New or critical Norwegian Algæ.

By

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(With 3 Plates).

Peyssonelia balanicola (Strømf.) nob.

Hæmatostagon balanicola Strømf. Algveg. Isl. p. 25.[1])

Descr. Peyssonelia Rosenvingii Schm. in Rosenv. Grønl. Havalg. p. 782.[2])

I collected in the middle of June 1892 at Lyngø near Tromsø 4 specimens of a *Squamariacé* much reminding one of *Hæmatostagon balanicola* Strømf. It has now proved to be identic with the lately described *Peyssonelia Rosenvingii* Schm. The specimens coincide fully with the description l. c., only smaller and somewhat thinner. The crusts are 0.5—1 cm. in diameter and fastened to a dead *Lithothamnion* from a depth of about 6 fathoms, probably *L. glaciale,* and one of the crusts partly overgrown by *Lithothamnion mutabile* Fosl. mscr.

No doubt *P. Rosenvingii* is identic with *Hæmatostagon balanicola* Strømf. In Strømfelt's collections in the Riksmuseum at Stockholm I have recently seen a couple of slides of this plant, so far as at present known the only fragments existing, however not well prepared and indistinct except a transverse section which agrees well with a similar section of a younger crust taken by me at Lyngø. The figure 14 by Strømfelt l. c. is in so much incorrect as the upright filaments in the named fragments

[1]) H. F. G. Strømfelt, Om Algvegetationen vid Islands Kuster. Akademisk Afhandling. Göteborg 1886.

[2]) L. Kolderup Rosenvinge, Grønlands Havalger. Særtryk af „Meddelelser om Grønland." III. Kjøbenhavn. 1893.

of his specimen are attenuating upwards. However, the figure represents a part of a young crust, and in such ones the upper cells are, especially towards the margin, not seldom only slightly smaller than the lower ones.

Strømfelt remarks l. c. p. 26 „alla rotorgan saknande basallager". This depends thereon, that he has not decalcified the plant, as only the basal layer is visible in a section at least of specimens growing on *Lithothamnion*, but not the radicles before decalcifying.

The most important characters, by which even a steril specimen of this plant may be identified, are certainly not visible in Strømfelt's specimen, viz. the margin and the regularly radiating cell-rows of the decumbent layer, so that it might perhaps be referred to *P. Dubyi* Cr. But, so far as may be understood from Strømfelt's description and figures and the mentioned fragments, the colour and structure agree better with the present species than *P. Dubyi*, and besides it is not likely that *P. Dubyi* occurs at Iceland. I therefore feel obliged to adopt the elder name for the plant in question.

Delesseria Baerii Rupr.

Alg. Och. p. 239.

In the herbarium of the Riksmuseum at Stockholm are two specimens of this alga, assignably collected at the coast of Norway. They are labelled „Norv. arct. Berggren" det. et scr. J. G. Agardh. Also on the paper, to which the specimens are fastened, is written with pencil on one „51" and on the other „51 N.", which probably is to signify „no. 51, Norway". As the specimens were collected by professor Berggren in Gothenburg I wrote to him if possible to get information as to the locality and to ascertain if a mistake might have taken place. He kindly communicated the following.

„Då jag 1868 på återresan från Spetsbergen besökte Norges Finmarks-kuster insamlade jag hafsalger vid Tromsö — här temligen obetydligt — samt vid Kjeön och Krogönäs, som er beläget vid Lofoten. Norr om Tromsö har jag ej varit i land i Norge. Jag bemödade mig alltid att hålla samlingarne från de olika loka-

liteterna åtskilda. Nu er det så länge sedan att jag ej minnes, huru de på Norska kusten funna algerna förvarades, och jag lemnade från mig allesamman efter hemkomsten. Det skulle väl kunna vara en möjlighet, att under resan eller efter hemkomsten någon hopblanding eller förvexling i uppgift om växtställe kommit att ega rum. Men säkert är att Delesserian ej är från något ställe i Norge norr om Tromsö".

The specimens are well developed but steril, about 10 cm. high.

I have seen several other Norwegian algæ collected by Berggren on the same voyage when he found *B. Baerii*, but I have not met with any that seems to be from another place than that quoted, or Spitzbergen. I therefore do not suppose there can be any mistake as to the specimens in question.

It is not unlikely that *D. Baerii* occurs at the coast of Finmarken. I have often looked for it, but I have dredged little there, and it is probable that numerous arctic algæ may still be found especially in the sublitoral region along that very long tract of coast. However, Tromsø is farther south (69° 40 L. N.) and its nearest vicinity (Tromsøsund) is rather poor in higher algæ except *Lithothamnion*, and I suppose it to be doubtful that *D. Baerii* has been found in that enclosed sound. On the other hand Kjeø and Krogønes are rather far to the south, the latter place at about 68° 20 L. N. It is therefore impossible with any degree of probability to decide, in which of the named places the specimens may have been gathered. From a geographical point of view it would be of interest to know the locality.

Phyllophora interrupta (Grev.) J. Ag.

Spetsb. Alg. Progr. p. 3; Sphærococcus interruptus Grev. Act. Leop. 142, p. 423. Cfr. Kjellm. N. Ish. Algfl. p. 207—208.

Some years ago I collected a *Phyllophora* in the brackish water lake Borgepolden in Lofoten, which I suppose belongs to the above species. The „Borgepolden" consists of two lakes, the outer and inner Borgepold. The former is about 5 km. long, communicating with the sea through a stream, and the latter connected with the former by a streamlet. The outer lake, in which I col-

lected the specimens, has a depth of until 70 fathom. It has in former time been more directly connected with the sea, probably in its whole breadth, about $1^1/_2$ km., forming a fjord. The water is in the inner part very little brackish at the surface, but probably rather salt at the bottom. Here I found the specimens on a depth of about 8 fathom, as far as I now remember lying loose on the bottom.

Some of the specimens at least cannot be separated from *Ph. interrupta*, fully coinciding with Spitsbergian ones of that species. Cp. pl. 1 fig. 1. Others are provided with rather narrow and long prolifications somewhat reminding one of *Ph. Brodiæi*, though quite different from the typical form of that species.

I suppose it to be a remnant from a time when the purely glacial Flora had a more southern distribution than at the present time.

At Polden in the innermost part of the Lyngen-Fjord in Tromsø amt I met with another species which, to my opinion, also is a remain from that time. It is a form of *Polysiphonia arctica* J. Ag., rather differing in habit from the typical form, which also appears at several places along the coast of Finmarken. It grew on a depth of only 6 fathom. That is the only place in Tromsø amt where the species hitherto has been found.

Lomentaria sedifolia (Turn.) Strømf. mscr.

Fucus clavellosus β sedifolius Turn. Hist. Fuc. I, t. 30.

Syn. Gastridium purpurascens Lyngb. Hydroph. Dan. p. 69 et t. 17.
Chylocladia clavellosa var. sedifolia J. Ag. Spec. Alg. II, p. 366.

In the late H. F. G. Strømfelt's collection of algæ presented to the Riksmuseum at Stockholm I found some specimens labelled *Chylocladia sedifolia* (Turn.) Strømf. and collected at Nøkling in the Bømmelfjord. I also had the opportunity to see a manuscript written by Strømfelt, chiefly containing a list of algæ collected at the coast of Sweden and the western coast of Norway. Through the kindness of professor dr. V. Wittrock I was per-

mitted to make use of the manuscript treating of the Norwegian algæ, from which I quote the following.

„Föregående trenne arter (*Lomentaria*[1] *clavellosa*, *L. rosea*, *L. sedifolia*) växte ofta tillsammans på stipites af *Laminaria hyperborea*, eller på *Ascidia mentula*. Den sista (*L. sedifolia*) uppställdes af sin namngifvare Turner och efter honom af J. G. Agardh såsom varietet, ehuru med framhållande af dess stora habituela olikhet med hufvudarten. Skall emellertid *L. sedifolia* uppfattas såsom varietet, så måste afven *L. rosea* anses såsom sådan, ty den skiljes blott från *L. clavellosa* genom karakterer af samma grad och värde som den föregående. Olikheten med *L. clavellosa* består nämligen i den platta, hos *L. rosea* stundom uppblåsta bålen, som är försedd med 2-sidig mer eller mindre regelbundat riktade motsatta, åt begga håll starkt afsmalnande grenar, meden det att hos *L clavellosa* bålen är mer eller mindre trind och bär allsidigt riktade, vanligen mycket långa, oftast alternerande grenar. Dessa karakterer äro visserligen hos groddplantor föga utvecklade, hvarföre de tre arterna i detta stadium ej äro lätta att åtskilja, meden i något utvecklade exemplar kann ingen misstaga sig på dem. *L. rosea* är utmärkt genom sina korta, breda hufvudaxlar och enkla, aflångt elliptiska grenar; *L. sedifolia* genom sin trådlika förgrening med utdragen hufvudaxel och regelbundet monopodialt utvecklade grenar. Hos begge kan stundom en hufvudaxel uptill klyfva sig genom, såsom det synes, dikotomisk deling. Jåmför föröfrigt de citerade afbildningarne och beskrifningarne."[2])

I cannot agree with Strømfelt that *L. sedifolia* is distinct from *L. clavellosa* by characters of the same degree and value as *L. rosea*. To my opinion the latter is a more characterized species than the former. Among rather numerous specimens that I have seen I have not met with any true transition to *L. clavellosa*, though the species is rather varying. On the contrary *L. sedifolia* sometimes seems to be difficult to distinguish from *L.*

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[1]) *Chylocladia* in the manuscript.

