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Marine Algae in the Vicinity of the Akkesi Marine Biological Station

By

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With Plate VIII.

The present account includes an enumeration of the marine algae, which have been found for these several years in the vicinity of the Akkesi Marine Biological Station of our University, and forms a part of our plan making a complete list of the marine algae of Hokkaido. They amount to 125 species in all of which 17 belong to the Chlorophyceae, 49 to the Phaeophyceae and the rest, 59 to the Rhodophyceae. As new are described *Akkesiphycus*, a new genus belonging to the Coilodesmaceae and a species of *Ectocarpus*, *E. yezoensis*.

The expense of the present study was defrayed partly by the subsidy from the Department of Education and partly by that from the Japan Society for Promotion of Scientific Research, for which the writers express their best thanks.

CHLOROPHYCEAE

Ulotrichaceae

1) *Ulothrix flacca* (DILLWYN) THURET

in LE JOLIS, Liste alg. mar. Cherb. (1863) p. 56; COLLINS, Green alg. N. Amer. (1909) p. 185; YENDO, Notes alg. new Japan (1909) p. 119; SETCHELL and GARDNER, Mar. alg. Pacific Coast N. Amer., II (1920) p. 284; NAGAI, Mar. alg. Kurile Islands, I (1940) p. 5.

Japanese name. *Hibimidoro*.

Hab. Aikappu and Daikokuzima.

2) *Ulothrix pseudoflaccia* WILLE

Stud. u. Chlorophyc. (1901) p. 22, Taf. II, figs. 64-81; SETCHELL and GARDNER, l. c., p. 285, pl. 9, fig. 6, a-c; NAGAI, l. c., p. 6, pl. 1, figs. 3-4.

Japanese name. *Hoso-hibimidoro* (nov.).

Hab. Growing on wood in the sublittoral zone. Near Akkesi Marine

Biological Station.

The specimens agree very well with the figures of WILLE (l. c.). The plant forms a soft tuft growing on dirty wood in rather sheltered places. The frond is generally rather small, rarely much more than 0.5 cm. high. cells of the filaments have a breadth of about 4μ and their length is usually $\frac{1}{2}$ – $\frac{1}{3}$ times as long as their breadth. The chromatophore of the present species forms an incomplete ring while that of *Ulothrix flacca* is a complete one. The colour of the frond is light green.

Ulvaceae

3) *Enteromorpha prolifera* (MUELLER) J. AGARDH

Till. Alg. Syst., 3 (1883) p. 129, pl. IV, figs. 103–104; SAUNDERS, Alg. Harriman Exp. (1901) p. 411; COLLINS, l. c., p. 202; YENDO, l. c., p. 263; SETCHELL and GARDNER, Alg. N. W. Amer. (1903) p. 211, Mar. alg. Pacif. Coast N. Amer., II (1920), p. 254; NAGAI, l. c., p. 13, pl. 1, figs. 10–11.

Japanese name. *Toge-awonori*.

Hab. Lake Akkesi. Growing on sea grasses or on rocks.

4) *Enteromorpha intestinalis* (LINNAEUS) LINK

Epistola (1820) p. 5; J. AGARDH, Till. Alg. Syst. (1883) p. 131; SAUNDERS, Alg. Harriman Exp. (1901) p. 411; COLLINS, l. c., p. 204, Mar. Alg. Vancouver Is. (1913) p. 102; SETCHELL and GARDNER, Alg. N. W. Amer. (1903) p. 212, Mar. alg. Pacif. Coast N. Amer., II (1920), p. 252; NAGAI, l. c. p. 12.

Japanese name. *Yore-awonori*.

Hab. Growing on rocks.

5) *Enteromorpha Linza* (LINNAEUS) J. AGARDH

Till. Alg. Syst., pt. 3 (1883) p. 134, pl. 14, figs. 110–112; COLLINS, Ulvac. N. Amer. (1903) p. 23, pl. 42, fig. 8, Green alg. N. Amer. (1909), p. 206; SETCHELL and GARDNER, Alg. N. W. Amer. (1903) p. 212; OKAMURA, Icon. Japan. Alg., vol. 3 (1915) p. 163, pl. 138.

Japanese name. *Usuba-awonori*.

Hab. Growing on rocks in the littoral zone.

6) *Enteromorpha nana* SJÖSTEDT var. *minima* (NAEGELI) SJÖSTEDT

Enteromorpha Stud. (1939) p. 38.

Japanese name. *Hime-awonori* (nov.).

Hab. Growing on rocks.

7) *Ulva pertusa* KJELLMAN

Mar. Chlorophyc. Japan. (1897) p. 4, pl. 1, figs. 1-5, pl. 3, figs. 1-8; OKAMURA, l. c., vol. 4 (1921) p. 79, pl. 167, fig. 8, pl. 170.

Japanese name. *Ana-awosa*.

Hab. Growing on rocks in the littoral belt.

8) *Ulva latissima* LINNAEUS

Sp. Plant. (1573) p. 1163 (in part?); COLLINS, Green alg. N. Amer. (1909), p. 215; SETCHELL and GARDNER, l. c., 266; KAWABATA, Liste mar. alg. Shikotan (1936) p. 200; NAGAI, l. c., p. 9.

Japanese name. *Oba-awosa*.

Hab. Growing on rocks or on other algae.

The specimens found agree very well with the description of SETCHELL and GARDNER (l. c.). The frond is ample and reaches a considerable size, about 45 cm. in height. The thickness of the frond varies between 40μ and 55μ and thinner than that of *U. pertusa* KJELLM.

9) *Monostroma zostericola* TILDEN

Amer. Alg. (Exsicc.) no. 388 (1900); YENDO, l. c., VII (1917) p. 184; SETCHELL and GARDNER, l. c., p. 238, pl. 14, figs. 12-13; YAMADA, Mar. alg. Urup (1935) p. 9; KAWABATA, l. c., p. 199; NAGAI, l. c., p. 20, pl. 1, figs. 27-28.

Japanese name. *Motuki-hitoe*.

Hab. Growing on the leaves of *Phyllospadix*.

10) *Monostroma groenlandicum* J. AGARDH

Till: Tlg. Syst., pt. 3 (1883) p. 107, pl. III, figs. 80-83; ROSENVINGE, Grönlands Havalag. (1893) p. 954, fig. 53; SETCHELL and GARDNER, Alg. N. Amer. (1903) p. 208; COLLINS, Ulvac. N. Amer. (1903) p. 18, pl. XLI, figs. 20-21, Green alg. N. Amer. (1909) p. 208; YENDO, Notes alg. new Japan (1909) p. 117; YAMADA, l. c., p. 9; NAGAI, l. c., p. 16, pl. 1, figs. 22-24.

Japanese name. *Himo-hitoegusa*.

Hab. Daikokuzima. Growing on rocks in the exposed places.

Cladophoraceae

11) *Rhizoclonium tortuosum* (DILLWYN) KUETZING

Phyc. Germ. (1845) p. 205, Spec. Alg. (1849) p. 384, Tab. Phyc., III (1853) Tab. 68, fig. 1; SETCHELL and GARDNER, Alg. N. W. Amer. (1903)

p. 223, Mar. alg. Pacif. coast N. Amer., II (1920) p. 185; COLLINS, l. c., p. 328; KAWABATA, l. c., p. 201; NAGAI, l. c., p. 27.

Japanese name. *Naga-moture*.

Hab. Growing on *Rhodomela Laria*.

The frond grows on other algae and forms woolly skin-like or loose-rope-like masses of dark green colour. The filaments are rigid, crispate or slightly contorted. There is no rhizoidal filaments.

12) **Chaetomorpha moniligera** KJELLMAM

Mar. Chlorophyc. Japan. (1897) p. 24, pl. 4, figs. 17-23; OKAMURA, l. c., vol. 6 (1924) p. 15, pl. 260, figs. 1-8; KAWABATA, l. c., p. 201; NAGAI, l. c., p. 29.

Japanese name. *Tama-zyuzumo*.

Hab. Growing on rocks in the littoral zone.

13) **Chaetomorpha aerea** (DILLWYN) KUETZING

Spec. Alg. (1849) p. 379, Tab. Phyc., III (1853) Tab. 59, 1; COLLINS, l. c., p. 324, pl. 12, fig. 115; COTTON, Some Chinese Mar. Alg. (1915) p. 109; SETCHELL and GARDNER, l. c., p. 200, pl. 14, figs. 9-11; KAWABATA, l. c., p. 201; NAGAI, l. c., p. 29.

Japanese name. *Tarugata-zyuzumo*.

Hab. Growing on rocks or on other algae.

14) **Cladophora Stimpsonii** HARVEY

Charac. new Alg. (1859) p. 333; COLLINS, l. c., p. 104; SETCHELL and GARDNER; l. c., p. 219; YAMADA, Mar. alg. Mutsu Bay (1928) p. 501, fig. 4.

Japanese name. *Kinu-siwogusa*.

Hab. Growing on other algae.

15) **Spongomorpha saxatilis** (RUPRECHT) COLLINS

l. c., p. 360; YENDO, l. c., V (1916) p. 245; SETCHELL and GARDNER, l. c., p. 226; KAWABATA, l. c., p. 201; NAGAI, l. c., p. 34, pl. 2, figs. 6-7.

Japanese name. *Togenasi-moturegusa*.

Hab. Growing on rocks.

16) **Spongomorpha Mertensii** (RUPRECHT) SETCHELL et GARDNER

Phyc. Cont., 1 (1920) p. 280, l. c., p. 227; YAMADA, Mar. alg. Urup (1935) p. 10; NAGAI, l. c., p. 33, pl. 2, fig. 3.

Japanese name. *Kagi-moturegusa*.

Hab. Growing on rocks.

Codiaceae

- 17) *Codium tomentosum* (HUDSON) STACKHAUSE

Ner. Brit. (fasc. 3) (1801) p. 21, pl. 7; HOWE, Phyc. Stud. (1911) p. 493; COLLINS, l. c., p. 388; HARVEY, Phyc. Brit. (1846) pl. 93; VICKERS, Phyc. Barb. (1908) p. 22, pl. 26; SETCHELL and GARDNER, l. c., p. 174.

