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CEININA JAPONICA (N. GEN., N. SP.),
A NEW ABERRANT SPECIES OF THE AMPHIPODAN
FAMILY TALITRIDAE FROM JAPAN

BY

K. STEPHENSEN

(Zoological Museum, Copenhagen)

(With four text-figures)

The Amphipods which form the subject of this paper were sent for examination by my colleague Dr. MASUZO UÉNO of the Ôtsu Hydrobiological Station, Ôtsu, Shigaken, Japan; they turned out to be types of a new rather aberrant genus of the family Talitridae.

* * *

Locality. Yoichi, Hokkaidô (the coast of the Sea of Japan), penetrating into the stem of the brown alga *Undaria pinnatifida*. A few ♀ ovig., collected by T. KINOSHITA, June 1933. There were no ♂ in the material.

For diagnosis of the genus, see below.

Description of ♀ ovig. Length up to 7 mm.

The body has the back evenly vaulted and is not compressed as usually in the Amphipods; it is more Isopod-like.

The head is rather broad and Isopod-like, anteriorly somewhat narrowing, and with small but marked subantennal corners. There is no rostrum. The eyes are oval, medium-sized, black (in spiritus). The antennae are short, not longer than the head. Antenna 1 has in all 7 joints, decreasing in length and breadth from no. 1 to no. 6; the apical (7.) joint is very minute. Antenna 2 is about as long as antenna 1; (1.+) 2. joints are very thick, globose; of the following 3 joints of the peduncle, the ultimate joint is much longer than the others; the flagellum has only two, very short joints.

The upper lip is small, with the under margin straight; the lower lip has the ordinary shape, without inner lobes, but with some setae on the lateral angles. The mandibles are stout, with a rather straight but somewhat dentate cutting edge, but without any trace of molar tubercle. There is a small process on the outer side, but no palp. Each mandible has a lacinia mobilis with 4 sharp teeth, but no spines behind this, and there does not seem to be any difference between the lacinia of the left and of the right mandible. Maxilla

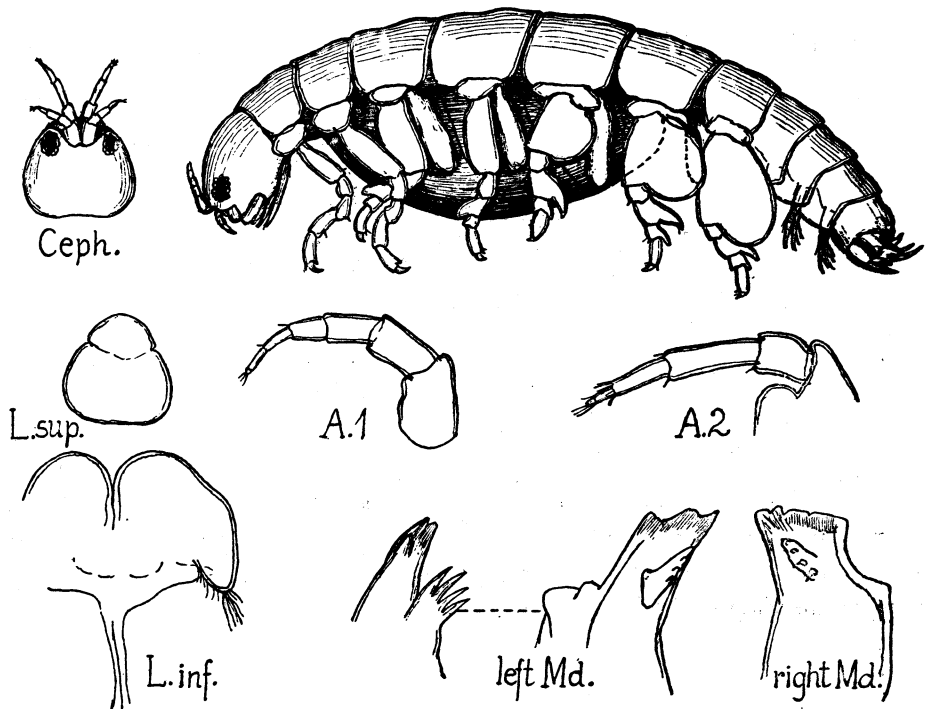


Fig. 1. *Ceinina japonica* n. gen., n. sp. ♀

Antenna 1-2 (A. 1-2), the head (Ceph.), upper and lower lip (L. sup., L. inf.), and the two mandibles (Md.). The left mandible is drawn seen both from the upper (dorsal) side and from the inner side.

