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SOME MARINE ALGAE FROM MAURITIUS

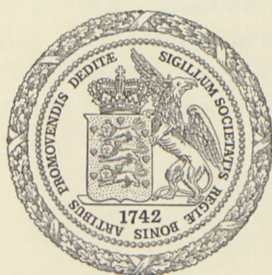
III. RHODOPHYCEAE

PART 3

RHODYMENIALES

BY

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KØBENHAVN

I KOMMISSION HOS EJNAR MUNKSGAARD

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This part of "Some Marine Algae from Mauritius" contains the species of the order *Rhodymeniales* which I have been able to identify in the present collections. That some few specimens surely belonging to this order are still left in the collections cannot be denied, but this material is poor and in a rather bad condition, so that it is impossible to determine it. This applies especially to material collected by the native DARUTY which often bears the stamp of having been picked up along the shore far from always in a fresh condition.

It has also been a great drawback that because of the war I have not been able to consult the herbarium of J. AGARDH in Lund, and incidentally the same applies to some of the former parts.

In the following list are mentioned only 10 species of this order from Mauritius, a not particularly large number which no doubt will be much augmented by later examinations. Several of the species are dredged in deep water and are therefore of special interest, just as several of these have proved to be species not yet described.

Besides upon Dr. JADIN's collection, in which DARUTY's gatherings are included and which belongs to the Muséum National d'Histoire Naturelle, Paris, the present part is based upon the collections made by Dr. TH. MORTENSEN and Dr. R. E. VAUGHAN.

V. Rhodymeniales.

Fam. 1. *Rhodymeniaceae*.

Subfam. 1. *Faucheae*.

Gloioderma J. Agardh.

1. *Gloioderma Robillardii* nov. spec.

Frons caespitosa, irregulariter globosa, usque ad 8 cm. ambitu expansa, tenuis, membranaceo-papyracea in sicco, in vivo verisimiliter mollis et lubricosa, irregulariter divisa, ex laciniis e basi repetite-dissectis, inferne attenuatis, ca. 3 mm. latis, ad apicem versus latioribus 8—9 mm. latis, mutualiter superpositis et verisimiliter anastomosantibus, marginibus sinuosis et integris, summis laciniarum emarginatis et acutis composita.

Sporangia cruciatim divisa in superficie thalli dispersa.

Mauritius: Without locality in the collection of V. DE ROBILLARD, Herb. THURET in Muséum National d'Histoire Naturelle, Paris.

Dr. HAMEL, Muséum National d'Histoire Naturelle, Paris has most kindly sent me an undetermined specimen of a *Florideae* from Mauritius collected by V. DE ROBILLARD and kept in Herb. THURET. Upon the label of the specimen BORNET has written: "Genus, ut videtur, novum ad *Rhodymeniaceas* (*Gloiocladieas*) forte referendum. Ex SCHMITZ in litt. 1894". Furthermore REINBOLD has added upon the label: "Vielleicht der Gattung *Gloioderma* (*Horea*) identisch, jedenfalls sehr ähnlich".

After an examination of the specimen (Fig. 1) in question it seems to me, as to REINBOLD, that it is referable to the genus *Gloioderma*. The anatomy agrees with this genus and the sporangia being cruciately divided and scattered over the surface of the thallus likewise agree with it; but it is of course a drawback that the cystocarps are unknown.

Fig. 2 shows a small piece of a transverse section of the thallus with sporangia. It consists in the middle of a layer of large cells the largest of these in the figure being $120\ \mu$ long and $100\ \mu$ broad. On both sides of these cells there is a layer of much smaller cells oval in transverse section; the innermost are the largest, of variable size up to about $60\ \mu$ long and $25\ \mu$ broad,

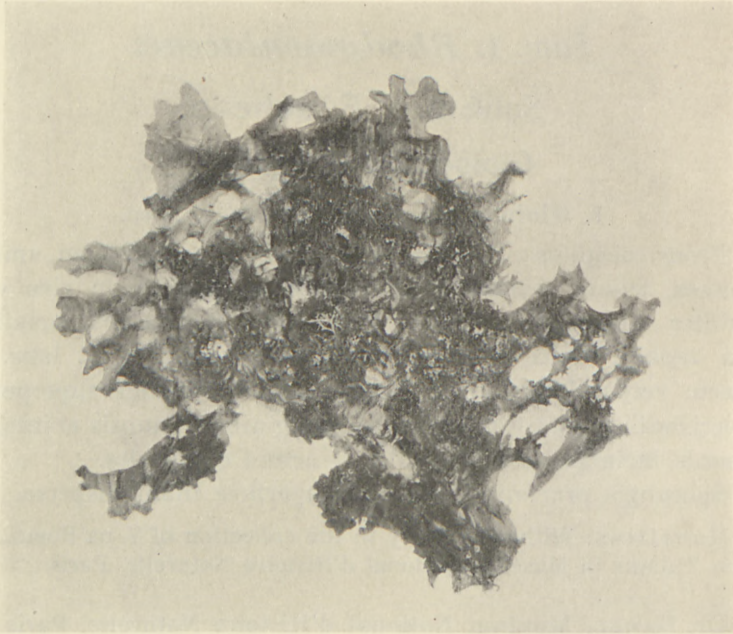


Fig. 1. *Gloioderma Robillardii* Borgs. The original specimen in Herb. THURET. Natural size.

decreasing in size towards the cortical layer which is formed by thin ramified filaments composed of small oval cells with rather a long distance between the cells. These are about $1-2\ \mu$ broad.

Where the sporangia are developed in the cortical layer the filaments become longer, more straight and less ramified.

The consistence of the thallus in the dried condition is papyraceous-cartilaginous but when saturated with water it quickly swells and becomes very soft and lubricous.

As to the habit of the plant, when living it most probably forms roundish clumps, the lobes of the thallus radiating to all sides, separated by smaller or larger openings. The lobes

are about 3—8 mm. broad, sometimes broader sometimes narrower, irregularly divided or subfurcated and often anastomosing. The terminal lobes are more or less emarginate and broadly rounded above.

The habit of this alga seems to agree very well with a plant from the Malayan Archipelago which MME WEBER (1928, p. 458, fig. 195) has determined as *Faucha*(?) *mollis* Howe var. *intermedia*. The plant of MME WEBER is cystocarpic, the cystocarps

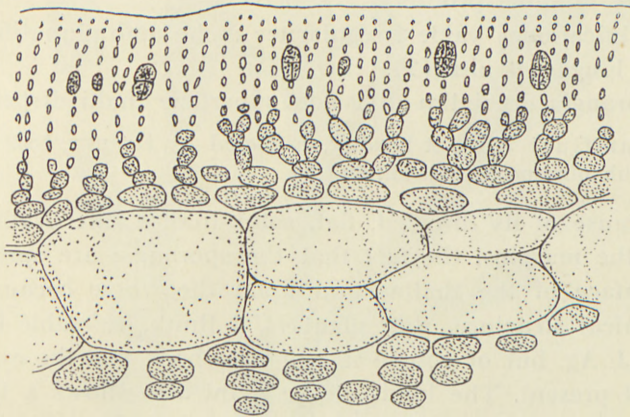


Fig. 2. *Gloioderma Robillardii* Børgs. Transverse section of the thallus with tetrasporangia. ($\times c. 300$).

not being provided with hornlike processes this feature places it in the genus *Faucha*, while hornlike processes are present in *Gloioderma*. On the other hand, the specimen I have had for examination is, as stated above, tetrasporic and as the tetrasporangia are scattered over the surface of the thallus, as is the case in *Gloioderma*, it is referred to this genus, since in *Faucha* the sporangia are placed in the sori.

