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SOME MARINE ALGAE FROM MAURITIUS

ADDITIONS TO THE PARTS PREVIOUSLY PUBLISHED, IV

BY

F. BØRGESEN

København
i kommission hos Ejnar Munksgaard
1952

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During the past year I have received several collections of algae from Mauritius, and by examining the specimens they contained I have found several interesting species, among them also some new ones.

The algal flora of the island must be said to be very rich, particularly considering that the deeper growing sublitoral algal vegetation has not yet, or at any rate but sparely, been the object of exploration.

As a result of the examination of the collections received lately, and leaving out of consideration the species more commonly found which have been mentioned previously, the present part contains 53 species, 20 of which have not previously been found in the island; 12 of these species are recorded as new species or varieties.

It is of special interest that Dr. VAUGHAN and his assistant, Mr. G. MORIN, have succeeded in finding a specimen of *Trichogloea* which turned out to belong to the same species as that of the Red Sea, *Trichogloea Requienii* (Mont.) Kütz., the type species of the genus.

Besides the dried specimen some material preserved in formol and seawater was also sent, and the examination of this has confirmed my supposition that *Trichogloea Jadinii* is a distinct species to be kept separate from *Tr. Requienii* and that thus two species of this genus are found in Mauritius. I am now inclined to consider the *Trichogloea* specimen collected by Colonel PIKE to be the same as *Tr. Requienii,* but since the specimen is sterile an exact determination is excluded.

Having received this new material from Mauritius I very much wanted to make a renewed examination of Colonel PIKE's specimen of *Trichogloea,* and upon my request Director, Dr. E. G.

SALISBURY most kindly permitted me to have on loan here again the specimen of PIKE being preserved in the Kew Herbarium. Besides this specimen I have borrowed two other specimens of algae; for this obligingness I wish to express my hearty thanks.

The material of *Ceramium* has in the previous parts been worked out by the late Dr. HENNING E. PETERSEN. Having during the last years received more material of this genus I am very much indebted to Mme GENEVIÈVE FELDMANN-MAZOYER for undertaking this determination. In the rather scarce material Mme FELDMANN has found 7 species 3 of which are new to science.

As, for comparison with some specimens of the genus *Sarcodia*, I very much wanted to see a specimen of *S. Gattyae* (J. Ag.) Kylin, I asked Miss DICKINSON of the Kew Harbarium whether a specimen of this species was to be found there. This not being the case Miss DICKINSON was so very kind as to inquire where a specimen is found and stated that such a one was found in the algal herbarium of the British Museum, Natural History, Kensington, London. As it is not permitted to lend out determined specimens from the Museum, the Keeper of the Algal Herbarium, Miss LINDA M. NEWTON, upon my request most kindly compared one of the Mauritian specimens with the specimens of *S. Gattyae* in the Museum and thus has given me very valuable help.

The lady artist Miss INGEBORG FREDERIKSEN has drawn the great majority of the figures in this part, for which help I thank her very much.

I am much indebted to the Trustees of the Carlsberg Foundation for a continued grant.

CHLOROPHYCEAE

I. Chaetophorales.

Fam. 1. Chaetophoraceae.

Bolbocoleon Pringsh.

1. **Bolbocoleon piliferum** Pringsh.

Pringsheim, N., Beiträge zur Morphologie der Meeresalgen, 1862, p. 1—4, pl. 1. Huber, J., Contributions à la connaissance des Chaetophorées, Paris 1893, p. 308, pl. XIII, figs. 8—12.

This little plant was found abundantly in the wall of *Gracilaria spinuligera* nov. spec.

Flic-en-Flacq, 3-5-51, R. E. V. no. 922.
Geogr. Distr.: Wide spread.

II. Siphonocladales.

Fam. 1. Valoniaceae.

Dictyosphaeria Decsne.

1. **Dictyosphaeria cavernosa** (Forssk.) Børgs.

Alg. Mauritius I, 1940, p. 12. Addit. List, 1946, p. 13.

var. *bullata* nov. var.

A forma *typica* praecipue differt superficie thalli irregulariter bullata.

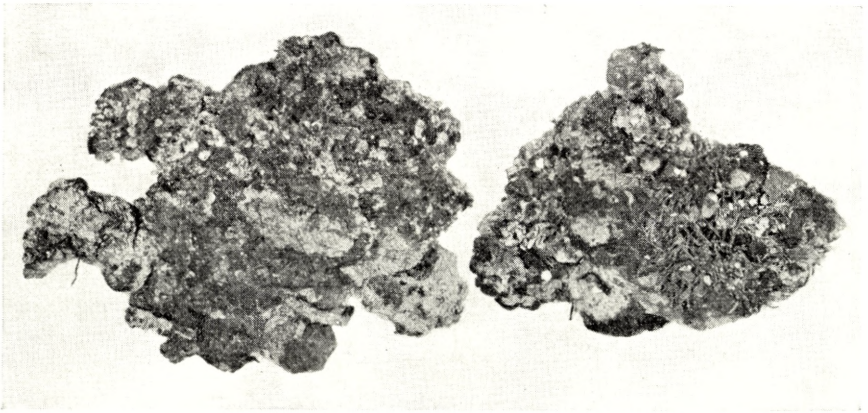

Fig. 1. *Dictyosphaeria cavernosa* (Forssk.) Børgs. var. *bullata* nov. var. Two specimens. (×1).

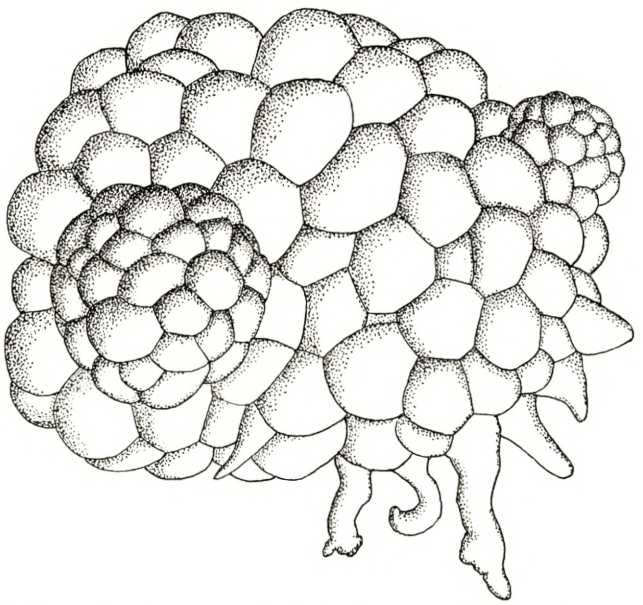

Fig. 2. *Dictyosphaeria cavernosa* (Forssk.) Børgs. var. *bullata* nov. var. (× c. 10). A fragment of a specimen.

This variety forms very irregular bodies because of the many outgrowths of variable size issuing from the thallus (Fig. 1).

These outgrowths are due to the fact that here and there a coenocyte by segregative division becomes divided into a number

of small ones which during their growth gradually form semi-globular outgrowths (Fig. 2) small or large, here and there in the thallus giving it a highly irregular shape. The outgrowths often become rather large, their diameter reaching up to about 2 cm or more.

The thallus ordinarily consists of a single layer of coenocytes, but because of the often large outgrowths broadening out over the underlying layer of coenocytes and perhaps also more or less becoming fixed to it, it may in places appear to be formed by two or more layers.

The diameter of the single coenocyte varies much, reaching up to nearly two mm. Needles are not found.

The plant is fixed to the rocks by means of rhizoids issuing from the base.

As to the locality where the plant was found it is said: "On rocks near reef exposed at low tide."

Mauritius: Riambel, 8-2-51, R. E.V. no. 1035.

Fam. 2. ***Boodleaceae.***

Struvea Sonder.

1. **Struvea anastomosans** (Harv.) Piccone.

Piccone, A., Alghe in E. D'Albertes, Crociera del Corsaro alle Isole Madera e Canarie, Genova 1884, p. 20. Børgesen, Some Chlorophyceae from the Danish West Indies, II, 1912, p. 268; Mar. Alg. D.W. I., p. 54. — *Cladophora*(?) *anastomosans* Harv. in Transact. R. I. Acad., vol. 22, p. 565; Phycologia Australica, vol. II, pl. 101. — *Struvea delicatula* Kütz., Tab. Phyc., vol. 16, tab. 2. Murrey and Boodle, A structural and systematic account of the genus Struvea in Annals of Botany, vol. 11, p. 277, pl. 16, figs. 6—8.

Some few specimens of this delicate plant not earlier recorded from Mauritius were contained in a recently received batch of algae from the island.

Being mostly rather small, the blade-like part in a single specimen (Fig. 3) was about $2\frac{1}{2}$ cm broad and the reticulum rather densely ramified. The stalk is often ramified in the specimens.

Fig. 3. *Struvea anastomosans* (Harv.) Piccone. A large specimen. ($\times 1\frac{1}{2}$).

As to the locality it is said: "Base of large rocks in calm water."

Mauritius: Pointe aux Sables, 22-6-51, R. E. V. no. 1150.
Geogr. Distr.: Most warm seas.

Fam. 3. ***Cladophoraceae.***

Rhizoclonium Kütz.

1. **Rhizoclonium grande** Børgs.

Alg. Mauritius, 1946, p. 31; Additional List, 1948, p. 6.

Some fine specimens of this characteristic species were found in a recently received collection.

As to the locality it is said: "Base of large rocks in calm water."

Mauritius: Pointe aux Sables, 22-6-51. G. Morin, no. 1151.

III. Siphonales.

Fam. 1. Caulerpaceae.

Caulerpa Lamouroux

1. Caulerpa crassifolia (Ag.) J. Ag.

Agardh, J., Till Algernes Systematik, I, p. 13. Howe, M. A., Phycological Studies, II, 1905, p. 574. Børgesen, F., Mar. Alg. D.W.I., Vol. I, 1913, p. 130. — *Caulerpa pinnata* Weber, Monogr. des Caulerpes, 1898, p. 289, pl. XXIV, figs. 1—4.

Two small specimens (no. 1128) (Fig. 4) are as to the shape of the pinnules to be placed near the forma *typica* of this species. They are peculiar in having, besides the usual marginal pinnules, oppositely placed along the margins of the midrib, also such ones issuing without order from the flat sides of the assimilators (Fig. 5).

The pinnules are about 1—1½ mm long and about 450 μ broad and several of them are a little narrowed at their base.

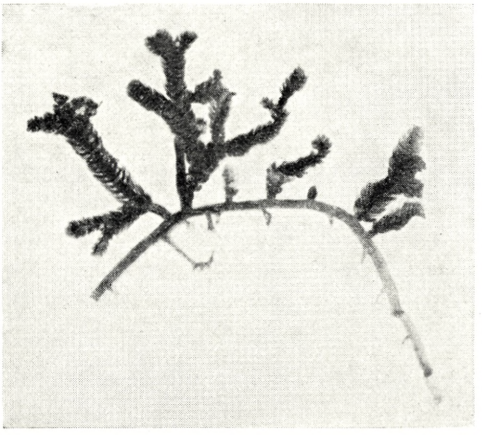

Fig. 4. *Caulerpa crassifolia* (Ag.) J. Ag. Natural size.

The midrib is about 1200 μ broad and the longest assimilator in the specimens only 2½ cm high; they are rather much ramified.

The specimens answer best to Kützing's Fig. 2 in Tab. Phycol., vol. 7, pl. 5 which is called *C. mexicana* there, but as pointed

out by Mme WEBER in her monograph, this figure represents the forma *typica*, while Fig. 3, which KÜTZING calls *C. Herveyana*, is forma *mexicana*.

About the locality it is said: "Near shore, on flat-topped rocks." *Champia parvula* was found together with it.

Another small specimen (no. 1085) is referable to the var.

Fig. 5. *Caulerpa crassifolia* (Ag.) J. Ag. A form with pinnules given out also from the flat sides of the thallus. (× ca. 3).

mexicana (Sond.) Weber, having the pinnules narrowed at their bases.

The specimens, when compared with the West Indian ones, are very small, the breadth of the assimilators reaching only a length of about 3 mm and the highest assimilators $2\frac{1}{2}$ cm only, while in West Indian specimens the assimilators are up to about $1\frac{1}{2}$ cm broad and their length proportional to this.

In a collection of algae from Australia, which Professor A. B. CRIBB most kindly has sent me, a very similar small form of this species was contained, collected on rocks at Colundra, Queensland.

This small form which seems to be characteristic of the southern part of the Indian Ocean I propose to call forma *minima*.

Mauritius: Pointe aux Roches, 1-5-51, R. E. V. no. 1128. Mahébourg near Ile aux Aigrettes, 21-3-51, G. MORIN no. 1085.

Geogr. Distr.: Wide spread in tropical seas.

2. **Caulerpa peltata** Lamour.

var. *typica* Web. v. Bosse.

Alg. Mauritius, I, 1940, p. 51; Add. List, 1946, p. 39; Additions, III, 1951, p. 10.

Some very beautiful specimens were collected in a deep pool behind reef.

Mauritius: Flic-en-Flacq, 22-5-51, R. E.V. no. 1053.

3. **Caulerpa racemosa** (Forssk.) Weber v. Bosse.

Alg. Mauritius, I, 1940, p. 51; Add. List, 1946, p. 39, and 1948, p 32; 1949, p. 14; 1951, p. 10.

In a collection of algae lately received from Mauritius several gatherings of *Caulerpa racemosa* are included. The specimens are referable to the following varieties: var. *clavifera* (Turn.) Web. v. Bosse nos. 1052, 1079; var. *laetevirens* (Mont.) Web. v. Bosse, no. 1066; var. *microphysa* (Web. v. Bosse) Taylor nos. 1051, 1058. But as has often been pointed out, thus lately by Taylor (1942, p. 34), it is an exceedingly variable species and the varieties are united by intermediate forms.

Mauritius: var. *clavifera*, Flic-en-Flacq, near reef submerged at low tide, 22-2-51, R. E.V. no. 1052. Mahébourg, Ile aux Aigrettes, on reef near lagoon, 26-3-51, R. E.V. no. 1079; var. *microphysa*, small form growing densely entangled with no. 1052, R. E.V. no. 1051; Flic-en-Flacq, near reef, 22-2-51, R. E.V. no. 1058; var. *laetevirens* (Mont.) Web. v. Bosse, Mahébourg, reef near Ile aux Aigrettes, 8-3-51, R.E.V. no. 1066.

4. **Caulerpa lentilifera** J. Ag.

forma *parvula* Børgs.

Alg. Mauritius, Additions, I, 1949, p. 15, figs. 5—7.

Some few specimens of this small form were recently received from Mauritius.

As to the locality it is said: "Dredged at 2—3 fathoms."

Mauritius: Tombeau Bay, 30-5-51, R. E.V. no. 1139.

Spongocladia vaucheriaeformis Aresch.

Alg. Mauritius, Additional List, 1948, p. 23, figs. A, B.

Accidentally I have come to examine some material of *Spongocladia vaucheriaeformis* Aresch., the algal symbiont of which I think is a *Cladophoropsis*, and when examining the very irregular and peculiar shape of the cells of the alga in the basal part of the symbiont, it became clear to me that the peculiar bodies which were found in the material preserved in formol of *Cladophora Vaughani* (Alg. Mauritius, 1948, p. 15, 16) and which I presumed to be akinete-formations of this species, in reality are fragments of the much transformed basal filaments of the *Cladophoropsis*.

Most probably the *Cladophora* has been growing near the *Spongocladia* and some of the basal filaments of the *Cladophoropsis* have been mixed with those of the *Cladophora*.

RHODOPHYCEAE

Florideae.

I. Nemalionales.

Fam. 1. Chantransieae.

Acrochaetium Nägl.

1. Acrochaetium subseriatum Børgs.

Alg. Mauritius, III, 1, 1942, p. 15, fig. 6.

Several specimens of this species are found among some epiphytes upon old filaments of *Valoniopsis pachynema*. The specimens formed tufts up to 1 mm high. Many of the sporangia placed unilaterally in long rows are pedicellate.

The species is surely closely related to the West Indian species *Acroch. seriatum* Børgs.

Mauritius: Riambel, 18-12-50, R. E. V. no. 1018.

2. Acrochaetium Trichogloeae nov. spec.

Thallus parvus, ca. 200—300 μ altus, caespitosus, endophyticus, in mucum hospitis (*Trichogloeae Requienii*) immersus.

