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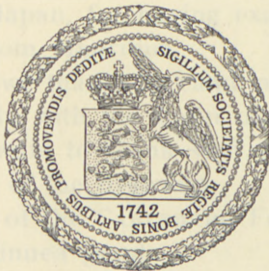
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# SOME MARINE ALGAE FROM MAURITIUS

ADDITIONS TO THE PARTS PREVIOUSLY  
PUBLISHED, **VI**

BY

F. BØRGESEN



København 1954

i kommission hos Ejnar Munksgaard

Det Kongelige Danske Videnskabsnævn

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## CHLOROPHYCEAE

As in former years I have also in the past year received collections of algae from Mauritius, and the result of the examination of these is published in this part. Besides some species not previously found in the island, among which two are described as new, I have been able to give some additions and corrections to some species mentioned in earlier parts.

For their continual great interest in collecting the algal material I want most heartily to thank Director, Dr. R. E. VAUGHAN and his Assistant, Mr. G. MORIN.

For very valuable assistance I am much indebted to several specialists.

Thus Mme, Dr. GENEVIÈVE FELDMANN has most kindly examined some few fragments of *Ceramium* found among other algae.

I also feel much indebted to the well-known specialist in *Corallinaceae*, Mme, Dr. PAUL LEMOINE, who has been kind enough to work out some specimens of this group received from Mauritius.

And my best thanks are likewise due to Professor T. SEGI, University of Mie, Japan, for having examined the material of *Polysiphonia* sent from Mauritius.

Furthermore I owe thanks to cand. mag. TYGE CHRISTENSEN for his valuable help with the Latin diagnoses.

And likewise I want to thank stud. polyt. JENS TH. KEIDING for producing some of the drawings.

To the Trustees of the CARLSBERG FOUNDATION I am much indebted for a continued grant.



# CHLOROPHYCEAE

## I. Siphonocladales.

### *Fam. 1. Boodleaceae.*

#### **Microdictyon** Decsne.

##### 1. *Microdictyon Agardhianum* Decsne.

Alg. Mauritius, I, 1940, p. 25, fig. 7. Addit. List, 1946, p. 18.

In a collection of algae received in April 1953 from Mauritius some fine large specimens of this species were contained.

Referring to the more detailed description in Part I of some specimens of this species I shall with regard to the specimens now received mention only that they have a diameter up to about 7 cm. The outline of the specimens is very irregularly sinuated and lobed.

The colour of the specimens in a dried condition is greyish green.

The specimens were "epiphytes on stems of *Cymodocea*".

Mauritius: Point aux Roches, 22-9-52, R. E. V. no. 1289.

## II. Siphonales.

### *Fam. 1. Bryopsidaceae.*

#### **Bryopsis** Lamour.

##### 1. *Bryopsis indica* A. & E. S. Gepp.

Alg. Mauritius, I, 1940, p. 44; Additions V, 1953, p. 6, fig. 1.

In lately received collections of algae two gatherings contain a small *Bryopsis* which I think is referable to *Bryopsis indica*.

The arrangement of the ramuli, characteristic of this species, in two double, oppositely placed rows up along both sides of the rachis is not always so regular as was the case in the specimens previously examined. But according to the description of A. and E. S. GEPP some variations as to this character are often present, for instance it often happens that the ramuli now and then are placed in a single row only.

As to the locality it is said: "epiphyte on various algae, *Sargassum*, etc."

Mauritius: Riambel, 6-7-52, R. E. V. nos. 1245, 1247.

## Fam. 2. *Caulerpaceae*.

### *Caulerpa* Lamour.

#### 1. *Caulerpa Vickersiae* Borgs.

Alg. Mauritius, Additions I, 1949, p. 6, figs. 1—2. Additions V, 1953, p. 6.

Entangled among the thallus of *Halodictyon* spec. a small specimen of this little *Caulerpa* was found.

About the locality it was said: "In cavities of rocks mixed with other algae."

Mauritius: Pointe aux Roches, 6-9-52, G. MORIN, no. 1282.

#### 2. *Caulerpa crassifolia* (Ag.) J. Ag.

Alg. Mauritius, Additions IV, 1952, p. 9, figs. 4—5.

Of this species I have from the island seen only some few small and more or less abnormally developed specimens having besides the usual rows of opposite pinnules some irregularly placed ones in between them.

It was therefore of interest from Dr. VAUGHAN to receive a large specimen (Fig. 1) in which the assimilators nevertheless are small, ovate-oblong in shape, about  $1\frac{1}{4}$ — $1\frac{1}{2}$  cm long and  $\frac{1}{2}$  cm broad, rarely more; and the pinnules, being longest in the middle of the assimilators, where they are about  $1\frac{1}{2}$  mm long, become shorter upwards and downwards. The shape of the

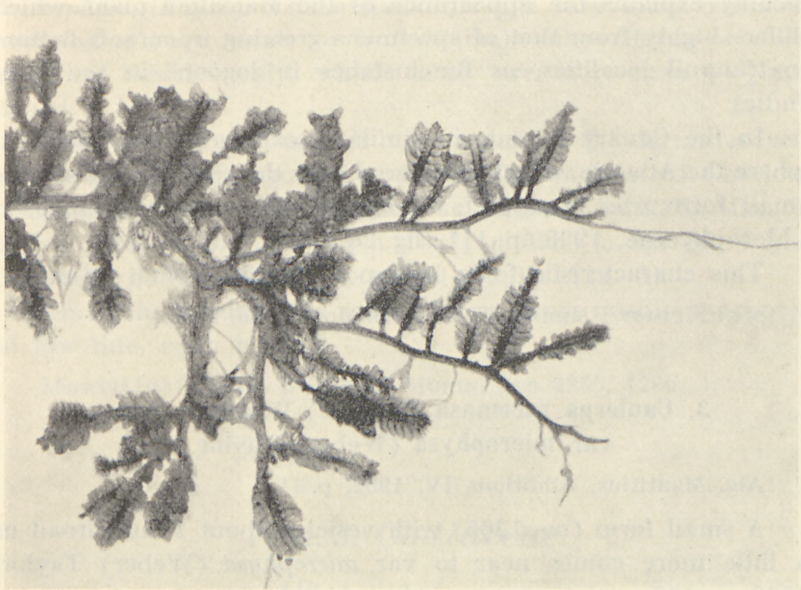


Fig. 1. *Caulerpa crassifolia* (Ag.) J. Ag. forma *exposita* Borgs.  $\times 1$ .

pinnules is obliquely oval (Fig. 2) to more elongate, tapering towards the base and the mucronated or also often rounded apex.

The assimilators are borne upon quite a short stipe about 1 mm high only.

About the locality it is said: "Creeping over rocks in rough water exposed to strong surf near reef." The character of the

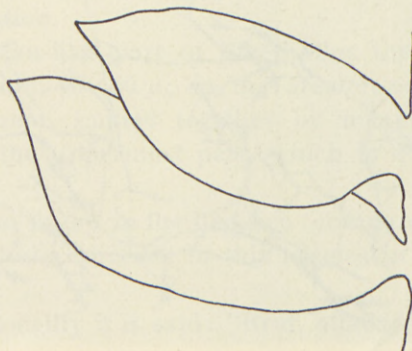


Fig. 2. *Caulerpa crassifolia* (Ag.) J. Ag. forma *exposita* Borgs.  
Two pinnules. (About 20:1).

locality explains the appearance of the Mauritian plant, which differs highly from that of specimens growing upon soft bottom in tranquil localities, as for instance in lagoons in the West Indies.

In the Canary Islands in similar localities as in Mauritius, where the Atlantic rollers thundered over the reefs a very similar small form was found; cf. BØRGESSEN, Alg. Canary Islands, I. Chlorophyceae, 1925, p. 111, fig. 26.

This characteristic form I propose to call forma *exposita*.

Mauritius: Riambel, 24-7-52, G. MORIN, no. 1259.

3. *Caulerpa racemosa* (Forssk.) Weber v. Bosse.  
var. *microphysa* (Weber) Taylor.

Alg. Mauritius, Additions IV, 1952, p. 11.

A small form (no. 1265) with vesicles about 1 mm broad or a little more comes near to var. *microphysa* (Weber) Taylor, 1928, p. 102.

About the locality it is said: "in lagoon exposed at low tide, on old coral."

Another very much reduced small form (no. 1266) consisting mostly of the much ramified, thin rhizome, the thickest ones about  $\frac{1}{2}$  mm thick, is, I think also referable to forma

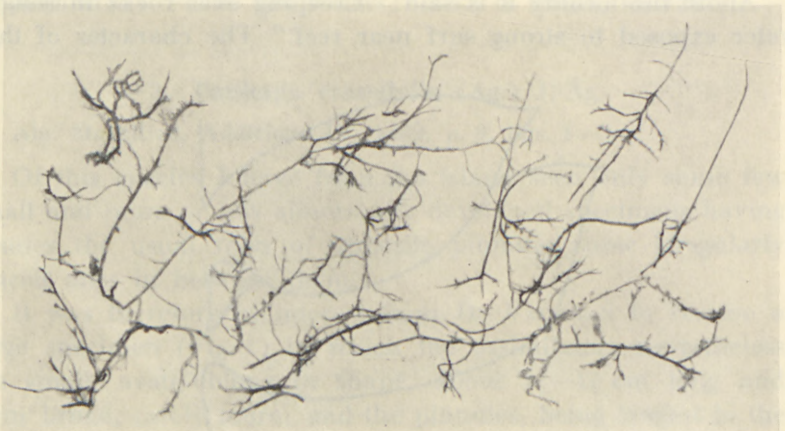


Fig. 3. *Caulerpa racemosa* (Forssk.) Web. v. Bosse var. *microphysa* (Weber) Taylor ad f. *reductam* Borgs. vertens.  $\times 1$ .



*microphysa* (Fig. 3). The assimilators are very much reduced, carrying often a single or a few small subpyriform or more spherical vesicles only, which rarely are more than  $\frac{1}{2}$ — $\frac{3}{4}$  mm broad.

This small form reminds very much of the forma *reducta* which many years ago I found near the harbour of Charlotte Amalia, St. Thomas (in Kgl. Danske Vidensk. Selsk. Skrifter, 7. Række, Bd. IV, 5, København 1907, p. 393—4, figs. 36—7 and Mar. Alg. D. W. I., 1913—4, p. 150—3, figs. 122—3).

About the locality it is said: "forms dense cushions exposed at low tide, calm water."

Mauritius: Cassis, 8-8-52, G. MORIN, nos. 1265, 1266.

### Fam. 3. *Codiaceae*.

#### *Udotea* Lamour.

##### 1. *Udotea javensis* (Mont.) A. and E. S. Gepp.

A. and E. S. GEPP in Journ. of Bot., XLIII, 1904, p. 363, tab. 417, figs. 1—4. The *Codiaceae* of the Siboga Expedition, 1941, p. 110, fig. 36a—c. OKAMURA, Icon. Jap. Alg. I, 1908, p. 228, pl. XLV, figs. 1—7. — *Rhipidosiphon javensis* Montagne, Prdr. Phycolog. Antarct., 1848, p. 14.