1 has the outer lobe very strong, terminating in 8 strong, more or less denticulated spines; the inner lobe is somewhat shorter, rather narrow, terminating in a single seta. There is no palp. Maxilla 2 in normal, with the lobes equally broad and nearly of equal length; the outer lobe terminates in 5 stronger and 5 shorter and slender spines; the inner lobe has 6 (2 or 3 strong, 4 or 3 more slender) spines; the median spine is more or less kneed and not alike in the maxillae, rather short and extremely heavy or very long and acute. The maxillipeds are rather normal, with the outer and inner lobes of nearly the same length and breadth; the inner lobes are truncate, each terminating in (reckoned from the lateral to the median edge) 1 or 2 very short and blunt teeth, a few (3-5) spines, and 2 triangular teeth; the outer lobe has a few setae or spines. The palp has the usual 5 joints, decreasing in breadth from no. 1 to no. 5; nos. 1-3 are of nearly equal length, no. 4 somewhat shorter, no. 5 (the finger) rather short; none of the joints has any process or the like.

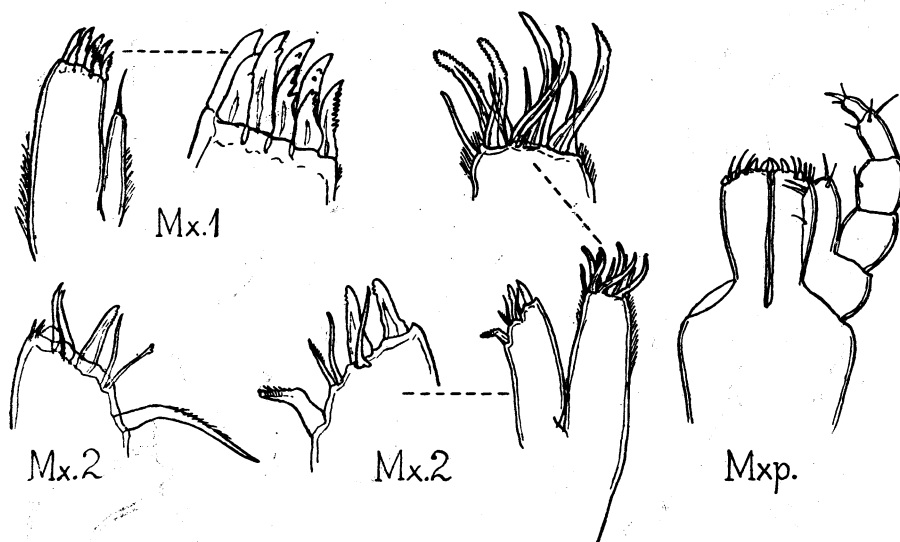


Fig. 2. *Ceinina japonica* n. gen., n. sp. ♀
Maxilla 1-2 (Max. 1-2) and maxillipeds (Mxp.).

