HOKKAIDO UNIVERSITY

Title	紅藻よつがさね屬日本產二新種に就て
Author(s)	時田, 郇
Citation	札幌博物学会会報, 12(2-3), 105-113
Issue Date	1932-07-10
Doc URL	https://hdl.handle.net/2115/64017
Type	journal article
File Information	Vol.12No.2-3_008.pdf

Hokkaido University Collection of Scholarly and Academic Papers : HUSCAP

ON TWO NEW SPECIES OF ANTITHAMNION FROM JAPAN

BY

JUN TOKIDA

(With one Plate and 5 Text-figures)

In the algal collection made by me in southern Saghalien in July and August of the year 1930, I found three species of *Antithamnion*, quite sharply distinct from each other viz., *A. Corallina* (RUPR.) KJELLM. from Robben Island, a well-known fur-seal island in the Ochotsk Sea, *A. corticatum* sp. nov. and *A. sparsum* sp. nov. from Lake Tobuchi, an interesting lagoon in Aniwa Bay. The first one of these species I have described in detail in another paper entitled "*The Marine Algae from Robben Island, Saghalien.*[1]" In the present paper I shall describe the latter two species new to science.

So far as I know there have been only three species of *Antithamnion* reported from Japan. One of these is found in the southern-most part of Hokkaido, and the rest on the Pacific side of Central Honshu. During my study on the algae of Saghalien, I have not found any of these already known species present there.

Here I wish to express my sincere thanks to Professor H. KYLIN of the University of Lund, Sweden, for examining my specimens and writing me his opinions with kind advice. I am much obliged also for the kindness of the gentlemen of the Karafuto Agar-Agar Company, especially to Mr. S. MATSUBARA for his valuable assistance.

Antithamnion sparsum sp. nov.

Plate III, Fig. a; Text-figures 1 & 2

Frons 2–4 cm. alta sparse ramosa; rhizoideis numerosis ab segmentis inferioribus vel cellulis basalibus ramorum et ramulorum superiorum emittentibus, raro in apicibus disciformibus; cellulis ramorum principalium pinnis oppositis, superiore latere pectinatis; nulla pinna ramis opposita; ramulis ultimis apice

1.) *Vid.* Bulletin of the School of Fishery, Hokkaido Imperial University. Vol. 2. 1932.

attenuatis sed non acribus saepe cellulis glandulinis ornatis; cellulis ramorum 40-90 μ raro ad 105 μ crassis, diametro 2-5.5-plo longioribus, cellulis basis ramorum quadratis; chromatophoris numerosis disculiformibus; tetrasporangiis in pinnis pedicellatis vel sessilibus, 37.5-57 μ crassis, 60-73 μ altis, cruciatim divisis. Carpogonia et antheridia ignota.

Habitat: Tobuchi Lake, Saghalien (J. TOKIDA, Aug. 1930, No. 423).

Nom. Jap.: *Kinuito-yotsugasane.*

Fronds 2-4 cm. high, attaching to the substratum by means of long rhizoidal filaments arising from the basal segments of the frond; rhizoidal filaments arise also from the basal cells of lateral branches and branchlets in the middle

