The Marine Algae from the Island of Yonakuni

By

YUKIO YAMADA and TAKESI TANAKA

When the writers made a journey for collecting marine algae to the Ryūkyū archipelago in the spring of 1935, the junior writer sojourned for several days in the island of Yonakuni, which forms the western end of the archipelago, facing westwards toward the northern part of Formosa. He collected a number of specimens on the coast of Sonai, Pinai, and Kubura, which are enumerated on the following pages and include some new species and also some ones new to the Japanese marine flora.

The present island has not been visited nor has the marine flora of this island been investigated by any phycologist so far as the writers are aware. Therefore the result of this study seems to the writers to be interesting and to contribute to some extent to the marine flora of the southern parts of our empire.

The expense of the journey was defrayed by a subsidy from the Japan Society for the Promotion of Scientific Research, to the directors of which the writers wish to extend their sincere thanks.

CHLOROPHYCEAE

ULVACEAE

Ulva

1) **Ulva pertusa** KJELLMAN

Mar. Chlorophyc. Japan (1897), p. 4, pl. 1, figs. 1–5, pl. 3, figs. 1–8; OKAMURA, Icon. Japan. alg., vol. 4 (1921), p. 79, pl. 170 & pl. 169, fig. 8; YAMADA, Mar. Chlorophyc. Ryūkyū (Journ. Fac. Sci., Hokkaido Imp. Univ., Ser. V, vol. 3, no. 2, 1934), p. 35.

Japanese name. *Ana-aosa.*

Hab. Sonai; Pinai.

Enteromorpha

2) **Enteromorpha** sp.

Hab. Pinai.

VALONIACEAE

Valonia

3) **Valonia Forbesii** HARVEY

Alg. Ceylon exsic., no. 75, Char. new alg. etc. (1859), p. 333; J. AGARDH, Till. Alg. Syst., VIII, p. 96; DE TONI, Syll. Alg., vol. 1 (1889), p. 374, Phyc. Jap. nov. (1895), p. 62; HEYDRICH, Beitr. Kenntn. Algenfl. Kaiser Wilhelmsland (Ber. deut. bot. Ges., vol. 10, 1892), p. 465; OKAMURA, Alg. Ogasawara-jima (Bot. Mag. Tokyo, vol. 11, 1897), p. 2; WEBER VAN BOSSE, Liste alg. Siboga, vol. 1 (1913), p. 59; YAMADA, Stud. Meeresalg. Formosa, Chlorophyc. (Bot. Mag. Tokyo, vol. 39, 1925), p. 79, Mar. Chlorophyc. Ryūkyū (Journ. Fac. Sci., Hokkaido Imp. Univ., Ser. V, vol. 3, no. 2, 1934), p. 36, figs. 1–2; BOERGESEN, Some mar. alg. Ceylon (1936), p. 62.

Japanese name. *Magatamamo.*

Hab. Sonai; Pinai.

The specimens at hand also show several annular constrictions on the basal portions of the fronds which have been figured recently by Dr. BOERGESEN in the Indian specimens (BOERGESEN, l. c.), and also described by the senior writer in Formosa ones (YAMADA, l. c.).

4) **Valonia fastigiata** (HARVEY) J. AGARDH

Till. Alg. Syst., VIII, p. 101; BOERGESEN, Some mar. alg. Ceylon (1936), p. 61; HARVEY, Ceylon Alg. 74 (nomen nudum).

Japanese name.

Hab. Sonai; Pinai.

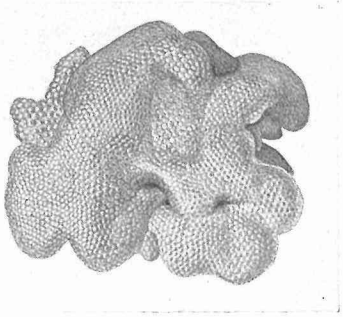

Fig. 1. *Dictyosphaeria Versluysi* WEBER VAN BOSSE. ×1.

Dictyosphaeria

5) **Dictyosphaeria Versluysi** WEBER VAN BOSSE Text-fig. 1.

Note Dictyosphaeria (Nouva Notar., Ser. XVI, 1905), p. 144, Liste alg. Siboga, vol. I (1913), p. 64.

Japanese name. *Muku-kikkōgusa.*

Hab. Sonai; Pinai.

6) **Dictyosphaeria cavernosa** (FORSSKÅL) BOERGESEN

Rev. Forssk.' Alg. (Dansk Bot. Arkiv, vol. 8, 1932), p. 2.—*Dictyosphaeria favulosa* DECAISNE, Class. des alg. calcif. p. 32; HARVEY, Ner. Bor. Amer., part 3 (1857), p. 50, pl. 44, B; WEBER VAN BOSSE, Note Dictyosphaeria (Nouva Notar., Ser. XVI, 1905), p. 143, Liste alg. Siboga,

vol. 1 (1913), p. 63; HEYDRICH, Einige Alg. Loochoo- od. Riu-kiu-Inseln (Ber. deut. bot. Ges., Bd. 25, 1907), p. 101; OKAMURA, Icon. Japan. alg., vol. 1 (1908), p. 205, pl. 40, figs. 13–24; YAMADA, Mar. Chlorophyc. Ryūkyū (Journ. Fac. Sci., Hokkaido Imp. Univ., Ser. V, vol. 3, no. 2, 1934), p. 39.

Japanese name. *Kikkōgusa.*

Hab. Sonai; Pinai.

BOODLEACEAE

Cladophoropsis

7) **Cladophoropsis fasciculata** (KJELLMAN) BOERGESEN

Contr. connais. Siphonocladus (1905), p. 288; OKAMURA, Icon. Japan. alg., vol. 4 (1921), p. 75, pl. 169, figs. 1–7, Mar. alg. Kōtōsho (Bull. Biogeogr. Soc. Japan, vol. 2, 1931), p. 97; YAMADA, Stud. Meeresalg. Formosa, Chlorophyc. (Bot. Mag. Tokyo, vol. 39, 1925), p. 85.—*Siphonocladus fasciculatus* KJELLMAN, Mar. Chlorophyc. Japan (1897), p. 36, pl. 7, figs. 10–17.

Japanese name. *Midorige.*

Hab. Sonai; Pinai; Kubura.

Boodlea

8) **Boodlea coacta** (DICKIE) MURRAY et DE TONI

Journ. Linn. Soc. Bot., XXV, p. 243–245, pl. 49; DE TONI, Syll. Alg., vol. 1 (1889), p. 363; OKAMURA, Illustr. mar. alg. Japan, vol. 1 (1901), p. 41, pl. 15.

Japanese name. *Aomogusa.*

Hab. Sonai; Pinai.

Microdictyon

9) **Microdictyon Okamurai** SETCHELL

Notes Microdictyon (Univ. Calif. Publ. Bot., vol. 13, 1925), p. 107, Notes Microdictyon, II (Ibid. vol. 13, 1926), p. 149, Genus Microdictyon (Ibid. vol. 14, 1929), p. 553, figs. 76–84; YAMADA, Mar. Chlorophyc. Ryūkyū (Journ. Fac. Sci., Hokkaido Imp. Univ., Ser. V, vol. 3, no. 2, 1934), p. 40, figs. 6–7.—*M. pseudohapteron* OKAMURA (non A. & E. S. GEPP) Icon. Japan. alg., vol. 2 (1910), p. 105, pl. 80, figs. 8–12 (in part).

Japanese name. *Tanomogusa.*

Hab. Sonai; Pinai.

10) **Microdictyon nigrescens** (YAMADA) SETCHELL

Notes Microdictyon (Univ. Calif. Publ. Bot., vol. 13, 1925), p. 107, Genus Microdictyon (Ibid. vol. 14, 1929), p. 523, figs. 44–48.—*Rhipidi-*

phyllon nigrescens YAMADA, Stud. Meeresalg. Formosa, Chlorophyc. (Bot. Mag. Tokyo, vol. 39, 1925), p. 83, fig. 11.

Japanese name. *Kuro-amimoyō.*

Hab. Sonai; Pinai.

ANADYOMENACEAE

Valoniopsis

11) **Valoniopsis pachynema** (MARTENS) BÖRGESEN

Mar. alg. Arab. sea etc. (1934), p. 10, Some mar. alg. Ceylon (1936), p. 63.—*Bryopsis pachynema* MARTENS, Preus. Exped. Ost-Asien (1866), p. 24, pl. 4, fig. 2.—*Valonia confervoides* HARVEY, Alg. Ceylon exsic. 73, Alg. excis. Friendly Isl. 101; J. AGARDH, Till. Alg. Syst., VIII, p. 100; DE TONI, Syll. Alg., vol. 1 (1889), p. 378; HEYDRICH, Einige Alg. Loochoo- od. Riu-kiu Inseln (Ber. deut. bot. Ges., Bd. 25, 1907), p. 101; OKAMURA, Icon. Japan. alg., vol. 2(1909), p. 59, pl. 65, figs. 7–10; YAMADA, Stud. Meeresalg. Formosa, Chlorophyc. (Bot. Mag. Tokyo, vol. 39, 1925), p. 80.—*Valonia pachynema* WEBER VAN BOSSE, Liste alg. Siboga, vol. 1 (1913), p. 61.

Japanese name. *Hoso-baroniya.*

Hab. Sonai; Pinai.

SIPHONOCLADIACEAE

Chamaedoris

12) **Chamaedoris orientalis** OKAMURA et HIGASHI Text-fig. 2.

Mar. alg. Kōtōsho (Bull. Biogeogr. Soc. Japan, vol. 2, 1931), p. 98, pl. 10, Icon. Japan. alg., vol. 6 (1932), p. 68, pl. 284, figs. 8–15; YAMADA, Mar. Chlorophyc. Ryūkyū (Journ. Fac. Sci., Hokkaido Imp. Univ., Ser. V, vol. 3, no. 2, 1934), p. 48, fig. 11.

Japanese name. *Tanpoyari.*

Hab. Sonai; Pinai.

The number of articulations in the central axis of the capitulum seems to be rather variable, as already has been supposed by one of the writers (l. c.). The examination of a good number of specimens from Yonakuni confirmed this view, the number of articulations fluctuating between about 18 and 11, though mostly about 14. The Naha specimens which were referred to this species by the senior writer seem to be extremely long ones. The form of the capitulum also varies considerably, some being nearly globose while some others elongated, and the longer ones are usually looser than shorter ones.

