SPECIES OF CAULERPA (CHLOROPHYCEAE) COLLECTED ON THE INTERNATIONAL INDIAN OCEAN EXPEDITION

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One of the major scientific efforts of the decade has been the International Indian Ocean Expedition of 1960—64, involving several institutions and ships and numerous scientists. With an oceanographic focus, not only physical and biological open sea oceanographic studies were carried on, but littoral and sublittoral work as well, on shores and reefs. Geographically, too, the range was wide, and respecting algae particularly so, though predominately western.

The chief algal collectors were Professors G. F. Papenfuss (University of California, Berkeley) and R. F. Scagel (University of British Columbia). Papenfuss joined the Israel South Red Sea Expedition prior to sharing in the Indian Ocean Expedition, and Scagel joined him to work on the African east coast and off-lying islands, continuing south to Cape Town. The Red Sea *Caulerpas* will be reported elsewhere by myself, and those from South Africa by Papenfuss. To a few Australian collections from Scagel are added a few more from Singapore and elsewhere by Dr. L. H. Colinvaux (Ohio State University) and Professor R. E. Norris (University of Washington). Materials from Papenfuss and Scagel reached me in generous measure directly from the collectors; material from the others came by courtesy of the Smithsonian Oceanographic Sorting Center, and to all these sources I am much indebted for the materials and for information of various kinds.

In the List of Species which follows all collections with numbers bearing the prefix 'PR' were made jointly by G. F. Papenfuss and R. F. Scagel; those with 'R' only, by R. F. Scagel independently. Their collections will be distributed primarily between the herbaria at Berkeley (UC), at Vancouver (UBC), and at Washington (US), and these depositories will not be designated throughout the text. In the cases of other collectors they are named and the place of deposit is indicated, usually Washington (US), since the material was returned there. The typical variety is not indicated under the different species, and the first group of specimens recorded comprises in each case individuals without distinctive features as well as some approximating to the type.

It is hardly profitable to draw conclusions from a list of species in a single genus collected over such a wandering course. Doubtless Papenfuss will be able, familiar as he is with the South African flora, to compare it with the flora of East Africa, the large contiguous islands and the Red Sea when all his studies are complete. Many of the records are new for their areas, as would be expected, and in general they reinforce the current impression of the wide range of many members of the genus. There are exceptions, of course: *Caulerpa ashmeadii* and *C. paspaloides* of the western Atlantic, *C. holmesiana* and *C. zeyheri* of eastern Africa, as several Australian species, but the long-recognized list of cosmopolitan species headed by *C. racemosa* may be extended by widening the ranges of *C. cupressoides* and several others. While opinions as to the significance of varietal names in the genus may long remain at variance, it can be confidently expected that this genus, readily recognized, will be one of the most studied of the marine *Chlorophyceae*.

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LIST OF SPECIES

Caulerpa antoensis Yamada

ZANZIBAR. Bwenju Reef, *PR-XV-76*, 18-x-62.
MOZAMBIQUE. Ponta Abril, *PR-XXIV-12*, 11-xi-62. North of Lumbo, Praia Chokas, *PR-XXVIII-68*, *-69*, 15/17-xi-62.

This material (and in particular sample *XXVIII-69*) seems to agree sufficiently with *C. antoensis* Yamada (1941, p. 16; 1944a, p. 27), and I so refer it, but not without misgiving. Although Yamada stresses distichous arrangement of the ramelli he admits irregular radial arrangement to occur and figures it over much of his illustration. One bit of *XXVIII-68* was clearly distichous, but the rest of the material not so. Authentic material sent many years ago by Professor Yamada certainly showed an irregularly radial disposition of the ramelli, and sizes of ramelli and stolons in the present material conformed to it.

The stolons in the present material were either naked, or with distinct rhizophores, or with scattered, branched rhizoidal filaments. The stolon diameter reached 270—410 μ, but was commonly less. The erect axes reached a length of 2.5 cm, though usually about 1.5 cm, and were simple or bore 1—3 branches. The simple ramelli were not contracted at the base, were usually much incurved, reached a length of 0.9—1.4 mm, and a diameter of 170—270 μ. Their tips were apiculate above, but those lower on the axis were often not even acute.

