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New or Noteworthy Algae from Izu

By

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With Plates LV–LVIII.

A large number of the algae collected from Izu have already been listed by the writer in 'On the marine algae of Susaki, Prov. Izu, and its Vicinity, I–III.' Thus, the marine flora of Izu has become clear in its main outline, and the distributional consideration shall be published at another time. However, still more unlisted algae in large number have been left for future study. Some of the unlisted algae, such as *Cladophora* spp., *Corallinaceous algae, Hypnea* spp., etc., are too difficult to determine in respect to their systematic names in such a floristic study, and therefore, the determination of them should be expected in some monographic studies in future. On the other hand, among the unlisted algae, there are some whose names are comparatively easily determined. The present paper deals with them.

The writer wishes to express here his hearty thanks to Prof. Y. YAMADA for his kind direction. The present study has been carried out at the Mitsui Institute of Marine Biology. The writer is very glad to take this opportunity to express his sincere thanks to Mr. T. MITSUI and Prof. I. AMEMIYA, for affording the opportunity for this study.

Pseudochlorodesmis furcellata (ZANARDINI) BOERGESEN

Plate LV, and Text-fig. 1.

Mar. Algae from Canary Isl., I (1925) p. 78, figs. 30–34; HAMEL, Chloroph. côtes françaises (1931) p. 75; FELDMANN, Alg. Mar. de la Côte des Albères, II (1937) p. 97, figs. 33, 34.

Syn. *Bryopsis furcellata* ZANARDINI, 'Saggio (1843) p. 60'; Icon. Phyc. Adriat., I, p. 135, t. 32, fig. A; KÜTZING, Tab. Phyc., vol. 6 (1856) fig .2; HAUCK, Meeresalgen (1885) p. 475.

Syn. *Derbesia*(?) *furcellata* ARDISSONE, Phyc. Mediter., II (1886) p. 161; DE TONI, Syll. Alg., vol. 1 (1889) p. 426.

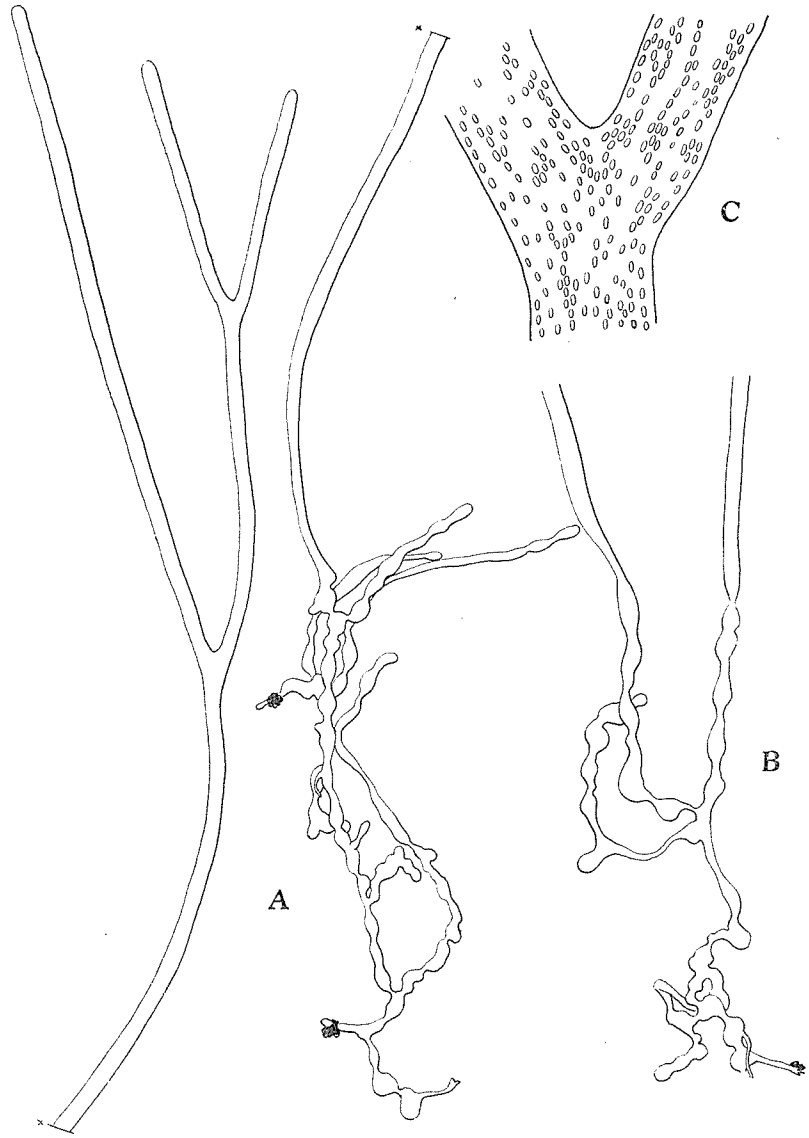

Fig. 1. *Pseudochlorodesmis furcellata* (ZANARDINI) BOERGESEN.
A. Habit of the plant. ×33. B. Base of the thallus. ×56.
C. Part of the filament showing chromatophores. ×250.

Syn. *Derbesia*(?) *dubia* FELDMANN, Contrib. fl. algol. Algérie(1931) p.207, pl. 9.

Japanese name:
Nise-mayuhaki.

Hab.: Arasidomari near Susaki.

Until now *Pseudochlorodesmis furcellata* has been recorded only from the Mediterranean Sea and the Canary Islands. In January, 1939, this interesting alga was found in our district growing upon a shell dredged from the bottom at 25 m depth by H. and Y. TANAKA.

Its dense tufts attain 0.5–1.5 cm in height. The tufts are very soft and of course uncalcified.

The basal filaments are subdichotomously and so densely branched that they form a felt-mass. As noted by BOERGESEN and FELDMANN, the filaments are irregularly swollen and constricted. The rhizome-like part sends out many rhizoids by means of which the tuft is fastened to the substratum.

The erect filaments usually have some constrictions at the base bearing a great resemblance to the

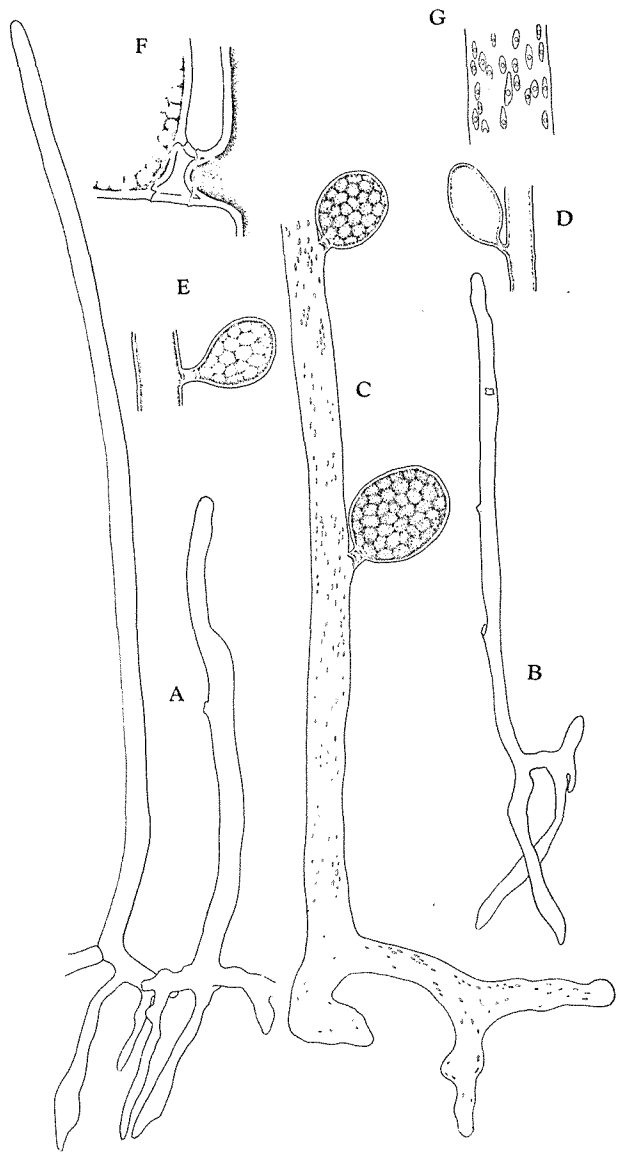

Fig. 2. *Derbesia minima* W. v. BOSSE.
A,B. Habit of the plants. ×43.
C. Lower portion of the frond. ×98.
D,E. Sporangia. ×98.
F. Neck of the sporangium. ×435.
G. Chromatophores. ×196.

basal part. Then they become cylindrical through their whole remaining length, having no constriction. In the present specimens, the ramification seems to be rather regularly dichotomous, and to be usually forked twice. Filaments are 45–55μ in thickness.

