

THE MARINE ALGAE OF BRAMPTON ISLAND, GREAT BARRIER REEF,
OFF MACKAY, QUEENSLAND.

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Synopsis.

This paper describes the marine algal flora of Brampton Island. This flora was found to be very rich and to include a number of species new to Queensland, and some new to Australia.

A comparison is made between the results obtained and other algal records from N.E. Australia and also between the floras of the various areas of the island.

INTRODUCTION.

There are relatively few collections of, or studies on, the marine algae of any part of the Great Barrier Reef of Australia. We have the records of the Great Barrier Reef Expedition of 1928-1929, which include Lucas's summary of algal species hitherto recorded from N.E. Australia (1931) and the report by Stephenson and others (1931) which includes a study of the ecology of the algae of the Low Islands. We have also the detailed lists given by Lucas (1934) of the algae of the Low Islands. Other than these the records are more fragmentary, the most detailed being by Sonder (1871).

The present paper presents the results of a collection made at Brampton Island, in the Great Barrier Reef, off Mackay, Queensland, by the author during June, 1948 (specimens numbered 2660-2815), and also of a second collection from the same locality made by members of the Sydney University Biological Society in January, 1949 (specimens No. A-H). This second collection yielded two additional species (*Sargassum carpophyllum* and *Goniolithon* ? *Fosliei*), while one other species (*Sargassum flavicans*), which had been found by the author only as drift material, was found growing attached. Obviously further collections at other seasons of the year are likely to increase the number of species known from Brampton Island.

The marine algal flora of Brampton Island appears to be exceptionally varied. It includes 85 species, as compared with 74 from the Low Islands (Lucas, 1934), and 205 hitherto recorded (Lucas, 1931) from N.E. Australia. This list from N.E. Australia, however, does not include the Myxophyceae, and is anyway not complete; for instance, records by Grunow (1874) and even by Lucas himself (1927) are omitted. Recent additions to the records of species occurring in Queensland have been made by the present author (1946, 1948, 1949, 1951).

It is of interest to note that while the Low Islands are richer than is Brampton Island in the number of species of Chlorophyceae recorded, they are poorer in the number of species of Rhodophyceae recorded.

In the algae of Brampton Island the following species appear to be recorded from Australia for the first time: *Cladophoropsis* ? *membranacea*, *Vaughaniella rupicola*, *Brachytrichia Quoyi*, *Calothrix pilosa*, *Sirocoleum guyanense*, *Galaxaura subfruticulosa*, *Dasya pacifica*, *Endosiphonia spinuligera*, *Amphiroa* prob. *foliacea*.

The following species have been recorded from other parts of Australia but are not previously known from Queensland: *Caulerpa papillosa*, *Entophysalis conferta*, *Ceramium gracillimum*, *Polysiphonia implexa*, *Polysiphonia zostericola*.

Brampton Island is a continental island with a tide range of about 15 feet. For ecological comparison the sand and mud flats extending about the island have been treated in this paper collectively as "Flats", while the main reef developed of one side of the island is designated "Reef". One rocky headland—Pelican Island—appears detached from the main island at high tide, but is linked by rock-strewn flats at low

tide; algae from this general location have been treated in this paper as from the "Pelican Island Flats". Carlyle Island also becomes land-linked to Brampton at extremely low tides, and since a coral reef from this adjoining island was particularly well developed, the collection from it has also been included in the present paper; algae from this location are marked as from "Coral Reef".

Apart from these four above described areas, two species were collected encrusting rocks at high-tide level, and some drift material was also collected. These collections are so labelled in the paper.

For a comparison of the floras of the various ecological areas the accompanying table (Table 1) of species found in each location is presented. However, it is emphasized

TABLE 1.
The Species Collected from the Different Areas.

Flats.	Reef.	Coral Reef.	Pelican Is. Flats.	Encrusting Rocks at H.T.L.	Found Only as Drift.
CHLOROPHYCEAE.					
<i>Ulva lactuca.</i>					
<i>Enteromorpha</i> sp.	<i>Anadyomene brownii.</i>	<i>Valoniopsis pachy-</i> <i>nema.</i>			
<i>Dictyosphaeria Ver-</i> <i>sluysi.</i>	<i>D. favulosa.</i>		<i>D. favulosa.</i>		
<i>Struvea delicatula.</i>	<i>S. delicatula.</i> <i>Boergesenia Forbesii.</i> <i>Cladophoropsis ?</i> <i>membranacea.</i> <i>S. vaucheriaeformis.</i>	<i>S. delicatula.</i>	<i>Bornetella oligospora.</i>		
<i>Spongocladia vaucher-</i> <i>iaeformis.</i>					
<i>Udotea flabellum.</i>	<i>U. flabellum.</i> <i>U. orientalis.</i>		<i>U. orientalis.</i>		
<i>Halimeda macroloba.</i>	<i>H. macroloba.</i>				
<i>H. incrassata.</i>	<i>H. incrassata.</i> <i>H. opuntia.</i> <i>Codium spongiosum.</i>				
<i>Caulerpa sertularioides.</i>					
<i>C. serrulata.</i>	<i>C. serrulata.</i>				
<i>C. racemosa.</i>		<i>C. racemosa.</i> <i>C. papillosa.</i>			
No. of species :					
11	13	4	3	0	0
PHAEOPHYCEAE.					
	<i>Ectocarpus confer-</i> <i>roides.</i>	<i>E. confervoides.</i>	<i>E. confervoides.</i>		
			<i>Sphacelaria tribul-</i> <i>oides.</i> <i>Pocockiella nigrescens.</i>		
	<i>Stypopodium zonale.</i>		<i>Dictyota dichotoma.</i> <i>D. pardalis.</i> <i>P. Commersonii.</i>		
<i>Dictyopteris pardalis.</i>	<i>P. Commersonii.</i>				
<i>Padina Commersonii.</i>					
<i>Vaughaniella rupicola.</i>	<i>H. clathratus.</i>				
<i>Hydroclathrus</i> <i>clathratus.</i>	<i>Chnoospora obtus-</i> <i>angula.</i>				
<i>Cystophyllum muri-</i> <i>catum.</i>	<i>Hormophysa triquetra.</i> <i>Sargassum scabripes.</i>		<i>S. carpophyllum.</i> <i>S. flavicans.</i>		<i>S. lophocarpum.</i>
	<i>Turbinaria ornata.</i>				
No. of species :					
5	8	1	8	0	1

TABLE 1.—Continued.

