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Some Marine Algae from Canton Atoll

by

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The following annotated list has resulted from an examination of a collection of algae made during the first part of February, 1958, by Dr. and Mrs. Otto Degener on Canton Atoll in the Phoenix group. Only the green, brown, and red algae are treated here, inasmuch as a rather large series of Cyanophyta has been identified by Dr. Francis Drouet and is accounted in Bulletin No. 64.

With the exception of about a dozen species mentioned by Degener & Gillaspy (1955) on the basis of determinations by M. S. Doty, this is the first floristic list of which I am aware of the marine vegetation of Canton Atoll, or of any island in the Phoenix group. Accordingly, these records supplement and extend our knowledge of central Pacific atoll floras derived from such reports as have appeared in recent years for the Marshall, Gilbert, and Line Islands (cf. Taylor 1950, Dawson, Aleem & Halstead 1955, Dawson 1956, 1957, Moul 1957).

The specimens are cited according to Degener collection numbers. The first set of specimens, all of which are liquid preserved, has been deposited in the Herbarium of the University of California, Berkeley.

CHLOROPHYTA

Enteromorpha clathrata (Roth) J. Ag. 24841.

Enteromorpha sp. 24863. This appears to agree with what Chapman has called E. clathrata var. pumila (Aresch.) Chapm. from New Zealand.

Enteromorpha kylinii Bliding 24763; 24764; 24739; 24849?

Ulveella lens Crouan 24843a, growing on Caulerpa serrulata.

Cladophora fascicularis (Mert) Kütz. 24717. This material, about $\frac{1}{2}$ cm. tall, is in good agreement with Borgesen's illustrations of specimens both from Mauritius and the West Indies. The specimens are much smaller in height than many West Indian ones, but agree in cell size and form.

Cladophora flexuosa (Griffiths) Harv. 24852. The specimens show such close accord in size, habit, branching and cell form with this tropical Atlantic species as to be referable here with reasonable certainty. The similarity to Vicker's illustration of the species from Barbados is especially striking. The plant is reported from Australia, but apparently not from the central Pacific.

1. Contribution from the Beaudette Foundation for Biological Research, Solvang, California.

Dictyosphaeria cavernosa (Forrsk.) Börg. 24724; 24735; 24832;
24839; 24865.

Boodlea composita (Harv.) Brand 24716b; 24719. The latter specimen represents a lax form and bears much sterile Ceramium gracillimum v. byssoides.

Cladophoropsis gracillimum Dawson 24758. These are in good agreement in structure, but are slightly coarser than either the Mexican type or material from Arno Atoll, Marshall Islands, and much coarser than Eniwetok material. The colony is quite compact and the filaments densely arranged in a rather erect fashion. The exceedingly long cells and thick, stratified walls are distinctive. Number 24781 is still coarser, up to 140 μ in diameter in some places, although mostly about 125 μ . Some of the walls are up to 20 μ thick. This would seem to be a particularly robust form of this generally slender species.

Cladophoropsis sundanensis Reinbold 24715. This is very much like material from Palmyra Island, forming rounded, compact colonies as reported from there. The filaments are about the same size or tending to be slightly larger. 24826a, growing in a turf with Jania tenella, has filaments 70-100 μ in diameter. 24747 is a very young colony compacted with Lyngbya filaments. 24766 shows the characteristic sub-spherical clumps, but the cells are very long. 24820 has filaments 100-130 μ in diameter. 24846 is a darker colored form with somewhat shorter cells than other material from this area. It may be a distinct entity, but points of distinction are not clear.

Derbesia attenuata Dawson 24572a. Well developed, typical material, on Turbinaria.

Caulerpa racemosa var. peltata (Lamx.) Eubank 24713; 24716;
24756a; 24787; 24831; 24845; 24861; 24864.

Caulerpa racemosa var. turbinata (J. Ag.) Eubank 24784.

Caulerpa serrulata (Forrsk.) J. Ag. emend. Börg. 24751; 24756;
24782; 24843.

Caulerpa urvilleana Mont. var. 24840; 24842.

Bryopsis pennata Lamx. 24731; 24743 (On Turbinaria); 24822a;
24837; 24850. Unilateral branching is especially prominent and consistent in this last collection.

The following identifications and notes on Codium are provided by Dr. Paul C. Silva, University of Illinois.

Codium ovale Zanard. 24746; 24740. This latter collection is a mixture of two species growing in intimate association: Codium ovale and a member of the C. arabicum complex. The known range of C. ovale has now been extended beyond the type locality

(New Guinea) to include Kwajalein, Majuro and Canton islands. The adherent Codium is somewhat more cerebriform than is usual for C. arabicum, but anatomically it clearly reveals its relationship to the C. arabicum complex.

Codium geppii O. C. Schmidt 24714; 24570; 24788; 24821; 24851; 24825. These are very similar to the type collection. In the Indo-Pacific region a member of the C. arabicum complex and one of the C. geppii complex are always found as an integral part of the biocenosis of coral reefs. In the Atlantic a similar, but less constant, relationship holds: an adherent form, referable to the C. intertextum complex, is invariably present on coral reefs, while a repent form, referable to the C. repens complex, is found only on certain islands.

Halimeda fragilis Taylor 24774.

Halimeda micronesica Yamada 24768. A good specimen 6-7 cm. tall.