Caulerpa brachypus Harvey

ZANZIBAR. Bwenju Reef, *PR-XV-17*, *-78*, 18-x-62. Makunduchi Reef, in front of lighthouse, *PR-XVI-4*, *-29*, 19-x-62.
MOZAMBIQUE. North of Lumbo, Praia Chokas, *PR-XXVIII-7*, *-18*, *-71*, 15/17-xi-62.

Harvey's original description (1859, p. 333) of *C. brachypus* clearly states the blades to be 'integerrimus'. Okamura in his Icones first used the name *C. anceps* of Harvey (v. 3, pl. 125) for his Japanese material, but later considered this synonymus with *C. brachypus* (v. 7, p. 83), referring to the same illustrations. Material assignable to *C. brachypus* varies a great deal. This was discussed at length by Gilbert (1942, p. 9) and by Papenfuss and Egerod (1957, p. 86). Some of the plants are quite small enough to match *C. parvifolia* Harv. A Philippine specimen from Dalupiri I. (*no. 14993*) ascribed by Gilbert (1942, p. 11) to that species is very delicate, with its largest blade only 1.5 mm broad and 10 mm long, but it and some other smaller blades are serrate. While he would keep the species separate I agree with Papenfuss that *C. parvifolia* must be reduced to synonymy. Børgesen's *C. mauritiana* (1940, p. 45, pl. 3) seems to be just a rather large, entire-margined form of *C. brachypus*. The basal swelling of the leaf-stalk emphasized by Yendo (1903, p. 155) and figured by Yamada (1941, p. 98) was rarely distinguishable on herbarium specimens, even on Japanese material, but did show on a few from Japan and on one from Mozambique in formaldehyde, but not on all. Plants of *C. brachypus* available have blades sometimes entire, sometimes irregular of margin, sometimes serrate in part or completely, with the tooth size and shape varying. Serration bears

no relation to leaf size. While in some cases the teeth are just as Okamura figured them (Icones, v. 3, p. 94, pl. 125, fig. 6), when formaldehyde specimens were seen in edge view they seemed to be offset alternately toward one blade face or the other. Commonly the teeth bore 2—3 apiculae rather than a single one. These characters are marked in Sonder's presentation of his *C. biserrulata* (1871, p. 64, pl. 2), and it seems to me that this name also must go into the synonymy of *C. brachypus*.

Caulerpa brownii Endlicher

AUSTRALIA. West Australia, Cowararump Bay, *R-LVII-5*, 27-vii-62. Victoria, Cape Patterson, coll. *R. E. Norris, Sta. D-10*, 20-i-63 (US, MICH).

Caulerpa cactoides (Turner) C. Agardh

AUSTRALIA. Victoria, Cape Patterson, coll. *R. E. Norris, sta. D-10*, 20-i-63 (US, MICH).

Caulerpa cupressoides (West) C. Agardh

TANGANYIKA. Near Dar-es-Salaam, point north of Oyster Bay, *PR-XXVII-66, -96*, 11/13-x-62.
ZANZIBAR. Bwenju Reef, *PR-XXV-75*, 18-x-62.
MOZAMBIQUE. North of Lumbo, Praia Chokas, *PR-XXVIII-66*, 15/17-xi-62. Inhaca I., Barreia Vermelha, *PR-XXI-2*, 9-xi-62.

var. **lycopodium** (J. Agardh) Weber-van Bosse

MOZAMBIQUE. Inhaca I., Barreia Vermelha, *PR-XXI-2 p.p.*, 9-xi-62; Cabo Inhaca, lighthouse rocks, *PR-XXII-114 p.p.*, 10-x-62.

fa. **amicorum** (Harvey) Weber-van Bosse

MOZAMBIQUE. Inhaca I., Barreia Vermelha, *PR-XXI-2 p.p., -43, PR-XXVI-2, -9*, 12-ix-62. Not very distinctive.

fa. **disticha** Weber-van Bosse

ZANZIBAR. Bwenju Reef, *PR-XV-18*, 18-x-62.

var. **mamillosa** (Montagne) Weber-van Bosse

ZANZIBAR. Makunduchi Reef, in front of the lighthouse, *PR-XVI-3, -28*, 19-x-62.