[2]) „Turner säger (l. c.), att grenarnes anordning hos *β sedifolius* fullkomligt liknar bladens hos *Sedum sexangulare!* Dettta kan jag ej finna öfverensstämmande med hans uppgift, att de aro „distichous"."

clavellosa. Typically developed specimens are certainly easily recognized but especially among numerous specimens of *L. clavellosa* collected at Kristiansund by F. L. Ekman I have seen such ones very nearly related to *L. sedifolia*.

L. sedifolia has also been collected by Schübeler at Akrehavn on Karmøen, growing in company with *L. rosea* on the stem of *Laminaria digitata* on a depth of about 20 fathom.

L. rosea seems to be rather commonly dispersed along the western coast at least from Kristiansund to Stavanger. A form with thread-narrow elongated main axis has been found at Kristiansund (Ekman) and on Karmøen (Schübeler).

Pelvetia canaliculata (L.) Dcsne et Thur.

f. *radicans* Fosl.

Alg. not. p. 1.[1])

In the quoted paper I published a short description of the named alga growing in pools of probably brackish water along the lower part of the river Rindelven at the inner part of the Trondhjem Fjord, and besides I announced the distribution of it in Hauck et Richter, Phykotheka universalis.

The plant appeared in a great number when collected some years ago by dr. Hagen, and we considered it highly probable that it still occurred on the same locality. However, last summer I searched for it very carefully just on the same locality where the mentioned specimens were collected, but I did not detect a trace of the plant, and I am sure it is not for the present to be found there.

The figure 2 on pl. 1 is of a moistened speçimen from a dense bundle. The margins are in some parts of the plant slightly bent inwards, and, as quoted before, the form is never distinctly canaliculated. The punctuated line indicates how far the plant has penetrated into the clay.

I was told by inhabitants at Rindenleret, that the lowermost part of the river Rindelven has often changed its course, and the current from the river Værdalselven, the mouth of which being

[1]) Det kgl. norske Videnskabers Selskabs Skrifter. Trondhjem 1892.

about 1 km. from thence, sets towards Rindenleret carrying and washing up great masses of clay, so that the bank Rindenleret is much increased in a rather short space of time. This together with covering of ice in the winter and partly draining in the summer of the small pools in the clay along the banks of the river makes it explicable that the algæ cannot hold out for a long time.

The typical form of *Pelvetia canaliculata* was rather abundant at Trones on the other side of that branch of the fjord, about 1 km. or a little more opposite to Rindenleret. I suppose the spores may have been conveyed by wind and the current from the Værdalselven to Rindenleret, and by spring tide conveyed farther up into the small pools, where they have been able to germinate. The unfavorable conditions have subsequently caused the peculiar alteration in the development of the plant. As it was collected in the beginning of May, it must have risen from spores carried thither, at any rate the foregoing spring or summer.

Subgen. **Seirocarpus** nob.
(sub *Elachista* Duby.)

Sporangiis unilocularibus filis erectis seriatis.

Elachista (Seirocarpus) moniliformis nob.

E. filis erectis inferne in basim subæqualiter in apicem obtusum obsolete attenuatis vel raro incrassatis. Cellulis inferne partim subinflatis, 15—25 μ crassis, superne subcylindricis, 12—20 μ crassis, diametro 2-plo brevioribus ad $2^1/_2$-plo longioribus. Sporangiis plurilocularibus fere linearibus, eramosis(?), 4—6 μ crassis, loculis zoosporiferis 10—18 e strato hypothallino vel interdum basi filorum ortis. Sporangiis unilocularibus seriatis, 20—25 μ crassis, filis erectis terminantibus. Tab. 1, fig. 3-6.

Among the interesting collection of algæ gathered by B. Hansteen in the western part of the coast is a solitary slide labelled *Elachista stellaris*, which with regard to the unilocular sporangia differs so much from the true *Elachistæ*, that it at least forms the type of a new subgenus.

The specimen has been taken at Medholmen on about 59° 43′ L. N. in the beginning of August, growing on *Scytosiphon lomentarius* in a lagoon or rock-pool in the litoral region. The plant seems to form rather extended stains on the host, about $^3/_4$ – 1 mm. high.

The hypothallus is, so far as may be seen in the plain and rather dark piece in the slide, not vigorously developed, but nearly parenchymatous. Judging from loosened fragments, the cells seem often to be nearly spherical, and much varying with regard to the size.

The upright, assimilating filaments are 300—800 μ high, most common 400—600 μ. They are usually thickest a little above the base, at the point of growth, from there rather plainly attenuating towards the base, and feebly attenuating towards the more or less obtuse apex. Sometimes they are equal in thickness in the upper part, seldom even feebly increasing towards the apex. The cells are at the point of growth sometimes rather swollen, 15—25 μ in diameter, and up to 2 times shorter than the diameter. In the upper part they are nearly cylindrical or tun-shaped, partly rather much, partly little constricted at the interwalls, 12—20 μ thick, 1—2 times or seldom $2^1/_2$ times longer than the diameter, with rather thick walls. The cells are in the upper part of the filaments always rich in endochrome, but I cannot decide the form of the chromatophores, which, however, seem to be much varying.

I have seen some few short filaments resembling paraphyses, plainly attenuating from the apex towards the base, and in the upper part about 10—12 μ thick.

The plurilocular sporangia are numerous and very densely crowded, so far as I have seen always unbranched, rising from the surface of the hypothallus or short processes from there, seldom from the base of the assimilating filaments, nearly linear, or not seldom slightly increasing upwards, 4—6 μ in thickness, with 10—18 room in a single row, and each room always(?) containing one spore. The sporangia are when rising from the surface of the hypothallus borne on a shorter or somewhat elongated shaft composed of long and thin cells which are poor in endochrome.

It may, however, be remarked that this principally refers to some loosened fragments of the plant in the named slide. Pl. 1, fig. 3—4.

The plant seems also to be provided with another kind of plurilocular sporangia. In a fragment in the slide of a filament most probably belonging to the present species I found two small lateral processes of 1 and 3 cells rather resembling the lateral plurilocular sporangia in *Leptonema fasciculata* var. *flagellare* Rke., Atlas, t. 10, fig. 11, and not fully developed.

The unilocular sporangia are developed from transformed vegetative cells in the uppermost part of the filaments, much resembling those in *Pylaiella*, in chains of 2—7, most frequently only 2—3 in number, and so far as seen always terminal. Fully developed sporangia are scarce, but I have seen some others in development. They are usually almost spherical or tun-shaped, much constricted at the interwalls, 20—25 μ in diameter, and now and then by more or less oblique walls parted into two or very seldom three rooms. Pl. 1, fig. 5—6.

In some respects this species reminds one of *Phycophila stellulata* Kütz. Tab. Phyc. VIII, t. 1, fig. b. Perhaps the dark coloured cells in the upper part of some of the filaments in the named figure really represent unilocular sporangia. If so, both the species probably are very nearly connected. On the other hand it strikingly reminds one of *Elachista stellulata* Harv. Phyc. Brit. pl. 261, fig. 3, and at first I was inclined to refer it to that species, but I have afterwards been acquainted with the interesting work by Sauvageau[1]) and it appears from his description, that the typical *Elachista stellulata* Griff. is quite different from *E. moniliformis*.

The subgenus *Seirocarpus* is separated from the true *Elachista* by its unilocular sporangia developed in transformed cells of the assimilating filaments, while in the latter, which I propose to name *Euelachista*, they rise from the surface of the hypothallus. Thus the difference in this respect is so important, that it would justify the record of a separate genus. However, the reproductiive

[1]) Sauvageau, Sur quelques Algues phéosporées parasites. Journal de Botanique. Tome VI. Paris 1892.

organs in *Elachista* are not yet well known, and, so far as may be judged from a solitary and not well prepared specimen, *Seirocarpus* agrees with *Euelachista* with regard to the vegetative part as well as the development of the plurilocular sporangia. I therefore hold it most suitable for the present to consider it a subgenus.