The Species Collected from the Different Areas.—Continued.

Flats.	Reef.	Coral Reef.	Pelican Is. Flats.	Encrusting Rocks at H.T.L.	Found Only as Drift.
MYXOPHYCEAE.					
<i>Brachytrichia Quoyi.</i>			<i>Hormothamnion solutum.</i>	<i>Entophysalis conferta.</i>	
	<i>Hydrocoleum lyngbyaceum.</i> <i>Sirocoleum guyanense.</i>			<i>Calothrix pilosa.</i>	
<i>Lyngbya majuscula.</i>			<i>L. majuscula.</i>		
No. of species : 2	2	0	2	2	0
RHODOPHYCEAE.					
<i>Liagora ceranoides.</i>	<i>L. ceranoides.</i>				
<i>Galaxaura glabriuscula.</i>	<i>Gelidiella acerosa.</i>	<i>G. subfruticulosa.</i> <i>G. acerosa.</i>			
<i>Desmia Kilneri.</i>	<i>Peyssonnelia Gunniana.</i>		<i>P. Gunniana.</i>		
		<i>Mastophora plana.</i> <i>Amphiroa</i> prob. <i>foliacea.</i>	<i>Goniolithon ? Fosliei.</i> <i>Fosliella farinosa.</i>		
<i>Metagonolithon graniferum.</i>					
<i>Jania rubens.</i>	<i>J. rubens.</i>	<i>Sebdenia ceylonica.</i>			
	<i>Sarconema filiforme.</i> <i>Eucheuma muricatum.</i> <i>H. Valentiae.</i> <i>H. cervicornis.</i>				
<i>Hypnea Valentiae.</i>		<i>Plocamium hamatum.</i> <i>Gracilaria lichenoides.</i>	<i>G. lichenoides.</i>		
<i>Corallopsis minor.</i>					
<i>C. Urvillei.</i>					
<i>Ceratodictyon spongiosum.</i>					
<i>Champia parvula.</i>					
<i>Ceramium gracillimum.</i>					
<i>Centroceras clavulatum.</i>	<i>Spyridia filamentosa.</i>				
<i>Dasya pacifica.</i>	<i>Dasya</i> sp.	<i>Dasya</i> sp. <i>Dasya</i> sp.	<i>D. pacifica.</i>		
<i>Polysiphonia implexa.</i>					
<i>P. zostericola.</i>					
<i>Digenea simplex.</i>	<i>D. simplex.</i>		<i>D. simplex.</i> <i>R. glomerulata.</i>		
<i>Roschera glomerulata.</i>	<i>E. spinuligera.</i>				
<i>Endosiphonia spinuligera.</i>					
<i>Leveillea jungermannioides.</i>	<i>L. jungermannioides.</i>				
	<i>Amansia glomerata.</i>	<i>A. glomerata.</i>			
<i>Laurencia rigida.</i>					
<i>L. obtusa.</i>	<i>L. obtusa.</i>	<i>L. obtusa.</i>			
<i>Acanthophora spicifera.</i>					
<i>Chondria</i> sp.		<i>Chondria</i> sp.			
No. of species : 23	15	12	7	0	0
Total no. of species : 41	38	17	20	2	1

that these figures are only approximate, the main purpose during the collecting being to get a representative specimen of every species then growing at Brampton Island, and only secondarily of all species in each location. The outstanding observation from this table is the high percentage incidence of species of Chlorophyceae on the Reef (34% of species occurring there), of Phaeophyceae in the Pelican Island Flats area (40% of species occurring there) and of Rhodophyceae in the extreme Coral Reef region (71% of species occurring there).

My sincere thanks are due to Dr. F. Drouet, of the Chicago Natural History Museum, who kindly identified all the Myxophyceae recorded in the present paper.

CHLOROPHYCEAE.

ULVALES.

Family ULVACEAE.

ULVA Linnaeus.

ULVA LACTUCA L., 1753, p. 1163; Borgs., 1939, pp. 57-58.

No. 2755, Flats.

Geogr. Distr.: Widespread. N., S. and E. Australia.

ENTEROMORPHA Link.

ENTEROMORPHA sp.

Epiphytic on *Cystophyllum muricatum*.

No. 2723, Flats.

SIPHONOCLEDALES.

Family ANADYOMENACEAE.

ANADYOMENE Lamouroux.

ANADYOMENE BROWNII (Gray) J. Ag., 1886, p. 127; De Toni, 1889, p. 370.—*Calonema Brownii* Gray, 1866, p. 46, t. 44, f. 3.

No. 2786, 2787, Reef.

Geogr. Distr.: Celebes. N.E. Australia.

VALONIOPSIS Borgesen.

VALONIOPSIS PACHYNEMA (Martens) Borgs., 1934, pp. 10-17.—*Bryopsis pachynema* Martens, 1866, p. 24, Pl. 4, fig. 2.—*Valonia confervoides* Harv. Alg. Ceyl. Exsicc. No. 73; Alg. Friendly Is. Exsicc. No. 101; in J. Ag., 1886, p. 100; De Toni, 1889, p. 378.

No. 2769, Coral Reef.

Geogr. Distr.: Warm Atlantic and Indian Oceans, Ceylon, Friendly Is., Hawaiian Archipelago, Lord Howe Is. N. and E. Australia.

Family VALONIACEAE.