Japanese name. *Imose-miru*.

Hab. Growing on rocks.

In our specimens the frond is dark green and the ramification is irregularly subdichotomous. The utricles are cylindrical or cylindric clavate, 450–700 μ long and 100–250 μ broad and usually distinctly thickened and scarcely or rarely mucronate at the apex. The gametangia are broadly fusiform, 250–380 μ long and 80–150 μ wide. Hairs are abundantly present in all specimens, especially in the upper part of the frond.

*PHAEOPHYCEAE**Ectocarpaceae*

- 18) *Pylaiella littoralis* (LINNAEUS) KJELLMAN

Skand. Ectocarp. Tiloapt. (1872) p. 99, Alg. Arct. Sea (1883) p. 281, Beringhafv. Algfl. (1889) p. 51; SAUNDERS, Phyc. Mem. (1898) p. 156, pl. 25, figs. 1–2, 5–6, Alg. Harriman Exp. (1901) p. 418; SETCHELL and GARDNER, Alg. N. W. Amer. (1903) p. 235, Mar. alg. Pacific N. Amer., III (1925) p. 402, pl. 37, fig. 32; YENDO, l. c., p. 120; YAMADA, Mar. alg. Urup (1935) p. 11; KAWABATA, l. c., p. 201; NAGAI, l. c., p. 37.

Japanese name. *Piraera*.

Hab. Growing on *Fucus evanescens* Ag.

Text-fig. 1.

- 19) *Ectocarpus confervoides* (ROTH) LE JOLIS f. *typicus* KUCKUCK

Beitr. Kennt. Ect. Arten (1891) p. 69, fig. 3; SETCHELL and GARDNER, Alg. N. W. Amer. (1903) p. 237, Mar. Alg. Pacific N. Amer., III (1925) p. 414.

Japanese name.

Hab. On *Desmarestia viridis* and *D. ligulata*.

The present species is found as an epiphyte upon *Desmarestia viridis* (MUELL.) LAMOUR. and *D. ligulata* (LIGHTF.) LAMOUR. The frond is fixed to the substratum by means of rhizoids issued from the basal cells. The erect filaments are about 25–40 μ thick, becoming thinner gradually upwards to the apex. The cells are 1– $\frac{1}{2}$ times as long as broad. The plurilocular

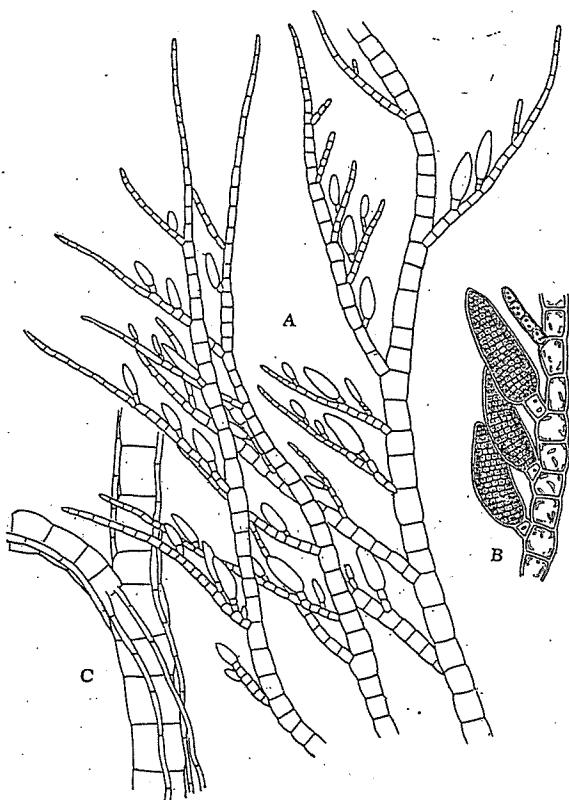


Fig. 1. *Ectocarpus confervoides* (ROTH) LE JOLIS f. *typicus* KUCKUCK.

A. Habit of the plant. $\times 90$. B. Sporangia. $\times 250$.

C. Base of the Thallus. $\times 250$.

sporangia are rather short and spindle-shaped, often slightly curved, shortly pedicellate, rarely sessile. They are about $60-85\mu$ long and $25-35\mu$ broad. The shape of chromatophore is band-like.

The present species shows some resemblance to *E. acutus* SETCH. et GARDN. but it differs from the latter by its obtuse ramuli and the shape of sporangia. The writers, fortunately, have been able to compare the specimens of *E. acutus* SETCH. and GARDN. from Neach Bay, Washington (GARDNER, no. 3817).

20) *Ectocarpus tomentosus* (HUDSON) LYNGBYE

Text-fig. 2.

Hydrophyt. Dan. (1819) p. 132, pl. 44A, 1-3; SAUNDERS, Phyc. Mem. (1898) p. 155, pl. 24, figs. 1-2, Harriman Exp. (1901) p. 417; SETCHELL and GARDNER, Alg. N. W. Amer. (1903) p. 238; Mar. Alg. Pacific Coast

N. Amer., III (1925) p. 417.

Japanese name. *Kagi-siomidoro* (nov.).

Hab. Growing on *Fucus evanescens*.

The plant forms a small tuft, about 1 cm. high or more, and these tufts form rope-like spongy masses. The erect filaments are about $8-12\mu$ thick, decreasing their diameter gradually upwards and the terminal hairs measure $4-6\mu$ in width. The cells are generally 1.5-3 times as long as broad. The ramification is very irregular. The branchlets are inserted in about right angle to the main filaments and they are often short and form short hooks at the summit. The chromatophores have the shape of irregular band. The plurilocular sporangia are oblong-ovoid, lateral or terminal, either pedicellate or sessile. They are rather variable in size, $50-90\mu$ long and $10-15\mu$ broad.

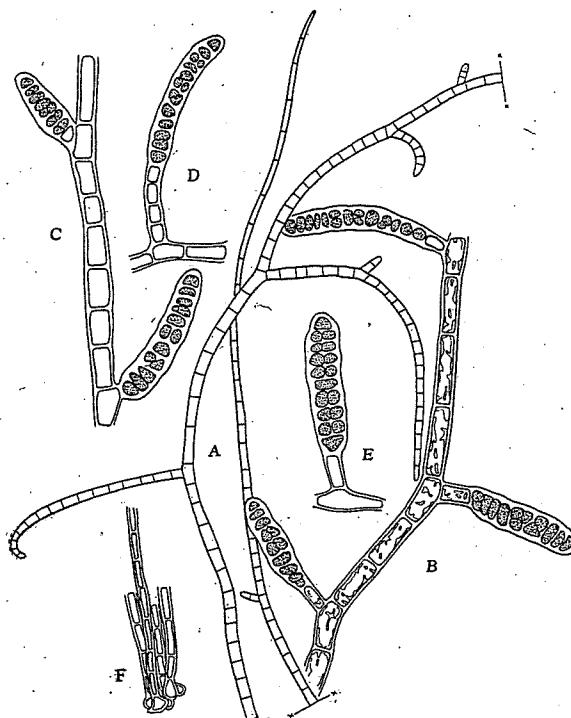


Fig. 2. *Ectocarpus tomentosus* (HUDSON) LYNGBYE.
A. Habit of the plant. $\times 190$. B-F. Sporangia. $\times 450$.

F. Base of the thallus. $\times 190$.

21) *Ectocarpus yezoensis* YAMADA et TANAKA spec. nov. Text-fig. 3.

Frons minuta, ca. 1 mm alta, floccos parvos ad folium Laminariae formans, filamentis rhizoideis ex filamentis repentibus emittentibus adfixa; filamentis repentibus irregularibus, raro ramosis, cellulis irregularibus; filamentis erectis simplicibus, rarissime vage ramosis, $12-18\mu$ crassis, sursum attenuatis, cellulis 1.5-2 plo diam. longioribus, ad dissepimenta non constrictis; chromatophoris irregulariter taeniatis, parietes cellularum fere tegentibus; sporangiis plurilocularibus terminalibus, rarissime lateralibus,

clavatis vel cylindrico-conicis vel fusiformibus, 80–150 μ longis, 20–25 μ latis.

Japanese name. *Ezo-siomidoro* (nov.).

Hab. Growing on *Laminaria* sp.

Fronds minute, about 1 mm. high, forming small tufts on the leaves of *Laminaria*, attached to the host by the short rhizoidal filaments sent from

the creeping filaments; creeping filaments irregular, rarely branched, with cells irregular in shape; erect filaments simple, very rarely branched, 12–18 μ thick, tapering toward the apex, with cells 1.5–2 times as long as the diam., not constricted at the partitions; chromatophores irregularly band-shaped, nearly covering the cell; plurilocular sporangia terminal, very rarely lateral, clavate cylindrico-conical or fusiform, ca. 80–150 μ long, 20–25 μ diam.

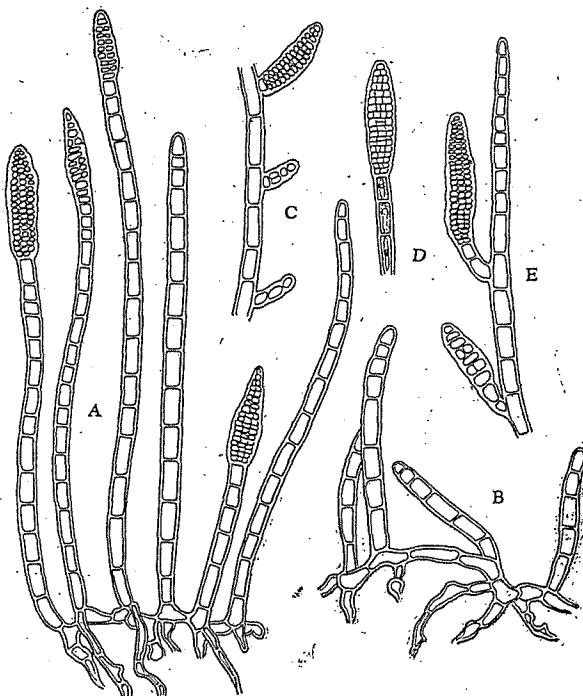


Fig. 3. *Ectocarpus yezoensis* YAMADA et TANAKA.