Dichosporangium repens Hauck

Meeresalg. p. 339.

f. *varians* nob.

f. filis erectis sursum incrassatis, cellulis supremis interdum irregulariter divisis et contexto parenchymatico formantis, vel cellulis non divisis et ramis ramulisque brevissimis utrinque egredientibus, vel plerumque filo pilo et ramis ramulisque, in fasciculo globoso densissimo congestis, terminante; pilis et sporangiis pluriloculariibus interdum e filo primario endophytico egredientibus. Tab. 2, fig. 1—6.

The primary, endophytic threads resemble those in the typical form, perhaps less branched and somewhat thinner. The cells are 6—9 μ thick and 1—2 times longer than broad.

The upright filaments, too, are thinner than in the typical form, almost ever increasing in thickness upwards, in the lower part generally 10—12 μ, at the apex 11—17 μ thick. The cells are cylindrical or nearly cylindrical, $1^1/_4$—4 times as long as broad. Pl. 2, fig. 1. Sometimes, and seldom more than the uppermost cell of the filament divides itself in an irregular manner, by farther division forming a small parenchymatous tissue composed of angular or rounded cells, with wartlike processes or short branchlets, now and then bearing unilocular or plurilocular sporangia and a hair. Pl. 2, fig. 3—5. Other filaments are monosiphonous throughout, ending in a hair with a basal point of growth, and from one or more of the uppermost cells issue very short branches from both sides, more or less irregularly branched, or bearing wartlike processes. Pl. 2, fig. 2. Occasionally such a branch-complex develops itself from the one side of the uppermost cell and an uni-

locular sporangium from the other side. Most frequently, however, is to be found a very dense, globular branch-complex developed from the uppermost cell of the filament, 80 - 150 μ in diameter, composed of irregularly branched and very thin threads, sometimes nearly parenchymatous. Pl. 2, fig. 6. In such individuals the hair terminating the filament has rather often disappeared or is bent aside. The hairs are always few in number, and never more than two may be found terminating a filament, but they also issue, though seldom, from the primary, creeping filaments, or are lateral on the upright filaments.

The unilocular sporangia resemble those in the typical form, apparently a little smaller and more often rounded obovate, though many globular ones are to be found, 25—50 μ long and 20—40 μ broad, or 30—40 μ in diameter. They commonly appear scattered on the primary part of the plant as in f. *typica*, but seldom at the end of the upright filaments; here I have not seen more than 3—4 crowded together, issuing from a monosiphonous cell, or solitary between short branchlets. They, seldom, also occur lateral in the middle of the filaments. Once I have seen a sporangium growing into the holster of an emptied one.

The plurilocular sporangia are very scarce, appearing most often solitary between short and little developed branchlets issuing from the uppermost cell of the uprigt filaments, or from the parenchymatous tissue of cells, linear or nearly linear, 20—30 μ long and 9—11 μ broad. Pl. 2, fig. 3 and 5. They also rise from the creeping, primary threads, or terminate on short side shoots issuing from the latter.

I do not know the form of the chromatophores. They seem to be disc-shaped and more than one in each cell.

I only know *Dichosporongium repens* from the description by Hauck l. c., but the above mentioned alga seems to be so nearly related to that species, that it probably cannot be considered an independent one. It is smaller and thinner, the sporangia are seldom developed in the upright filaments, and the latter most often terminate in a globular branch-complex. It is much varying, and

transitions to *D. repens* are to be found, but I suppose it to be a well characterized form of the species.

The species was at first, with doubt, referred by Hauck[1]) to *Myriotrichia*, probably owing to the „mehrreihig werdenden Gliedern", but afterwards to a separate genus, as sporangia were not known in the primary threads of *Myriotrichia*. Unilocular sporangia have lately been found by Karsakoff[2]) also in the primary threads of the last named genus, and therefore he proposes to strike the genus *Dichosporangium*.

The named genus is by Kjellman[3]) placed in another family than *Myriotrichia* and near to *Streblonema*.

The form *varians* is in some respects more nearly related to *Myriotrichia* than the typical form, judging from the description by Hauck l. c. But on the other hand I have seen fully developed specimens of the former with the upright filaments monosiphonous throughout, and the primary threads sometimes also bearing plurilocular sporangia, thus very nearly related to *Ectocarpus* (*Streblonema*). That is, however, still more the case with the other species known, *Dichosporangium Chordariae* Wollny.[4]) I therefore keep the genus *Dichosporangium*, though it seems to connect the genus *Myriotrichia* and *Ectocarpus* (*Streblonema*), or else *Myriotrichia* must be regarded as a subgenus of *Ectocarpus*, which, however, may not yet be required.

D. repens f. *varians* has been found at Espevär on the western coast in the later half of July (H. H. Gran), growing in a specimen of *Eudesme virescens* richly provided with unilocular and pluriloculalar sporangia.

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[1]) Hauck, Beitr. 1879, p. 242, sec. Meeresalgen p. 339.

[2]) N. Karsakoff, Quelques remarks sur le genre *Myriotrichia*. (Journ. de Botnnique. 1892). Ref. Bot. Centralbl. Bd. 54, p. 25.

[3]) F. R. Kjellman, Phæophyceæ. — Engler und Prantl, Die natürlichen Pflanzenfamilien. 1 Teil, 2 Abteil. p. 186.

[4]) R. Wollny, Algologische Mittheilungen, p. 3, t. I et t. II, fig. 3. (Hedwigia. 1886. Heft. IV).

Gen. **Myrionema** Grev.

Subgen. **Eumyrionema** nob.

Myrionema intermedium nob.

M. thallo maculam 1—2 mm. formante. Filis erectis simplicibus vel subramosis, subclavatis, superne 7—10 μ crassis. Pilis plerumque paucis. Sporangiis unilocularibus e strato basali vel basi filorum egredientibus, pyriformis vel interdum obovatis 45—84 μ longis, 22—36 μ crassis. Tab. 3, fig. 1--10.

From Dr. J. Brunchorst, Bergen I got some dried algæ for determination, collected at Kilestrømmen near Bergen by P. Boye. Among these is a specimen of *Enteromorpha compressa* scanty infested with the above species, bearing unilocular sporangia in the former half of August.

The plant forms small expansions about 1—2 mm. in diameter and not seldom surrounding the host plant.

The basal disc coincides with that of *M. strangulans*, the radiating filaments only slightly coarser.

The upright filaments are in general unbranched, almost ever rather increasing in thickness upwards, most often subclavate, in the upper part 7—10 μ thick, and the cells 1—2 times the diameter in length. Pl. 3, fig. 1—2. Sometimes, however, may be found a short lateral branch in the upper part (pl. 3, fig. 3), unfrequently also in the lowermost part of a filament, occupying the place of a sporangium. Now and then the uppermost cell of a filament is somewhat bent aside or oblique, or the two uppermost cells are parted by oblique walls in an irregular manner, from which short and irregular processes issue. Pl. 3, fig. 4—10. In some sections of the plant I found these irregular processes not uncommon, in others quite wanting, and in all the processes as well as the lateral branches are scarce, the very greatest number of the filaments being simple.

The upright filaments are often not so plainly increasing in height from the outer part towards the middle of the disc as in

other species of this section of *Myrionema*. Sometimes may be found a number of filaments which are somewhat higher than the adjacent ones, the height in specimens bearing sporangia varying between 60 and 160 μ, most common 70—120 μ.

The hairs issue from the basal disc, but they are commonly very few in number.

The unilocular sporangia rise from the basal disc, sessile or on a short peduncle, or sometimes they are lateral in the lowermost part of the upright filaments. They are rather varying in shape, but most often pear-shaped or elongated pear-shaped, or ellipsoidic pear-shaped, or sometimes even obovate, the length from $1^1/_4$—$2^1/_2$ times the diameter, and not seldom more or less obliquely attenuating, 45—84 μ long and 22—36 μ thick. Pl 3, fig. 1—2.