DICTYOSPHAERIA Decaisne.

1. DICTYOSPHAERIA FAVULOSA Decne., 1842, p. 32; De Toni, 1889, p. 371.

No. 2790, Reef; D., Pelican Is. Flats.

Geogr. Distr.: Mexico, Red Sea, warm Indian and Pacific Oceans. N. Australia.

2. DICTYOSPHAERIA VERSLUYSI W.v.B., 1905, p. 114.

No. 2692, 2734, Flats.

Geogr. Distr.: Malayan Archipelago, Mexico. N.E. Australia.

Family SIPHONOCLEADACEAE.

STRUVEA Sonder.

STRUVEA DELICATULA Kuetz., 1849-1869, t. 2, f. 2; De Toni, 1889, p. 366.

No. 2706, Flats; 2766, Coral Reef; 2793, Reef.

Geogr. Distr.: Ceylon, Island of Guadeloupe, Mexico. W. and N.E. Australia.

BOERGESSENIA Feldmann.

BOERGESSENIA FORBESII (Harv.) Feldm., 1938, p. 18, figs. 3-5; Borgs., 1948, p. 21-22.—*Valonia Forbesii* Harv., Alg. Ceylon Exsicc. No. 75; Friendly Islands Algae Exsicc. No. 102; in J. Ag., 1886, p. 96; De Toni, 1889, p. 374.

No. 2676, 2782, Reef.

Geogr. Distr.: Red Sea, Indian and Pacific Oceans. N.E. Australia.

CLADOPHOROPSIS Borgesen.

CLADOPHOROPSIS (?) MEMBRANACEA (Ag.) Borgs., 1905, p. 288-289, figs. 8-13.—*Cladophora membranacea* (Ag.) Kuetz., 1849, p. 415.—*Siphonocladus membranaceus* (Ag.) Born. in Hariot, 1887, p. 56; De Toni, 1889, pp. 358-359.—*Conferva membranacea* Ag., 1824, p. 120.

No. 2797, Reef.

Geogr. Distr.: Antilles and Santa Cruz, New Zealand. Probable new record to Australia.

SPONGOCLADIA Areschoug.

SPONGOCLADIA VAUCHERIAEFORMIS Aresch., 1853, p. 201; De Toni, 1889, p. 360.

No. 2675, Reef; 2724, Flats; 2777, Reef.

Geogr. Distr.: Mauritius, Malayan Archipelago, New Guinea, Lord Howe Is., etc. N.E. Australia.

DASYCLADALES.

Family DASYCLADACEAE.

BORNETELLA Munier-Chalmas.

BORNETELLA OLIGOSPORA Solms-Laubach, 1893, p. 87, tab. 9, figs. 1-4, 6, 7.

No. 2800, Pelican Is. Flats.

Geogr. Distr.: Malayan Archipelago, New Guinea. N.E. Australia.

SIPHONALES.

Family CODIACEAE.

UDOTEA Lamouroux.

1. UDOTEA ORIENTALIS A. and E. S. Gepp, 1911, pp. 119-120, Pl. 1, figs. 1, 4, Pl. 6, figs. 47-48.

No. 2679, 2788, Reef; 2811, Pelican Is. Flats.

Geogr. Distr.: Indian and Pacific Oceans. N.E. Australia.

2. UDOTEA FLABELLUM (Ellis and Sol.) Lamour., 1812, p. 186; Pap., 1944, pp. 337-338.—*Corallina Flabellum* Ellis and Sol., 1786, p. 124, tab. 24, figs. A-C.

A. and E. S. Gepp (1911, pp. 131-133, Pl. 3, figs. 26-28) describe and figure this plant under the name *U. flabellum* (Ellis and Sol.) Howe.

No. 2678, Reef; 2728, Flats.

Geogr. Distr.: Atlantic Ocean, Red Sea, Madras, Ceylon, Friendly Islands. N.E. Australia.

HALIMEDA Lamouroux.

1. HALIMEDA OPUNTIA (L.) Lamour. emend. Bart., 1901, p. 18; Lamour., 1812, p. 186.—*Corallina Opuntia* L., 1765, p. 805 (in part).

No. 2677, Reef.

Geogr. Distr.: Widespread in warm seas. N. Australia.

2. HALIMEDA MACROLOBA (Decne.) Bart., 1901, p. 24; Decne., 1841, p. 118.

No. 2693, Flats; 2776, Reef.

Geogr. Distr.: Warm Indian and Pacific Oceans, Red Sea. W. and N. Australia.

3. HALIMEDA INCRASSATA (Ellis) Lamour. emend. Bart., 1901, p. 25; Lamour., 1812, p. 186.—*Corallina incrassata* Ellis, 1755, p. 53, tab. 25, f. A.

No. 2713, Reef; 2721, Flats.

Geogr. Distr.: Atlantic, Indian and Pacific Oceans, W. Indies, Madagascar, Malayan Archipelago, China Sea, Friendly Islands, etc. N.E. Australia.

CODIUM Stackhouse.

CODIUM SPONGIOSUM Harv., 1855, p. 565; De Toni, 1889, pp. 489-490.

No. 2667, drift; 2669, Reef.

Geogr. Distr.: W.N. and E. Australia.

Family CAULERPACEAE.

CAULERPA Lamouroux.

1. CAULERPA SERTULARIOIDES (Gmel.) Howe, 1905, p. 576.—*Fucus sertularioides* Gmelin, 1768, tab. 15, fig. 4.—*Caulerpa plumaris* (Forsk.) W.v.B., 1898, pp. 294-296.

No. 2727, Flats.

Geogr. Distr.: Tropical seas generally. N.E. and S. Australia.

2. *CAULERPA SERRULATA* (Forsk.) J. Ag. emend. Borgs., 1932; J. Ag. 1872, p. 19.—*Fucus serrulatus* Forsk., 1775, p. 188.—*Caulerpa freycineti* Ag., 1823–1828, p. 446; W.v.B., 1898, pp. 310–318, Pl. 25, figs. 4–11, Pl. 26, figs. 1–6.