Caulerpa elongata Weber-van Bosse

TANGANYIKA. Near Dar-es-Salaam, point north of Oyster Bay, *PR-VIII-56, -87*, 11/13-x-62.
ZANZIBAR. Makunduchi Reef, in front of lighthouse, *PR-XVI-106*, 19-x-62.
MOZAMBIQUE. Inhaca I., Ponta Abril, *PR-XXIV-114*, 11-xi-62. North of Lumbo, Praia Chokas, *PR-XXVIII-64*, 15/17-xi-62.

Elongation of the ramelli on the stolons, which reaches a climax in *C. webbiana* v. *tomentella*, was absent, ruling out that species and its variety. The ramelli on the stolons of our material were smaller than those of the erect axes, seeming to rule out *C. pickeringii*

Harvey & Bailey (1851, p. 373). Occasional small rhizophores were present on the stolons, but no tomentose covering of scattered rhizoids.

Caulerpa fastigiata Montagne

MOZAMBIQUE. North of Lumbo, Praia Chokas, *PR-XXVIII-161*, 15/17-xi-62.

Short lateral branchlets are more abundant in this material than was expected from past experience, but Mme Weber also figures them as numerous.

Caulerpa fergusonii Murray

MOZAMBIQUE. Zavora Reef, *PR-XX-41*, 4-xi-62. North of Lumbo, Praia Chokas, *PR-XXVIII-65*, 15/17-xi-62 (depauperate). Inhaca I., Cabo Inhaca, Lighthouse Rocks, *PR-XXII-98*, 10-xi-62; Ponta Abril, *PR-XXIV-103*, *-104*, 11-xi-62.
ZANZIBAR. Makunduchi Reef, in front of lighthouse, *PR-XVI-30*, 19-x-62.

These plants are very thick-walled. The ramelli are broadly clavate, somewhat contracted at the base, but they do not have a specialized pedicel with a constriction at its summit, as should *C. okamurai*. Mme Weber-van Bosse figures a bilateral distribution of the ramelli in this species but the plants in these collections all seem much stunted and bilaterality is seldom conspicuous, appearing strongly only in part of *PR-XVI-30*, which appears in fig. 3.

Caulerpa filiformis (Suhr) Hering [= *C. flagelliformis* C. Agardh]

MOZAMBIQUE. Xai-Xai, *PR-XIX-29*, 2 & 3-xi-62.

Caulerpa flexilis Lamouroux [= *C. hypnoides* (R. Brown) C. Agardh]

AUSTRALIA. West Australia, Cowararump Bay, *R-LVII-41*, 27-viii-62; Yanchep Beach, *R-LXVIII-8*, 31-viii-62.

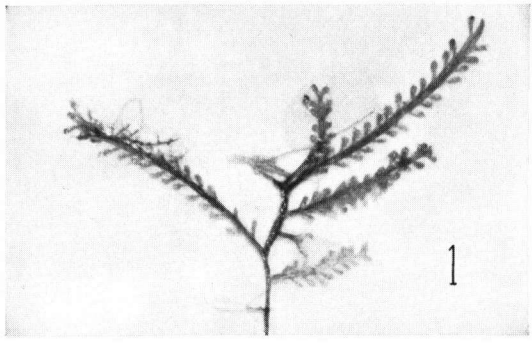
var. **muelleri** (Sonder) Womersley

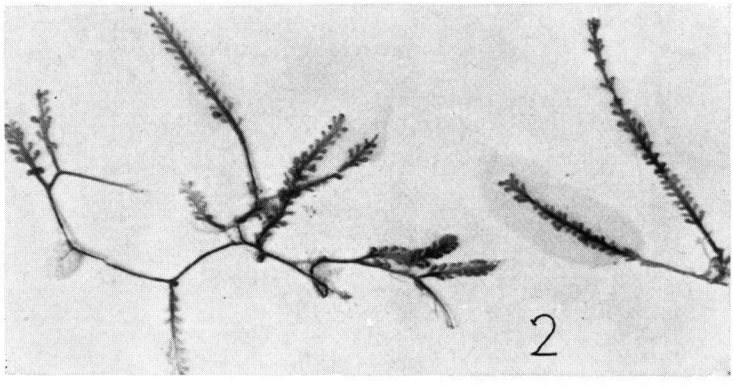
AUSTRALIA. West Australia, Point Peron, *R-LXIII-26*, *-48*, 29-viii-62; south of Sorrento, *R-LXVI-43*, 20-viii-62.