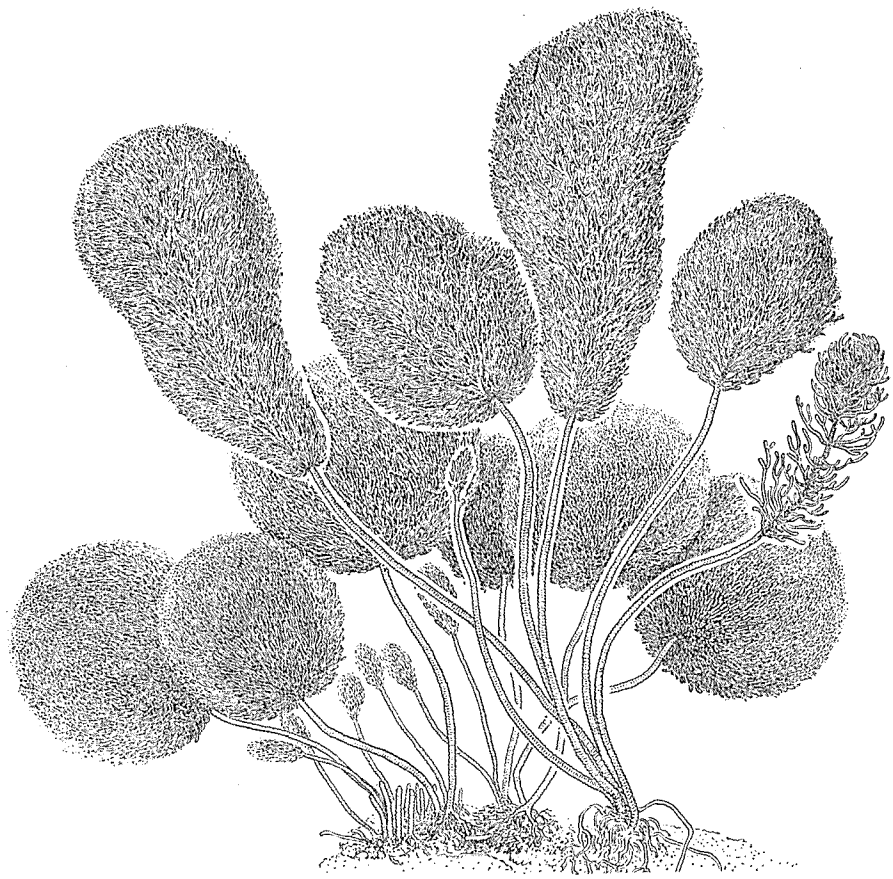

Fig. 2. *Chamaedoris orientalis* OKAMURA et HIGASHI. ×1.

CLADOPHORACEAE

Cladophora

13) **Cladophora prolifera** KUETZING

Phyc. Germ. (1845), p. 207, Spec. Alg. (1849), p. 390, Tab. Phyc., Bd. 3 (1853), p. 82, fig. 3; DE TONI, Syll. Alg., Vol. 1 (1889), p. 306; VICKERS, Phycol. Barbad. (1908), p. 18, pl. 12; OKAMURA, Mar. alg. Kōtōsho (Bull. Biogeogr. Soc. Jap., vol. 2, 1931), p. 96.

Japanese name.

Hab. Sonai; Pinai.

14) **Cladophora (Aegagropila) Sibogae** REINBOLD

Einige neue Chlorophyc. Ind. Ozean (Nouva Notar., Ser. XVI, 1905),

p. 146; WEBER VAN BOSSE, Liste alg. Siboga, vol. 1 (1913), p. 81, fig. 19; OKAMURA, Mar. alg. Kōtōsho (Bull. Biogeogr. Soc. Japan, vol. 2, 1931), p. 96; YAMADA, Mar. Chlorophyc. Ryūkyū (Journ. Fac. Sci., Hokkaido Imp. Univ., Ser. V, vol. 3, no. 2, 1934), p. 45.

Japanese name. *Nedasi-siogusa.*

Hab. Sonai; Pinai.

Chaetomorpha

15) **Chaetomorpha Linum** (MUELLER) KUETZING

Phyc. Germ. (1845), p. 204, Spec. Alg. (1849), p. 378, Tab. Phyc., Bd. 3 (1853), p. 55, fig. 3; DE TONI, Syll. Alg., vol. 1 (1889), p. 269; YENDO, Notes alg. new Japan, IV (1916), p. 48; YAMADA, Mar. Chlorophyc. Ryūkyū (Journ. Fac. Sci., Hokkaido Imp. Univ., Ser. V, Vol. 3, no. 2, 1934), p. 42.

Japanese name. *Usuiro-zyuzumo.*

Hab. Pinai.

16) **Chaetomorpha antennina** (RORY) KUETZING

Spec. Alg. (1849), p. 379; VICKERS, Phycol. Barbad. (1908), p. 17, pl. 8; BOERGESEN, Mar. alg. Danish West Ind., vol. 1 (1913), p. 16, figs. 4–5.

Japanese name.

Hab. Pinai.

The present specimens agree well with the description and figures given by VICKERS and BOERGESEN. The filaments of this species arising from an irregularly ramified rhizoid reach a height of about 4 cm.

In the specimens at hand the basal cells of the filaments have characteristic annular constrictions and are much longer than the other cells. This species is a new addition to the marine flora of Japan.

DASYCLADACEAE

Bornetella

17) **Bornetella ovalis** YAMADA

Notes some Japan. alg., V (Journ. Fac. Sci., Hokkaido Imp. Univ., Ser. V, vol. 2, 1933), p. 277, Mar. Chlorophyc. Ryūkyū (Ibid. vol. 3, no. 2, 1934), p. 51, figs. 14–15.—*B. capitata* OKAMURA (non J. AGARDH), Icon. Japan. alg., vol. 1 (1908), p. 225, pl. 44, figs. 1–10.

Japanese name. *Mizutama.*

Hab. Sonai; Pinai.

Neomeris

18) **Neomeris annulata** DICKIE

"On alg. Mauritius (Journ. Linn. Soc., vol. 14, 1876), p. 198"; SOLMS LAUBACH, Ueber Algengen. *Cymopolia, Neomeris* u. *Bornetella* (Ann. Jard. bot. Buitenzorg, vol. 11, 1892), p. 62 etc.; HOWE, Phyc. stud., IV (1909), p. 87, pl. I, fig. 2; BOERGESEN, Mar. alg. Danish West Ind., vol. 1 (1913), p. 71, figs. 55–57; WEBER VAN BOSSE, Liste alg. Siboga, vol. 1 (1913), p. 88;

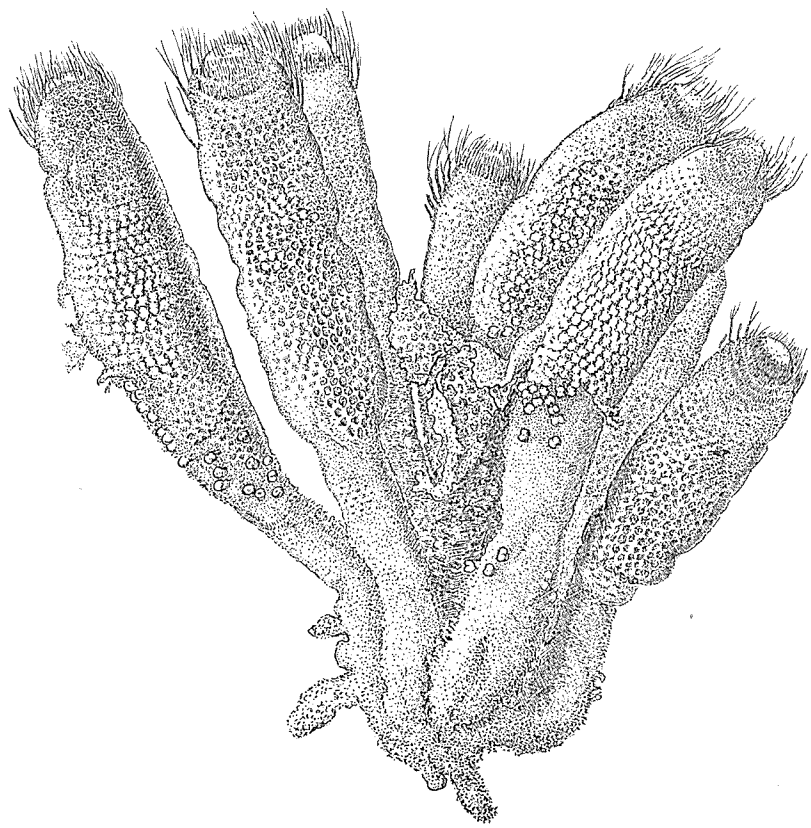

Fig. 3. *Neomeris mucosa* HOWE. ×ca. 9.

YAMADA, Mar. Chlorophyc. Ryūkyū (Journ. Fac. Sci., Hokkaido Imp. Univ., Ser. V, vol. 3, no. 2, 1934), p. 51, figs. 16–17.—*N. Kelleri* CRAMER, Ueber verticil. Siphon. besond. *Neomeris* u. *Cymopolia* (1887), pp. 3, 39, pl. 1, pl. 2, figs. 1–12, pl. 3, figs. 1, 2, Ueber verticil. Siphon. besond. *Neomeris* u. *Bornetella* (1890), p. 9, pl. 1, figs. 1–12, pl. 2, figs. 1–6, pl. 4, figs. 14–24,

VICKERS, Phyc. Barbad., vol. 1 (1908), pl. 46.

Japanese name. *Hudenoho.*

Hab. Kubura; Pinai.

19) **Neomeris mucosa** HOWE Text-fig. 3.

Phyc. stud., IV (1909), p. 84, pl. 1, fig. 5, pl. 5, figs. 1–14.

Japanese name. *Nure-hudenoho.*

Hab. Kubura; Pinai.

Generally, Yonakuni specimens agree rather well with the description and figures of HOWE. The spores are usually subglobose or slightly obovoid, but there are often found obovoid ones. In a slide the writers have met with a few branches bearing three corticating branchlets of the second order instead of two, which have been found by HOWE quite often in *N. stipitata* HOWE.

BRYOPSIDACEAE

Bryopsis

20) **Bryopsis Harveyana** J. AGARDH

Till. Alg. Syst., VIII (1886), p. 22; VICKERS, Phyc. Barb. (1908), pl. 51; OKAMURA, Mar. alg. Kōtōsho (Bull. Biogeogr. Soc. Japan, vol. 2, 1931), p. 100.—*B. plumosa* var. *secunda* HARVEY, Ner. Bor. Amer., III (1857), p. 31, t. 45, A, figs. 1–3.

Japanese name. *Kataha-no-hanemo.*

Hab. Sonai; Pinai.

CAULERPACEAE

Cauperpa

21) **Caulerpa racemosa** WEBER VAN BOSSE var. **clavifera** f. **microphysa** WEBER VAN BOSSE

Mónogr. Caulerpes (1898), p. 361, pl. 33, figs. 5.

Japanese name.

Hab. Pinai.

22) **Caulerpa racemosa** WEBER VAN BOSSE var. **laete-virens** WEBER VAN BOSSE

Monogr. Caulerpes (1898), p. 366, pl. 33, f. 8 ,16–22; OKAMURA, Icon. Japan. alg., vol. 3 (1913), p. 67, pl. 119, figs. 2–5.—*C. cylindracea* SONDER, in HARVEY's, Phyc. Austr., vol. 1 (1858), pl. 30; J. AGARDH, Till. Alg. Syst.,

1 (1872), p. 34.—*Chauvinia laete-virens* KUETZING, Tab. Phyc., Bd. VII (1857), t. 12, fig. 2.—*Ch. cylindrica* KUETZING, l. c., Bd. VII (1857), t. 15, f. III.—*C. cylindracea* var. *macra* HARVEY, Phyc. Aust., vol. 1 (1858), pl. 30, fig. 2.—*C. laete-virens* MONTAGNE, J. AGARDH, Till. Alg. Syst., 1 (1872), p. 34; SVEDELIUS, Ceylon spec. Caulerpa (1906), p. 124.

Japanese name. *Surikogi-zuta.*

Hab. Pinai.

23) **Caulerpa peltata** LAMOUROUX var. **typica** WEBER VAN BOSSE

l. c., p. 375, pl. 31, fig. 9; OKAMURA, Icon. Japan. alg., vol. 6 (1931), p. 60, pl. 280, figs. 10–12.—*C. peltata* LAMOUROUX, in SVEDELIUS', Ceylon spec. Caulerpa (1906), p. 131, figs. 31–32.