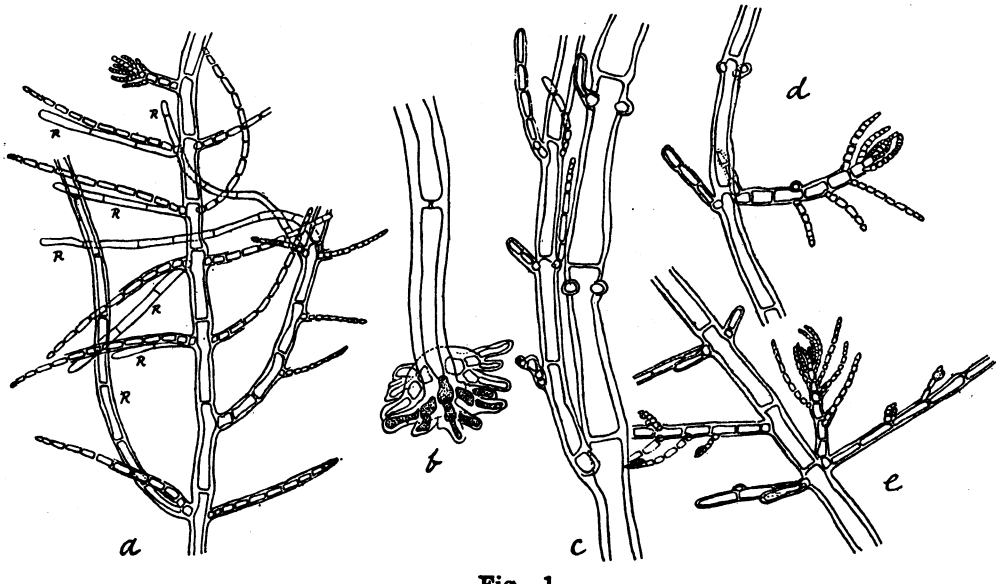


Fig. 1

Antithamnion sparsum sp. nov. *a.* Middle portion of a frond, showing the rhizoids (*R*). *b.* Distal end of a rhizoid with a discoid holdfast. *c.* Lower portion of a frond. *d.* & *e.* Abnormal cases of the position of a branch. a, c, d, & e ×64; b ×159.

as well as the upper part of the frond, a few of them ending with a discoid holdfast; sparingly branched; main branches provided with two opposite branchlets on each cell, these pairs of branchlets not in the same plane but crossing each other at an angle; branchlets pectinate on the upper side; no branchlet opposite a main branch, which terminates with an apical growing point and arises not only on a main branch but in a few cases also on a branchlet; ultimate ramuli with tapering tips but not so sharp, often provided with glandular cells;

in the main branches 45–90 μ rarely up to 150 μ in diam.; basal cells of branches and branchlets quadrate, other cells 2–5.5 times as long as broad; chromatophores numerous, small, disk-shaped; tetrasporangia ovoid, 37.5–57 μ in diam. and 60–78 μ long, pedicellate on branchlets, sometimes sessile on branchlets and ramuli, cruciately divided; sexual reproductive organs unknown.