Regarding *Faucha*(?) *mollis* Howe, *Phycological Studies*, V, 1911, p. 507, pl. 32 and pl. 33, fig. 6, then this species is described upon sterile material only and, as hinted by HOWE who placed a ? after the generic name, the determination is therefore doubtful. Moreover the plant from Mauritius is also rather different from that from Mexico, the thallus of the Mexican plant being larger with broader segments, and the anatomy being also different, so it seems most correct to regard it as a separate species.

The plant from Mauritius must also be compared with *Gloioderma(?) expansa* Weber (1914, p. 283, pl. 18, figs. 28—29) but this species is in all respects larger with much broader lobes; also its anatomical structure is different; thus the cortical layer has not a filamentous character.

2. *Gloioderma mauritiana* nov. spec.

Frons plana, furcata, ca. 1 cm. lata ad apicem vertens angustior, ex margine prolifera.

Prolificationes valde irregulariter dichotomo-pinnatifidae, ca. $\frac{3}{4}$ cm. longae et ultra(?).

Sporangia cruciatim divisa in superficie thalli dispersa.

Mauritius: Without locality, collected by DARUTY, 1892 in Herb. JADIN sub nomine *Suhria vittata*.

Because of its furcated, flat, solid thallus, the proliferations along the margins, the fact that the sporangia are spread over the surface of the thallus and upon the whole because of its anatomical structure, this plant is, I think, referable to *Gloioderma* J. Ag. but of course it is a drawback that the cystocarps are not present. The habit of the plant also shows a fair likeness to Australian species, for instance *Gloioderma fruticulosum* (Harv.) De Toni and *G. halymenioides* (Harv.) De Toni according to the illustrations in HARVEY, Phycologia Australica. The plant may also as to its habit be very like *Meristotheca tasmanica* J. Ag. according to KYLIN's figure of the original specimen in Herb. J. AGARDH; but according to KYLIN (*Gigartinales*, 1932, p. 29, pl. 12, fig. 29) this plant has a structure like that of *Faucheopsis*.

Figure 3 shows a photographic representation of the specimen which is a fragment only, and it cannot therefore be said how large the plant may grow. The fragment is 13 cm. long and below the thallus is about 1 cm. broad. The flat thallus is repeatedly furcated; along the margins numerous proliferations (Figs. 3, 4), very irregular in shape, are given out, the largest ones in the specimen reaching a length of about $\frac{3}{4}$ cm.; upon the flat side of the thallus no proliferations are found.

As to the anatomical structure (Fig. 5), the middle of the thallus is occupied by large cells, oblong in transverse section



Fig. 3. *Gloioderma mauritiana* Børgs. Habit of the original specimen.
Natural size.

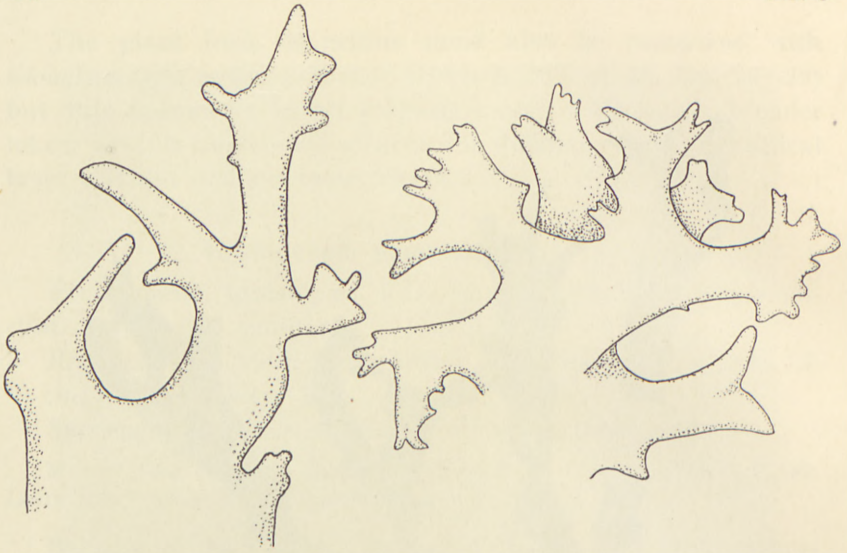


Fig. 4. *Gloioderma mauritiana* Børgs. Some of the marginal proliferations.
(about $\times 15$).

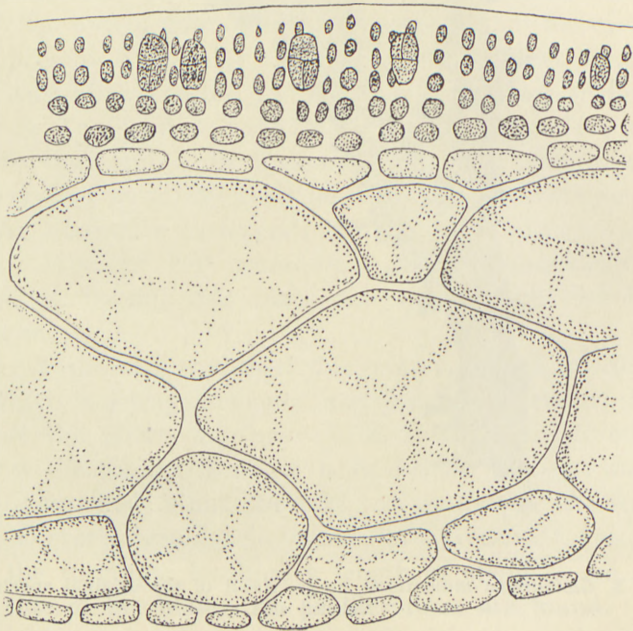


Fig. 5. *Gloioderma mauritiana* Børgs. Transverse section of the thallus.
(about $\times 300$).

and covered on both sides by smaller ones decreasing in size towards the periphery; from the outmost of these cells issue anticlinal assimilating filaments forming the cortical layer.

The tetrasporangia are formed in the cortical layer, being scattered over the surface of the thallus, and likewise found in the proliferations. They are cruciately divided.