Japanese name. *Takatuki-zuta.*

Hab. Pinai.

24) **Caulerpa cupressoides** AGARDH var. **typica** WEBER VAN BOSSE

Monogr. Caulerpes (1898), p. 327, pl. 27, figs. 1–3, pl. 28, fig. 1; OKAMURA, Icon. Japan. alg., vol. 4 (1923), p. 194, pl. 200, fig. 2.

Japanese name. *Byakusin-zuta.*

Hab. Pinai.

25) **Caulerpa sertularioides** (GMELIN) HOWE

Phyc. stud., II (1905), p. 565; SVEDELIUS, Ceylon spec. Caulerpa (1906), p. 114; OKAMURA, Icon. Japan. alg., vol. 3 (1913), p. 36, pl. 110, figs. 1–3; BOERGESEN, Some Ind. green and brown alg. etc. (Journ. Ind. Bot. Soc., vol. 2, 1932), p. 59; YAMADA, Mar. Chlorophyc. Ryūkyū (Journ. Fac. Sci., Hokkaido Imp. Univ., Ser. V, vol. 3, no. 2, 1934), p. 68.—*Fucus sertularioides* GMELIN, Hist. Fuc. (1768), p. 151, pl. 15, fig. 4.—*Fucus plumaris* FORSSKÅL, Fl. Aegypt-Arab. (1775), p. 190.—*Caulerpa plumaris* AGARDH, Spec. Alg., vol. 1 (1822), p. 436; WEBER VAN BOSSE, l. c., p. 294, pl. 24, figs. 4–6 et 10; REINKE, Ueber Caulerpa (1900), p. 17, figs. 21–22.

Japanese name. *Takanoha-zuta.*

Hab. Pinai.

26) **Caulerpa Webbiana** MONTAGNE

Histoire naturelle Iles Canaries (1840), p. 178, pl. 9; J. AGARDH, Till. Alg. Syst., 1 (1872), p. 7; WEBER VAN BOSSE, l. c., p. 269, pl. 21, figs. 1–4; REINKE, Ueber Caulerpa (1900), p. 9, figs. 8–9; BOERGESEN, Mar. alg. Danish West Ind., vol. 1 (1913), p. 125, fig. 99.—*Chauvinia Webbiana* KUETZING, Spec. Alg. (1849), p. 499, Tab. Phyc., Bd. VII (1857), pl. 16, fig. 3.

f. **tomentella** WEBER VAN BOSSE, l. c., p. 270; OKAMURA, Icon. Japan. alg., vol. 3 (1913), p. 69, pl. 119, figs. 6–9.

Japanese name. *Koke-iwazuta.*

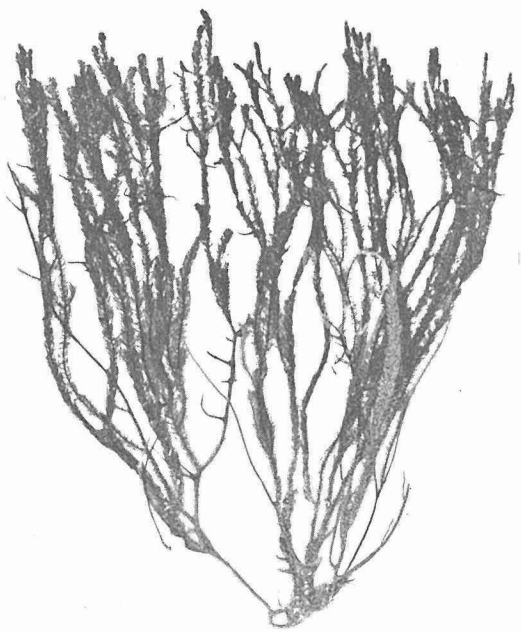

Fig. 4. *Caulerpa Webbiana* MONT. f. *elegans* YAMADA et TANAKA. Slightly reduced.

Hab. Pinai.

f. **elegans** f. nov. Fig. 4.

Frons elata, saepe ramulis distichiusculis ornata.

Hab. Pinai.

27) **Caulerpa serrulata** J. AGARDH var. **Boryana** f. **occidentalis** (WEBER VAN BOSSE) YAMADA et TANAKA comb. nov.

Caulerpa Freycinetii AGARDH var. *Boryana* f. *occidentalis* WEBER VAN BOSSE, l. c., p. 315, pl. 25, figs. 10–11; OKAMURA, Icon. Japan. alg., vol. 3 (1913), p. 19, pl. 105, figs. 4–6.

Japanese name.

Saihai-zuta.

Hab. Pinai.

CODIACEAE

Chlorodesmis

28) **Chlorodesmis formosana** YAMADA

Stud. Meeresalg. Formosa, Chlorophyc. (Bot. Mag. Tokyo, vol. 39, 1925), p. 92, fig. 5.

Japanese name. *Itogeno-mayuhakimo.*

Hab. Pinai; Kubura.

29) **Avrainvillea lacerata** J. AGARDH f. **typica** GEPP

Codic. Siboga Exped. (1911), p. 38, pl. 13, figs. 105–107.

Japanese name.

Hab. Pinai.

Udotea

30) **Udotea javensis** (MONTAGNE) GEPP

Rhipidosiphon and *Callipsygma* (Journ. Bot., vol. 42, 1904), p. 364, pl. 467, figs. 1–4, Codiac. Siboga Exped. (1911), p. 110, pl. 5, fig. 36; OKAMURA, Icon. Japan. alg., vol. 1 (1908), p. 228, pl. 45, figs. 1–7; YAMADA, Mar. Chlorophyc. Ryūkyū (Journ. Fac. Sci., Hokkaido Imp. Univ., Ser. V, vol. 3, no. 2, 1934), p. 73.

Japanese name. *Hime-ityō.*

Hab. Pinai.

31) **Udotea orientalis** A. et E. S. GEPP

Codiac. Siboga Exped. (1911), p. 119, pl. 1, figs. 1 & 4, pl. 6, figs. 47–48; YAMADA, Mar. Chlorophyc. Ryūkyū (Journ. Fac. Sci., Hokkaido Imp. Univ., Ser. V, vol. 3, no. 2, 1934), p. 74, figs. 42–43.—*U. conglutinata* OKAMURA (non LAMOUROUX), Icon. Japan. alg., vol. 1 (1908), p. 231, pl. 44, figs. 11–12, pl. 45, figs. 8–13.

Japanese name. *Hagoromo.*

Hab. Sonai; Pinai.

Halimeda

32) **Halimeda macroloba** DECAISNE

Arch. Mus. Hist. Nat. Paris. Tom II (1841), p. 118, Ess. Classif. Alg. mém. Corall. (1842), p. 91; BARTON, Genus Halimeda (1901), p. 24, figs. 33–38; HARVEY, Phyc. Aust., vol. 5 (1863), tab. 267; OKAMURA, Icon. Japan. alg., vol. 3 (1915), p. 210, figs. 1–8.

Japanese name. *Hiroha-sabotengusa.*

Hab. Pinai.

33) **Halimeda Opuntia** LAMOUROUX

Sur Classif. Polyp. Corall. etc.; BARTON, Genus Halimeda (1901), p. 18, pl. 2, figs. 19–27; VICKERS, Phyc. Barbad. (1908), pl. 35; YAMADA, Mar. Chlorophyc. Ryūkyū (Journ. Fac. Sci., Hokkaido Imp .Univ., Ser. V, vol. 3, no. 2, 1934), p. 80, figs. 50–51.

f. **typica** BARTON, l. c., p. 20, pl. 2, fig. 19.

Japanese name.

Hab. Pinai; Sonai.

f. **intermedia** YAMADA, l. c., p. 81, figs. 50–51.

Japanese name. *Hira-sabotengusa.*

Hab. Pinai; Sonai.

Codium

34) **Codium adhaerens** (CABRERA) AGARDH

Spec. Alg., vol. 1 (1822), p. 457; HARVEY, Phyc. Brit., vol. 4, pl. 35,

A; OKAMURA, Icon. Japan. alg., vol. 3 (1915), p. 140, pl. 134, figs. 1–3; SCHMIDT, Beitr. Kenntn. Gattung Codium (1923), p. 26; BOERGESEN, Mar. alg. Canary Isl., vol. 1 (1925), p. 89; YAMADA, Mar. Chlorophyc. Ryūkyū (Journ. Fac. Sci., Hokkaido Imp. Univ., Ser. V, vol. 3, no. 2, 1934), p. 76, fig. 45.

Japanese name. *Hai-miru.*

Hab. Sonai.

35) **Codium repens** (CROUAN) VICKERS

In An. Sc. Nat. Bot. 9. Sér (1905), p. 56, Phyc. Barbad. (1908), pl. 29; SCHMIDT, Beitr. Kenntn. Codium (1923), p. 43, fig. 23; YAMADA, Stud. Meeresalg. Formosa, Chlorophyc. (Bot. Mag. Tokyo, vol. 39, 1925), p. 94, Mar. Chlorophyc. Ryūkyū (Journ. Fac. Sci., Hokkaido Imp. Univ., Ser. V, vol. 3, no. 2, 1934), p. 77, figs. 46–47; OKAMURA, Mar. alg. Kōtōsho (Bull. Biogeogr. Soc. Japan, vol. 2, 1931), p. 100.

Japanese name. *Yasegata-moture-miru* (*Syakutori-miru*).

Hab. Pinai.

DERBESIACEAE

Derbesia

36) **Derbesia ryukyuensis** YAMADA et TANAKA spec. nov. Text-fig. 5.

Frons ex filamentis rhizoideis, brevibus, saepe cymosim parce ramosis exsurgens, ca. 3–10 mm alta, simplex vel parce dichotome vel lateraliter ramosa, 35 μ–45 μ crassa, apice obtusa, non septata. Zoosporangia breviter pedicellata, plerumque elliptica vel obovoidea, rarissime pyriformia, apice rotundata vel saepe non nihil truncata, 115 $\mu \times$ 60 μ–154 $\mu \times$ 77 μ, in partibus mediis superioribusque frondis secunda.

Japanese name. *Hime-tuyunoito.*

Hab. Pinai.

Frond standing on creeping rhizoids; rhizoids short, often somewhat cymoidly branched; erect parts about 3–10 mm high, simple or sparingly dichotomously or laterally branched, 35 μ–45 μ in diameter, apices obtuse, without septums.