This nice little species was found in a recently received batch of algae. The specimens are in good accordance with GEPP's description.

In the fan-like part of the thallus the filaments had a breadth of about 40—60  $\mu$ ; in the greater part of the thallus they are coherent, knitted together by means of a chalk incrustation; in the uppermost part, which is not incrustated, they are free.

Having been found in the Red Sea (compare Alg. Mauritius I, 1940, p. 44), the occurrence of this species in Mauritius was to be expected.

About the locality it is said: "Reef, attached to dead corals."

Mauritius: Mahébourg, 21-3-51, G. MORIN, no. 1074.

Geogr. Distr.: Indian & Pacific Oceans, Red Sea.

## Codium Stackh.

### 1. *Codium Bartlettii* Tseng and Gilbert.

Alg. Mauritius, Additions V, 1953, p. 11, fig. 3.

Some specimens, which I take to be referable to this characteristic species, being in good accordance with the description of this species and likewise with the specimen mentioned in Part V, have recently been received from Mauritius.

Two gatherings are present and of both some material is preserved in formol and sea water and has thus kept its natural shape, in one of these (no. 1286) a sample has been taken below a division of the thallus and on examination shows that it is broadly flattened, in the other gathering (no. 1258) originating from the upper part of the thallus, this is subterete; the shape of the thallus is thus in good accordance to the description of the species.

As to the locality it is said: "Sandy pools submerged at low tide."

Mauritius: Riambel, 6-7-52, R. E. V. no. 1246. Same locality, 24-7-52, R. E. V. no. 1258.

# PHAEOPHYCEAE HETEROGENERATAE

## *Polystichineae.*

### Punctariales.

#### *Fam. 1. Encoeliaceae.*

#### Chnoospora J. Ag.

##### 1. *Chnoospora fastigiata* J. Ag.

Alg. Mauritius, II, 1941, p. 63. Additional List, 1948, p. 50.

Some fine specimens of this species have lately been received from Mauritius. The specimens form up to about 14 mm high, much ramified tufts composed of the repeatedly furcated filaments; these are more or less flattened, about twice as broad as thick.

In my paper: Marine Algae from Easter Island, 1920, p. 263 I have given some illustrations of specimens found there. The habit figure (Fig. 11) shows much developed clusters of hairs. These are not so large in the specimens from Mauritius and while the thallus in the Easter Island plant was very little compressed, that of the plant from Mauritius, as said above, is more flattened. Otherwise the anatomy of the plant from Mauritius exhibits quite well the same character as that found in the plant from Easter Island; cp. Fig. 12, p. 264, l. c.

Two collections were found of which no. 941 was collected "in rocky pools near shore", these specimens being closely covered by large tufts of *Ectocarpus Mitchellae* Harv. About the locality of the other collection no. 1253 it is said: "On large rocks exposed at low tide and subjected to strong surf."

Mauritius: Savinia, 17-9-50, R. E. V. no. 941. Riambel, 24-7-52, G. MORIN, no. 1253.

# RHODOPHYCEAE

## FLORIDEAE

### I. Nemalionales.

#### *Fam. 1. Helminthocladiaceae.*

##### *Liagora* Lamouroux.

###### 1. *Liagora rugosa* Zan.

Alg. Mauritius, III, 1, 1942, p. 30, fig. 14; Additions IV, 1952, p. 21, fig. 10.

Some specimens recently received from Mauritius are by their habit and structure in good accordance with the plant mentioned in Additions IV, 1952, p. 21.

The material was sterile.

As to its habitat it is said: "Firmly attached to large basalt rocks exposed at low tide."

Mauritius: Pointe aux Roches, 22-9-52, R. E. V. no. 1288.

### II. Cryptonemiales.

#### *Fam. 1. Corallinaceae.*

##### Subfam. 1. Melobesieae.

Par Mme PAUL LEMOINE.

Dans la précédente liste, M. F. BOERGENSEN (1943, p. 16) avait seulement mentionné les algues signalées par JADIN (1934) recueillies: sur récifs, *Lithophyllum incrassatum* Foslie à Port Louis et Mahébourg, et (sous le nom de *Lithophyllum incrustans* Phil.) à Flacq; sur coquilles, *Melobesia (Pliostroma) mauritiana* Foslie, à Flacq; sur algues, *Melobesia farinosa* Lamour., à Flacq;

enfin en épaves, à Flacq, sur la plage, *Porolithon onkodes* (Heydr.) Fosl. et *Lithothamnium Lenormandii* (Aresch.) Fosl.

*L. incrassatum* ayant d'abord été considéré par FOSLIE (New or crit. calc. alg. p. 29, 1900) comme une forme de *L. incrustans*, ce dernier nom est par suite à supprimer de la liste des algues de Maurice.

Les récoltes de R. E. VAUGHAN et Dr. TH. MORTENSEN apportent une intéressante contribution à la connaissance des Algues de Maurice, par la découverte des deux espèces: *Mesophyllum crispescens* (Fosl.) Lem. et *Archaeolithothamnium Schmidtii* Fosl.

## A. LITHOPHYLLIEAE

### *Lithophyllum* Philippi.

#### 1. *Lithophyllum moluccense* Fosl. forma *pygmaea* Heydr.

Cette espèce a déjà été signalée à Maurice par HEYDRICH (1901, p. 533) sous le nom de *Lithophyllum pygmaeum*, d'après les échantillons de la Collection Agassiz du Muséum de Paris; puis par Mme LEMOINE (1938, p. 306) d'après l'étude de la collection HENRI MICHELIN (n° 187 in Herbarium Muséum Paris). La forma *pygmaea* est figurée par HEYDRICH (Kalkalg., 1897, p. 3, fig. 1, pl. I, fig. 8 à 10 et par FOSLIE ("Siboga", 1904, pl. XII, fig. 7, 12, 13). D'autre part des échantillons de la Collection AGASSIZ, dans l'Herbarium FARLOW, de provenance incertaine, mais probablement de Maurice, nommés par FOSLIE ("New Melob", 1900 (1901), p. 11) *Lithophyllum torquescens* Fosl. ont été ensuite rattachés au *L. moluccense* comme forma *torquescens* (Siboga, p. 70, pl. XII, fig. 11; 1929, pl. LV, fig. 17); cependant un échantillon de l'Herbarium du Muséum de Paris déterminé par FOSLIE *Lithophyllum torquescens*, ne m'a pas montré les rangées alternativement longues et courtes caractéristiques de *L. moluccense*. La réunion des deux espèces reste à élucider par l'étude d'autres échantillons.

Maurice: Flic en Flacq, 3 mai 1950, R. E. VAUGHAN, no. 925 "seaward edge of reef".

Distr. géogr.: Océans Indien et Pacifique.

## 2. *Lithophyllum Kaiserii* Heydr.

HEYDRICH. Corall. insb. Melob. 1897, p. 64, pl. III, fig. 8, 12, 13.

Un massif jeune a été recueilli sur récif; l'espèce avait déjà été signalée à Maurice par FOSLIE (STANLEY GARDINER, 1907, p. 188).

Maurice: Flic en Flacq, 3 avril 1950, R. E. VAUGHAN, no. 913 "sur le bord externe du récif".

Distr. géogr.: Mer Rouge, Océan Indien (La Réunion etc.) Pacifique.

# B. ARCHAEO LITHOTHAMNIEAE

## Archaeolithothamnium Rothpletz.

### 1. *Archaeolithothamnium Schmidtii* Fosl.

FOSLIE, Flora Koh Chang, p. 16; Siboga Exp., 1904, p. 43, pl. VIII, fig. 15—17.

L'unique échantillon recueilli correspond comme aspect extérieur à la description de FOSLIE; la structure concorde, mais les cellules dépassent en des points localisés, la dimension extrême indiquée par FOSLIE, 22  $\mu$ , et atteignent 27  $\mu$  en coupe transversale et 30  $\mu$  en coupe longitudinale; il est stérile.

Maurice: Ile Flat, 16 octobre 1929, Dr. TH. MORTENSEN, Java, S. Africa Exp., 1929—1930, St. 44, 25 br. (= 45 m.), sables coralliens.

Distr. géogr.: Océans Indien (Maldives, Addu Atoll) et Pacifique, (Golfe de Siam 9 m., Arch. Sulu 15 m., Nouvelle-Guinée, récif).

# C. LITHOTHAMNIEAE

## Mesophyllum Lemoine.

### 1. *Mesophyllum crispescens* (Fosl.) Lem. mscr.

Cette espèce, décrite comme forme de *Lithothamnium simulans* Fosl., (Siboga, 1904, p. 16, pl. I, fig. 21—23) se différencie par des cellules plus longues dans l'hypothalle et le périthalle, ce qui me paraît justifier la distinction des deux

espèces qui toutes deux appartiennent au genre *Mesophyllum* Lem. (1928).

L'échantillon est voisin de la fig. 22, pl. I, Siboga.

Cette espèce était inconnue à Maurice et dans l'Océan Indien.

Maurice: Flic en Flacq, 3 avril 1950, R. E. VAUGHAN, no. 913, "sur le bord externe du récif, fixée sur la croûte de *L. Kaiserii*".

Distr. géogr.: Archipel Malais, sur récifs et de 27 à 54 m.

## Subfam. 2. Corallinae.

### *Jania* Lamour.

#### 1. *Jania tenella* Kütz.

Cette espèce avait été recueillie par R. E. VAUGHAN, n° 354, Août 1939, Pointe aux Sables, sur *Galaxaura* (F. BOERGESEN, 1943, p. 26). Je l'ai retrouvée fixée sur *L. Kaiserii* et *Mes. crispescens*.

Dans les sections décalcifiées, les rameaux ont un diamètre de 53 à 63  $\mu$  et seulement 47  $\mu$  à la partie supérieure. Ainsi qu'il est de règle dans les *Jania*, les cellules de l'article et de l'articulation ont à peu près la même longueur.

L'articulation est formée d'une rangée de cellules de 45 à 60  $\mu$  de haut et 5 à 9  $\mu$  de large; les cellules des articles, disposées en rangées rigoureusement horizontales, mesurent 40 à 46  $\mu$   $\times$  3 à 7  $\mu$ ; dans les rameaux supérieurs la disposition en rangées s'efface et les cellules deviennent plus petites; celles des filaments centraux n'ont que 10 à 17  $\mu$   $\times$  2  $\frac{1}{2}$   $\mu$  à 4  $\frac{1}{2}$   $\mu$ ; celles de la partie externe 6 à 7  $\mu$  de large.

Maurice: Flic-en-Flacq, 3 Avril 1950, R. E. VAUGHAN, no. 913, "sur le bord externe du récif".

Distr. géogr.: Mexico, Méditerranée, Océans Indien et Pacifique.

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### III. Gigartinales.

#### *Fam. 1. Solieriaceae.*

#### **Tenaciphyllum** Børgs.

##### 1. **Tenaciphyllum lobatum** Børgs.

Alg. Mauritius, Additions V, 1953, p. 28, figs. 8—10.

In a gathering of algae quite recently received from Mauritius a large well developed dried specimen of this species, besides some fragments in formol and sea water, was included.