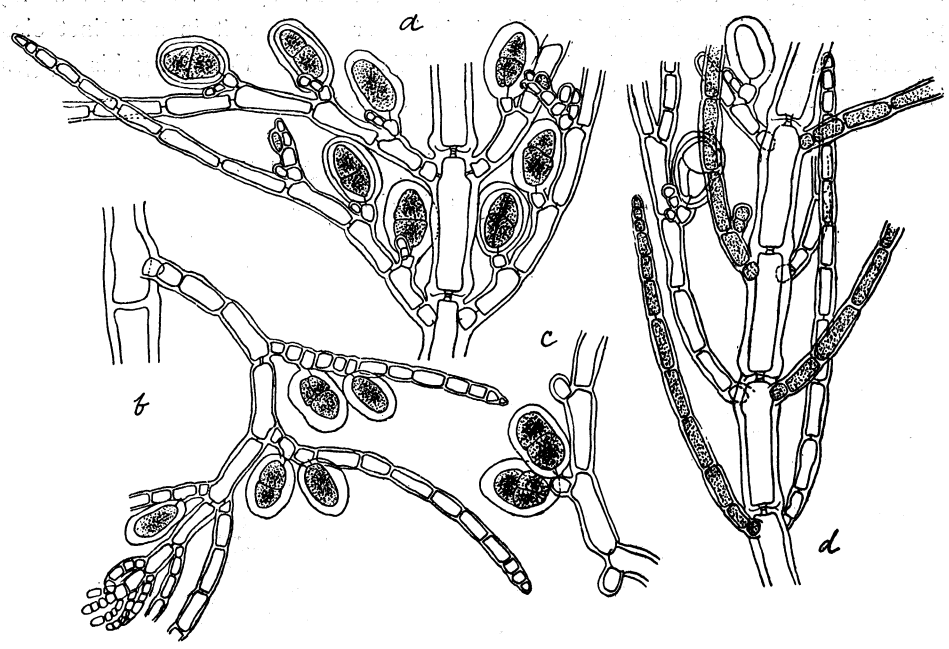


Fig. 2

Antithamnion sparsum sp. nov. *a*. Pedicellate tetrasporangia, and glandular cells. *b*. Sessile tetrasporangia. *c*. Two sporangia on a pedicel. *d*. Upper part of a branch, showing opposite pinnae strictly not distichous. a-d ×155.

On shells of *Ostrea* brought up from a depth of about three fathoms in Lake Tobuchi, this species was found growing side by side with *A. corticatum* described in this paper. One of the distinct characteristics of our plant is that there is no branchlet opposite a main branch. In 1925 Professor H. KYLIN[2] described a new species which has no branchlet opposite a main branch and named it as *A. defectum*. This curious characteristic was thought to be unique in the last mentioned species, until in 1927 two new species were described by

2.) H. KYLIN, (1925), The Marine Red Algae in the Vicinity of the Biological Station at Friday Harbor, Wash., p. 46, f. 27. Lunds Univ. Årsskr. N. F. Avd. 2. Bd. 21, Nr. 9.

Dr. N. L. GARDNER[3] viz., *A. setaceum* GARDN., and *A. pygmaeum* GARDN., which resemble *A. defectum* KYLIN, especially in the absence of branchlets opposite main branches. Comparing the descriptions and figures of these three with ours, I am inclined to think our Saghalien plant is most closely related to the last mentioned species. Professor H. KYLIN kindly examined my specimens writing me that they are closely related to his species, but that as my plant has much longer cells than his it is better to place it in a distinct classification rather than to make it a form of his species. Following his suggestion, I describe here our plant as a new species.

Antithamnion corticatum sp. nov.

Plate III, Figs. b–d; Text-figures 3–5

Fig. 3

Antithamnion corticatum sp. nov. Apical portion of a frond, showing the branching mode. ×67.5.

Frons erecta, 3 cm. alta, distiche decomposita, inferne corticata, superne

3.) N. L. GARDNER, (1927), New Rhodophyceae from the Pacific Coast of North America. IV. & V. Univ. Calif. Publ. Bot., Vol. 13, p. 373 & 413.

ecorticata; rhizoideis ad basin axium principalium a filamentis corticatis continuis affixa; alterne vel subdichotome ramosa; cellulis ramorum pinnis oppositis; pinnis inferne ramulis oppositis superne secundis ornatis; nulla cellula glandulina; ramulis axillaribus ad cellula basales pinnarum laterale oppositis praeter axes ramorum sursum incurvas, saepe ramosissimis; inferne filamentis corticatis intramembranis opposite vel alterne ramosis, a cellulis basis ramorum et pinnarum nunnumquam etiam ramulorum axillarium deorsum emittentibus corticata; ramulis adventitiis brevibus simplicibus vel raro ramosis super corticem sparsis; ramis principalibus ad basin 300–375 μ crassis, sursum attenuatis inferne e cellulis diametro aequalibus, superne 2–4-plo longioribus constitutis; cellulis superioribus lagunculiformibus; pinnis ad basin 21–24 μ crassis; ramulis ultimis ad basin 12 μ crassis, sursum attenuatis apicibus rotundatis cellulis apicalibus 6–9 μ crassis; chromatophoris in cellulis majoribus e fasciculis tenuibus perpendiculis marginibus irregularibus constitutis; tetrasporangiis in ramulis sessilibus vel breviter pedicellatis cruciatim divisis; antheridiis in apicibus pinnarum et ramulorum; ramulis carpogonatis 4-cellularibus in cellulis subapicalibus ramorum.