Zoosporangia shortly pediceled, the diameter of pedicels 14 μ–18 μ, mostly elliptical or sometimes obovoid or very rarely pyriform, with apices rounded or often somewhat truncate, 115 $\mu \times$ 60 μ–154 $\mu \times$ 77 μ, disposed secundly on the middle and upper portions of the erect parts, containing about 26 spores. Growing on the frond of the *Corallinae* and *Polychaete.*

Judging from the descriptions and figures, the present species seems

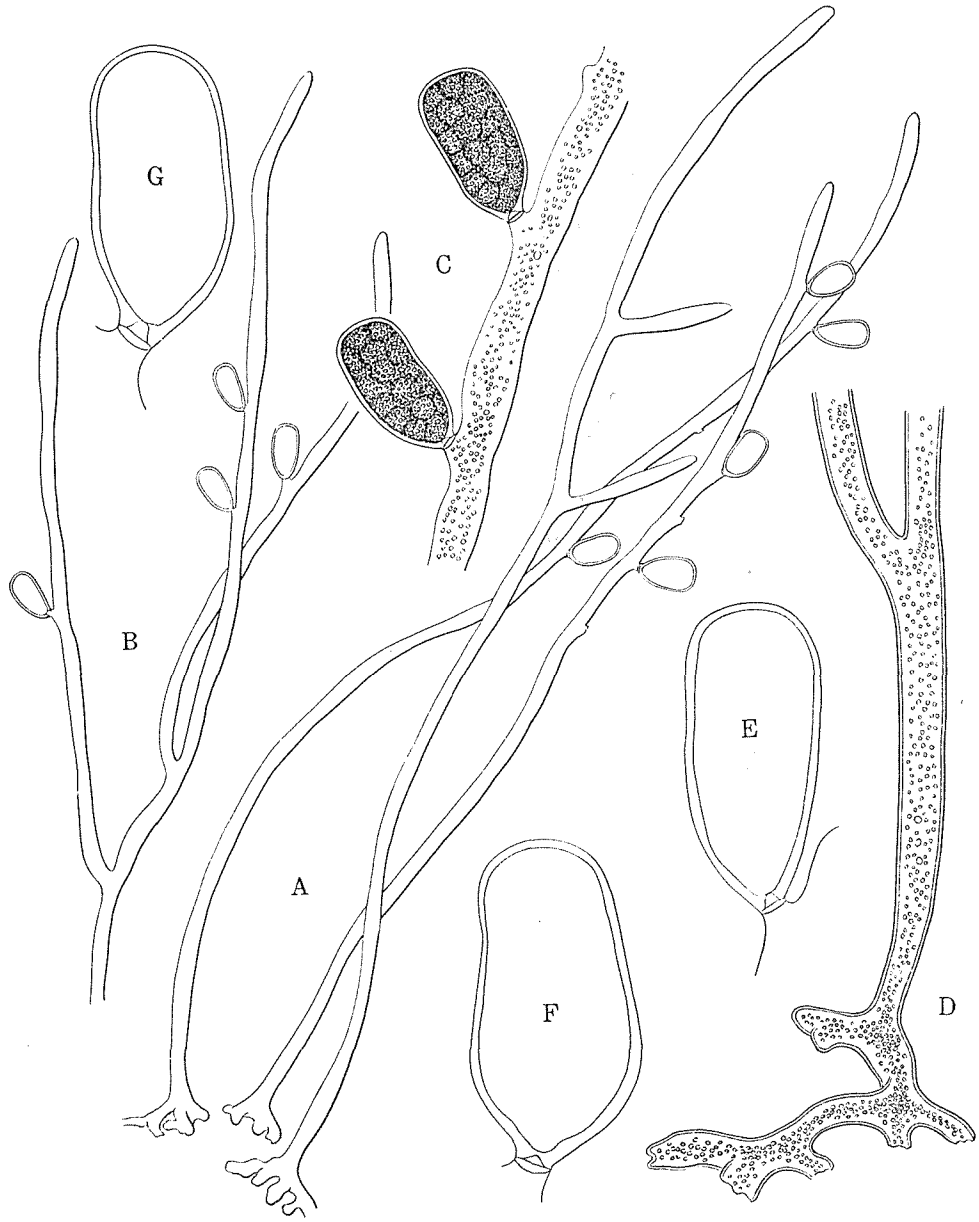

Fig. 5. *Derbesia ryukyuensis* YAMADA et TANAKA. A. Habit of three plants. ×53. B. Upper portion of a frond. ×53. C. Filament with two sporangia. ×170. D. Base of thallus. ×170. E. F. G. Sporangia. ×300.

to be related most closely to *D. tenuissima* (DE NOT.) CROUAN, and *D. minima* WEBER VAN BOSSE. But the new species can be distinguished from the former species by the shape of sporangia, and from the latter by the pedicels of sporangia which are not septated by two walls.

PHAEOPHYCEAE

ECTOCARPACEAE

Ectocarpus

37) **Ectocarpus breviarticulatus** J. AGARDH

Spec. Alg., vol. 1 (1848), p. 16; BOERGESEN, Mar. alg. Danish West Ind., vol. 2 (1914), p. 173, fig. 136; YAMADA, Stud. Meeresalg. Formosa, Phaeophyc. (Bot. Mag. Tokyo, vol. 39, 1925), p. 239.—*Ectocarpus hamatus* CROUAN, in VICKERS', Phyc. Barbad., part. 2 (1908), pl. 29.

Japanese name. *Tamagata-siomidoro.*

Hab. Kubura.

SPHACELARIACEAE

Sphacelaria

38) **Sphacelaria** sp.

Hab. Pinai.

DICTYOTACEAE

Padina

39) **Padina Commersonii** BORY

Voyage Coquille, Botanique (1828), p. 114; HAUCK, Ueber einige von J. M. Hildebrandt im Rothen Meere und Ind. Ozean gesam. Algen. (Hedwigia, 1887), p. 42; WEBER VAN BOSSE, Liste alg. Siboga, vol. 1 (1913), p. 178; BOERGESEN, Some Ind. green and brown alg. Bombay (Journ. Ind. Bot. Soc., 1930), p. 170; YAMADA, Notes some Japan. alg., II (Journ. Fac. Sci., Hokkaido Imp. Univ., Ser. V, vol. 1, no. 2, 1931), p. 68; OKAMURA, Icon. Japan. alg., vol. 6 (1932), p. 89, pl. 295, figs. 5–11.

Japanese name. *Akaba-umiutiwa.*

Hab. Pinai.

40) **Padina crassa** YAMADA

Notes some Japan. alg., II (Journ. Fac. Sci., Hokkaido Imp. Univ., Ser. V, vol. 1, no. 2, 1931), p. 67, pl. 17, fig. 2; OKAMURA, Icon. Japan. alg.,

vol. 6 (1932), p. 87, pl. 294, figs. 5–11.

Japanese name. *Kona-umiutiwa.*

Hab. Pinai.

Dictyopteris

41) **Dictyopteris repens** (OKAMURA) BOERGESEN

Mar. alg. Easter Island (1924), p. 265, fig. 13; OKAMURA, Icon. Japan. alg., vol. 6 (1931), p. 47, pl. 275, figs. 17–27.—*Haliseris repens* OKAMURA, List mar. alg. coll. Caroline and Mariana Islands (Bot. Mag. Tokyo, vol. 30, 1916), p. 8, pl. 1, figs. 7–18, & text-fig. 3.

Japanese name. *Hime-yahazu.*

Hab. Pinai.

CHNOOSPORACEAE

Chnoospora

42) **Chnoospora implexa** (HERING) J. AGARDH

Spec. Alg., vol. 1 (1848), p. 172; WEBER VAN BOSSE, Liste alg. Siboga, vol. 1 (1913), p. 137; YAMADA, Stud. Meeresalg. Formosa, Phaeophyc. (Bot. Mag. Tokyo, vol. 39, 1925), p. 242.—*Dictyota obtusangula* HARVEY, Charact. new alg. (1859), p. 329, n. 14; KUETZING, Tab. Phyc., IX (1859), t. 28, fig. 11.—*Chnoospora obtusangula* SONDER, Alg. trop. Austr., p. 45; DE TONI, Syll. Alg., III (1895), p. 465, Phyc. Jap. nov. (1895), p. 54; OKAMURA, Icon. Japan. alg., vol. 4 (1918), p. 52, pl. 164, figs. 1–9.

Japanese name. *Muratidori.*

Hab. Sonai.

FUCACEAE

Sargassum

43) **Sargassum duplicatum** J. AGARDH

Spec. Sarg. Austr. (1889), p. 90; GRUNOW, in WEBER VAN BOSSE's Liste alg. Siboga, vol. 1 (1913), p. 157; OKAMURA, Icon. Japan. alg., vol. 5 (1923), p. 10, pl. 205.

Japanese name. *Hutae-moku.*

Hab. Pinai; Kubura; Sonai.

Turbinaria

44) **Turbinaria ornata** J. AGARDH

Spec. Alg., vol. 1 (1848), p. 266; BARTON, Syst. struct. account Turb. (1891), p. 219; OKAMURA, On alg. Ogasawara-jima (Bot. Mag. Tokyo, vol.

11, 1897), p. 8; HEYDRICH, Einige Alg. Loochoo- od. Riu-kiu-Inseln (Ber. deut. Bot. Ges., Bd. 25, 1907), p. 102; YENDO, Fucac. Japan (1907), p. 43; WEBER VAN BOSSE, Liste alg. Siboga, vol. 1 (1913), p. 149; YAMADA, Stud. Meeresalg. Formosa, Phaeophyc. (Bot. Mag. Tokyo, vol. 39, 1925), p. 244.

Japanese name. *Rappa-moku.*

Hab. Pinai; Kubura.

RHODOPHYCEAE

BANGIACEAE

Goniotrichum

45) **Goniotrichum Alsidii** (ZANARDINI) HOWE

Mar. alg. Peru (1914), p. 75.—*Goniotrichum elegans* (CHAUVIN) LE JOLIS, in J. AGARDH's Till. Alg. Syst. (1882), p. 13; ROSENVINGE, Mar. alg. Denmark, part 1 (1909), p. 75, figs. 15–16.—*Goniotrichum dichotomum* KUETZING, Tab. Phyc., vol. 3 (1853), t. 27, 1.

Japanese name.

Hab. Sonai. Growing on *Cladophora* sp. and *Spermothamnion* sp.

Erythrocladia

46) **Erythrocladia subintegra** ROSENVINGE

Mar. alg. Denmark, 1 (1909), p. 73, figs. 13–14; BOERGESEN, Mar. alg. Danish West Ind., II (1915), p. 7, figs. 3–4; INAGAKI, Some mar. alg. recently discov. Japan etc. (Sci. Pap. Inst. Alg. Res., vol. 1, 1935), p. 41.

Japanese name. *Isohanabi.*

Hab. Sonai; Pinai. Growing on *Microdictyon Okamurai* SETCH.

HELMINTHOCLADIACEAE

Trichogloea

47) **Trichogloea lubrica** (HARVEY) J. AGARDH

Epicr. (1876), p. 514; OKAMURA, Icon. Japan. alg., vol. 4 (1923), p. 188, pl. 197, figs. 1–8.

Japanese name. *Akebono-mozuku.*

Hab. Pinai.

Liagora

48) **Liagora Setchellii** YAMADA

Spec. Liag. Japan (Sci. Pap. Inst. Algol. Res., vol. 2, 1938), p. 13.

Japanese name. *Suzi-konahada.*
Hab. Pinai.

49) **Liagora caenomyce** DECAISNE
Essai classif. alg. etc. (1842) p. 107; YAMADA, l. c., p. 6.
Japanese name. *Hai-konahada.*
Hab. Pinai; Sonai.

50) **Liagora farinosa** LAMOUROUX
Hist. polyp. (1816) p. 240; YAMADA, l. c., p. 23.
Japanese name. *Ke-konahada.*
Hab. Pinai.

51) **Liagora ceranoides** LAMOUROUX f. **leprosa** (J. AGARDH) YAMADA
l. c., p. 21.
Japanese name. *Ao-konahada.*
Hab. Pinai.