Sporangia permanentia, magna ca. 20 μ lata et 25 μ longa, germinantia in duas partes divisa, ex parte inferiore filum decumbente inter filamenta assimilationis hospitis emittente, ex parte superiore filamenta erecta.

Fila erecta e basi ramosa, ramis alternis aut magis irregulariter ortis.

Cellulae subcylindricae, ca. 7—8 μ latae et 20 μ longae, chromatophorum axilem, pyrenoide centrali instructum, continentes.

Pili perlongi hyalini plus minus numerosi ex cellulis apicalibus filamentorum orti.

Monosporangia sessilia aut pedicellata, obovata, ca. 8—9 μ longa et 14 μ lata.

Antheridiis in glomerulis parvis pedatis formata.

Mauritius: Barkly Island, 30-10-51, G. MORIN no. 1171a.

This small *Acrochaetium* (Fig. 6) was found abundantly in a specimen of *Trichogloea Requienii* received from Mauritius. It was

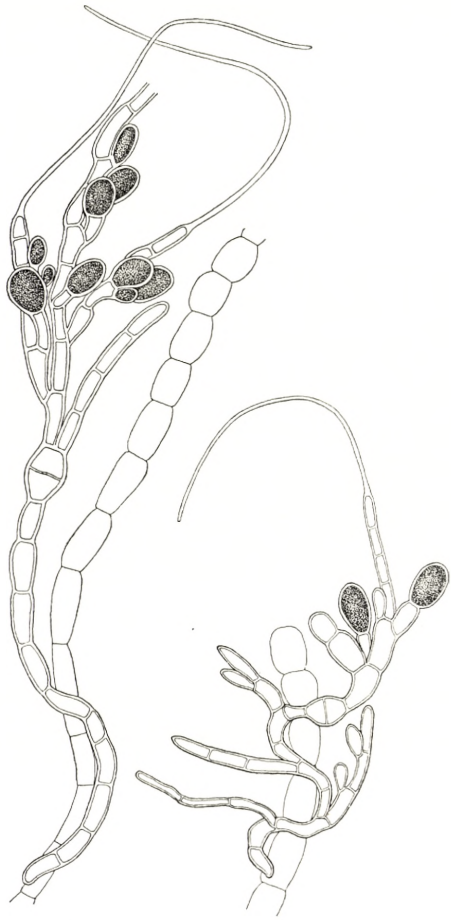

Fig. 6. *Acrochaetium Trichogloeae* nov. spec. Two specimens clinging to the assimilating filaments of the host. (× ca. 400).

quite imbedded in the slime of host, clinging to the assimilating filaments of the host by means of its decumbent filaments.

The germinating spore is permanent. When germinating the spores at first become divided by a transverse wall into two cells from the lowermost of which the downwards growing filaments issue; the filaments are about 5 μ thick and composed of rather long cells.

From the upper cell of the spore the erect filaments are given out; they are ramified from below and form a more or less branched tuft about 200—300 μ high. The ramification is in most cases alternating. The cells of which the filaments are composed are often a little thickened, having above a breadth of 7—8 μ and being 2—3 times as long; they contain an axial cromatophore.

The apical tips of the filaments carry long hairs about 2—3 μ thick and 200—300 μ long.

The ovate monosporangia are sessile or borne upon a short stalk, mostly consisting of a single cell. The sporangia are relatively large, ovate, about 8—9 μ broad and 14 μ long.

Antheridia (Fig. 7) were also found; they form small pedicellate clusters about 25 μ high. As a rule they are present upon separate specimens, but in rarer cases also together with sporangia.

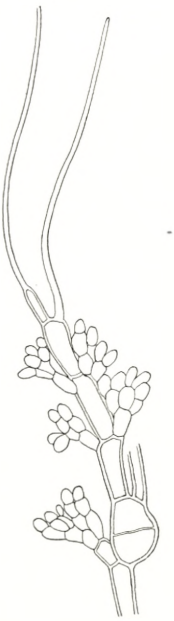

Fig. 7. *Acrochaetium Trichogloeae* nov. spec. A specimen with antheridial bodies. (×ca. 400).

Cystocarpic specimens are not found.

As to its appearance and mode of living this species reminds of *Acrochaetium Collinsianum* Børgs. (syn. *Acr. Liagorae* Børgs.) Mar. Alg. D.W.I., p. 57, figs. 60—62, p. 451.

Fam. 2. ***Helminthocladiaceae.***

Trichogloea Kütz.

Last year I had the great privilege of having on loan here the two original specimens of *Trichogleoea Requieni* (Mont.) Kütz. preserved in the Muséum National d'Histoire Nat., Paris, and as a result of the examination of the specimens I arrived at the

conclusion that the plant JADIN had collected in the island could not be referred to the Red Sea plant and furthermore that PIKE's specimen found in the Kew Herbarium could scarcely be referable to *Tr. Requienii*. Because of this I named it only *Trichogloea* spec. in Additions III, 1951, p. 21.

However, as I last autumn had the pleasure to receive from Dr. VAUGHAN a specimen of *Trichogloea* collected in Mauritius I can state that this specimen is in good accordance with the original specimens of *Tr. Requienii* preserved in Paris.

And since the specimen received from Mauritius seemed to me to show some likeness to PIKE's specimen I therefore asked Director, Professor E. G. SALISBURY to have it on loan here again to make a renewed examination of it; according to this I am now much inclined to consider PIKE's plant as referable to *Tr. Requienii*. Before reporting the results of the examination of the specimens I want to point out that the material has comprised only a single specimen of each form except *Tr. Jadinii*, of which I have seen two specimens, one preserved in Paris and one here in Copenhagen.

As to the most valuable specific characters of *Trichogloea* these seem to be found in the shape and development of the nutritive filaments and the cells of which they are composed.

1. **Trichogloea Requienii** (Mont.) Kütz.

Alg. Mauritius, Additions, III, 1951, p. 15.

Last autumn, as stated above, I received from Dr. VAUGHAN a single small but nicely prepared specimen of *Trichogloea* (Pl. I), and when comparing it with the habit figure of one of the specimens of *Tr. Requienii* preserved in Paris and found in M. A. HOWE's paper on Hawaiian algae, 1914, no. 36, fig. 3, showing the female specimen, it immediately struck me that the specimen from Mauritius was the same species as that from the Red Sea.

In both specimens the branches are given out from the main axis in all directions, the lowermost oppositely, and the branches are in both specimens more or less densely covered by short, worm-like bent branchlets tapering towards their subacute apex. Furthermore the main branches become furcated near their distal

ends more or less in two or three branches; in the lowermost branch on the left in HOWE's photo this is also found.

Comparing the specimen from Mauritius with the figure of ZANARDINI, Plant. Mar. Ruber, 1858, p. 67, tab. V, fig. 1, of a specimen of *Tr. Requienii*, collected by PORTIER "ad scopulos circa Tor", we find the branches issuing from the main axis densely clad with similar small worm-like filaments.

Together with the dried specimen I also from Dr. VAUGHAN received a small sample of it preserved in formol and sea water.

An examination of this material has quite confirmed my supposition that the specimen from Mauritius is *Trichogloea Requienii*.

The examination has brought forward that the specimen is monoecious; the sexual organs may be found mixed, but often they are also found separated in groups here and there.

Fig. 8 shows the upper parts of some of the sterile assimilating filaments. The cells of which they are composed are uppermost subglobose, about 6—8 μ broad, becoming gradually longer downwards. The apical cells in the assimilating filaments are a little longer than those in the original specimens and I have not been able to find here the oblique walls often found in the original specimens. The filaments are about 800 μ long. The chromatophores are hood-shaped with short elongations below.

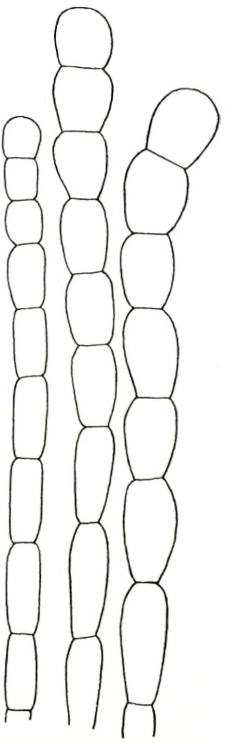

Fig. 8. *Trichogloea Requienii* (Mont.) Kütz. Distal ends of assimilating filaments. (× ca. 300).

The antheridial filaments have as a rule 2 to 5—6 fertile cells in a row below the uppermost sterile ones. Only in a few cases I have found the apical cell to be fertile. In two cases I have found the fertile filaments ramified; in one of these filaments two branchlets were issued, one from the 4th apical cell and one from the 6th; the uppermost branchlet had two fertile cells and the other 4 fertile cells; below in the filaments the cells had only some few antheridial bodies.

The gonimoblasts (Fig. 9) are subglobose when young, when

older broadly dome-like or more irregularly shaped, up to about 200 μ in diameter.

The nutritive filaments as a rule are given out from 3—4, sometimes 5—6, cells in the stipe below the gonimoblasts. As a

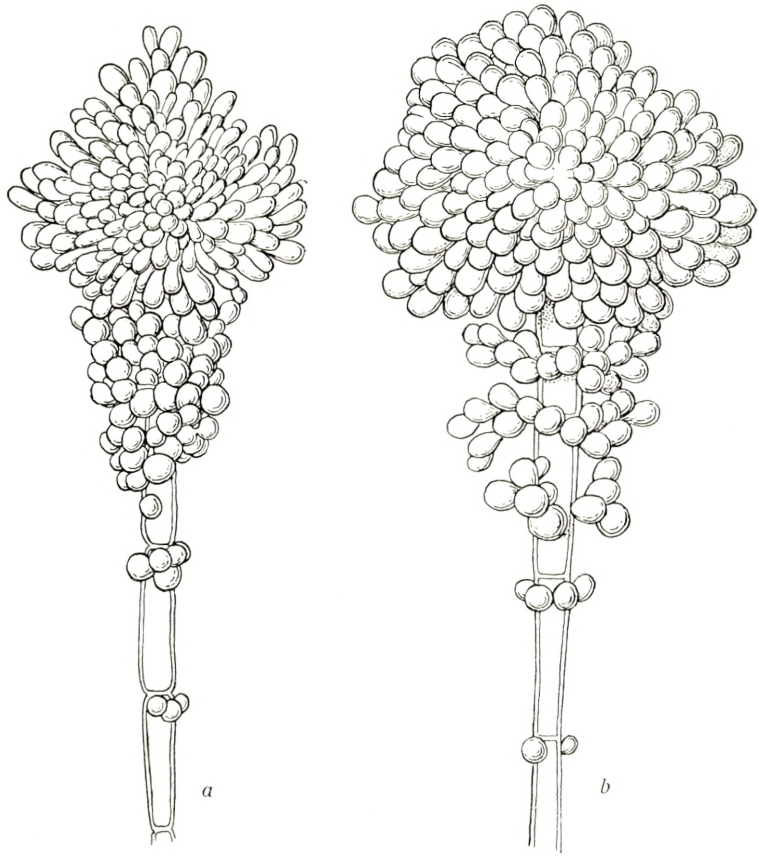

Fig. 9. *Trichogloea Requienii* (Mont.) Kütz. Two gonimoblasts. (× ca. 300).

rule the uppermost whorl is the largest and is often pressed up against the base of the gonimoblasts. The following 2—3 whorls become gradually shorter and are likewise in most cases mutually pressed densely together with the uppermost one in that way covering the whole stipe (Fig. 9*a*); but specimens are also found in which the whorls are more or less separated and the stipe visible (Fig. 9*b*). The lowermost whorls are reduced to a single or a few cells only.

The terminal cells in the nutritive filaments are globose or globose-pyriform about 5—6 μ broad.

In most cases the stipe does not become much thicker during the growth, but it may become so, in such cases reaching a breadth of about 25 μ uppermost. As the nutritive filaments nearly always cover the stipe densely, it is difficult to observe if the cells above in the stipe coalesce during the growth, as found by PAPENFUSS (1946, p. 428, fig. 25) in the *Trichogloea* which he refers to *Tr. Requienii*; but when the nutritive filaments do not cover the stipe densely, it is easily observed that in some cases 2—3 cells in the uppermost part of the stipe become connected by wide canals and often at last coalesce completely.

When this description of the specimen from Mauritius is compared with that of the original specimens (Additions III, 1951, p. 15), it is especially the somewhat shorter cells in the distal parts of the assimilating filaments of the type-specimens which show a deviation from the Mauritian specimen; but the long period of having been dried up might perhaps in any case to some extent be the explanation. Otherwise it must be said that the structure of the Mauritian specimen regarding the antheridial bodies as well as the female ones and the shape and development of the nutritive filaments are in good accordance with the same organs of the typical specimens.

As to the fact that the specimen from Mauritius is monoecious, while the type-specimens are considered to be a male specimen and a female one, this is surely a supposition only, not to be relied on, as one often in parts of a specimen of *Trichogloea* finds only male organs, in other female ones, and because the type-specimens are small, they have been examined carefully only in the same parts of the thalli.

By the fact that the nutritive filaments are pressed more or less up against the base of the gonimoblasts and upon the whole the dense growing together of the nutritive filaments often densely covering the stipe, — in these features *Trichogloea Herveyi* Taylor according to the detailed description and figures of TAYLOR (1951, p. 113) reminds of *Tr. Requienii*, only that these characters are much more fully developed in the plant from Bermuda.

Trichogloea spec.

Alg. Mauritius, Additions, III, 1951, p. 21.

As said above, I have had again the specimen collected by Colonel PIKE on loan here and have made a thorough examination of it, if possibly to find sexual organs in it, but this has been in vain.

Being from Mauritius the specimen is of special interest and a figure of it is therefore given here (Plate II).

From this it appears that the habit of PIKE's specimen, when superficially observed, is rather different from that of the small specimen from Mauritius mentioned above and likewise from ZANARDINI's figure (1858, Tab. V, fig. 1). But after a more thorough examination I have gradually arrived at the conclusion that the differences are not so essential that a referring of it to *Tr. Requienii* is out of the question.

Thus in the small fragment of a specimen of *Tr. Requienii* received from Dr. VAUGHAN the branches issuing from the main stem are more or less oppositely placed and many of the branches are near their distal ends furcated in a way very similar to that in PIKE's specimen and these features are found also in the original specimen of which HOWE has published a figure. And finally the small characteristic worm-like branchlets given out from the main branches and being so characteristic of *Tr. Requienii* are also found in the PIKE specimen.

As to the structure the distal parts of the assimilating filaments in PIKE's specimen are very like those in Dr. VAUGHAN's specimen, but in both plants they are longer than those in the original specimens.

As a result of this comparison I am therefore now highly inclined to consider PIKE's plant to be referable to *Tr. Requienii*, even if an examination of a rich material, comprising the various forms and with fertile specimens, is necessary to make this sure.

Yet I want to point out that the fact that the small lately found specimen occurred in the same locality, Barkly Island, as where PIKE gathered his specimens, this also supports the supposition that both belong to the same species.

As to the colour of the living specimen Dr. VAUGHAN writes: "Colour very pale pinkish-brown" and regarding the locality: "Somewhat calm water, 2—3 feet deep at low tide behind reef."

Mauritius: Barkly Island, 30-10-51, G. MORIN no. 1172a.
Geogr. Distr.: Red Sea, Hawaii.[1]

2. **Trichogloea Jadinii** Børgs.

Alg. Mauritius, Additions, III, 1951, p. 18, figs. 6—7, pl. 1.

In the autumn of 1951 I received from Dr. TANAKA a paper: Studies on Some Marine Algae from Southern Japan, I, Dec. 1950, in which is described a new species of *Trichogloea*: *Tr. Papenfussii*. This species especially as to shape and arrangement of the nutritive filaments seems to show a very great likeness to *Tr. Jadinii*; but the upper cells in the assimilating filaments are shorter and the habit of the thallus seems to differ from *Tr. Jadinii*.

When TANAKA in the same paper, p. 175 refers *Trichogloea lubrica* Okamura (Icones of Japanese Algae, vol. IV, 1930, p. 183, pl. 197, figs. 1—8) to *Tr. Requienii* I cannot follow him. In any case, as said already in my paper of 1951, p. 21 OKAMURA's fig. 6 showing a gonimoblast, the shape of the nutritive filaments in this figure are in good accordance with those of *Tr. Jadinii* and not like those of *Tr. Requienii*; on the other hand the habit fig. 1 on the same plate reminds by the presence of the numerous small branchlets of *Tr. Requienii*.