A. Habit of the plant. $\times 185$. B. Young plant. $\times 185$.

C-D. Sporangia. $\times 185$.

it in the terminal plurilocular sporangia and irregularly band-shaped chromatophores.

22) *Ectocarpus fusiformis* NAGAI.

I. c., p. 38, pl. 2, figs. 16–18.

Japanese name. *Tumugata-siomidoro*.

Hab. Growing on the leaves of *Laminaria* sp.

23) *Streblonema evagatum* SETCHELL et GARDNER

Text-fig. 4.

Phyc. Cont., V (1922) p. 390, pl. 42, figs. 1–5, Mar. alg. Pacific Coast N.

Amer., III (1925) p. 449.

Japanese name.

Hab. Growing among the paraphyses of *Laminaria* sp.

The plant forms circular masses, measuring about 3-5 mm in diameter. They consist of a basal part of creeping filaments and erect filaments. The creeping portion penetrates among the sporangia of the *Laminaria* sp. The cells of the erect filaments are cylindrical, 6-15 μ long and 2-3.5 times as long as the diameter, slightly constricted at the cross walls. The gametangia are cylindrical, lateral, sessile or on short pedicels, measuring ca. 70 μ long and ca. 7 μ wide. The "Ascocysts" are sessile or on pedicels on the creeping filaments, clavate, measuring ca. 25 μ long and ca. 8 μ wide.

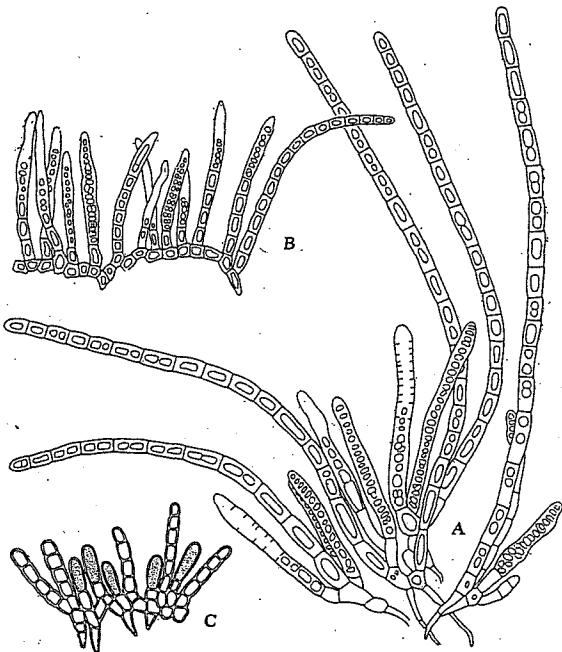


Fig. 4: *Streblonema evagatum* SETCHELL et GARDNER.
A. Fragments of the fronds free from the host bearing gametangia. $\times 250$. B. A part of the frond showing gametangia on short pedicels from a basal filament. $\times 300$. C. A part of the frond bearing "Ascocysts" (?). $\times 250$.

24) *Sorocarpus uvaeformis* PRINGSHEIM

Beitz. z. Morphol. Meeresalg. (1862) p. 12, taf. 3, figs. 1-8; OKAMURA, Icon. Japan. Alg., vol. 6 (1929) p. 1, pl. 251, figs. 1-7; TAKAMATU, *Sorocarp*. Matsushima Bucht u. Morph. Unters. (1936) p. 90, taf. IV.

Japanese name. *Isobudo*.

Hab. Growing on rocks in the littoral zone.

Myrionemataceae

25) *Compsonema secundum* SETCHELL et GARDNER f. *terminale* SETCHELL et GARDNER

Text-fig. 5.

Phyc. Cont., III (1922) p. 366, pl. 37, figs. 4-5, Mar. alg. Pacific Coast

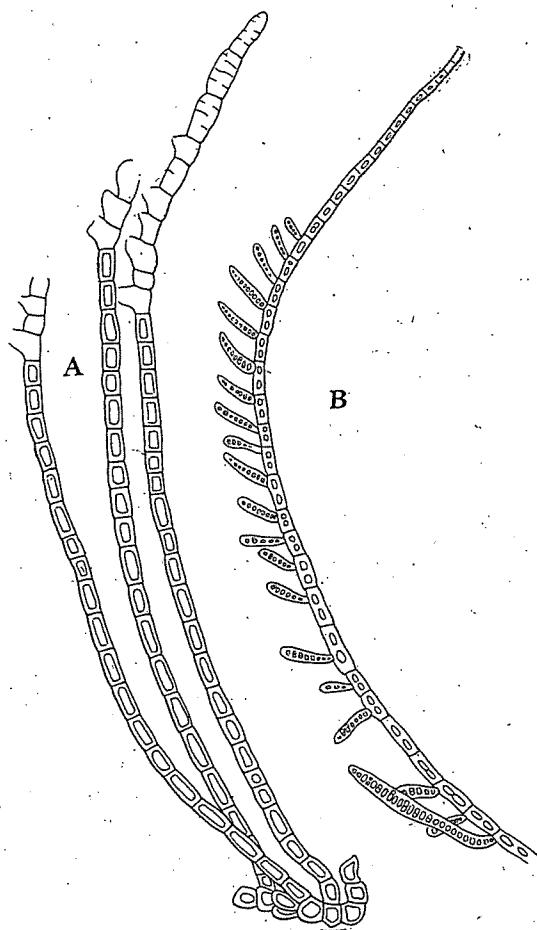


Fig. 5. *Compsonema secundum* S. et G.
f. *terminale* S. et G.

A. A part of the frond bearing empty gametangia.
x 350. B. Part of the frond with gametangia. x 350.

N. Amer., III (1925) p. 484,
pl. 54, figs. 4-5.

Japanese name.

Hab. Growing on *Lat-*
minaria sp. and *Alaria an-*
gusta KJELLM.

The frond forms a continuous velvety stratum of indefinite expanse on the host. It consists of a basal prostrate portion and erect filaments. The prostrate portion is monostromatic and composed of much crisped, branched filaments. The erect filaments are unbranched, 500-700 μ long. The cells of the erect filaments are cylindrical, 12-20 μ long and 1.2-2.5 times as long as the diameter. The gametangia are nearly cylindrical, almost sessile near the upper end of the erect filaments, or on short pedicels from the creeping filaments, measuring ca. 70 μ long and ca. 10 μ broad. The zoosporangia are not found in our specimens.

Elachistaceae

26) *Halothrix ambigua* YAMADA

Mar. alg. Mutsu Bay (1928) p. 513, fig. 12; TAKAMATY, *Halothrix* nord.
Honshu, Japan (1938) p. 186.

Japanese name. *Somewakegusa*.

Hab. Growing on *Phyllospadix Scouleri* Hook.

Heterochordariaceae

- 27) **Heterochordaria abietina** (RUPRECHT) SETCHELL et GARDNER
Phyc. Cont., VII (1924) p. 6, Mar. alg. Pacific N. Amer., III (1925)
p. 550, pl. 36, figs. 18-19, pl. 91; KAWABATA, l. c., p. 203; NAGAI, l. c., p. 51.
Japanese name. *Matomo*.
Hab. Growing on rocks.

Sphacelariaceae

- 28) **Sphacelaria subfuscata** SETCHELL et GARDNER
Phyc. Cont., VII (1924) p. 1, Mar. alg. Pacific Coast N. Amer., III
(1925) p. 395, pl. 37, fig. 28; NAGAI, l. c., p. 41, pl. 2, figs. 9-11.
Japanese name. *Mitumata-kurogasira*.
Hab. Growing on *Rhodomela Larix*.

Leathesiaceae

- 29) **Leathesia difformis** ARESCHOUG
Phyc. Scand., 1. (1846) p. 154; KJELLMAN, Alg. Arct. Sea (1883) p.
252; SETCHELL and GARDNER, Alg. N. W. Amer. (1903) p. 249, Mar. alg.
Pacific Coast N. Amer., III (1925) p. 511, pl. 40, fig. 52, pl. 43, figs. 65-66;
OKAMURA, Icon. Japan. Alg., vol 1 (1907) p. 80, pl. 18; NAGAI, l. c., p. 43.
Japanese name. *Nebarimo*.
Hab. Growing on rocks in the littoral zone.
- 30) **Leathesia sphaerocephala** YAMADA
Notes some Japan. Alg., IV (1932) p. 269, fig. 2; NAGAI, l. c., p. 44.
Japanese name. *Hime-nebarimo*.
Hab. Growing on *Cystophyllum hakodatense* YENDO.

Chordariaceae

- 31) **Saundersella simplex** (SAUNDERS) KYLIN
Phaeophyceenord. Chordariales (1940) p. 42.
Japanese name. *Gobia*.
Hab. Growing on *Chordaria flagelliformis* AG.
- 32) **Chordaria flagelliformis** (MUELLER) AGARDH
Syn. Alg. Scand. (1817) p. 12, XII, Spec. Alg., 1 (1823) p. 166;

KJELLMAN, Alg. Arct. Sea (1883) p. 249; Beringhafv. Algenfl. (1889) p. 48; OKAMURA, Icon. Japan. Alg., vol. 2 (1912) p. 140, pl. 90; SETCHELL and GARDNER, Mar. alg. Pacific Coast N. Amer., III (1925) p. 572; TOKIDA, Mar. alg. Robben Isl. (1932) p. 8; YAMADA, Mar. alg. Urop (1935) p. 13; KAWABATA, l. c., p. 202; NAGAI, l. c., p. 45.

f. *typica* KJELLMAN

Spets. Thal., II (1877) p. 28; SETCHELL and GARDNER, Alg. N. W. Amer. (1903) p. 250; Mar. alg. Pacific Coast N. Amer., III (1925) p. 573, pl. 39, fig. 44; NAGAI, l. c., p. 45.