Habitat: Tobuchi Lake, Saghalien (J. TOKIDA, Aug. 1930, No. 420; S. MATSUBARA, July 1930).

Nom. Jap.: *Beni-hanemo.*

Fronds erect, 3 cm. high, corticated below, ecorticated above, attached to the substratum by means of rhizoids at the extreme base of the main axis, continuous from the corticating filaments, no rhizoids elsewhere; alternately or subdichotomously branched; each cell in the main branches with two opposite branchlets; branchlets distichous, with ramuli on each cell below, except only a few simple youngest branchlets near the growing apex of a branch, lower ramuli opposite, upper ones secund on the lower (outer) side or sometimes also on the upper (inner); glandular cells absent; ramuli sometimes with ramulets; the lowest or axillary ramuli on the basal cell of a branchlet, rarely also one more couple of ramuli on the succeeding cell, opposite laterally and curved upwards along the branch axis, often repeatedly divided; the basal cell of upper branches, rarely that of branchlets as well, provided with one more ramulus on the lower side beside two axillary ramuli above mentioned; main axes corticated below with intra-membranous, branching rhizoidal filaments, emitted downwards from the lower end of the basal cell of branches and branchlets, sometimes also of the axillary ramuli, branching oppositely and alternately; short simple, rarely divided, adventitious ramuli scattered on the cortication; main axes up to 300–375 μ thick near the base, usually thinner than 300 μ below, gradually attenuate upwards, upper cells of main axes often bottle-shaped; branchlets at the base 21–24 μ in diam.; ultimate ramuli 12 μ thick

at the base, slightly tapering toward the apices, with round tips, 6–9 μ thick at the apical cell; lower cells nearly equal in length with the diameter, upper ones 2–4 times as long as the diameter; chromatophores long slender vertical bands with irregular margins in larger cells; tetrasporangia sessile or shortly pedicellate on the upper side of ramuli, cruciately divided; antheridia at the apical portions of branchlets and ramuli; carpogonal branches 4-celled, curved upwards, standing on a supporting cell, which is lateral on the subapical cells of branches.

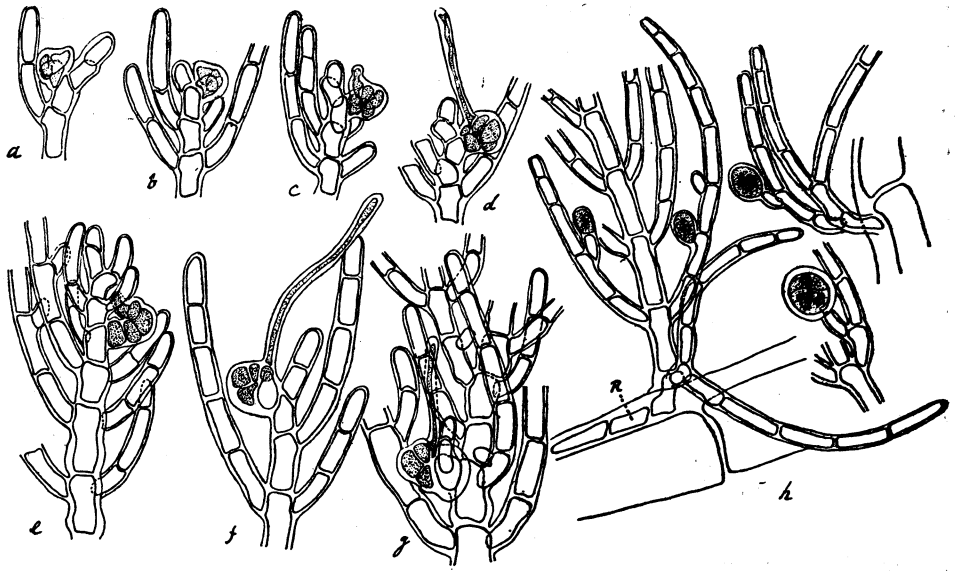


Fig. 4

Antithamnion corticatum sp. nov. *a–g.* Apical portions of branches, showing the carpogonal branches in various stages of development, in *g* the supporting cell is the basal cell of a 3-celled branchlet. *h.* Young tetrasporangia, and a young corticating rhizoidal filament (*R*). a–g ×261; h ×146.