Liagora Lamouroux.

1. **Liagora rugosa** Zan.

Alg. Mauritius, III, 1, 1942, p. 30, fig. 14; compare also: Additions, 1949, p. 28.

In a recently received batch of algae from Mauritius a small *Liagora* (Fig. 10) is found which I take to be referable to *Liagora rugosa* Zan.

[1] In Additions, Part III, 1951, p. 17 I have expressed some doubts whether the plant from Hawaii is the same as that from the Red Sea. According to my renewed examinations also of the specimen collected by Colonel PIKE I now feel more uncertain whether my doubts are justified.

Most probably all the specimens belong together, having formed a low roundish tuft about 3 cm high.

The thallus is rather regularly di—trifurcated and has in a dried condition a whitish-grey colour with a reddish tinge, while the upper young parts are red; it is rather much shrivelled.

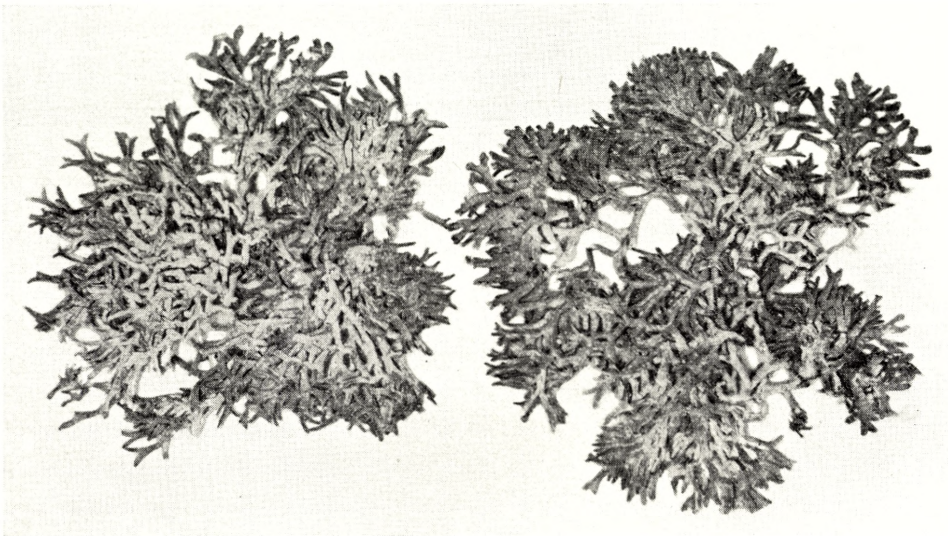

Fig. 10. *Liagora rugosa* Zan. Two specimens. (×1).

The specimens are all antheridial. The antheridial bodies are given out from the uppermost 1—2 cells below the apical ones in the assimilating filaments (Fig. 11). When compared with those formerly figured (1942, p. 30), the shape of the cells in the distal ends of the assimilating filaments of the specimens now found differs somewhat: thus the apical cells are more elongated pyriform, about 25 μ long and 12 μ broad, and the cells below, carrying the antheridial bodies, are also slenderer and longer.

Referring to my remarks quoted above about related forms it must be pointed out that new, especially female, material and examination of ZANARDINI's specimen are necessary to be able to clear up the relationship to the species.

Mauritius: Blue Bay, 8-5-51, R. E. V. no. 1119.

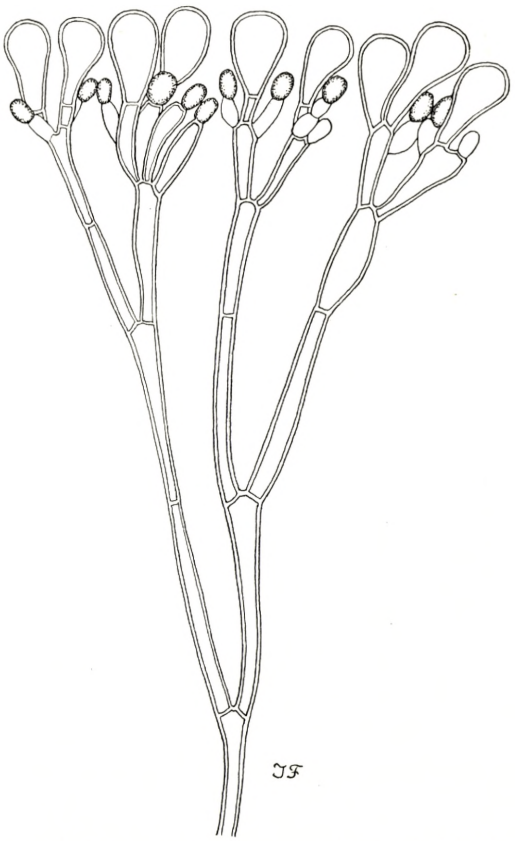

Fig. 11. *Liagora rugosa* Zan. Assimilating filament with antheridial bodies. (× ca. 500).

2. **Liagora mauritiana** Børgs.

Alg. Mauritius, III, 1, 1942, p. 32, figs. 15—16; Additions, III, 1951, p. 27, fig. 12.

In a collection received later a single specimen of this species is found. As previously stated, the species is monoecious and in the specimen received just now well developed antheridia are present in great number while I earlier have seen few. Fig. 12 shows some of the antheridia issuing from the apices of the assimilating filaments.

About the locality it is said: "Pools behind reef attached to stems of *Cymodocea*."

Mauritius: Riambel, 8-2-51, R. E. V. no. 1041.

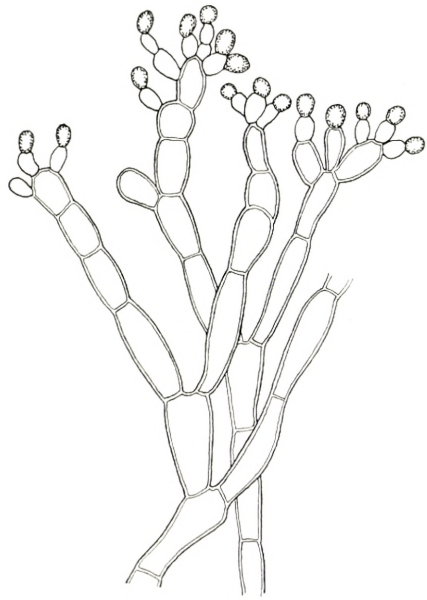

Fig. 12. *Liagora mauritiana* Børgs. Assimilating filaments with antheridia. (× ca. 500).

Gelidiales.

Fam. 1. ***Gelidiaceae.***

Gelidiella Feldm. et Hamel.

1. **Gelidiella acerosa** (Forssk.) Feldm. et Hamel.

Alg. Mauritius, III, 2, 1943, p. 5; Additions, II, 1950, p. 5 and III, 1951, p. 38.

Some few gatherings of this species are included in later received collections of algae from Mauritius.

No. 1045 forms "dense mats entangled with other algae", and as to no. 1050, a very similar form, it is said about the locality and habit: "Forms a dense entangled flat mat-like growth on large rocks protected from strong surf."

No. 1112 is a small, 2—3 cm high, robust form, about the locality of which it is said: "On rocks submerged at low tide."

And finally no. 1076 is a larger form with few, shorter and rather distantly placed ramuli. About this is said only: "Attached to old pieces of corals."

Mauritius: Riambel, 8-2-51, G. MORIN no. 1045. Flic-en-Flacq, 22-2-51, R. E. V. no. 1050. Mahébourg, 26-3-51, R. E. V. no. 1076. Pointe aux Sables, 24-4-51, G. MORIN no. 1112.

Gelidium Lamouroux.

1. **Gelidium pusillum** (Stackh.) Le Jolis.

Alg. Mauritius, III, 2, 1943, p. 5, fig. 1.

Some specimens in a later received collection agree very well with KÜTZING's figures in Tal. Phyc., vol. 15, tab. 37, fig. i.

The specimens were collected: nos. 1102 and 1103 in "2' water at low tide growing on rocks", and no. 1182, "usually attached to large pieces of dead corals, and no. 1113 "submerged at low tides, on rock".

Mauritius: Pointe aux Sables, 24-4-51, G. MORIN nos. 1102, 1103, 1113. Ile aux Aigrettes, Mahébourg, 26-3-51, G. MORIN no. 1082.

Genus incertae sedis.

Wurdemannia Harv.

1. **Wurdemannia miniata** (Drap.) Feldm. et Hamel.

Alg. Mauritius, Additions, II, 1950, p. 39.

Of this species some fine specimens were recently received from Mauritius. The specimens formed densely felted tufts in which also *Champia parvula* (Ag.) Harv. and a small sterile *Hypnea* showing much likeness to *H. nidulans* Setch. were included.

All these small, creeping species, richly provided with hapters given out here and there from the thalli and by means of which they are firmly attached together, share in the formation of the cushions.

About the habitat of the specimens is said: "On flat topped basalt rocks exposed at low tide."

Mauritius: Flic-en-Flacq, 20-5-51, R. E. V. no. 1137.

II. Gigartinales.

Fam. 1. Solieriaceae.

Sarconema Zanard.

1. **Sarconema filiforme** (Sonder) Kylin.

Alg. Mauritius, III, 2, 1943, p. 39; Additions, II, 1950, p. 13.

Some small specimens with filaments nearly as fine as a hair are contained in a collection received later.

The specimens were growing on an old pier.

Mauritius: Ilôt Barkly, 1-4-46, G. Morin no. 514.

Gilidiopsis Schmitz.

1. **Gelidiopsis scoparia** (Mont. et Mill.) Schmitz.

Schmitz, Fr., Marine Florideen von Deutsch-Ostafrika, 1895, p. 149. Feldmann, J., Remarques sur les genres *Gelidium* Lamour., *Gelidiopsis* Schmitz et *Echinocaulon* (Kütz.) emend., 1931, p. 7. — *Gelidium scoparium* Mont. et Millardet, Algues de la Réunion, p. 13, tab. 27, fig. 1. Kützing, Tab. Phyc., vol. XVIII, tab. 46, fig. 2.

Fig. 13. *Gelidiopsis scoparia* (Mont. et Mill.) Schmitz. (×1).

A fine collection of specimens of this characteristic species described upon specimens from Réunion was lately received from Mauritius.

Most regrettably no base of the plant is found in the specimens, but according to the description of MONTAGNE and MILLARDET the erect filaments issue in great number "d'un même point", most probably a disc, thus forming a tuft about 5—6 mm heigh. Referring otherwise to the author's description I shall mention only that the filaments usually begin to be divided at a height of 1—1½ cm. The divisions occur in the way that the apices of the branches become broadened out and flattened and then furcated in a number of lobes (mostly 4), as seen uppermost in fig. 13. This process may be repeated several times.

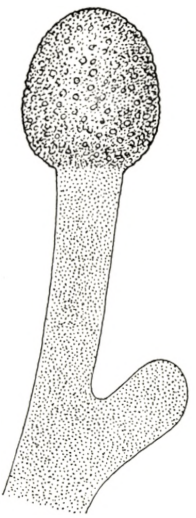

Fig. 14. *Gelidiopsis scoparia* (Mont. et Mill.) Schmitz. A stichidium. (× ca. 20).

The thallus is flattened, about 300 μ thick and its breadth is rather variable, increasing in the places where divisions have taken place.

The plant has hitherto been found sterile only, but in the material now received I have found several stichidia (Fig. 14). These are terminally placed upon a branchlet; they are heart-shaped, ca. 500 μ broad and 750 μ long and densely studded with sporangia.

About the locality it is said: "on large rocks submerged at lowtide."

Mauritius: Pointe aux Sables, 24-4-51, R. E. V. no. 1115.
Geogr. Distr.: Réunion.

Fam. 2. ***Hypneaceae.***

Hypnea Lamouroux.

1. **Hypnea nidulans** Setch.

Alg. Mauritius, III, 2, 1943, p. 62; Additions, II, 1950, p. 17.

Several fertile specimens of this species (no. 1107) were found in a lately received collection of algae.

As to the locality it is said: "On rocks exposed at low tide."

Some other, but sterile, specimens (no. 1145) are surely also referable to this species, but being sterile they cannot be determined with certainty.

As to the locality it is said: "Forms dense moss-like growths on rocks near shore exposed at low tide."

Mauritius: Pointe aux Sables, 24-4-51, G. MORIN no. 1107. Same locality, 22-6-51, R. E. V. no. 1145.

2. **Hypnea**(?) **horrida** (Ag.) J. Ag.

Alg. Mauritius, III, 2, 1943, p. 62, fig. 32; Additions, II, 1950, p. 18, fig. 4.

Two large fine specimens of this endemic species are contained in a lately received collection. The colours of the dried specimens is a splendid deep red. As usually the specimens are sterile.

As to the locality it is said: "On lagoon-side of reef exposed at low tide."

Mahébourg, 26-3-51, R. E. V. no. 1081.

Fam. 3. ***Sphaerococcaceae.***

Phacelocarpus Endl. et Dies.

1. **Phacelocarpus tristichus** J. Ag.

Alg. Mauritius, III, 2, 1943, p. 65, fig. 33.

Of this species endemic in Mauritius I have in collections received recently found some fine specimens, having formerly seen some quite small fragments only.

The specimens reach a height of about 8—9 cm and the plant forms a dense roundish tuft arising from the upwards increasingly dense ramification.

The specimens are most regrettably sterile.

As compared with the specimens mentioned in the previous paper, Fig. 33, the appearance of those now received are more robust.

KYLIN (1932, p. 51, pl. 19, fig. 15) gives an illustration of the original specimen found in J. AGARDH's herbarium in Lund agreeing very well with the specimens now received.

As pointed out by J. AGARDH, Till Algernes Systematik, 1884, p. 57, the Mauritian species is closely related to *Phacelocarpus tortuosus* Endl. & Dies. known from Cape and Port Natal, but according to AGARDH the African species is in all respects larger than the Mauritian one.

As to the locality it is said: "In rock cavities near reef, submerged at low tide."

Riambel, 8-12-50, G. MORIN no. 1000.

Fam. 4. ***Sarcodiaceae.***

Sarcodia J. Ag.

Sarcodia mauritiana nov. spec.

Frons ca. 6 cm alta, plana, carnoso-membranacea, irregulariter palmatim divisa et furcata, e segmentis ca. 1 cm et magis latis, ex marginibus proliferis, cuneato-linearibus aut apicem versus magis expansis, superne plus minus late rotundatis aut in lobulos subacutos divisis composita.

Cystocarpia permagna, globosa, e marginibus et pagina thalli orta.

Tetrasporangia et antheridia non observata.

Color thalli sicci fuscus.

Mauritius: Pointe aux Sables, 22-11-51, G. MORIN no. 1147d.

The specimens, which I take to be the representative of a new species, are somewhat fragmentary as no basal discs are found; but most probably the plant forms 5—6 cm high tufts upon rocks.

The thallus (Pl. III) is very irregularly divided several times in oblong or more or less elongated-cuneate lobes having narrow bases and becoming broader upwards. Lobes or proliferations issue from the margins. And to this irregularity comes the fact that the thallus, as appears from the material preserved in formol, is much sinuated. The large globular cystocarps issuing in

great number from the flat sides of the thallus as well as from the edges augment the irregularity, at the same time giving the thallus a very elegant appearance.

As to the anatomy a transverse section of the thallus shows that the epidermal cells are elongated and very densely placed; then follows a layer of small roundish cells gradually becoming longer inwards and followed by, first, polygonal, then stellate or irregularly shaped cells, the innermost issuing long arms, from which the filaments traversing the slimy interior are given out.

Upon a longitudinal section of the cystocarps it is seen that they have a thick peripheral wall consisting of densely placed rows of small cells; above a peristome is present. A tissue of roundish cells is present in the base of the cystocarp, being a continuation of the cortical layer; above this, near the middle of the cystocarps, a tissue of irregularly formed cells are found from which the much divided carposporic filaments are given out. OKAMURA in Icones Jap. Alg., vol. IV, p. 110, pl. 178, fig. 10 gives a picture of the cystocarps of *Sarcodia Montagneana* J. Ag. which shows a great likeness to that of the present species.

Some few of the dried specimens are tetrasporic (Plate III, the specimen below on the left). These specimens have somewhat broader lobes and upon the whole the thallus is not so much divided. The sporangia are transversely divided, about 30—35 μ long and 15 μ broad, and formed in the cortical layer.