The plant of which only a single specimen is found is mentioned in JADIN'S list p. 163 as *Suhria vittata*. No exact locality is given. JADIN writes about it: "Cette plante paraît rare, je ne l'ai pas trouvée et n'ai reçu qu'un exemplaire recueilli sur la plage par DARUTY".

Faucheia Mont.

1. *Faucheia profunda* nov. spec.

Frons pygmæa, ca. 2—3 cm. alta, subcaespitosa aut flabellatim expansa, irregulariter lacinulata et lacerata, laciniis inferne angustioribus ad apicem vertens latioribus, cornubus damae per-similibus, per sinus rotundatos separatis, marginibus saepe proliferis et hic illic cum lobis vicinis anastomosantibus.

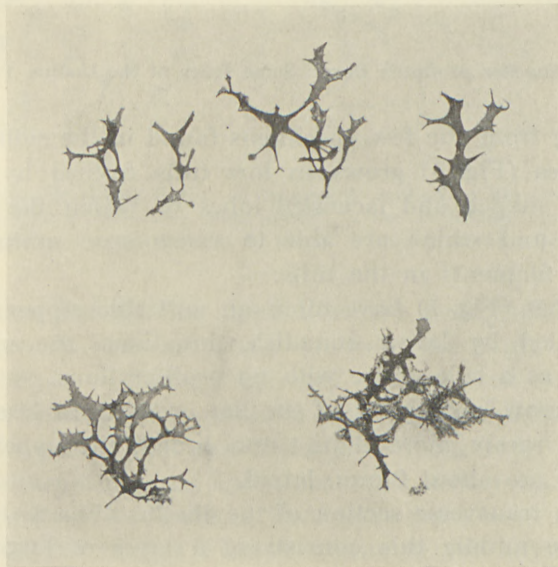


Fig. 6. *Faucheia profunda* Børgs. Habit of the original specimens. Natural size.

Substantia in sicco cartilagineo-membranacea.

Color plantae pulchre roseus-sanguineus.

Tetrasporangia in soros aggregata, ca. $35\ \mu$ longa et $24\ \mu$ lata.

Cystocarpia non praesentia.

Mauritius: Between Gunner's Quoin and Flat Island, dredged at a depth of 25 fathoms, 15. Oct. 1929, TH. MORTENSEN.

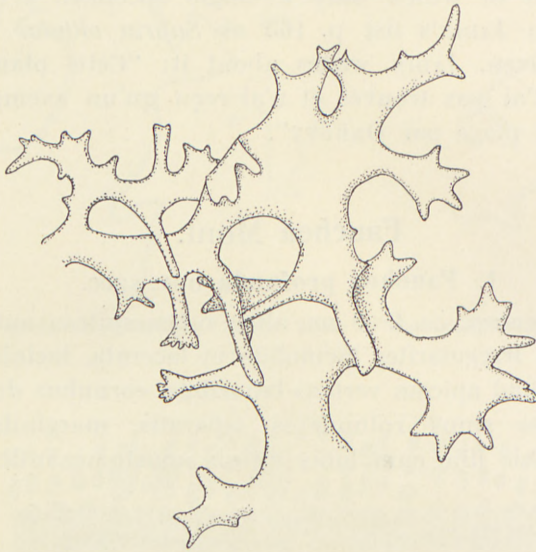


Fig. 7. *Fauchea profunda* Børgs. Some lobes of the thallus. ($\times c. 5$).

Judging from the few specimens found in the collection this little species (Fig. 6) grows in low tufts formed by the very irregularly shaped and lacerated lobes of which the thallus is composed, and which are able to anastomose mutually with neighbour filaments in the tufts.

The lobes (Fig. 7) have often an antlerlike appearance and are separated by larger roundish sinuations, the margins of which are as a rule entire with no proliferations.

The narrow basal parts of the flat or more or less sinuated thallus are rarely more than 1 mm. broad, the upper lobes of the thallus are about 2 mm. broad.

From a transverse section of the thallus (Fig. 8 a) it is seen that in the middle this consists of a layer of large subrectangular cells about $90\ \mu$ thick and often more than $200\ \mu$ long;

in places also several layers of smaller cells are found; when observed from above the large cells are elongated-polygonal (Fig. 8 c). On both sides of the large cells some smaller ones are found from which issue the short assimilating filaments a few times divided. While the innermost cells in the assimilating

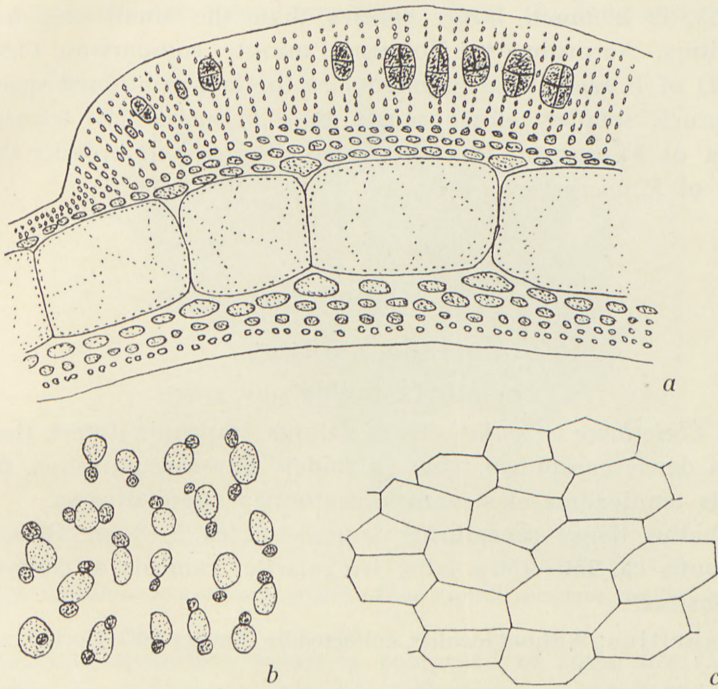


Fig. 8. *Fauchea profunda* Borgs. a, transverse section of the thallus with a sorus. b, peripheral cells seen from above. c, the medullary layer seen from above. (a, about $\times 400$; b, about $\times 700$; c, about $\times 75$).

filaments are oblong, the uppermost are nearly globular. The small peripheric cells are given out from the larger ones below to a number of 1–2 (Fig. 8 b); they are scattered over the surface of the thallus with rather a long distance between them.

Only in one of the specimens have I succeeded in finding a single tetrasporic sorus and since most unfortunately, before I had discovered the sorus, I had made transverse sections of this part of the thallus I am not able to say anything about the shape of it. A transverse section (Fig. 8 a) of the sorus

shows that it has a well-marked edge, vaulted up above the surface of the thallus; the sorus is about 110μ thick, having nearly the same thickness as that of the vegetative thallus.

