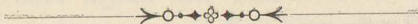


THE REPRODUCTIVE ORGANS IN TURNERELLA SEPTENTRIONALIS.

ECTOCARPUS (STREBLONEMA) TURNERELLAE, A NEW ALGA.

BY

M. FOSLIE.



TRONDHJEM 1896.

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C. Egg-like bodies.

THE REPRODUCTIVE ORGANS IN TURNERELLA SEPTENTRIONALIS

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The Reproductive Organs in *Turnerella septemtrionalis*.

By

M. Foslie.

In Rosenvinge's Grönlands Havalger¹⁾ p.817 Prof. Schmitz refers *Callymenia septemtrionalis* Kjellm.²⁾ to *Turnerella*, a new genus founded on *Schizymenia Mertensiana* (Post. et Rupr.) J. Ag.³⁾ as the type. He found the structure of the carpogon to accord with that of the named genus, and the presence of cellulæ glandulinae in the cortical layer of the frond also rendered it most probable, that it should be referred to the genus *Turnerella*, as such are wanting in *Callymenia*, which it in other respects rather resembles.

As mentioned by Kjellman i. c. this species occurs at Spitzbergen, Novaya Zemlya and the northern part of the Norwegian coast. I have myself met with it at several places from Tromsö to the western part of East-Finmarken⁴⁾, but nearly always young and very small specimens, which mostly have been fastened to Lithothamnia. The last two years I met with sterile specimens of an alga resembling that species at some places in the Trondhjem Fjord, frequently larger than farther north, but

1) In „Meddelelser om Grönland“ III. Kjøbenhavn 1893.

2) Norra Ishafvets Algfl. p. 204.

3) Cp. Schmitz. Floridiæ in A. Engler, Syllabus der Vorlesungen über Botanik, Berlin 1892.

4) Cp. Foslie, Contribution I, p. 31.

seldom attaining any considerable size. In March last winter, however, I found two fragmentary specimens rather richly provided with ripe carpospores and one with tetrasporangia in development, which prove it to be identic with the above species, and also showing that Prof. Schmitz has been right in referring the species to *Turnerella*. In August last year I found the species with cystocarps in development.

The immersed cystocarps partly are scattered partly and more frequently somewhat crowded here and there in the frond, apparently seldom in any greater number, in a fully developed stage equally prominent in both sides of the frond, subhemispherical and 250—450 μ in diameter, generally about 300—350 μ . Now and then and especially in a younger stage they are a little more prominent in the one than the other side of the frond, and in a very young stage not seldom to be seen only in the one side. Thus in a specimen from Korsnes in Nordland, probably taken in October, I found young cystocarps in development, all of which were a little prominent only in the one side. In the specimens from the Trondhjem Fjord I also found such, but here the cystocarps frequently were equally prominent in both sides even in a very young stage. So far as I have seen they fully accord with those in *Turnerella* as described by Schmitz l. c. the spores densely crowded without any order in the peripheral portions of the nucleus. But I am not sure whether only the end-cell of the branchlets in the gonimolobes forms a carpospore. The carpostome is at first to be seen just before the spores are ripe, and by and by the whole or nearly the whole prominent pericarp often gets dissolved, so that at length a smaller or larger hole is formed through the frond.

The tetrasporangia appear to occur in other individuals than the cystocarps. However, I have seen but a solitary specimen with the former organs in development. Seen from the surface of the frond they form small and irregular stains of indefinite shape, rather resembling those in *Callymenia reniformis*. The sporangia were not yet parted.

In the Trondhjem Fjord the species grows in scattered indi-

viduals on a depth of 5—15 fathom, fastened to smaller stones or to Lithothamnia. Here it attains a diameter of up to about 20 cm., frequently, however, only the half or less, and most of the specimens collected have been rather young. Exceptionally I met with old individuals lying loose on the bottom, but these probably have been loosened from the substratum by external causes. It is very much varying as to the spape. The larger specimens are irregularly lobed or sinuate, more rigid than those from the northern part of the coast, and rather crisp, with a broadly cordate or sometimes even nearly saggitate and deeply cleft base, somewhat undulate, often with extremely irregular margin, which here and there is crenulate but more frequently dentate. The frond is somewhat varying in thickness, up to about 250 μ , but in general about 150—200 μ , and here and there perforated. The structure fully accords with that in specimens from the north, only the cellulae glandulinae sometimes being less numerous. With reference to colour old specimens are much darker than younger ones, and the former do not adhere to the paper, while the latter sometimes adhere rather well sometimes not.