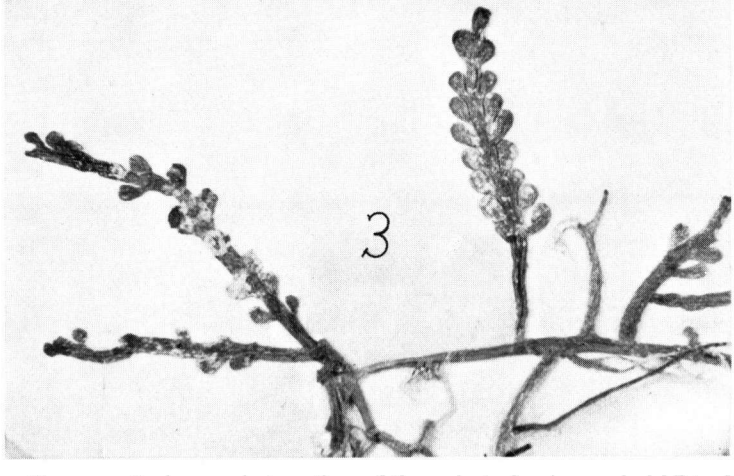
Caulerpa lanuginosa J. Agardh

ZANZIBAR. Makunduchi Reef, in front of lighthouse, *PR-XVI-105*, 19-x-62.

These specimens seem referable to *C. lanuginosa*, a species reasonably to be expected in the region. The plants are considerably less tall than most West Indian material, but Mme Weber-van Bosse did recognize a var. *delicatula* (Grun.) Weber-van Bosse of her *C. lycopodium*, which was smaller. The erect axes reach about 3 cm in height. The stolon apex is naked; its mature diameter reaches 850 μ and it is densely matted with branched rhizoids. The simple ramelli are densely crowded around the axes and are little curved, except hear the axis bases; they are only occasionally acute. In length







Figs. 1, 2. *Caulerpa zeyheri*, portions of three plants showing marked bilateral arrangement of the ramelli. (1. ×2; 2. × 1.4).
— Fig. 3. *Caulerpa fergusonii*, portion of a plant showing the ramelli in clear bilateral position, × 1.3.

they reach 2.5—3.0 mm, and in diameter 200—270 μ, so they are somewhat thicker than those on West Indian plants.

Caulerpa lentillifera J. Agardh

TANGANYIKA. Near Dar-es-Salaam, a point north of Oyster Bay, *PR-VIII-94*. North of Dar-es-Salaam, at Bagamoyo, *PR-IX-31*, 14-x-62.
ZANZIBAR. Kizimkaze, Dembani Beach, *PR-XIV-22*, *-90*, 17-x-62. Near Kepwani, Unguja, Ukuu Beach, *PR-XIII-24*, 17-x-62.
MOZAMBIQUE. Inhaca I., Ponta Abril, *PR-XXIV-41*, 15/17-xi-62. North of Lumbo, Praia Chokas, *PR-XXVIII-63*, 15/17-xi-62.

The ramelli vary greatly in abundance on these plants; sometimes they are scant but not definitely biseriate. The pedicels which are constricted at the top, are short, about half the diameter of the swollen distal portion which is about 0.9—1.5 mm diam. The diameter of the axis is less than this. The resemblance of much of this material to *C. microphysa* (W.-v. B.) Feldmann of the West Indies in marked, but the ramelli are usually smaller. The starch grains and plastids appeared as figured by Feldmann (1955, p. 425), but there seemed no reason to assign the material to *C. longistipitata* (W.-v. B.) Sved. (1906, p. 137) as a species separate from *C. lentillifera*.

