

Marine Benthic Algae from Howland Island and Baker Island, Central Pacific¹

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PRESENTED HERE is an annotated listing of the marine benthic algae collected by Mr. C. R. Long, under the auspices of the Pacific Ocean Biological Survey Program, Division of Birds, Smithsonian Institution, from two islands in the Central Pacific—Howland Island (0°48'N, 176°38'W) and Baker Island (0°12'N, 176°29'W).

A survey of the literature reveals no published papers on the algae from these two islands, although Degener and Gillaspay (1955), Degener and Degener (1959), and Dawson (1959) have reported on the algae of Canton Island, in the Phoenix Group, which lies approximately 400 miles southeast of Baker Island.

The collection numbers are those of Mr. Long, whom the authors thank for the opportunity to work on his collection. All specimens are deposited in the herbarium of Dr. Maxwell S. Doty, University of Hawaii.

CYANOPHYTA

Schizothrix calcicola (Ag.) Gomont, 1892:307; Drouet, 1963:275.

BAKER ISLAND: CRL 2395, in seep holes on NE end of island, brackish water, Oct. 14, 1964. The collection appears as gelatinous sheets about 5 mm in thickness, with the individual filaments about 2μ in diameter.

CHLOROPHYTA

Ulva fasciata Delile, 1813:153; Børg., 1940:10.

BAKER ISLAND: CRL 2368.1, on rusting machinery off SW beach opposite wrecked landing craft, Oct. 13, 1964; CRL 2369.3, beachdrift on

SW beach opposite wrecked landing craft, Oct. 13, 1964.

HOWLAND ISLAND: CRL 2325, in shallow pools with sandy bottom at NW point, Oct. 14, 1964.

Enteromorpha kylinii Bliding, 1948:1; Bliding, 1963:103, fig. 61.

BAKER ISLAND: CRL 2367 and CRL 2368.2, on rusting machinery off SW beach, Oct. 13, 1964. The thalli of specimen CRL 2367 are about 12–15 cm high with proliferations occurring only at the basal portion. The base is approximately 70μ wide and increases to 225μ at the compressed terminal portion. The square to rectangular cells, about 9–15μ in diameter, are arranged in longitudinal rows and contain 2–3 pyrenoids per cell. Specimen CRL 2368.2, although listed here, seems to be more representative of *E. tubulosa* (Kütz.) Kütz. in external appearance, but also possesses 2–3 pyrenoids.

Cladophora sp.

BAKER ISLAND: CRL 2369.4, in beachdrift on SW beach opposite wrecked landing craft, Oct. 13, 1964. The specimen, about 1 cm high, was found epiphytic on *Hypnea* sp. (CRL 2369.1). The thalli consist of irregular branches of uniform diameter, 140μ, with no predominant main axis present.

Dictyosphaeria cavernosa (Forsskål) Børg., 1932:2, pl. 1 (fig. 1); Egerod, 1952:350, figs. 1e–g.

BAKER ISLAND: CRL 2168, in beachdrift on south reef, July 21, 1964; CRL 2381.4, in drift in tidepool on north beach, Oct. 14, 1964; CRL 2382.2, in pools on NE beach exposed at low tide, Oct. 14, 1964; CRL 2384, in beach pools on NE shore, Oct. 14, 1964; CRL 2403.1, on reef on NE side of island (collected by C. D. Hackman), Oct. 15, 1964.

HOWLAND ISLAND: CRL 2190.3, on exposed

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reef on west side, July 23, 1964; CRL 2324.1, in crevices at NE point, Oct. 9, 1964; CRL 2333.1, in beachdrift on NW point of island, Oct. 10, 1964; CRL 2342.1, in beachdrift on SE shore, Oct. 10, 1964; CRL 2351.2, in beachdrift on SW beach, Oct. 11, 1964; CRL 2362.1, on exposed reef at low tide on south side near beach rock shelf (collected by C. R. Long and P. Woodward), Oct. 12, 1964.