Our plant was found on a shell of *Ostrea*, growing side by side with *Antithamnion sparsum* TOKIDA as already mentioned above, and on the body of *Styela*, in a depth of about three fathoms in Lake Tobuchi. Because our plant is characterized at first glance by the possession of the cortication such as we see in some species of *Callithamnion*, e. g., *C. tetragonum* AG., I searched for corticated species among the *Antithamnion* hitherto known. As far as I could discover, there were only two species, viz., *Antithamnion ? microptilum* (GRUN.) DE TONI and *A. cladodermum* (ZANARD.) HAUCK. Both seem to me

quite different from our plant. I sent my specimens to Professor H. KYLIN who kindly wrote me stating that it was certainly undescribed. The corticated of our plant seems to be unique at present among the *Antithamnion*, while it is perhaps rather common among the *Callithamnion*. A cortical filament appears at first as a single small cell at the lower end of the basal cell of branches and branchlets. These small initials of the filaments are met with even in the upper cells of the main axes; for example, they begin to appear in the 24th cell below the apex. In the specimens collected by myself in August of 1930, there are both female plants with carpogonal branches, and asexual plants with a few small immature tetrasporangia, mostly undivided and 15–27 μ in diam., 24–30 μ long, rarely with a transverse septum and 42 μ in diam., 46.5 μ long. The specimens collected by Mr. S. MATSUBARA in July of the same

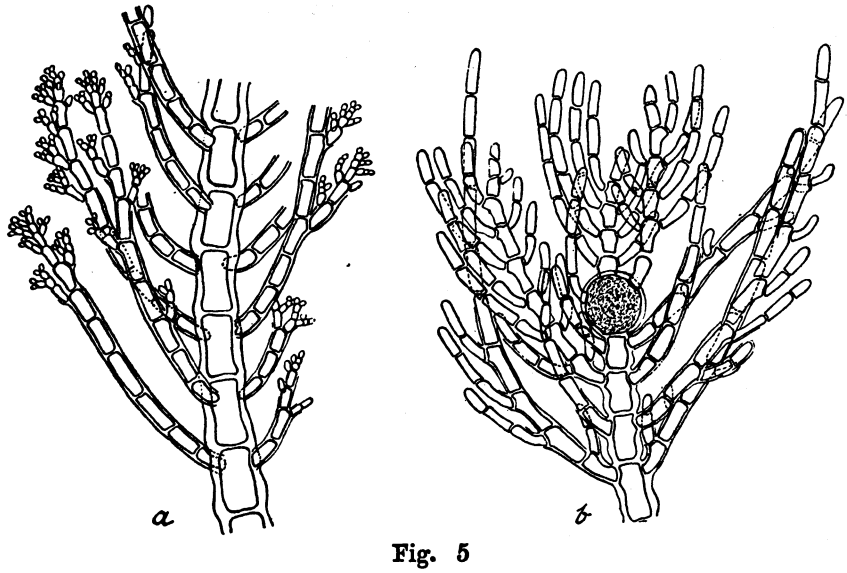


Fig. 5

Antithamnion corticatum sp. nov. *a.* A branch with antheridia. *b.* Apical portion of a branch with a large globular cell probably infected by a parasitic fungus. a–b ×163.

year, are both male and female, the former with mature antheridia. The supporting cell of a carpogonal branch of our female plants is usually a single outgrowth from the subapical axial cell, instead of the basal cell of a branchlet of normal growth as in the case of some other species, for example, *A. plumula* (ELLIS) THUR.,[4] in other words, the fertile branchlets or "Tragäste"