The chromatophores are very minute, oblong, and 5μ long in the largest one. In respect to its regularly dichotomously branched thallus, the material seems to agree rather with the Mediterranean plant than with the Canarian one.

Derbesia minima W. v. BOSSE

Text-fig. 2.

Liste des Alg. du Siboga, I (1913) p. 95, fig. 23.

Japanese name: *Miru-tuyunoito.*

Hab.: Arasidomari near Susaki.

The tiny *Derbesia* is found growing on the frond of *Codium fragile.*

The basal rhizoids develop moderately creeping between the utricles of the host. The erect filaments are strictly simple, 2.5–5 mm in height, 30–55μ in width. The end of the filaments is obtuse.

The zoosporangia are ovoid, rarely obovoid, 75–85$\times$105–130μ in size. They are at first in open connection with the mother filament, later on they are separated from it by two walls in the neck-shaped base. They have rather a short neck which has a length of 12–22μ, and a width of 12–17μ.

The chromatophores are rather large and spindle-shaped with a pyrenoid, coinciding with the figure prepared by FELDMANN[1] in *D. tenuissima.*

Judging from above mentioned characters, the writer has identified it with *D. minima.* There are two related species among hitherto described species: *D. tenuissima* (DE NOT) CROUAN, and *D. ryukyuensis* YAMADA et TANAKA. In the former, the sporangia have rather a long neck, reaching 35–50μ (by BOERGESEN), and in the latter a very short neck. In the present species they have a neck which is 12–22μ in length, and the necks are septated by two walls.

Ectocarpus izuensis spec. nov.

Text-fig. 3.

Thallus ca. 2.5 mm altus, ex filamentis endophyticis (in Codio intricato) et filamentis liberis constructus. Filamenta endophytica irregulariter ramosa, inter se aggregata, inter utriculos profunde penetrantia, ex cellulis

1) FELDMANN: Alg. Mar. de la Côte des Albères, I–III (1937) p. 95, fig. 32, A.

20–30μ latis et 3–5 plo diametro longioribus formata. Filamenta erecta in parte basali ramosa, superne simplicia, ex cellulis ca. 20μ latis et 0.5–1.5 plo diametro longioribus formata. Sporangia plurilocularia sessilia aut pedicellata prope basem, rarissime lateralia super parte media, fusiformia, ca. 100μ longa, et ca. 30μ lata. Sporangia unilocularia oblonga, ca. 70μ longa, et 30μ lata.

Japanese name:

Miru-siomidoro.

Hab.: Hatizyō-zima.

Thallus ca. 2.5 mm high, composed of two parts: endophytic filaments (in *Codium intricatum*) and exposed filaments. Endophytic filaments penetrating between the utricles of the host, exceedingly developed; irregularly branched, densely intertwined near the exposed part. Exposed filaments much branched at the base, but subsimplex in the upper part, and keeping the same diameter to their end. Cells ca. 20μ in diameter in the exposed main filaments, a little thicker (20–30μ) in the penetrating part, and 0.5–1.5 times in exposed part, 3–5 times as long as diameter in the penetrating part.

Plurilocular sporangia conical or long conical, often curved, subacute or obtuse at apices, growing near the surface of the host, sessile or terminal on the

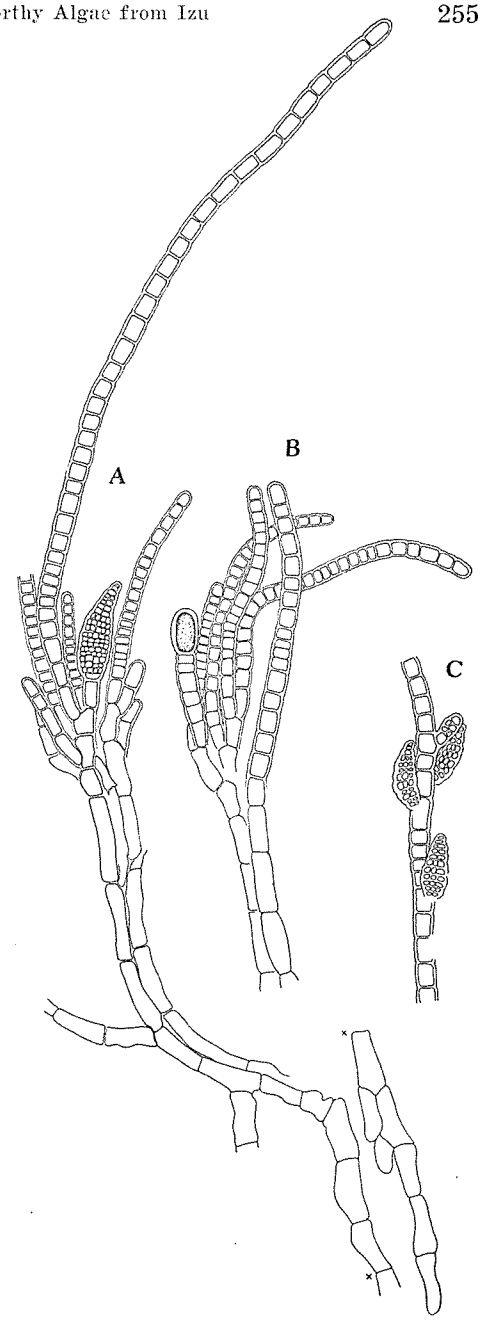

Fig. 3. *Ectocarpus izuensis* SEGAWA.
A. Plant with a plurilocular sporangium. ×123.
B. Plant with a unilocular sporangium. ×123.
C. Lateral plurilocular sporangia. ×123.

short branches, rarely lateral growing on the middle part of the exposed filament, ca. 30μ wide, ca. 100μ long. Unilocular sporangia oblong, situated on the same part as the plurilocular sporangia, ca. 70×30μ.

Chromatophores diskshaped.

Considering the characteristics of the erect filament, the writer describes it as an *Ectocarpus*-species. The present species bears some likeness to *Streblonema Cockeri* HOWE. In *Str. Cockeri,* however, the chromatophores are rather irregular in shape.

Sphacelaria Yamadae spec. nov.

Text-fig 4.

Frons parasitica(?), filamentis erectis caespitosis, 3–5 mm altis, ca. 50μ latis; ramis interdum secundis, basi attenuatis, 20–50μ latis. Segmenta sine sectione transversa, 15–30μ alta. Propagulum di-dichotome divisum, tenue; caule breviore, radiis primis longioribus et radiis secundis brevissimis constructum. Radii primi et secundi ad basin valde constricti. Sporangia et gametangia ignota.

Japanese name: *Tukubane-kurogasira.*

Hab.: Susaki; Mikomoto-zima; Mera; Miyake-zima.

Frond parasitic(?) on *Sargassum* sp., penetrating into the host not deeply with a short bundle of thin filaments, on the penetrating part forming a shallow disk with the entangled mass of filaments. Erect filaments arising from the disk, 3–5 mm high, ca. 50μ thick, forming a

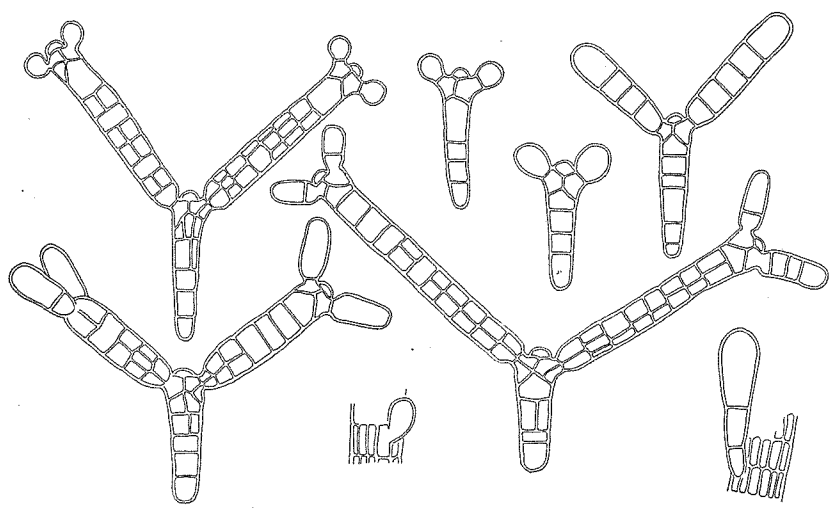

Fig. 4. *Sphacelaria Yamadae* SEGAWA. Propagula. ×124.

dense tuft, attenuated at the base. Branches 20–50μ thick, sometimes arranged in the secund manner, attenuated toward the base. Segments of the erect filaments ca. 15–30μ high, shorter than broad, showing only several longitudinal partitions.