This species must be considered either a separate one, or a form of *M. strangulans* Grev., or uniting the latter with *M. punctiforme* Lyngb. (*Phœosphœrium punctiforme* Kjellm. Handb. p. 41). As mentioned above, it almost fully coincides with the former as to the basal disc. The upright filaments are a little thicker and usually higher than in *M. strangulans*, and it agrees with both with regard to the position of the sporangia. Thus the only true difference is that it sometimes bears a lateral branch or short processes, in this respect somewhat reminding one of *Ulonema rhizophorum*, and the sporangia are proportionally of a large size, as to the shape also uniting the named two species, though more nearly related to *M. strangulans*. In my opinion this difference would not be sufficient to found a separate species, especially as the vertical filaments mostly are simple, and branched ones sometimes are very rare, but Nägeli[1]) describes plurilocular sporangia in *M. strangulans* quite different from those in *M. punctiforme* as described by Kjellman l. c. I therefore keep it a separate species until the plurilocular sporangia in this section of *Myrionema* are better known. On the contrary I do not think *Phœosphœrium* can be maintained as a separate genus.

[1]) Algensyst. p. 145, t. II, fig. 31, 33, 34.

Subgen. **Phycocelis** (Strømf.) nob.

Myrionema majus nob.

Ascocyclus major Fosl. Contrib. II, p. 15.

I here want to give the following addition to the description of this species.

Sometimes the basal disc it rather large before the upright filaments arise, sometimes the are to be found in a disc of a little advanced state, but, at least in elder specimens, the filaments always occupy only a small space of the middle of the disc in proportion to the size of the disc itself. The cells of the disc are large and not much varying in size, but nearly always with sharp corners and thick cell-walls. Pl. 3, fig. 18

The upright filaments not seldom terminate in a hair, and the cell-walls are thick. Pl. 3, fig. 19.

The description of the chromatophoras is from a specimen prepared in gelatin-glycerin.

I have still only found a solitary and not fully developed plurilocular sporangium. Pl. 3, fig. 19. I have, however, in the upper part of a couple of other filaments found an embossment in one of the cells, which probably are young foundations of sporangia. It therefore seems that the plurilocular sporangia, probably, are always lateral in the upper part of the vertical filaments.

I have been unable to find any real distinction between *Myrionema*, *Phycocelis* and *Ascocyclus*, and therefore I consider the two latter as subgenus of the former, *Ascocyclus* however principally founded on the presence of paraphyses.

The difference between the basal disc in *Myrionema* and *Phycocelis* (*Ascocyclus*) seems not to be so important that it may serve as the character of genus. In the former the cells generally are longer and narrower, when seen from above, and at the margin the radiating cell-rows are not always so densely connected as in *Phycocelis*. Cp. Kütz. Tab. Phyc. 7, t. 93, II, fig. c. Ho-

wever, transitions are to be found. Magnus[1]) describes the basal disc in *Ascocyclus* and refers to Nägeli with regard to *Myrionema*. The description by Nägeli[2]) seems however to be from a true *Phycocelis*.[3]) In *Myrionema* as well as *Phycocelis* the vegative part of the plant consists in the beginning of a disc, from which the upright filaments later issue. This disc may, in both, be smaller or larger, before the latter are developed.

Reinke[4]) places *M. Leclancherii* in *Ascocyclus*, while it by Kjellman[5]) is placed in *Myrionema*, the latter by him even referred to another family *(Chordariaceæ)* than *Ascocyclus* and *Phycocelis* (*Ectocarpaceæ*). The basal disc in the named species almost fully agrees with that of *M. strangulans*.[6]) On the other hand *Ectocarpus reptans* Kjellm.[7]) is by Reinke[8]) still placed in *Ectocarpus* (*E. repens* Rke.), while *E. reptans* Cr. is referred to *Ascocyclus*.[9]) Kjellman maintains l. c. p. 81 his *E. reptans* as identic with Crouan's plant, here however referring it to *Phycocelis*. The basal disc in *E. reptans* Kjellm. much resembles that of *Phycocelis* and seems to coincide better with *A. reptans* Rke., Atlas t. 15 than the above mentioned *E. repens* Rke. l. c. t. 19.

Thus there seems to be varying opinions with regard to the apprehension of *Phycocelis (Ascocyclus)* and *Myrionema*.

Unilocular sporangia are not, as yet, with certainty verified in *Phycocelis* and *Ascocyclus*, but in the nearly related genus *Mikrospongium*.[10]) Kützing figures such ones in *Myrionema (Phycocelis) ocellatum* nearly coinciding with those in *M. strangulans*.[11]) It has, however, not yet been confirmed.[12])

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1) Die Botanischen Ergebnisse der Nordseefahrt von 21 Juli bis 9 Septbr. 1872. Jahresbericht der Kommission zur Untersuchung der deutschen Meere in Kiel. 1874.
2) Algensyst. p. 145.
3) Cp. l. c. t. II, fig. 32.
4) Algenfl. p. 44.
5) Handbok p. 44.
6) Cp. Le Jolis, Alg. mar. Cherb. no. 57.
7) Skand. Ectocarp. o. Tilopt. p. 52, pl. II, fig. 8.
8) Algenfl. p. 42; Atlas, t. 19.
9) l. c. p. 44 et t. 15.
10) Cp. Reinke, Algenfl. p. 47.
11) Cp. Kützlng, Tab. Phyc. 7, t. 94, III, fig. d.
12) Cp. Reinke l. c. p. 45.

Plurilocular sporangia are known in two species of *Myrionema*, viz. *M. punctiforme* and *M. Leclancherii*. Those of the former are described by Kjellman l. c. p. 41, and seem not to be essentially differing from the same organs in *M. (Phycocelis) globosum*.[1]) The plurilocular sporangia in *M. Leclancherii* are nearly related to those of *M.* (*Phycocelis*) *ocellatum*.

As to the upright filaments there is less difference between the known species of *Myrionema* and typical *Phycocelis* than between those of the latter mutually.

The hitherto known species I group in the following manner:

Subgen. **Eumyrionema** nob.

M. punctiforme (Lyngb.) Harv.
M. intermedium Fosl.
M. strangulans Grev.
M. Leclancherii Chauv.

Subgen. **Ascocyclus** (Magn.) nob.

M. orbiculare J. Ag.

Subgen. **Phycocelis** (Strømf.) nob.

M. reptans (Cr.)
M. majus Fosl.
M. ocellatum Kütz.
M. balticum (Rke.)
M. foecundum (Strømf.)
M. globosum (Rke.)

Mikrospongium gelatinosum Rke.
Algenfl. p. 46.

The collection of algæ brought together by B. Hansteen from the western part of the coast contains a slide of a couple of minute specimens of a plant which may be referred to the above species. It is taken at Døkjeviken in the Vindefjord in the

[1]) Cp. Reinke, Algenfl. p. 46; Atlas p. 20, t. 17.

middle of August, „forming brown dots about 1 mm. in diameter on *Corallina officinalis.*" The specimens in the slide are smaller and somewhat damaged by too strong pressure espeaially as to the unilocular sporangia.

I have not been able to decide with certainly whether the plant has been gelatinous (it is prepared in gelatin-glycerin), however it looks so by one of the specimens. An older basal disc seems to consist of two layers of cells. The upright filaments are 100—150 μ high and 5—6 μ thick, generally simple, but now and then with a short branch of 2 - 3 cells issuing from one of the three uppermost cells of the main filament. The cells are 1—3 times as long as broad. Scattered and very few but rather long hairs arise from the basal disc, about 8 μ thick.

One of the specimens bears both unilocular and plurilocular sporangia. The former are mostly clavate, sometimes obovate, and about 60 μ, seldom only 25 μ long. They are loosened by pressure, but at least most of them probably have been lateral and sessile, sometimes perhaps terminate. The plurilocular sporangia are terminate and about 5 μ thick, 6—12 in the row and each containing one spore.

There can be but little doubt that the plant in question is referrible to *Mikrospongium gelatinosum*, but perhaps it ought to be kept a named form of the species. The materials is, however, too little and not well preserved, and therefore not useful for closer examination. Moreover *M. gelatinosum* is according to Reinke l. c. (cp. Atlas, t. 7—8) a much varying species both in ramification and the form of the sporangia.

Gen. **Ulonema** nob.
(Fam. *Ectocarpacearum*).

Thallo epiphytico, e filis repentibus statu juniore contortis, adultiore fere in membranam conjunctis, rhizinos vel fila plus minusve elongata in parenchymate hospitis et fila erecta emittentibus composito. Sporangiis unilocularibus e filis repentibus vel basi filorum erectorum ortis. Sporangiis plurilocularibus ignotis.

U. rhizophorum nob.

U. thallo maculam diametro 1—3 mm. media parte 80—140 μ crasso formante. Filis erectis confertis, cylindricis vel subclavatis, interdum subramosis; cellulis 6—9 μ crassis, 1—$2^1/_2$ plo longioribus. Pilis paucis. Sporangiis obovatis vel subclavatis, 30—55 μ longis, 15—25 μ crassis. Tab. 3, fig. 11—17.