Fauchea microspora Bornet (1890, p. 139), collected by RODRIGUEZ in deep sea near the Balearics, which Mme WEBER has found in a collection of algae from the Indian Ocean (1914, p. 282), is a much larger species than the small one from Mauritius. According to BORNET's minute comparison (1890, p. 142) of *F. repens* and *F. microspora* the last-mentioned species has much smaller tetrasporangia than *F. repens*. The tetrasporangia of *F. profunda* are somewhat shorter and broader than those of *F. microspora*.

Subfam. 2. Rhodymenieae.

Coelothrix Børgs.

1. *Coelothrix indica* nov. spec.

A *Coelothrix irregulari* (Harv.) Børgs. imprimis differt, thallo magis dense caespitoso, sine rhizoideis anastomosantibus, filamentis tenuioribus et structura anatomica etiam diversa.

Thallus dense caespitosus, suberectus, ca. 5–6 cm. altus, ex filamentis ca. $250\text{--}450\mu$ latis, irregulariter ramosis et contextis compositus.

Mauritius: Without locality, collected by DARUTY 1893 (Herb. JADIN).

Of the monotypic genus *Coelothrix* hitherto only known from the West Indies I have found a specimen in Dr. JADIN's collection which even if it is nearly related to the West Indian plant (*Coelothrix irregularis* (Harv.) Børgs., 1920, p. 389, figs. 373–4) nevertheless seems to be the representative of another species. The specimen forms a dense tuft in shape and also in size very like a shaving brush (Fig. 9). The rather slender filaments are densely crowded and stick together, and this though I searched in vain for the groups of rhizoids which are so common in the West Indian plant and by means of which the filaments in this very irregularly shaped plant are connected. The filaments in the plant from Mauritius have a diameter of $250\text{--}400\mu$ rarely up to 450μ , while those of the type-specimen

of *Coel. irregularis* (collected by PALLE BANG) are about 300—500 μ ; but in the specimen of this species published in *Phycotheca Bor.-Amer.* no. 18 from Key West the breadth of the filaments is up to 900 μ .

The anatomical structure too presents differences. Upon a transverse section (Fig. 10) of the thallus it is seen that the epidermal cells are oblong-lanceolate, about 23 μ long and 8—9 μ



Fig. 9. *Coelothrix indica* Børgs. Habit of the typical specimen. Natural size.

broad. The medullary tissue is composed of some few layers of cells, the largest ones having a diameter of about 23—38 μ . The innermost cells upon which the glands are placed, facing the cavity in the interior of the thallus, are smaller. When compared with a transverse section of the West Indian plant the epidermal cells are proportionally shorter and broader, about 20 μ long and 12 μ broad. The medulla is thicker and composed of larger cells up to 50 μ broad. This statement is taken from the type specimen of *C. irregularis*; in the stouter plant from Key West the epidermal cells are about 23 μ long and 12—16 μ broad, the medullary tissue is very thick and the diameter of the larger cells is up to 60 μ long. When the peripheric cells of the cortical layer of the plant from Mauritius are viewed (Fig. 11) from above, the shape of the cells is irregularly elong-

ated angular of variable size, the larger cells attaining a length of about 45μ and a breadth of $16-18\mu$. In the specimen from St. Croix these cells are proportionally shorter and broader but a comparison is always difficult as the shape of the peripheric cells varies a good deal in different parts of the thallus.

Taking into consideration the differences mentioned above between the West Indian plant and that from Mauritius it seems

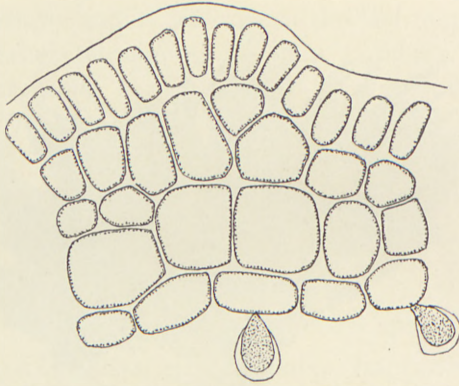


Fig. 10. *Coelothrix indica* Børgs. Transverse section of the thallus. (about $\times 300$).

to me justifiable to keep the two forms, even if nearly related, specifically separated.

Most regrettably the specimen from Mauritius is sterile.

About the fruiting of *Coelothrix* I have mentioned in my paper (1920, p. 391) the rather few and incomplete details which were known when I described the genus. It is somewhat strange that in none of the papers it is said directly that the sporangia are cruciately divided, but as the plant was referred to the genus *Cordylecladia*, which has cruciately divided sporangia, it is of course justifiable to presume that in *C. irregularis* also the sporangia were cruciately divided.

TAYLOR also in his later published work: *The Marine Algae of Florida*, 1928, p. 160 gives no more exact information about its fructification. To be sure TAYLOR was the first to publish a habit figure of the thallus with stichidia but about the fructification he only says: "reproduction by tetraspores carried in short swollen ovoid pedicellate branches". Meanwhile there

seems to be no doubt that the sporangia of *Coelothrix* are cruciately divided (like those of *Cordylecladia*).

When therefore KYLIN, 1931, p. 31, in some critical remarks about *Coelothrix* and its systematic position pointed out concerning the tetrasporangia that they are tetrahedrally divided and this fact made its systematic position uncertain, I again made a thorough search in the literature for information about

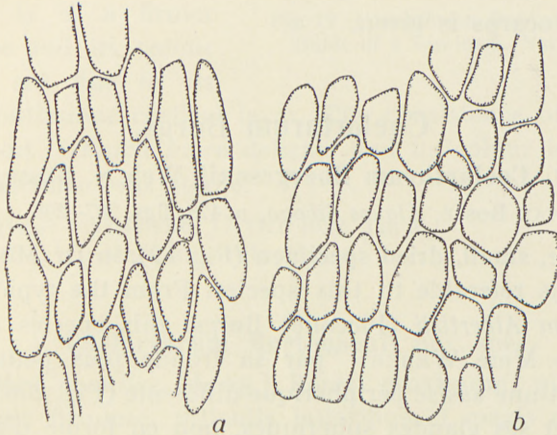


Fig. 11. Cortical cells of *Coelothrix* seen from above. *a*, from the specimen of *C. indica* Børgs. *b*, from the typical specimen of *C. irregularis* from St. Croix. (about 300).

the division of the tetrasporangia, and being unable to find anything else than that mentioned above I asked Professor KYLIN whether his statement was based upon his own investigations not yet published or, if this was not the case, where it was to be found. Professor KYLIN has now in a letter dated 25. Febr. 43 most kindly informed me that he himself has not seen the sporangia and that at present he cannot remember whence his information is derived. Finally KYLIN writes (translated into English):

“The information that the sporangia of *Coelothrix* are tetrahedrally divided I presume to be wrong, wheresoever it may have come from”.

According to this declaration I think we can leave out of consideration the question of tetrahedrally divided sporangia in *Coelothrix*.