Var. *DE BORYANA* (Ag.) W.v.B. (*loc. cit.*, pp. 315–316, Pl. 25, figs. 10–11).

No. 2703, Flats; 2711, Reef.

Geogr. Distr.: Red Sea, Gaudeloupe. N.E. Australia.

3. *CAULERPA RACEMOSA* (Forsk.) J. Ag. emend. W.v.B., 1898, pp. 357–373, Pl. 31, figs. 5–8, Pl. 32, figs. 1–7, and Pl. 33; J. Ag., 1872, p. 35, n. 51.—*Fucus racemosus* Forsk., 1775, p. 191.

Var. *LAETEVIRENS* (Mont.) W.v.B. (*loc. cit.*, pp. 366–368, Pl. 33, fig. 8).

No. 2725, 2726, Flats.

Geogr. Distr.: Is. of Toud, Ceylon, Florida, Gaudeloupe. W. and N.E. Australia.

? var. *NUMMULARIA* (Harv.) W.v.B. (*loc. cit.*, p. 376). A very small specimen.

No. 2768, Coral Reef.

Geogr. Distr.: Friendly Islands, etc. N.E. Australia.

4. *CAULERPA PAPILLOSA* J. Ag., 1872, p. 42, n. 61; W.v.B., 1898, pp. 383–384, Pl. 34, fig. 8.—An unexpected species.

No. 2764, Coral Reef.

Geogr. Distr.: W. and S. Australia.

PHAEOPHYCEAE.

ISOGENERATAE.

ECTOCARPALES.

Family ECTOCARPACEAE.

ECTOCARPUS Lyngbye.

ECTOCARPUS CONFEROIDES (Roth.) Le Jol., 1863, p. 75; May, 1939, pp. 537–554.—*Ceramium confervoides* Roth., 1797, pp. 151–152, Pl. 8, fig. 3.

Plurilocular reproductive structures do not bear hairs at their apices in these specimens.

No. 2759, Coral Reef; 2779, Reef; F., Pelican Is. Flats.

Geogr. Distr.: Widespread. All around Australia.

SPHACELARIALES.

Family SPHACELARIACEAE.

SPHACELARIA Lyngbye.

SPHACELARIA TRIBULOIDES Menegh., 1840, p. 2, n. 1; De Toni, 1895, pp. 502–503.

No. 2809, Pelican Is. Flats.

Geogr. Distr.: Mediterranean, Adriatic and Red Sea, Atlantic Ocean, Hawaii, etc. W. and N. Australia.

DICTYOTALES.

Family DICTYOTACEAE.

POCOCKIELLA Papenfuss.

POCOCKIELLA NIGRESCENS (Sond.) Pap., 1943, p. 467.—*Zonaria nigrescens* Sond., 1845, p. 50.—*Gymnosorus nigrescens* (Sond.) J. Ag., 1894, p. 12; De Toni, 1895, pp. 228–229.

No. 2665, drift; 2807, Pelican Is. Flats.

Geogr. Distr.: N., S., E. and W. Australia.

STYPOPODIUM Kuetzing.

STYPOPODIUM ZONALE (Lamour.) Pap., 1940, pp. 205–206.—*Fucus zonalis* Lamour., 1805, 38, Pl. 25, fig. 1.

My grateful thanks are due to Miss C. I. Dickinson, of Royal Botanic Gardens, Kew, England, who has kindly compared my material with other specimens of this species.

No. 2789, Reef.

Geogr. Distr.: W. Indies, S. Africa, Japan, N.E. Australia.

DICTYOTA Lamouroux.

DICTYOTA DICHOTOMA (Huds.) Lamour., 1809, p. 42; De Toni, 1895, pp. 263-264.—*Ulva dichotoma* Huds., 1778, p. 476.

Var. INTRICATA (Ag.) Grev., 1830, p. 58.

No. 2814, Pelican Is. Flats.

Geogr. Distr.: Widespread. N. and E. Australia and Tasmania.

DICTYOPTERIS Lamouroux.

DICTYOPTERIS PARDALIS (Harv.) May, 1947, p. 274.—*Haliseris pardalis* Harv. in Kuetz., 1849-1869 (Part 9), p. 24, t. 59, f. 2; De Toni, 1895, p. 258.

No. 2729, Flats; 2802, Pelican Is. Flats.

Geogr. Distr.: W., N. and E. Australia.

PADINA Adanson.

PADINA COMMERSONII Bory, 1828, n. 41, t. 21, f. 2; De Toni, 1895, p. 244.—As Harvey's Alg. Ceylon Exsicc. No. 55 sub nomine *P. Pavoniae*.

No. 2715, Reef; 2750, Flats; C., Pelican Is. Flats.

Geogr. Distr.: Mauritius, Ceylon, Malaya, Japan, Friendly Is., etc. N., W. and S. Australia.

VAUGHANIELLA Borgesen.

VAUGHANIELLA RUPICOLA Borgs., 1950, pp. 1-10, figs. 1-8.

No. 2751, Flats. On *Padina* sp.

Geogr. Distr.: Mauritius. New record to Australia.

HETEROGENERATAE.

PUNCTARIALES.

Family ENCOELIACEAE.

HYDROCLATHRUS Bory.

HYDROCLATHRUS CLATHRATUS (Bory) Howe, 1920, p. 590; Setchell and Gardner, 1925, p. 543.—*Fucus clathratus* Bory in Ag., 1823-1828.

Nos. 2683, 2722, Flats; 2778, Reef.

Geogr. Distr.: Widespread in tropical Atlantic and Pacific Oceans, Mediterranean and Red Seas. N., S., E. and W. Australia.

CHNOOSPORA J. Agardh.