Propagula slender, usually twice forked, composed of a stalk, two primary and four (or more) secondary rays. Stalk of the propaglula comparatively shorter than primary rays, consisting of 3–6 segments, ca. 23μ thick at the upper part, attenuated toward the base. Primary rays consisting of 5–10 segments, ca. 30μ thick, 170–340μ long. Secondary rays very short. Both primary and secondary rays constricted at the base. Sporangia and gametangia unknown.

The present alga was first found on a frond of *Sargassum nipponicum* floating on the sea-surface near Mikomoto-zima, in May, 1934. In this material, no hair develops at all. On the other hand, not a few hairs are observed in the material from Miyake-zima, in December, 1935.

In the character of the propagula, the species in question is not referable to any known species in the genus.

The present *Sphacelaria* is rather common in this district. Furthermore the writer has recently collected this alga on the coast of Inaba Province.

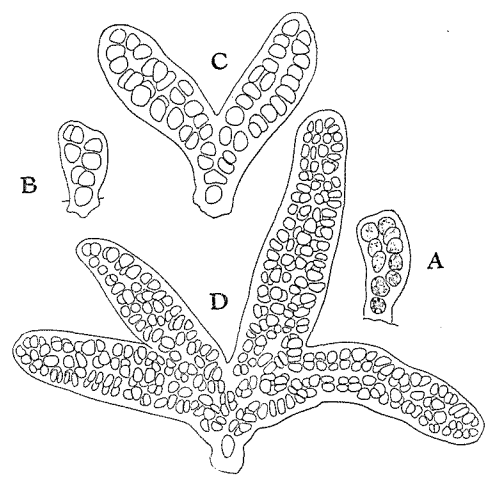

Fig. 5. *Goniotrichum cornu-cervi* (Reinsch) Hauck.
A–C. ×311. D. ×200.

Goniotrichum cornu-cervi (Reinsch) Hauck

Text-fig. 5.

Meeresalgen (1885) p. 519; Howe, Mar. Alg. Peru (1914) p. 76; Hamel, Flor. de Fr., Bangiales (1925) p. 39, figs. C, D; Kylin, Anat. der Rhodoph., (1937) p. 41; Feldmann, Alg. Mar. de la Côte de Albères (1937) p. 257.

Syn. *Stylonema Cornu Cervi* Reinsch, 'Contrib., (1875) p. 40, t. 15'.

Japanese name: *Kazuno-hosinoito.*

Hab. Susaki.

Until now, only *Goniotrichum Alsidii* (Zanardini) Howe has been recorded from Japan. In February, 1940, the writer found a microscopic

alga belonging to the genus *Goniotrichum* on a filament of *Spermothamnion Tamamiru* SEGAWA dredged from deep water in the above mentioned locality.

The present material seems to be rather young. So that in the most developed individual, it is only twice forked and the height is 200μ. In the broadest part of the frond, the cells at the same level are 4–6 in number and their breadth is 20–45μ. Plants are fixed to the substratum by means of a tiny disk formed by a basal cell, which is more or less longer than other cells. The cells are irregularly arranged, irregularly polygonal in shape and ca. 7μ in diameter. The chromatophore is starlike.

As mentioned above, the present material coincides with HAUCK's plant in the main points.

Contarinia Okamurae spec. nov.

Plate LVI, 2, and Text-fig. 6.

Frons cartilaginea, 0.5–1 mm crassa, ramis Cladophorae cingenter epiphytica, cylindrica, tubulosa, dichotome ramosa, rhizinis substrato adfixa, ex perithallo et hypothallo constructa. Hypothallus parce evolutus, cellulis 20–30μ crassis. Perithallus ex filis cellularum erectis constructus, multi-

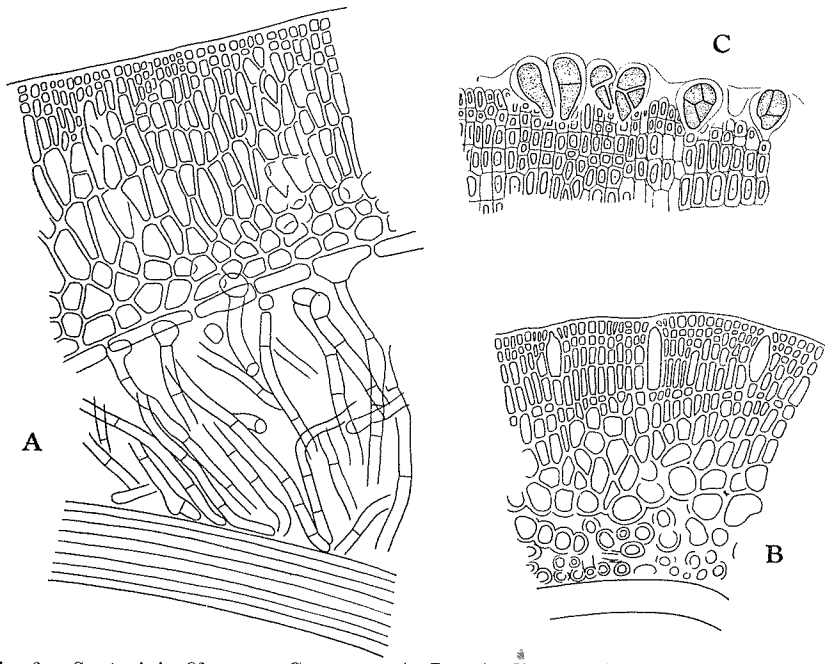

Fig. 6. *Contarinia Okamurae* SEGAWA. A. Longitudinal section of the frond. ×225. B. Transverse section of the frond. ×135. C. Sporangial sorus. ×250.

stratus. Fila erecta dichotome divisa, cellulis peripheriam versus decrescentibus, cellulis peripheriis ca. 4μ latis, 4–12μ longis. Cellulae glandulae(?) saepe in perithallo sparsae. Tetrasporangia obovata, irregulariter cruciatim divisa, ca. 30μ alta, 20μ lata, in soros ex apice fili transformata.

Japanese name: *Siogusa-goromo.*

Hab.: Sirahama; Ōsima (collected by S. MATUMOTO).

Frond cartilagineous, 0.5–1 mm thick, cylindrical, tubular, dichotomously divided, enclosing the frond of *Cladophora Ohkuboana*, composed of three parts: perithallium, hypothallium, and few-celled root-fibres. Hypothallium weakly developed. Perithallium composed of vertical cell-rows dichotomously divided, showing many strata in the periodical growth of cells. Cells in the hypothallium 20–30μ thick, in the perithallium gradually becoming smaller towards the periphery, in the uppermost perithallium, ca. 4μ broad, 4–12μ high. Gland(?) cells frequently found in the perithallium. Tetrasporangia in sori, at the top of the vertical cell-rows, obovate, cruciately (sometimes irregularly) divided, ca. 30μ long, ca. 15μ thick.

The epiphytic character of this alga corresponds fairly well to that of *Peyssonnelia distenta* (HARVEY) YAMADA.[1] At first, the epiphyte appears as a thin crust on the frond of *Cladophora*. Afterwards, the frond of the epiphyte encloses the frond of *Cladophora*, so that it becomes cylindrical and tubular.

There are described two species belonging to this genus. It is easy to separate the present alga from these in many respects.

It is an interesting fact that the fresh material has one sort of smell like that of the frond of *Chondrococcus*.

Cruoriopsis japonica spec. nov.

Text-fig 7.

Frons crustaeformis, 170–180μ crassa, pagina inferiori omnino adnata, interdum rhizinis unicellularibus affixa. Stratum basale 2-stratosum, cellulis inferioribus 8–14μ latis, 10–18μ altis, latitudine 2–3-plo longioribus, cellulis superioribus trapezoidalibus, minutis. Fila erecta 10–16-cellularia, cellulis ca. 4μ latis, 4–10μ altis. Sporangia oblonga, 45–90μ longa, 25–30μ lata, cum 1–5-cellulis pedicellata .

Japanese name: *Kainokawa.*

Hab.: Sirahama; Miyake-zima.

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1) It was noted by OKAMURA in 'Icones, vol. 2, p. 27' (as *Peyssonnelia involvens* ZANARDINI).