When I described the plant in Mar. Alg. D. W. R., vol. II, p. 389 I placed the new genus in the Subfam. *Rhodymenieae* of the Fam. *Rhodymeniaceae* just before the genus *Chrysymenia* at that time still comprehensive, to which genus and some of its sister genera it is surely most nearly related; and there it has also been placed in the present paper.

Meanwhile, for the final conclusion as to the systematic position of *Coelothrix* we must wait until an exact description of the cystocarps is given.

Coelarthrum Børgs.

1. *Coelarthrum Boergesenii* Web. v. Bosse.

WEBER VAN BOSSE, *Algues Siboga*, p. 473, figs. 207—208.

A single, small, dried specimen (Fig. 12), in Dr. MORTENSEN'S collection is referable to this species. From the typical species *Coelarthrum Albertisii* (Piccone) Børgs. this species differs according to Mme. WEBER: "par sa fronde plus petite, par sa paroi ayant une assise périphérique différente (Fig. 208), ses anastomoses et ses glandes sphériques, non en forme d'étoile."

Of these characters it is especially the cortical layer which makes the difference from that in *Coelarthrum Albertisii*, as it is coherent and formed by 1—2 layers of small cells. As to the anastomoses of the thallus I have not been able to ascertain this in the small dried specimen from Mauritius but such anastomoses are surely also present in *Coelarthrum Albertisii*. And as for the small irregularly stellate cells upon which the spherical gland-cells are placed in *Coelarthrum Albertisii* (comp. my figures 390—391 in Mar. Alg. D. W. I., vol. II, pp. 404—6) I have not, to be sure, been able to find them in the dried material from Mauritius, and thus convince myself that they are like those in *Coel. Albertisii*, but when Mme. WEBER says that the gland cells are spherical, not stellate in *Coel. Boergesenii*, according to which statement it must be supposed that the gland cells in *Coel. Albertisii* should be stellate, this supposition must be said to be due to a misunderstanding. It is the mother-cells carrying the gland-cells which are stellate, while the glands themselves are spherical; compare my figures in Mar. Alg.

D. W. I., p. 405, figs. A and E and pag. 406, fig. 391.

After a comparison with West Indian material the habits and shapes of the plants from both areas seem to be rather alike, but the thallus of the plant from Mauritius is of a firmer consistence and its colour a darker red due to its

thicker, continuous cortical layer. The consistence of the West Indian plant is much more delicate and its colour is rosy-red.

The specimen was sterile.

Mauritius: Flat Island, 17. Oct. 1929, TH. M.

Geogr. Distr.: Malayan Archipelago.

1. *Coelarthrum Mortensenii* nov. spec.

Coelarthro opuntiae (J. Ag.) Børgs. proximum, quod tamen thallo magis firmiore, articulis latioribus et magis ovalibus et structura anatomica diversa a nostra specie praecipue distinguitur.

Frons rosea, subcylindrica vel subcomplanata, circiter 10 cm. alta et ultra, identidem furcata et articulata.

Articuli elongati-oblongi in parte basali ca. 2½ cm. longa et 4 mm. lata ad apicem vertens minores et magis obovales.

Substantia thalli molliuscula.

Tetrasporangia cruciatim divisa in superficie thalli dispersa. Cystocarpia singula hic illic praesentia.

Mauritius: Between Gunner's Quoin and Flat Island, dredged at a depth of 25 fathoms, 15. Oct. 1929, TH. MORTENSEN.

DR. MORTENSEN'S collection contains some specimens of a *Coelarthrum* which I at first presumed to be the same as the Indian *Coelarthrum Opuntia* (J. Ag.) Børgs., but after a comparison with the figure of the type specimen in J. AGARDH'S herbarium (compare KYLIN, Rhodymeniales, p. 33, pl. 20, fig. 46) and with MME. WEBER'S good figure in *Algues Siboga*, p. 408, pl. XVI, fig. 7 as also with a specimen from South India found

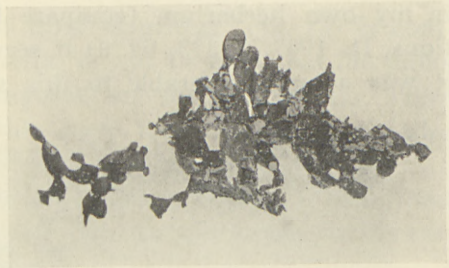


Fig. 12. *Coelarthrum Boergesii* Weber.
Habit of a specimen. Natural size.

in my own herbarium (compare the figure of it in Contributions, II, 1937, p. 333, fig. 9) it seemed to me doubtful whether it was actually referable to this species. Consequently I have



Fig. 13. *Coelarthrum Mortensenii* Borgs. Habit of the original specimen.
Natural size.

made, too, some comparison of the anatomical structure of the two plants and as I have also found some differences here I have no hesitation in considering the plant from Mauritius as a distinct species.

If the habit of the plant from Mauritius (Fig. 13) is compared with that of *Coel. Opuntia*, it will be seen that the joints of which the former is composed are much slenderer, more elongated oblong with cuneate base than the much broader joints obovate in shape found in *Coel. Opuntia*.

In the habit figure of the large specimen (Fig. 13) the joint to the left above the long basal joint in the figure, is $1\frac{1}{2}$ cm.

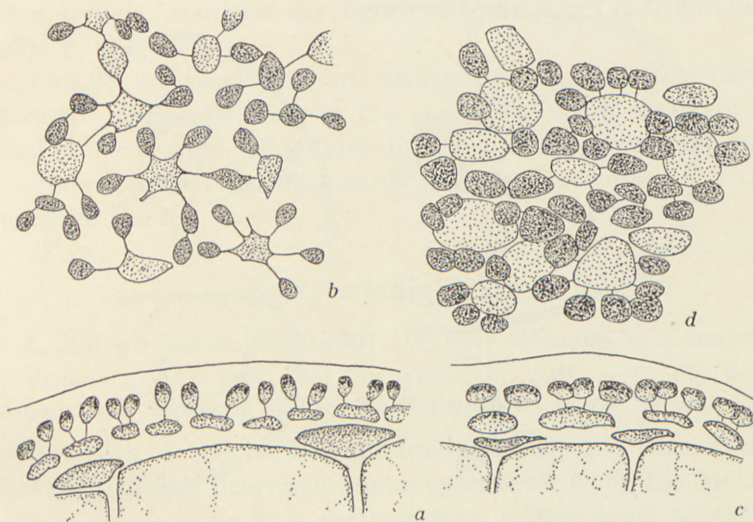


Fig. 14. Transverse sections and surface view of *Coelarthrum Mortensenii* Børgs. (a, b) and of *Coelarthrum Opuntia* (J. Ag.) Børgs. (c, d) respectively. (\times about 500).

long, above 4 mm., decreasing slowly to the base; and the joint to the right is at the top 3 mm. broad, increasing downwards to 4 mm. and then tapering to the cuneate base where it is 1 mm. broad below. Upwards in the thallus the joints decrease in size, especially in length, becoming more oblong. From the upper ends of each joint two, in more rare cases, three joints are given out. The colour of the thallus is rosy red and its consistency is rather delicate; this may perhaps have some connection with the fact that the plant was dredged in deep water.