An examination of the material in formol has shown that the material is sterile, but the structure is quite in conformity with that of the type specimen no. 905.

Regarding the external conditions in which the formerly found plant lives, nothing was said by the collector (1953, p. 29). And as to the locality in which the latest received specimen occurred, it is said only: "Growing on old coral in lagoon." This must, I think, be indicative of a tranquil locality, and not, as I presumed, an exposed one.

Mauritius: Riambel, 4-11-52, G. MORIN, no. 1304.

##### 2. **Tenaciphyllum rotundilobum** Børgs.

Alg. Mauritius, Additions V, 1953, p. 32, figs. 11—12, pl. III, the two figures below.

Also of this species (Fig. 4), in all respects smaller than that mentioned above, some fine specimens were present in a lately received batch of algae.

An examination of some material preserved in formol and sea water has shown that the specimens are built up quite in accordance with those first received.

The material examined was sterile.

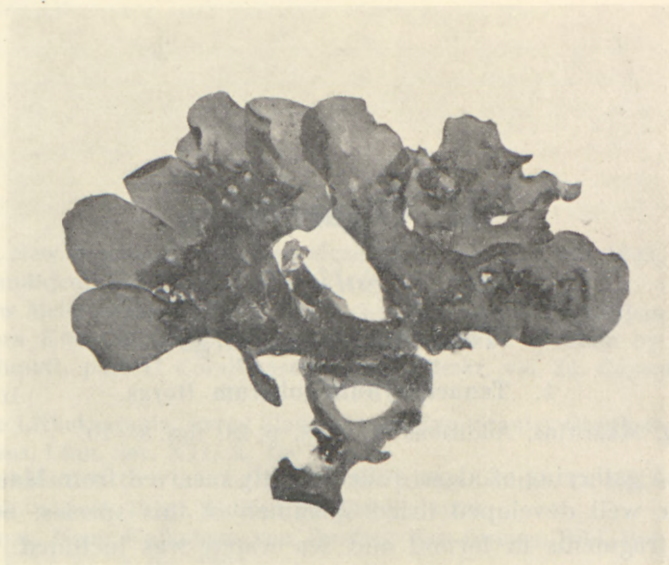


Fig. 4. *Tenaciphyllum rotundilobum* Borgs. Habit of a specimen. Natural size.

As to the locality it is said only: "creeping upon rocks and other algae." Whether or not the locality was exposed to strong surf is not mentioned; nor was this mentioned about the type-specimen formerly received.

Mauritius: Riambel, 20-7-52, G. MORIN, no. 1257.

## Fam. 2. *Rhodophyllidaceae*.

### *Gelidiopsis* Schmitz.

#### 1. *Gelidiopsis acrocarpa* (Harv.) Schmitz.

SCHMITZ, FR., *Marine Floridun von Deutsch Ostafrika*, 1895, p. 148.  
 FELDMANN, J., *Remarques sur les genres Gelidium Lamour., Gelidiopsis Schmitz et Echino caulon (Kütz.) emend.*, 1931, p. 7. — *Gelidium acrocarpum* Harv., *Friendly Island Algae* no. 40.

Some few small specimens (no. 1285), having a structure like that of *Gelidiopsis*, are found in a batch of algae recently received from Mauritius.

Fig. 5 shows 3 of the specimens.



Fig. 5. *Gelidiopsis acrocarpa* (Harv.) Schmitz ( $\times 1$ ).

From prostrate creeping filaments fixed to the substratum the erect parts of the thallus are given out; these are in their basal parts terete, about  $500 \mu$  thick and of variable length, up to about two cm, rarely more; the upper part of the thallus becomes broadened out more or less ribbonlike, elongate ellipsoidal, getting a length of about 3 cm and up to about  $2\frac{1}{2}$  mm broad where they are broadest, from there tapering towards both ends, the apical ones being obtuse.

The specimens from Mauritius have some likeness to KÜTZING's figure of a plant which he calls *Gelidium repens* in Tab. Phycolog., vol. 18, pl. 60, figs. a, b, a figure to which FELDMANN refers in his paper quoted above, when mentioning *Gelidiopsis acrocarpa* (Harv.) Schmitz and as "échantillon authentique" FELDMANN quotes HARVEY's Friendly Island Algae no. 40. Most regrettably no specimen of this is found in the herbarium of the Botanical Museum, Copenhagen, nor any of HARVEY's Ceylon Algae no. 34, which is the same species.

SETCHELL in "American Samoa", 1924, p. 163 says that he has examined both specimens in HARVEY's Herbarium in Trinity



Fig. 6. *Gelidiopsis acrocarpa* (Harv.) Schmitz. A specimen from Tahiti ( $\times 1$ ).

College, Dublin, and compared some specimens which he has collected in Tutuila Island with HARVEY'S specimens, and has found, that they are the same species. And later SETCHELL has also referred a plant collected in Tahiti ("Tahitian Algae", 1928, p. 99) to this species; of the plant from Tahiti I have from SETCHELL received some specimens (no. 5192). Fig. 6.

A comparison of this plant with that from Mauritius shows, however, rather essential differences not only is the plant from Mauritius much smaller and more delicate, but the flat parts of the thallus are proportionally much broader; and in the Tahitian plant the flat parts run out into some more or less long, whiplike prolongations. About the Tahitian plant SETCHELL points out that it has much likeness to *Sphaerococcus angustifolius* Kütz., Tab. Phycol., vol. 18, pl. 99 from New Caledonia, and this figure has also some likeness to the plant from Mauritius.

SETCHELL in the same paper, p. 99, also refers to *Gelidium*

*samoense* Reinbold in Denkschr. Akademie d. Wissensch., Bd. 81, Wien 1908, p. 204, and gives an illustration of a specimen from Tahiti which he finds "clearly answering to REINBOLD's description". REINBOLD about his plant says that it reminds of *Acrocarpus pulvinatus* Kütz., Tab. Phycol., vol. 18, tab. 37 and of *Sphaerococcus angustifolius* Kütz., Tab. Phycol., vol. 18, tab. 99, but to this SETCHELL remarks: "Our plant bears some resemblance to the former but the latter is more clearly resembling the plant we have referred to *Gelidium acrocarpum* Harv.", and this is also in accordance with my view.

And yet it must be mentioned that SETCHELL in the same paper gives two figures (pl. 18, figs. 1—2) of a plant which he refers to *Gelidium acrocarpum* Harv.; their likeness to the specimens from Mauritius seems not very striking.

In this connection it should be added also that GRUNOW in "Algen der Fidschi-, Tonga- und Samoainseln", 1873, p. 39, mentions *Gelidium acrocarpum* Harv., (Ceylon Algae No. 34, Kg., Tab. Phyc. Bd. XIX, tab. 23), as found "An Korallenriffe von Ovalau", and GRUNOW adds: "*G. repens* Kg. tab. phyc. Bd. XVIII, tab. 60, welches VEILLARD bei Neu-Caledonien sammelte, scheint mir gar nicht von *G. acrocarpum* verschieden zu sein, und entsprechen die Exemplare von Ovalau beiden citierten Abbildungen."

And finally I want to mention that HAUCK in Hedwigia, 1888, p. 89 about *Gelidium acrocarpum* Harv. says: "Die Tetrasporangien tragenden Pflanzen entsprechen die KÜTZING'schen Abbildungen von *Gelidium acrocarpum*, Tab. Phyc., XIX, tab. 23 und *Gelidium repens*, Tab. Phyc., XVIII, tab. 60, während die sterilen Pflanzen und Thallusstücke sehr gut mit den KÜTZING'schen Habitusbildern von *Gelidium variabile* Tab. phyc., XIX, Tab. 23 und *Acrocarpus setaceus* Tab. phyc., XVIII, tab. 33 übereinstimmen."

As appears from what is said above, the apprehensions of the different investigators of these very variable but closely related forms are rather deviating and to reach a satisfactory result a large material from localities with different external conditions is surely necessary.

But as our knowledge of these forms is now, and as I have very little material to base any construction upon, I am at present

inclined to consider most of these forms, perhaps all, as members of a single very variable and polymorphous species: *Gelidiopsis acrocarpa* (Harv.) Schmitz.

About the locality it is said: "growing in crevices of large rocks in lagoon."

Mauritius: Pointe aux Roches, 22-9-52, R. E. V. no. 1285.

## 2. *Gelidiopsis scoparia* (Mont. et Millard.) Schmitz.

Alg. Mauritius, Additions IV, 1952, p. 26, figs. 13—14. Additions V, 1953, p. 36.

A small and tender form with much developed furcations of the thallus giving it a very elegant appearance has recently been received from Mauritius.

The plant forms low, 4—5 cm high, tufts upon rocks.

While in former collections the base has been wanting, this is present here. It consists of decumbent filaments fixing themselves to the substratum by small discs.

From this base the erect stem-like shoots are given out; these are terete below, becoming gradually flattened upwards and broader up to where the furcations take place, forming an often very regular fanlike upper part. Some of the rays may again continue the growth, becoming furcated and forming a new fan.



Fig. 7. *Gelidiopsis scoparia* (Mont. et Millard.) Schmitz. A specimen ( $\times 1$ ).

The specimens were sterile.

About the locality it is said: "Rock crevices, exposed to surf on reef."

Mauritius: Flic en Flacq, 3-4-51, R. E. V. no. 904.

### Fam. 3. *Hypneaceae*.

#### *Hypnea* Lamour.

##### 1. *Hypnea chordacea* Kütz.

KÜTZING, F., Regensb. Flora, 1847; Spec. Alg., 1849, p. 760.  
WEBER, A., Algues Siboga, p. 448. TANAKA, T., The genus *Hypnea*  
from Japan, 1941, p. 230, figs. 2, 3.

In a collection of algae recently received a rather characteristic small *Hypnea* is found which I think is referable to *Hypnea chordacea* Kütz. as it agrees very well with the description in KÜTZING, Species Algarum, 1849, p. 760. (Fig. 8).

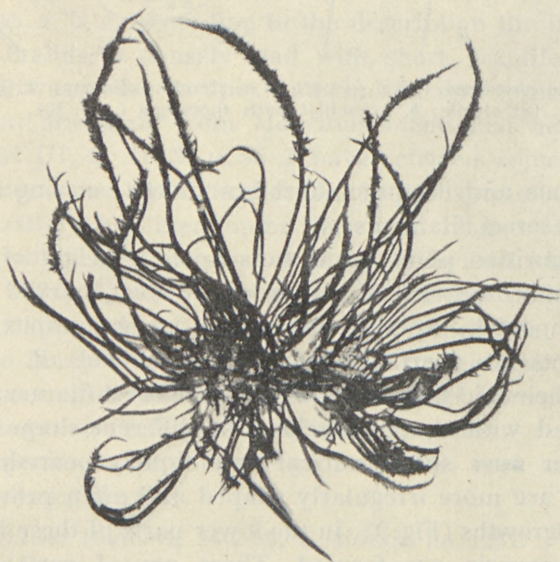


Fig. 8. *Hypnea chordacea* Kütz. A specimen ( $\times 1$ ).