All the pereopods are rather short, and all the side plates are small, short, and not in continuity. Pereiopod 1 has all the joints of nearly the same breadth (except the finger); 2. joint is rather long, longer than 3.+4. joints combined. 5. joint is about as long as the 2 preceding joints combined and as long as the 6. joint, which has the margins almost parallel, with the hinder apical corner triangular and a little protruding, with a very short palm; thus the limb is not really subchelate. The finger is much longer than the breadth of the 6. joint, with the apex partly covering a rather strong spine. Pereiopod 2 is quite like per. 1, but somewhat longer. Pereiopods 3-4 have rather short 2. and 3. joints; 4. joint is somewhat longer, with the lower fore-corner somewhat protruding; 5. joint is very short, 6. joint longer, the finger rather short and very strong. Pereiopods 5-7 increase in length from no. 5 to no. 7; this is due to the different length of the broad 2. joint. The side plates of these legs are equally as deep as those of per. 1-14; that of per. 5 is bilobate, but the hind-lobe not deeper than the fore-lobe. In pereiopod 5, 2. joint is almost circular in outline (but with the fore-margin straight); 3. joint is very short, 4. joint somewhat longer, with the lower hind corner very elongate; 6. joint is very broad; the finger very short and stout. Pereiopod 7 has nearly the same shape as per. 5, apart from 2. joint which is rather elongate, with the hind-lobe nearly as long as the two next joints combined.