Japanese name. *Naga-matumo*.

Hab. Growing on rocks in the littoral zone.

f. *Chordaeformis* KJELLMAN

Spets. Thall. II (1877) p. 28, pl. 1, figs. 13-15; SETCHELL and GARDNER, Alg. N. W. Amer. (1903) p. 251; Mar. alg. Pacific Coast N. Amer., III (1925) p. 573; YAMADA, Notes some Japan. Alg., VI (1932) p. 269, pl. IV, Mar. alg. Urop (1935) p. 13; TOKIDA, Mar. alg. Robben Isl. (Suppl. 1934) p. 17, 1; KAWABATA, l. c., p. 202; NAGAI, l. c., p. 46.

Japanese name. *Himo-nagamatomo*.

Hab. Growing on rocks in the littoral belt.

33) *Chordaria gracilis* SETCHELL et GARDNER

Phyc. Cont., VII (1924) p. 8; Mar. alg. Pacific Coast N. Amer., III (1925) p. 573, pl. 84; YAMADA, Mar. alg. Urop (1935) p. 13, pl. 3; KAWABATA, l. c., p. 203; OKAMURA, Icon. Japan. Alg., vol. 7 (1937) p. 78, pl. 345, 1; NAGAI, l. c., p. 46.

Japanese name. *Hoso-matumo*.

Hab. Growing on rocks.

34) *Chordaria Nagaii* TOKIDA

Phyc. Observ., IV (1938) p. 213, figs. 1-4; NAGAI, l. c., p. 47.

Japanese name. *Nise-turumo*.

Hab. Daikokuzima. Growing on rocks in the littoral zone.

Aegiraceae

35) *Aegira virescens* (CARMISCHAEI) SETCHELL et GARDNER

Phyc. Cont., VII (1924) p. 11; Mar. alg. Pacific Coast N. Amer., III (1925) p. 547, pl. 42, figs. 56-60; KAWABATA, l. c., p. 48; NAGAI, l. c., p. 48.

Japanese name. *Nise-hutomozuku* (nov.).

Hab. Daikokuzima. Growing on rocks or on other algae.

Desmarestiaceae

- 36) *Desmarestia ligulata* (LIGHTFOOT) LAMOUROUX

Essai (1813) p. 25; GREVILLE, Alg. Brit. (1830) p. 37, Tab. 5, fig. 1; SETCHELL and GARDNER, Alg. N. W. Amer. (1903) p. 247, Mar. alg. Pacific N. Amer., III (1925) p. 566, pl. 87; OKAMURA, Icon. Japan. Alg., vol. 2 (1910) p. 82, pl. 72, figs. 1-4; KAWABATA, l. c., p. 204; NAGAI, l. c., p. 54.

Japanese name. *Urusigusa*.

Hab.

- 37) *Desmarestia viridis* LAMOUROUX

Essai (1813) p. 25; OKAMURA, Icon. Japan. Alg., vol. 2 (1910) p. 84, pl. 73, figs. 1-3, pl. 74; KAWABATA, l. c., p. 204.

Japanese name. *Ke-urusigusa*.

Hab.

Asperococcaceae

- 38) *Litosiphon yezoense* YAMADA et NAKAMURA

YAMADA, Notes some Japanese Alg., X (1944) p. 12.

Japanese name. *Kobu-no-hige*.

Hab. Growing on *Laminaria* sp.

Punctariaceae

- 39) *Punctaria plantaginea* (ROTH) GREVILLE

Alg. Brit. (1830) p. 53, Tab. 9.

Japanese name. *Habadamasi*.

Hab. Growing on rocks in the littoral zone.

- 40) *Punctaria flaccida* NAGAI

l. c., p. 56, pl. 2, figs. 12-13, pl. 3, fig. 7.

Japanese name.

Hab. Growing on *Phyllospadix Scouleri* HOOK.

Scytoniphonaceae

- 41) *Ilea Fascia* (MUELLER) FRIES

Flor. Scan. (1835) p. 321; SETCHELL and GARDNER, Phyc. Cont., VII

(1924) p. 12, Mar. alg. Pacific Coast N. Amer., III (1925) p. 535, pl. 44, figs. 68-71, 73; YAMADA, Stud. u. Meeresalg. Ins. Formosa (1925) p. 242.

Japanese name. *Seiyō-habanori*.

Hab. Growing on rocks or on other algae.

42) **Scytesiphon Lomentarius** (LYNGBYE) J. AGARDH

Spec. Alg., 1 (1858) p. 126; KJELLMAN, Alg. Arct. Sea (1883) p. 258, Beringhafv. Algl. (1889) p. 49; SETCHELL and GARDNER, Alg. N. W. Amer. (1903) p. 243, Mar. alg. Pacific Coast N. Amer., III (1925) p. 531, pl. 44, figs. 72, 74-75; OKAMURA, Icon. Japan. Alg., vol. 1 (1908) p. 144, pl. 30; TOKIDA, Mar. alg. Robben Isl. (1932) p. 7; KAWABATA, l. c., p. 202; NAGAI, l. c., p. 58.

Japanese name. *Kayamo-nori*.

Hab.

f. **complanatus major** SETCHELL et GARDNER

Mar. alg. Pacific Coast N. Amer., III (1925) p. 534.

Japanese name.

Hab. Growing on rocks.

43) **Colpomenia sinuosa** (ROTH) DERBES et SOLIER

Mem. Phys. Alg. (1856) p. 11, pl. XXII, fig. 7-8; SAUNDERS, Phyc. Mem. (1898) p. 164, pl. 32, figs. 7-8, Alg. Harriman Exp. (1901) p. 421; SETCHELL and GARDNER, Alg. N. W. Amer. (1903) p. 242, Mar. alg. Pacific Coast N. Amer., III (1925) p. 539, pl. 45, figs. 82-86; OKAMURA, Icon. Japan. Alg., vol. 1 (1907) p. 86, pl. 19, figs. 11-12, pl. 20, figs. 10-12; HOWE, Mar. alg. Peru (1914) p. 50, Chinese Mar. alg. (1924) p. 126; KAWABATA, l. c., p. 202; NAGAI, l. c., p. 59.

Japanese name. *Hukuronori*.

Hab. Growing on *Cystophyllum hakodatense* YENDO.

f. **deformans** SETCHELL et GARDNER.

Alg. N. W. Amer. (1903) p. 242, pl. 18, figs. 13-15, New mar. alg. Gulf. Calif. (1924) p. 726, pl. 19, figs. 61-62, Mar. alg. Pacific Coast N. Amer., III (1925) p. 542; YAMADA, Mar. alg. Urup (1935) p. 12.

Japanese name. *Watamo*.

Hab. Growing on rocks.

Coilodesmaceae

44) **Coilodesme japonica** YAMADA

Notes some Japan. Alg., VIII (1938) p. 120, pl. 20.

Japanese name. *Ezobukuro.*

Hab. Growing on *Cystophyllum hakodatense* YENDO.

45) *Coilodesme Cystoseirae* (RUPRECHT) SETCHELL et GARDNER

Alg. N. W. Amer. (1903) p. 241, Mar. alg. Pacific Coast N. Amer., III (1925) p. 583; YAMADA, Notes some Japan. Alg., VIII (1938) p. 119, pl. 16; NAGAI, l. c., p. 62.

Japanese name. *Hoso-ezobukuro.*

Hab. Growing on *Cystophyllum hakodatense* YENDO.

Akkesiphycus YAMADA et TANAKA gen. nov.

Frons breviter stipitata, radice discoidea parva affixa, solida, linearis vel linear-lanceolata, lubricissima, pilis numerosis ornata; contextis mediis cellulis magnis irregularibus, hyalinis exter minoribus et elongatis compositis; corticalibus filamentis assimilatoribus brevibus, ex 2 vel 3 cellulis compositis, simili modo ut cellulis valliformibus dispositis; sporangiis unilocularibus utroque latere frondis productis, positionem filamenti assimilatoris occupantibus; sporangiis plurilocularibus ignotis.

Fronds shortly stipitate, attached by a small discoid base, solid, linear or linear-lanceolate in outline, very lubricous, hairs abundant, composed of two tissues, the inner consisting of large irregular colorless cells becoming smaller outward and elongated cells; the outer cortical portion consisting of short assimilating filaments consisting of 2 or 3 cells and arranged palisade-like; unilocular sporangia on both surfaces of the frond, occupying the position of assimilating filaments; plurilocular sporangia unknown.

The present genus seems to relate very closely to *Coilodesme* and *Phaeostrophion*. But from the former it differs in the solid frond and in the presence of hairs, and from the latter also in the presence of hairs and in the structure of the cortex.

Pl. VIII and Text-figs. 6-7.

46) *Akkesiphycus lubricum* YAMADA et TANAKA spec. nov.

Frons breviter stipitata, radice discoidea adfixa, circumscriptione linearis vel linear-lanceolata, ca. 50-120 cm. longa et ultra, ca. 3-5 cm. lata, ca. 450 μ crassa, margine integra vel undulata, interdum longitudinaliter fissa, lubrica; pilis numerosis; sporangiis unilocularibus numerosis, longe ovovatis, ca. 40 μ longis, ca. 13 μ latis; sporangiis plurilocularibus ignotis.

Japanese name. *Kombu-modoki* (nov.).

Hab. Daikokuzima and Aikappu. Growing on rocks.

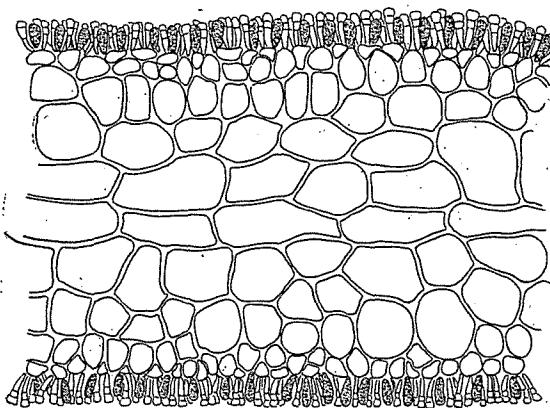


Fig. 6. *Akkesiphycus lubricum* YAMADA et TANAKA.
Cross section of the mature frond. $\times 90$.