4.) Cf. H. KYLIN, (1930), Ueber die Entwicklungsgeschichte der Florideen, f. 47, A–D. Lunds Univ. Årsskr. N. F. Avd. 2, Bd. 26, Nr. 6.

after SCHUSSNIG[5] in our female plants are much reduced, mostly represented by only a single supporting cell or the mother cell of the auxiliary cells, but rarely composed of about three cells, the undermost of which is the supporting cell. According to Professor H. KYLIN[6] *A. pacificum* (HARV.) KYLIN has reduced "Tragäste" composed of 2–3 cells. In either case, the carpogonal branch curves upward along not the lateral but the outer side of the supporting cell. This direction of the branch somewhat resembles that of *A. nigricans* GARDN. described by Dr. N. L. GARDNER[7].

In conclusion, it would be well to add that some intercalary cells of the branches are seldom enlarged to become spherical in shape, up to about 60 μ in diameter, with granular and hyaline contents. These bodies seem to me to be due to a parasite, most probably of Chytridinaceous fungus. They are often found empty with a small round opening. The contents are rarely divided into a few zoospore-like masses. Sometimes there occurs a branch, probably attacked by the same parasite, composed of large moniliform cells with hyaline granular contents.

October, 1931.

Botanical Loboratory, School of Fishery,
Hokkaido Imperial University,
Sapporo, Japan.

Explanation of Plate

a. *Antithamnion sparsum* sp. nov. Apical portion of a frond, showing the branching mode. ×67.5

b–d. *Antithamnion corticatum* sp. nov. b. A carpoganal branch on the subapical segment of a branch. ×300

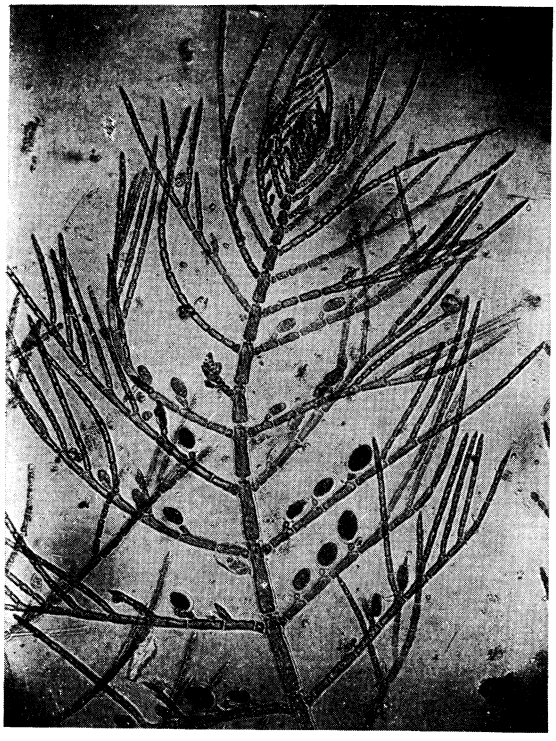
c. Middle portion of a frond, showing axillary ramuli and corticating filaments. ×300

d. Portion of a branch, showing the initials of corticating filaments. ×300

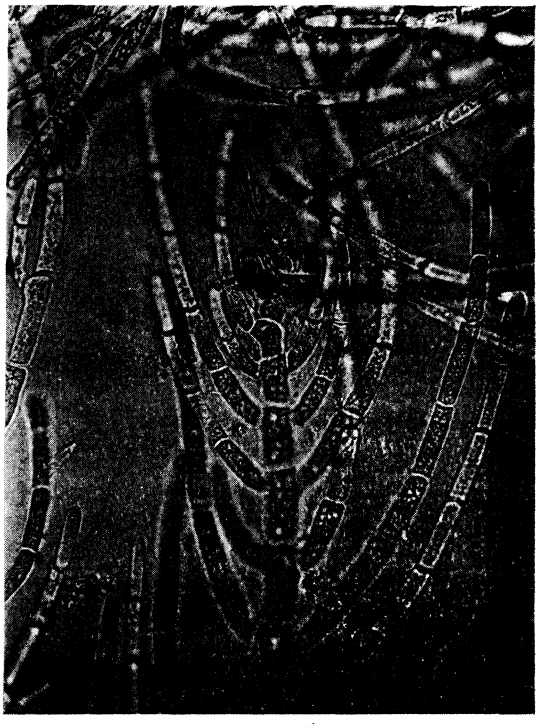
5) Cf. H. KYLIN, (1930), l. c., p. 69.