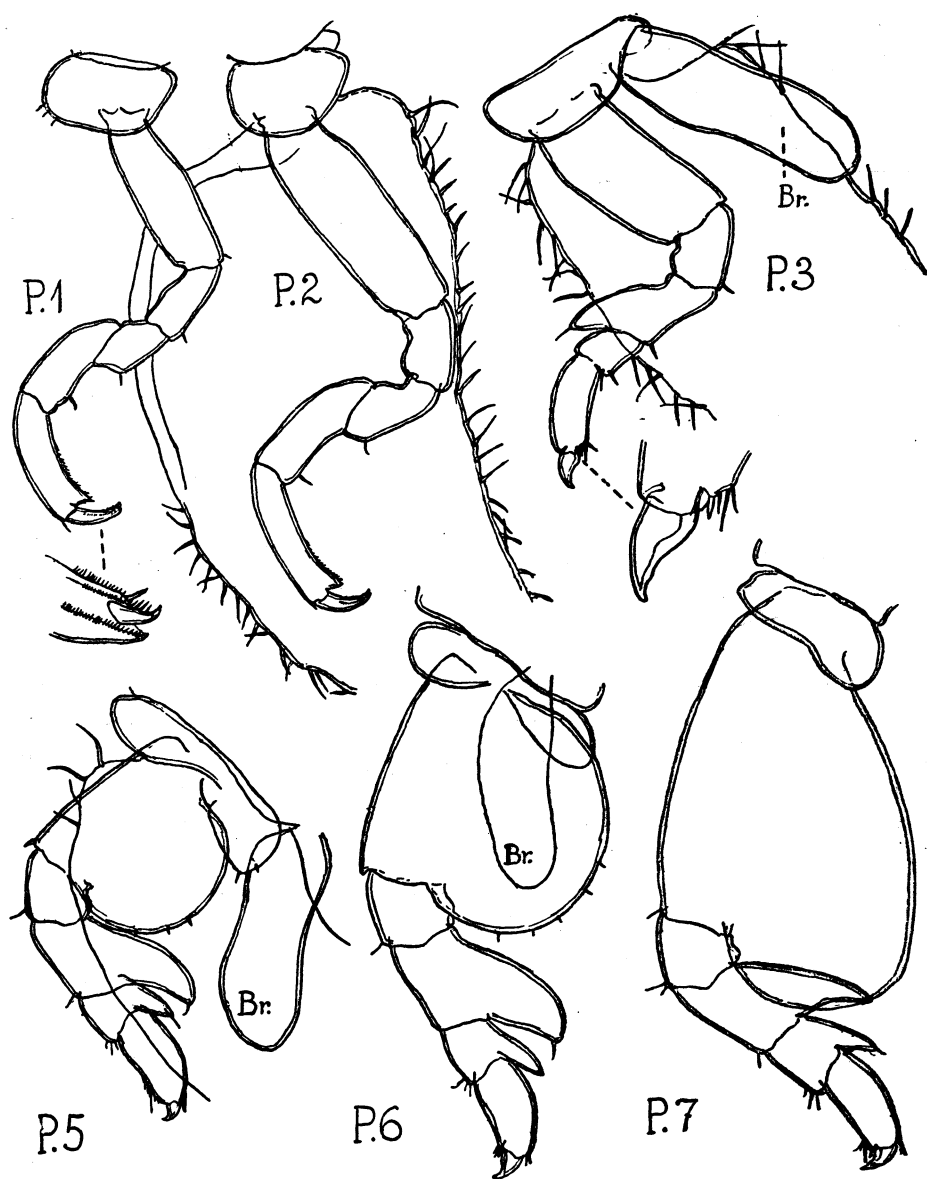


Fig. 3. *Ceinina japonica* n. gen., n. sp. ♀
 Pereopods 1-3 and 5-7 (P. 1-3, 5-7) Br.=the branchiae.

There are 4 pairs of simple and rather short gills on pereiopods 3-6. The brood-pouch has 4 pairs of long marsupial plates, on per. 2-5, with very short setae on the margins.

The epimeral parts of the metasome segments have the lower hind corners almost rectangular. The pleopods have the peduncles almost quadrate in outline, very broad; the outer rami are normal, with few articulations; the inner rami are rather contorted and somewhat broader.

1. urosome segment is as long as the metasome segments and dorsally covers the two next segments and the telson. 2. and 3. urosome segments are rather short and probably coalesced. Uropod 1 has a short, broad peduncle and two simple rami, of which the outer ramus is a trifle longer than inner. Uropod 2 is not different from urop. 1. Each uropod 3 is reduced to a single more or less circular lobe with a single or very few setae.

The telson consists of two somewhat circular or rectangular thick lobe; it is totally covered with the dorsal process of 1. urosome segment.

No trace of colour was kept, except in the black eyes.

The genus *Ceinina* may be characterized as follows (but unfortunately the male is not known). The body somewhat cylindrical, Isopod-like, not compressed. The side plates very small and shallow, not contiguous. Antenna 1-2 (in ♀) very short, consisting of only

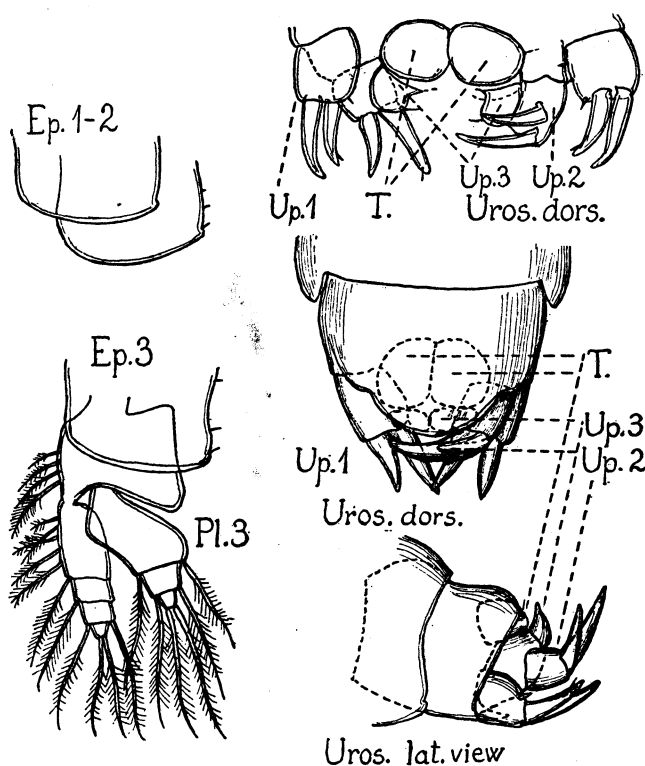


Fig. 4. *Ceinina japonica* n. gen., n. sp. ♀

Epimeral parts of 1-3. metasome segments (Ep. 1-3), pleopod (Pl. 3), and urosome in dorsal and lateral view (Uros.). In the upper fig. of the urosome in dorsal view the dorsal part of 1. urosome segment is omitted; in the lower fig. of the same, the left uropod is omitted (T.=the two lobes of the telson; Up. 1-3=uropod 1-3).