CHNOOSPORA OBTUSANGULA (Harv.) Sond., 1871, p. 45; De Toni, 1895, p. 465.—*Dictyota obtusangula* Harv., 1859, p. 329, n. 14.

As Harvey's Friendly Island Algae Exsicc. No. 4.

Nos. 2714, 2795, Reef.

Geogr. Distr.: Atlantic Ocean, Japan, Friendly Islands. N.E. Australia.

CYCLOSPOREAE.

FUCALES.

Family SARGASSACEAE.

CYSTOPHYLLUM J. Agardh.

CYSTOPHYLLUM MURICATUM (Turn.) J. Ag., 1848, p. 231; De Toni, 1895, p. 154.—*Fucus muricatus* Turn., 1808-1819 (vol. 2), p. 108, tab. 112.

Prevalent, but by accident there remains only a poor specimen.

No. 2723, Flats.

Geogr. Distr.: India, Admiralty Islands, etc. All around Australia.

HORMOPHYSA Kuetzing.

HORMOPHYSA TRIQUETRA (L.) Kuetz., 1843, p. 359; Borgs., 1939, p. 96.—*Fucus triqueter* L., 1771, p. 312.—*Cystoseira triquetra* (L.) J. Ag., 1848, p. 215.

Osborn (1948, p. 48) records that the Australian plant known as *Hormosira ? articulata* (Forsk.) Zan. is in fact *Hormophysa triquetra*.

No. 2664, drift; 2712, Reef.

Geogr. Distr.: India, Red Sea. W., N. and E. Australia.

SARGASSUM Agardh.

1. SARGASSUM SCABRIPES J. Ag., 1872, p. 52; 1889, p. 48, tab. 2.
No. 2660, Reef; 2661, drift.
Geogr. Distr.: N. Australia.
2. SARGASSUM CARPOPHYLLUM J. Ag., 1848, p. 304; 1889, p. 82, tab. 25 (2).
No. A., Pelican Is. Flats.
Geogr. Distr.: Indian Ocean. N. and W. Australia.
3. SARGASSUM FLAVICANS (Mert.) Ag., 1823-1828, p. 18; J. Ag., 1889, pp. 82-83, tab. 25 (3).—*Fucus flavicans* Mert., 1819, p. 8.
No. 2663, drift; B., Pelican Is. Flats.
Geogr. Distr.: W., N. and E. Australia.
4. SARGASSUM LOPHOCARPUM J. Ag., 1889, p. 93, tab. 27 (2).
No. 2662, drift.
Geogr. Distr.: N., S., E. and W. Australia.

TURBINARIA Lamouroux.

- TURBINARIA ORNATA J. Ag., 1848, p. 266; De Toni, 1895, p. 128.—*Fucus turbinatus* var. *ornatus* Turn., 1809-1819 (vol. 1), p. 50, tab. 24, figs. c-h.
No. 2668, Reef.
Geogr. Distr.: Ceylon, New Zealand, Andaman Islands, Friendly Islands, Admiralty Islands, Samoa, etc. N. Australia.

MYXOPHYCEAE.

Family CHAMAESIPHONACEAE.

ENTOPHYSALIS Kuetzing.

- ENTOPHYSALIS CONFERTA (Kuetz.) Dr. and Dailey, 1948, p. 79.—*Palmella conferta* Kuetz., 1845, p. 149.
No. 2701, encrusting rocks at high tide level.
Geogr. Distr.: Widespread. E. Australia.

Family STIGONEMATACEAE.

BRACHYTRICHIA (Zanardini) Bornet and Flahault.

- BRACHYTRICHIA QUOYI (Ag.) Born. and Flah., (Part 2) 1886-1888, p. 73.—*Nostoc Quoyi* Ag., 1824, p. 22.
Nos. 2736, 2757, Flats.
Geogr. Distr.: Widespread. New record to Australia.

Family NOSTOCACEAE.

HORMOTHAMNION (Grunow) Bornet and Flahault.

- HORMOTHAMNION SOLUTUM Born. and Grun. ex Born. and Flah., (Part 4) 1886-1888, p. 259.
Nos. 2803, 2813, Pelican Is. Flats.
Geogr. Distr.: Widespread. W. and N.E. Australia.

Family RIVULARIACEAE.

CALOTHRIX (Agardh) Bornet and Flahault.

- CALOTHRIX PILOSA Harv. ex Born. and Flah., (Part 1) 1886-1888, p. 363.
No. 2701, encrusting rocks at high tide level.
Geogr. Distr.: Red Sea, Mauritius, Friendly Is., Jamaica, Mexico, Brazil, etc. New record to Australia.

Family OSCILLATORIACEAE.

HYDROCOLEUM (Kuetzing) Gomont.

- HYDROCOLEUM LYNGBYACEUM Kuetz. ex Gom., (Part 15) 1892, p. 337, Pl. 12, f. 8, 9, 10.
No. 2671, Reef.
Geogr. Distr.: Widespread. N.E. Australia.

SIROCOLEUM (Kuetzing) Gomont.

SIROCOLEUM GUYANENSE Kuetz. ex Gom., (Part 15) 1892, p. 348.

No. 2671, Reef.

Geogr. Distr.: Widespread. New record to Australia.

LYNGBYA (Agardh) Gomont.

LYNGBYA MAJUSCULA Gom., (Part 16) 1892, p. 131, Pl. 3, figs. 3 and 4.

No. 2742, growing on *Digenea simplex*.

Nos. 2707, 2735, 2742, Flats; 2812, Pelican Is. Flats.

Geogr. Distr.: Widespread. N.E. Australia.

RHODOPHYCEAE.

FLORIDEAE.

NEMALIONALES.

Family HELMINTHOCLADIACEAE.

LIAGORA Lamouroux.

LIAGORA CERANOIDES Lamour., 1816, p. 239; Borg., 1939, p. 104.—*Liagora leprosa* J. Ag. 1847, p. 8.

No. 2697, Flats; 2716, 2796, Reef.