Dictyosphaeria versluysii Weber van Bosse, 1905:155; Egerod, 1952:351, figs. 1a and 2b-k.

BAKER ISLAND: CRL 2397.1, in tidepool on SE reef, Oct. 14, 1964.

Cladophoropsis gracillima Dawson, 1950:149, figs. 12-13.

BAKER ISLAND: CRL 2397.2, in tidepool on SE reef, Oct. 14, 1964.

HOWLAND ISLAND: CRL 2333.1, in beachdrift on NW point, Oct. 10, 1964; CRL 2351.3, in beachdrift on SW beach, Oct. 11, 1964.

The filaments are clumped together, appearing as felt-like cushions. The erect filaments, about 110-140 μ wide, attain a height of 2 cm, with the branches, if present, occurring only at the terminal portion. The walls are distinctly striated longitudinally.

Caulerpa serrulata var. *typica* f. *serrulata* (Weber van Bosse) Gilbert, 1942:15; Eubank, 1946:418.

HOWLAND ISLAND: CRL 2189, in crevices on exposed reef, July 23, 1964. The marginal serrations are at regular intervals throughout the untwisted fronds.

Halimeda spp.

Ten specimens were sent to Dr. L. H. Colinaux, Department of Botany and Plant Pathology, Ohio State University, for a more critical study.

PHAEOPHYTA

Ectocarpus indicus Sonder in Zollinger, 1854: 3; Børg., 1941:16, figs. 6-7.

BAKER ISLAND: CRL 2380, intermixed with silt in pools on NE beach covered by high tide, Oct. 14, 1964; CRL 2382.3, epiphytic on *Turbinaria ornata* (Turner) J. Ag. in pools on NE beach exposed at low tide, Oct. 14, 1964.

Sphacelaria sp.

BAKER ISLAND: CRL 2369.4, in beachdrift on SW beach opposite wrecked landing craft, Oct. 14, 1964. A fragmentary specimen lacking propagulae is the only representative of this genus in the collection.

Dictyota friabilis Setchell, 1926:91, pl. 13 (figs. 4-7), pl. 20 (fig. 1).

HOWLAND ISLAND: CRL 2324.3, in water-filled crevices on reef at NE point, Oct. 9, 1964.

Turbinaria ornata (Turner) J. Ag., 1848:266; Taylor, 1964:483.

BAKER ISLAND: CRL 2167, in beachdrift on south reef, July 21, 1964; CRL 2382.1, in pools on NE beach exposed at low tide, Oct. 14, 1964; CRL 2383.4 and CRL 2383.5, in drift in pools on NE point, Oct. 14, 1964. Specimens CRL 2167 and CRL 2383.5 are very similar to Taylor's circumscription of *T. ornata* var. *ornata* f. *ecoronata* Taylor, characterized by its prominent vesicle and lack of secondary rows of teeth. Specimens CRL 2382.1 and CRL 2383.4 are somewhat atypical forms in which the leaves possess only an occasional secondary tooth near the margin.

RHODOPHYTA

Gelidiopsis sp.

HOWLAND ISLAND: CRL 2324.3, in crevices on reef at NE point, Oct. 9, 1964; CRL 2342.2, in beachdrift on SE shore, Oct. 10, 1964; CRL 2333.1, in beachdrift on NW point of island, Oct. 10, 1964. The stoloniferous branches are attached to the substratum or to each other by means of short haptera-like attachment organs, giving rise to erect branches which may be simple or moderately branched. In cross section the cylindrical branches possess medullary cells up to 11 μ in diameter, decreasing in size toward the periphery. The cortical cells are slightly elongated and radially arranged. The stichidia are intercalary, about 0.5 mm from the tip of the branch, and appear lanceolate in shape.

Jania capillacea Harvey, 1853:84 (Florida); Dawson, 1954:432, figs. 41a-b.