As this species seemed to me to show much likeness to *Sarcodia Gattyae* (J. Ag.) Kylin from Arabia (Aden), compare KYLIN, 1923, p. 56, pl. 21, fig. 51, showing the specimen upon which J. AGARDH described the species I asked Miss DICKINSON, the Kew Herbarium, whether any specimens of this species were found there; this not being the case Miss DICKINSON most kindly stated that a specimen was found in the Natural History Museum, London. As determined specimens are not allowed out on loan from the museum, I sent a specimen of the species from Mauritius to the keeper of the Herbarium, Miss L. M. NEWTON, asking her if she would compare my plant with the specimens of *S. Gattyae*. And Miss NEWTON most kindly answered: "Miss GATTY's plant is very much smaller, is slightly thinner in texture and a lighter red in colour; the cystocarps are borne only on the edges of the frond, not scattered over the thallus." According to this valuable in-

formation the Mauritian plant must be said to be well separated from *Sarcodia Gattyae*.

The previously received material of *Sarcodia* (compare Alg. Mauritius, III, 2, p. 66, fig. 34 and Additions II, 1950, p. 21, figs. 7—8), as said in the papers, consisted only of fragments and specimens cast ashore and my referring of them to *S. ceylanica* Harv. is surely wrong, most specimens perhaps being most probably referable to the species described here.

Fam. 5. ***Gracilariaceae.***

Gracilaria Grev.

1. **Gracilaria spinuligera** nov. spec.

Frons ut videtur decumbens, caespites rotundatos, depressos formans. Thallus teres carnosus, ca. 4 mm latus, ramosus, ramio principalibus ramulos breviores, ca. 3 cm longos spinuliferos gerentibus.

Substantia carcososa-cartilaginea. Color in sicco brunneo-ametysthinus.

Stratum corticale in sectione transversali ex cellulis angustis,

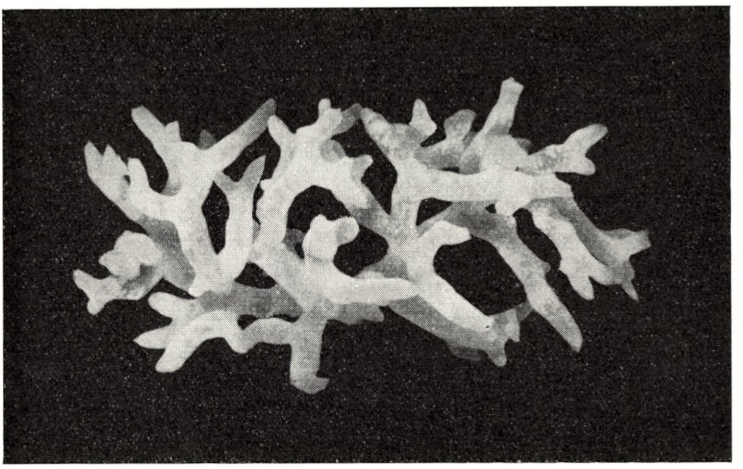

Fig. 15. *Gracilaria spinuligera* nov. spec. Fragment of a specimen preserved in formol and sea water. (×1).

parvis, elongatis compositum; medulla ex cellulis subglobosis exterioribus parvis, interioribus ad 800 μ latis formata.

Tetrasporangia in strato corticali praesentia, cruciatim divisa, ca. 50 μ longa et 25 μ lata.

Mauritius: Flic-en-Flacq, near reef, 3-5-50, R. E. V. no. 922.

According to the material consisting of a single dried specimen (Pl. IV) and a smaller part preserved in formol (Fig. 15), this

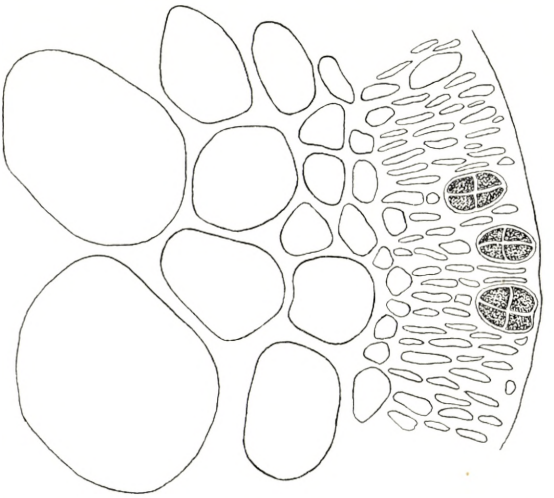

Fig. 16. *Gracilaria spinuligera* nov. spec. Transverse section of the thallus with tetrasporangia. (× ca. 200).

species most probably forms a low somewhat expanded roundish tuft upon rocks.

It has a terete, fleshy, ca. 4 mm thick thallus (Fig. 15) here and there a little narrowed; it is much ramified, from the main branches giving out about 3 cm long, more or less curved branches upwards and outwards. The lowermost half of these branches are naked, then a single short spine-like branchlet is given out, a little higher up another, and the apices of the branches end with a spine or often two, more or less curved. Generally the ramification occurs like this; but it varies much from branch to branch.

A transverse section of the thallus (Fig. 16) shows that the peripheric tissue is about 100 μ thick and consists of densely

placed narrow, thick-walled, ellipsoidal cells, about 5—6 μ broad and twice as long and rather irregularly placed. Then follows a layer of, first, quite small, but gradually larger roundish cells with thick walls; the contents of these cells are stellately contracted from the pores, reminding of what for instance takes place in *Eucheuma*. Then the real medulla begins with rather thin-walled globular cells increasing in size inwards, the innermost having a diameter up to about 800 μ.

The specimen is tetrasporic; the crauciately divided sporangia are formed in the peripheric layer; they are oblong-oval, about 50 μ long and half this breadth.

About the locality of this species it is said only "near reef", but according to its habit and structure the plant surely has its home in very similar localities to those of *Gracilaria crassa* Harv., viz. localities exposed to strong surf.

2. **Gracilaria crassa** Harv.

HARVEY, W. H., Alg. Ceylon exsic., no. 29. J. AG., Epicrisis, p. 417. BØRGESEN, F., Some Marine Algae from Ceylon, 1936, p. 86, fig. 8. — *Corallopsis Opuntia* J. Ag., Epicrisis, p. 409. BØRGESEN, Alg. Mauritius, III, 2, 1943, p. 69; Additions, II, 1950, p. 24, figs. 9—10 and Additions, III, 1951, p. 41.

In the papers mentioned above dealing with the algae of Mauritius and also in earlier papers quoted in the paper from 1950, I have pointed out that in my opinion *Corallopsis Opuntia* J. Ag. cannot be kept separate from *Gracilaria crassa* Harv. Referring to what is said in my former papers I now go the whole length, calling the species *Gracilaria crassa* Harv.

I have been induced to do so by a statement in a letter from Miss LINDA M. NEWTON, the British Museum, in which she writes: "I have read with interest your remarks on *Gracilaria crassa* and *Corallopsis opuntia* and agree with you that they seem to be the same thing. But I think they might belong to the genus *Gracilaria* and not *Corallopsis*." In this I quite agree with Miss NEWTON; being in accordance with my treating of the question in the above quoted paper on algae from Ceylon and also confirmed by examination of later received algae from Mauritius. And since

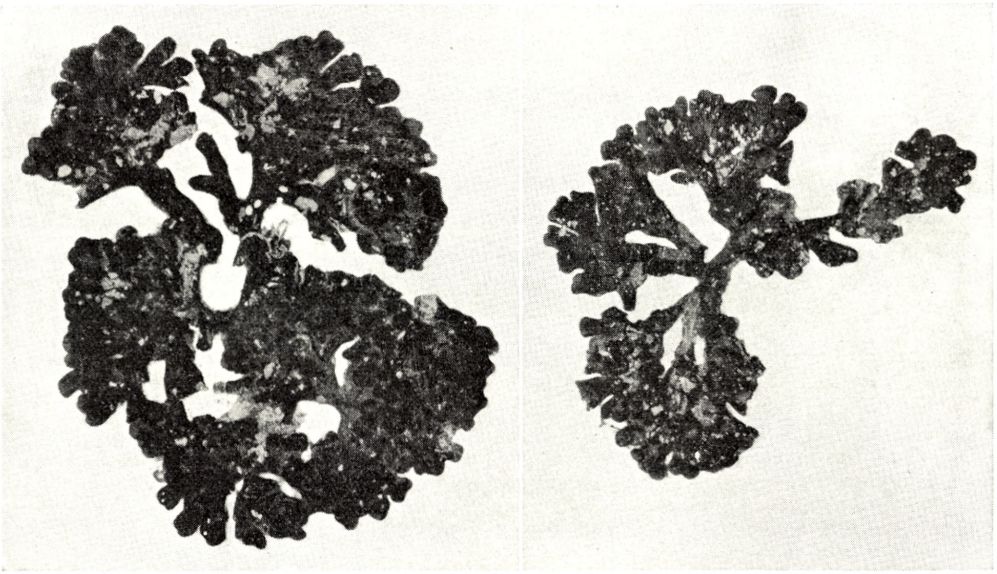

Fig. 17. *Gracilaria crassa* Harv. forma *conglomerata* n. form. (×1).

Grac. crassa Harv. has no. 29 in HARVEY, Ceylon Alg. Exsicc. and *Corallopsis Cacalia* Harv. (= *Corallopsis Opuntia* J. Ag.) is no. 30 the former name must be preferred.

Forma *conglomerata* n. form.

Of this variable species I have in a batch of algae lately received from Mauritius found an interesting form growing upon rocks in an exposed locality.

To judge from the specimens, both dried (Fig. 17) and preserved in formol and seawater (Fig. 18), the plant has formed a low dense, firm cushion on the rocks composed of the much and densely ramified branches firmly entangled.

The thallus is up to 3 mm broad, here and there with narrowings and with blunt, broadly rounded apices.

A transverse section of the thallus shows that the cells in the medulla have very thin walls, the largest in the middle of the thallus are about 350 μ broad.

Corallopsis reptans Weber, 1926, p. 146, fig. 37, shows some

Fig. 18. *Gracilaria crassa* Harv. forma *conglomerata* nov. form. Fragment of a specimen preserved in formol and seawater. (×1).

likeness to this form, but I have not observed rhizoids in the Mauritian plant.

Mauritius: Mahébourg, "reef near Ile aux Aigrettes—exposed to strong surf", 26-3-51, R. E. V. no. 1078.

3. **Gracilaria arcuata** Zan.

Var. *Snackeyi* Weber.

Alg. Mauritius, III, 2, 1943, p. 69, fig. 35.

In collections received later several specimens very like those I formerly have referred to this variety are found. The gathering reminding most of the description and figure given by Mme Weber is no. 1077, of which I give a figure of some specimens here (Fig. 19). The thallus is fleshy, about 4 mm thick; the tips of the thallus are now acute, now roundish. In the female specimens the semiglobular sporangia are very protruding, $\frac{1}{2}$—$\frac{3}{4}$ mm broad.

A transverse section shows that the cells in the middle of the thallus are very large, up to 600—700 μ in diameter.

Another gathering, no. 1064, was more densely branched with shorter branchlets and mostly with broadly rounded apices.

Fig. 19. *Gracilaria arcuata* Zan. var. *Snackeyi* Weber. (×1).

Finally a third gathering, no. 1065, had longer, slenderer branchlets tapering slowly towards the acute apices.

Mauritius: Ile aux Aigrettes near Mahébourg; no. 1077 "exposed at low tide; thallus fleshy, red purple and green", R. E. V., 26-3-51; no. 1064 "exposed at low tide, thallus deep red or reddish-green", G. MORIN, 8-3-51; no. 1065, "lagoon edge of reef", R. E. V., 8-3-51.

Gracilariopsis Dawson.

1. **Gracilariopsis dumosa** (Harv.) comb. nov.

Gracilaria dumosa Harv., Friendly Island Alg., no. 37. AGARDH, J., Epicrisis, p. 416. KÜTZING, Tab. Phycol., vol. XIX, tab. 21, figs. e–f.

The specimens from Mauritius are in good agreement with a specimen in HARVEY's "Friendly Island Algae", no. 37, found in the herbarium of the Botanical Museum. And likewise they agree very well with the description given by J. AGARDH, *l. c.*, and with the habit figure of a fragment of the thallus in KÜTZING's Tabulae.

To judge from the dried specimens (Pl. V), the plant forms much entangled tufts; as the basal discs are wanting I cannot make any statement about their height. The breadth of the thallus is up to about 2 mm. The upper branches taper upwards, ending in pointed apices, but in some cases the filaments in the upper parts become a little thicker and then tapering rather abruptly near the upper ends.

The ramification is very irregular, furcated with shorter or longer distances between the divisions, in places also secund; near the upper ends of the branches the ramification becomes often very dense, nearly tufted.

The colour of the older parts of the thallus in a dried condition is dark brown-violet, in the younger parts yellowish-violet.

A transverse section of the thallus shows that the medulla consists of roundish cells, the largest ones, in the middle, having a diameter up to about 300—400 μ; as is shown in KÜTZING's figure f the walls are rather thick, about 5—7 μ.

In one of the specimens a branch with cystocarps is present; these are not very high, but rather broad. A transverse section shows that the parenchyma in the gonimoblast consists of rather small cells with rich contents and furthermore that nutritive filaments are absent. Because of this, as already stated above, the present species is no *Gracilaria*, but is referable to the genus *Gracilariopsis* Dawson, 1949, p. 3.

Most regrettably I have not found any tetrasporangia, nor antheridia.

As to the locality it is said: "In calm water near shore."

Mauritius: Les Salines, Roche Noire, Pt. Louis, 11-11-50, G. MORIN no. 912.

Geogr. Distr.: Friendly Islands.

III. Rhodymeniales.

Fam. 1. Rhodymeniaceae.

Coelothrix Børgs.

Coelothrix indica Børgs.

Alg. Mauritius, III, 3, 1944, p.14 and Additions, II, 1950, p. 40.

A fertile specimen with the characteristic elongate, clavate stichidia was found as an epiphyte upon *Digenea simplex*.

Mauritius: Flic-en-Flacq, 22-2-51, R. E. V. no.1055.

Erythrocolon J. Ag.

1. Erythrocolon podagricum (Harv.) J. Ag.

Agardh, J., Analecta Algologica, 3, 1896, p. 90. Kylin, H., Die Florideengattung Rhodymeniales, 1931, p.14, fig. 4AB, tab. 6, fig.13. — *Chylocladia podagrica* Harv., Friendly Island Algae, no. 50. J. Agardh, Epicrisis, p. 302. — *Chrysymenia podagrica* (J. Ag.) Weber, Alg. Siboga, p. 471, fig. 204.

Some specimens of this species are found in a collection of algae lately received from Mauritius. The shape of the specimens is in good agreement with Agardh's description and with the figure given by Kylin of the specimen in Agardh's Herbarium, and likewise the structure agrees well with Kylin's figures and description.

As we had not here in Copenhagen any specimen of Harvey's plant I am much indebted to Director Salisbury for the permission to have had on loan here a specimen for comparison with that from Mauritius. This has brought out that the plant from Mauritius is in good agreement with that of Harvey, differing only by its much smaller size, for which reason I propose to name it forma *minor*.

But I want to point out that the plant I in part 3, *Rhodymeniales*, 1944, p. 18, referred to *Coelathrum Boergesenii* Weber is not rightly referred to that species, but is the present one.

When the habit figure given there (Fig. 12) is compared with HARVEY's plant, its much smaller size is clearly seen.

About the locality it is said: "Sea edge of reef exposed to strong surf, rare."

Mauritius: Blue Bay, 8-5-51, G. MORIN no. 1121. Dr. MORTENSEN's specimen was collected at Flatt Island.

Geogr. Distr.: Friendly Islands, Malayan Archipelago.

Champia Desv.

1. **Champia parvula** (Ag.) Harv.

Alg. Mauritius, III, 3, 1944, p. 30.

This species was found intermingled in the thallus of *Actinotrichia fragilis*.

Furthermore it occurred in densely felted clumps of *Wurdemannia miniata* and other algae.

Mauritius: Flic-en-Flacq, 3-5-50, R. E. V. no. 916. Same locality, 20-5-51, R. E. V. no. 1137.

IV. Ceramiales.

Fam. 1. Ceramiaceae.

Subfam. 1. Crouanieae.

Antithamnion Nägeli.

1. **Antithamnion elegans** Berth.?