As to the anatomical structure of the plant from Mauritius the cortical layer in transverse section (Fig. 14 a) is composed of about two layers of cells, some larger cells below, from which two to four or more obovate cells are given out towards the

periphery. When the peripheric tissue is observed from above (Fig. 14 *b*) the larger cells below are found to be very irregularly shaped, often even stellate and from the corners of these cells the more coloured obovate, peripheric, assimilating cells are given out. As the figures show, these cells are rather distantly placed. For the sake of comparison I have made some similar drawings of the cortical layer of *Coel. Opuntia* (Fig. 14 *c, d*).

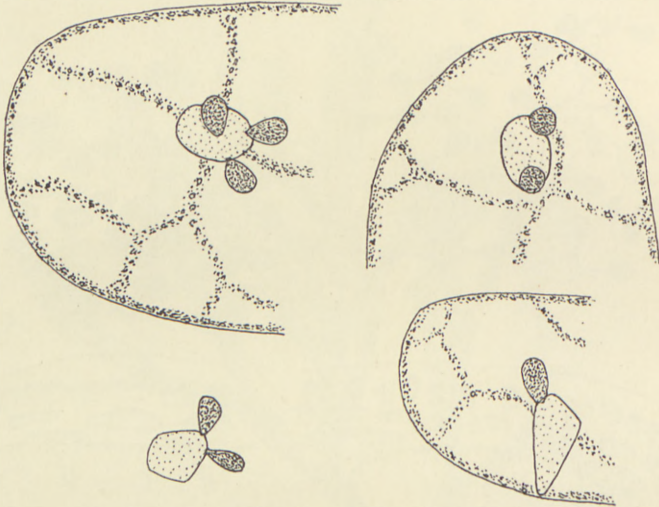


Fig. 15. *Coelarthrum Mortensenii* Borgs. Fragments of the large cells of the wall facing the cavity carrying small cells with glands. (\times about 200).

A glance at the figures of both plants is all that is needed to see the differences prevailing, the cortical layer in *Coel. Opuntia* being much more firmly built than that of *Coel. Mortensenii* owing to the fact that the peripheric cells as well as those below are larger and much more densely placed than those of *C. Mortensenii*. Also the shape and size of the cells is different, as those of *Coel. Opuntia* are more roundish and the subepidermal cells not stellate.

The diameter of the peripheric cells of *Coelarthrum Opuntia* is $5-12\mu$ long while in *Coel. Mortensenii* by far the greater number of them are about 5μ broad, only some few larger ones up to 8μ .

Below the cortical layer there is a single layer of large clear cells which in *Coel. Mortensenii* are up to about 500μ long and

nearly half as broad. Upon those facing the cavity in the interior of the thallus small cells are found here and there, provided with 1—3 glands (Fig. 15), the shape of these small cells is mostly oblong, also more irregularly polygonal, but real stellately shaped ones, as these usually are in *Coelarthrum*, I have not found. The large cells in *Coel. Opuntia* are roundish-polygonal and much smaller, having a diameter of only 110—150 μ , and the cells carrying the glands are more irregularly shaped, often stellate; compare my figure 10 *a* and *b* in Contributions II, 1937, p. 334.

Two of the specimens are tetrasporic; the cruciately divided sporangia are scattered over the surface; a small fragment of a plant is cystocarpic. Like those in *Coel. Opuntia* (comp. my figure mentioned above) the cystocarps are developed here and there upon the thallus.

Botryocladia Kylin.

1. *Botryocladia Kuckuckii* (Weber) Yamada et Tanaka.

YAMADA and TANAKA, Mar. Alg. Yonakuni, 1938, p. 77. figs. 8—9. — *Chrysymenia Kuckuckii* Weber, Alg. Siboga, 1928, p. 466, fig. 199.

It seems to me rather questionable whether *Chrysymenia Kuckuckii* Weber described upon specimens from the Malayan Archipelago is to be kept separate from *Chrysymenia Skottsbergii* Børgs. from Easter Island established by me in the year 1920 in my paper on the algae of this island. In spite of both plants being so very nearly related, Mme. WEBER when describing her species has evidently not taken into consideration the plant from Easter Island.

As I have in the material of algae from Mauritius some very good specimens of a plant (Fig. 16) of the same type as Mme. WEBER's species mentioned above, I have made a comprehensive comparison of this plant with that from Easter Island and have arrived at the result that they are very much alike not only as to their habit but also in their anatomical structure, both plants having a continuous firm cortical layer and the gland-cells placed in groups up to a number of 10 upon the mother cell. To be brief, the difference between the two species is that *Chrysymenia Kuckuckii* seems to be in all respects some-

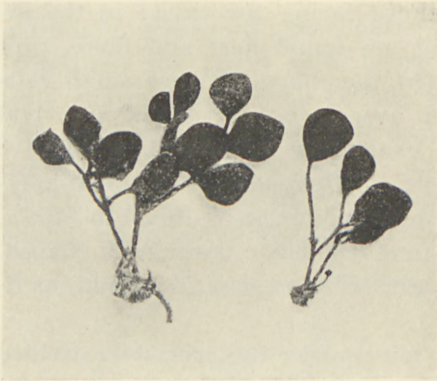


Fig. 16. *Botryocladia Kuckuckii* (Weber) Yamada et Tanaka. Habit of specimens. Natural size.

what larger than *Chrysymenia Skottsbergii* and to this must be added as perhaps the most essential difference that the wall of the vesicles of *Chrysymenia Kuckuckii* in transverse section proves to be composed in most cases of two layers of large cells reaching a thickness of about $150\ \mu$, while that of *Chrysymenia Skottsbergii* has mostly one layer only; here and there, however, two layers are

found and the thickness of the wall is about $100\ \mu$. Compare as to this feature MME. WEBER'S fig. 199 and YAMADA and TANAKA'S fig. 9 with my figure 50 c.

Concerning the relative sizes of the two species, the vesicles of *Chrysymenia Skottsbergii* are 5–6 mm. long and 4–5 mm. broad, while those of *Chrysymenia Kuckuckii* are about 6–8 mm. long and 6 mm. broad. And similarly, in accordance with this the innermost large cells in the wall of *Chrysymenia Skottsbergii* are up to about $100\ \mu$ broad, while those in *Chrysymenia Kuckuckii* may reach a breadth of $120\text{--}150\ \mu$.

Fig. 17 shows some of the large cells of both plants drawn to the same scale of magnification.

The cortical cells of the plant from Mauritius are roundish when seen from above, about $7\ \mu$ broad; in transverse section they are oblong.