Caulerpa macrodisca Decaisne

SINGAPORE. Singapore I., Pu Sukudu, *L. H. Colinvaux*, 16-x-65 (US).

I have, elsewhere, treated this as a variety of *C. peltata*, of which I would consider it an evolutionary extension, and dwarf forms of it would be hard to distinguish from *C. peltata*, but fully developed it is quite different.

Caulerpa mexicana (Sonder) J. Agardh

ZANZIBAR. Kizimkaze, Dembani Beach, *PR-XIV-23*, 17-x-62. Bwenju Reef, *PR-XV-110*, 18-x-62. Makunduchi Reef in front of lighthouse, *PR-XVI-32*, *-34*, 18-x-62.
MOZAMBIQUE. Mozambique I., Ponta Isla, *PR-XXVII-77*, 14-xi-62. North of Lumbo, Praia Chokas, *PR-XXVIII-67*, 15/17-xi-62.
MADAGASCAR. Nossi Bé, Pointe du Cratère, *R-LXXVIII-62*, 12-ix-62.

Caulerpa peltata Lamouroux

TANGANYIKA. Near Dar-es-Salaam, point north of Oyster Bay, *PR-VIII-95*, 11/13-x-62. North of Dar-es-Salaam, Bagamoyo, *PR-IX-33*, 14-x-62.
ZANZIBAR, Nyange Reef, *PR-XIB-10*, 16-x-62. Makunduchi Reef, in front of lighthouse, *PR-XVI-31*, 19-x-62.
MOZAMBIQUE. Zavora Reef, *PR-XX-49*, 4-ix-62. Inhaca I., Ponta Abril, *PR-XXIV-111*, 11-xi-62. North of Lumbo, Praia Chokas, *PR-XXVIII-60*, 15/17-xi-62.
MAURITIUS. Ilôt Brocus, *R-LXX-81*, 4-iv-62.

Caulerpa racemosa (Forsskål) J. Agardh

ZANZIBAR. Nyange Reef, *PR-XIB-11*, *-12*, 16-x-62. Kizimkaze, Dembani Beach, *PR-XIV-24*, *-94*, 17-x-62. Bwenju Reef, *PR-XV-79 p.p.*, 18-x-62. Makunduchi Reef in front of lighthouse, *PR-XVI-27* (partly very large), 19-x-62.

MOZAMBIQUE. Zavora Reef, *PR-XX-40*, *-41*, 4-xi-62. Cabo Inhaca, Lighthouse Rocks, *PR-XXII-162*, *-164*, 10-xi-62. Inhaca I., Ponta Abril, *PR-XXIV-43*, 11-xi-62. Mozambique I., Ponta Isla, *PR-XXVII-74*, *-76*, 14-xi-62. North of Lumbo, Praia Chokas, *PR-XXVIII-56A*, *-57 p.p.*, 15/17-xi-62.

MADAGASCAR. Nossi Bé, Ambohodahy, Pointe Amporaha, *R-XXXII-33*, 8-ix-62. Nossi Tanikely, *R-LXXIII-2*, 9-ix-62.

MAURITIUS. Flic-en-Flacq, *R-LXIX-91*, 2-ix-62. Ilôt Brocus, *R-LXX-82*, 4-ix-62.

SINGAPORE. Singapore I., Pu Sekudu, *L. H. Colinvaux*, 16-x-63 (US).

var. **clavifera** (Turner) Weber-van Bosse

TANGANYIKA. Near Dar-es-Salaam, point north of Oyster Bay, *PR-VIII-27*, *-89*, *-90*, *-91 p.p.*, 11/13-x-62.

ZANZIBAR. Nyange Reef, *PR-XIB-11 p.p.*, 16-x-62. Bwenju Reef, *PR-XV-77 p.p.*, 18-x-62. Makunduchi Reef, in front of lighthouse, *PR-XVI-26 p.p.*, 19-x-62.