BERTHOLD, G., Über die Vertheilung der Algen im Golf von Neapel, 1882, p. 516. FUNK, G., Über einige Ceramiaceen aus dem Golf von Neapel, 1922, p. 241, pl. V, fig. 17, BØRGESEN, F., Mar. Alg. Canary Islands, III, 3, 1930, p. 56, figs. 21—23. FELDMANN-MAZOYER, GENEVIÈVE, Recherches sur les Ceramiacées, 1940, p. 267, figs. 100—102.

The reason why I have put a ? after the specific name of the species is that I have found only sterile specimens. But since the vegetative structure of the plant—,more especially the characteristic position of the gland-cells is in good conformity with that found

in this species, I have in reality no doubt as to the referring of the Mauritian plant to this species. The short description below of the Mauritian plant will show it.

The plant was found creeping upon a cable in Port Louis harbour. The tufts had a height of about 1 cm.

Near the base the erect filaments are about 80 μ thick, tapering slowly upwards; the cells have a length of about 300 μ.

In accordance with the vigour of the specimens only two oppositely placed simple branchlets are given out in the poorest ones, while 3—4 to 5 ramified branchlets, verticillately placed, are present in the vigorous filaments.

The gland cells are oblong, about 11 μ long and 6 μ broad, and placed on the ventral side of a single cell, being a little shorter than this. This cell is nearly always the basal cell in a branchlet; generally only a single gland-cell is found in each branchlet.

Mauritius: Port Louis harbour, 28-5-51, G. Morin no.1136.

Geogr. Distr.: Western part of the Mediterranean Sea. Canary Islands.

Subfam. 2. Ceramieae.

Ceramium Lyngbye.

Par Mme Dr. Geneviève Feldmann-Mazoyer.

1. **Ceramium Codii** (Richards) G. Mazoyer.

Mazoyer, G., Céramiacées Afrique du Nord, 1938, p. 324. Feldmann-Mazoyer, G., Recherches sur les Céramiacées de la Méditerranée occidentale, Alger (1940) 1941, p. 285, figs. 40, 59, 105. — *Ceramothamnion Codii* Richards, A new Rhodophyceous alga, 1901, p. 257—265, pl. 21—22. — *Ceramothamnion adriaticum* Schiller, Schussnig, Österreichische botanische Zeitschrift, 1914, p. 85—93.

Sur des échantillons de *Codium dichotomum* (Huds.) S. F. Gray, j'ai observé quelques filaments de cette espèce assez répandue sur le même hôte en Méditerranée. Les filaments rampants à la surface des utricules de l'hôte mesurent environ 80 μ de diamètre et présentent des nœuds à cortication très réduite d'où peuvent naître des rhizoïdes s'insinuant entre les utricules du *Codium*.

La plante de l'Ile Maurice ne me parait différer en rien de celle de la Méditerranée, bien caractérisée en particulier par le très faible développement des cellules corticales des nœuds.

D'après les notes que m'a communiquées le Dr. Børgesen, certains échantillons de l'Ile Maurice étaient pourvus de tétrasporanges, je n'en ai pas observés sur les échantillons que j'ai examinés, mélés à divers épiphytes et en particulier à un *Polysiphonia*.

Ile Maurice: Par 1—2 milles SSW de Round Island, Juin 2, 1948, F. D. Omaney, n° 838.

Distribution géogr.: Baltique (Danzig), Bermudes, Méditerranée.

2. **Ceramium Camouii** Dawson.

Dawson, Y., Marine algae of the Gulf of California, 1944, p. 319, pl. 51, figs. 2—3; 1950, Review of *Ceramium*, 1950, p. 129.

Je rapporte au *Ceramium Camouii* décrit du Golfe de Californie par Dawson, un petit *Ceramium* qui semble bien correspondre à la description et aux figures publiées par Y. Dawson.

Ce petit *Ceramium* (Fig. 20) se présente sous forme de filaments lâches, ne dépassant guère plus de 3,5 mm, rampant sur le *Codium Vaughani* Boerg., auquel il se fixe par des rhizoïdes naissant au niveau des nœuds de la région inférieure de la fronde.

Les entre-nœuds sont bien nets sur toute l'étendue de l'algue et ils sont 2 à 4 fois plus hauts que les nœuds, sauf tout à fait au sommet des rameaux.

Les bords inférieurs et supérieurs des nœuds sont nettement délimités et les cellules corticales, plus ou moins anguleuses, sont disposées d'une manière irrégulière. Les extrémités des rameaux sont droites. Le diamètre des filaments est sensiblement le même sur toute leur étendue et atteint une soixantaine de μ au niveau des nœuds stériles qui sont légèrement renflés. Les nœuds fertiles sont très nettement renflés, déformés et lobés, ils atteignent 130 μ de large.

Les tétrasporanges de cette espèce sont verticillés par 4 ou 5 sur un rang, en partie recouverts par les cellules corticales. Ils sont subsphériques ($45 \times 50\ \mu$ de diamètre environ).

L'échantillon présentait des spermatanges situés tout autour des nœuds supérieurs.

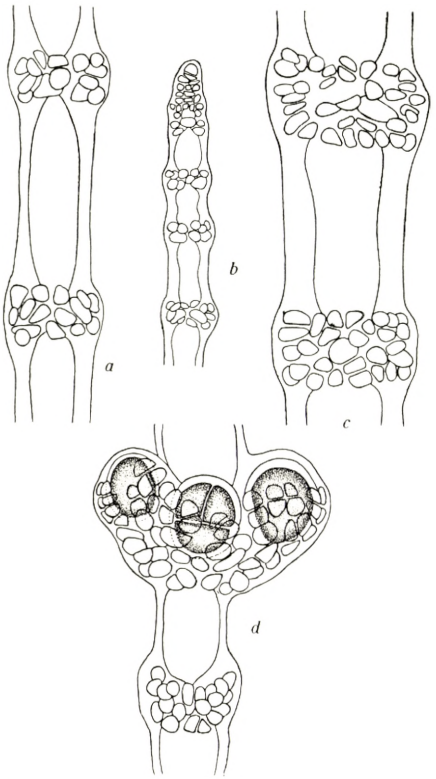

Fig. 20. *Ceramium Camouii* Dawson. *a* et *c*: nœuds de la région supérieure et moyenne; *b*: sommet d'un rameau; *d*: nœudsfertile avec 3 tétrasporanges. *a*, *c* et *d* ×230 env. *b* ×135 env.

Cette espèce est à rapprocher du *Ceramium Codii* mais en diffère par sa cortication plus développée, la largeur de ses entre-nœuds et surtout la disposition de ses tétrasporanges régulièrement verticillés sur des nœuds fortement renflés.

Ile Maurice: Dans une cuvette rocheuse, l'Ilot Brocus (R. E. Vaughan n° 163).

Distribution: Golfe de Californie.

3. **Ceramium gracillimum** (Griff.) Harv.

var. *byssoideum* (Harv.) G. Mazoyer.

Mazoyer, G., Céramiacées Afrique du Nord, 1938, p. 323. Feldmann-Mazoyer, G., Céramiacées de Villefranche, 1939, p. 8; Céramiacées de la Méditerranée, p. 293—295, fig. 109. — *Ceramium byssoideum*

Harvey, Nereis Bor. Amer., pt. II, p. 218; Howe in Britton, Flora of Bermuda, 1918, p. 351. — *C. transversale* Collins et Harvey, Algae of Bermuda, 1917, p. 145, pl. 5, figs. 29—31. Børgesen, Marine Algae in Ostenfeld, Plants from Beata Island, St. Domingo, 1924.

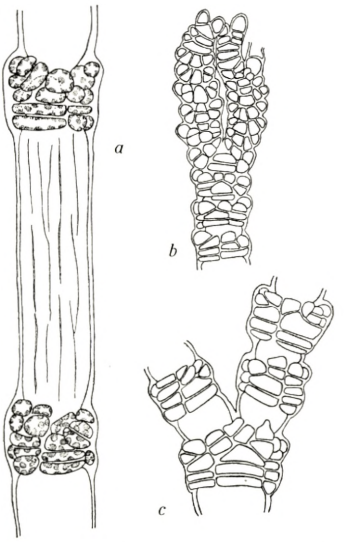

Fig. 21. *Ceramium gracillimum* (Griff.) Harv. var. *byssoideum* (Harv.) G. Mazoyer. *a*: région moyenne de la fronde; *b*: sommet d'un rameau; *c*: région supérieure d'un rameau. × 230 env.

Les échantillons (Fig. 21) de l'Ile Maurice que j'ai examinés, correspondent bien à ceux de Méditerranée; la disposition des cellules corticales des nœuds, allongées transversalement, est particulièrement bien nette.

Ile Maurice: Août 1939, Fort William et Barkly Island, par R. E. Vaughan, n° 327.

Distribution: Semble exister dans toutes les mers chaudes.

4. **Ceramium macrotrichum** G. Feldm. nov. spec.

Frondes pusillae, ad folias Cymodoceae, caespitulos usque ad 3—4 mm altos formantes, filamentis repentibus, rhizoidibus affixis, et filamentis erectis dichotomis, patentibus, constitutae.

Filamenta erecta, apicibus rectis aut paulo incurvis, ad apicem versus 75—80 μ lata, in partibus adultioribus usque ad 100—200 μ lata.

Zonae corticales fere usque ad apicem distinctae, interstitiis pellucidis 4—5 plo longitudinem zonarum superantibus, separatae.

Cellulae corticales majores, in parte inferiori zonarum, rectangulares et transversaliter elongatae. Cellulae corticales superiores zonarum, pilum hyalinum, robustum gerentes.

Tetrasporangia subsphaerica, tetraedrice divisa, 75 μ diam.

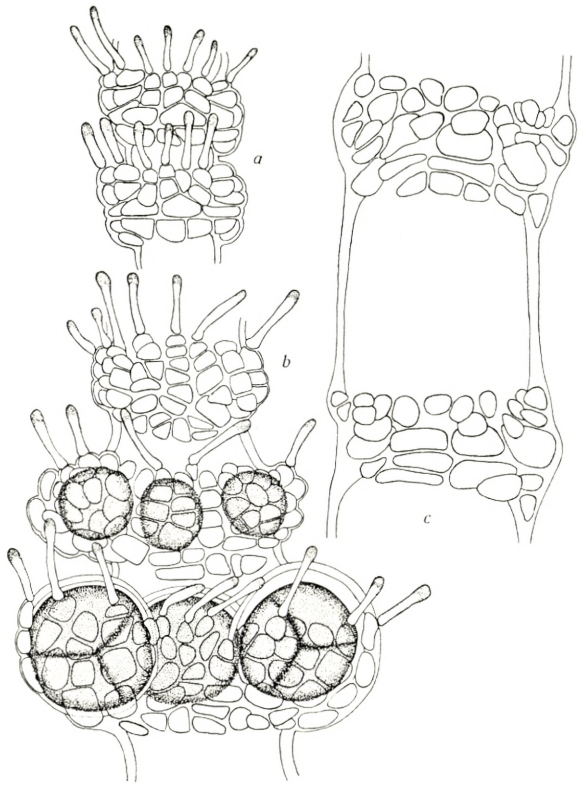

Fig. 22. *Ceramium macrotrichum* G. Feldm. *a*: nœuds situés vers le sommet montrant la disposition des poils; *b*: nœuds de la région supérieure montrant la disposition des tétrasporanges et des poils; *c*: cortication de la région moyenne de la fronde montrant la présence de cellules transversale. × 230 env.

ad zonas eximie inflatas regulariter verticillata et cellulis corticalibus fere omnino obtecta.

Habitat ad folias *Cymodoceae*, in Oceano Indico ad Insulam Mauritii.

Ce petit *Ceramium* (Fig. 22) croît sur les feuilles de *Cymodocea*, formant des petites touffes hautes de 3 à 4 mm. La base des

rameaux est rampante et adhère au substratum par des rhizoides digités, larges d'environ 25 μ naissant des nœuds.

Les rameaux sont irrégulièrement pennés à filaments larges de 100 à 200 μ vers leur base et de 75 à 80 μ vers leurs extrémités. Les cellules axiales peuvent atteindre 450 μ de haut et 125 μ de large vers la base de l'algue, leur hauteur étant 4 à 5 fois égale à celle des nœuds. Les extrêmités sont généralement droites ou à peine recourbées.

La disposition et la forme des cellules corticales rappellent beaucoup celles du *C. gracillimum* bien que la cortication soit plus développée que chez ce dernier.

La limite inférieure et supérieure des nœuds est nettement délimitée. Dans la moitié inférieure des nœuds, on observe des cellules rectangulaires allongées transversalement. Je n'ai pas constaté la présence de cellules sécrétrices qui ont pu éclater dans le liquide fixateur.

Les nœuds des régions supérieures présentent de magnifiques poils disposés en verticilles tout autour des nœuds et naissant des cellules corticales délimitant leur bord supérieur. Cette disposition parait bien régulière chez l'échantillon étudié. Bien que la présence ou l'absence de poils hyalins unicellulaires ne puisse généralement être considérée comme un caractère systématique constant; ce caractère semblant lié à l'état physiologique ou à l'habitat de l'algue envisagée, ceux du *Ceramium machrotrichum* me paraissent bien caractéristiques de cette espèce car ils diffèrent des poils hyalins unicellulaires d'autres *Ceramium* par leur situation régulière, leur diamètre plus grand et leur persistance plus prolongée sur les nœuds assez âgés.

Parmi les échantillons examinés, certains présentaient des tétrasporanges à peu près sphériques (75 μ de diamètre) verticillés par 3 ou 4 et immergés dans le cortex toujours bien développés. D'autres individus étaient sexués et portaient soit des gonimoblastes, soit des spermatanges situés sur le côté externe des nœuds de la région supérieure.

Cette espèce est à rapprocher du *C. gracillimum* dont elle se distingue nettement, comme on le verra en comparant les figures 2 et 3, par le diamètre beaucoup plus grand de ses filaments, ses entre-nœuds plus courts ainsi que la disposition de ses tétrasporanges.

Par ce dernier caractère, le *Ceramium macrotrichum* se rapproche d'une espèce de Californie jusqu'ici confondue avec le *C. transversale* (= *C. gracillimum* var. *byssoideum*) et que Y. Dawson (loc. cit. 1950) a décrit sous le nom de *C. Masonii* et qu'il distingue nettement du *C. transversale* par les tétrasporanges recouverts par les cellules corticales. A en juger par la description qu'il en a donné, la plante de Californie est plus voisine du *C. transversale* que de l'espèce de l'Ile Maurice.

Loc.: Riambul le 8 décembre 1950 sur les feuilles de *Cymodocea* par R. E. Vaughan n° 955 et n° 995.

5. **Ceramium Saviniae** G. Feldm. nov. spec.

H. E. Petersen (Alg. Mauritius III, 4, 1945, p. 10) a considéré que deux specimens de la collection du Dr. Vaughan (n° 281 et n° 307) se rapportaient avec certitude au *C. Johnstonii* Sach. et Gard. Cette espèce de Californie caractérisée notamment par sa fronde entièrement corticquée a été réunie par Dawson (1950) à titre de variété au *C. sinicola* Set. et Gard. Je n'ai eu entre les mains que le n° 307 du Dr. Vaughan provenant de Savinia (août 1939). Cette algue n'a certainement aucun rapport avec le *C. Johnstonii* et le *C. sinicola*. Elle me parait se rapporter au groupe d'espèces que l'on réunit souvent sous la dénomination de *C. diaphanum* mais elle me parait suffisamment différente des formes européennes que j'ai observées pour la considérer comme une espèce distincte: le *C. Saviniae* nov. sp. dont voici la diagnose:

Frons pulvinata usque ad 2 cm. alta e filamentis usque ad 300 μ diam., apiculis attenuatis et eximie forcipatis, dichotomis aut raro ramulos laterales gerentibus, constituta.

Zonae corticales usque ad apicem distinctae, haud inflatae, 2—3 plo latiores quam altae, interstitiis pellucidis, longitudine semper aequali per totam frondis (i. e. versus basin frondis haud elongatis) 2—3 plo altitudinem zonarum superantibus, separatae.

Cellulae corticales sine ordine dispositae, in parte inferiore zonarum saepe paulo majores.

Tetrasporangia subsphaerica, tetraedrica divisa, 45—50 μ diam., verticillata et cellulis corticalibus obtecta.

Habitat in Oceano Indico, ad Insulam Mauritii.