Plant crustaceous, attached by the whole lower surface, sometimes developing tiny rhizoids, 170–180μ thick; the basal layer 2 cells thick, the lower cells of the basal layer 8–14μ broad, 10–18μ high, 2–3 times as long

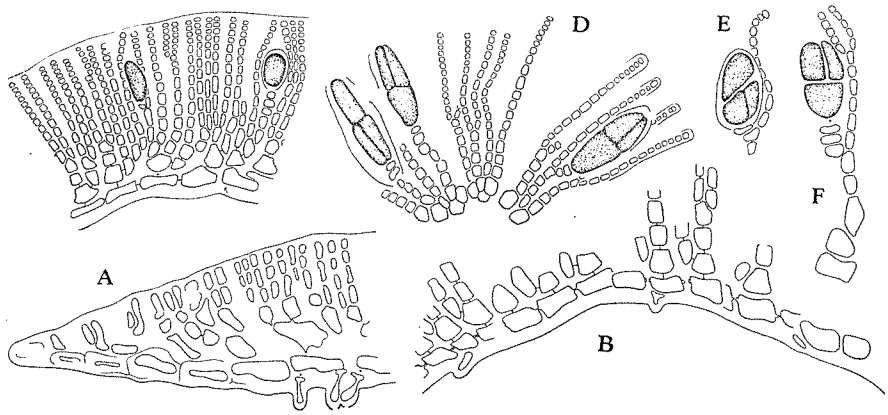


Fig. 7. *Cruoriopsis japonica* SEGAWA. A. Vertical section of the margin. ×183. B. Vertical section of the older part showing the basal layer. ×183. C. Vertical section of the frond showing unripe sporangia. ×117. D. Cross-section of the frond showing ripe sporangia. ×117. E,F. Sporangia. ×183.

as broad; the upper cells smaller than the lower, trapezoidal in longitudinal section; erect filaments arising from the upper cells of the basal layer, divided into a large number near the base, rarely dichotomous above, consisting of 10–16 cells; cells in the filament cubic or a little elongated, ca. 4μ broad and 4–10μ high in the middle of the filaments; sporangia regularly cruciate, stalked, oblong, 45–90μ long, 25–30μ diam.; the stalk of the sporangia lateral on the erect filament, consisting of 1–5 cells; the cells of stalk somewhat larger than the cells of erect filaments.

This species was found at Miyake-zima, in 1936, encrusted on a shell of *Tegula rustica*. Afterwards, at Sirahama the same plant was found on a shell of *Thais* sp. taken up by a diver from the bottom of 10 m depth. These specimens seem to agree very well with each other.

This species differs from the other hitherto described species by the presence of rhizoids, by the erect filament consisting of many cells which are comparatively narrow, and the comparatively large sporangia.

Bertholdia japonica (OKAMURA) comb. nov.

Syn. *Platoma japonica* OKAMURA, Icon., vol. 5 (1928) p. 181, pl. 246; SEGAWA, Mar. Alg. of Susaki, II (1936) p. 183.

Japanese name: *Hōnowo*.

Hab.: Susaki; Kisami; Kōzu-sima.

The abundant material of this alga collected from Susaki and preserved in formalin was carefully observed by the writer for a re-examination of the anatomical characters. The fresh, young material has always acute apices and then near the apex the frond is almost cylindrical. At the apex, a large apical cell can be seen by means of which axial cells are successively cut off though it becomes immediately difficult to seek the central axis. That is to say, the structure of the alga belongs to the 'Zentralfadentypus'. As the result of the above-mentioned study it has now become clear that the alga cannot be put into the family *Nemastomaceae* (s.str. KYLIN, 1932) but must be transferred to the family *Calosiphoniaceae* (KYLIN, 1932).

The gonimoblast starts always from the 'Verbindunsfaden' near the auxiliary cell as shown in OKAMURA's figure. So the above combination is newly proposed.

Hypneocolax stellaris BOERGESEN

Text-fig. 8.

Mar. Alg. D. W. Indies, IV, Rhodophyceae (6) (1920) p. 479, figs. 433–435; DE TONI, Syll. Alg., vol. 6, sect. 5 (1924) p. 191.

f. **orientalis** W. v. BOSSE

Liste des algues du Siboga, IV. Rhodophyceae, (3) Gigartinales et Rhodymeniales (1928) p. 393, fig. 143.

Japanese name: *Aneyakata-nori* (HAYASI).

Hab.: Miyake-zima (collected on the coast of Anayakata).

Upon a specimen of *Hypnea variabilis* sent to the writer, in 1936, by Mr. K. HAYASI, many parasitic bodies were found. They are small and wart-like or stellate, having shorter processes with broad bases and acute or roundish apices. The parasite occurs especially on young branches of the host. They are 0.5–1 mm in diameter and the colour is yellow in drying. As the result of the anatomical study it became evident that the alga is to be referred to the above-mentioned species.

As Boergesen notes, the cells in the middle of the tissue are roundish-polygenal, rather irregular in shape with rather thick walls forming a parenchymatic tissue. Towards the periphery the cells gradually become smaller and distinctly arranged in rows, forming short filaments. The peripheral cuticule is very thick (about 15μ).

The sporangia are zonately divided into four spores, as in WEBER's form, and measure ca. $30\times10\mu$ in size. The development of the cystocarp

seems to be similar to the West Indian plant. No carpostoma opens at all.

In the present material, only one aspect is very note-worthy. The epidermal layer of the host is risen around the base of the parasite, and the parasite is firmly inclosed by the layer at the base. On the other hand, the longitudinal section shows distinctly that somewhat rhizoidal cell-rows of the parasite penetrate into the tissue of the host. The West Indian plant does not show such a mechanism.

Chondrus Yamadae spec. nov.

Plate LVII, and Text-fig. 9.

Frons ex parvo disco erecta, 10–30 cm alta, linearis, 2–4 mm lata,

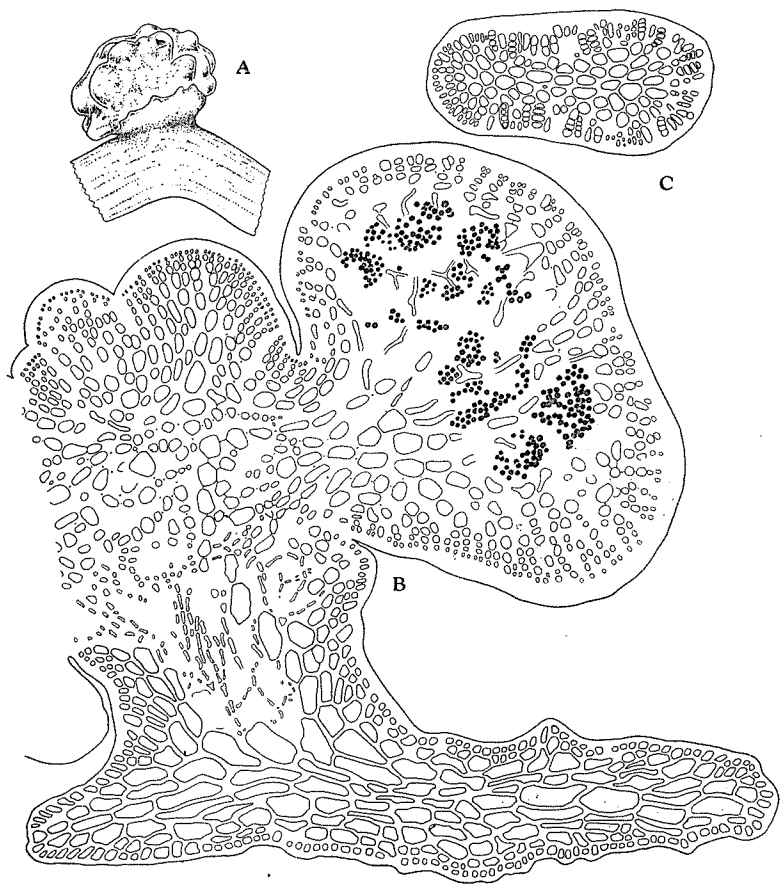


Fig. 8. *Hypneocolax stellaris* BOERGESEN f. *orientalis* W. v. BOSSE.
A. Habit of the plant. ×23. B. Vertical section of the female plant. ×102.
C. Transverse section of the frond showing tetrasporangia. ×102.

leviter canaliculata, ad basin gradatim attenuata et subteres, regulariter repetite dichotome (6–7-plo) divisa, margine ramis dense pinnatim distiche ornata; ramis 0.2–3 cm longis, 1–2 mm latis, subteretibus, ad basin leviter