very few joints. The upper lip is distally straight; the lower lip has a tuft of setae on the lateral angles. The mandibles have no molar process. Maxilla 1 has no palp; the inner lobe is not very short, with 1 apical seta. Maxilla 2 is normal. The maxilleipeds have the inner and outer lobes of equal length; the palp is normally with 5 joints, none of them with apical process. Pereiopods 1-2 (in ♀) quite alike, somewhat subchelate, but with the palm very short (the finger much longer); pereiopods 3-7 have 4. joint rather expanded and apically projecting; pereiopods 5-7 have 2. joint very expanded. Simple gills on pereiopods 3-6, marsupial plates on pereiopods 3-6, marsupial plates on pereiopods 2-5. The pleopods have the peduncles very broad. Uropod 1-2 normal; uropod 3 each reduced to a small lobe. Urosome segments 2-3 coalesced (?); telson bilobate, cleft to the base.

Affinities of the genus, etc. This new genus is most closely allied to the genus *Ceina* DELLA VALLE, with a single species. *C. egregia* (CHILTON), living at the roots of kelp and on various sea-weeds near low tide-mark off New Zealand; for description etc., see especially CHILTON 1919a, with 25 figs. (and STEBBING 1906, p. 554).

The two genera are different as to several characters: in *Ceina*, for instance, the back is carinate, the side plates are deep and contiguous, pereiopods 1-2 are distinctly subchelate in ♀ (per. 1 in ♂ is chelate); pereiopod 2 in ♀ has both gill and brood plate. But they agree in the want of molar process in the mandibles, in the want of palp in maxilla 1, and in the very reduced uropod 3 consisting only of a single joint.

The very shallow side plates of the pereiopods are a character found in several other Amphipods living in cylindrical tubes, for instance *Siphonoecetes*, *Corophium* and *Chelura*.

The habitat of the new genus is very interesting, for previously only one boring Amphipod is known, viz. *Chelura* (see CALMAN 1921, p. 219 and CHILTON 1919b, p. 6).

The generic name *Ceimina* was chosen in allusion to the similarity with *Ceina*.

Literature

- CALMAN, W. T. 1921: Notes on marine wood-boring animals. II. Crustacea.—Proc. Zool. Soc. London, 1921, pp. 215-220.
- CHILTON, Charles. 1919a: *Ceina*, an Aberrant Genus of the Amphipodan Family Talitridae.—Trans. New Zealand Inst'tute, vol. 51, Wellington, N. Z., 1919, pp. 118-129.
- 1919b: Desctructive boring Crustacea in New Zealand.—The New Zealand Jour. of Sci. and Technology, vol. 2, no. 1, Wellington, N. Z., 1919, pp. 3-15 (with literature).
- STEBBING, T. R. R. 1906: Amphipoda I. Gammaridea.—Das Tierreich, Lieferung 21.

CONTRIBUTIONS TO THE FLORA OF NORTHERN JAPAN II

BY

KINGO MIYABE AND MISAO TATEWAKI

10. *Hymenophyllum Wrightii* V. D. BOSCH: MIYABE & KUDO, Fl. Hok. & Saghal. I. (1929), 5; Krysholovich, in Bull. Jard. Bot. Prim. de URSS. XXIX. (1930), 412.

NOM. JAP. *Kokeshinobu*.

HAB. *S. Saghalien*. Toyohara, Horo (Y. KIKKAWA, XI. 15, 1929).

N. Saghalien. Alexandrowsk, on the Rivers Akzngy, Mudjunay & Egranvis (A. Krysholovich, 1918, 1929),

11. *Asplenium Trichomanes* L. Sp. Pl. ed. 1, (1753), 1080; LEDEB. Fl. Ross. IV. (1853), 521; HOOK. & BAK. Syn. Fil. (1874), 196; BRIT. & BR. Ill. Fl. Nor. Am. I. (1896), 24; DIELS, in ENGL. u. PR. Nat. Pfl.-fam. I: 4. (1902), 235, *Fig. 126, C*; MATSUM. Ind. Pl. Jap. I. (1904), 272; CHR. Ind. Fil. (1906), 135; HEGI, Ill. Fl. Mittel-Europ. I. (1906), 26, *Taf. 5, Fig. 2*; FOMIN, Fl. Sib. Or. Extr. (1930), 144; MAKINO & NEMOTO, Fl. Jap. ed. 2, (1931), 27.