BAKER ISLAND: CRL 2369.2, in beachdrift on SW beach opposite wrecked landing craft, Oct. 13, 1964; CRL 2385.2, in shallow pool on NE

beach, Oct. 14, 1964; CRL 2397.3, in tidepool on SE reef, Oct. 14, 1964.

HOWLAND ISLAND: CRL 2324.13, in crevices on reef at NE point, Oct. 9, 1964; CRL 2333.2, in beachdrift on NW point of island, Oct. 10, 1964.

All specimens form small clumps about 1 cm high and always are found in association with other algae. The intergenicula are cylindrical, rather coarse, approximately $100\text{--}115\mu$ thick, and about 5–8 diameters long. Branching is dichotomous to irregularly decussate and wide-angled, about $60^{\circ}\text{--}90^{\circ}$. All specimens examined were sterile.

Jania micrarthrodia Lamx., 1816:271; Dawson, 1956:49, fig. 2.

HOWLAND ISLAND: CRL 2324.2, in crevices on reef at NE point, Oct. 9, 1964; CRL 2333.2, in beachdrift on NW point of island, Oct. 10, 1964; CRL 2351.2, in beachdrift on SW beach, Oct. 11, 1964.

This alga forms hemispherical cushions to about 2.5 cm tall and 4 cm broad. It is often found in association with other algae. The erect branches are compact, basically dichotomous and decussate, but sometimes trichotomous or having several branches present on only one side of the main axis. Although basically dichotomous, the unequal spread of the branches gives the impression of a percurrent main axis. The conceptacles are antenniferous, with the antennae giving rise to branches which may bear other conceptacles.

Hypnea sp.

BAKER ISLAND: CRL 2369.1, in beachdrift on SW beach opposite wrecked landing craft, Oct. 13, 1964. The only representative of this genus in the collection is a fragmentary specimen less than 1 cm in length. It is irregularly branched, with no distinct main axis present.

Lomentaria sp.

BAKER ISLAND: CRL 2378, in sandy pool on NE reef, Oct. 14, 1964. A single specimen about 3 mm high with a slightly flattened thallus and irregular branching pattern was found in the collection. Five to six layers of small cortical cells about 6μ in diameter, with larger medullary cells about 30μ in diameter, were seen in cross sections.

Ceramium gracillimum var. *byssoideum* (Harv.)

G. Mazoyer, 1938:323; Dawson, 1954: 448, figs. 55e–f.

BAKER ISLAND: CRL 2378.2, in sandy pool on NE reef, Oct. 14, 1964. The specimens are characterized by the division of the nodal cortications at the lower third by a clear line, with the upper two thirds made up of angular cells cutting off smaller superficial cells, and the lower third made up of 1–2 tiers of horizontal cells; and also by the presence of whorls of spermatia found at the nodal cortication. However, our specimens possess whorls of long thin hairs originating from the upper portion of the nodal cortications. All specimens are antheridial.

Ceramium spp.

BAKER ISLAND: CRL 2381.3, in drift in tidepool on north beach, Oct. 14, 1964.

HOWLAND ISLAND: CRL 2333.2, in beachdrift on NW point of island, Oct. 10, 1964; CRL 2362.2, on exposed reef at low tide on south side near beach rock shelf (collected by C. R. Long and P. Woodward), Oct. 12, 1964.

Laurencia nana Howe, 1920:566; Dawson, 1957:124, fig. 30.

BAKER ISLAND: CRL 2385.1, in shallow pool on NE beach, Oct. 14, 1964; CRL 2403.2, on reef on NE side of island (collected by C. D. Hackman), Oct. 15, 1964.

HOWLAND ISLAND: CRL 2324.3, in crevices on reef at NE point, Oct. 9, 1964.

The thalli, 2–3 cm high, anastomose in clumps due to the presence of rhizoidal haptera. In cross section the surface cells are radially elongated and arranged in a palisade. Our specimens (about 0.85 mm in width) are twice as wide as Howe's specimen (0.45 mm wide).

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