Le *C. Saviniae* (Fig. 23) forme des touffes gazonantes dont les filaments dressés n'atteignent pas 2 cm. de haut, souvent ramifiés

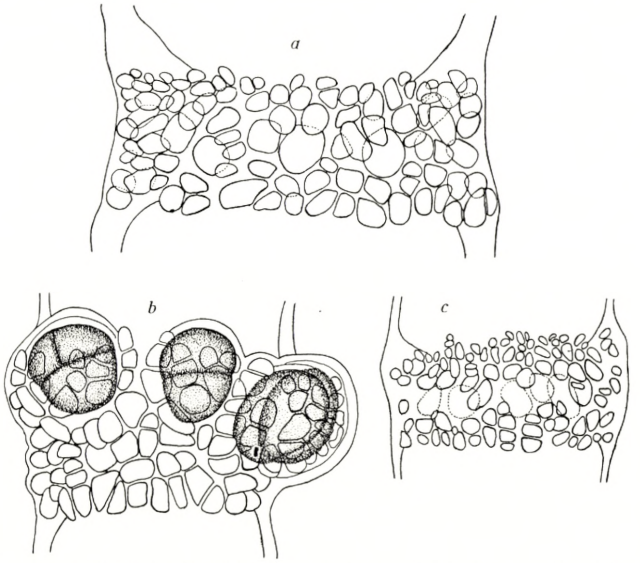

Fig. 23. *Ceramium Saviniae* G. Feldm. *a* et *b*: nœuds situés dans la région moyenne de la fronde; *c*: nœud de la région supérieure présentant 3 tétrasporanges. *a* et *b* $\times$230 env. *c* $\times$130 env.

dichotomiquement, 2 à 3 dichotomies et quelques rares rameaux adventifs latéraux. Dans les régions bien développées le diamètre atteint 300 μ, les extrêmités ne mesurent plus que 75—100 μ de diamètre, leurs sommets sont fortement recourbés en tenaille. Les nœuds sont nettement séparés sur toute la longueur de la plante et nettement distincts même au sommet où ils sont presque contigüs. Les nœuds dont le diamètre ne dépasse pas celui des entre-nœuds, toujours plus larges que hauts (2 à 3 fois plus larges que hauts) atteignent dans les parties moyennes 70—100 μ $\times$ 200—210 μ.

Les entre-nœuds sont d'une longueur relativement constante dans toutes les parties moyennes de l'algue, ils sont en général

2 à 3 fois plus longs que les nœuds ne s'allongeant pas considérablement du sommet vers la base comme c'est le cas par exemple chez le *Ceramium diaphanum*.

La structure des nœuds rappelle celle du *C. diaphanum* étant constitués par plusieurs assises de cellules corticales dont les plus externes sont plus petites et disposées sans ordre apparent. Les cellules corticales sont nettement plus grandes dans la région inférieure des nœuds que vers le sommet de ceux-ci. Sur les bords inférieurs et supérieurs, les cellules sont généralement disposées d'une manière assez ordonnée par suite du recoupement des cellules qui se fait à peu près dans le même sens.

Les tétrasporanges sont disposés en verticilles sur un rang vers la région supérieure des nœuds vers le sommet de la fronde où ils déterminent des renflements. Leur diamètre est de 45—50 μ.

Les échantillons présentaient également des gonimoblastes entourés de 4 à 5 rameaux involucraux.

6. **Ceramium diaphanum** (Roth) Harv. f.a *indica* G. Feldmann.

A typo differt statura mediocri interstitiis pellucidis brevioribus, cellulibus corticalibus paulo majoribus.

Je rapporte au *Ceramium diaphanum* une petite forme (Fig. 24)

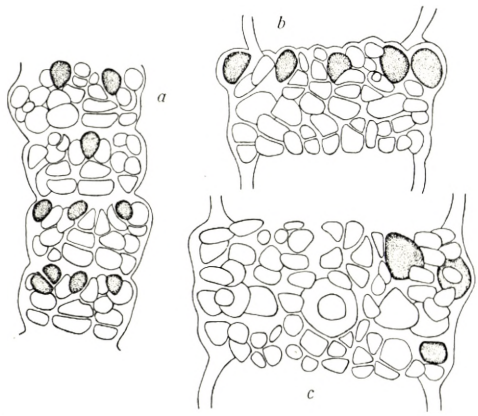

Fig. 24. *Ceramium diaphanum* (Roth) Harv. forma *indica* G. Feldm. *a*: nœud de la région supérieure présentant des cellules parasites (en pointillés) par un Phycomycète; *b* et *c*: nœuds de la région moyenne présentant également des cellules parasitées. ×230 env.

de quelques millimètres de haut présentant les caractères généraux du *Ceramium diaphanum* mais assez différente des formes européennes de cette espèce très polymorphe. Elle s'en distingue en particulier par sa ramification dichotome et ses entre-nœuds sont une à une fois et demi plus hauts que les nœuds. La fronde mesure de 60 à 70 μ vers le sommet et de 150 à 175 μ de diamètre dans les régions moyennes.

Les cellules corticales sont disposées d'une façon quelconque et ne forment pas un cortex très développé. Parmi ces cellules corticales, un certain nombre d'entre-elles présentent un contenu granuleux plus ou moins brunâtre qui rappelle beaucoup celui observé chez les échantillons de *C. mauritianum* et qui est dû vraisemblablement à la présence d'un Phycomycète parasite.

Ile Maurice: Mahebourg reef, G. Morin n° 1068.

7. **Ceramium mauritianum** G. Feldm. nov. spec.

Frons intricata, epiphytica e filamentis repentibus rhizoidibus affixis et filamentis erectis dichotomis et ramulis lateralibus praeditis, constituta.

Filamenta erecta, 150—200 μ lata, apicibus rectis, abrupte attenuatis, zonis corticalibus, usque ad apicem distinctis, interstitiis pellucidis 2—4 plo longiores, separatis.

Zonae corticales e cellulis parvis pro maxima parte rotundatis, inferioribus minoribus, longitudinaliter eximie elongatis, in unam vel duas series dispositis.

Tetrasporangia 50 μ diam., in parte superiora zonarum verticillatim inserta, proeminantia, omnino nuda.

Habitat in Oceano Indico ad Insulam Mauritii.

Sur diverses algues (*Laurencia*, *Corallina*) s'observe un petit *Ceramium* (Figs. 25 *a* et 25 *b*) à ramification dichotome et à ramules latéraux, vivant sous forme d'individus densément enchevêtrés, d'abord rampant sur le substratum où ils se fixent par des rhizoides digités. Les filaments dressés sont souvent non ramifiés ou à peine ramifiés.

Vers les extrémités qui sont droites et brusquement atténuées les nœuds sont extrêmement rapprochés les uns des autres. Dans les parties complètement développées, la hauteur des entre-nœuds

est de 2 à 4 fois égale à celle des nœuds (400 μ de long pour des nœuds de 100 μ de haut par exemple).

Le diamètre des filaments est compris entre 150 et 200 μ dans les régions moyennes et inférieures et entre 100 et 120 μ dans

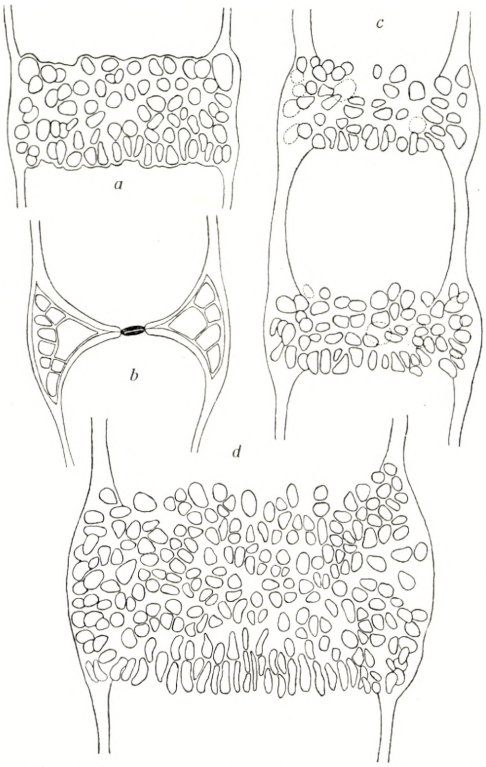

Fig. 25, I. *Ceramium mauritianum* G. Feldm. nov. sp. A gauche, extrémité d'un rameau; à droite jeune nœud portant un tétrasporange et des cellules parasitées figurées en pointillés. $\times$ 230 env.

les régions supérieures. La cortication des nœuds est nettement délimitée sur le bord supérieur, elle l'est moins sur le bord inférieur quoique cette cortication ne soit jamais basipète comme elle s'observe chez le *Ceramium circinatum* J. Ag. de Méditerranée par exemple.

La cortication du *Ceramium mauritianum* est bien caractérisée grâce à la forme allongée longitudinalement vers le bas des nœuds des cellules disposées en une ou deux séries parallèles à l'axe du filament.

Les cellules corticales sont relativement petites, celles des parties moyennes des nœuds sont plus ou moins arrondies ou anguleuses, mesurant 4 à 10 μ de diamètre, les inférieures allongées mesurant en moyenne 5×20 μ.

Parmi les échantillons examinés certains présentent de curieuses cellules à contenu brunâtre parfois granuleux disposées selon plusieurs verticilles et que l'on pourrait prendre pour des cellules sécrétrices ou des cellules-mères de tétrasporanges. En

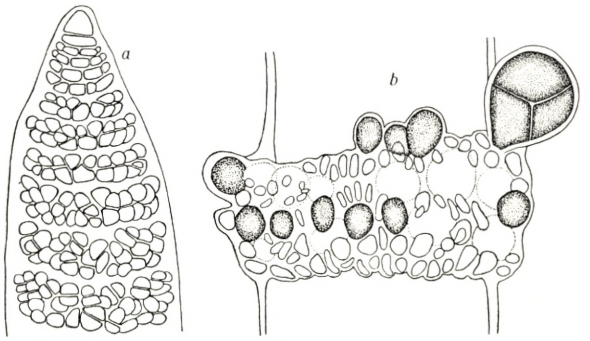

Fig. 25, II. *Ceramium mauritianum* G. Feldm. nov. sp. *a* et *d*: nœuds de la région moyenne et inférieure; *b*: coupe optique d'un nœud; *c*: nœuds de la région supérieure. $\times 230$ env..

réalité il semble s'agir de cellules hypertrophiées par un Phycomycète parasite dont on connait des expèces vivant dans les cellules corticales de *Ceramium* dont il détermine une hypertrophie (*Eurychasmidium tumefaciens* (Magnus) Sparrow par exemple).

Un parasite analogue se retrouve également dans le *Ceramium diaphanum* forma *indica* de l'Ile Maurice. Chez cette algue on peut observer des cellules corticales hypertrophiées renfermant un sporocyste vidé du Phycomycète pourvu d'un tube de décharge des zoospores.

En réalité, malgrè la rareté des tétrasporanges mûrs, ceux-ci sont localisés à la partie supérieure des nœuds, verticillés, font saillie à l'extérieur et ne sont pas recouverts par le cortex. Ils atteignent une cinquantaine de μ de diamètre.

Je n'ai pas observé d'organes femelles mais seulement des plantes mâles dont les rameaux terminaux étaient recouverts de spermatanges.

Ile Maurice: N° 995, 384, 915, 1138.

Subfam. 2. Spyridieae.

Spyridia Harv.

1. Spyridia filamentosa (Wulf.) Harv.

Alg. Mauritius, III, 4, p. 11.

Some few specimens are contained in a collection lately received. One of these, no. 934, was "growing on sand near shore in calm water".

Another specimen (1094) was tetrasporic; it was like the form with short and thick branchlets which I have mentioned in Mar. Alg. D.W.I. p. 234, fig. 224. It was found "attached to blocks of cement, near reef".

Mauritius: Flic-en-Flacq, 29-7-50, R. E.V. no. 934. Ilôt Barkly, 7-4-51, G. Morin no. 1094.

Subfam. 3. Spongoclonieae.

Haloplegma Mont.

1. Haloplegma Duperreyi Mont.

Alg. Mauritius, III, 4, Ceramiales, 1945, p. 11, figs. 3—8.

Some very fine material (Fig. 26) of this species are contained in collections lately received.

In the paper quoted above I have made references to some other species of *Haloplegma* to which I refer here, only pointing out that in some of the specimens recently received, the young tissue was very similar to Kützing's figure in "Tabulae Phycologicae", vol. XII, pl. 63, fig. e of a plant which he calls *Halopl. africanum*, but which surely is the same species as that mentioned here.

Some of the specimens were tetrasporic.

About the locality it is said: no. 977: "in deep pool near reef" and no. 999: "on rocks and old coral; near reef".

Mauritius: Riambel near Souillac, 23-11-50, R. E.V. no. 977 and same locality, 8-12-50, R. E.V. no. 999.

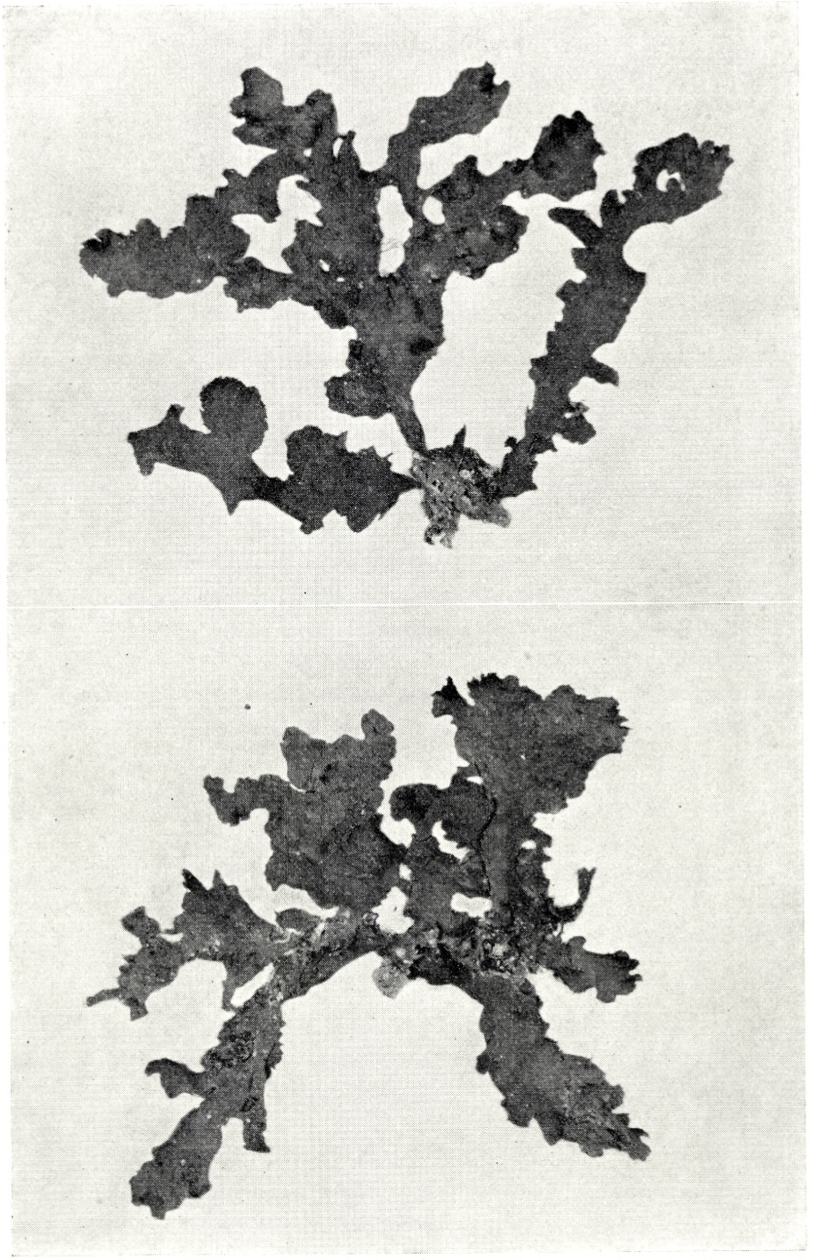

Fig. 26. *Haloplegma Duperreyi* Mont. (×1).

Subfam. 4. Spermothamnieae.

Spermothamnion Areschoug.

1. Spermothamnion Cymodoceae nov. spec.

Frons filiformis, ca. 1—1½ cm alta, ex filamentis repentibus, rhizoideis brevibus substrato (*Cymodoceae ciliatae*) adfixis et filamentis erectis, in parte basali simplicibus, ca. 50 μ latis, apicem versus ramosis, gradatim tenuioribus, ramis sparsis vel in parte superiore unilateralibus composita.