6.) Cf. H. KYLIN, (1930), l. c., f. 47, H-I.

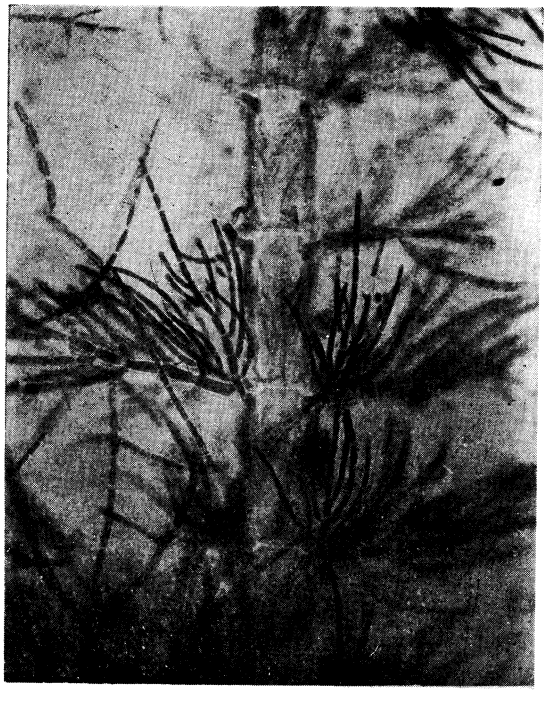
7.) N. L. GARDNER, (1927), New Rhodophyceae from the Pacific Coast of North America. V, p. 409. Univ. Calif. Publ. Bot., Vol. 13, No. 19.



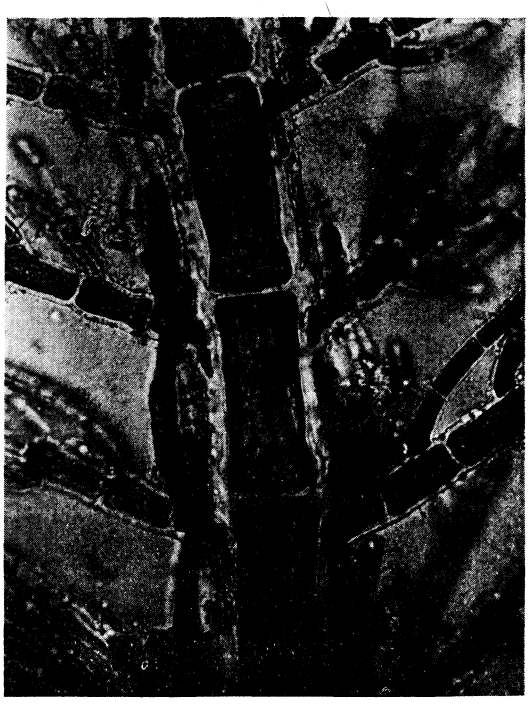
a



b



c



d

摘　　要

紅藻よつがさね屬日本産二新種に就て

時　田　　郁

本邦領有南部樺太島沿岸に産する海藻を研究中、昭和五年の夏、予は紅藻類いぎす科 *Ceramiaceae* に屬するヨツガサネ屬 *Antithamnion* 三種を發見せり。即ち、海豹島にて *Antithamnion corallina* (RUPR.) KJELLM. を、遠淵湖(亞庭灣內)にて二新種 *A. corticatum* 及び *A. sparsum* を採集したり。此の中第一種は日本新産にして、予は之を『海豹島の海藻』(水產研究彙報第二卷)と題する別の論文に發表せり。玆には後の二新種を紹介せんとす。