Geogr. Distr.: West Indies, Red Sea, Mauritius, Indian Ocean, Malayan Archipelago, Japan, etc. N.E. Australia.

Family CHAETANGIACEAE.

GALAXAURA Lamouroux.

1. GALAXAURA SUBFRUTICULOSA Chou, 1944, pp. 41–44, Pl. 2, fig. 6, Pl. 8, fig. 2.

In this specimen the tumid cell is very large, usually being half as wide again as the terminal cell; Chou reports the size of this cell is variable.

No. 2763, Coral Reef.

Geogr. Distr.: Mexico, prob. Japan and China. New record to Australia.

2. GALAXAURA GLABRIUSCULA Kjellm. emend. Chou, 1945, pp. 11–13, Pl. 4, figs. 14–20, Pl. 10, fig. 1; Kjellm., 1900, pp. 56–77, Pl. 7, figs. 1–2, Pl. 20, fig. 26.

No. 2710, Flats.

Geogr. Distr.: Tahiti, Hawaii, Bonin Islands, Java. N.E. Australia.

GELIDIALES.

Family GELIDIACEAE.

GELIDIELLA Feldmann and Hamel.

GELIDIELLA ACEROSA (Forsk.) Feldm. and Hamel, 1934, t. 46, p. 533; Borg., 1939, p. 107.—*Fucus acerosus* Forsk., 1775, p. 190.

No. 2771, Coral Reef; 2780, Reef.

Geogr. Distr.: Warm seas generally. N.E. Australia.

CRYPTONEMIALES.

Family RHIZOPHYLLIDACEAE.

DESMIA Lyngbye.

DESMIA KILNERI J. Ag., 1876, p. 355.—*Chondrococcus Kilneri* (J. Ag.) De Toni, 1897–1905 (pt. 4), p. 1676.Papenfuss (1940, p. 218) discusses the use of the generic name *Desmia* in preference to *Chondrococcus*.

No. 2704, Flats.

Geogr. Distr.: N. Australia.

Family SQUAMARIACEAE.

PEYSSONNELIA Decaisne.

PEYSSONNELIA GUNNIANA J. Ag., 1876, p. 387; De Toni, 1924, p. 591.

Adherent to undersides of rocks.

No. 2673, Reef; 2806, Pelican Is. Flats.

Geogr. Distr.: Malayan Archipelago. N., S. and E. Australia, Tasmania.

Family CORALLINACEAE.

GONIOLITHON Foslíe.

GONIOLITHON ? FOSLIEI (Heydr.) Fosl., 1903, p. 470, t. 25, f. 3; W.v.B. and Foslíe, 1904, pp. 46-48, fig. 19, Pl. 9, figs. 1-5.—*Lithothamnion Foslíei* Heydr., 1897, p. 58 ex parte.

Insufficient material for sure determination.

No. H., Pelican Is. Flats.

Geogr. Distr.: Maldive and Laccadive Islands, Red Sea, Zanzibar, Malayan Archipelago. Murray Island, N. Australia.

FOSLIELLA Howe.

FOSLIELLA FARINOSA (Lamour.) Howe, 1920.—*Melobesia farinosa* Lamour., 1816, p. 315, tab. 12, fig. 3.

Specimen epiphytic on *Sargassum* sp.

No. 2815, Pelican Is. Flats.

Geogr. Distr.: Widespread. N., S., E. and W. Australia.

MASTOPHORA Decaisne.

MASTOPHORA PLANA (Sond.) Harv., 1847, p. 108; De Toni, 1924, p. 695.—*Melobesia plana* Sond., 1845, p. 55.

No. 2758, Coral Reef.

Geogr. Distr.: Marianas Is. W. and N.E. Australia.

AMPHIROA Lamouroux.

AMPHIROA prob. FOLIACEA Lamour., in Freyc., 1824-1826, p. 628, t. 93, f. 2-31; W.v.B. and Foslíe, 1904, pp. 92-93, tab. 14, figs. 1-11.

A poor specimen, insufficient for definite determination. The plant bears a minute epiphyte, *Dasya* sp. (No. 2772).

No. 2773, Coral Reef.

Geogr. Distr.: India, Malaya, Marianas. Not previously recorded from Australia.

METAGONIOLITHON Weber van Bosse.

METAGONIOLITHON GRANIFERUM (Harv.) W.v.B. and Foslíe, 1904, p. 103, tab. 15, figs. 10, 12; De Toni, 1924, p. 704.—*Amphiroa granifera* Harv. Syn. in 1858-1863, p. xxx, n. 362.

No. 2691, Flats.

Geogr. Distr.: Peru. W., N., S. and E. Australia.

JANIA Lamouroux.

JANIA RUBENS (L.) Lamour., 1816, p. 272; De Toni, 1924, p. 709.—*Corallina rubens* L., 1765, p. 1305.

As Harvey's Alg. Exsicc. Friendly Is. No. 30.

Nos. 2681, 2781, Reef; 2702, Flats; 2741, Flats as epiphyte on *Digenea simplex* (No. 2739).

Geogr. Distr.: Temperate and warm seas, Lord Howe Island. N., E. and S. Australia.

GIGARTINALES.

Family SEBDENIACEAE.

SEBDENIA Berthold.

SEBDENIA CEYLONICA (Harv.) Heydr., 1892, p. 477, t. 26, f. 16-17; De Toni, 1924, p. 297.—*Halymena ceylonica* Harv., Alg. Ceyl. Exsicc. No. 39; in Kuetz. 1849-1869 (Part 16), t. 93.

No. 2760, Coral Reef.

Geogr. Distr.: Red Sea, Ceylon, New Guinea, Samoa. N.E. Australia.

Family SOLIERIACEAE.

SARCONEMA Zanardini.

SARCONEMA FILIFORME (Sond.) Kylin, 1932, pp. 22-23.—*Dicranema filiforme* Sond., 1845, p. 56.