Prof. Schmitz remarks l. c. that there could be reason to doubt whether *T. septentrionalis* and *T. Pennyi* (Harv.) are specifically distinct, or the former only to be considered as a young stage of the latter. But on the other hand is to be opposed, as he remarks, that in a small and typical specimen of the former have been found well developed carpogons and that the true *T. Pennyi* has not yet been found at Spitzbergen, Novaya Zemlya and Norway, where *T. septentrionalis* occurs. He supposes, therefore, that they are to be considered as distinct species. However, the form of the species found in the Trondhjem Fjord shows, that the difference between these two species is even less than supposed by Schmitz, or in fact they accord with one another except therein, that the one (*T. Pennyi*) gets a little thicker and always has been found lying loose on the bottom, but the other, at least as a rule fastened to any harder object and provided with a very short stipe, which, so far as I know, never has been seen in *T. Pennyi*, or specimens found that appear to

have been fastened. Judging also from the carpogon found in *T. septemtrionalis* which accords with that in *T. Pennyi*, the only reproductive organs observed in the latter, both the named plants no doubt belong to one and the same species. It is not likely that the cystocarps in *T. Pennyi* are different from those in *T. septemtrionalis*, and, therefore, the latter is, in my opinion, most highly to be considered as a denominated form of the latter.

This species appears not only to live within the arctic circle, but is probably to be found even in more southern waters than hitherto known, as it at least on the Norwegian coast apparently grows larger to the south.

Trondhjem, April 1896.

Ectocarpus (Streblonema) Turnerellae, a new Alga.

By

M. Foslie.

E. thallo minutissimo, irregulariter ramoso, cellulis ramorum primariorum 5—7 μ , interdum usque ad 10 μ , secundariorum 2—5 μ crassis, diametro 1—3-plo longioribus; zoosporangiis unilocularibus statu juniore (?) obovatis, 9—12 μ longis, 7—10 μ crassis, terminalibus.

In specimens of *Turnerella septentrionalis* from the Trondhjem Fjord and from Korsnes in Nordland I met with the above alga, which without doubt is to be considered as a new species of *Ectocarpus (Streblonema)*, although the reproductive organs appeared not to be fully developed.

The species grows endophytic in the named host plant. It is partly much partly but little branched in a more or less irregular manner. The primary as well as partly also the secondary branches are extended through the central layer of the host, here and there sending forth undivided branches through the cortical layer of the latter, and these branches produce terminate unilocular sporangia. The cells of the primary threads are frequently very irregular in shape and thickness, 4—5, mostly 4-angulate, or the oldest ones sometimes roundish, and often irregularly bent, 1—3 times as long as broad, attaining a thickness of up to about 10 μ , but frequently about 5—7 μ . The secondary branches are often very thin and less irregular than the former, partly

but 2—3 μ partly up to 5, in general about 4 μ , and in all a branch frequently is much thinner than its main axis. I have not seen hairs. The chromatophores seem to be 1 (?) to more in each cell.

I have seen but a couple of probably not fully developed unilocular sporangia found in specimens collected in March. They are terminate on the secondary branches just breaking through the cortical layer of the host plant, obovate or broadly obovate, 9—12 μ long and 7—10 μ thick.

This species appear to be most nearly related to *Ectocarpus Pringsheimii* Rke. (*Streblonema fasciculatum* Thur.) with regard to the vegetative part of the frond, partly, however, also reminding one of endophytic specimens of *Ectocarpus* (*Streblonema*) *Stilophorae* Cr., but the unilocular sporangia reminds one of those in *Ectocarpus* (*Streblonema*) *sphaericus* Derb. et Sol. It differs from the latter by its slenderness, more irregular and shorter cells, and above all by its probably even in a fully developed stage much smaller unilocular sporangia. In the other species have not yet been found the last named organs, and it differs also from these by its slenderness and more irregular cells as well as its habitat.

Trondhjem, April 1896.