MOZAMBIQUE. Mozambique I., Ponta Isla, *PR-XXVII-12*, 14-xi-62. North of Lumbo, Praia Chokas, *PR-XXVIII-57*, 15/17-xi-62.

fa. **simplicissima** Børgesen

MOZAMBIQUE. North of Lumbo, Praia Chokas, *PR-XXVIII-65*, 15/17-xi-62.

Perhaps simply highly depauperate individuals unworthy of a particular name.

var. **laetevirens** (Montagne) Weber-van Bosse

ZANZIBAR. Bwenju Reef, *PR-XV-77 p.p.*, 18-x-62. Makunduchi Reef, in front of lighthouse, *PR-XVI-26 p.p.*, 19-x-62.

var. **macrophysa** (Kützing) Taylor

MOZAMBIQUE. North of Lumbo, Praia Chokas, *PR-XXVIII-56A*, *-58*, 15/17-xi-62.

These are not very distinctive of the variety.

var. **occidentalis** (J. Agardh) Børgesen

TANGANYIKA. Dar-es-Salaam, north of Oyster Bay, *PR-VIII-90*, 11/13-x-62.

var. **turbinata** (J. Agardh) Eubank [= var. *chemnitzia* (Esper) Weber-van Bosse]

TANGANYIKA. Near Dar-es-Salaam, point north of Oyster Bay, *PR-VIII-92*, *-192*, 11/13-x-62.

Years ago, in correspondence with F. Børgesen, I became aware that the Forsskål type of *C. racemosa* might be of the form which we have been calling var. *clavifera*. However, I was unwilling to make the necessary nomenclatorial changes since I had not seen the type myself and Børgesen did not feel that the case was clear. To do so would leave the mass of Western Atlantic collections without varietal designation, for it is those with round, short-stalked ramelli rather than clavate ones which I consider morphologically the most characteristic of the species in that area. Papenfuss and Egerod (1957, p. 88) do make the primary move, but by including this form, that with clavate ramelli, and var. *uvifera* as well, they broaden the characterization of *C. racemosa* var. *racemosa* to a point where I am reluctant to follow. Some of the varietal segregations which they seem to accept do not appear to me more worthy than those just mentioned which they reject: segregations which some of us feel needful will probably always be considered artificial and forced by others. As nearly as I can, I have used the segregations I have distinguished hitherto (Taylor 1960), recognizing that evolution in the Red Sea,

Indian Ocean, and western Pacific has not followed precisely the path followed in the Atlantic, and that the fits are not always exact. Under *C. racemosa* (without varietal designation) I have included plants I consider morphologically characteristic of the species and many others which do not have any very distinctive features at all. Under the varieties I have placed those which best approximated my understanding of them and in some instances, as probably *C. racemosa* var. *turbinata* (for the former var. *chemnitzia*) plants probably more closely matching the nomenclatural type than one could easily find in the Western Atlantic.

Caulerpa scapelliformis (R. Brown) C. Agardh

KENYA. Mombasa, reef in front of Nyali Beach Hotel, *PR-IV-50*, 1-x-62.
TANGANYIKA. Kingome, 35 km south of Tanga R.R. Station, *PR-VII-7*, 7-x-62.
MOZAMBIQUE. Xai-Xai, *PR-XIX-28*, 2/3-xi-62 (with some blades showing traces of teeth). Inhaca I., Cabo Inhaca, Lighthouse Rocks, *PR-XXII-63*; Ponta Abril, *PR-XXIV-36*, 11-xi-62.

var. **denticulata** (Decaisne) Weber-van Bosse

TANGANYIKA. North of Dar-es-Salaam, Bagamoyo, *PR-IX-11*, *-28* (very fine), 14-x-62.