No. 2799, Reef.

Geogr. Distr.: All around Australia.

EUCHEUMA J. Agardh.

EUCHEUMA MURICATUM (Gmel.) W.v.B., 1913-1928 (part d.), pp. 413-415, Pl. 12, figs. 1-5 and fig. 164.—*Fucus muricatus* Gmel., 1768, p. 111, Pl. 6.—*Eucheuma spinosum* (L.) J. Ag., 1852-1863, p. 626; De Toni, 1897-1905 (Part 1), pp. 369-370.

No. 2794, Reef.

Geogr. Distr.: S. Africa, Indian Ocean, Sumatra, New Guinea, Lord Howe Is., Japan. N. and W. Australia.

Family HYPNACEAE.

HYPNEA Lamouroux.

1. HYPNEA CERVICORNIS J. Ag., 1852-1863, p. 451; Tanaka, 1941, pp. 240-242, fig. 13. No. 2785, Reef.

Geogr. Distr.: Brazil, Mexico, W. Indies, Atlantic and Indian Oceans. W. and N.E. Australia.

2. HYPNEA VALENTIAE (Turn.) Mont., 1840, p. 161; Hauck, 1887, p. 20; Borg., 1934a, pp. 17-18; 1943, pp. 58-59.—*Fucus Valentiae* Turn., 1808-1819, Pl. 78.—*Hypnea charoides* Lamour., 1813, p. 44, Pl. 10, figs. 1-3; Tanaka, 1941, pp. 243-244, fig. 16; Borg., 1943, pp. 56-58.—*Hypnea seticulosa* J. Ag., 1852-1863.

This species appears to be both prevalent and variable. No. 2680 is very hirsute, while No. 2696 is nearer *H. nidifica* J. Ag. Neither specimen bears stellate bulbils, but other Australian collections have led me to the opinion that the presence or absence of these bulbils is not of specific importance so I follow Hauck (1887, p. 20) and include *H. charoides* among the synonyms of *H. Valentiae*.

No. 2680, Reef; 2696, Flats, on *Cymodocea* sp.

Geogr. Distr.: Indian Ocean, Japan, S. Pacific. All around Australia.

Family PLOCAMIACEAE.

PLOCAMIUM (Lamouroux) Lyngbye.

PLOCAMIUM HAMATUM J. Ag., 1876, p. 338; De Toni, 1897-1905 (Part 1), p. 589.

No. 2767, Coral Reef.

Geogr. Distr.: Norfolk Is. N. and E. Australia.

Family GRACILARIACEAE.

GRACILARIA Greville.

GRACILARIA LICHENOIDES (L. in Turn.) Harv., 1844, p. 445; May, 1948, pp. 27-39.—*Fucus lichenoides* L. in Turn., 1808-1819, tab. 118A (excl. var. and synonym.).

Specimens are very small, so are not treated in subspecific units.

No. 2775, Coral Reef; 2808, Pelican Is. Flats.

Geogr. Distr.: East Indian to Pacific Ocean. N. and E. Australia.

CORALLOPSIS Greville.

1. CORALLOPSIS MINOR (Sond.) J. Ag., 1876, p. 409; De Toni, 1897-1905 (part 1), p. 459.—*Corallopsis salicornia* var. *minor* Sond., 1871, p. 24, t. 3, f. 6-11.

Nos. 2666, 2748, Flats.

Geogr. Distr.: Marianas Islands. N. Australia.

2. CORALLOPSIS URVILLEI (Mont.) J. Ag., 1852-1863, p. 583; De Toni, 1924, p. 276.—*Hydropuntia Urvillei* Mont., 1842, p. 7.

No. 2731, Flats.

Geogr. Distr.: China Sea. N. Australia.

CERATODICTYON Zanardini.

CERATODICTYON SPONGIOSUM Zan., 1878, n. 8; De Toni, 1924, p. 243.

Attached to pebbles in mud.

Nos. 2670, 2682, Flats.

Geogr. Distr.: Warm Pacific and Indian Oceans. N.E. Australia.

RHODYMENIALES.

Family CHAMPIACEAE.

CHAMPIA Desveaux.

CHAMPIA PARVULA (Ag.) J. Ag., 1876, p. 303; De Toni, 1924, p. 307.—*Chondria parvula* Ag., 1824, p. 207.

No. 2732, Flats.

Geogr. Distr.: Common in warm seas. All around Australia.

CERAMIALES.

Family CERAMIACEAE.

CERAMIUM (Roth) Lyngbye.

CERAMIUM GRACILLIMUM Griff. and Harv. in Harv., 1846–1851, t. 206; De Toni, 1924, p. 515.

No. 2708 was growing on *Desmia Kilneri* J. Ag., No. 2704. The distribution of this species in Australia seems surprising.

Nos. 2694, 2708, 2737, 2744, Flats.

Geogr. Distr.: Atlantic Ocean, Mediterranean and Adriatic Seas, West Indian Ocean, Japan, etc. S. Australia and Tasmania.

CENTROCERAS Kuetzing.

CENTROCERAS CLAVULATUM Mont., 1840–1850, p. 140; Feldmann-Mazoyer, 1940, pp. 337–341, figs. 128–129.

No. 2695 growing on *Cymodocea* sp.; No. 2740 on *Digenea simplex*.

Nos. 2695, 2740, 2753, Flats.

Geogr. Distr.: Mediterranean and Adriatic Seas, Atlantic and Pacific Oceans. All around Australia.

SPYRIDIA Harvey.

SPYRIDIA FILAMENTOSA (Wulf.) Harv. in Hook., 1833, p. 336; Feldmann-Mazoyer, 1940, pp. 348–351, fig. 133.—*Fucus filamentosus* Wulf., 1803, p. 64.

No. 2720, Reef.

Geogr. Distr.: Atlantic coasts of Europe, Africa and America, Mediterranean and Red Seas, Indian Ocean, Japan. N., S. and E. Australia and Tasmania.