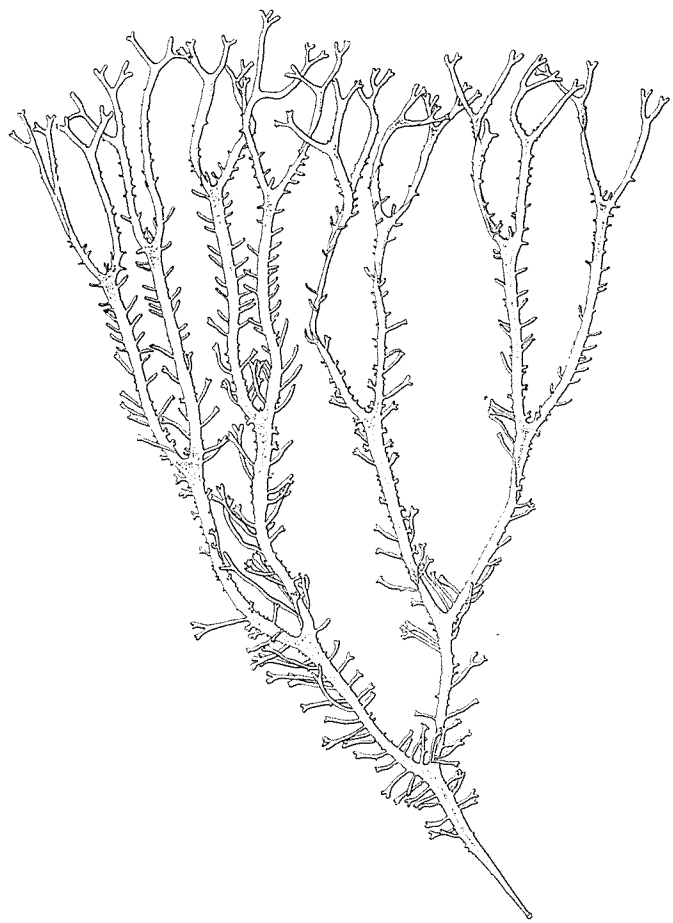


Fig. 9. *Chondrus Yamadae* SEGAWA. × ½.

constrictis, simplicibus vel dichotome (1–2-plo) furcatis. Cystocarpia in ramis producta, inter se approximate serialia. Tetrasporangia ignota.

Japanese name: *Hane-tunomata.*

Hab.: Susaki (collected by K. TUTIYA); Sirahama; Itō.

The plants are 10–30 cm in height. The fronds rise from a scutate disc, and the basal portion is subterete for a short distance. The rami-

fication is regularly (6–7 times) dichotomous, and the main segments are pinnately and densely ornamented with distichous branches. The main segments are linear, 2–4 mm broad, compressed, and slightly canaliculate. The branches are subcylindrical, slightly constricted at the base, simple or 1–2 times forked, up to 3 cm long, and 1–2 mm broad. The apices of main segments and branches are bifurcate or obtuse. The cystocarps are produced only in the lateral branches, and arranged in a row.

The species shows some likeness to *Chondrus pinnulatus* (HARVEY) OKAMURA. But in the fruiting and the mode of the branching, the alga differs distinctly from the latter species.

The species has been collected only in the above cited localities on the eastern coast of Izu Peninsula. The specimens collected from Itō in May, 1935, are all young. Ones from Sirahama in July, 1937, are very large but yet sterile. Only one cast up on the shore of Sirahama in October is completely mature.

Fauchea leptophylla spec. nov.

Plate LVIII, 1, and Text-fig. 10.

Frons ca. 4 cm alta, 150–200μ crassa, subcoriacea, dichotome (3–4-plo) divisa; axillis rotundis; segmentis linearibus, 1.5–3 mm latis, apice obtusis, margine integris; cystocarpiis marginalibus, sessilibus, rotundis vel obovatis, ca. 0.9 mm diam.; tetrasporangiis ignotis. Stratum corticale e 2–3 seriebus cellularum compositum.

Japanese name: *Togenasi-madara.*

Hab.: Kōzu-sima.

Only one female specimen is at hand. It was dredged from the bottom at 20 m depth, as an epiphyte on a frond of *Gelidium subcostatum,* in 1937.

The plant is ca. 4 cm in height. The frond is thin and subcoriaceous in texture. The frond is 3–4 times forked, with round axils and the segments are patent with each other. The segments are linear, nearly uniform in width throughout, or slightly wider under the dichotomies, 1.5–3 mm wide, and ending obtuse apices. Their margins are strictly entire.

The medullary layer is composed of 1–3 series of large and nearly empty cells which are mostly oval or elliptical, and 30–85μ in diameter, without smaller interstitial cells. The subcortical layer rather abruptly passes from the medulla, and is composed of 2–3 of smaller cells.

The cortical layer is composed of only 2–3 series of minute (ca. 7μ in diameter) cells, so the anticlinal arrangement of the cells in the cortex is

scarcely recognizable except at the margin. As pointed out by SJÖSTEDT in *Fauchea Fryeana* SETCHELL, at least at the margins, such arrangement of the cells is distinct, also, in the present species.

The cystocarps are spherical or obovoid. They are prominent on the margin, but sessile without coronal processes.

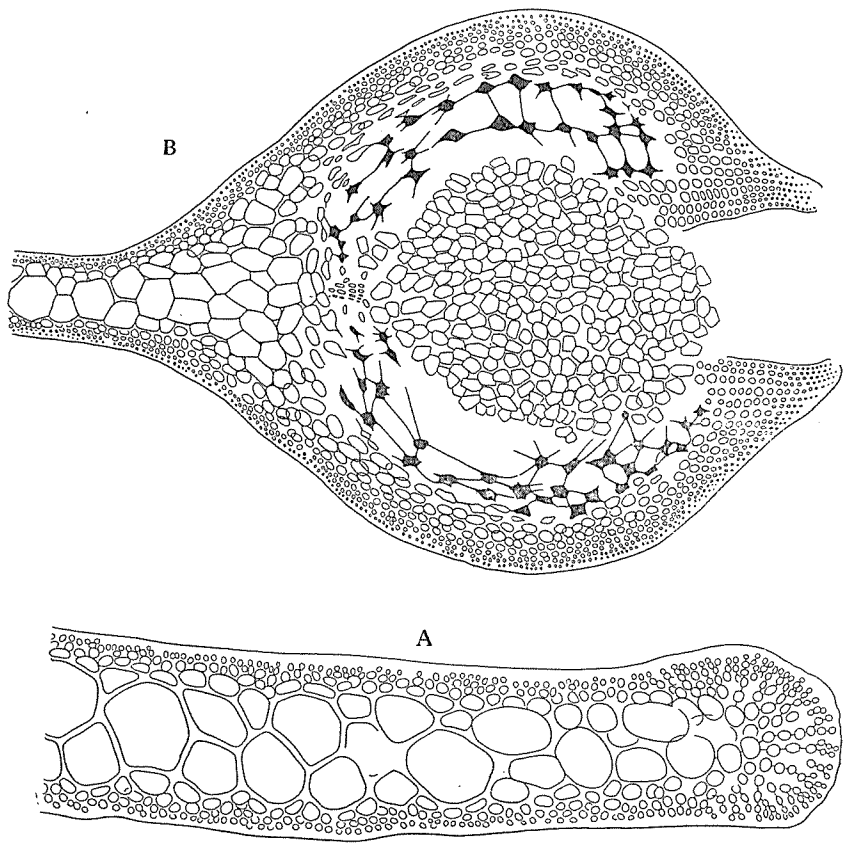


Fig. 10. *Fauchea leptophylla* SEGAWA. A. Cross-section of the frond showing the marginal part. ×140. B. Vertical section of a cystocarp. ×77.

Though the writer has not been able to observe any sporangial individuals, the cystocarp and the structure show that the alga is surely to be classified into the genus *Fauchea*.

The present species bears some resemblance in external appearance to *Fauchea Sefferi* HOWE. In *F. Sefferi*, however, the cortex has 4–8 cells arranged in anticlinal rows.

Halichrysis (?) **japonica** spec. nov.

Plate LVIII, 2, and Text-fig. 11.

Frons horizontaliter repens, estipitata, membranacea, foliacea, irregulariter lobata, margine undulata, ca. 10 cm lata, ca. 0.8 mm crassa, solida, dorsiventraliter constructa. Medulla e cellulis parvis, laxe irregulariter disposita. Stratum interius e 2–3 seriebus cellularum grandium compositum. Stratum corticale e 3–4 seriebus cellularum minimarum compositum. Cystocarpia per frondis paginam superorum sparsa, prominentia.