Caulerpa serrulata (Forsskål) J. Agardh

TANGANYIKA. Near Dar-es-Salaam, north of Oyster Bay, *PR-VIII-36*, *-88*, 11/13-x-62.
ZANZIBAR. Kizimkaze, Dembani Beach, *PR-XIV-93*, 17-x-62.
MADAGASCAR. Nossi Bé, Amsamantsara, Ambatoloaka Beach, *R-LXXV-23*, 10-ix-62; Ambohodahy, Pointe Amporaha, *R-LXXII-13*, 8-ix-62. Nossi Tanikely, *R-LXXIII-5*, 9-ix-62.

var. **serrulata** forma **spiralis** Weber-van Bosse

ZANZIBAR. Chuckwani Beach, *PR-X-39*, 15-x-62.

var. **boryana** (J. Agardh) Gilbert

TANGANYIKA. North of Dar-es-Salaam, Bagamoyo, *PR-IX-34*, 14-x-62.
ZANZIBAR. Bwenju Reef, *PR-XV-80*, 18-x-62. Nyange Reef, *PR-XIB-1*, 16-x-62.

Caulerpa sertularioides (Gmelin) Howe

TANGANYIKA. North of Dar-es-Salaam, Bagamoyo, *PR-IX-29*, 14-x-62.
ZANZIBAR. Kizimkaze, Dembani Beach, *PR-XIV-95*, 17-x-62. Makunduchi Reef, in front of lighthouse, *PR-XVI-33*, *-35*, 14-xi-62.
MOZAMBIQUE. Mozambique I., Ponta Abril, *PR-XXVIII-78*, 14-xi-62.
SINGAPORE. Singapore I., Pu Sekudu, *L. H. Colinvaux*, 16-x-63 (US).

var. **sertularioides** forma **brevipes** (J. Agardh) Svedelius

ZANZIBAR. Bwenju Reef, *PR-XV-81*, 18-x-62.
MOZAMBIQUE. North of Lumbo, Praia Chokas, *PR-XXVIII-70*, 15/17-xi-62.

var. **sertularioides** forma **longiseta** (Bory) Svedelius

TANGANYIKA. Near Dar-es-Salaam, Oyster Bay, *PR-VIII-97*, 11/13-x-62.

ZANZIBAR. Vilanculos Beach, *PR-XVII-5*, 30-x-62.

On the whole, the specimens from these areas did not fall clearly into the cited varieties, and so were placed under the general category, with the best available variants associated with the form names above.

Caulerpa taxifolia (Vahl) C. Agardh

TANGANYIKA. North of Dar-es-Salaam, Bagamoyo, *PR-IX-30*, 14-x-62.

Caulerpa verticillata J. Agardh

SINGAPORE. Tanjong Berlayer (Labrador Beach), *L. H. Colinvaux and H. M. Burkill*, 19-x-65 (US). THAILAND. Phuket I., Palong, *R. E. Norris*, 23-iii-63 (US).

Caulerpa webbiana Montagne

AUSTRALIA. Victoria, Cape Patterson, *R. E. Norris sta. D-10*, 20-I-63 (US, MICH).

Caulerpa zeyheri Kützing

MOZAMBIQUE. Inhaca I., Cabo Inhaca, Lighthouse Rocks, *PR-XXII-29*, 10-xi-62; Ponta Abril, *PR-XXIV-43*, 11-xi-62; Mozambique I., Ponta Isla, *PR-XXVII-79*, 14-xi-62; north of Lumbo, Praia Chokas, *PR-XXVIII-61*, 15/17-xi-62.

This very nice little plant does not seem to me particularly closely related to *C. racemosa*, and I do not think that Mme Weber-van Bosse did wisely in reducing it to varietal status under that species. It is uniformly smaller, with smaller vesicular ramelli basically bilaterally disposed. The ramelli are sometimes nearly spherical, more typically turbinate to pyriform, about 170—340 μ diam., 230—680 μ long, generally in the smaller rather than the larger range. When *C. racemosa* is depauperate the ramelli do not assume this position, and in any case it is the fullest-developed plants which ought to be compared, not the stunted ones. In *C. zeyheri* the bilaterality is often not marked on short erect axes, but in fluid preserved material it can almost always be recognized and in some cases is conspicuous (fig. 2) closely resembling (if somewhat more luxuriant) plants recognized as *C. racemosa* var. *zeyheri* (Kütz.) Weber-van Bosse by Papenfuss from the Cape Province, South Africa. Mme Weber suggests (1898, p. 364) that the ramelli are laterally compressed, but this did not seem conspicuous in the preserved material available,

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