NOM. JAP. *Chasen-shida*.

HAB. *Yezo*: Kanayama, Prov. Ishikari (S. ITO, VIII. 1932).

Remarks. New to the flora of Hokkaido & Saghalien.

12. *Polypodium hastatum* THUNB. form. *pygmaea* MAXIM.: MIYABE & KUDO, Fl. Hok. & Saghal. I. (1920), 41.

NOM. JAP. *Chabo-mitsudeuraboshi*.

HAB. *Yezo*: Mt. Oputateshike, Kutcharo, Prov. Kushiro (M. TATEWAKI & T. SASAKI, VIII. 17, 1933).

13. *Lycopodium cryptomerinum* MAXIM.: MIYABE & KUDO, Fl. Hok. & Saghal. I. (1929), 53.

NOM. JAP. *Sugiran*.

HAB. *Yezo*: Mt. Rokutsu, Prov. Iburi (K. TOGASHI, V. 9, 1933).

14. *Pulsatilla angustifolia* TURCZ. var. *nipponica* TAKEDA, Alp. Pl. (1933), 55, *pl. 234, 244*.

Anemone Taraoi TAKEDA, var. *nipponica* TAKEDA, in Journ. Bot. XLVIII. (1910), 267.

Pulsatilla nipponica OHWI, in Acta Phytotax. et Geobot. I. (1932), 36; TATEWAKI, *ibid.* II. (1933), 87.

NOM. JAP. *Tsukumogusa*.

HAB. *Yezo*: Mt. Pipairo, Hidaka Ranges (Y. TOKUNAGA & M. SAKAMOTO, VII. 8, 1929; Y. HOSHINO, IX. 3, 1933); Mt. Ashibetsu, Yubari Ranges (S. NISHIDA & H. YANAGISAWA, VIII. 3-5, 1913); Mt. Nipesotsu, Central Ranges (Y. TOKUNAGA, VII. 31, 1932); Mt. Horonupuri, Kitami Ranges (M. TATEWAKI, VII. 1933); Mt. Rishiri (T. KAWAKAMI, VIII. 1899).

15. *Saxifraga bracteata* D. DON: MIYABE & TATEWAKI, in Trans. Sapporo Nat. Hist. Soc. XIII.-I. (1933), 1.

NOM. JAP. *Kiyoshiso*.

HAB. *S. Saghalien*: Shikka, Shibunkoro (Y. HOSHINO & S. SUGIYAMA, VIII. 6, 1933); Nosuki (Y. OKADA, VII. 21, 1933).

Remarks. New to the flora of Saghalien.

16. *Gentiana yuparensis* TAKEDA, in Not. Roy. Bot. Gard. Edinb. VIII. (1915), 234; MAKINO & NEMOTO, Fl. Jap. ed. 2, (1931), 950.

form. *albiflora*.

Flores albi.

NOM. JAP. *Shirobana-yubaririndo*.

HAB. *Yezo*: Mt. Yubari, Prov. Ishikari (T. HARADA, VIII. 9, 1933).

17. *Campanula dasyantha* BIED. form. *albiflora*

Flores albi.

NOM. JAP. *Shirobana-chishima-gikyo*.

HAB. *Kuriles*: Iyema, Isl. Urup (Y. YAMADA, VIII. 1933).

18. *Campanula lasiocarpa* CHAM. in Linnaea IV. (1829), 39; KUDO, Fl. Isl. Paramushir, (1922), 163; HULT. Fl. Kamtschat. IV. (1930), 150; KOMAR. Fl. Pen. Kamtschat. III. (1930), 113; TATEWAKI, in Trans. Sapporo Nat. Hist. Soc. XI. (1931), 206.