Japenese name: *Tiri-botan.*

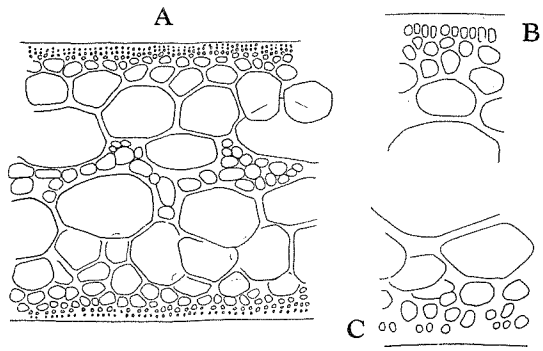


Fig. 11. *Halichrysis*(?) *japonica* SEGAWA.
A. Transverse section of the frond. ×50.
B. Upper cortex. ×225.
C. Lower cortex. ×225.

Hab.: Tanoura near Susaki.

Only one specimen of this alga is available. The material was washed ashore on the coast of Tanoura, in October, 1936.

Frond horizontally repent, leaf-like, without special stalk, attached to the substratum by means of rhizoidal processes issuing from the margins or the under surface(?), lobed with undulate margins, ca. 10 cm in diameter. Frond solid, ca. 0.8 mm in thickness; medullary cells small, irregularly, but not densely arranged; inner layer consisting of 2–3 series of great cells; cortex consisting of 3–4 series of very small cells. Cystocarps produced in the upper surface, very prominent.

The dorsiventral characteristic is, also, shown in the structure. That is to say, the cell-series in the upper cortex develop more or less than in the lower one.

Having comparatively many small cells in the medulla, the present plant seems to stand near the genus *Erythrymenia,* but on the other hand, the arrangement of the medulla and the inner layer shows some likeness to the genus *Cryptorachne.* After considering the repent habit of this alga, the writer describes it as a member of the genus *Halichlysis.*

Neomonospora sericata spec. nov.

Plate LV, 2, and Text-fig. 12.

Planta epiphytica, in parte basali repens. Filamenta erecta 1–2 cm alta, ecorticata, repetite subdichotomo-pinnatim dense ramosa, axillis acutis. Cellulae ad basin frondis ca. 150μ crassae, 5–7-plo diametro longiores, in parte media ca. 85μ crassae, 8–10-plo diametro longiores, in ramulis ca. 25μ crassae, 6–8-plo diametro longiores. Cellulae ultimae ramulorum obtusae. Sporangia indivisa, ellipsoidea, ca. 120μ longa, ca. 65μ lata, cellula discoidali brevissime pedicellata, in ramulis interne lateraliter disposita, ad furcas saepe plura aggregata. Cystocarpia in ramulis terminalia, ramulis paucis involucrata, ex 3 corpusculis composita. Corpuscula antheridiorum ignota.

Japanese name: *Hai-kinuge.*

Hab.: Tōzi.

The present alga was found on the frond of *Callophyllis* sp. cast ashore. At the base, it shows a decumbent habit. It is fastened to the host by means of rhizoids which are very short, one-celled, and placed near the back end of the cells of creeping filaments. From the foremost end of the cells of the creeping filaments, the erect ones issue. In these characteristics, the epiphyte bears a close resemblance to some species of *Spermothamnioneae.*

The erect filaments are 1–2 cm high. No cortical layer is found. The plant is much ramified subdichotomo-pinnately and somewhat distichously. The axils are so acute, that the branching of the tuft becomes very thick. Near the base of the plant, the cells are about 150μ in width, and gradually taper upwards. In the middle, the cells are about 85μ, and in the branchlets they become only about 25μ in width. Through the whole of the frond, the cells are cylindrical and very long, 5–10 times as long as their diameter. The terminal cells are obtuse.

Sporangial and female plants are seen in the collection but there is no male one. The sporangia are undivided and ellipsoid. They are found solitary upon the lowermost cell in the slender and short branchlets of two cells or a few. They grow on the inner side of the branchlet, so that they are sheltered by the branchlet. The sporiferous branchlets appear frequently in pairs (or more) at each dichotomy facing each other. The monosporangia seem superficially to be sessile on the branchlet, but there is usually a discoidal short cell between the sporangium and the lowermost cell of the branchlet. They are ca. 120×65μ in size.

The procarp occurs terminally. As to the development of the

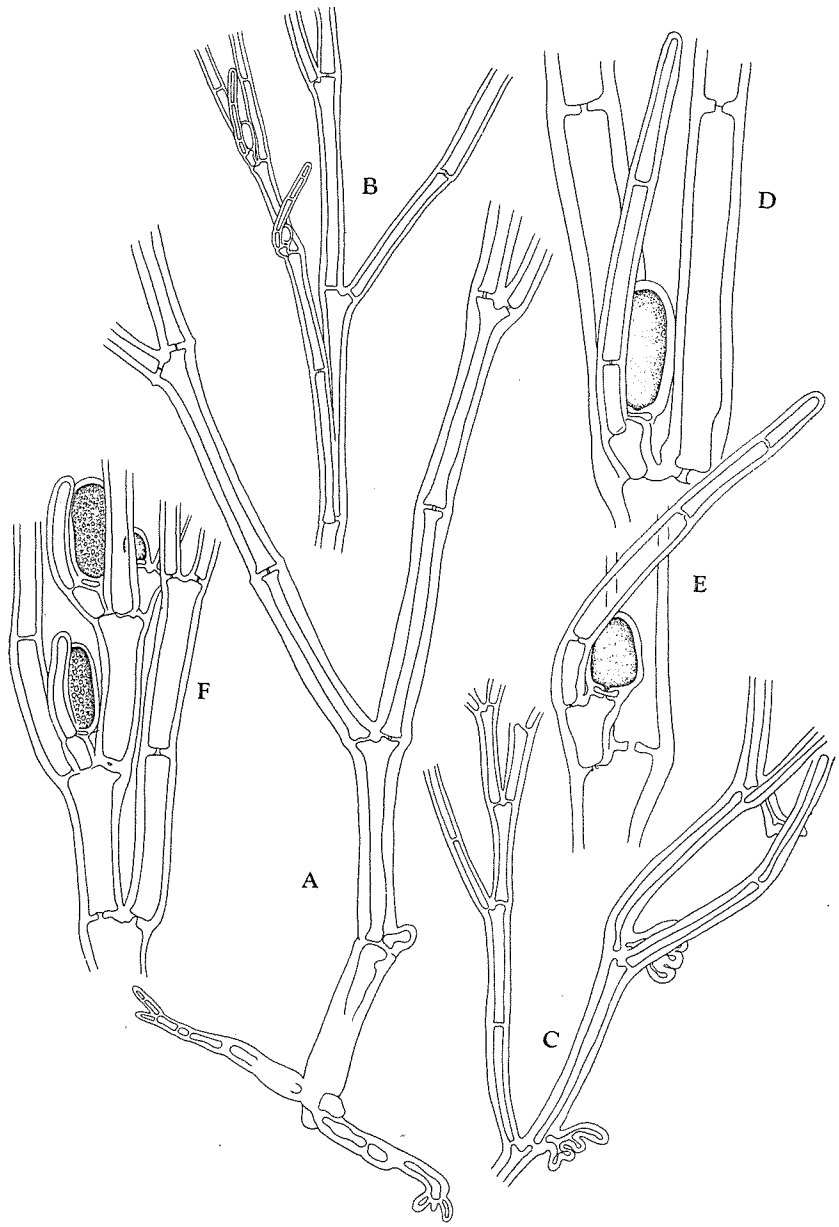


Fig. 12. *Neomonospora sericata* SEGAWA.
A. Lower portion of the frond. ×123. B. Upper portion of the frond. ×123.
C. Creeping filament. ×45. D,E,F. Sporangia. ×191.

cystocarp, the writer has not been able to observe in detail. A cystocarp is composed of three gonimolobes. It is distinctly observed that three lobes come from one (auxiliary?) cell. The cystocarp is surrounded by some 2–3 or more celled involucres.

Among the hitherto described species, there is another species having creeping filaments. It is *Monospora herpestica* VICKERS. The species is rather incompletely described. Considering from its diagnosis, it seems that the present alga differs from that species.

Myriogramme subdichotoma spec. nov.

Plate LVI, 1, and Text-fig. 13.

Frons ca. 2 cm alta, breviter stipitata, monostromatica, cum intervallis brevibus repetite subdichotomo-partita, subdichotome costata, enervosa, venis microscopicis destituta, segmentis ca. 2.5 mm latis, margine undulatis, apice rotundatis vel bifidis. Sori tetrasporangiorum rotundati, in costa vel inter marginem et costam dispositi. Cysctocarpia et antheridia ignota.

Japanese name: *Hime-beniyahazu.*

Hab.: Susaki, Kisami.