Tetrasporangia oblongo-rotundata, ca. 70 μ longa et 50 μ lata, pedicellis portata.

Pedicelli e partibus apicalibus cellularum vegetativarum orti, plerumque singuli, interdum bini, oppositi, rarissime terni, verticillati, septis transversalibus cellularum suffultoriarum adjacentes praeter nonnumquam alios infra ortos.

Antheridia obovato-elongata, ca. 80 μ longa et 40 μ lata in latere ventrali pinnularum evoluta.

Gonimoblasti subgloboso-depressi, ca. 150 μ alti et 200 μ lati, nunc nudi, nunc 1—3 ramulis involucralibus involuti, terminales, in ramulis brevibus, 1, raro 2 cellulas continentibus, evoluti.

Organa fructifera in plantis inter se diversis orta.

Mauritius: Riambel, 8-12-50, R. E. V. no. 996.

The plant forms dense, soft tufts, 1—1½ cm tall upon *Cymodocea*.

The creeping, basal filaments are composed of cells up to about 100 μ long and 40 μ broad and are fixed to the host plant by means of short, unicellular rhizoids about 100 μ long and terminated by a broad disc (Fig. 27 *a*).

From the creeping filaments the erect ones are given out; in their lower part the filaments are about 50—80 μ broad and composed of cells about 250 μ long; from their middle the filaments taper slowly upwards to about 10—12 μ and are ended with obtuse tips. The wall of the main filaments is in the lower part of the thallus about 25 μ thick.

While the filaments in the basal part are simple or very little ramified, the ramification becomes profuse from about their

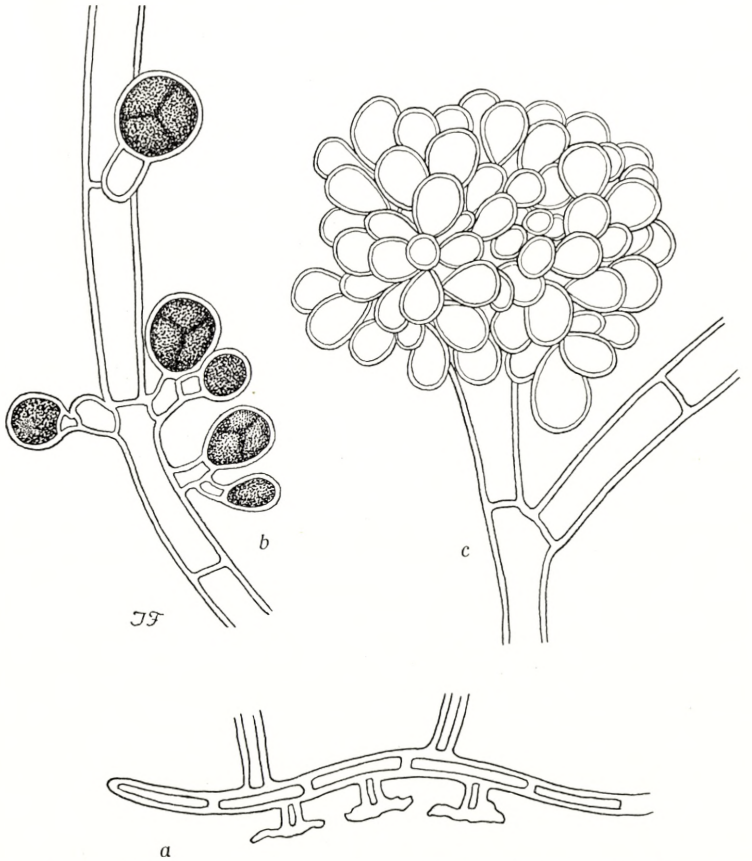

Fig. 27. *Spermothamnion Cymodoceae* nov. spec. *a*, fragment of the base; *b*, tetrasporangia; *c*, a gonimoblast. (*a*, ×125; *b*, *c*, ×400).

middle upwards. The ramification is rather irregular in all directions, in the upper parts unilateral. The branches are given out at acute angles.

The fructiferous organs are found in separate specimens.

I have seen few tetrasporic specimens. The tetrahedrally divided sporangia (Fig. 27 *b*) are stipitate, the pedicels issuing singly, sometimes oppositely and sometimes 3 in a whorl, are given out from the upper end of the mother cell. And in a few cases I have found one and even two pedicels with sporangia issuing in a row below that given out at the upper end of the cell. The same is the case for instance in *Aglaothamnion neglectum* Feldmann-Mazoyer, Ceramiacées, p. 460, fig. 181. The tetraspo-

rangia are often solitarily placed upon the pedicel, but often also a new pedicel with a sporangium is given out below the first or even more.

The sporangia are oblong-roundish about 50 μ broad and 70 μ long, and have thick walls; the pedicels are about 30—50 μ long.

Fig. 28. *Spermothamnion Cymodoceae* nov. spec. *a*, branchlets with antheridial bodies. *b*, branchlets with procarps; (*a*, *b*, ×450).

In the male specimens the subcylindrical, antheridial bodies (Fig. 28 *a*) are about 80 μ long and 40 μ broad; they are sessile, issuing from the ventral side at the upper end of the cells.

The procarps (Fig. 28 *b*) are terminally placed upon short branches issuing unilaterally. The gonimoblasts (Fig. 27 *c*) form large subglobose bodies about 200 μ broad and 150 μ high.

Some of the gonimoblasts are naked, but often a single, two, or three filaments are given out from the cell below the gonimoblasts; these branches in most cases grow into long shoots.

The large pyriform carpospores are about 50 μ long and 25 μ broad.

This species is surely closely related to *Spermothamnion repens* (Dillw.) Rosenv., "Mar. Alg. Denmark", Rhodophyceae, p. 298, fig. 202—211, but when compared in more detail several essential differences become evident.

Thus the Mauritian plant is much smaller than *Sp. repens*, which reaches a height of 5 cm and more.

Tetrasporangia sometimes issue in a row below each other upon a single cell, a pecularity which is not observed in *Sp. repens*.

The antheridial bodies are in *Sp. repens* both sessile and stipitated, while in the plant from Mauritius they are always sessile. Furthermore the antheridial bodies are ovate in *Sp. repens*, but in *Sp. Cymadoceae* ovate-cylindrical.

And lastly the gonimoblasts in *Sp. repens* are as a rule surrounded by a whorl of involucral filaments, while in *Sp. Cymodoceae* none or a few only are found.

A mixture of tetrasporangia, antheridial bodies, and gonimoblasts, as found in *Sp. repens*, has not been found in the Mauritian plant.

Subfam. 5. Lejolisieae.

Lejolisia Bornet.

1. **Lejolisia mediterranea** Bornet.

Bornet, E., Nouv. genre de Floridée, 1859, p. 91, pl. 1—2. Feldmann-Mazoyer, Geneviève, Recherches sur les Ceramiacées de la Mediterranée occidentale, Alger 1940, p. 198—99, figs. 77—78, et p. 377—79, fig. 148. Jean et Geneviève Feldmann, Sur la structure du procarpe et le développement du gonimoblaste chez *Lejolisia mediterranea*, Paris 1940.

In two collections from two different localities I have found this small alga, in both places it formed low soft tufts upon *Actinotrichia fragilis* (Forssk.) Børgs. As compared with the detailed description by Mme Feldmann-Mazoyer in her very valuable monograph of the *Ceramiaceae* p. 377 the Indian plant (Fig. 29) must be said to agree quite well with the Mediterranean one.

The creeping filaments are about 30 μ thick and the erect ones 14—20 μ near their base, 5 μ or less near their apical ends, reaching a length of up to 1 mm.

The great majority of the specimens were tetrasporic. The tetrasporangia develop upon short branchlets issuing from near the basal end of the erect filaments or more rarely also from the creeping filaments. The branchlets are often undivided, composed of a single or two cells provided with a

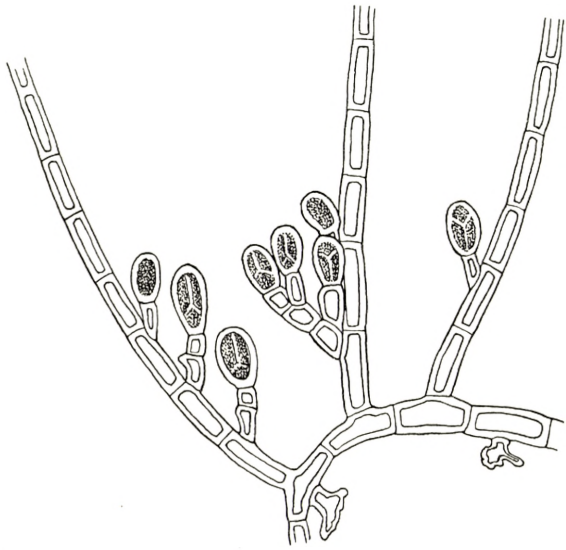

Fig. 29. *Lejolisia mediterranea* Bornet. Basal part of a specimen with tetrasporangia. (×200).

few ramuli. The sporangia are ovate, about 50 μ long and 30 μ broad.

In one of the collections (no. 751) some few procarps were found, but none of the small beautiful cystocarps (compare the above-mentioned figures of FELDMANN) were met with.

The specimen (no. 751) was gathered at a depth of 5—6 fathoms.

Mauritius: Pointe aux Roches, Dec. 12, 1947, R. E. V. no. 749. Port Louis Harbour, Aug. 21, 1947, F. D. OMMANEY no. 751.

Geogr. Distr.: Mediterranean Sea, Indian Ocean (Somali).

Subfam. 6. Wrangelieae.

Wrangelia C. Ag.

Wrangelia Argus Mont.

Alg. Mauritius, III, Ceramiales, 1945, p.18.

Having formerly seen only some fragments of this small alga I have lately received from Mauritius several specimens. Nearly all of these were tetrasporic, only once I have met with an antheridial specimen. As compared with the figure of the antheridia of *Wr. penicillata* I have published in Mar. Alg. D.W.I. vol. II, p.121, fig.132, several differences are found. Thus those in *W. Argus* are much larger, having a diameter of up to 100 μ; they are more densely built and the enveloping filaments are larger, often branched, composed of several cells, and forming rather an open cover round the antheridia, while those in *Wr. penicillata* consist of a single curved cell only.

The antheridial bodies are placed upon short branchlets.

When sterile *Wr. Argus* is easily known by the small acute cells ending the filaments.

As to the localities it is said: no. 1093 "attached to old block of cement, near reef"; no. 1111 "on rocks submerged at low tide"; no. 1123 "entangled with other algae".

Mauritius: Ilôt Barkly, 7-4-51, G. Morin no.1093. Pte aux Sables, 24-4-51, R. E.V. no.1111. Blue Bay, 8-5-51, R. E.V. no.1123.

Subfam. 7. Callithamnieae.

Aglaothamnion Feldm.-Mazoyer.

1. **Aglaothamnion Sarcodiae** nov. spec.

Frons caespitosa, ca. $\frac{1}{2}$ cm alta, non corticata, erectiuscula, ramosa, ramis spiraliter ortis aut superne alternis.

Axis centralis ex cellulis cylindricis compositus, in parte basali brevioribus, ca. 80—100 μ latis, in media parte crassioribus, ca. 125—150 μ latis, apicem versus gradatim tenuioribus, filamentis superioribus ramosissimis, cellulis apicalibus 8—10 μ latis. Pili hyalini praesentes.

Tetrasporangia subgloboso-pyriformia, ca. 50 μ longa et 35 μ lata, tetraedrice divisa, ex lateribus ventralibus ramorum orta.

Antheridia pulvinos elongatos in lateribus ventralibus ramorum formantia. Gonimolobi gemini, subgloboso-polygonui at sublobati, ca. 200 μ lati.

Mauritius: Riambel near Souillac, 23-11-50, R. E. V. no. 982.

Upon a specimen of *Sarcodia* spec. (no. 892) a small epiphyte formed smaller or larger soft tufts. I take it to be a new species of the genus *Aglaothamnion*.

The plant has a height of about 4—5 mm and is fastened to the host by means of rhizoids growing out from the lowermost cells in the main stem (Fig. 30 *a*); the rhizoids are irregularly ramified and by means of their pointed terminal cells well apt

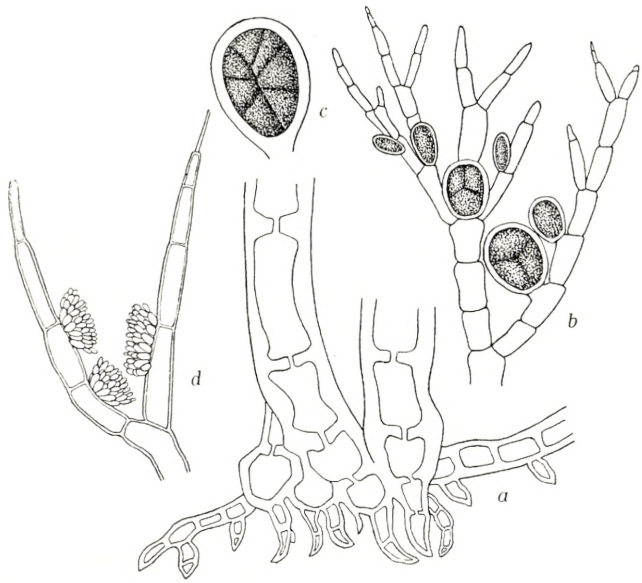

Fig. 30. *Aglaothamnion Sarcodiae* nov. spec. *a*, base; *b*, part of a tetrasporic specimen; *c*, a sporangium with many spores; *d*, part of an antheridial specimen. (*a*, × about 300; *b*, × 400; *c*, × 600; *d*, × 400).

to penetrate into the cortical layer of the host. The specimens occur singly, but often also crowded together and in that case their bases are fused, forming larger or smaller discs.

The size of the plant varies much, the tetrasporic specimens

seem to be most vigorously developed. Thus a tetrasporic specimen was nearly ½ cm high and had a main stem which in the lower half was about 200 μ broad with cells about 100 μ long only. But as a rule the cells of the stem near the base are about 80—100 μ broad, increasing upwards to about 125—150 μ near the

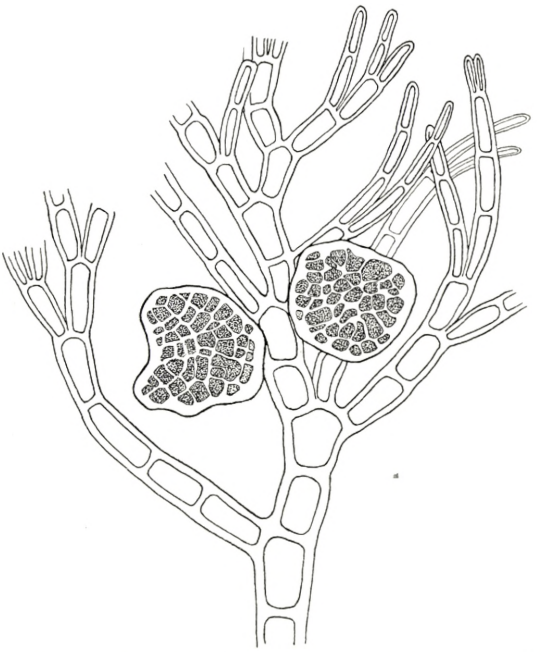

Fig. 31. *Aglaothamnion Sarcodiae* nov. spec. Part of a specimen with gonimolobes. (× about 300).

middle of the thallus, whence the breadth of the stem slowly decreases towards the tips, which are about 8—10 μ broad only; in the basal part of the stem the cells are shorter than their breadth, upwards increasing slowly in length, in the uppermost tips 3—4 times longer than the breadth. The tips of the apical cells are obtuse; some of the apical cells are terminated by hairs ca. 40—50 μ long and 3—4 μ broad. The walls of the cells are very thick in the lower part of the plant, about 20 μ, decreasing slowly upwards in the thallus. As to the ramification the branches are in the lower part of the thallus placed in a screw to the left, branches issuing in vigorous specimens from each joint; higher up in the thallus it becomes alternating.

The chromatophores are elongate ribbon-like or broader and more irregularly lobed; the cells have a single nucleus.

The tetrasporangia (Fig. 30 *b*) are placed in short rows upon the ventral sides of the branchlets, a single one given out from each cell; when young the sporangia are elongate-oblong. They are up to 50 μ long and 35 μ broad, roundish-pyriform in shape and have a thick wall. A vigorous tetrasporic specimen is crowded with sporangia.