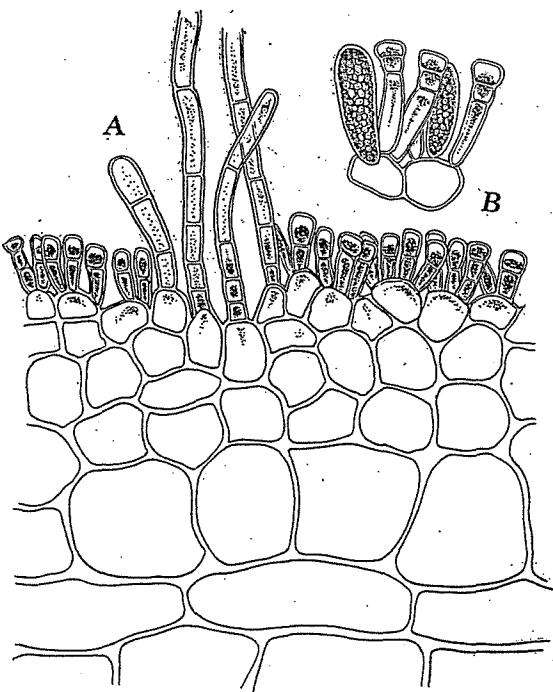


Fig. 7. *Akkesiphycus lubricum* YAMADA et TANAKA.
A. Cross-section of the frond showing a group of hairs.
 $\times 350$. B. Mature zoosporangia. $\times 450$.

KAWABATA, l. c., p. 204; NAGAI, l. c., p. 64.

Fronds shortly stipitate, attaching to the substratum by means of a small disc, linear or linear-lanceolata in outline, usually about 50-120 cm. long or more, about 3-5 cm. wide, about 450μ thick, at margin entire or undulate, sometimes splitting longitudinally, very lubricous, adhering firmly to the paper in drying; hairs abundant; unilocular sporangia numerous, longly obovate, about 40μ long, about 13μ broad; gametangia unknown.

Dictyosiphonaceae

47) *Dictyosiphon foeniculaceus*

(HUDSON) GREVILLE

Alg. Brit. (1830) p. 56, pl. 8, figs. 1-4; KJELLMAN, Alg. Arctic Sea (1883) p. 269, Bering-hafv. Algfi. (1889) p. 51; SAUNDERS, Alg. Harriman Exp. (1901) p. 422; SETCHELL and GARDNER, Mar. alg. Pacific Coast N. Amer., III (1925) p. 589, pl. 40, figs. 47-49; YAMADA, Mar. alg. Mutsu Bay (1928) p. 507, fig. 8, Mar. alg. Urup (1935) p. 14;

Japanese name. *Uikyōmo.*

Hab. Growing on *Fucus evanescens* AG. and *Pelvetia Wrightii* YENDO and on other algae.

Laminariaceae

48) *Laminaria longipedalis* OKAMURA

Laminariac. Japan. (1896) p. 89, pl. 7, figs. 1-3; MIYABE, Laminariac. Hokkaido (1902) p. 30, pl. 8.

Japanese name. *Enaga-kombu.*

Hab. Lake Akkesi.

49) *Laminaria coriacea* MIYABE

l. c., p. 40, pl. 11; MIYABE and NAGAI, Laminariac. Kuriles (1933) p. 89; KAWABATA, l. c., p. 205; NAGAI, l. c., p. 77.

Japanese name. *Gakkara-kombu.*

Hab. Tukusikoi.

50) *Laminaria yezoensis* MIYABE

l. c., p. 41, pl. 12, 13; MIYABE and NAGAI, l. c., p. 90; YAMADA, Mar. alg. Urup (1935) p. 18; KAWABATA, l. c., p. 205; NAGAI, l. c., p. 83.

Japanese name. *Gohei-kombu.*

Hab. Daikokuzima and Tokotan.

51) *Laminaria diabolica* MIYABE f. *genuina* MIYABE et NAGAI

Nagai, l. c., p. 72.

Japanese name. *Oni-kombu.*

Hab.

52) *Laminaria angustata* KJELLMAN var. *longissima* MIYABE

in OKAMURA's Mar. alg. Japan. (in Japanese, 1936) p. 287; NAGAI, l. c., p. 75.

Japanese name. *Naga-kombu.*

Hab.

53) *Kjellmaniella gyrata* (KJELLMAN) MIYABE

l. c., p. 44, pl. 15-16; OKAMURA, Icon. Japan. Alg., vol. 5 (1925) p. 88, pl. 223; MIYABE and NAGAI, l. c., p. 92; NAGAI, l. c., p. 89.

Japanese name. *Tororo-kombu.*

Hab.

54) *Agarum cibrosum* BORY

in Dict. Class., IX (1826) p. 193 (in part); SETCHELL, Kelps U. S. and Alaska (1926 a) p. 155; SETCHELL and GARDNER, Mar. alg. Pacific Coast N. Amer., III (1925) p. 615, pl. 63; MIYABE and NAGAI, l. c., p. 94; NAGAI, l. c., p. 94.

Japanese name. *Aname*.

Hab.

55) *Costaria costata* (TURNER) SAUNDERS

Prelim. paper Costaria, etc. (1895) p. 57; SETCHELL, Kelps U. S. and Alaska (1926 a) p. 154; SETCHELL and GARDNER, Mar. alg. Pacific Coast N. Amer., III (1925) p. 610, pl. 56, fig. B., pl. 79, fig. A; MIYABE and NAGAI, l. c., p. 93; YAMADA, Mar. alg. Urup (1935) p. 18; NAGAI, l. c., p. 92.

Japanese name. *Suzime* or *Zaramè*.

Hab.

56) *Arthrothamnus bifidus* (GMELIN) J. AGARDH

Laminaria. (1867) p. 28; MIYABE, l. c., p. 47, pl. XVIII; OKAMURA, Icon. Japan. Alg., vol. 5 (1925) p. 100, pl. 227; SETCHELL and GARDNER, Alg. N. W. Amer. (1903) p. 267, Mar. alg. Pacific N. Amer., III (1925) p. 620; YENDO, *Hedophyllum spirale* and its relation to *Thalassiohyllum* and *Arthrothamnus* (1903) p. 169, pl. VI, figs. 9-11; MIYABE and NAGAI, l. c., p. 95; KAWABATA, l. c., p. 206; YAMADA, Observ. *Arthrothamnus bifidus* (1938) p. 113-118, figs. 1-5; NAGAI, l. c., p. 101.

Japanese name. *Nekoasi-kombu*.

Hab. Daikokuzima and Tokotan.

57) *Thalassiohyllum Clathrus* POSTELS et RUPRECHT

Ill. Alg. (1840) p. 11, pl. XVIII, XIX; KJELLMAN, Beringhafv. Algfl. (1889) p. 42; MIYABE, l. c., p. 60, pl. 28; SETCHELL, Alg. Pribilof. Isl. (1899) p. 592, Postemb. Laminariac. (1905) p. 123, pl. XIII, figs. 6-13; OKAMURA, Icon. Japan. Alg., vol. 5 (1925) p. 104, pl. 229; MIYABE and NAGAI, l. c., p. 96; YAMADA, Mar. alg. Urup (1935) p. 17; NAGAI, l. c., p. 103.

Japanese name. *Kikuishi-kombu*.

Hab. Cast up ashore, Tokotan. Only one specimen.

58) *Alaria praelonga* KJELLMAN

Beringhafv. Algfl. (1889) p. 38, Tab. IV; YENDO, Monogr. *Alaria* (1919) p. 86, pl. IV; NAGAI, l. c., p. 106.

Japanese name. *Ainu-wakame*.

Hab. Daikokuzima.

59) **Alaria angusta KJELLMAN**

Beringhafv. Algfl. (1889) p. 38, Tab. III, figs. 1-4; YENDO, Monogr. Alaria (1919) p. 123, pl. XV; MIYABE and NAGAI, l. c., p. 87; YAMADA, Mar. alg. Urup (1935) p. 16; KAWABATA, l. c., p. 204; NAGAI, l. c., p. 114.

Japanese name. *Hosoba-wakame*.

Hab. Daikokuzima and Aikappu.

60) **Alaria fistulosa POSTELS et RUPRECHT**

l. c., p. 11, pl. 16; KJELLMAN, Om Beringh. Algfl. (1889) p. 40; MIYABE, l. c., p. 52, pl. 21; YENDO, Monogr. Alaria (1919) p. 76, pl. 1; SETCHELL and GARDNER, Mar. alg. Pacific Coast N. Amer., III (1925) p. 644; MIYABE and NAGAI, l. c., p. 96; YAMADA, Mar. alg. Urup (1935) p. 15; KAWABATA, l. c., p. 204; NAGAI, l. c. p. 105.

Japanese name. *Oni-wakame*.

Hab. Cast ashore. Tokotan.

Fucaceae

61) **Fucus evanescens AGARDH**

Spec. Alg., I (1820) p. 92; KJELLMAN, Om Spets. Thall., II (1877 a) p. 3, Alg. Arct. Sea (1883) p. 202; SETCHELL and GARDNER, Alg. N. W. Amer. (1903) p. 281, Mar. alg. Pacific N. Amer., III (1925) p. 681; YENDO, Fuc. Japan. (1907) p. 14, pl. 1, figs. 1-2; GARDNER, Genus Fucus (1922) p. 36, pl. 1, fig. 2; YAMADA, Mar. alg. Urup (1935) p. 20; NAGAI, Japan. f. v. *Fucus evanescens* (1935) p. 324, l. c., p. 119; KAWABATA, l. c., p. 206.

Japanese name. *Hibamata*.

Hab.