今日まで本邦産として報告されたるヨツガサネ屬は三種あり。何れも樺太にて採集したること無し。

スエーデン國、ルンド大學の教授ハラルド・シリン氏 (Prof. HARALD KYLIN) は、余の送附せる標本を親しく檢し、氏の意見を書送られたり。玆に氏の好意に對して深甚なる感謝の意を表す。余は亦、遠淵湖畔に一工場を有する樺太寒天合資會社の社員諸氏の厚情、殊に松原庄介氏の助力に負ふ所大なり。

Antithamnion sparsum TOKIDA. キヌイトヨツガサネ

第1及2圖、第三圖版a圖、標本番號 423 (時田採集)

本種は主枝に對生する羽枝を缺く性質に於て *A. defectum* KYLIN, *A. setaceum* GARDNER 及び *A. pygmaeum* GARDNER に似たり。而して、此の內 KYLIN の種に最も近し。KYLIN は余の標本を調べ、本種が著く長き細胞を有する點に於て氏の種と異り、多分別種とするを可とすべしとの意見なり。氏の說に從ひて今之を新種とす。即ち枝の基部細胞は短く方形なれど他の細胞は徑の 2-5.5 倍長し。体の高さ 2-4 糎、根樣絲を以て地物に附着し、根樣絲の或ものは先端盤狀となる。約3尋の水底にあるカキの介殼に着生す。主枝の太さは 45-90 μ 稀に 105 μ に達す。僅かに分岐し、主枝は各細胞に對生する二羽枝を有す。羽枝の上側には各節より小枝櫛比す。最末小枝の先端は細くなれども尖らず腺狀細胞を俱ふ。色素体は小盤狀にして多數あり。四分胞子囊あり、十字樣に分裂す。有性生殖器官は未詳。

Antithamnion corticatum TOKIDA. ベニハネモ

第3及4圖; 第三圖版 b-d 圖、標本番號 420 (時田)、419 (松原採集)

本種は体の下部に *Callithamnion* 屬に見る如き皮層を有することを著しき特徵とす、即ち、枝、羽枝の基部より發して主枝の細胞膜內を分岐しつゝ下向する根樣絲より成り、往々表面より、不定小枝を散在的に生じ、体の基部に於ては根樣絲は下に伸長して根となり、カキの殼或はエボヤの体上に着生す、体の高さ3糎、直立す、屢々互生又は稍叉狀に分岐し、主枝は各節に對生する二羽枝あり、羽枝は二列に生じ、更に小枝を有す、羽枝の基部細胞より生ずる腋生小枝は側方に對生して、枝の軸に沿ふて上方に曲り、屢々分岐す、主軸は下部に於て徑 375μ に達し、上方に次第に細く、上部の細胞は屢々壜形を呈す、最末小枝は基部の徑 12μ, 先端丸し、体の下部細胞は殆ど徑と同長、上部のものは徑の 2-4 倍長し、色素体は多數あり大形細胞內にては、縱に細長き帶狀にしてその緣邊不規則に凹凸あり、四分胞子囊、精子器、胎原列あり別々の個体に生ず、胎原列は4個細胞より成り枝の先端に近き細胞に側生する一個の支持細胞(稀に 2-3 個細胞より成る矮小枝の基部細胞)に立ち、支持細胞の外側に沿つて上方に屈曲す。

稀に枝の一部又は或る細胞が肥大して略々球狀となり、顆粒狀內容を有し、紅色を失へるものあり、往々內容數個に分裂し、又一小孔を以て空虛となれり、之は多分或種菌類の寄生したるものならん。

昭和六年十月　　北海道帝國大學附屬水產專門部植物學教室