The antheridial bodies (Fig. 30 *d*) form elongate tufts mostly upon the ventral sides of the cells; the tufts are about 20 μ high.

In a few cases 1—3 tetrasporangia were found in an antheridial specimen; but the sporangia were not normally divided, having several smaller spores (Fig. 30 *c*).

The gonimoblasts (Fig. 31) are formed by two gonimolobes the shape of which is roundish-polygonal or sublobed; the breadth of the gonimoblasts reaches a length of up to 200 μ.

Regarding related forms this species as to the shape of the gonimoblasts shows some likeness to the West Indian species *Callithamnion cordatum* Børgs., Marine Algae of the Danish West Indies, vol. II, p. 216, which Mme FELDMANN refers to her new genus *Aglaothamnion* (1940, p. 456—7). But being a deep-sea plant the West Indian plant differs much from the Mauritian one.

The small *Aglaothamnion monopodon* Børgs. described in Part III, 4, 1945, p. 19, differs so much from the much larger species described here, that I need not make any more detailed comparison between them.

The species described here was an epiphyte upon a specimen of *Sarcodia* spec. As to the locality it is said: "On seawaved slope of reef exposed to strong surf."

Fam. 2. ***Delesseriaceae.***

Subfam. 1. Nitophylleae.

Martensia Hering.

Martensia elegans Hering.

Alg. Mauritius, III, 4, 1945, p. 27.

Of this species, of which I have formerly seen very little material, I have recently received several fine specimens.

Many of the specimens were tetrasporic.

Regarding the place in the thallus in which the tetrasporangia are formed, SVEDELIUS in his large thorough work on *Martensia* (*l. c.* p. 27) points out that they are met with not only in the reticular part of the thallus but also in the coherent, not reticular part.

This was also the case in the specimens received lately, sporangia being present also in the coherent part of the thallus; but they are most numerous by far in the reticular part.

As to the locality it is said: "at base of large rocks submerged at low tide."

Mauritius: Pointe aux Sables, 24-4-21, G. MORIN no. 1100.

Subfam. 2. Sarcomenieae.

Claudea Lamouroux.

1. **Claudea multifida** Harvey.

HARVEY, W. H., in Hooker Journal. Bot., Vol. VI, p. 145; Ceylon Alg. Exsicc. no. 2. KÜTZING, Tab. Phycol., vol. XIX, pl. 56, fig. a—c. PAPENFUSS, G., Structure and Reproduction of Claudea multifida, Vanvoorstia spectabilis, and Vanvoorstia coccinea, 1937, p. 5.

This beautiful small alga originally found in Ceylon by HARVEY, where for instance near Galle it is rather common, I have later found in a collection of algae from South India gathered by Prof. PARTHASARATHY IYENGAR, and now some small specimens are present in a collection of algae from Mauritius.

Papenfuss in the paper quoted above has given a detailed description of this species to which reference is made here.

The specimens from Mauritius were sterile.

They were found as epiphytes upon pieces of *Valoniopsis pachynema*.

Mauritius: Riambel, 8-12-50, R. E. V. no. 1018.
Geogr. Distr.: Ceylon, South India.

Fam. 3. ***Rhodomelaceae.***

Subfam. 1. Laurencieae.

Laurencia Lamour.

1. **Laurencia papillosa** (Forssk.) Grev.

Alg. Mauritius, III, 4, 1945, p. 58.

Several specimens of this species are found in collections received later. I shall mention some of them.

No. 1944 is a small form, most probably from exposed shore; as to the locality it is said: "On reef in crevices of rocks."

No. 1947 on the other handis a large form, about the locality of which it is said: "Foot of beach in shallow sandy water."

No. 1054 is a smaller, more compact form which was "growing between large rocks near reef exposed at low tide".

And finally no. 1126 is a compact form growing on "Reef subjected to strong surf".

Mauritius: Riambel, near Souilla, 8-2-51, G. Morin no. 1044. Riambel, 8-2-51, R. E. V. no. 1047. Flic-en-Flacq, 22-2-51, G. Morin no. 1054. Blue Bay, 8-5-51, R. E. V. no. 1126.

2. **Laurencia nidifica** J. Ag.

Alg. Mauritius, III, 4, 1945, p. 47, figs. 21—24.

A small *Laurencia* found in a collection recently received from Mauritius shows a great likeness to the plant I referred to this species in the paper mentioned above.

The specimens are tetrasporic and the shape of the stichidia agrees very well with those pictured in fig. 23*a*.

The specimens were creeping "on block of old cement".

Mauritius: Ilôt Barkly, 7-4-51, G. MORIN no.1096.

3. **Laurencia decumbens** Kütz.

Alg. Mauritius, III, 4, 1945, p. 50, figs. 25—27.

Some small specimens (no. 1130) recently received agree very well with those which I formerly referred to this species.

As to the locality it is said: "Reef near Blue Bay, exposed site."

Mauritius: Blue Bay, 8-5-51, R. E.V. no.1130.

4. **Laurencia distichophylla** J. Ag.?

AGARDH, J., Spec. alg., vol. 2, p. 755; Epicrisis, p. 656. YAMADA, Y., Notes on Laurencia, 1931, p. 235.

Some few specimens (no. 1080) recently received from Mauritius are, I think, referable to this species, answering rather well to the descriptions of J. AGARDH and YAMADA; but having not seen any authentic specimens to compare with it I have put a ? after the specific name.

Fig. 26 shows one of the specimens; regarding the habit of this I want to point out immediately that the specimens surely have been dried under strong pressure and because of this the thallus has become broader than it actually is.

YAMADA, who has seen the specimens in AGARDH's Herbarium in Lund, gives (*l. c.*) a short description of one of the specimens (no. 37171) saying, "it is a very nice specimen, being about 7 cm high, flattened in frond, about 1.5 mm wide in the widest part, distichously pinnately branched, branches often *alternate*! with round angles and with stichidial branchlets arranged corymbosely." The specimens when compared with this description certainly in most respects show much likeness to this description, but some differences are present, thus the specimens are only ca. 5 cm high and having been pressed so much, their breadth has become greater than it actually is, but otherwise they agree

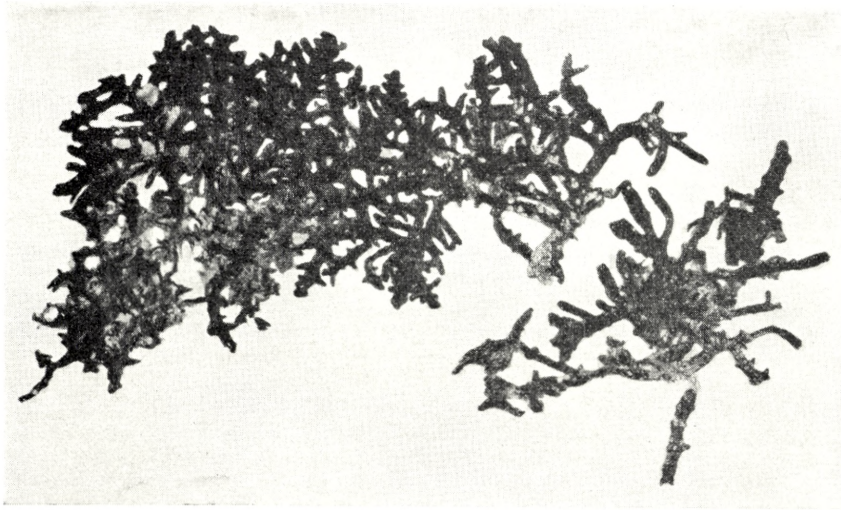

Fig. 32. *Laurencia distichophylla* J. Ag.? Habit of a specimen. (×1).

quite well with the description of the original specimens; most regrettably the specimens from Mauritius are sterile.

Regarding the structure of the thallus this, too, seems to be in good agreement with the description of YAMADA. Thus no thickening of the walls of the cells in the medulla is found, and the surface cells are not palisade-like.

While some of the specimens are from New Zealand those upon which YAMADA has based his description are "an e Cap b. Spei".

About the locality of the specimens is said only: "Closely adpressed to rock crevices."

Mauritius: Reef near Ile aux Aigrettes, 26-3-51, G. MORIN no. 1080.
Geogr. Distr.: New Zealand, Cape(?).

5. **Laurencia flexilis** Setch.

Alg. Mauritius, III, 4, p. 56, figs. 31—33.

Some well prepared specimens of this species has recently come from Mauritius.

Referring to my former description and figures of this plant I shall here restrict myself to giving only a habit figure of a well prepared tuft of the species (Fig. 33).

Laurencia tropica Yam. (1931, p. 233, figs. P, Q) seems ac-

Fig. 33. *Laurencia flexilis* Setch. Habit of a specimen. (×1).

cording to a specimen Professor YAMADA most kindly has sent me to come close to SETCHELL's species, but on the other hand the habit-figure of YAMADA's species (Pl. 20) is rather deviating.

The plant was collected in an exposed locality.

Mauritius: Riambel near Souillac, 8-2-51, G. MORIN no. 1046.

6. **Laurencia obtusa** (Huds.) Lamour.

var. *natalensis* (Kylin) Børgs.

Alg. Mauritius, III, 4, 1945, p. 59.

Some specimens (no. 1338) found in a collection of algae recently received from Mauritius seem to agree quite well with

the description and figures of *Laurencia natalensis* Kylin, which I (1945, p. 59) referred as a variety to *Laurencia obtusa*.

A transverse section of the thallus has shown that no special thickenings of the cell walls in the medulla are found.

About its habit and habitat it is said: "Dark greenish-brown, firmly attached to rocks exposed to surf."

Mauritius: Riambel, near Souillac, 8-2-51, R. E. V. no. 1038.

Fam. 3. ***Rhodomelaceae.***

Subfam. 1. Amansieae.

Amansia Lamour.

1. **Amansia glomerata** Ag.

Alg. Mauritius, III, 4, 1945, p. 43.

Two gatherings of this species are found in collections received later from Mauritius.

One of these, no. 665, most probably collected in an exposed locality, is quite typical, having a thallus forming small dense rosettes some few cm high and broad only.

The other specimen, no. 542, on the other hand, has long flattened branches, 3—4 cm long, but the characteristic arrangement of these in rosettes is well marked. This specimen reminds much of that mentioned in the paper quoted above p. 43 and which JADIN has referred to *Amansia multifida* Lamour but which I take to be a form of *A. glomerata* showing much likeness to HARVEY's figure in "Algae of Mauritius", 1834, p. 151, pl. 126.

The deviating appearance of this specimen is surely due to the fact that it has grown in a sheltered locality; but unfortunately no information about the locality is given.

Mauritius: Ilôt Barkly, 4-2-46, G. MORIN no. 542. Trou d'Eau Douce, 22-3-47, R. E. V. no. 655.

Subfam. 2. Polysiphonieae.

Roschera Sonder.

1. **Roschera glomerulata** (Ag.) Weber v. Bosse.

Weber van Bosse, A., Algues Siboga, p. 359. *Hutchinsia glomerulata* Ag., Systema Algarum, 1824, p. 158.
For more literature see Weber *l. c.* p. 359—362.

The specimens from Mauritius are in good apreement with Weber's description. They are without trichoblasts and no anastomoses between the apical cells of the branchlets are present. The Mauritius plant agrees quite well with that which I have gathered in India near Dwarka (Kew Bulletin, 1931, Nr. 1, p. 17, fig. 11) with the exception that in the Indian specimens numerous, long trichoblasts were present; but the Indian plant was also a male plant, the oblong, oblique antheridial bodies being formed by the trichoblasts.

With reference to the locality in which the plant was collected Dr. Vaughan writes: "Rather rare, grows on rocks exposed to strong surf."

Mauritius: Pointe aux Sables, 4-3-50, R. E. V. no. 903. Mahébourg reef, near Ile aux Aigrettes, 26-3-51, G. Morin no. 1084.
Geogr. Distr.: Widespread in Indian and Pacific Oceans.

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Additions to the lists in former parts.

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Index specierum.

with some few synonyms, the latter italicized.

Chlorophyceae.

Rhodophyceae.

Indleveret til selskabet den 3. april 1952.
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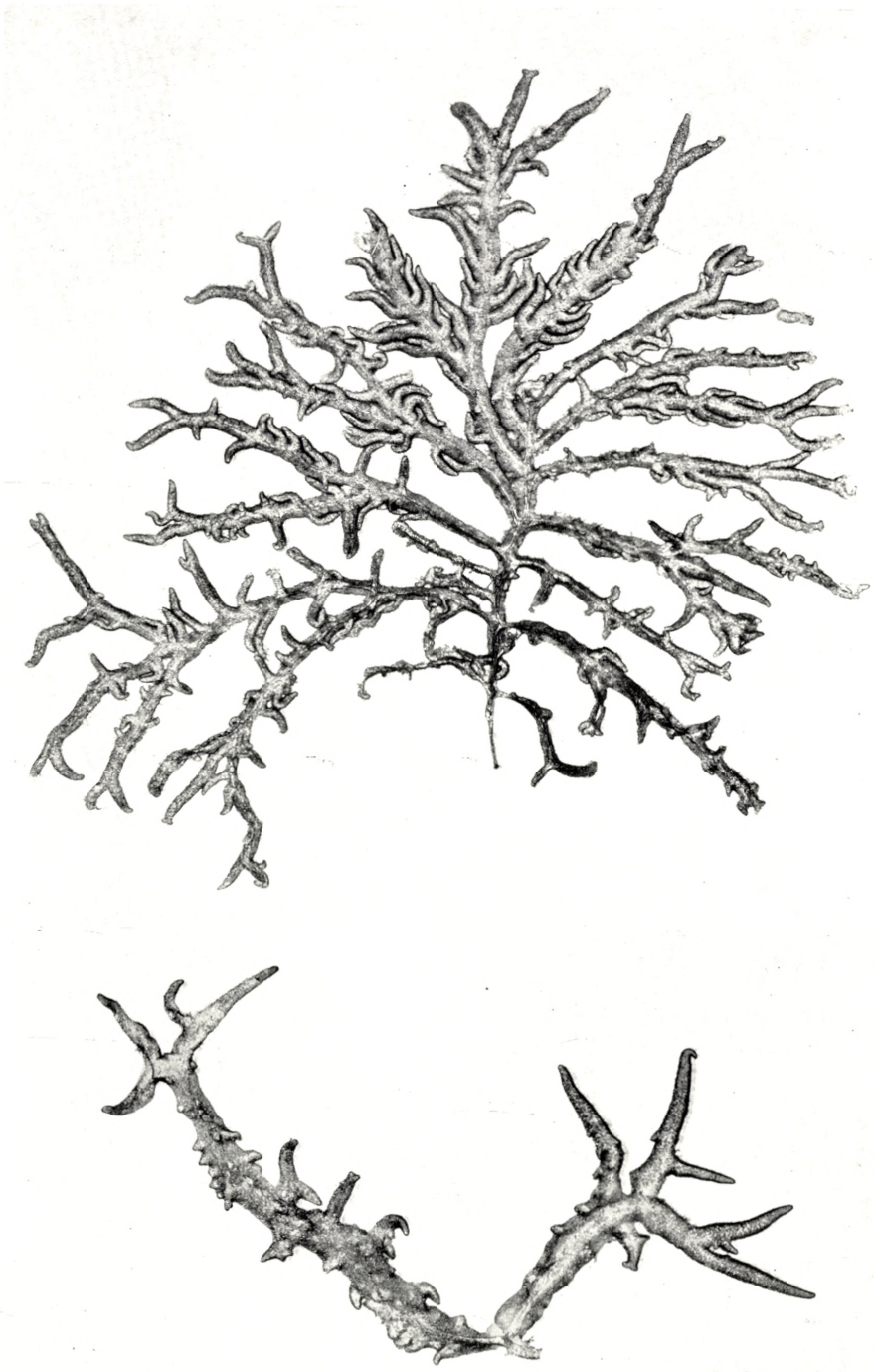

Trichogloea Requienii (Mont.) Kütz.
Above, a specimen ($\times {}^{2}/_{3}$). Below, a fragment of a specimen ($\times 1$).

PLATE II

Trichogloea spec. The specimen collected by Colonel *Pike* and found in the Kew Herb. (×about $\frac{2}{3}$).

Sarcodia mauritiana nov. spec. (×1).

Gracilaria spinuligera nov. spec. (×1).

Gracilariopsis dumosa (Harv.) nov. comb. (×1).

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