62) **Pelvetia Wrightii YENDO**

Fucac. Japan. (1907) p. 20, pl. 1, figs. 4-5; OKAMURA, Icon. Japan. Alg., vol. 5 (1928) p. 183, pl. 248; KAWABATA, l. c., p. 206; NAGAI, Mar. alg. Kurile Islands, I (1940) p. 127.

Japanese name. *Yezo-isige*.

Hab.

63) **Cystophyllum hakodatense YENDO**

Fuc. Japan. (1907) p. 32, pl. 2, figs. 13-16; OKAMURA, Icon. Japan.

Alg., vol. 5 (1924) p. 43, pl. 211; NAGAI, Mar. alg. Kurile Islands, 1 (1940) p. 131.

Japanese name. *Ugano-moku*.

Hab.

64) **Cystophyllum crassipes J. AGARDH**

Spec. Alg., 1 (1848) p. 232; YENDO, Fucac. Japan. (1907) p. 29, pl. 2, figs. 9-12; KAWABATA, l. c., p. 206; NAGAI, Mar. alg. Kurile Islands, 1 (1940) p. 130.

Japanese name. *Nebuto-moku*.

Hab.

65) **Sargassum Miyabei YENDO**

Fucac. Japan. (1907) p. 112, pl. 14, figs. 13-14; KAWABATA, l. c., p. 206; NAGAI, Mar. alg. Kurile Islands, 1 (1940) p. 136.

Japanese name. *Miyabe-moku*.

Hab.

66) **Sargassum Thunbergii O. KUNTZE**

Revisio. Sargass. (1880) p. 215; YENDO, Fucac. Japan. (1907) p. 114, pl. 15, fig. 5; OKAMURA, Icon. Japan. Alg., vol. 5 (1923) p. 6, pl. 203; NAGAI, Mar. alg. Kurile Islands, 1 (1940) p. 134.

Japanese name. *Umitoranowo*.

Hab. Growing on rocks in the littoral zone.

RHODOPHYCEAE

Bangiaceae

67) **Goniotrichum Alsidi (ZANARD.) HOWE**

Mar. alg. Peru (1914) p. 75; INAGAKI, Oshorowan no Kosorui (in Japanese, 1933) p. 12.

Japanese name. *Beni-midoro* (nov.).

Hab. Growing on *Heterochordaria abietina*.

68) **Bangia fusco-purpurea (DILLWYN) LYNGBYE**

Hydrophyt. Dan. (1819) p. 83, t. XXIV; OKAMURA, Icon. Japan. Alg., vol. 4 (1921) p. 87, pl. 171, figs. 6-12.

Japanese name. *Usikenori*.

Hab. Growing on rocks.

69) *Erythrotrichia carneae* (DILLWYN) J. AGARDH

Till. Alg. Syst., vol. 6 (1883) p. 15, pl. 1, figs. 8-10; YAMADA, Notes some Japan. Alg., vol. 6 (1935) p. 28.

Japanese name. *Hosinoito*.

Hab. Growing on *Spongomorpha* sp. and *Sphacelaria subfusca*.

70) *Porphyra variegata* (KJELLMAN) HUS

Account Porphyra (1902) p. 225, pl. 21, fig. 18; UEDA, Syst. stud. Japan. *Porphyra* (in Japanese, 1932) p. 38, pl. 1, fig. 9, pl. 9, fig. 7, pl. 10, figs. 1-3, pl. 23, 2, pl. 24, fig. 1.

Japanese name. *Huiritasa*.

Hab. Growing on *Phyllospadix Scouleri* Hook. or on other algae.

71) *Porphyra crassa* UEDA

l. c., p. 27, pl. 1, figs. 9-10, pl. 6, figs. 1-7, pl. 18, fig. 1.

Japanese name. *Atuba-amanori*.

Hab. Daikokuzima and Aikappu.

The frond is as a rule reniform or orbiculate, not undulate at the margin, and provided with a very short stipe. The thickness of the frond varies from 45μ to 70μ . The species is monoecious (?); each sporocarp contains 16 or rarely 32 carpospores. The manner of division may be represented by the formula: $16 \left(\frac{a}{2} \frac{b}{2} \frac{c}{4} \right)$ or $32 \left(\frac{a}{2} \frac{b}{4} \frac{c}{4} \right)$. This spermatia produced in each antheridium number 126 and the formula is $126 \left(\frac{a}{4} \frac{b}{4} \frac{c}{8} \right)$.

72) *Porphyra umbilicalis* (L.) J. AGARDH

f. *linearis* (GREVILLE) HARVEY

Phyc. Brit., II (1849) pl. 211, figs. 2-3; UEDA, l. c., p. 32, pl. 21, fig. 1.

Japanese name.

Hab. Daikokuzima and Aikappu. Growing on rocks.

The specimens which we refer to the present species are usually linear lanceolate, always rising with a distinct but very short stipe and very slightly undulate at the margin. The thickness of the frond varies between 40μ and 75μ .

73) *Porphyra abyssicola* KJELLMAN

Alg. Arctic Sea (1883) p. 191, pl. 17, fig. 5, pl. 18, figs. 10-11; Hus,

Account *Porphyra* (1902) p. 223; UEDA, l. c., p. 39, pl. I, 5-9, pl. X, 4-5, pl. 24, 2.

Japanese name. *Akanori*.

Hab. Growing on *Iridophycus cornucopiae* (P. et R.) SETCH. et GARDN.

Chantransiaceae

74) **Rhodochorton Codii** (CROUAN) NAKAMURA

Species Rhodochorton from Japan, II (1944) p.

Japanese name.

Hab. Growing on *Codium tomentosum* (HUDSON) STACKH.

75). **Rhodochorton Rhizoideum** DREW

Revis. *Chantransia*, *Rhodochorton*, *Aerochaetium* (1928) p. 182, pl. 42, figs. 42-44; NAKAMURA, l. c., p.

Japanese name.

Hab.

Dumontiaceae

76) **Dumontia filiformis** GREVILLE

Alg. Brit. (1830) p. 165, tab. 17; OKAMURA, Icon. Japan. Alg., vol. I (1907) p. 65, pl. 16, figs. 1-8; YAMADA, Mar. alg. Urup (1935) p. 21; KAWABATA, l. c., p. 208; NAGAI, Mar. alg. Kurile Islands, II (1941) p. 158.

Japanese name. *Ryūmonsō*.

Hab. Growing on rocks in the littoral zone.

77) **Farlowia irregularis** YAMADA

Notes some Japan. alg., V (1933) p. 280, pl. XI; NAGAI, l. c., II (1941) p. 160.

Japanese name. *Nise-karekigusa*.

Hab. Growing on rocks in the littoral zone. Near Marine Biological Station.

78) **Neodilsea Yendoana** TOKIDA

On so-called *Dilsea edulis* Japan (1943) p. 93, figs. 1-9.

Japanese name. *Akaba*.

Hab.

79) *Constantinea subulifera* SETCHELL

A revis. genus *Constantinea* (1906) p. 172; KAWABATA, l. c., p. 208; NAGAI, l. c., II (1941) p. 162.

Japanese name. *Ōba-okitubara*.

Hab. Tokotan.

80) *Contantinea rosa-marina* (GMELIN) POSTELS et RUPRECHT

l. c., p. 17, t. 30; SETCHELL and GARDNER, Alg. N. W. Amer. (1903) p. 355; SETCHELL, A revis. genus *Constantinea* (1906) p. 170; OKAMURA, Icon. Japan. Alg., vol. 2 (1910) p. 91, pl. 77, 78, figs. 8-13; NAGAI, l. c., II (1941) p. 161.

Japanese name. *Okitubara*.

Hab. Aikappu and Tokotan.

Corallinaceae

81) *Corallina pilulifera* POSTELS et RUPRECHT

l. c., p. 20, t. 15, fig. 101; YENDO, Corall. Japan. (1902) p. 30, t. 3, figs. 14-16, t. 7, figs. 14-17; NAGAI, l. c., II (1941) p. 168.

Japanese name. *Pirihiba*.

Hab.

82) *Amphiroa cretacea* (POSTELS et RUPRECHT) ENDLICHER

Gen. Plant. Suppl., III (1843) p. 49; YENDO, Corall. Japan. (1902) p. 7, t. 1, fig. 4, t. 4, fig. 2; NAGAI, l. c., II (1941) p. 166.

Japanese name. *Isokiri*.

Hab.

Grateloupiaceae

83) *Grateloupia divaricata* OKAMURA

New little known Alg. Japan. (1895) p. 482, pl. 9, figs. 1-2, Icon. Japan. Alg., vol. 3 (1913) p. 55, pls. 116-117, Figs. 12-18.

Japanese name. *Katanori*.

Hab.

Endocladiaeae

84) *Gloiopeletis furcata* (Post. et RUPR.) J. AGARDH

Spec. Alg., II (1851) p. 235, Epier. (1876) p. 275; OKAMURA, Icon. Japan. Alg., vol. 5 (1927) p. 164, pl. 244; KAWABATA, l. c., p. 208; NAGAI,

I. c., II (1941) p. 169.

Japanese name. *Hukuro-hunori*.

Hab.

Tichocarpaceae

- 85) ***Tichocarpus crinitus* (GMELIN) RUPRECHT**

Tange Ochot. Meer. (1851) p. 320, pl. 17; OKAMURA, Icon. Japan. Alg., vol. 3 (1914) p. 79, pls. 121-123; TOKIDA, Mar. alg. Robben Isl. (1932) p. 20; KAWABATA, I. c., p. 210; NAGAI, I. c., II (1941) p. 170.

Japanese name. *Karekigusa*.

Hab. Growing on rocks in the lower littoral belt.

Callymeniaceae

- 86) ***Callophyllis rhynchocarpa* RUPRECHT**

Tange Ochot. Meer. (1851) p. 260, tab. 13; TOKIDA, Mar. alg. Robben Isl. (1932) p. 15; NAGAI, I. c., II (1941) p. 172.

Japanese name. *Hime-tosakamodoki*.

Hab.