BONNEMAISONIACEAE

Asparagopsis

52) **Asparagopsis Sanfordiana** HARVEY
Phyc. Aust., vol. 1 (1858), pl. 6; OKAMURA, Icon. Japan. alg., vol. 1 (1908), p. 135, pl. 28, figs. 1–12.
Japanese name. *Kagikenori.*
Hab. Pinai; Sonai; Kubura.

CHAETANGIACEAE

Actinotrichia

53) **Actinotrichia fragilis** (FORSSKÅL) BOERGESEN
Revis. FORSSKÅL's *Alg.* (Dansk Botan. Arkiv., Bd. 8, 1932), p. 6.—*Actinotrichia rigida* (LAMOUROUX) DECAISNE, in KUETZING's Spec. Alg. (1849), p. 531; OKAMURA, Icon. Japan. alg., vol. 4 (1916), p. 30, pl. 158, figs. 17–19; WEBER VAN BOSSE, Liste alg. Siboga, vol. 2 (1921), p. 207, pl. 6, figs. 1–2.
Japanese name. *Sodegarami.*
Hab. Sonai.

Galaxaura

54) **Galaxaura rudis** KJELLMAN
Floridé-slägtet Galaxaura (1900), p. 43, tab. 2, figs. 1–9, tab. 20, fig. 11;

TANAKA, Genus Galaxaura Japan (Sci. Pap. Inst. Alg. Res., vol. 1, no. 2, 1936), p. 144, pl. 34, fig. 1 and text-figs. 1–2.

Japanese name. *Husa-garagara.*

Hab. Sonai.

55) **Galaxaura fasciculata** KJELLMAN

l. c., p. 53, tab. 5, figs. 1–9, tab. 20, fig. 14; WEBER VAN BOSSE, Liste alg. Siboga, vol. 2 (1921), p. 211; TANAKA, l. c., p. 147, pl. 34, fig. 3 and text-figs. 5–6.

Japanese name. *Birōdo-garagara.*

Hab. Sonai.

56) **Galaxaura elongata** J. AGARDH

Epicr. (1876), p. 529; KJELLMAN, l. c., p. 56, tab. 7, figs. 6–12; WEBER VAN BOSSE, Liste alg. Siboga, vol. 2 (1921), p. 212; YENDO, Notes alg. new Japan, V (Bot. Mag. Tokyo, vol. 30, 1916), p. 254; TANAKA, l. c., p. 153, pl. 38, text-figs. 16–17.

Japanese name. *Naga-garagara.*

Hab. Pinai.

57) **Galaxaura fastigiata** DECAISNE

Sur les Corallines (1842), p. 16; J. AGARDH, Spec. Alg. (1876), p. 527; KJELLMAN, l. c., p. 64, tab. 9, figs. 1–2, tab. 20, fig. 4; TANAKA, l. c., p. 157, pl. 37, fig. 2 and text-figs. 20–21.—*G. Schimperi* DECAISNE, l. c., p. 116; KJELLMAN, l. c., p. 61, tab. 7, figs. 19–20, tab. 8, figs. 16–22, tab. 20, figs. 1–2.

Japanese name. *Garagara.*

Hab. Sonai; Pinai.

58) **Galaxaura arborea** KJELLMAN

l. c., p. 72, tab. 11, figs. 1–11, tab. 20, fig. 39; BUTTERS, Liagora and Galaxaura (Minnesota Bot. Stud., 1911), p. 180; YENDO, Notes alg. Japan, VIII (Bot. Mag. Tokyo, vol. 32, 1918), p. 65; TANAKA, l. c., p. 161, pl. 40 and text-figs. 24–25.

Japanese name. *Hosoba-garagara.*

Hab. Sonai; Pinai.

59) **Galaxaura clavigera** KJELLMAN

l. c., p. 76, tab. 13, figs. 1–13, tab. 20, fig. 25; WEBER VAN BOSSE, l. c., p. 216; TANAKA, l. c., p. 163, pl. 41, fig. 1, text-figs. 28–29.

Japanese name. *Atuba-garagara.*

Hab. Sonai; Pinai.

GELIDIACEAE

Gelidiella

60) **Gelidiella acerosa** (FORSSKÅL) FELDMANN et HAMEL

Observat. sur quelq. Gélidiac. (Rev. Génér. Bot., tome 46, 1934), p. 6.—*Gelidiopsis rigida* (VAHL.) WEBER VAN BOSSE, Note deux alg. l'archipel Malaisien, no. 1 (1904), p. 104, Liste alg. Siboga, vol. 4 (1928), p. 427, fig. 172; OKAMURA, Icon. Japan. alg., vol. 2 (1912), p. 34 & p. 188, pl. 59, figs. 1–6; BOERGESEN, Mar. alg. Danish West Ind., vol. 2 (1920), p. 370, fig. 362. —*Gelidium rigidum* (VAHL.) GREVILLE, in KUETZING's Spec. Alg. (1849), p. 766; J. AGARDH, Spec. Alg., II (1852), p. 468, Epicr. (1876), p. 548.—*Echinocaulon spinellum* KUETZING, Phyc. Gener. (1843), p. 406, Spec. Alg., (1849), p. 762, Tab. Phyc., vol. 18 (1868), t. 38, d–e; J. AGARDH, Spec. Alg., II (1852), p. 478.—*Echinocaulon ramelliferum* KUETZING, Tab. Phyc., vol. 18 (1868), t. 39, d–e.—*Echinocaulon rigidum* KUETZING, Tab. Phyc., vol. 18 (1868), t. 40, a–d.

Japanese name. *Sima-tengusa.*

Hab. Sonai.

RHIZOPHYLLIDACEAE

Chondrococcus

61) **Chondrococcus Hornemanni** (MERTENS) SCHMITZ

Mar. Florid. deutsch. Ostafr. (1895), p. 170; OKAMURA, Icon. Japan. alg., vol. 4 (1922), p. 158, pl. 190, figs. 1–14.—*Desmia Hornemanni* J. AGARDH, Spec. Alg., II (1852), p. 641, Epicr. (1876), p. 357.

Japanese name. *Hosoba-naminohana.*

Hab. Sonai; Pinai; Kubura.

Rhodopeltis

62) **Rhodopeltis borealis** YAMADA

Notes Japan. alg., II (Journ. Fac. Sci., Hokkaido Imp. Univ., Ser., V, vol. 1, 1931), p. 75, pl. 19, fig. 1.

Japanese name. *Garagaramodoki.*

Hab. Sonai.

SQUAMARIACEAE

Peyssonnelia

63) **Peyssonnelia distenta** (HARVEY) YAMADA

Notes Japan. alg., I (Journ. Fac. Sci., Hokkaido Imp. Univ., Ser. V, vol. 1, no. 1, 1930), p. 29, pl. 6, fig. 7 & text-fig. 1.—*Galaxaura distenta*

HARVEY, Charact. new alg. (Proceed. Amer. Acad., vol. 4, 1859), p. 331, n. 28; J. AGARDH, Epicr. (1876), p. 531; DE TONI, Phyc. Japon. nov. (1895), p. 20, n. 7.—*Peyssonnelia involvens* OKAMURA (non ZANARDINI) Icon. Japan. alg., vol. 2(1909), p. 27, pl. 57, figs. 11–17.

Japanese name. *Kuda-iwanokawa.*

Hab. Sonai.

CORALLINACEAE

Mastophora

64) **Mastophora macrocarpa** MONTAGNE

Voy. au Pol. sud, p. 149; J. AGARDH, Spec. Alg., II (1852), p. 528; KUETZING, Tab. Phyc., vol. 8 (1858), t. 100; HEYDRICH, Beitr. Algenfl. Ostasien (Hedwigia, Bd. 33, 1894), p. 300; FOSLIE, Corallin. Siboga-Exped. (1904), p. 70, pl. 13, text-fig. 27.

Japanese name.

Hab. Pinai.

Cheilosporum

65) **Cheilosporum jungermannioides** RUPRECHT

POSTELS et RUPRECHT, Illustr. alg. Pacifici (1840); J. AGARDH, Spec. Alg., II (1852), p. 456; YENDO, Enum. Cor. alg. (Bot. Mag. Tokyo, vol. 16, no. 186, 1902), p. 193; WEBER et FOSLIE, Corallin. Siboga-Exped. (1904), p. 107.

Japanese name. *Hime-sikoro.*

Hab. Sonai; Pinai.

GRATELOUPIACEAE

Halymenia

66) **Halymenia Durvillaei** BORY var. **formosa** (KUETZING) WEBER VAN BOSSE

Liste alg. Siboga, vol. 2 (1921), p. 235.—*H. formosa* KUETZING, Tab. Phyc., vol. 16, tab. 91; OKAMURA, Icon. Japan. alg., vol. 2 (1909), p. 44, pl. 62, figs. 1–3.

Japanese name. *Tuzuregusa.*

Hab. Sonai.

Carpopeltis

67) **Carpopeltis formosana** OKAMURA

Mar. alg. Kōtōsho (Bull. Biogeogr. Soc. Japan, vol. 2, 1931), p. 110, pl. 12.

Japanese name.
Hab. Sonai.

GRACILARIACEAE

Ceratodictyon

68) **Ceratodictyon spongiosum** ZANARDINI

Phyceae Papuanae n. 8; SCHMITZ in ENGLER u. PRANTL's Nat. Pflanzenfam. (1897), p. 388; OKAMURA, Icon. Japan. alg., vol. 2 (1909), p. 1, pls. 51–52.—*Marchesettia spongioides* HAUCK, Ueber Vorkommen *M. spongioides* HAUCK, etc. (Hedwigia, 1889), p. 175.

Japanese name. *Kaimensō.*
Hab. Pinai.

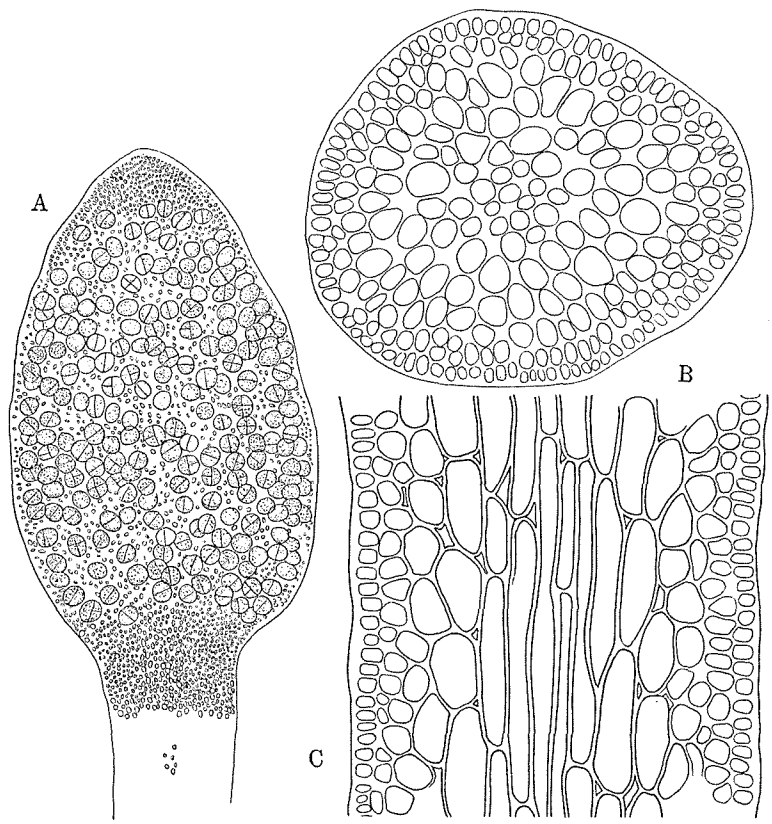

Fig. 6. *Gelidiopsis intricata* (AG.) VICKERS.
A. A stichidium. ×82. B. Transverse section of the frond. ×310.
C. Longitudinal section of the frond. ×310.