This species, which DE TONI in *Sylloge Algarum* II, p. 473 takes with a ? as a synonym of *Hypnea spicifera*, is, as is pointed out by Mme WEBER l. c., well characterized in three respects from *H. spicifera* (Suhr) Harv., the most closely related species, namely by its more compact consistence, its curved erect stem-

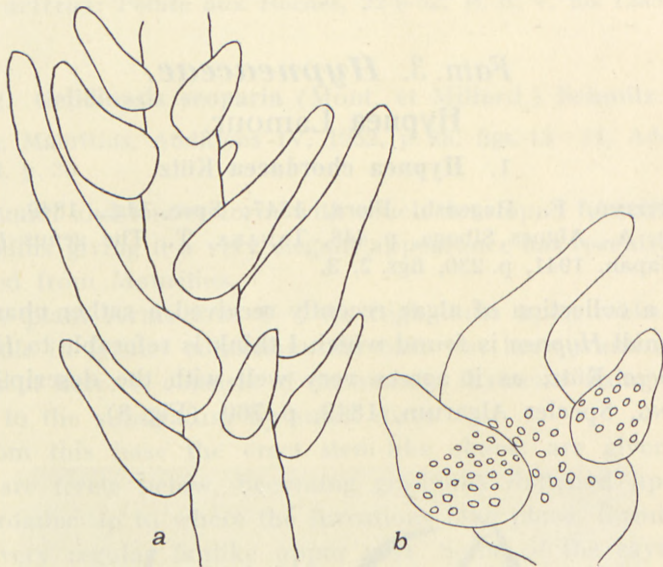


Fig. 9. *Hypnea chordacea* Kütz. a, part of a stemlike filament with branchlets yet sterile; b, branchlet with sporangia ( $\times$  c. 30).

like filaments and its quite short branchlets covering the upper part of the erect filaments.

The Mauritian plant forms tufts up to a height of 5–6 cm; the tufts are composed of a number of erect, curved filaments about 1 mm thick, tapering upwards to an acute apex. Some of the filaments are sparingly branched, some not all.

From their middle or a little lower the erect filaments become densely clad with short branchlets of different shape and size, the younger ones subcylindrical or obliquely pear-shaped; the older ones are more irregularly shaped and often provided with smaller outgrowths (Fig. 9); in the lower parts of these branchlets the tetrasporangia are formed. These are of variable shape, some nearly cylindrical with broadly rounded ends, about  $50 \mu$



long and  $20\ \mu$  broad, others are shorter and broader. The colour of the dried specimens is dark red, nearly blackish.

Being built in this way our plant reminds much of the two *Hypnea*-species: *H. spicifera* (Suhr) Harv. and *H. Harveyi* Kütz. from Cape, and about *H. Boergesenii* Tanaka from Japan; but a more detailed comparison with these species nevertheless shows essential differences.

Thus the Japanese species, according to the description (see TANAKA, The Genus *Hypnea*, 1941, p. 233) and two specimens most kindly sent me from Professor TANAKA, is a much taller and more ramified plant and furthermore carrying densely placed fertile branchlets from near the base of the plant up to the apices of the branches.

*Hypnea spicifera* is likewise a taller plant and its thallus is often much ramified. Furthermore, the fertile branchlets are given out in the upper parts of the thallus only; yet it must be mentioned that its colour in most of the specimens I have seen is a rather light red.

And finally as to KÜTZING's species I want to point out that I know it only from the description by KÜTZING in "Species Algarum", p. 760 and from his figure in Tab. Phycol., vol. 18, tab. 28, figs. a, b, c. According to the description the more or less ramified thallus is densely clad with short, fructiferous, acute branchlets from base to apex and thus in this respect very different from the plant from Mauritius mentioned here.

In Part III, 2, 1943, p. 55 I have referred some small specimens found in JADIN's collection to this species of KÜTZING.

And lastly, when mentioning these and related forms, I also want to remind of some specimens from Karachi which in Kew Bulletin, 1934, p. 189 I referred to *H. spicifera*, following, as I did at that time, J. AGARDH in his supposition that *H. Harveyi* Kütz. is to be considered a synonym of *Hypnea spicifera*; but if one does not agree with J. AGARDH, the plant from Karachi has perhaps better be referred to KÜTZING's species.

The specimens have been gathered "in rock crevices exposed to strong surf".

Mauritius: Riambel, 24-7-52, G. MORIN, no. 1251.  
Geogr. Distr.: Java, Japan.

## 2. *Hypnea musciformis* (Wulf.) Lamour.

Alg. Mauritius, III, 2, 1943, p. 54.

A fine, large specimen of this species is found in a collection of algae recently received.

As to the locality it is said: "Usually epiphytic on *Sargassum* etc. in lagoon."

Mauritius: Riambel, 4-11-52, R. E. V. no. 1302.

## 3. *Hypnea* (?) *pectinella* nov. spec.<sup>1</sup>

Thallus parvus ca. 1.5 cm altus, caespitosus, ramosus, compositus ex partibus decumbentibus, repentibus, teretibus, rhizoidibus disciformibus ad saxa adfixis et partibus erectis, basi teretibus supra planis, ex marginibus ramulos teretes, ca. 1 mm longos, plus minus regulariter oppositos pectinatim gerentibus, quorum plurimi semper simplices, nonnulli autem indefinite crescentes ramigeri.

Tetrasporangia zonatim divisa, ca. 17—20  $\mu$  longa et 6—7  $\mu$  lata, in superficie thalli formata.

Mauritius: Riambel, 24-7-52, R. E. V. no. 1254.

This nice little species (Fig. 10) forms upon rocks small tufts up to about 1½ cm high.



Fig. 10. *Hypnea?* *pectinella* nov. spec. ( $\times 1$ ).

The base of the thallus consists of decumbent creeping terete filaments (Fig. 11 b) fixed to the substratum by short roundish

<sup>1</sup> When putting a? after the generic name it is because I have not seen any female or male organs, but also because the thallus is flattened.

discs formed by groups of coherent rhizoids issuing here and there from the underside of the filaments.

From the upper side of these filaments the erect shoots are given out. Below, these are terete, becoming flattened upwards,

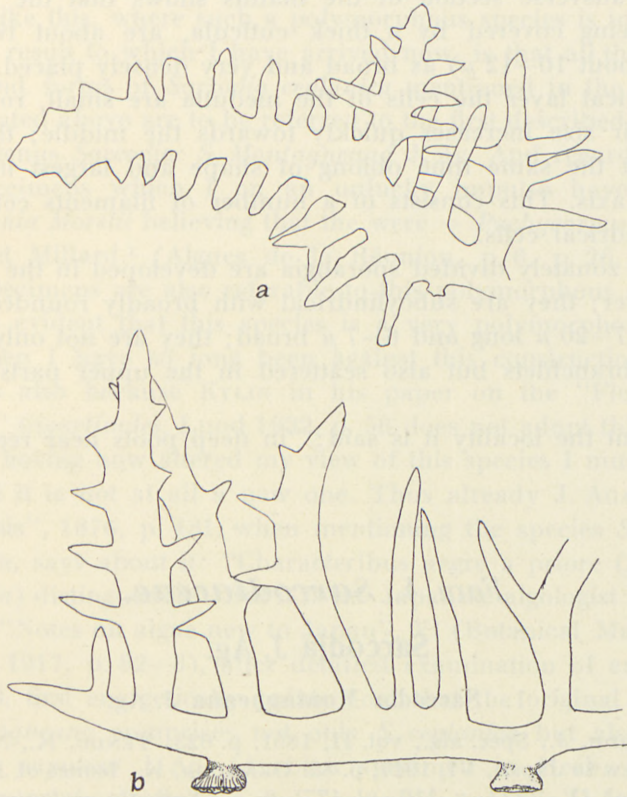


Fig. 11. *Hypnea (?) pectinella* nov. spec. *a*, upper part of the thallus, *b*, apex of basal filament with young erect shoots ( $\times$  ca. 15).

about  $\frac{1}{2}$  mm broad and  $200 \mu$  thick. From the edges of these shoots terete branchlets issue more or less regularly, oppositely placed, giving the thallus a nice, pectinate appearance; most of these branchlets remain undivided, reaching a length of about 1 mm or a little more; some of them get a single or a few branchlets near their upper ends, and now and then a side-branch with indefinite growth is given out by means of which the ramification of the thallus is carried out (Fig. 11 a). The branchlets

are nearly cylindrical, tapering in their upper ends towards the acute apex.

The epidermal cells in the younger parts of the thallus are provided with hairs.

A transverse section of the thallus shows that the cortical cells, being covered by a thick cuticula, are about twice as long (about 10—12  $\mu$ ) as broad and very densely placed. Below the cortical layer the cells of the medulla are small, roundish, but their size increases quickly towards the middle; they become at the same time oblong of shape and largest near the central axis. This consists of a number of filaments composed of cylindrical cells.

The zonately divided sporangia are developed in the epidermal layer; they are subcylindrical with broadly rounded ends, about 17—20  $\mu$  long and 6—7  $\mu$  broad; they are not only found in the branchlets but also scattered in the upper parts of the thallus.

About the locality it is said: "in deep pools near reef."

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

##### *Sarcodia* J. Ag.

###### 1. *Sarcodia Montagneana* J. Ag.

AGARDH, J., Spec. alg., vol. II, 1851, p. 623. YENDO, K., Notes on Algae New to Japan, VI, 1917, p. 82. OKAMURA, K., Icones of Japanese Algae, vol. IV, 1923, p. 110, pl. 177—8. — *Sarcodia ceylanica* Harv., Alg. Ceylon Exsicc. no. 27. BØRGESSEN, F., Alg. Mauritius, III, 2, 1943, p. 66, where literature is quoted; Additions II, 1950, p. 21; Additions V, 1953, p. 37, fig. 13. — *Callymenia Morelii* Børgs., Additions, III, 1951, p. 39, pl. V. — *Sarcodia mauritiana* Børgs., Additions, IV, 1952, p. 29, pl. III.

A short time ago, in a letter dated Port Louis Dec. 21, 1953, Dr. VAUGHAN asked me about some of the specimens previously received. About two of them he writes as follows: "I cannot distinguish between *Callymenia Morelii* no. 957 and *Sarcodia Ceylanica* var. *Mauritiana* no. 1037; this material comes from the same locality."

Owing to this I have taken the question up for renewed examination and not only that about the two gatherings mentioned above, but practically all the material received of this species.

However, the material has not been particularly extensive in a case like this, where such a polymorphous species is involved.

The result to which I have arrived now, is that all the specimens and forms of *Sarcodia ceylanica* mentioned in the papers enumerated above are to be referred to the first described species of the genus *Sarcodia*: *S. Montagneana* J. Ag. And regarding the few specimens which I on an unlucky impulse have called *Callymenia Morelii* believing that the were = *Pachycarpus Morelii* Mont. et Millard,<sup>1</sup> (Algues de la Réunion, p. 6, p. 26, fig. 2), these specimens are also referable to this polymorphous species.

It is evident that this species is a very polymorphous one, and when I have so long been against this construction, it is perhaps also because KYLIN in his paper on the "Florideengattung" *Gigartinales*, Lund 1932, p. 56 does not adopt this view.

