5. Cross-section. Preservation like fig. 4.

6. Oblique section. Axial hole filled with detritus.

Figs. 7-9. *Aciculella bacillum* Pia.

7. Cross-section. ×24.

8. Oblique section, nearly axial. ×22.

9. Probably tangential section. ×24.

Figs. 10-12. *Diplopora phanerospora* Pia. Oblique sections, ×10. (Drawings already published in 1920 and reproduced here for comparison).

10. Sterile specimen.

11. Fertile specimen. Sporangia filled with calcite.

12. Fertile specimen. Sporangia opened and filled with detritus.


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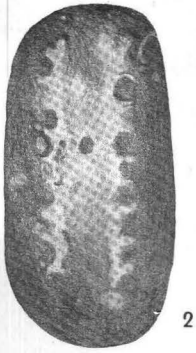
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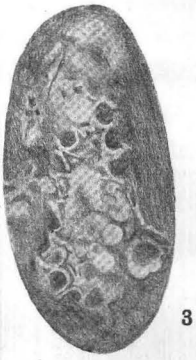
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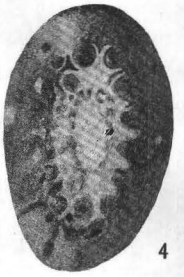
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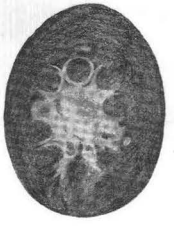
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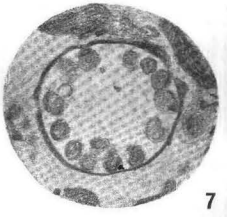
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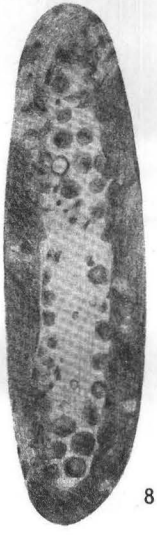
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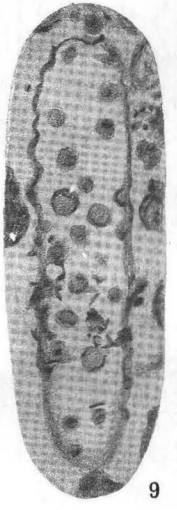
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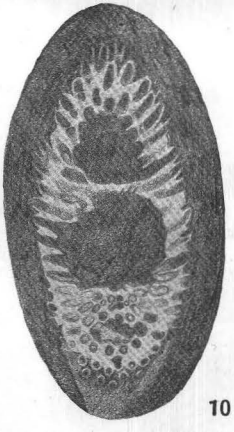
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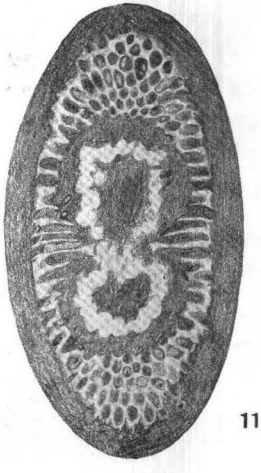
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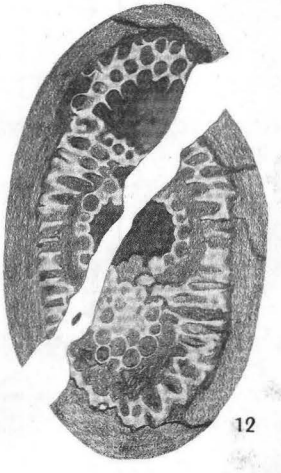
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HOLOSPORELLA SIAMENSIS, *nov. gen., nov. sp.*