Gelidiopsis

69) **Gelidiopsis intricata** (AGARDH) VICKERS Text-fig. 6.

"Liste des alg. mar. de Barbade (Ann. Sc. Nat. Bot., 9e Série, t. 1, 1905)"; WEBER VAN BOSSE, Alg. de l'Exp. danoise aux îles Kei (1925), p. 140, Liste alg. Siboga, vol. 4 (1928), p. 425; FELDMANN, Remarques sur *Gelidium, Gelidiopsis* et *Echinocaulon* (1931), p. 7.—*Sphaerococcus intricatus* C. AGARDH, Spec. Alg. (1823), p. 333.—*Gelidium intricatum* KUETZING, Spec. Alg. (1849), p. 767; SETCHELL, Vegetation of Tutuila Island (1924), p. 163, fig. 31.—*Acrocarpus intricatus* KUETZING, Tab. Phyc., vol. 18(1868), pl. 35, figs. d–f.

Japanese name. *Moture-tengusamodoki.*

Hab. Sonai.

In the present specimens the fronds are generally terete, but often somewhat flattened near the end of the branches, and they adhere to each other by means of small hapters, especially near the base of the frond, thus the alga forms a densely packed, rather expanded mass.

In some specimens tetrasporangia are found. They are divided cruciately, and produced in a spathulate portion at the apex of branches. As seen in the accompanying figure the stichidia are very similar to those of other species of Gelidiopsis.

SETCHELL also reported the present species (under the name of *Gelidium intricatum* KUETZING) from Samoa and gave a figure of compound stichidia. According to him the tetrasporangia are borne on short ellipsoideo-conical branchlets, single or clustered, which appear to be rather widely different from those of Yonakuni specimens.

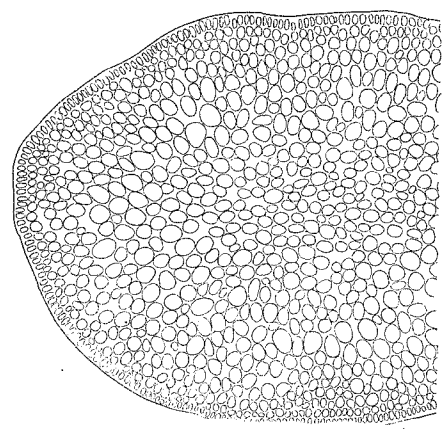

Fig. 7. *Gelidiopsis repens* (KUETZ.) SCHMITZ.
Transverse section of the frond. ×117.

70) **Gelidiopsis repens**(KUETZING) SCHMITZ Text-fig. 7.

Mar. Florid. Deutsch-Ostafr. (ENGLER's Jahrb., vol. 21, 1895), p. 148; WEBER VAN BOSSE, Liste alg. Siboga, vol. 4 (1928), p. 425.—*Gelidium repens* KUETZING, Tab. Phyc., vol. 18 (1868), pl. 23.—*Gelidiopsis acrocarpa* SCHMITZ, l. c.; FELDMANN, Remarques sur *Gelidium, Gelidiopsis* et *Echinocaulon* (1931),

p. 7.—*Gelidium acrocarpum* HARVEY, Ceylon alg., n. 34; SETCHELL, Tahitian alg. (Univ. Calif. Pub. Bot., vol. 12, 1926), p. 99, pl. 18, figs. 1, 2.

Japanese name. *Tengusa-modoki.*

Hab. Sonai.

All specimens from Yonakuni are much smaller than those from other localities of the Pacific. The same fact can be seen in Formosa specimens. No kind of reproductive organs has been met with.

PLOCAMIACEAE

Plocamium

71) **Plocamium Telfairiae** HARVEY

KUETZING, Spec. Alg. (1849), p. 885; J. AGARDH, Spec. Alg., II (1852), p. 400, Epicr. (1876), p. 342; YENDO, Notes alg. new Japan, III (Bot. Mag. Tokyo, vol. 29, 1915), p. 111.

Japanese name. *Yukari.*

Hab. Sonai; Kubura.

SPHAEROCOCCACEAE

Caulacanthus

72) **Caulacanthus Okamurai** YAMADA

Notes Japan. alg., V (Journ. Fac. Sci., Hokkaido Imp. Univ., Ser. V, vol. 2, no. 3, 1933), p. 278.—*Endocladia complanata* (non HARVEY) OKAMURA, Icon. Japan. alg., vol. 1 (1908), p. 129, pl. 27, figs. 12–20, pl. 28, figs. 13–17.

Japanese name. *Isodantū.*

Hab. Sonai.

SARCODIACEAE

Sarcodia

73) **Sarcodia ceylanica** HARVEY

Alg. exsicc. Ceyl. n. 7; KUETZING, Tab. Phyc., vol. 19 (1869), t. 33, a–b; J. AGARDH, Epicr. (1876), p. 431; KYLIN, Florideengat. Gigart. (1932), p. 56.—*S. Montagneana* YENDO, Notes alg. new Japan (Bot. Mag. Tokyo, vol. 31, n. 363, 1917), p. 82; OKAMURA, Icon. Japan. alg., vol. 4 (1921), p. 110, pl. 177, figs. 1–2, pl. 178, figs. 8–11. (non J. AGARDH).

Japanese name. *Atubanori.*

Hab. Sonai.

SOLIERIACEAE

Eucheuma

74) **Eucheuma serra** J. AGARDH

Spec. Alg., vol. 2 (1852), p. 626; WEBER VAN BOSSE, Liste alg. Siboga., vol. 4 (1928), p. 411, pl. 13, figs. 4–5; KYLIN, Florideengat. Gigart. (1932), p. 24, pl. 10, fig. 21; YAMADA, Spec. Eucheuma Ryūkyū and Formosa (Sci. Pap. Inst. Alg. Res., vol. 1, no. 2, 1936), p. 120, pls. 21–22, figs. 1–2.—*E. nodulosum* ARESCHOUG, "Phyc. nov. (1854), p. 22"; KYLIN, l. c., p. 24, pl. 10, fig. 22.

Japanese name. *Toge-kirinsai.*

Hab. Sonai.

CHAMPIACEAE

Champia

75) **Champia parvula** (AGARDH) HARVEY

Ner. Bor. Amer., part 2 (1853), p. 76; J. AGARDH, Epicr. (1876), p. 303; OKAMURA, Icon. Japan. alg., vol. 2 (1910), p. 89, pl. 76; BOERGESEN, Mar. alg. Danish West Ind. (1920), p. 407, figs. 392–393; WEBER VAN BOSSE, Liste alg. Siboga, vol. 4 (1928), p. 476.—*Chondria parvula* AGARDH, Syst. (1824), p. 207.—*Lomentaria parvula* KUETZING, Spec. Alg. (1849), p. 964, Tab. Phyc., vol. 15 (1865), t. 87, a–b; J. AGARDH, Spec. Alg., II (1863), p. 729.

Japanese name. *Watunagisō.*

Hab. Sonai.

RHODYMENIACEAE

Chrysymenia

76) **Chrysymenia Kairnbachii** GRUNOW

In SCHUMAN et HOLLR., Flora von Kaiser Wilhelmsland (1889), p. 4; WEBER VAN BOSSE, Liste alg. Siboga, vol. 4 (1928), p. 469, pl. 5, fig. 1 & figs. 202–203; OKAMURA, Icon. Japan. alg., vol. 6 (1932), p. 77, pl. 288, figs. 1–8.

Japanese name. *Hanasakura.*

Hab. Pinai. Grownig on *Polychaete.*

Botryocladia

77) **Botryocladia Kuckuckii** (WEBER VAN BOSSE) YAMADA et TANAKA comb. nov. Text-figs. 8–9.

Chrysymenia Kuckuckii WEBER VAN BOSSE, Liste alg. Siboga, vol. 4 (1928), p. 466, fig. 199.

Japanese name. *Atukawa-hananoeda.*

Hab. Sonai.

A few specimens of the present species, which however bear both cystocarps and tetrasporangia are found in the Yonakuni collection. As already described by WEBER VAN BOSSE the thick membrane of the vesicles is characteristic to this species.

The gland cells are pedicellate or pro-

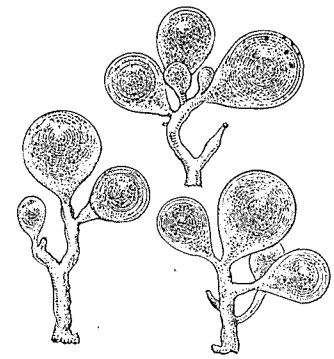

Fig. 8. *Botryocladia Kuckuckii* (WEBER VAN BOSSE) YAMADA et TANAKA. ×1.5.

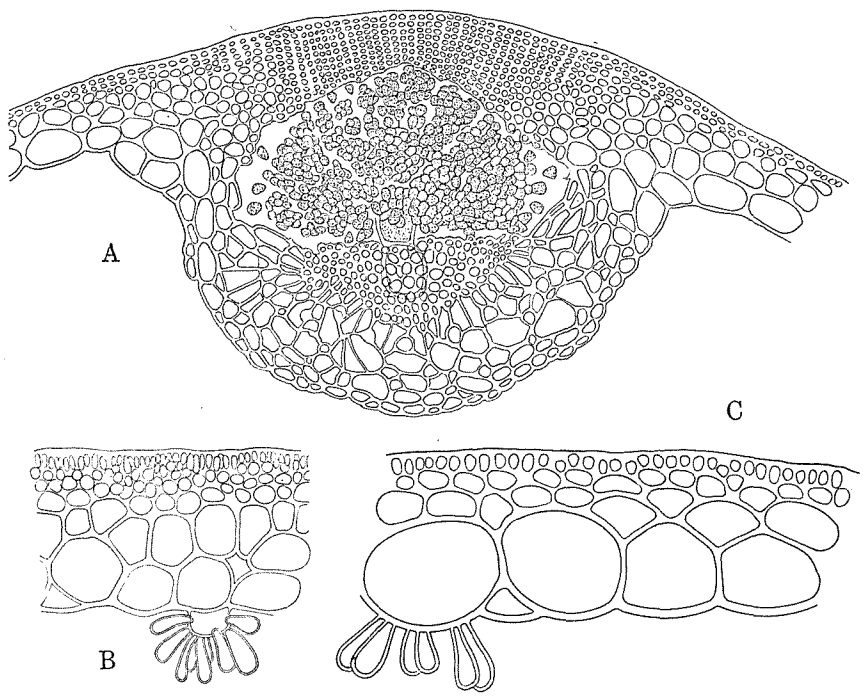

Fig. 9. *Botryocladia Kuckuckii* (WEBER VAN BOSSE) YAMADA et TANAKA.
A. Transverse section of a cystocarp. ×90.
B. C. Transverse sections of fronds with gland cells. B. ×177. C. ×183.

duced on a large cell which forms the innermost layer of the membrane of the vesicles.

Erythrocolon

78) **Erythrocolon podagricum** (HARVEY) J. AGARDH Text-figs. 10–11.