But having now altered my view of this species I must point out that it is not at all a new one. Thus already J. AGARDH in "Epicrisis", 1876, p. 431, when mentioning the species *Sarcodia ceylanica*, says about it: "Characteribus aegre a priore (*S. Montagneana*) distinguenda". But it is the Japanese algologist YENDO, who in "Notes on algae new to Japan", VI (Botanical Magazine, vol. 31, 1917, p. 82—3), after detailed examination of extensive material, first energetically pointed out that the original species *S. Montagneana* comprises not only *S. ceylanica* but also *Meristotheca papulosa* J. Ag. (Arabian specimen in Herb. J. Ag.), *Sarconema palmata* Sonder and *Sarconema capensis* J. Ag., however, putting a ? after the two latter species. And the Japanese algologist OKAMURA in his "Icones of Japanese Algae", vol. IV, p. 110, pl. 177—8 likewise referred *Sarcodia ceylanica* to *S. Montagneana*.

Having tried myself also without any happy result to distinguish between some of the most characteristic forms of this

<sup>1</sup> What the above-mentioned species of MONTAGNE et MILLARDET is, does not seem to have been cleared up yet. DE TONI in *Sylloge Alg.*, vol. IV 1897, p. 254 says about it: "est forsán *Callymenia* spec."; however, in *Callymenia* the tetrasporangia are cruciately divided, but that pictured in MONTAGNE et MILLARDET's paper seems to be tetrahedrally divided.

polymorphous species I now refer not only *S. ceylanica* Harv. but also, as done above, *S. mauritiana* Børgs. to *S. Montagneana* J. Ag.

### 1. *Sarcodia multifida* Børgs.

Alg. Mauritius, Additions V, 1953, p. 39, fig. 11.

Since this species was described in 1953 I have had an opportunity to examine some more material, and this has shown that this species is rather polymorphous; but I have difficulty in believing in the possibility that it should be a form of the above-mentioned species.

Figs. 12 a, b shows some specimens of the plant.

As was the case with the material formerly examined, the specimens now received are all fragments without bases, but as was said already in the description of the species, I have no



Fig. 12 a. *Sarcodia multifida* Børgs. Fragment of a specimen ( $\times 1$ ).

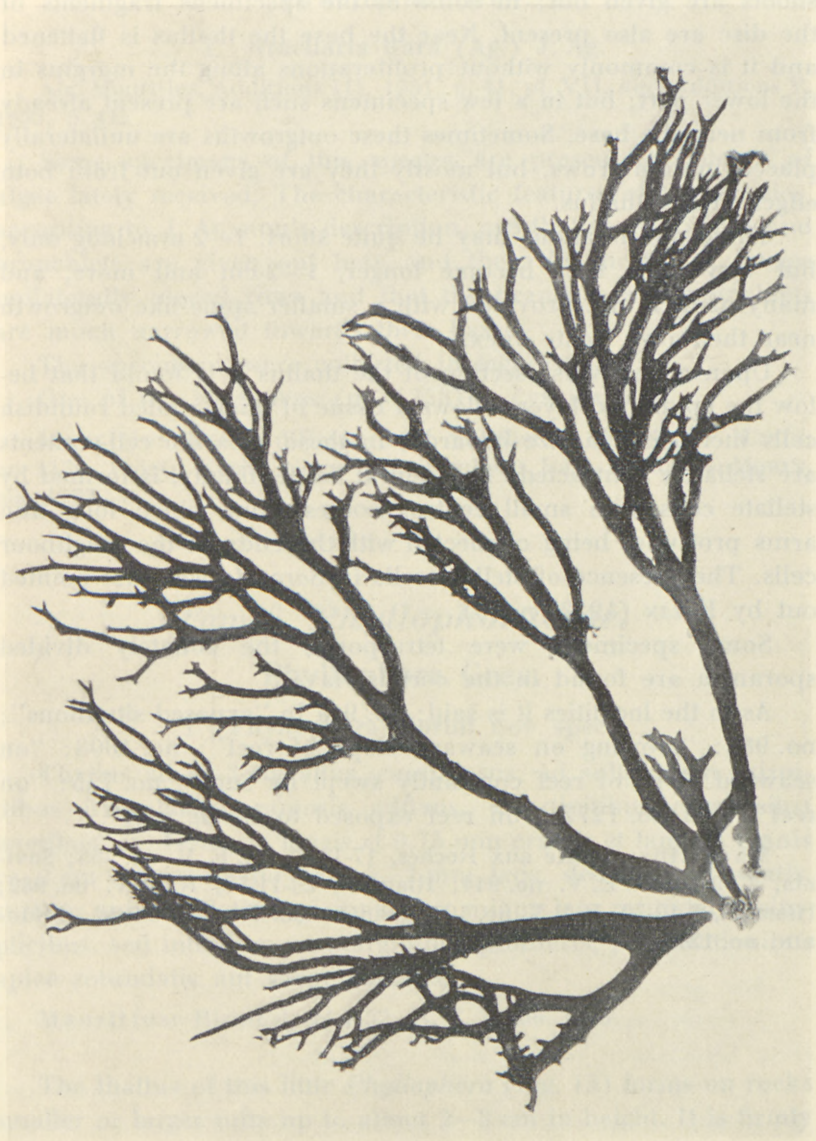


Fig. 12 b. *Sarcodia multifida* Børgs. Fragments of a specimen ( $\times 1$ ).

doubt that the present specimens have had an irregularly lobed disc firmly fixed to the rocks, from which a number of erect shoots are given out; in some of the specimens fragments of the disc are also present. Near the base the thallus is flattened and it is commonly without proliferations along the margins in the lower part; but in a few specimens such are present already from near the base. Sometimes these outgrowths are unilaterally placed in short rows, but mostly they are given out from both edges of the thallus.

These proliferations may be quite short, 1—2 mm long only, but very often they become longer, 1—2 cm and more, and many of them are provided with a smaller spine-like outgrowth near their own acute apex.

Upon a transverse section of the thallus it is found that below the epidermal layer follows a tissue of thick-walled roundish cells increasing in size inwards; in these cells the cell-contents are stellately contracted. The central tissue, finally, is formed by stellate cells with small central bodies from which long thin arms protrude, being connected with the ends of the neighbour cells. The presence of stellate cells in *Sarcodia* was first pointed out by KYLIN (1932, p. 56).

Some specimens were tetrasporic; the zonately divided sporangia are found in the cortical layer.

As to the localities it is said: no. 944 in "exposed situations"; no. 982: "growing on seaward slope of reef"; no. 1003: "on seaward slope of reef constantly swept by surf"; no. 755: "on reef", and no. 1277: "on reef exposed to strong surf".

Mauritius: Pointe aux Roches, 17-11-47, R. E. V. no. 755; Savina, 17-9-50, R. E. V. no. 944; Riambel, 23-11-50, R. E. V. no. 982; Riambel, 8-12-50, R. E. V. no. 1003; Pointe aux Roches, 6-9-52, G. MORIN, no. 1277.



*Fam. 5. Gracilariaceae.***Gracilaria** Grev.1. *Gracilaria dura* (Ag.) J. Ag.

Alg. Mauritius, Additions III, 1951, p. 41, pl. VII, and Additions V, 1953, p. 41.

Some specimens of this species are present in batches of algae lately received. The characteristic features of this species, according to J. AGARDH's description, are that the branches and branchlets are given out here and there in shorter or longer unilaterally placed rows and that the branches and branchlets are much narrowed towards their bases.

The specimens were collected in lagoons.

One of the specimens (no. 1258) is cystocarpic.

Mauritius: Pointe d'Eesny, near Mahébourg, 15-11-51, G. MORIN, no. 1176. Pointe Roche Noire near Tombeau Bay, 9-7-52, G. MORIN, nos. 1237—8.

*Fam. 6. Phyllophoraceae.***Phyllophora** Grev.1. *Phyllophora Morini* nov. spec.<sup>1</sup>

Thallus ad 2—3 cm altus, caespitosus, ad substratum rhizoidibus irregulariter ramosis adfixus, ex stipitibus compositus teretibus, ca. 1—3 mm longis et 0.75 mm crassis et laminis planis ca. 2 cm longis, medio ca. 1.5—2 mm latis, deorsum attenuatis, sursum subaequilatis, apicibus plus minus late rotundatis, simplicibus, sed interdum ex marginibus proliferis, proliferationibus apice rotundatis aut saepe furcatis.

Mauritius: Riambel, 24-7-52, R. E. V. no. 1255.

The thallus of this little *Phyllophora* (Fig. 13) forms on rocks smaller or larger tufts up to about 2—3 cm in height. It is firmly

<sup>1</sup> Named in honour of Mr. G. MORIN, Taxidermist at the Mauritius Institute, who, according to kind information from Director R. E. VAUGHAN, is a very keen worker and preparator and who has collected a great number of the algae enumerated in this and previous papers dealing with the algal flora of Mauritius.



Fig. 13. *Phyllophora Morini* nov. spec. Some specimens  $\times 1$ .

fixed to the substratum by means of irregularly ramified hapters issuing from the short stem-like, basal, terete part of the erect thallus. From this stem the ribbon-like part of the thallus is given out, reaching a breadth of  $1\frac{1}{2}$ —2 mm, where it is broadest, from where it tapers gradually downwards and less upwards or not at all, becoming in cases even a little broader towards the upper, more or less broadly rounded apex.

The erect thallus mostly is not branched; but some specimens are provided with adventitious shoots or proliferations, shorter or longer, issuing from the margins; the apices of these shoots are often bifurcate.

The consistency of the thallus is very tough.

A transverse section of the thallus shows that it is built in good accordance with that of *Phyllophora*.

The peripheral layer is covered by a thick cuticula and composed of densely placed palissade-like cells, about  $7$ — $8\ \mu$  long and about half as broad; then follows a layer of small roundish densely placed cells surrounding the medulla, the cells

of which are proportionally large, oblong, thick-walled, about  $50 \mu$  long and half as broad.

Any concentric cortical layers as found in the stipe of *Phyllophora Brodiaei* (compare ROSENVINGE Mar. Alg. Denmark, p. 524, fig. 500) are not observed in the tiny stipe of this little species; the tissue found here is composed of densely placed cells in transverse section, roundish, in longitudinal ones sub-cylindrical, and have thick walls.

Most regrettably the specimens are sterile.

As to the locality it is said: "on rocks exposed to strong surf."

## IV. Ceramiales.

### Fam. 1. *Ceramiaceae*

#### Subfam. 1. *Griffithsieae*.

#### *Griffithsia*. C. Ag.

##### 1. *Griffithsia subeylindrica* Okamura.

Alg. Mauritius, Additions V, 1953, p. 53.

In the paper quoted above it is mentioned that this species occurs in the island; in a batch of algae lately received from Mauritius another specimen of this species was present.

An examination of it has shown that it is a male plant.

As to the locality it is said: "Lagoon, epiphytic on *Cymodocea*, etc."

Mauritius: Riambel, 4-11-52, G. MORIN, no. 1305.