The present species was found growing on rocks near the low tide-mark (Kisami), often in tide-pools (Susaki) in a sheltered place.

The alga is very small and about 2 cm in height. The fronds rise from irregularly ramified rhizoids. The basal portion is subterete for a short distance. From the rhizoids and the stalk, some minute proliferous fronds are often developed. The frond is divided repeatedly and subdichotomously at short intervals, and the midrib runs from the base and disappears near the apex. Macroscopic and microscopic veins are absent. The breadth of the segment is about 2.5 cm, and the margin is very undulate.

The transverse section shows that the frond consists of a single

Fig. 13. *Myriogramme subdichotoma* SEGAWA.
Young plant. ×ca. 3,8.

layer of cells except for the midrib portion and the tetrasporangial sorus. of cells except for the midrib portion and the tetrasporangial sorus. Tetrasporangial sori are round in outline and produced on the costa or between the costa and the margin.

The present species shows some likeness to *Myriogramme bombayensis* BOERGESEN[1] in general appearance, though differing distinctly from the latter species in the portion of the sporangial sori.[2] When the species was referred by BOERGESEN to the genus *Myriogramme,* he noted: "This species belongs to a group of species of *Myriogramme* characterized by KYLIN by the presence of vigorous nerves. As the nerves are often dichotomously divided it comes near also to the genus *Schizoseris,* but, to judge from the species referred by KYLIN to this genus, these are all larger forms with the thallus divided into many leaf-like parts and all formerly referred to the genus *Delesseria.* I am much indebted to Professor KYLIN, who has most kindly confirmed my reference of this and the previous species to *Myriogramme.*" For the same reason, the writer has provisionally put it in the genus *Myriogramme.* On the other hand, nevertheless, it seems that the present alga much resembles *Schizoseris dichotoma,*[3] in general appearance.

Vanvoorstia coccinea J. AGARDH

'Sp. III, p. 1271'; DE TONI, Syll. Alg., vol. 4 Florideae, sect. II. Familiae I–IV (1900) p. 754; PAPENFUSS, The structure and reproduction of *Claudea multifida, Vanvoorstia spectabilis,* and *Vanvoorstia coccinea* (Symbolae Botanicae Upsalienses, II: 4) (1937) p. 55, figs. 62–72.

Syn. *Vanvoorstia spectabilis* (non HARVEY) OKAMURA, Nihon-kaisōsi (1936) p. 791, fig. 381; SEGAWA, Mar. Alg. Susaki, II (1936) p. 196.

Syn. *Implicaria reticulata* HEYDRICH, Impl., ein neues Gen. der Delesseriaceen (1902) p. 479, t. 22; DE TONI, Syll. Alg., sect. V (1924) p. 357.

Japanese name: *Karagoromo.*

Hab.: Ōsima; Kōzu-sima; Miyake-zima; Hatizyō-zima.

In his excellent work, PAPENFUSS has reported in detail on the anatomy of two confused species belonging to the genus *Vanvoorstia.*

There is an elegant *Vanvoorstia*-species called by the name *'Karagoromo'* in our territory. OKAMURA had adopted the name of *Vanvoorstia*

1) BOERGESEN: Some Indian Rhodophyceae especially from the shores of the Presidency of Bombay (1931) p. 23.

2) BOERGESEN: A list of marine algae from Bombay (1935) p. 57.

3) KYLIN: Die Delesseriaceen Neu-Seelands (1929) p. 9, pl. 7, fig. 15.

spectabilis for this alga. No discussion has been published by any Japanese phycologists on the nomenclature for a long time. Thus, the writer also reported it from the province of Izu using the name *V. spectabilis*. Now, this is a good chance to solve the confusion.

The blade of the Japanese alga are corticated. The stichidia become cylindrical and the apices do not anastomose with other blades. Furthermore, the stichidia have no wing portion composed of one cell in thickness along the margin. Considering these aspects, '*Karagoromo*' is not *V. spectabilis* by any means, but corresponds to *V. coccinea* in general.

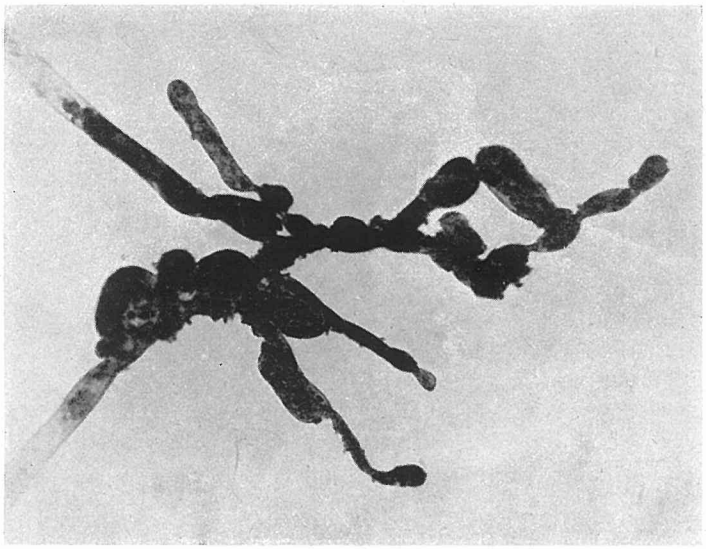
HEYDRICH established a new genus *Implicaria* in 1902. His description and figures show that *I. reticulata* HEYDRICH seems to be identified with *V. coccinea*.

PLATES LV–LVIII

PLATE 55

Pseudochlorodesmis furcellata (ZANARDINI) BOERGESEN.
The base of the thallus. ×100.

Neomonospora sericatus SEGAWA. ×1.



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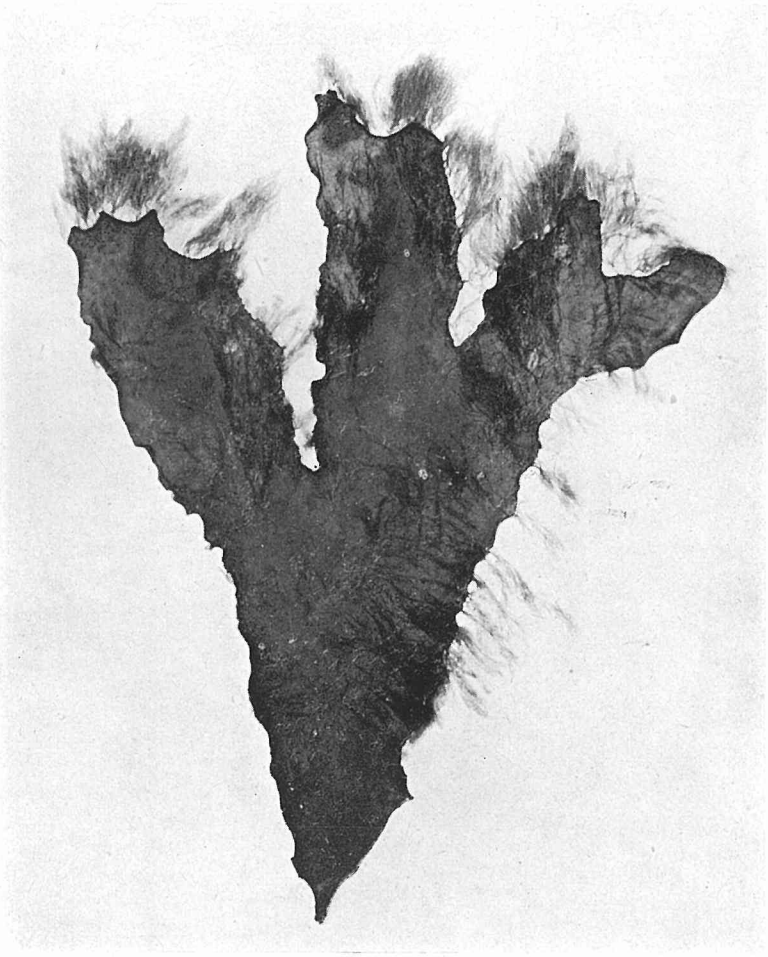

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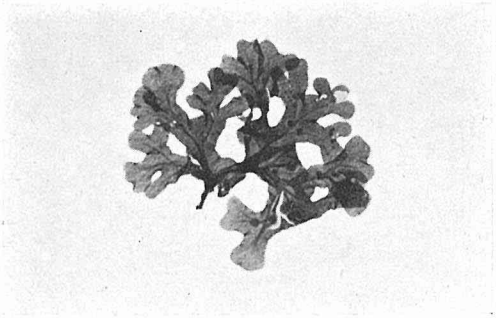
PLATE 56

1. *Myriogramme subdichotoma* SEGAWA. ×1.
2. *Contarinia Okamurae* SEGAWA. ×1.