Occasionally groups of gland cells are found, but not in great number. The gland cells (Fig. 18) issue from small somewhat polygonal cells protruding somewhat above the surface of the surrounding large cells of the wall facing the cavity in the interior of the vesicles. These cells in some cases carry only a single or a few glands, in some they are densely covered by glands up to a number of 10 or more; the glands vary a good deal as to size, the larger ones having a diameter of about $35\ \mu$. The arrangement and shape of the gland cells of the plant from

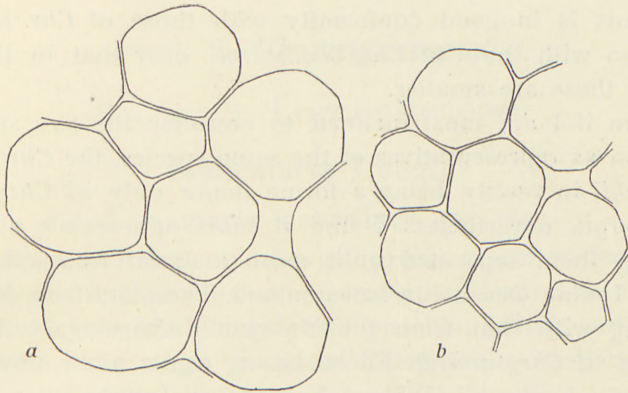


Fig. 17. Some of the large cells of the wall. *a*, from the plant from Mauritius; *b*, from that of Easter Island. (\times about 125).

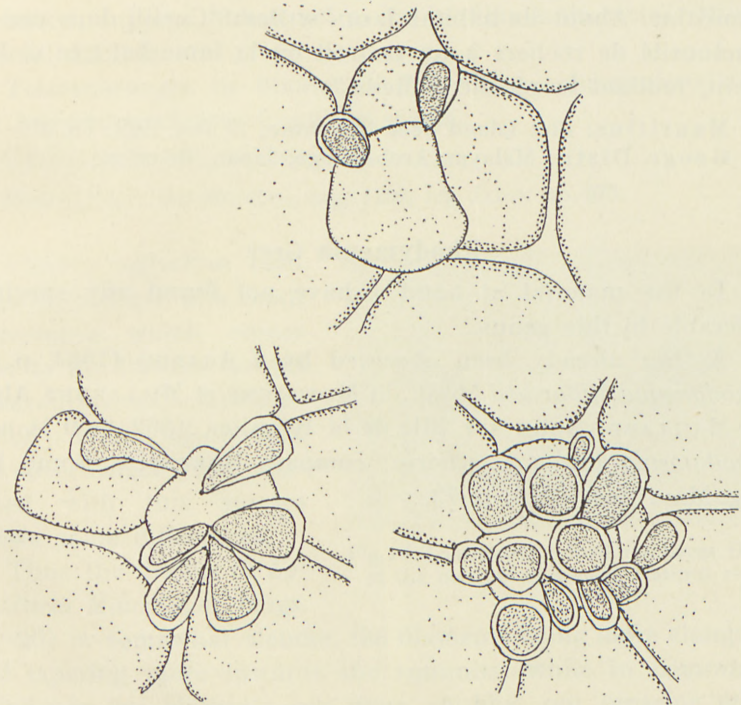


Fig. 18. *Botryocladia Kuckuckii* (Weber) Yamada et Tanaka. Groups of gland cells. (\times about 200).

Mauritius is in good conformity with those of *Chr. Kuckuckii* and also with those of *Chr. Skottsbergii*, only that in the latter species these are smaller.

Even if I am most inclined to consider the two species in question as representatives of the same species, the *Chrysymenia Kuckuckii* in reality being a *forma major* only of *Chrysymenia Skottsbergii*, nevertheless I find it more appropriate at present to keep them separated until more material from other parts of the Indian Ocean can be examined. The plant from Mauritius agreeing with that from the Malayan Archipelago is therefore referred to *Chrysymenia Kuckuckii* or, as its name now is, *Botryocladia Kuckuckii* (Weber) Yamada et Tanaka.

JADIN in his list p. 166 mentions *Chrysymenia obovata* Sonder from Réunion. Dr. JEAN FELDMANN has most kindly sent me a small piece of JADIN's specimen from the examination of which it is obvious that it is in reality the same species as that from Mauritius. About its habitat JADIN writes: "Cueilli dans une anfractuosité de rochers à un endroit où la lame bat très violement, rendant la récolte difficile."

Mauritius: Flat Island near the shore, 17. Oct. 1929, TH. M.

Geogr. Distr.: Malayan Archipelago, Japan, Réunion.

Rhodymenia Grev.

In the material at hand I have not found any specimen referable to this genus.

As has already been observed by J. AGARDH (1884, p. 64), *Rhodymenia Millardetii* Mont., in MONTAGNE et MILLARDET, Algues in MAILLARD, Notes sur l'Ile de la Réunion, 1862, p. 9 is not a *Rhodymenia* but a *Gracilaria*; compare BØRGESSEN, Some Mar. Alg. Mauritius, 1943, p. 72.

Fam. 2. *Champiaceae*.Subfam. 1. *Lomentarieae*.*Lomentaria* Lyngb.1. *Lomentaria mauritiana* nov. spec.

Lomentariae corallicolae Børgs. proxima sed differt thallo paulo graciliore, filamentis ad apicem vertentibus magis elongatis et gracilioribus, ramis interdum suboppositis; cellulis corticalibus a superficie visis magis elongatis. Filamentis tetrasporangiferis etiam gracilioribus.

Frons usque ad 1 cm. alta, caespitosa, teres aut subcomplanata (?), tubulosa, filamenta crassiora ca. 500—600 μ lata, in superiore parte tenuiora ca. 200 μ lata.

Rami hic illic irregulariter evoluti, in parte basali plus minus constricti, superne obtusi vel saepe in filamentis vicinis rhizoides adhaerentes.

Tetrasporangia in filamentis latioribus, subcomplanatis (?) per totam superficiem frondis dispersa.

Cystocarpia non praesentia.

Mauritius: Ilot Barclay, Aug. 1890, leg. JADIN no. 373.

JADIN's collection contains a specimen of a small *Lomentaria* which comes near to the Iranian species *Lomentaria corallicola* Børgs. (1939, p. 113—6, figs. 30—32), but nevertheless when compared with this species shows some differences.

Thus the thallus of *Lomentaria Mauritiana* (Figs.

19—20) is somewhat slender, the filaments being more elongated and tapering more towards the summits, while in *Lomentaria corallicola* the filaments are more chubby, not tapering much towards the summits which are more broadly rounded.