Family DASYACEAE.

DASYA Agardh.

1. DASYA PACIFICA Harv., Friendly Is. Alg. No. 12; in J. Ag., 1852–1863, p. 1223; De Toni, 1897–1905 (Part 3), p. 1207.

Nos. 2743, 2754, Flats; 2804, Pelican Is. Flats.

Geogr. Distr.: Friendly Islands. New record to Australia.

2. DASYA sp.

A prevalent and distinctive species, probably new. The plant is dendroid, about 3 cm. high, bears dichotomous monosiphonous hairs from near the apex, has five pericentral cells and is much corticated. It has not been found fertile.

Nos. 2718, 2783, 2784, Reef; 2770, Coral Reef.

Geogr. Distr.: I have also collected this species at Woolgoolga, northern N.S.W.

3. DASYA sp.

A small amount of a little epiphyte, No. 2772, was found growing on *Amphiroa* prob. *foliacea*, No. 2723, from the Coral Reef.

Family RHODOMELACEAE.

POLYSIPHONIA Greville.

1. POLYSIPHONIA IMPLEXA H. and H., 1845, n. 59; De Toni, 1897-1905 (Part 3), pp. 889-890.

As Lucas's specimens from Lord Howe Is. (Lucas, 1935). A surprising distribution. Nos. 2684, 2749, Flats.

Geogr. Distr.: Lord Howe Is. S.W. Australia.

2. POLYSIPHONIA ZOSTERICOLA Lucas, 1919, p. 177.

Checked against type material in Lucas's Herbarium (housed at National Herbarium of N.S.W., Sydney, Aus.).

No. 2687, Flats.

Geogr. Distr.: E. Australia.

DIGENEA Agardh.

DIGENEA SIMPLEX (Wulf.) Ag., 1823-1828, p. 389; De Toni, 1924, p. 404.—*Conferva simplex* Wulf., 1803, p. 17, n. 16.

Specimens of this species were usually found bearing many epiphytes.

No. 2739, Flats; 2792, Reef; E., Pelican Is. Flats.

Geogr. Distr.: Most warm seas. N. and W. Australia.

ROSCHERA Sonder.

ROSCHERA GLOMERULATA (Ag.) W.v.B., 1914, p. 289; De Toni, 1924, pp. 404-405.—*Tolyptocladia glomerulata* (Ag.) Schmitz. in Engl. and Prantl, 1897, p. 442.—*Hutchinsia glomerulata* Ag., 1823-1828, p. 102.

Plant size is variable.

Nos. 2685, 2686, 2733, Flats; 2805, Pelican Is. Flats.

Geogr. Distr.: E. Africa, W. India, Ceylon, Japan, Friendly and Philippine Islands, New Zealand, etc. N. Australia.

ENDOSIPHONIA Zanardini.

ENDOSIPHONIA SPINULIGERA Zan., 1878, p. 34, n. 4; Falk., 1901, p. 571, t. 13, f. 12; W.v.B., 1913-1928 (Part c), p. 354.

A species but rarely collected previously.

Weber van Bosse (*loc. cit.*) points out that her specimen (Siboga material) differs from the type material in that there is only one layer of cells next to the pericentral cells of the same length as these pericentral cells, whereas on description there should be two or more such layers. She concludes, however, that both specimens represent the same species. The Australian material in L.S. of the thallus, shows two rows of cells external to, and of the same length as, the pericentral cells.

No. 2719, Reef; 2746, Flats.

Geogr. Distr.: New Guinea, E. Indian Ocean. New record to Australia.

LEVEILLEA Decaisne.

LEVEILLEA JUNGERMANNIOIDES (Mart. and Hering) Harv., 1855, p. 539; Borg., 1939, p. 132.—*Amansia jungermannioides* Mart. and Hering in Mart., 1836, p. 485.

No. 2791 growing on *Digenea simplex*.

No. 2745, 2752, Flats; 2791, Reef.

Geogr. Distr.: Red Sea, Indian Ocean, Japan, Norfolk Island. W. and N.E. Australia.

AMANSIA Lamouroux.

AMANSIA GLOMERATA Ag., 1824, p. 247; De Toni, 1924, p. 426.

No. 2674, Pool in Reef; 2765, Coral Reef.

Geogr. Distr.: Warm Pacific and Indian Oceans. N.E. Australia.

LAURENCIA Lamouroux.

1. LAURENCIA RIGIDA J. Ag., 1876, p. 651; De Toni, 1897-1905 (Part 3), p. 789.

No. 2747, Flats.

Geogr. Distr.: Warm Indian Ocean, Java, Korea. N. and S. Australia.

2. *LAURENCIA OBTUSA* (Huds.) Lamour., 1813, p. 42; De Toni, 1924, p. 371.—*Fucus obtusus* Huds., 1778, p. 586.

This seems to be a prevalent species of rather varying habit.

No. 2688, Flats; 2717, Reef; 2762, Coral Reef.

Geogr. Distr.: Widespread in warm seas. All around Australia.

ACANTHOPHORA Lamouroux.

ACANTHOPHORA SPICIFERA (Vahl) Borg., 1910, p. 201, figs. 18-19; 1945, p. 61.—*Fucus spiciferus* Vahl, 1802, p. 44.

No. 2730 is a poor specimen.

Nos. 2730, 2738, Flats.

Geogr. Distr.: Widespread in tropical seas. N.E. Australia.

CHONDRIA Harvey.

CHONDRIA sp.

I have insufficient comparative material to determine the species.

No. 2709, Flats; 2761, Coral Reef.

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* The full reference to Siboga Expedition is: "Uitkomsten op zoologisch, botanisch, oceanographisch en geologisch gebied verzameld in Nederlandsch Oost-Indië 1899-1900 aan boord H.M. "Siboga" onder commando van Luitenant ter Zee 1^e kl. G. F. Tydeman."

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