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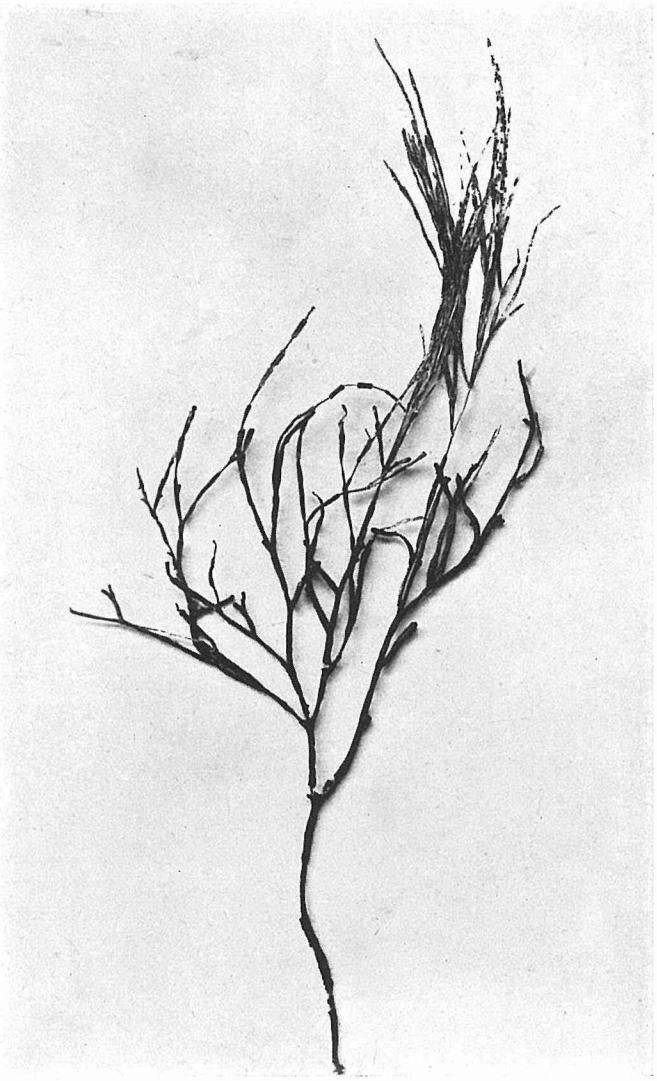

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PLATE 57

Chondrus Yamadae SEGAWA. × ca. ½.

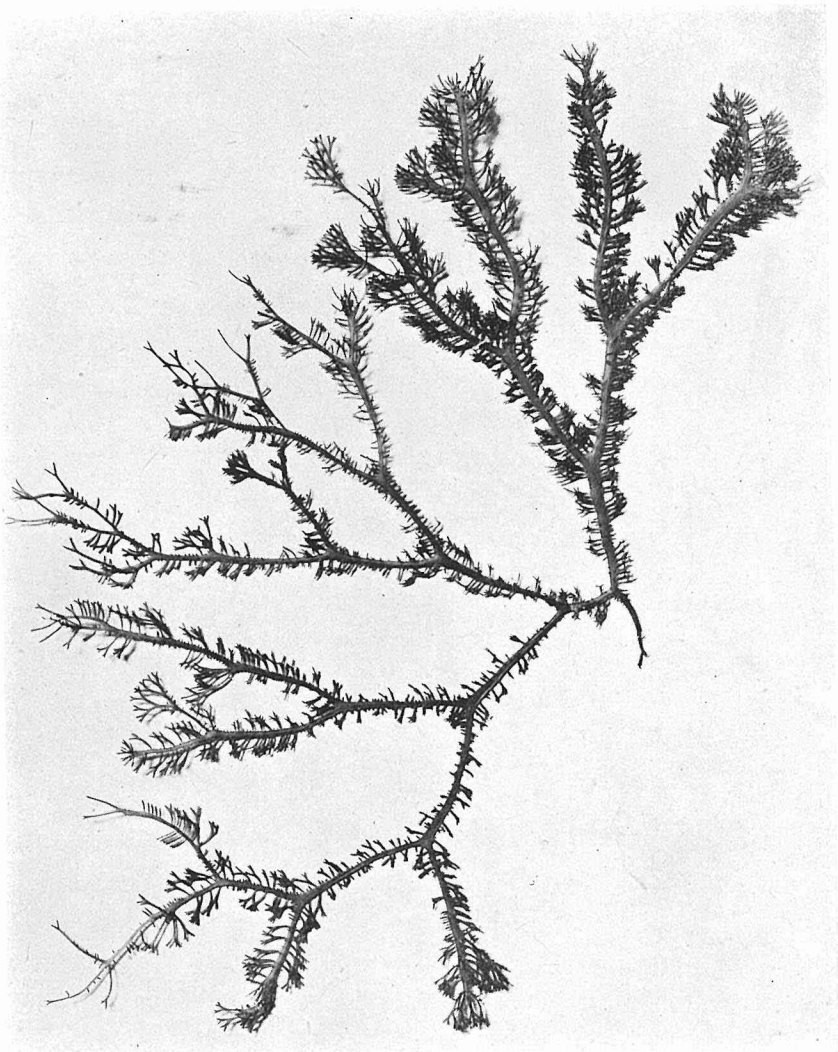
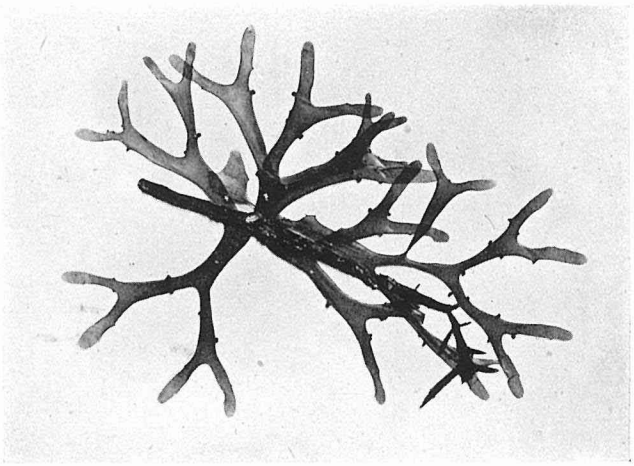


PLATE 58

1. *Fauchea leptophylla* SEGAWA. ×1.
2. *Halichrysis(?) japonica* SEGAWA ×1.



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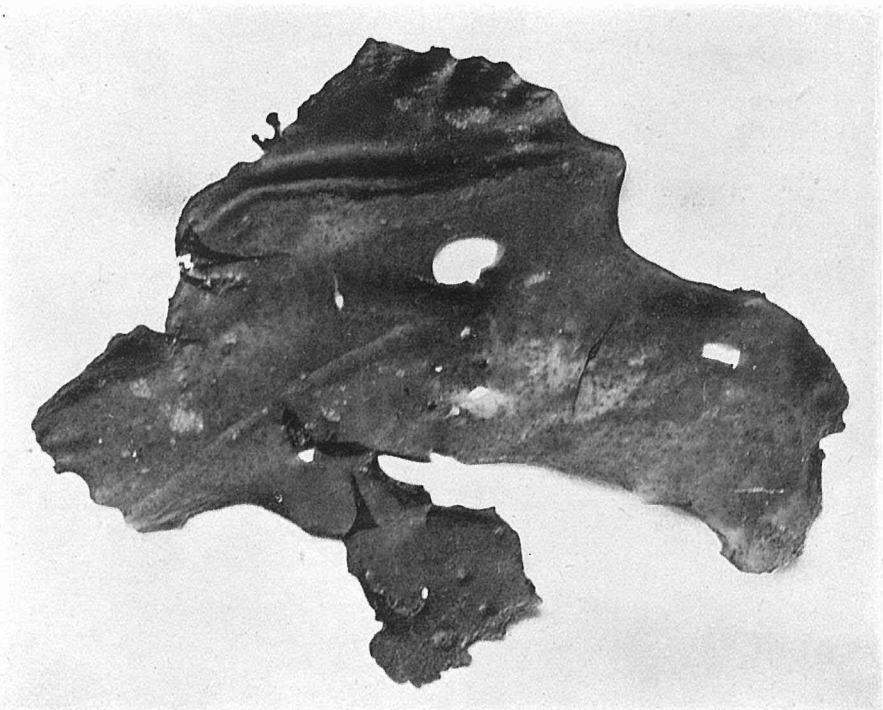

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