In GRUNOW's alg. Fidschi, Tonga- u. Samoa-Inseln, p. 33; Anal. Alg. Cont., III (1896), p. 90; KYLIN, Florideengat. Rhodymeniales (1931), p. 14, pl. 6, fig. 13.—*Chylocladia podagrica* HARVEY, Friendly Island alg. no. 53.—*Chrysymenia podagrica* WEBER VAN BOSSE, Liste alg. Siboga, vol. 4 (1928), p. 471.

Japanese name. *Hime-hukurotunagi.*

Hab. Sonai.

One of Yonakuni specimens whose figure is here given, seems to represent its natural state. It creeps on a rock, and ramifies palmately, dichotomously or laterally nearly in one plane, all branches attaching to each other by means of small hapters; thus the frond forms a rather incomplete flabellate outline.

As compared with the figure of the original specimens of J. AGARDH given by KYLIN (l. c.), Yonakuni specimens are smaller in general, but other characteristics agree well with those of the present species. On the

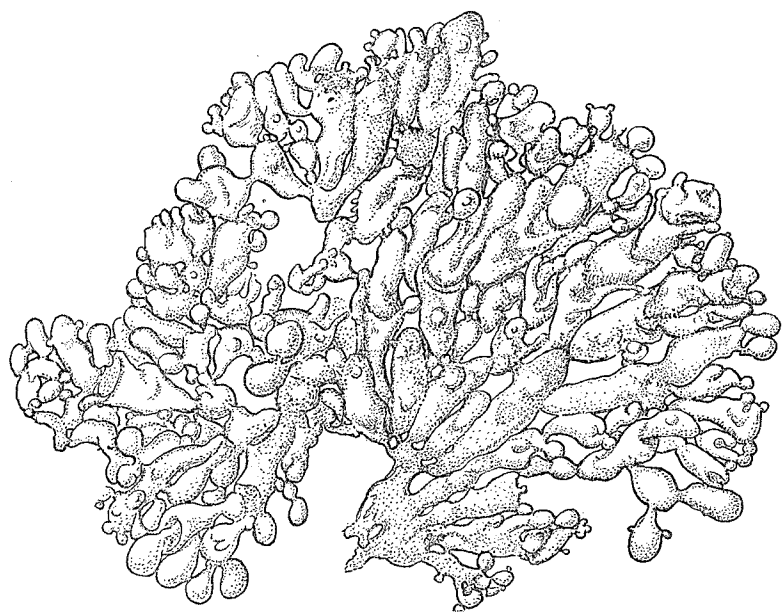

Fig. 10. *Erythrocolon podagricum* (HARVEY) J. AG. ×1.7.

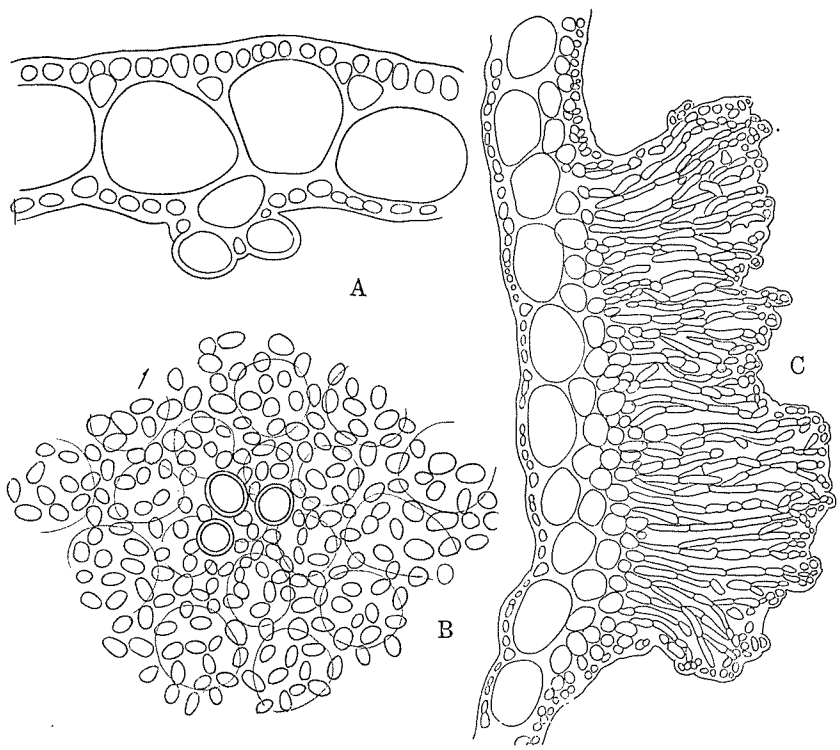

Fig. 11. *Erythrocolon podagricum* (HARVEY) J. AG.

A. Transverse section of the frond with gland cells. ×295. B. Thallus seen from the cavity. ×295. C. Transverse section of the hapter. ×135.

other hand some specimens which should be referred also to the present species, have been collected by the writers at Garanbi, Formosa, among which there can been seen a complete series between great and small forms.

CERAMIACEAE

Spermothamnion Text-figs. 12–13.

79) **Spermothamnion yonakuniensis** YAMADA et TANAKA spec. nov.

Frons dense caespitosa, minutissima, e filamentis prostratis et filamentis erectis composita; filamentis prostratis vage irregulaterque ramosis, sursum filamenta erecta, deorsum rhizoidea emittentibus, cellulis ca. 15–20 μ crassis, 3–6-plo diametro longioribus, ad dissepimenta non constrictis; rhizoideis unicellularibus, tenuioribus filamentis prostratis, nunc brevibus nunc longi-

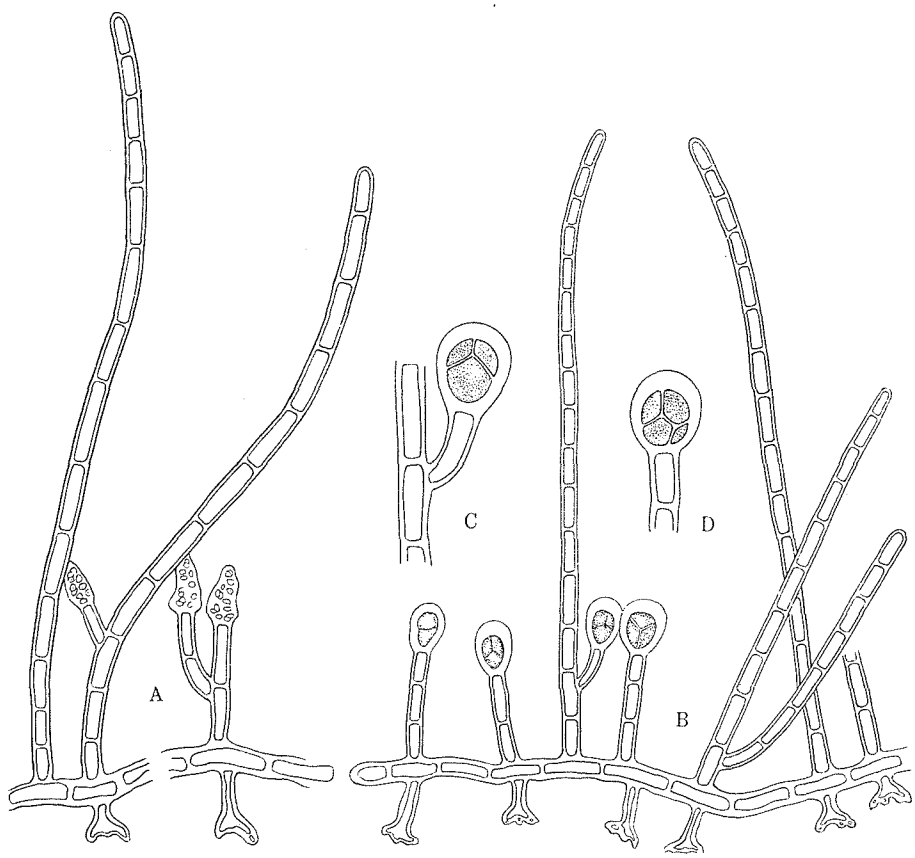

Fig. 12. *Spermothamnion yonakuniensis* YAMADA et TANAKA.
A. A male plant. ×147. B. A tetrasporic plant. ×147.
C. D. Tetrasporangia. ×262.

oribus (saepe 60 μ attingentibus) discum terminalem ferentibus; filamentis erectis perpendiculariter e filamentis prostratis exsurgentibus, plerumque simplicibus rarissime ad basin ramosis, 1 mm vix superantibus, equicrassis vel sursum levissime diminutis, cellulis ca. 17 μ crassis, 2–6-plo diametro longioribus, cylindricis, ad dissepimenta non constrictis, apice rotundatis; tetrasporangiis obovoideis, ca. 42 μ longis, ca. 33 μ crassis, tripartibus vel interdum polypartitis, in filamentis erectis brevioribus terminalibus vel in partibus inferioribus filamentorum pedicello breviter ornatis; antheridiis forma irregularibus, obovoideis vel irregulariter cylindraceis; cystocarpiis involucrum destitutis. Species dioica, antheridiis et cystocarpiis in similibus partibus filamentorum erectorum ac tetrasporangiis productis.

Japanese name. *Yonakuni-kusudama.*

Hab. Sonai. Growing on *Actinotrichia fragilis* (FORSSKÅL) BOERGESEN.

Frond very minute, densely caespitose, consisting of prostrate filaments and erect ones. Prostrate filaments sparingly and irregularly branched, issuing erect filaments upwards and rhizoids downwards; cells of prostrate filaments about 15–20 μ thick, about 3–6 times as long as diameter, not constricting at dissepiments; rhizoids one-celled, thinner than prostrate filaments, sometimes very short, sometimes longer (longer ones often reaching 60 μ), provided with a discoid hapter at the end. Erect filaments issued from prostrate filaments nearly perpendicularly, usually simple, very rarely ramified, scarcely 1 mm in height, in thickness about the same throughout the whole length, or slightly tapering upwards; cells about 17 μ thick, 2–6 times as long as diameter, cylindrical, not constricted at dissepiments, end cells rounded at the apex.

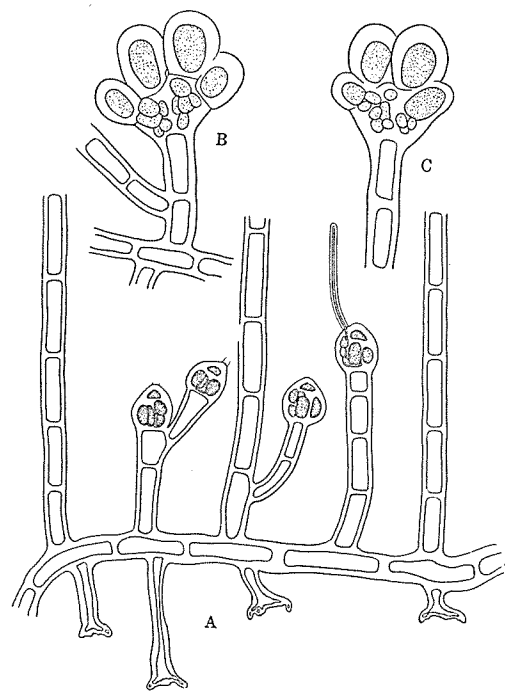

Fig. 13. *Spermothamnion yonakuniensis* YAMADA et TANAKA.
A. A female plant with procarps. ×207.
B. C. Cystocarps. ×207.