And while the filaments in the plant from Mauritius are in

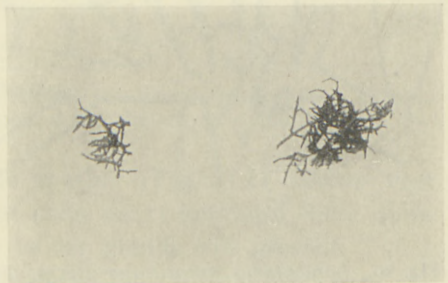


Fig. 19. *Lomentaria mauritiana* Børgs. Habit of the original specimen. Natural size.

most cases provided with some few branches which are often suboppositely placed (Fig. 20) those in *L. corallicola* had a few scattered branchlets or none at all.

As is the case in *L. corallicola*, so also in *L. mauritiana* rhi-

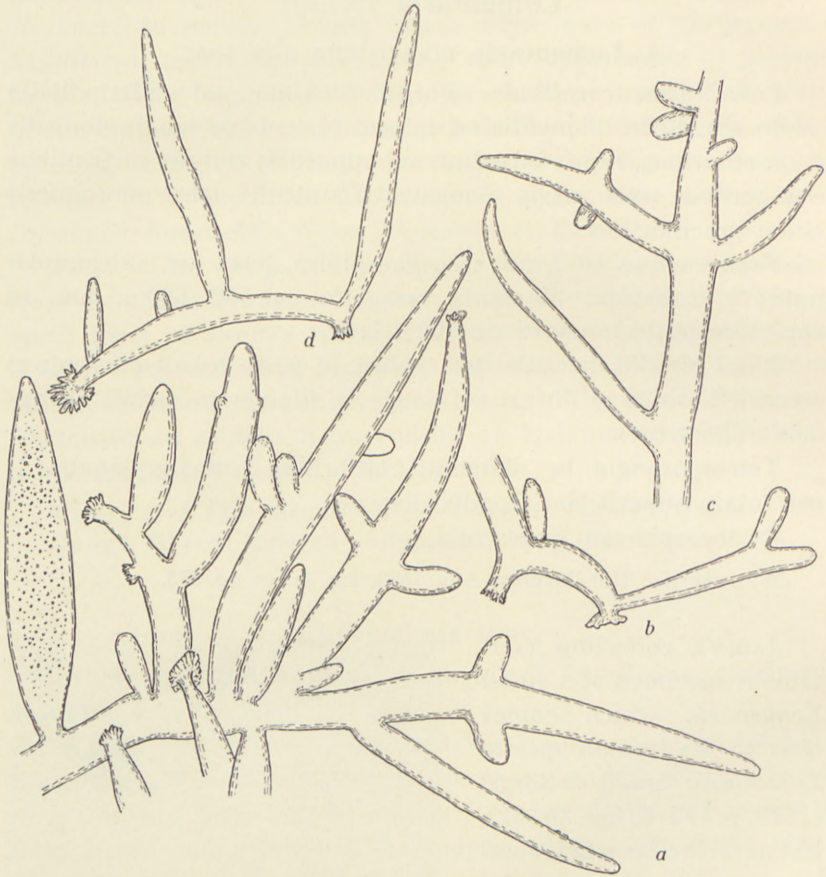


Fig. 20. *Lomentaria mauritiana* Børgs. Fragments of the thallus; in *a*, the erect branch to the left with tetrasporangia. \times about 10 natural size.

zoids are often developed from the apices of the filaments (Fig. 20) by means of which the filaments of the tuft become firmly connected, thus strengthening the tuft; decumbent filaments likewise are able to fix themselves to the substratum.

Fig. 21 *a* shows a small part of the peripheric cortical cells seen from above; these are oblong, elongated in the direction of

the thallus with oblique walls above and below, and not arranged in rows. The larger cells are about 40μ long and half as broad, but several of the cells are smaller. Compared with the cortical cells in *L. corallicola* those in this species are more roundish-polygonal, proportionally broader and shorter, having a diameter of up to 27μ in the larger cells.

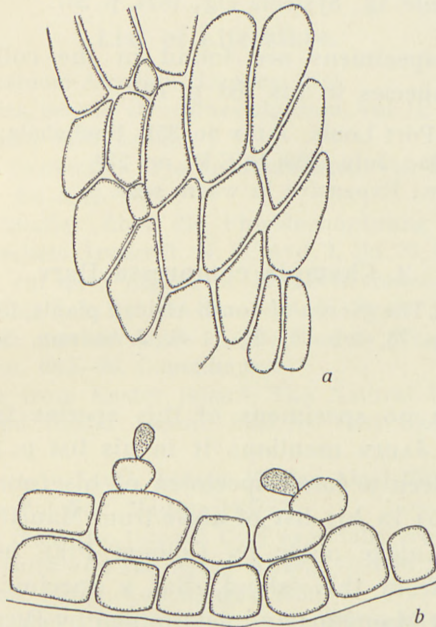


Fig. 21. *Lomentaria mauritiana* Borgs. *a*, cortical cells seen from above; *b*, transverse section of a fragment of the thallus. (\times c. 250).

A transverse section of the thallus (Fig. 21 *b*) shows that this consists of a few layers of cells only; here and there upon the innermost cells facing the cavity glands are present.

The tetrasporangia occur scattered over the thallus; they are cruciately divided and are about 42μ broad.

According to the number of the specimen (no. 373) JADIN in his list calls this plant *Champia Kotschyana*. As to its habitat he writes: "Croissant sur des coquilles rejetées à la plage."

Subfam. 2. Champieae.

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

HARVEY, W. H., Nereis Bor.-Am. vol. II, p. 76. J. AGARDH, Epicrisis, p. 303. BLIDING, C., Studien über ... Rhodymeniales, 1928, pp. 5-22. — *Chondria parvula* Ag., Systema alg., 1824, p. 207.

Some few specimens are found in the collections. JADIN mentions this species in his list p. 167.

Mauritius: Port Louis, JADIN no. 351. Rochebois, Aug. 1890, JADIN no. 377. Flic-en-Flac, July 1939, R. E. V., no. 279.

Geogr. Distr.: Expansive in warm seas.

2. *Champia compressa* Harv.

HARVEY, W. H., The genera of South African plants, 1838, p. 402; Nereis Australis, 1847, p. 78, tab. 30, figs. 1-6. J. AGARDH, Spec. alg., p. 370; Epicr., p. 305.

I have seen no specimens of this species from Mauritius. From Réunion JADIN mentions it in his list p. 166. From this island I have seen a small specimen of his (no. 143).

DICKIE (1875) in his list of algae from Mauritius based upon a collection of algae made by Colonel PIKE mentions p. 193 *Ch. compressa* from this island. But a specimen collected by Colonel PIKE at Mauritius and determined by DICKIE as *Ch. compressa* is in reality *Ch. parvula*. The specimen belongs to the Riksmuseum, Stockholm.

As *Ch. compressa* occurs at Réunion there is every reason to believe that it also occurs at Mauritius, for which reason it is inserted in the list.

Réunion: Sainte-Gilles, JADIN, April 1890, no. 143.

Geogr. Distr.: Ceylon, Cape, Borneo, Friendly Islands etc.

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