*Fam. 2. Rhodomelaceae.*

Subfam. 1. Polysiphonieae.

**Polysiphonia** Grev.

By Professor T. SEGI.

1. *Polysiphonia subtilissima* Montagne.

"Centurie II, n. 6 in Ann. Sc. Nat. Avr. 1840, Syll. p. 442"; KÜTZING, Spec. Alg. (1849) p. 804; Id., Tab. Phyc. vol. 13 (1863) pl. 28, figs. a—e; HARVEY, Ner. Bor. Amer. (1853) p. 34; J. AGARDH, Spec. Alg. vol. 2 (1863) p. 962; FARLOW, Mar. Alg. New Eng. (1881) p. 178; Phyc. Bor. Amer. Fas. 1 (1892) No. 45; DE TONI, Syll. Alg. vol. 4 (1903) p. 874; l. c. vol. 6 (1924) p. 393; PILGER, Meeresalg. Kamerun (in Engler's Jahrb. vol. 46, 1911) p. 304; TAYLOR, Mar. Alg. Northeast. coast of North Amer. (1937) p. 365; TSENG, Mar. Alg. Hong Kong, VI. Polysiphonia (Papers Michigan Acad. Sci. Arts and Lett. vol. 29, 1944) p. 70, pl. 1; SEGI, Polysiphonia from Japan (Jour. Fac. Fish. Pref. Univ. Mie, vol. 1, No. 2, 1951) p. 197, pl. III, 6, fig. 8.

This plant has four siphons without cortical cells.

In the Mauritian specimen (Fig. 14) the cystocarps (Fig. 15) are almost globose (ca.  $260-320 \times 270-340 \mu$ ) as figured, but in the Japanese one they are broadly urceolate (SEGI, l. c.). It seems to the writer that there are two types of cystocarps as noted by DE TONI (l. c. vol. 6).



Fig. 14. *Polysiphonia subtilissima* Montagne. A specimen. About natural size.

The present specimens agree with KÜTZING's figure (Tab. Phyc. l. c.) and on the whole with the American specimen (Phyc.

Bor. Amer. Fasc. 1, 1892, No. 45). But the frond is not so finely branched as that of the Japanese plant (Samani).

The plant is purplish red or almost blackish in drying.

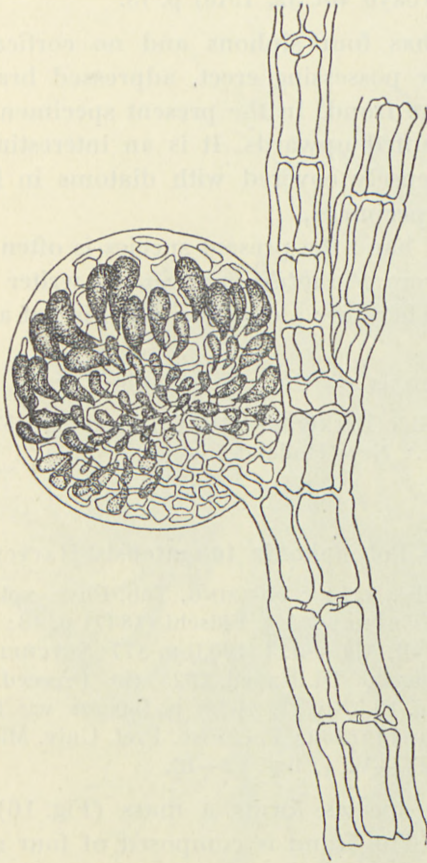


Fig. 15. *Polysiphonia subtilissima* Mont. A cystocarp  $\times$  ca. 120.

Mauritius: Ilôt Barkly, 3-10-48, G. MORIN, no. 737, no. 782.

Geogr. Distr.: Atlantic coast of France and America; Hong Kong; Japan.

## 2. *Polysiphonia scopulorum* Harvey?

"Mar. Bot. of West Austr. n. 88 in Trans. Irish Ac. vol. 22, p. 540; Id., Austr. Alg. n. 186"; J. AGARDH, Spec. Alg. vol. 2 (1863) p. 940; KÜTZING, Tab. Phyc. vol. 14 (1864) p. 12, pl. 37, figs. a—c;

DE TONI, Syll. Alg. vol. 4 (1903) p. 1065; SEGI, Polysiphonia from Japan (Jour. Fac. Fish. Pref. Univ. Mie, vol. 1, No. 2, 1951) p. 200, pl. III, 7, fig. 9.

Syn. *P. ferulacea* (non Suhr) Yendo, Notes on Alg. New to Japan VIII (Bot. Mag. Tōkyō vol. 32, 1918) p. 75.

This plant has four siphons and no cortical layers. It is characterized by possessing erect, adpressed branchlets on the upper part of the frond. In the present specimen the branchlets are somewhat tufted upwards. It is an interesting fact that the branches are densely covered with diatoms in both Mauritian and Japanese specimens.

On the other hand the present species is often rather difficult to distinguish from *P. subtilissima*. So the writer remains somewhat in doubt. Therefore a question mark is put after the specific name.

The specimen is on the whole rather grey.

Mauritius: Îlot Barkly, 1-4-46, G. MORIN, no. 522.

Geogr. Distr.: New Holland; Japan.

### 3. *Polysiphonia tongatensis* Harvey.

“Alg. Friend. Isl. n. 14”; KÜTZING, Tab. Phyc. vol. 14 (1864) p. 14, pl. 41, figs. a—d; GRUNOW, Alg. Fidschi (1847) p. 48; Id., “Alg. Kelan p. 4”; DE TONI, Syll. Alg. vol. 4 (1903) p. 877; SETCHELL and GARDNER, Mar. Alg. Revillagigedo Isl. Exped. 1925 (in Proceed. Calif. Acad. Sci. Fourth Series, vol. 19, No. 11, 1930) p. 160 (as var. (?)); SEGI, Polysiphonia from Japan (Jour. Fac. Fish. Pref. Univ. Mie, vol. 1, No. 2, 1951) p. 207, pl. IV—V, 1, figs. 12—13.

The present species forms a mass (Fig. 16), expanded in every direction. The frond is composed of four siphons, having no cortical layers.

In the specimen at hand the writer could observe a connection between branches and trichoblasts in the origin as figured (Fig. 17). The branches do not arise in connection with the trichoblasts. Sometimes they occur in the place of the trichoblasts. It is noticeable that in the Mauritian plant one trichoblast arises per two segments, with  $\frac{1}{4}$  divergence in a left-hand spiral, while in the Japanese plant there is one per segment in the same manner. The writer wants to study this interesting point further.

In outward appearance this specimen agrees with the Ja-



Fig. 16. *Polysiphonia tongatensis* Harv. ( $\times \frac{4}{3}$ ).

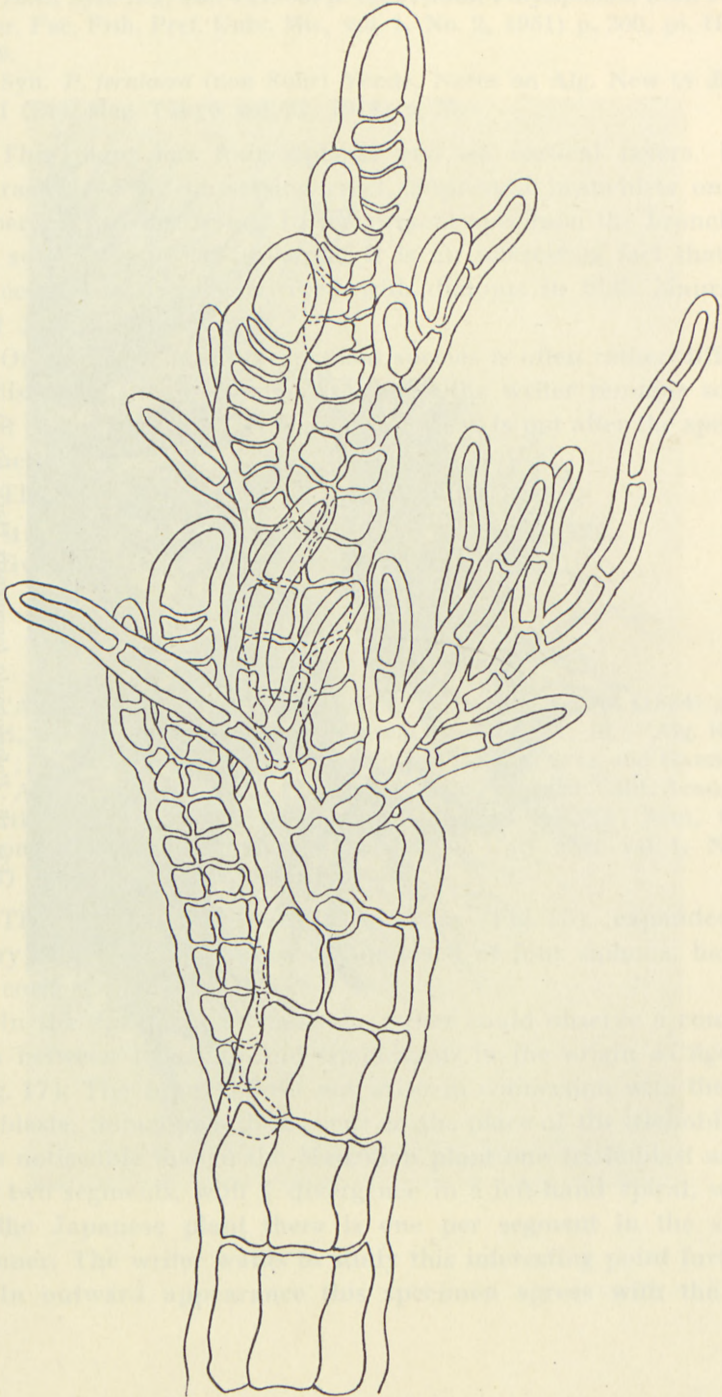


Fig. 17. *Polysiphonia tongatensis* Harvey. Tip of a branch showing trichoblast and branchlet which issue independently of each other  $\times$  ca. 700.



panese (Segamiike) and the American one (Herb. Univ. Calif. No. 261338, Port Phaeton, Tahiti Isl. det. Setchell).

The plant is purplish red in drying.

Mauritius: La Preneuse, 12-4-52, R. E. VAUGHAN, no. 1211.

Geogr. Distr.: Tonga (Friendly) Isl.; New Caledonia; Tahiti Isl.; Fiji Isl.; Japan.