The young plant consists of irregularly branched, creeping and somewhat contorted filaments, in a rather advanced state destitute of rhizoids or erect threads. Pl. 3, fig. 11. Fully developed specimens form mostly small, flattened-hemispherical expansions 1—3 mm. in diameter, much resembling those of *Myrionema punctiforme* f. *strangulans*, in the middle generally 80 – 140 μ in thickness, and not seldom surrounding the host plant *Dumontia filiformis*.

The procumbent filaments are in elder specimens densely crowded, forming a pseudoparenchymatous disc, towards the margin, however, more or less distant and less contorted, sometimes rather attenuating. They are composed of cells that in longitudinal section are rectangular, or square, or five-angular, not seldom polygonal, or roundish, or tunshaped, and in all much varying as to the shape as well as the size, and rich in endochrome. Certain filaments of the disc point and bend downwards forming short rhizoids, or such ones issue from the side or lower part of a cell penetrating a little between the cortical cells of the host plant. Pl. 3, fig. 13. Other filaments penetrate rather far the tissue of the host plant. Pl. 3, fig. 14. They are, however, very scarce; neither are the rhizoids numerous, and as a rule only to be found in the inner part of the disc. The endophytic filaments are occasionally poor in endochrome and provided with thinner walls than the procumbent ones.

The upright filaments are always numerous and densely crowded in general even towards the margin, plainly decreasing in height from the middle of the disc. They are cylindrical or more often somewhat increasing in thickness towards the apex, in the upper part 6—9 μ thick, and the cells 1 - $2^1/_2$ times the diameter in length. Pl. 3, fig. 12—13. Most of the filaments are

simple, but not seldom more or less bent aside in the upper part, or now and then irregularly bent. Other filaments bear, though seldom, short and irregular branches at the apex, consisting of 1—3 cells, or a filament may very seldom be twice divided in a subdichotomous manner. Pl. 3, fig. 16—17. Seldom, too, some other short branches appear farther down. The cells are rich in endochrome, but I cannot decide the form of the chromatophores. They seem to be disc-shaped, one or more in each cell.

The hairs are few in number, issuing from the creeping filaments, and about 10 μ thick.

The unilocular sporangia generally rise from the procumbent filaments, sometimes also issuing from the basal cell of the upright filaments, or very seldom from another one of the three lowermost cells of the latter, solitary, or very seldom more than one in number. Pl. 3, fig. 13 and 15. The shape of the sporangia, within a certain degree, depends on the closeness of the upright filaments. If the latter are not very dense, the sporangia most often assume a nearly obovate form and become sometimes rather thick in proportion to the length, nearly roundish, but otherwise they commonly are oblong or subclavate, sometimes oblique, 15 - 25 μ thick and 30—55 μ long, now and then the length up to three times the thickness.

This genus ought perhaps to be regarded as a subgenus of *Ectocarpus*, but at least for the present I consider it an intermediate genus between *Ectocarpus* and *Myrionema*, most nearly related to the former as to the pseudoparenchymatous disc, in this respect standing between *E. terminalis* and *E. repens*, and nearly connected with *Myrionema* as to the upright filaments and the reproductive organs, but differing from either with regard to the rhizoids. The scarce endophytic filaments are also rather to be regarded as elongated fastening organs.

The species has been found at Lyngø in the neighbourhood of Tromsø, growing on *Dumontia filiformis* in the lower part of the litoral region. It was richly provided with sporangia in the middle of June. A solitary specimen of *Dumontia* has been collected at Syltefjord in East-Finmarken infested with the present

epiphyte, the latter formerly referred to *Myrionema strangulans*, bearing sporangia in the later half of July.

Ectocarpus Landsburghii Harv.

Phyc. Brit. pl. 233.

Some fragments of an *Ectocarpus* collected at Alvestadnesset in the Vindefjord by B. Hansteen agree well with the above species. It grew on a depth of 5—8 fathoms with „hard rocky bottom" together with *Cladophora*, provided with plurilocular sporangia in the beginning of August.

Through the kindness of Geo. Will. Traill, who has often been kind enough to supply me with Britisk algæ, I got an authentic specimen of the named species from Greville's herbarium for comparison. It is collected at „Largs" in July. I succeeded in finding plurilocular sporangia also in this specimen, which so far as I know has never been described.

I have not been able to get a complete view of the ramification. The species seems to be irregularly branched in a subdichotomous manner, but partly a main axis may be followed rather far, with numerous lateral, short or elongated branches, the former often consisting of only 1—5 cells, the latter not seldom again bearing short side branches. The elongated branches sometimes are bent downwards, sometimes upwards, and especially the short ones most often issuing under a right angle. Seldom a lateral branch grows out into a rhizoidlike filament poor in endochrome. The main segments are about 50 μ thick, but the lateral branches, especially the short ones, are much thinner than their main axis. The branches are on the whole less attenuating than in fig. 2 by Harvey l. c. The cells are most often shorter than their diameter, seldom slightly longer, and with very thick walls. The chromatophores seem in a slide prepared in gelatin-glycerin to be disc-shaped, small and numerous, and as Harvey remarks l. c. „the endochrome completely fills the cavity." Only in this respect, I am not sure whether the Norwegian form coincides with the British one. However, in cells of the British specimen, moiste-

ned in water with addition of Eau de Javelle it looks, as if the chromatophores have been disc-shaped.

The plurilocular sporangia are somewhat varying, however fully coinciding with those in the British specimen. They are commonly terminate in a somewhat elongated lateral branch, more seldom on a short peduncle composed of about 3 cells, ovate, ellipsoidic-ovate, or cylindrical-ovate, 34—56 μ long and 21—36 μ broad. Once I found in the British specimen as well as the Norwegian one a not fully developed intercalar sporangium separated from a terminate one by one or two vegetative cells

The original specimen of this plant, as figured by Harvey l. c. has, it seems, been provided with the named reproductive organs. No doubt, fig. 3 l. c. represents a part of the plant bearing at least three not fully developed sporangia, probably overlooked by Harvey as being such organs

Ectocarpus Hansteeni nob.

E. thallo parce et subdichotome ramoso, ramis lateralibus paucis. Cellulis cylindricis vel fere cylindricis, 30—40 μ crassis, subæqualibus ad sesquilongioribus. Sporangiis plurilocularibus ovoideis vel ovoideo-ellipsoideis, breviter pedunculatis, subsecundis, 30—60 μ longis, 17—36 μ crassis. Sporangiis unilocularibus ignotis.

I have only seen two small specimens of this alga, and they are not fitted for closer examination, but it seems to be a new species. I cite the following translated diagnostic from fresh specimens given by Hansteen.

„Forms dark brown, entangled and extended patches. The cells cylindrical or feebly bean-shaped, from about 2 times longer than broad to shorter than broad. The chromatophores band-shaped, 1(?) in each cell. The plurilocular sporangia ovate, most often on 2—3 celled shaft, up to about 2 times longer than broad."

The species is little branched in a subdichotomous manner, with few lateral, simple or subsimple, most often short and spreading branches. The cells are in general cylindrical, 30—40 μ thick,

most commonly about as long as broad, partly a little shorter, partly $1^1/_2$ or, seldom, up to 2 times longer than broad.

The plurilocular sporangia are scattered and subsecund, seldom in pairs, most often borne on a peduncle of 2—3 cells, seldom 6 or only 1, issuing under a right angle, sometimes, however, bent a little downwards, sometimes a little upwards. They are ovate, elliptic-ovate, or cylindrical-ovate, 30—62 μ long and 18—36 μ broad. In a single case I mit with three sporangia in a row lateral on a short side branch and borne on a peduncle of 1—3 cells.

Hansteen remarks, that he found the species at Hisken on a depth of 17 fathom and in Alvestrømmen in 3 fathom water, at both places „on loose and sandy bottom between shells."

I know no other species of *Ectocarpus* to which this plant may be related than *E. Landsburghii*. It rather resembles that one in habit, but it is more delicate, more regularly and far less branched, and vegetative short branches are few in number. There is also a difference with regard to the position of the sporangia, and the chromatophores seem to be quite different. However, both species want nearer description.

Ectocarpus (Streblonema) aecidioides Rosenv.

Grønl. Havalg p. 894.

Just as I was going to describe a new *Ectocarpus (Streblonema)* from the northern part of the coast I got the interesting work on Grønlands Havalger by Kolderup Rosenvinge. Here I found a species described, in many respects closely agreeing with the plant taken by me, but on the other hand somewhat differing, though not so much that it need be regarded as a separate form. Moreover, the species seems to be rather varying without any defined limit between the forms.