- 87) ***Erythrophyllum Gmelini* (GRUNOW) YENDO**

Erythrophyllum Gmelini (GRUN.), nov. nom. (1915) p. 230, figs. 1-3; OKAMURA, Icon. Japan. Alg., vol. 4 (1921) p. 90, pl. 172; NAGAI, I. c., II (1941) p. 174.

Japanese name. *Ezotosaka*.

Hab.

- 88) ***Callymenia ornata* (POSTELS et RUPRECHT) J. AGARDH**

Spec. Alg., 1 (1851) p. 290, Epicr. (1876) p. 223; KJELLMAN, Bering-hafv. Algfl. (1889) p. 30; SETCHELL and GARDNER, Alg. N. W. Amer. (1903) p. 307; YAMADA, Mar. alg. Urup (1935) p. 21, pl. VIII; NAGAI, I. c., II (1941) p. 175.

Japanese name. *Kita-tukasanori*.

Hab. Cast ashore.

Graciliariaceae

- 89) ***Gracilaria confervoides* (L.) GREVILLE**

Alg. Brit. (1830) p. 123; HARVEY, Phyc. Brit., tab. 65; OKAMURA, Icon.

Japan. Alg., vol. 4 (1916) p. 1, pl. 151; KAWABATA, l. c., p. 210; NAGAI, l. c., II (1941) p. 180.

Japanese name. *Ogonori*.

Hab. Lake Akkesi.

Solieriaceae

- 90) **Turnerella Mertensiana** (POSTELS et RUPRECHT) SCHMITZ

Syst. Florid. (1889) p. 7; OKAMURA, Icon. Japan. Alg., vol. 3 (1914) p. 83, pl. 123, figs. 9-10; TOKIDA, Mar. alg. Robben Isl. (1932) p. 18; YAMADA, Mar. alg. Urup (1935) p. 22; KAWABATA, l. c., p. 210; NAGAI, l. c., II (1941) p. 178.

Japanese name. *Yezonamesi*.

Hab.

Gigartinaceae

- 91) **Gigartina unalaskensis** RUPRECHT

in litt. Herb. Acad. Petropol; YENDO, Notes alg. Japan, IV (1916) p. 54, fig. 2; YAMADA, Mar. alg. Mutsu Bay (1928) p. 517; TOKIDA, Mar. alg. Robben Isl. (suppl. 1934) p. 20; KAWABATA, l. c., p. 209; NAGAI, l. c., II (1941) p. 183.

Japanese name. *Ibonori*.

Hab. Growing on rocks in the littoral belt.

- 92) **Gigartina ochotensis** RUPRECHT

in litt. Herb. Acad. Petropol; YENDO, l. c., IV (1916) p. 57, fig. 4; OKAMURA, Icon. Japan. Alg., vol. 5 (1928) p. 183, pl. 247, fig. 9; NAGAI, l. c., II (1941) p. 186.

Japanese name. *Hoso-ibonori*.

Hab. Growing on rocks.

- 93) **Chondrus pinnulatus** (HARVEY) OKAMURA

Icon. Japan. Alg., vol. 6 (1930) p. 19, pl. 261, pl. 263, figs. 1-6; TOKIDA, Mar. alg. Robben Isl. (1932) p. 13, pl. 5, fig. b; NAGAI, l. c., II (1941) p. 188.

Japanese name. *Hirakotozi*.

Hab.

- 94) **Chondrus ocellatus** HOLMES f. **crispus** OKAMURA

Icon. Japan. Alg., vol. 6 (1932) p. 85, pl. 292, figs. 2-5.

Japanese name. *Yahazu-tunomata*.
 Hab. Growing on rocks.

95) **Rhodoglossum pulchrum** (KUETZING) SETCHELL et GARDNER

Iridophycus gen. nov. and its represent. in South Amer. (1936) p. 472; NAGAI, l. c., II (1941) p. 193.

Japanese name. *Akaba-ginnansō*.
 Hab.

96) **Iridophycus cornucopiae** (POSTELS et RUPRECHT) SETCHELL et GARDNER

Iridophycus in the Northern Hemisphere (1937) p. 170; NAGAI, l. c., II (1941) p. 189.

Japanese name. *Ginnansō*.
 Hab.

Champiaceae

97) **Lomentaria hakodatensis** YENDO

Novae algae Japan. (1920) p. 6.

Japanese name. *Kosuzi-husitunagi*.
 Hab. Aikappu. Growing on rocks in rather exposed places.

Rhodymeniaceae

98) **Rhodymenia palmata** GREVILLE

Alg. Brit. (1830) p. 93; KJELLMAN, Alg. Arctic Sea (1883) p. 147; SETCHELL and GARDNER, Alg. N. W. Amer. (1903) p. 314; TOKIDA, l. c., p. 16; OKAMURA, On alg. Alaska (1933) p. 90; YAMADA, Mar. alg. Urup (1935) p. 23; KAWABATA, l. c., p. 209; NAGAI, l. c., II (1941) p. 195.

Japanese name. *Darusu*.
 Hab.

99) **Rhodymenia pertusa** (POSTELS et RUPRECHT) J. AGARDH

Spec. Alg., II (1852) p. 376, Epier. (1876) p. 329; KJELLMAN, Alg. Arctic Sea (1883) p. 150; OKAMURA, Icon. Japan. Alg., vol. 1 (1907) p. 93, pl. 21, figs. 1-7; TOKIDA, l. c., p. 17; KAWABATA, l. c., p. 209; NAGAI, Mar. alg. Kurile Islands, II (1941) p. 200.

Japanese name. *Ana-darusu*.
 Hab. Daikokuzima and Tokotan.

100) **Halosaccion saccatum** KUETZING

Tab. Phyc., vol. 16 (1866) pl. 78, figs. a-b; YENDO, Notes alg. new Japan (1909) p. 129; TOKIDA, l. c., p. 17; YAMADA, Mar. alg. Urup (1935) p. 209; KAWABATA, l. c., p. 209; NAGAI, l. c., p. 201.

Japanese name. *Benihukuronori*.

Hab. Growing on rocks or on other algae.

101) **Halosaccion firmum** RUPRECHT

Tange Ochot. Meer. (1856) p. 292; YENDO, l. c., p. 131; YAMADA, Mar. alg. Urup (1935) p. 23; NAGAI, l. c., II (1941) p. 202.

Japanese name. *Kata-benihukuronori*.

Hab.

*Ceramiaceae*102) **Antithamnion Corallina** (RUPRECHT) KJELLMAN

Algenveg. Murm. Meer. (1877) p. 24; TOKIDA, l. c., p. 23, pl. III, figs. b-d, IX, fig. a, text-figs. 7-8.

Japanese name. *Karafuto-yotugasane*.

Hab. Growing on the root of *Cystophyllum hakodatense* YENDO.

103) **Ptilota pectinata** (GUNNERUS) KJELLMAN

Alg. Arctic Sea (1883) p. 174, pl. 15, fig. 6; OKAMURA, Icon. Japan. Alg., vol. 1 (1909) p. 235, pl. 47, figs. 1-15; TOKIDA, l. c., p. 21; YAMADA, Mar. alg. Urup (1935) p. 24; NAGAI, l. c., II (1941) p. 211.

Japanese name. *Kusi-benihiba*.

Hab.

f. **litoralis** KJELLMAN

Alg. Arctic Sea (1883) p. 174, pl. 15, figs. 2-5; OKAMURA, Icon. Japan. Alg., vol. 1 (1909) p. 236, pl. 47, figs. 16-17.

Japanese name. *Kobano-kusibenihiba* (nov.).

Hab.

104) **Ptilota asplenoides** (TURNER) AGARDH

Spec. Alg. (1822) p. 387; J. AGARDH, Spec. Alg. (1851) p. 98, Epier. (1876) p. 77; OKAMURA, Icon. Japan. Alg., vol. 1 (1909) p. 239, pl. 48; YAMADA, Mar. alg. Urup (1935) p. 24; KAWABATA, l. c., p. 211; NAGAI, l. c., II (1941) p. 210.

Japanese name. *Katawa-benihiba*.

Hab.

105) **Ceramium Kondoi** YENDO

Navae Alg. Japon. (1920) p. 9; NAGAI, l. c., II (1941) p. 214.

Japanese name. *Kondō-igisu*.

Hab. Growing on rocks or on other algae.

106) **Ceramium hypnaeoides** (J. AGARDH) OKAMURA

On *Campylaephora hypnaeoides* J. AG. (1927) p. 365; KAWABATA, l. c., p. 210; NAGAI, l. c., II (1941) p. 213.

Japanese name. *Egonori*.

Hab. Growing on *Zostera* sp. or on other algae.

107) **Ceramium japonicum** OKAMURA

Contr. knowl. mar. alg. Japan., II (1896) p. 38, pl. III, figs. 24-28, Icon. Japan. Alg., vol. 3 (1914) p. 91, pl. 124, figs. 14-22; NAGAI, l. c., II (1941) p. 215.

Japanese name. *Hane-igisu*.

Hab. Growing on other algae.

*Delesseriaceae*108) **Laingia pacifica** YAMADA

Notes some Japan. Alg., III (1932) p. 122; TOKIDA, l. c., (suppl., 1934) p. 22; KAWABATA, l. c., p. 211; NAGAI, l. c., II (1941) p. 216.

Japanese name. *Konohanori*.

Hab.

109) **Holmesia japonica** OKAMURA

Icon. Japan. Alg., vol. VI (1932) p. 97, pl. 300, figs. 10-11.

Japanese name. *Suzusironori*.

Hab.

110) **Phycodrys fimbriata** (DE LA PYLAEI) KYLIN

Stud. Delesseriac. (1924) p. 44; TOKIDA, Mar. alg. Robben Isl. (1932) p. 29; YAMADA, Mar. alg. Urup (1935) p. 24; NAGAI, l. c., II (1941) p. 219.

Japanese name. *Kasiwaba-konohanori*.

Hab. Tokotan. Growing on other algae.