#### 4. *Polysiphonia variegata* (C. Agardh) Zanardini.

"Syn. (1841) p. 60"; J. AGARDH, Alg. Med. (1842) p. 129; Id., Spec. Alg. vol. 2 (1863) p. 1030; KÜTZING, Spec. Alg. (1849) p. 821; Id., Tab. Phyc. vol. 13 (1863) pl. 81, figs. d—f; HARVEY, Phyc. Brit. vol. 2 (1846—51) pl. 155; Id., Ner. Bor. Amer. (1853) p. 45; THURET et BORNET, Etud. Phycol. (1878) pl. 42; FARLOW, Mar. Alg. New Eng. (1881) p. 173; ARDISSONE, Phyc. Mediter. vol. 1 (1883) p. 390; HAUCK, Meeresalg. (1885) p. 236; FALKENBERG, Rhodomelac. (1901) p. 119, t. 21, fig. 30; DE TONI, Syll. Alg. vol. 4 (1903) p. 922; l. c. vol. 6 (1924) p. 398; BØRGESSEN, Mar. Alg. of Dan. West Ind. vol. 2 (1918) p. 269, figs. 264—266; Id., Ind. Rhodophyc. IV (1934) p. 26, fig. 18; Id., Mar. Alg. Nor. Part Arabian Sea Geogr. Distr. (1934) p. 48; Id., List Mar. Alg. Bombay (1935) p. 62; Id., Mauritius (1945) p. 35; BATTEN, The Genus *Polysiphonia* (in Journ. Linn. Soc. Bot. vol. 46, 1923) p. 307, pl. 25, figs. 74—76; FELDMANN et MAZOYER, Addit. Fl. Alg. mar. l'Algerie (1937) p. 319; TAYLOR, Mar. Alg. Northeast. Coast of North Amer. (1937) p. 370.

Syn. *Hutchisia variegata* C. Agardh, Syst. Alg. (1824) p. 153; Id., Spec. Alg. vol. 2 (1828) p. 81.

There were six dried specimens at hand and they have all been identified with *P. variegata*. In the present specimens the frond is composed of 5—7 siphons without cortical cells. Thus the siphons are rather variable in number as well as in the outer appearance of the species. DE TONI, HARVEY, and THURET et BORNET also noted 5—8 siphons with or without cortical cells.

Fortunately the writer could ascertain a connection between branches and trichoblasts in the origin as figured. The branches are formed connectedly at the base of the trichoblasts as noted by various authors.

In comparison with foreign specimens, the present ones on the whole agree with them. Specimen no. 887 coincides with the European specimen (Herb. LENORMAND, Communicat. ex Herbario Lungduno-Batavo "*Hutchinsia variegata* Ag." côtes atlantiques de France, en Herb. CHAUVIN), no. 624 with the American

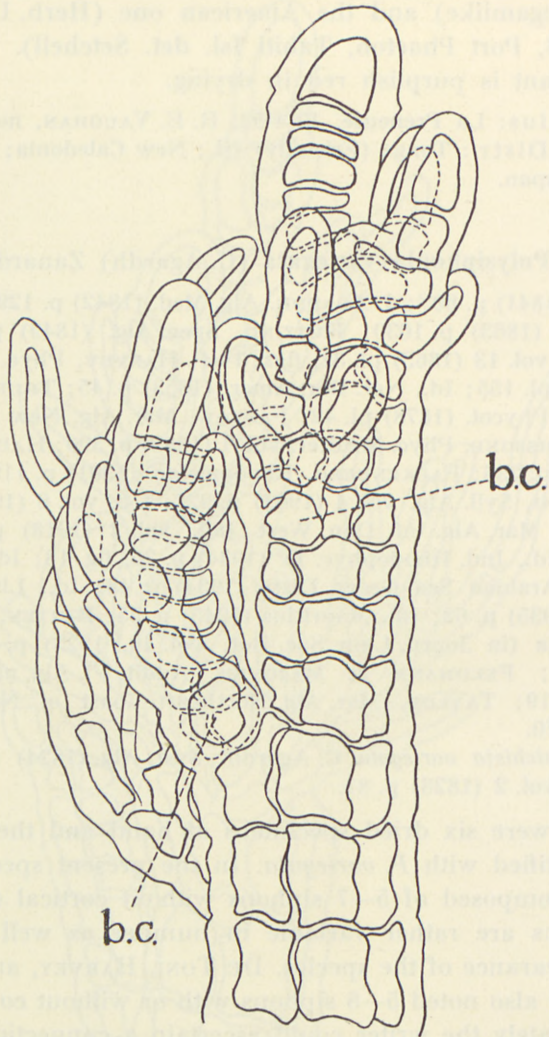


Fig. 18. *Polysiphonia variegata* (C. Agardh) Zanardini. Tip of a branch showing trichoblast and branchlet which issue connectedly in the origin  $\times$  ca. 600.  
*b.c.* basal cell of both trichoblast and branchlet common to both.

one (Duplicates from the Herbarium of Mrs. M. A. BOOTH, Distrib. by the New York Bot. Garden. "*P. variegata* Ag." Orient, Long Island) and no. 912 with indistinctive locality (*S. Sulliae*).

This species seems to be distributed widely in Europe and America, but not in Japan.

The plant is light or dark purplish red in drying.

Mauritius: Near Îlot Barkly, 9-10-48, no. 887. Flic-en-Flacq, R. E. VAUGHAN, no. 912. Ile aux Aigrettes, 14-1-52, G. MORIN, no. 1204. Ile aux Aigrettes, 12-5-52, G. MORIN, no. 1222. R. E. VAUGHAN, no. 624. Ile Maurici, Daruty 1892, Herb. E. JADIN.

Geogr. Distr.: Adriatic Sea; Mediterranean Sea; European and North American Coasts; West Indies.

### 5. *Polysiphonia nigrescens* (Smith) Greville.

In "HOOKER, Br. Fl. vol. 2 (1833) p. 322"; HARVEY, Phyc. Brit. (1846—51) pl. 277; Id., Man. (1849) p. 88; KÜTZING, Spec. Alg. (1849) p. 813; Id., Tab. Phyc. vol. 13 (1863) pl. 56, figs. f—i; J. AGARDH, Spec. Alg. vol. 2 (1863) p. 1057; Id., Florid. Morphol. (1879) pl. 33, fig. 14; FARLOW, Mar. Alg. New End. (1881) p. 174; HAUCK, Meeresalg. (1885) p. 244; FALKENBERG, Rhodomelac. (1901) p. 129; DE TONI, Syll. Alg. vol. 4 (1903) p. 940; l. c. vol. 6 (1924) p. 401; OLTMANN'S. Morph. u. Biol. Alg. II (1922) p. 309, fig. 525, p. 404, fig. 596; BATTEN, The Genus *Polysiphonia* (in Journ. Linn. Soc. Bot. vol. 46, 1923) p. 306, pl. 25, figs. 67—73; KYLIN, Stud. Ent. Florid. (1923) p. 116—123, figs. 73—76; Id., Rhodo. schwed. Westküste (1944) p. 84, fig. 52, A. B., pl. 28, figs. 80, 81, pl. 29, fig. 82.

Syn. *Conferva nigrescens* Smith, Engl. Bot. (1806) pl. 1717.

Syn. *Hutchinsia nigrescens* Ag., Syst. Alg. (1824) p. 15; Id., Spec. Alg. (1828) p. 69; LYNGBYE, Hydro. Dan. (1819) p. 109, pl. 33.

There were two dried specimens at hand. Among them no. 1 (Fig. 19) is cystocarpic and no. 2 not female.

The frond is composed of 6 siphons (no. 1), 7—8 ones (no. 2) and ecorticated (no. 1, no. 2). The lower part of the frond is branched in a decompound-dichotomous manner.

According to the description and plates of *P. nigrescens* given by KYLIN (l. c. 1944), this species includes three forms, *f. fucoides* (Hudson) J. Agardh, *f. protensa* J. Agardh and *f. flaccida* Arechoug. In his opinion, no. 1 seems to be related to *f. protensa* and no. 2 to none of the three forms.

On the other hand no. 2 (Fig. 20) seems to show a resemblance to *P. fastigiata*, especially in the dichotomous ramification. But the former has fewer siphons (7—8) than the latter (12—24) (DE TONI, l. c. vol. 4).

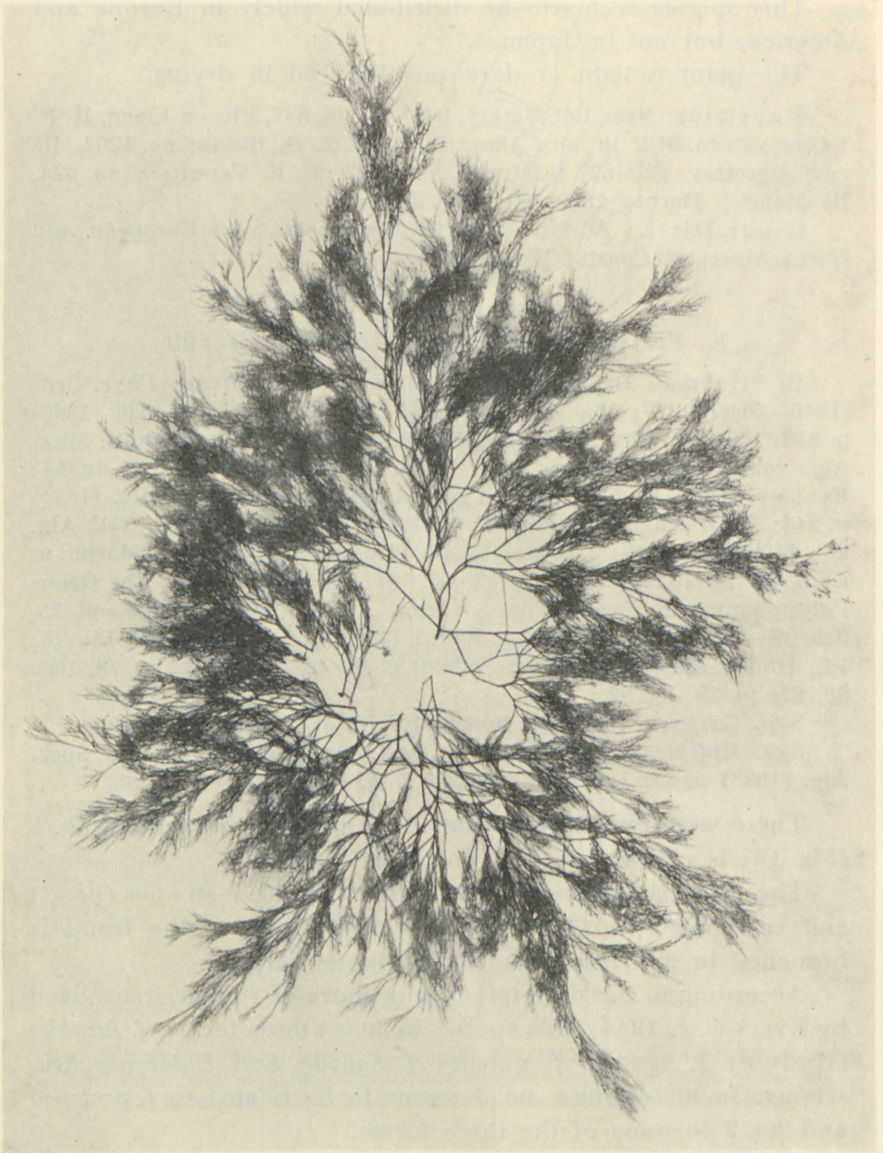


Fig. 19. *Polysiphonia nigrescens* (Smith) Grev. A cystocarpic specimen. No. 1.  
Herb. JADIN.  $\times 1$ .