I first found the plant at Kjelvik in West-Finmarken, living in the uppermost part of the leaf of *Laminaria saccharina* from a depth of about 15 fathom, and afterwards I met with nearly the same form at Lyngø in the neighbourhood of Tromsø also in the leaf of the named host plant from a depth of about 6 fathom.

The form from Kjelvik stands nearest to the Greenlandic one,

judging from the description l. c., but it is only provided with unilocular sporangia. I have seen numerous specimens fully coinciding with fig. 27 A. l. c., but on the other hand also specimens which are quite different.

The endophytic part is only little branched, but penetrates even the middle layer of the leaf of the host plant, the threads are often rather long and straight, and much varying as to the diameter. Pl. 1, fig. 9.

Some of the specimens bear numerous upright, free filaments, not seldom up to 30 or even 50 in number, forming a dense bundle of the same extent as the sori of sporangia. The filaments are 40—50 μ high, equal in thickness throughout, sometimes however a little attenuating, sometimes but more seldom slightly increasing in thickness upwards, simple, or very seldom forked. Cp. pl. 1, fig. 7. The cells are cylindrical, 6—8 μ thick and $1^1/_2$—3 times the diameter in length. I have by this form seen filaments attaining a length of 80 or even 100 μ and more, but that is however seldom. Short filaments have also been observed in Greenlandic specimens according to Rosenvinge l. c., but they have been proportionally poor in endochrome and supposed by him to be undeveloped hairs. I have also often seen such ones in the Finmarkian specimens, but others again, and especially those forming a dense bundle, have been rather rich in endochrome, so that the filaments are, no doubt, to be regarded as assimilating organs. I cannot decide the form of the chromatophores, as I have not examined living specimens, or prepared any for that purpose.

The sporangia are in general numerous and densely crowded, and somewhat varying as to the shape, 28—42 μ long and 19—24 or exceptionally up to 30 μ broad. I have not seldom met with such ones coinciding with fig. 27 B. l. c., but often also with the lower part narrower and much reminding one of the sporangia in *Elachista stellulata* Griff. figured by Sauvageau[1]) though in general obliquely attenuating. Sometimes, however, they are nearly globular, and once I found an angular one. Pl. 1, fig. 7. The sori break out in the same way as described by Rosenvinge l. c.

[1]) l. c. pl. 1, fig. 2.

The form from Lyngø is in every part coarser than the above mentioned, and it is provided both with unilocular and plurilocular sporangia.

The endophytic threads are numerous and a little more branched than in the form from Kjelvik, but often also rather long and straight, varying from 2—12 μ, generally 6—8 μ in thickness.

The upright filaments are more or less numerous, generally few or even wanting in specimens with numerous sporangia, and most commonly equal in thickness throughout, attaining a length of 60 μ or very seldom up to 150 μ by a thickness of 6—10 μ. The cells are cylindrical, $1^1/_2$—$3^1/_2$ times the diameter in length. The hairs are 10—12 μ thick, in greatest number accompanying the unilocular sporangia, but sometimes I have seen hairs and upright filaments in a bundle without sporangia breaking through the membran of the host plant

The unilocular and plurilocular sporangia commonly appear in different and very dense sori, partly with few and partly with numerous hairs especially accompanying the former. The plurilocular sporangia are 35—50 μ, seldom up to 80 μ long by a thickness of 6—7 μ, the rooms 9—14 in a single serie and each one like the typical form seldom containing more than one spore. The unilocular sporangia are sometimes rather large, obovate or now and then elongated obovate, 30—50 or seldom 62 μ long and 18—28 μ broad, and often obliquely attenuating.

This form does not always break out in the same way as the form from Kjelvik, sometimes several sori are confluent, and now and then isolated filaments break through the membran of the host plant.

I have been uncertain whether the species ought to be regarded as a named form of *Elachista stellulata* Griiff., or an independent one At any rate *E. stellulata* must be removed from the genus *Elachista* to *Ectocarpus* (*Streblonema*), or the same section, in which the present species may be placed. Besides its endophytic or parasitical mode of growth *E. stellulata* wants the nearly parenchymatic hypothallus and the paraphyses characterizing the true *Elachistæ*, and is provided with true, enduring hairs which

are wanting in the latter. On the other hand it is so nearly connected with *E. aecidioides*, that they perhaps cannot be maintained as different species, and through the latter also with *Streblonema*, to which I at least for the present refer it.

The species in question differs from *Ectocarpus (Streblonema) stellulatus* (Griff.) therein, that the assimilating filaments are few and feebly developed or wanting in specimens bearing numerous sporangia, while even in such specimens of the latter they seem to be well developed, longer and thicker, generally increasing in thickness towards the apex, with the cells shorter in proportion to the thickness than in the former, and rather contracted at the interwalls. In *E. aecidioides* the hairs are always thicker than the assimilating filaments, in *E. stellulatus* they seem to be thinner, but in all the latter is a larger and coarser plant.[1]) Also with regard to the endophytic part there seems to be a difference between the two species, in *E. stellulatus* the threads being more densely packed or somewhat parenchymatous towards the surface of the host plant, and the cells shorter. However, I have not had the opportunity to examine *E. stellulatus*, nor do I know the size of the unilocular sporangia. The plurilocular ones are only known from the description and figures by Harvey[2]) and Areschoug,[3]) thence supposed by both to be paraphyses. The former quotes them as club-shaped, but according to Areschoug l. c. they seem to be nearly linear.

?Haplospora globosa Kjellm.

Ectocarp. p. 5.

In Alg. Not.[4]) under the above name I mentioned a specimen of an alga collected at Trondhjem much resembling *Scaphospora speciosa* especially as to the plurilocular reproductive organs. Among some algæ that Korpsläge F. Hoch kindly sent me for examination I found a specimen collected about 30 years ago at Espevär on the western coast, in habit closely resembling certain forms of

[1]) Sauvageau l. c. p. 7, pl. 1, fig. 1 2.

[2]) Phyc. Brit. pl. 261.

[3]) Alg. pugill. sec. in Linnæa, vol. 17, p. 261, t. IX, fig. 4.

[4]) Det kgl. norske Videnskabers Selskabs Skrifter. Trondhjem 1892.

Pylaiella litoralis. It is, however, fragmentary, about 9 cm. high. The main axis is partly polysiphonous, and the segments regular, but few in number.

The plurilocular reproductive organs are much varying in shape, awl-shaped, cylindric spool-shaped, nearly clavate, or sometimes contracted in the middle, 50—120 μ long and 16—30 μ thick. They are partly terminate in an elongated side-branch, partly and more often borne on a short peduncle composed of 1—3 cells.

I do not know whether this specimen may be referred to *Haplospora globosa*, in which only unilocular reproductive organs have been found, or to *Scaphospora speciosa*, which as far as known, is always provided with both the named reproductive organs, or whether it units the named two species, or perhaps belongs to an undescribed species.[1]) It differs from both in habit, and the ramification is difficult to follow in the solitary and fragmentary, dried specimen. I here only want to quote the occurrence of the named form of this little known group of algæ.

Monostroma fuscum (Post. et Rupr.) Wittr.
Monostr. p. 53.

f. *tenuis* nob.

f. fronde elongato-obovato, parte monostromatica superne 12—15 μ crassa, cellulis sectione transversali horizontaliter rectangularibus.

This form resembles in habit the typical one, but it is thinner, more flaccid and the colour a little lighter, and it adhers better to the paper than the named one. However, it differs especially with regard to the structure. The cells are in the lower, distromatic part of the frond, in a transverse section, quadratic or more often horizontally rectangular, and in the upper and monostromatic part so far as I have seen always horizontally rectangular, even up to three times broader than high. It is in the uppermost part of the frond scarcely more than 15 μ thick and in all much thinner than the typical form.

[1]) Cp. Reinke, Ein Fragment aus der Naturgeschichte der Tilopterideen. 1889. Botanishe Zeitung, sec. ref. in Bot. Centralbl. Vol. 38, p. 190.

I have only seen two dried specimens, which are elongated obovate, ore the one nearly cuneate-obovate, 15—16 cm. long and 4—6 cm. broad in the upper part. I do not think the plant by closer examination of fresh specimens may appear to be more than a form of the rather varying *M. fuscum*.

This form has been found on a wreck at Stabben lighthouse near Aalesund by P. Boye.

Ostreobium Queketti Born. & Flah.

Pl. viv. d. l. test, p. 15, pl. IX, fig. 5—8.