Tetrasporangia obovoid, about 42 μ long, about 33 μ thick, tripartite or sometimes polypartite, borne on the top of short erect filaments or laterally near the base of erect filaments, provided with a short pedicel. Antheridia and cystocarps on the different individuals, produced about in the similar portion of erect filaments as tetrasporangia. Antheridial stands irregular in shape, nearly ovoid or sometimes irregularly cylindrical. Cystocarps with few large spores, destituting of an involucre.

The new species resembles *Sp. Cladophorae* YAM. et TANAKA from Formosa in vegetative characters, but completely differs in reproductive organs, especially in the structure of the cystocarps and in the position

of the antheridial stands. There are several specimens at hand, but the male individuals are exceedingly few in number.

80) **Spermothamnion Cladophorae** YAMADA et TANAKA

Three new red alg. Formosa (Trans. Nat. Hist. Soc. Formosa, vol. 24, no. 135, 1934), p. 342, figs. 1–2.

Japanese name. *Ito-hibidama.*

Hab. Sonai. Growing on *Cladophora* sp.

Ceramium

81) **Ceramium** sp.

Hab. Sonai.

Centroceras

82) **Centroceras clavulatum** (AGARDH) MONTAGNE

Explor. Sci. de l'Algérie, Algues, tome 1 (1846), p. 140; J. AGARDH, Spec. Alg., II (1851), p. 148, Epicr. (1876), p. 108; HARVEY, Ner. Bor. Amer. (1853), p. 211, t. 33, C; BOERGESEN, Mar. alg. Danish West Ind. (1918), p. 241.—*Ceramium clavulatum* AGADH, in OKAMURA's Illustr. Japan. alg., vol. 1 ((1901), p. 47, pl. 17; WEBER VAN BOSSE, Liste alg. Siboga, vol. 3 (1923), p. 321.

Japanese name. *Toge-igisu.*

Hab. Pinai.

Plumaria

83) **Plumaria ramosa** YAMADA et TANAKA

Three new red alg. Formosa (Trans. Nat. Hist. Soc. Formosa, vol. 24, no. 135, 1934), p. 346, fig. 5.

Japanese name. *Beni-hanegusa.*

Hab. Sonai. Growing on *Cladophora prolifera* KUETZ. or *Galaxaura clavigera* KJELLMAN.

Carpoblepharis

84) **Carpoblepharis Warburgii** HEYDRICH

Beit. Kenntn. Algenf. Ostasien (Hedwigia, 1894), p. 297, tab. 15, fig. 15.

Japanese name. *Ōba-tirimomizi.*

Hab. Sonai; Kubura; Pinai. Growing on *Chondrococcus Hornemanni* (MERT.) SCHMITZ.

Haloplegma

85) **Haloplegma Duperreyi** MONTAGNE

"Cell. exot. Cent. III, no. 69, t. 7, fig. 1"; KUETZING, Spec. Alg. (1849), p. 672, Tab. Phyc., vol. 12 (1862), t. 62, figs. a–c; YAMADA, Notes Japan. alg., VII (Sci. Pap. Inst. Alg. Res., vol. 1, no. 2, 1936), p. 138, pl. 31, 3.

Japanese name. *Benigōsi.*

Hab. Sonai.

DELESSERIACEAE

Martensia

86) **Martensia flabelliformis** HARVEY

Friendly Isl. alg., no. 11; J. AGARDH, Spec. Alg., vol. 2 (1863), p. 826; SVEDELIUS, Ueber Bau u. Entw. Florideengat. Martensia (1908), p. 35; WEBER VAN BOSSE, Liste alg. Siboga, vol. 3 (1923), p. 385; YAMADA, Notes Japan. alg., VII (Sci. Pap. Inst. Alg. Res., vol. 1, no. 2, 1936), p. 140, text-fig. 3.

Japanese name. *Etuki-ayanisiki.*

Hab. Sonai.

RHODOMELACEAE

Polysiphonia

87) **Polysiphonia fragilis** SURINGAR

Alg. Japonicae (1870), p. 37, t. 25, B; OKAMURA, Icon. Japan. alg., vol. 6 (1929), p. 7, pl. 255.

Japanese name. *Kuro-itogusa.*

Hab. Sonai. Growing on *Laurencia papillosa* GREV.

88) **Polysiphonia** sp.

Hab. Sonai.

Digenea

89) **Digenea simplex** (WULFEN) C. AGARDH

Spec. Alg., vol. 1 (1823), p. 389; J. AGARDH, Spec. Alg., II (1863), p. 845; Hauck, Meeresalg. (1885), p. 215, fig. 93; OKAMURA, Illustr. mar. alg. Japan, vol. 1 (1901), p. 25, pl. 9.

Japanese name. *Makuri* or *Kaininsō.*

Hab. Sonai; Pinai; Kubura.

Roschera

90) **Roschera glomerulata** (C. AGARDH) WEBER VAN BOSSE

Percy Sladen Trust Exp. Rhodophyc. (Tran. Linn. Soc., vol. XVI, 3, 1914), p. 289; OKAMURA, Icon. Japan. alg., vol. 4 (1922), p. 155, pl. 188, figs. 5–10; WEBER VAN BOSSE, Liste alg. Siboga, vol. 3 (1923), p. 359.—*Tolypiocladia glomerulata* (C. AGARDH) SCHMITZ in ENGLER u. PRANTL, Nat. Pflanzenfam. (1897), p. 442; FALKENBERG, Rhodomelac. Golf. Neapel (1901), p. 177, tab. 21, figs. 27–29.—*Hutchinsia glomerulata* AGARDH, Syst. Alg. (1824), p. 158.

Japanese name. *Itokuzu-gusa.*

Hab. Sonai.

Acanthophora

91) **Acanthophora Aokii** OKAMURA

Icon. Japan. alg., vol. 7 (1934), p. 35, pl. 318, figs. 15–17.

Japanese name. *Hime-togenori.*

Hab. Pinai; Sonai.

The present species grows always on the tube of *Polychaete,* and has been found by the writers in several places in Formosa.

92) **Acanthophora orientalis** J. AGARDH

Spec. Alg., vol. 2 (1863), p. 820; KUETZING, Tab. Phyc., vol. 15 (1865), t. 77, d–e; OKAMURA, Icon. Japan. alg., vol. 1 (1907), p. 35, pl. 8, figs. 1–7.

Japanese name. *Togenori.*

Hab. Pinai.

Acrocystis

93) **Acrocystis nana** ZANARDINI

Phyc. Ind. Pugillus (1872), p. 145, pl. 8, A, 1–6; OKAMURA, Icon. Japan. alg., vol. 1 (1907), p. 23, pls. 6–7; WEBER VAN BOSSE, Liste alg. Siboga, vol. 3 (1923), p. 356.

Japanese name. *Tukusi-hōzuki.*

Hab. Sonai.

Laurencia

94) **Laurencia papillosa** (FORSSKÅL) GREVILLE

Alg. Brit. syn., p. lii; J. AGARDH, Spec. Alg., vol. 2 (1863), p. 756, Epicr. (1876), p. 652; KUETZING, Tab. Phyc., vol. 15 (1865), t. 62; YAMADA, Notes Laurencia (Univ. Calif. Publ. Bot., vol. 16, n. 7, 1931), p. 190, pl. 1,

figs. a–b.

Japanese name. *Papira-sozo.*

Hab. Sonai; Pinai.

95) **Laurencia undulata** YAMADA

l. c., p. 243, pl. 29, fig. a & text-fig. T.

Japanese name. *Kobu-sozo.*

Hab. Sonai.

96) **Laurencia mariannensis** YAMADA

l. c., p. 200, pl. 5, fig. b, text-fig. F, G.

Japanese name. *Hukure-sozo.*

Hab. Sonai.

The present Laurencia has hitherto been found only in Saipan, Marianne Islands. Having found it in the Yonakuni collection, it seems to the writers that it may be distributed rather widely in the southern parts of the Pacific.

Herposiphonia

97) **Herposiphonia subdisticha** OKAMURA

Contr. know. mar. alg. Jap., III (Bot. Mag. Tokyo, vol. 13, 1899), p. 37, pl. I, figs. 12–14, Icon. Japan. alg., vol. 3 (1915), p. 199, pl. 146, figs. 11–18.

Japanese name. *Kuro-himegoke.*

Hab. Sonai. Growing on *Valonia, Corallinae* etc.

98) **Herposiphonia insidiosa** (GREVILLE) FALKENBERG

Rhodomelac. Golf. Neapel (1901), p. 317; OKAMURA, Icon. Japan. alg., vol. 6 (1930), p. 25, pl. 264, figs. 10–16.

Japanese name. *Kagi-himegoke.*

Hab. Pinai. Growing on sandy places.

Leveillea

99) **Leveillea jungermannioides** (MARTENS et HERING) HARVEY

Mar. Bot. West Aust. (1855), p. 539; SCHMITZ u. FALKENBERG in ENGL. u. PRANTL, Nat. Pflanzenfam. (1897), p. 463; fig. 260, E; FALKENBERG, Rhodomalac. Golf. Neapel (1901), p. 392, tab. 6, figs. 1–13, tab. 14, figs. 18–27; OKAMURA, Icon. Japan. alg., vol. 2 (1912), p. 148, pl. 92.— *Polyzonia jungermannioides* ZANARDINI, Alg. Mar. Rubr. (1858), p. 47.— *Leveillea Schimperi* HARVEY, Nereis Austr., p. 72, Phyc. Austr. (1860),

tab. 171; KUETZING, Spec. Alg. (1849), p. 882, Tab. Phyc., vol. 15 (1865), t. 7, figs. a–c.

Japanese name. *Zyabaranori.*

Hab. Pinai. Growing on *Dictyosphaeria Versluysi* WEBER VAN BOSSE.

Amansia

100) **Amansia glomerata** C. AGARDH

Syst. Alg. (1824), p. 247, Spec. Alg., vol. II (1863), p. 1111; KUETZING, Spec. Alg. (1849), p. 883; FALKENBERG, Rhodomelac. Golf. Neapel (1901), p. 416, tab. 1, figs. 20–21, tab. 6, figs. 14–29; OKAMURA, Illustr. mar. alg. Japan, vol. 1 (1901), p. 71, pl. 25.—*A. fasciculata* KUETZING, Tab. Phyc., vol. 15 (1865), t. 4, a–d.

Japanese name. *Kiku-hiodosi.*

Hab. Sonai.

Neurymenia

101) **Neurymenia fraxinifolia** (MERTENS) J. AGARDH

Spec. Alg., vol. 2 (1863), p. 1135; FALKENBERG, Rhodomelac. Golf. Neapel (1901), p. 444; OKAMURA, Illustr. mar. alg. Japan., vol. 1 (1901), p. 37, pl. 13; WEBER VAN BOSSE, Liste alg. Siboga, vol. 3 (1923), p. 374, pl. 10, fig. 9.—*Fucus fraxinifolius* MERTENS, in TURNER's Hist. Fuc., vol. 3 (1811), pl. 193.—*Dictyomenia fraxinifolia* HARVEY, Phyc. Austr., vol. 3 (1860), pl. 124.

Japanese name. *Isobasyō.*

Hab. Sonai; Pinai.

Wrightiella

102) **Wrightiella loochooensis** YENDO

Novae alg. Jap. Decas. I–III (Bot. Mag. Tokyo, vol. 34, 1920), p. 8.

Japanese name.

Hab. Sonai. Growing on rocks, *Polychaete* etc.