Fig. 20. *Polysiphonia nigrescens* (Smith) Grev. A sterile specimen. No. 2.  
Herb. JADIN.  $\times 1$ .

In *P. nigrescens* the siphons are rather variable in number (8—20, generally 16), according to DE TONI's description (*l. c.*). In general, however, there are fewer than in *P. fastigiata*. The branches in *P. nigrescens* are not dichotomous, being different from those of the Mauritian plant. On this point, however, the writer considers that it is only a question of individual variation.

It seems to the writer more reasonable to refer these two specimens to *P. nigrescens* than to *P. fastigiata*.

The plant is dark purplish red in drying.

Mauritius: Ile Maurice, envoi Daruty 1892, Herb. F. JADIN, no. 1.  
Ile Maurice, envoi Daruty 1892, Herb. F. JADIN, no. 2.

Geogr. Distr.: Europe; Canary Isl.; Australia; New Zealand (?).

## Subfam. 2. Laurencieae.

### Laurencia Lamour.

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

Alg. Mauritius, III, 4, 1945, p. 47.

Of this species surely common in Mauritius I have, since it was first mentioned in the paper quoted above, received several gatherings of which I shall mention some of the most essential.

No. 537; 543; 660 "rocky pools"; 661, "attached to rocks in deep pools"; 676; 906, "in shallow water near the shore attached to old coral and rocks".

Mauritius: Grand Baie, 16-2-46, G. MORIN, no. 537. Cassis, 4-2-46, G. MORIN, no. 543. Îlot Brocus, 25-8-46, R. E. V. nos. 660—661. Pointe aux Sables, 7-4-47, G. MORIN, no. 676. Flic-en-Flacq, 3-4-50, R. E. V. no. 906.

#### 2. *Laurencia decumbens* Kütz.

Alg. Mauritius, III, 4, 1945, p. 50, figs. 25—27; Additions IV, 1952, p. 65.

Some small specimens very like those I have formerly referred to this species have recently been received from Mauritius.

As to the locality it is said: "in lagoon, firmly attached to large rocks."

Mauritius: Pointe aux Roches, 22-9-52, G. MORIN, no. 1292.

#### 3. *Laurencia flexilis* Setchell.

Alg. Mauritius, III, 4, 1946, p. 56, figs. 31—33; Additions IV, 1952, p. 66, fig. 33; Additions V, 1953, p. 55.

Some few specimens of this species are included in a collection of algae recently received.

About the locality it is said: "In rock crevices, exposed to waves."

Mauritius: Riambel, 24-7-52, R. E. V. no. 1252.

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

Alg. Mauritius, III, 4, 1945, p. 58; Additions IV, 1952, p. 67.

var. *divaricata* (J. Ag.) Yamada.

YAMADA, K. Notes on *Laurencia*, 1931, p. 223. *Laurencia divaricata* J. Ag., *Epicris*, p. 649.

Some specimens recently received are, I think, referable to this variety. The specimens are tetrasporic; the tetrasporangia are developed densely round the apices of the fertile branchlets as described by J. AGARDH.

About the locality it is said: "on rocks and old coral near reef."

Mauritius: Pointe aux Roches, 6-9-52, G. MORIN, no. 1278.

### Subfam. 3. *Polyzonieae*.

#### *Leveillea* Decsne.

1. *Leveillea jungermannioides* (Mart. et Her.) Harv.

Alg. Mauritius, III, 4, 1945, p. 42.

In a batch of algae recently received some fragments of this species are found; it was creeping upon a specimen of *Vidalia fimbriata*.

About the locality it is said: "In rock crevices near reef submerged at low tide."

Mauritius: Riambel, 8-12-50, R. E. V. no. 1005.

### Subfam. 4. *Amansieae*.

#### *Vidalia* Lamouroux.

1. *Vidalia fimbriata* (R. Br.) J. Ag., Falkenb. emend.

Alg. Mauritius, III, 4, *Ceramiales*, 1945, p. 44, fig. 20.

While treating this species in the paper quoted above I had very little material to work with, namely two small specimens

from JADIN's collection and some fragments dredged in deep water and sent from Dr. VAUGHAN.

It was therefore of interest in a collection of algae received later from the island to find several specimens of this species.

Referring to the list of literature mentioned in the paper quoted above and likewise to the list of synonyms and what is said about the right naming of this species according to SCHMITZ and the detailed description of FALKENBERG as to the structure of the thallus, I shall only mention here, that an examination of the specimens now received has shown that there is great variation in the development of the adventitious shoots.

Thus the endogenous marginal shoots are sometimes present only as short spines, or they are much more developed, getting 2—3 curved branchlets; in Tab. Phycol., vol. 14, tab. 97, fig. b KÜTZING gives a good figure of such a branchlet. Now and then a branchlet may grow out into a long shoot. Also the most probably exogenous short shoots, growing out from the flat sides of the thallus, as a rule in 2 rows one on each side of the midrib, but sometimes also more scattered, often become large and well developed like the marginal ones.

The characteristic rather robust hairs were often found upon the branchlets.

Fructiferous organs were not observed in the specimens.

*Leveillea jungermannioides* (Mert. et Her.) Harv. was an epiphyte upon it.

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

Mauritius: Riambel, 8-12-50, R. E. V. no. 1005.

## Subfam. 5. Dasyeae.

### Dictyurus Bory.

#### 1. *Dictyurus purpurascens* Bory.

Alg. Mauritius, III, 4, 1945, p. 30.

Of this species, of which I have previously seen very little material, some fine specimens are found in a batch of algae recently received.



FALKENBERG, in "Rhodomelaceen", p. 675, bases his detailed description of this species upon material from Mauritius collected by K. MOEBIUS.

The specimens were collected "in cavities in rocks near reef exposed at low tide".

Mauritius: Pointe aux Roches, 6-9-52, G. MORIN, no. 1281.

## Halodictyon Zanard.

### 1. *Halodictyon* spec.

Some small specimens (Fig. 21) of a *Rhodophyceae* have after examination turned out to be a *Halodictyon*. As we in the Botanical Museum, Copenhagen, have only some few specimens of *Halodictyon mirabile* Zan. to compare with, I have sent a specimen of the plant to Mme, Dr. G. FELDMANN, Paris, who most kindly answered me that it most probably was a new species. But as the material is sterile, I have let it remain as *Halodictyon* spec.

The cells in the reticulate tissue are up to about  $250\ \mu$  thick with walls about  $30-50\ \mu$ . The short apical subpyramidal cells are about  $50\ \mu$  broad below.

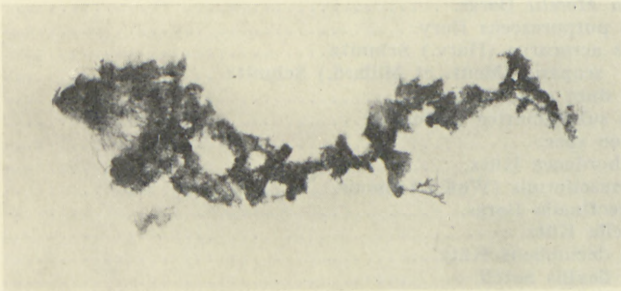


Fig. 21. *Halodictyon* spec. Habit of a specimen  $\times 1$ .

About the locality it is said: "In cavities of rocks mixed with other algae."

Mauritius: Pointe aux Roches, 6-9-50, G. MORIN, no. 1282.

## Index specierum.

with some few synonyms, the latter italicized.

### Chlorophyceae.

	Page
Bryopsis indica A. and E. S. Gepp. ....	5
Caulerpa crassifolia (Ag.) J. Ag. ....	6
— racemosa (Forssk.) Web. v. Bosse var. microphysa (Web. v. B.) Taylor .....	8
Caulerpa Vickersiae Borgs. ....	6
Codium Bartletti Tseng and Gilbert .....	10
Microdictyon Agardhianum Decsne. ....	5
Udotea javensis (Mont.) A. and E. S. Gepp. ....	9

### Phaeophyceae.

Chnoospora fastigiata J. Ag. ....	11
-----------------------------------	----

### Rhodophyceae.

Archaeolithothamnium Schmidtii Fosl. ....	14
<i>Callymenia Morelii</i> Borgs. ....	28
Dictyurus purpurascens Bory. ....	48
Gelidiopsis acrocarpa (Harv.) Schmitz. ....	18
— scoparia (Mont. et Millard.) Schmitz. ....	22
Gracilaria dura (Ag.) J. Ag. ....	33
Griffithsia subcylindrica Okamura .....	35
Halodictyon spec. ....	49
Hypnea chordacea Kütz. ....	23
— musciformis (Wulf.) Lamour. ....	26
— pectinella Borgs. ....	26
Jania tenella Kütz. ....	15
Laurencia decumbens Kütz. ....	46
— flexilis Setch. ....	46
— obtusa (Huds.) Lamour. ....	47
— papillosa (Forssk.) Grev. ....	46
Leveillea jungermannioides Decsne. ....	47
Liagora rugosa Zanard. ....	12
Lithophyllum Kayserii Heydr. ....	14
— moluccense Fosl. f. pygmaea Heydr. ....	13
Mesophyllum crispescens (Fosl.) Lem. ....	14
Phyllophora Morinii Borgs. ....	33
Polysiphonia nigrescens (Smith) Grev. ....	43
— scopulorum Harv. ....	37
— subtilissima Mont. ....	36
— tongatensis Harv. ....	38
— variegata (C. Ag.) Zan. ....	41

<i>Sarcodia ceylanica</i> Harv. ....	28
— <i>mauritiana</i> Børgs. ....	28
— <i>Montagneana</i> J. Ag. ....	28
— <i>multifida</i> Børgs. ....	30
<i>Tenaciphyllum lobatum</i> Børgs. ....	17
— <i>rotundilobum</i> Børgs. ....	17
<i>Vidalia fimbriata</i> (R. Br.) J. Ag., Falkenb. emend. ....	47

UNTERSUCHUNGEN  
 ÜBER DETERMINATION UND  
 DIFFERENZIERUNG

VON DER WIRKUNGSWEISE DES  
 DETERMINIERENDEN FAKTORS UND DER  
 BEDEUTUNG DER WURTELHÄUTE VON  
 EPIDERMIS, XYLEM UND PHLOEM TÄTIG IST

VON  
 C. BIRKEN JENSEN

Wid. og Kgl. Skriv. 1954

Indleveret til selskabet den 11. maj 1954.  
 Færdig fra trykkeriet den 7. oktober 1954.

28	<i>Adiantum...</i>
29	<i>Asplenium...</i>
30	<i>Polypodium...</i>
31	<i>Monophlebium...</i>
32	<i>Psidium...</i>

### Index...

with...

### Microphytes

	<i>Algae...</i>	
	<i>Fungi...</i>	
	<i>Plantae...</i>	
	<i>Protozoa...</i>	
	<i>Bacteria...</i>	
	<i>Virus...</i>	

### Macrophytes

	<i>Algae...</i>	
	<i>Fungi...</i>	
	<i>Plantae...</i>	
	<i>Protozoa...</i>	
	<i>Bacteria...</i>	
	<i>Virus...</i>	