A perforating alga referrible to the above species was found at Lyngø near Tromsø on a depth of about 6 fathom, living in a fragmentary, dead *Lithothamnion*, probably *L. glaciale* partly covered with *L. varians*. It appeared only in the upper layers of tissue of the host plant, here however in great numbers, but very seldom also penetrating into the lowermost part of the named living epiphyte.

The plant has the same thickness as the typical form, but apparently less branched. The most branched specimens I have seen are those figured on pl. 2, fig. 7—8. In a single case I met with a somewhat thickened branch, which especially in its upper half somewhat reminds one of a sporangium. Cp. pl. 2, fig. 9. I have, however, been unable to decide whether it may be an organ of reproduction, or not. The large bodies mentioned by Bornet & Flahault l. c. I found mostly isolated here and there in the host plant, short, simple with a thickness of 30—40 μ. Once I found young branches like the above mentioned issuing from the one end of such a body and the other end with short irregular processes. Cp. pl. 2, fig. 10.

Together with *Ostreobium* I found some few younger individuals of another plant probably referrible to *Mastigocoleus testarum* Lagerh.

Conchocelis rosea Batt.

in Phyc. Mem. I, p. 1.

After a part of the present paper was printed I found this

curious alga in a specimen of *Lithothamnion lævigatum* Fosl. mscr. collected at Drøbak in the Kristiania Fjord by H. H. Gran on a depth of 5—6 fathom. It is sterile, but otherwise agreeing with the description of the named species.

Trondhjem 7. II. 1894.

Explanation of the plates.

Plate I.

Phyllophora interrupta.

Fig. 1. Habit-figure. $\frac{1}{1}$.

Pelvetia canaliculata f. *radicans.*

„ 2. Habit-figure. The punctuated line indicates how far the plant has penetrated into the clay. $\frac{1}{1}$.

Elachista (Seirocarpus) moniliformis.

„ 3. An assimilating filament, a paraphyse and plurilocular sporangia issuing from a nearly spherical cell of the hypothallus $\frac{320}{1}$.

„ 4. Assimilating filaments with plurilocular sporangia. $\frac{320}{1}$.

„ 5—6. Terminate unilocular sporangia. $\frac{230}{1}$.

Ectocarpus (Streblonema) aecidioides.

„ 7. Vertical, vegetative filaments and an angular unilocular sporangium. $\frac{320}{1}$.

„ 8. An upright assimilating filament, hair and an unilocular sporangium. a. a. Cells of the host plant. $\frac{590}{1}$.

„ 9. A forked, upright assimilating filament. $\frac{320}{1}$.

„ 10. Part of an endophytic filament. $\frac{590}{1}$.

Plate II.

Dichosporangium repens f. *varians.*

Fig. 1. Part of a creeping filament with a vertical one ending in two hairs. $\frac{320}{1}$.

„ 2. The upper part of a vertical filament ending in a hair, with lateral branches. $\frac{320}{1}$.

„ 3. The upper part of a vertical filament with irregular processes, a hair and five plurilocular sporangia, one of which is emptied. $\frac{590}{1}$.

„ 4. The upper part of a vertical filament with lateral processes partly forming a parenchymatous tissue. $\frac{320}{1}$.

„ 5. The upper part of a vertical filament with irregular processes and a plurilocular sporangium. $\frac{320}{1}$.

„ 6. The upper part of a vertical filament ending in a globular branch-complex and a hair. $\frac{155}{1}$.

Ostreobium Queketti.

„ 7—8. Habit-figures of branched specimens. $\frac{230}{1}$.

„ 9. A branch probably with reproductive organs. $\frac{410}{1}$.

„ 10. A solitary, thick body from which young branches issue. $\frac{155}{1}$.

Plate III.

Myrionema (Eumyrionema) intermedium.

Fig. 1. Transverse section of a part of a disc with vertical filaments and two unilocular sporangia. $\frac{320}{1}$.

„ 2. A vertical filament with a lateral unilocular sporangium. $\frac{320}{1}$.

„ 3. A vertical filament with a lateral branch. $\frac{230}{1}$.

„ 4—10. The upper part of vertical filaments with irregular processes. $\frac{320}{1}$.

Ulonema rhizophorum.

„ 11. A young individual creeping on the surface of the host plant, destitute of rhizoids or vertical filaments. $\frac{230}{1}$.

„ 12. Transverse section of the margin of a disc with vertical filaments. $\frac{110}{1}$.

„ 13. Transverse section of a part of an elder disc with rhizoids, vertical filaments and two unilocular sporangia. $\frac{230}{1}$.

Fig. 14. Part of the disc with a vertical filament and an endophytic one. $\frac{3\,2}{1}\,0$.

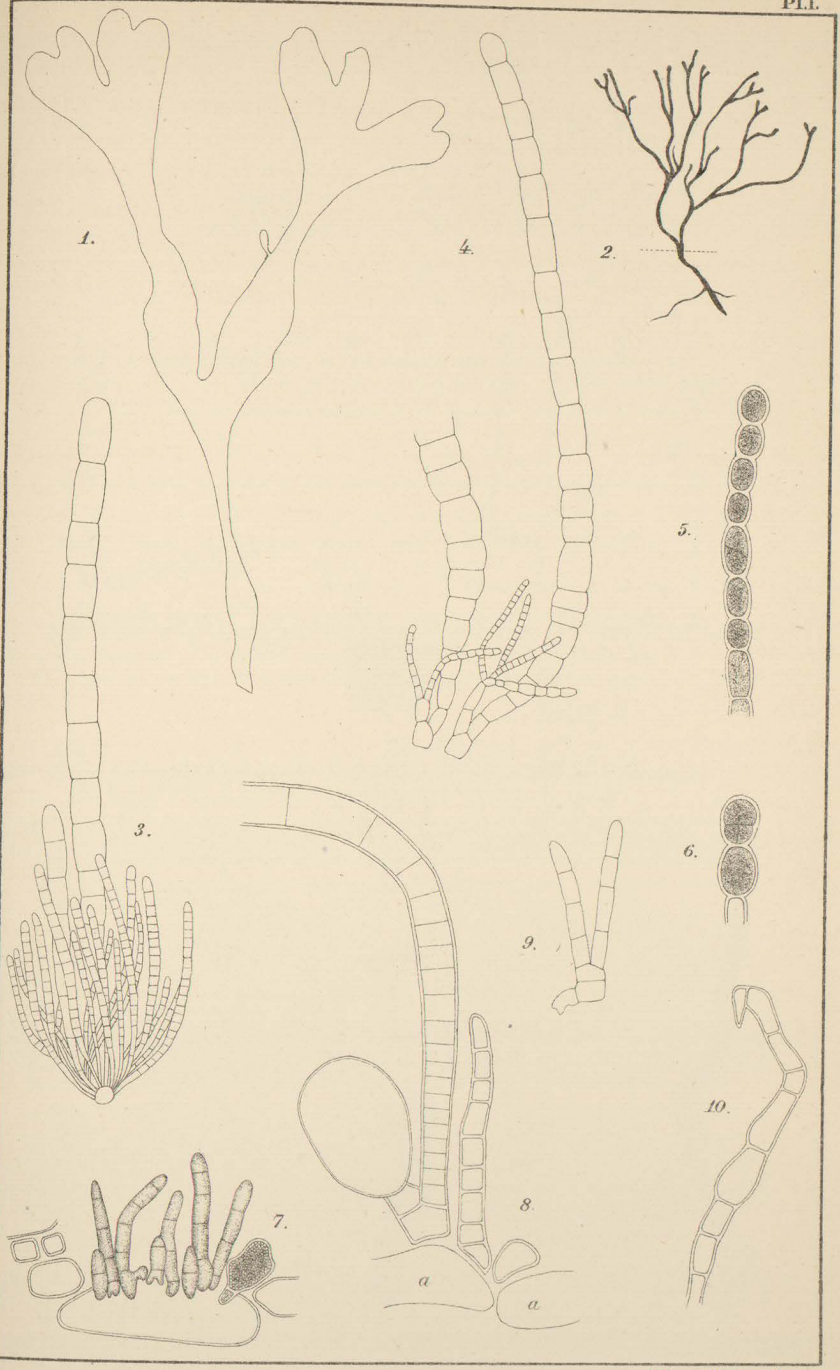
„ 15. A vertical filament with two lateral unilocular sporangia, and in the upper part a foundation of a branch. $\frac{3\,2}{1}\,0$.

„ 16—17. The upper part of two vertical, branched filaments. $\frac{3\,2}{1}\,0$.

