CALLISPHENUS GRACILIS, N. GEN., N. SP.
A FOSSIL ALGA FROM THE WENLOCK
OF THE OSLO REGION

BY
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WITH 2 PLATES

The specimen described below was found in August, 1910, on the small island of Kommersøy near Holmestrand, in the Oslo Fjord, by Miss Mary S. Johnston, and presented to the British Museum (Natural History) in 1936. Mr W. N. Edwards found that it was probably a new species, not previously described, and sent it to me, asking if it was already known in Norway, and suggesting that it might be an impression of one of the Dasycladaceae. The fossil is certainly not known before from the Paleozoic formations of Norway, and upon the whole it appears to represent a new and very interesting type.

I beg to express my respectful thanks to the Trustees of the British Museum and to Mr Edwards personally for kind permission to describe the fossil here.

The locality is situated on the East side of the island of Kommersøy, about equally distant from its North and South point. As far as Miss Johnston’s memory serves her it should be somewhere about the middle of the profile published by J. Kiær in “Das Obersilur” (1908, fig. 48, p. 216, compare Map IV), in a black shale a little above water level: if so, it should belong to the 8 b, the Zone with Chonetes sp. The details cannot be given with full certainty, on account of the long space of time elapsed since the collection.

The specimen is a small piece, about $9 \times 6$ cm, of a dark, calcareous rock, weathering yellowish grey, with two fossils on it; the counterpart is also preserved.

The fossil is wedge-shaped, the larger specimen $22$ mm long and $5$ mm broad, the other one very slightly smaller. The greatest breadth is near the top, and from here the thallus is slowly tapering towards the base, with straight sides, whereas the top is rounded. The very base itself is not preserved; at least in one case there
are two very delicate lines, forming an irregular continuation of either side of the thallus, but their nature and significance could not be made out.

There is not the slightest trace of calcification, the fossil consisting of an impression with a thin black layer of carbonaceous matter. The surface is somewhat uneven, and by means of various kinds of illumination, and partly by immersion in alcohol, some structural details can be made out.

There is a longitudinal central cell, visible only in some places in the upper half of the thallus; it stops a little below the top itself (Pl. 1, figs 2, 3). Mostly it is quite narrow, merely in the shape of a dark line; but in places, especially near the top, it is widened to a breadth of 0,3 - 0,5 mm. The rest of the thallus consists of a dense tissue, which in the central parts is seen as a reticulation, whereas towards the sides it has the form of lines curving out towards the surface and reaching it at a right angle. When examined moistened with alcohol and under a sufficiently strong magnification, the cells have the appearance of being tubes, 0,1 - 0,13 mm in diameter, often regularly hexangular in cross-section, and separated by cell walls, which are often very thin, but in many cases thickened in the corners. There is no trace of verticillation. The original nature of the superficial tissues cannot be made out. There may have been a kind of cortical layer, which has now more or less completely disappeared. In a few places there are seen cell walls extending from the main body of the fossil, e.g. in one place on the right hand side of Pl. 2 fig. 2, and at the top of the same specimen, as shown on Pl. 2 fig. 3. In the latter case they look like small tufts of hair; it is difficult to decide whether they represent cell walls of a cortical tissue, destroyed during the process of fossilization, or remains of a cover of hairs present in the living organism.

As to the nature of this fossil, it could scarcely be doubted that it is an alga. Its affinity to the Dasycladaceae suggests itself at first sight, on account of what seems to be an axial tube, with lateral cells radiating out from it. Certainly, objections may be raised to this view: First, because it is not definitely proved that the central organ really does correspond to the axial cell of a Dasycladacea; but, on the other hand, at least personally I cannot see any objection to this interpretation of it, and strong positive evidence is afforded by its structure in the upper part of one of the specimens, as
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seen in Pl. 1 figs. 2–3. The fact that it is thinner than in most previously known algae of the said group is no hindrance. More serious would be another objection, viz. to regarding the other cells as lateral tubes, analogous to those of, for instance, a Dasycladus; in our fossil they really seem to form a coherent tissue (Pl. 1 fig. 4), rather different from the ordinary discrete lateral appendages. In so far, there is rather some resemblance to algae of quite different groups, both brown and red. But if they are really tubes without any cross-walls (and that is what they look like), the mere fact that they cohere does not seem to be a feature of such importance as to make the affinity to the Dasycladaceae unacceptable; it is a kind of structure which may, to some extent, be connected with the complete lack of incrustation with lime. Definite proofs pro or contra could scarcely be produced; but at least provisionally it seems to be justifiable to regard our alga as a member of the Dasycladaceae or a related group. It has, however, a very isolated position.

All other fossil algae of the Paleozoic formations of Norway are very different from this new form. Those which are regarded, with more or less certainty, as members of the Dasycladaceae, viz. Dasyporella, Vermiporella, etc., are completely calcified and of quite another anatomical structure. The only uncalcified algae previously discovered in this region, Chaetocladus capillatus from the Ludlow of Ringerike, is not preserved in such a way that its anatomy could be studied, and even if it should belong to the Dasycladaceae, an idea which has been suggested but which is far from proved, it has certainly a very remote affinity to the one in question.

Similar is the case with the other fossil algae with which it might be compared. It is, then, necessary to institute a new genus for it. I propose to call it Callisphenus; it is characterized by its lack of calcification and by its slender axial cell, giving off, without any verticillation, numerous tubular lateral cells which radiate towards the surface, forming a coherent tissue. Organs of reproduction unknown. At least in the present species, C. gracilis, n. sp., the thallus is claviform and slender. The type specimen, from the Wenlock on the island of Kommersøy, near Holmestrand, coll. Miss Mary S. Johnston, is preserved in the British Museum (V. 24775). A paratype (counterpart) in the Paleontological Museum of the University, Oslo (PA 1321).
Plate 1.

Callisphenus gracilis, n. gen., n. sp.

Holotype, from the Silurian of Kommersøy, Oslo region, coll. Miss Mary S. Johnston, 1910. (Brit. Mus. V. 24775.) From photographs without retouch.

Fig. 1. Photographed dry. — Nat. size.

2. The right hand specimen of fig. 1. Upper part, photographed dry, showing the relief of the central cell. \( \times 8 \).

3. Same, photographed in alcohol. \( \times 8 \).

4. Part of fig. 3. \( \times 16 \).
Plate 2.

*Callisphenus gracilis*, n. gen., n. sp.

Holotype, as Pl. 1.

Fig. 1. Same specimen as Pl. 1 figs 2—4, photographed dry. — × 4.

" 2. The left specimen of Pl. 1 fig. 1, photographed dry. — × 4.

" 3. Same specimen, photographed in alcohol. — × 8.

" 4. Part of same specimen, photographed dry. — × 8.
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