111) **Hypophyllum Middendorfii** (RUPRECHT) KYLIN

Stud. Delesseriac. (1924) p. 53, fig. 42, f; TOKIDA, l. c., p. 30; NAGAI, l. c., II (1941) p. 222.

Japanese name. *Naga-konohanori.*

Hab. Tokotan.

112) **Myriogramme yezoensis YAMADA et TOKIDA**

YAMADA, Notes some Japan. Alg., VI (1935) p. 30, pl. 13, fig. 2, pl. 14.

Japanese name. *Atuba-suzugini.*

Hab.

Rhodomelaceae

113) **Polysiphonia hakodatensis YENDO**

Novae alg. Jap. Decas, I-III (1920) p. 7; YAMADA, Mar. alg. Mutsu Bay (1928) p. 521, fig. 16.

Japanese name. *Maki-itogusa.*

Hab. Growing on *Rhodomela Larix* Ag. or on other algae.

114) **Polysiphonia violacea GREVILLE**

in HARVEY'S Phyc. Brit., pl. 209; FALKENBERG, Rhodomelac. (1901) p.

115, t. 1, figs. 17-19; YENDO, Notes Alg. new Japan., IV (1916) p. 61; YAMADA, Mar. alg. Mutsu Bay (1928) p. 524, fig. 18.

Japanese name.

Hab. Lake Akkesi. Growing on *Zostera* sp. or on *Phyllospadix Scouleri*.

115) **Polysiphonia Morrowii HARVEY**

in GRAY's List Plants collected in Japan (1856) p. 331; OKAMURA, Icon. Japan. Alg., vol. 3 (1914) p. 104, pl. 127, figs. 1-8; NAGAI, l. c., II (1941) p. 226.

Japanese name. *Moroitogusa.*

Hab.

116) **Polysiphonia urceolata GREVILLE**

"Ed. p. 309"; HARVEY, Phyc. Brit., t. 167; YENDO, Notes alg. Japan., IV (1916) p. 60.

Japanese name. *Syōzyōkenori.*

Hab. Aikappu and Daikokuzima. Growing on rocks.

117) **Chondria dasypylla (Woodw.) AGARDH**

Spec. Alg. (1822) p. 350, Syst. Alg. (1824) p. 205.

Japanese name. *Yanaginori.*

Hab. Growing on sea grasses.

118) **Laurencia glandulifera** KUETZING

Spec. Alg. (1849) p. 855, Tab. Phyc., vol. XV, pl. 59, figs. c-d; YAMADA, Notes on *Laurencia* (1931) p. 218; NAGAI, l. c., II (1941) p. 229.

Japanese name. *O-sozo*.

Hab.

119) **Pterosiphonia bipinnata** (POSTELS et RUPRECHT) FALKENBERG

Rhodomelac. (1901) p. 273; SETCHELL and GARDNER, Alg. N. W. Amer. (1903) p. 328; OKAMURA, Icon. Japan. Alg., vol. 4 (1921) p. 134, pl. 185, figs. 1-7; TOKIDA, l. c., p. 30; YAMADA, Mar. alg. Urup (1935) p. 24; NAGAI, l. c., II (1941) p. 230.

Japanese name. *Itoyanagi*.

Hab.

120) **Pterosiphonia arctica** (J. AGARDH) SETCHELL et GARDNER

Alg. N. W. Amer. (1903) p. 329, pl. 19; OKAMURA, Icon. Japan. Alg., vol. 4 (1921) p. 135, pl. 185, figs. 8-16; TOKIDA, l. c., (supplement, 1934) p. 23; NAGAI, l. c., II (1941) p. 232.

Japanese name. *Inabogusa*.

Hab. Cast ashore.

121) **Sympyocladia latiuscula** (HARVEY) YAMADA

Notes some Japan. Alg., IX (1941) p. 215.

Japanese name. *Isomurasaki*.

Hab.

122) **Odonthalia aleutica** J. AGARDH

Spec. Alg., vol. II (1863) p. 895; SETCHELL and GARDNER, Mar. alg. N. W. Amer. (1903) p. 333; OKAMURA, Icon. Japan. Alg., vol. 6 (1932) p. 75, pl. 286; TOKIDA, l. c., (supplement, 1934) p. 23, pl. III-IVa; YAMADA, Mar. alg. Urup (1935) p. 25; KAWABATA, l. c., p. 212; NAGAI, l. c., II (1941) p. 240.

Japanese name. *Aryūsyā-nokogirihibā*.

Hab.

123) **Odonthalia corymbifera** (GMELIN) J. AGARDH

Spec. Alg., II (1863) p. 897; OKAMURA, Icon. Japan. alg., vol. 2 (1912)

p. 143, pl. 91; YAMADA, Mar. alg. Urup (1935) p. 25; KAWABATA, l. c., p. 212; NAGAI, l. c., II (1941) p. 237.

Japanese name. *Hakesaki-nokogirihiba*.

Hab.

124) **Odonthalia Kamtschatica** (RUPRECHT) J. AGARDH

Spec. alg., II (1863) p. 896; SETCHELL and GARDNER, Alg. N. W. Amer. (1903) p. 336; OKAMURA, Icon. Japan. Alg., vol. 6 (1932) p. 76, pl. 287; TOKIDA, l. c., (supplement, 1934) p. 24, pl. IVb, V, VI; NAGAI, l. c., II (1941) p. 242.

Japanese name. *Kamutyatka-nokogirihiba*.

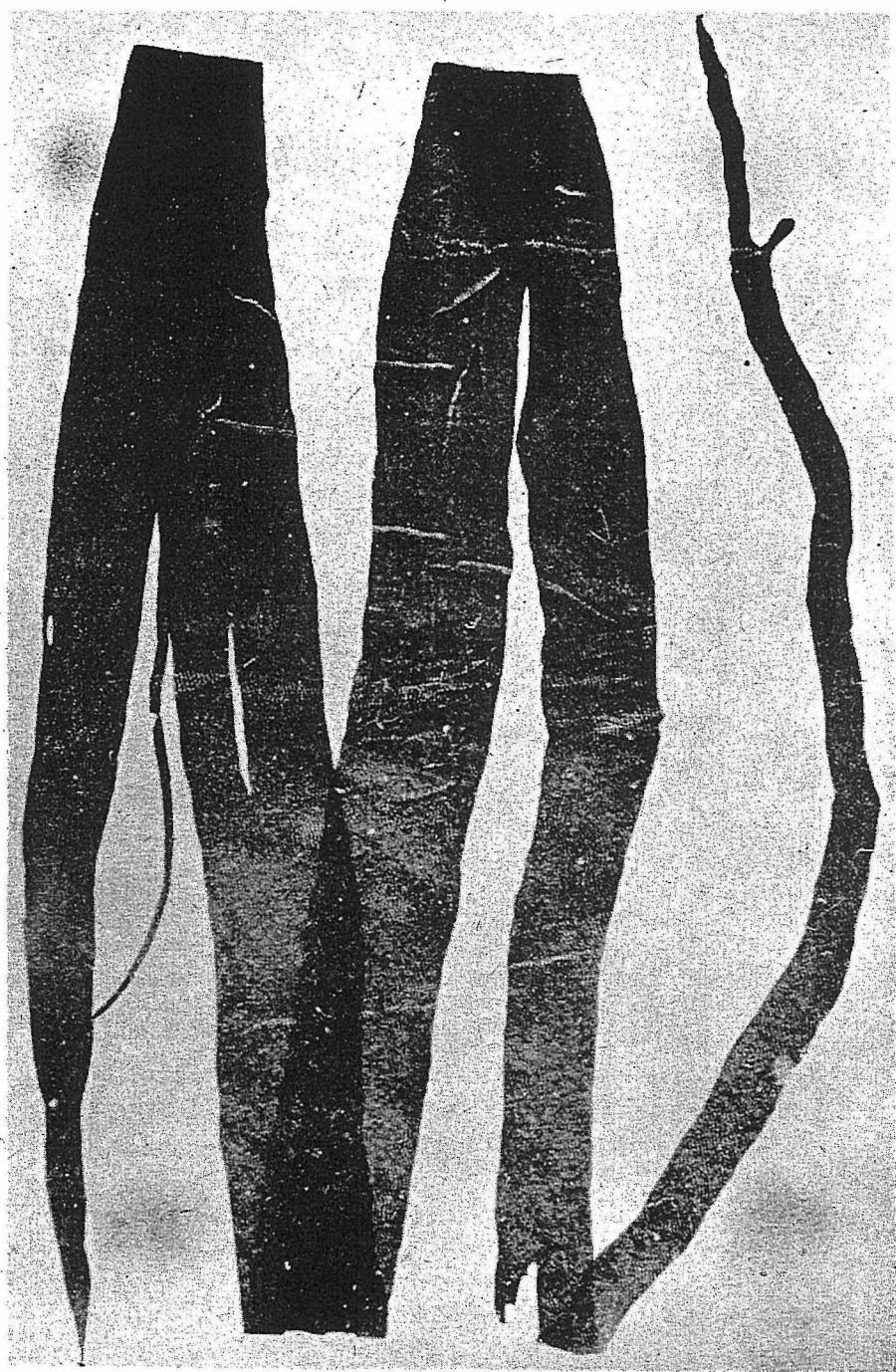
Hab.

125) **Rhodomela Larix** (TURNER) AGARDH

Spec. alg. (1823) p. 376; POSTELS et RUPRECHT, Ill. Alg. (1840) p. 14, t. 38, f. h.; J. AGARDH, Spec. Alg., II (1863) p. 886; KJELLMAN, Alg. Arctic Sea (1883) p. 117; FALKENBERG, Rhodomelac. (1901) p. 600, t. XI, fig. 1; OKAMURA, Icon. Japan. Alg.; vol. 4 (1922) p. 154, pl. 188, figs. 1-4; KAWABATA, l. c., p. 212; NAGAI, l. c., II (1941) p. 235.

Japanese name. *Huzinatomo*.

Hab. Growing on rocks in the littoral zone.



Akkesiphycus lubricum YAMADA et TANAKA. ca. $\times \frac{1}{2}$.