Myrionema (*Phycocelis*) *majus*.

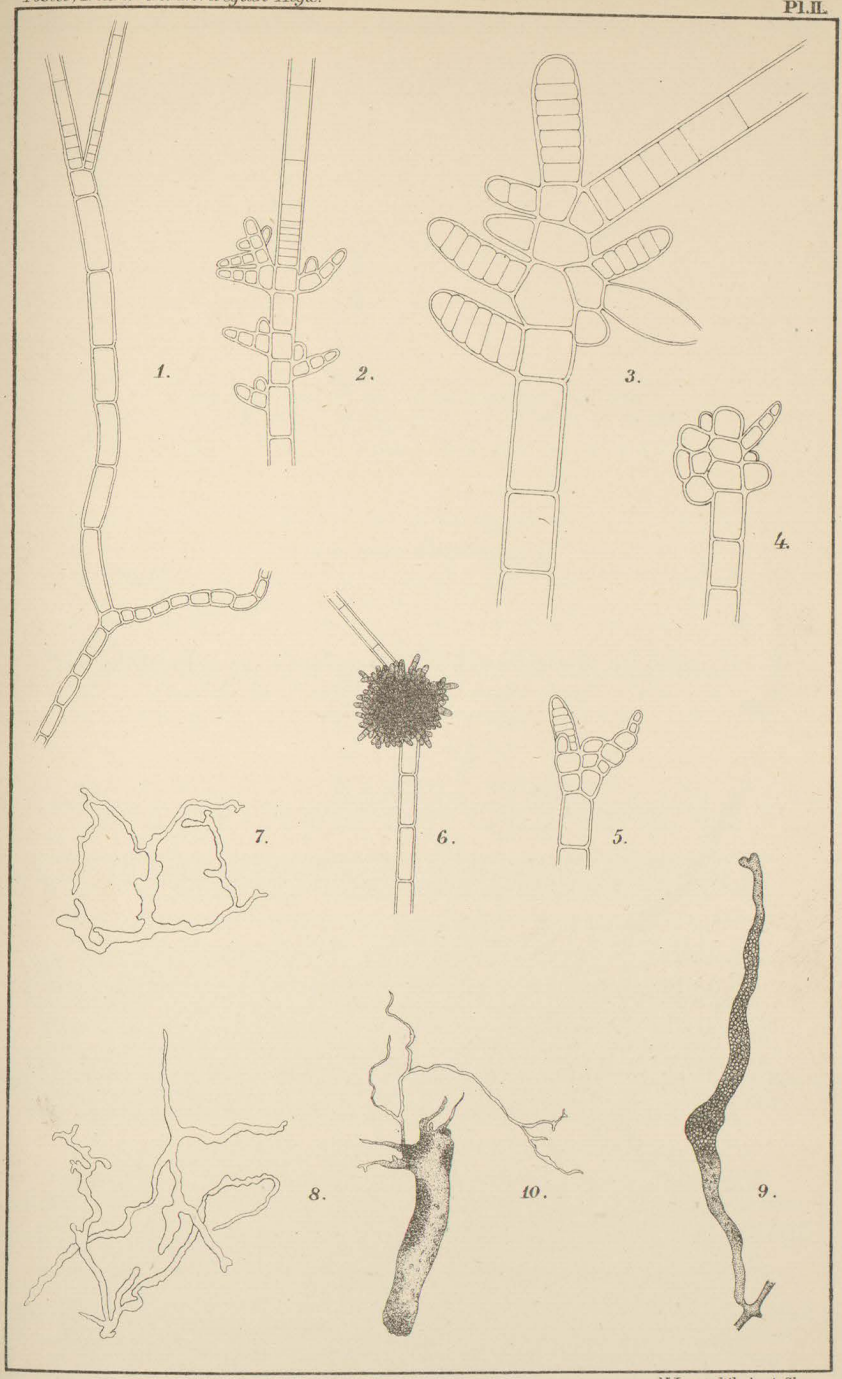
„ 18. Part of the basal disc. $\frac{2\,3}{1}\,0$.

„ 19. The upper part of a vertical filament ending in a hair, with a lateral, but not fully developed plurilocular sporangium. $\frac{3\,2}{1}\,0$.



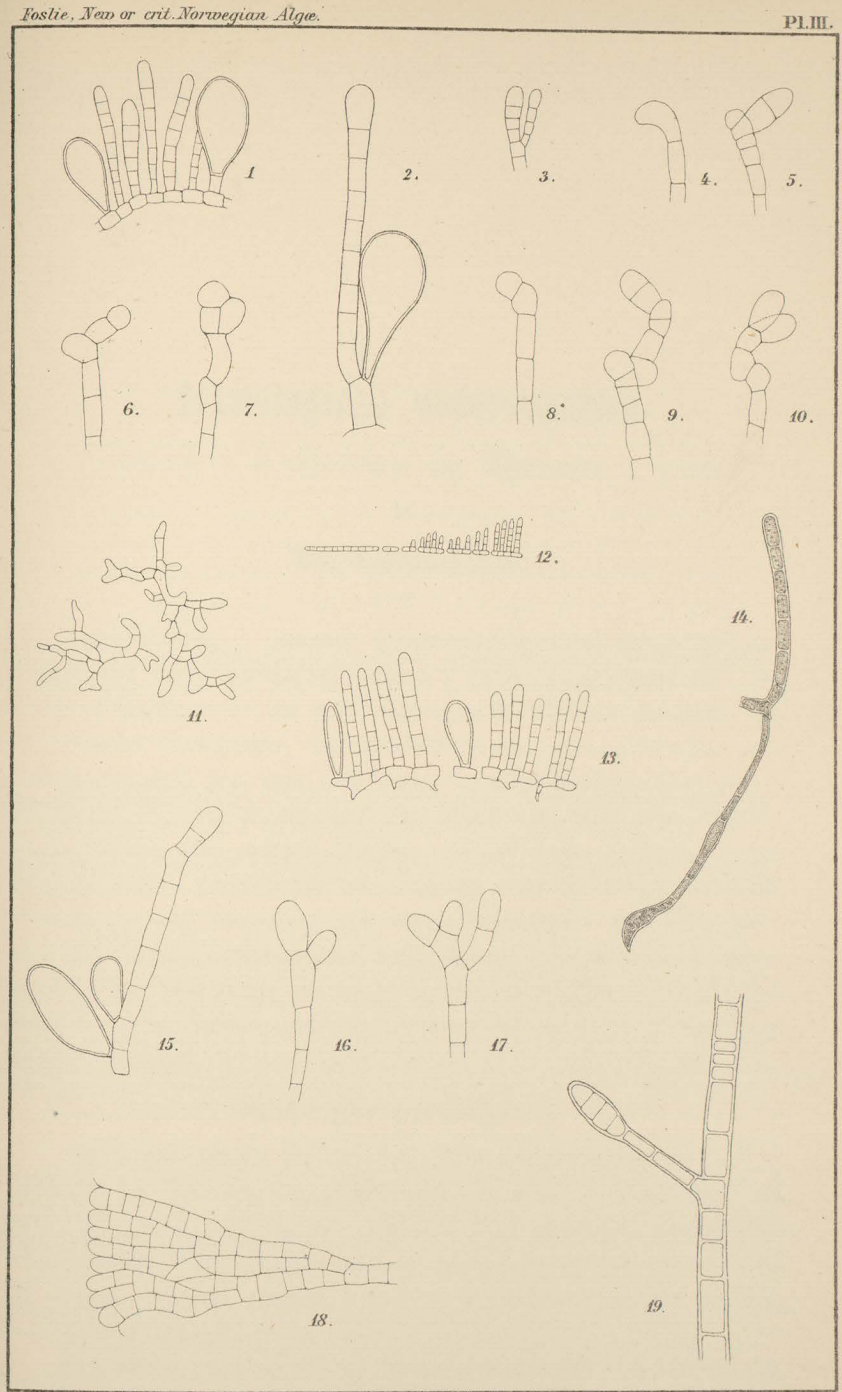
M. Lyngs lith. Anst. Chr.a.

1. Phyllophora interrupta 2. Pelvetia canaliculata f. radicans. 3–6 Elachista (Seirocarpus) moniliformis. 7–10 Ectocarpus (Streblonema) aecidioides.



M. Lynge & lith. Anst. Chr. a.

1–6 Dichosporangium repens f. varians. 7–10 Ostreobium Queketti.



M. Lyngs lith. Anst. Chr.a.

1–10 Myrionema (Eumyrionema) intermedium. 11–17. Ulonema rhizophorum. 18–19 Myrionema (Phycocelis) majus.