Halimeda opuntia (L.) Lamx. 24771.

PHAEOPHYTA

Ectocarpus indicus Sonder 24836. Good material on Turbinaria with very long plurilocular sporangia often to 200 μ or more.

Sphacelaria furcigera Kütz. 24754 (on old Turbinaria); 24752b.

Sphacelaria sp. 24723a. This may be a tropical form of S. subfusca Setch. & Gard. The specimens have propagulae like S. furcigera, but many of them are trifurcate rather than bifurcate. Plurilocular sporangia, however, are dominant on this material.

Dictyota friabilis Setchell 24845a; 24828; 24859; 24862; 24868. This latter collection is almost without doubt like the type from Tahiti.

Dictyopteris repens (Okam) Börg. 24752 (small amount).

Pocockiella papenfussii Taylor 24824.

Pocockiella variegata (Lamx.) Papenf. 24765.

Turbinaria ornata (Turn.) J. Ag. 24783.

Turbinaria trialata (J. Ag.) Kütz. 24721.

RHODOPHYTA

Gelidium pusillum (Stackh.) Le Jolis 24736. Typical, small, cystocarpic material 3-4 mm. tall.

Pterocladia sp. 24742; 24755. These tetrasporic and cystocarpic materials are well developed, over 2 cm. tall, and pinnately branched much as in Pterocladia nana Okam. from southern Japan and Formosa. They may be referred provisionally to that species, but additional Pterocladia collections from the central Pacific, such as at Palmyra Island where one is reported from intestinal contents of fishes (Dawson, Aleem and Halstead, 1955) are needed to enable us to interpret more satisfactorily the occurrence of this genus.

Gelidiella rigidiuscula (Grunow) J. Feldmann 24737. This richly fertile material has the stichidia and branching much as in G. acerosa, but is smaller in size: 300 μ down to 120 μ in the ultimate branchlets. This is in agreement with the discussion and key in Feldmann (1931) of G. rigidiusculum from Ceylon, for which reproduction is not reported. The size and habit are much like G. hancockii from the Gulf of California, but that species has cylindrical tetrasporangial stichidia on short lateral branchlets rather than acute, bulbous, terminal ones as in the present material. This disposition seems justified awaiting the report of fertile material from Ceylon for comparison. 24838 (with some Herposiphonia secunda); 24759 (tetrasporangial); 24832a (some growing with Dictyosphaeria); 24789. The tetrasporangial stichidia in this collection are so abundant as to terminate almost every branch.

Gelidiopsis intricata (C. Ag.) Vickers 24728; 24857a.

Jania capillacea Harv. 24857.

Jania micrarthrodia Lamx. 24761a (cystocarpic); 24737a (with Gelidiella rigidiuscula); 24860.

Jania tenella Kütz. 24826 (in mixture); 24822 (a questionable form with very abundant conceptacles).

Hypnea esperi Bory? 24730; 24854. These specimens have the tetrasporangial sori in part at first unilateral on the branches, causing some distortion. Later they may fill in all around. They are similar in this character to specimens reported and illustrated by Setchell as H. nidifica J. Ag. from Tahiti.

Gracilaria sp. 24866. This may be the plant described as Corallopsis reptans Weber van Bosse, from the Kei Islands.

Lomentaria sp. 24864b.

Ceramium clarionensis Setch. & Gard. 24730b.

Ceramium equisetoides Dawson 24864a. These are in good agreement with Pacific Mexican specimens.

Ceramium gracillimum var. byssoides (Harv.) G. Mazoyer 24716a; 24784a (with Caulerpa racemosa v. turbinata); 24730a (a very lax form); 24804; 24843b.

Ceramium vagabunde Dawson 24843c. This material is somewhat more slender than Eniwetok specimens and has nodal bands more like those of the material reported from Isla San Benedicto, Mexico, yet the agreement is generally satisfactory. Growing with Caulerpa serrulata.

Ceramium sp. 24840a. Fertile, tetrasporangial material apparently near C. personatum Setch. & Gard. The agreement is good except that the descending appendages within the axial cells were not observed. The tetrasporangia are at first abaxial, then whorled and involucrate. Growing with Caulerpa urvilleana.

Griffithsia sp. 24864c, sterile.

Herposiphonia secunda (Ag.) Ambronn 24733 (richly developed); 24805; 24829 (richly developed); 24834.

Heterosiphonia wurdemannii var. laxa Borg. 24748 (mixed with Herposiphonia); 24741 (in mixture); 24854a (on old Turbinaria); 24853.

The following determinations and notes on Polysiphonia are provided by Dr. George J. Hollenberg of the University of Redlands, California

Polysiphonia ferulacea Suhr 24866a. This determination is probably correct if Tseng, Cribb and others have been correct in their identifications of Pacific specimens. It should be considered tentative, however, until male plants are found.

Polysiphonia flaccidissima Hollenberg 24867. This determination is probably reliable although the segments are shorter (1.0-1.5 diameters) and the trichoblasts are not well developed and with tapering tips.

Polysiphonia mollis Hook. & Harv. ?? 24823. This identification is doubtful because of (1) small size; (2) obvious sympodial branching; (3) very long, continuous tetrasporangial branches.

Laurencia nana Howe 24761. The cortical cells are of the non-palisade type, although an error occurs in expressing this in Dawson 1957, p. 124.

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