NOM. JAP. *Iwa-gikyo*.

HAB. *S. Saghalien*: Shikka, in the alpine region about 40 kilom. west of Hoya (A. HIRUTA, VII. 22, 1933).

Remarks. New to the flora of Saghalien.

19. *Chrysanthemum Pallasianum* KOMAR. Fl. Mansh. III. (1907), 645; KUDO, Rep. Veg. Nor. Saghal. (1924), 233.

Artemisia Pallasiana FISCH. ex BESS. in Nouv. Mém. Soc. Nat. Mosc. III. (1834), 61; DC. Prodr. VI. (1837), 116; RGL. et TIL. Fl. Ajan. (1859), 103.

Tanacetum Pallasianum TRAUTV. et MEY. Fl. Ochot. (1856), 55, *Tab. 27*; MAXIM. Prim. Fl. Amur. (1859), 163; RGL. et MAACK, Fl. Ussur. (1862), 97.

Pyrethrum Pallasianum MAXIM. in Mém. Biol. VIII. (1872), 514.

NOM. JAP. *Oku-iwainchin*.

HAB. *S. Saghalien*: Shikka, Mt. Niitō (A. HIRUTA, IX. 1933).

Remarks. New to the flora of northern Japan.

20. *Ruppia spiralis* L. herb.; DUMORT. Fl. Belg. (1827), 164; HULT. Fl. Kamtchat. I. (1927), 80.

Ruppia maritima L. subsp. *spiralis* ASCHERS. et GRAEBN. Syn. Mitteleurop. Fl. I. (1896-98), 356; GRAEBN. in ENGL. Pfl.-reich. IV: 11. (1907), 142, *Fig. 30, A-G*.

Ruppia maritima L. var. *spiralis* HEGI, Ill. Fl. Mittel-Europ. I. (1906), 140.

NOM. JAP. *Nejiri-kawatsurumo*.

HAB. *S. Saghalien*: Shikka, Higashi-taraika (H. OHTANI & I. IMAI, VIII. 2, 1930).

Remarks. New to the flora of Hokkaido & Saghalien.

21. *Zannichellia palustris* L. Sp. Pl. ed 1, (1753), 969.

var. *repens* KOCH, Syn. ed. 1. (1837), 679; HEGI, Ill. Fl. Mittel-Europ. I. (1906), 141, *Taf. 17, Fig. 6*; HULT. Fl. Kamtchat. I. (1927), 81, in nota; KOMAR. Fl. Pen. Kamtschat. I. (1927), 124.

Zannichellia repens BOENN. Prodr. Fl. Monast. (1824), 272.

Zannichellia palustris L. subsp. *genuina* ASCHERS. et GRAEBN. var. *repens* ASCHERS. et GRAEBN. Syn. Mitteleurop. Fl. I. (1896-98), 362; GRAEBN. in ENGL. Pfl.-reich. IV: 11. (1907), 155.

NOM. JAP. *Kita-itokuzumo*.

HAB. *S. Saghalien*: Shikka, Higashi-taraika (H. OHTANI & Y. IMAI, VIII. 2, 1930).

Remarks. New to the flora of Saghalien & Hokkaido.

22. *Vallisneria spiralis* L.: MIYABE & KUDO, Fl. Hok. & Saghal. II. (1930), 103.

NOM. JAP. *Sekishomo*.

HAB. *S. Saghalien*. Odomari, Chipisani (S. SUGAWARA, IX. 25, 1930).

Remarks. New to the flora of Saghalien.

23. *Eriophorum alpinum* L.: MIYABE & KUDO, Fl. Hok. & Saghal. II. (1930), 198.

NOM. Jap. *Miyama-sagisuge*.

HAB. *S. Saghalien*: Shikka, Shibunkoro (Y. HOSHINO, VIII. 4, 1933).

Remarks. New to the flora of Saghalien.

24. *Cypripedium Calceolus* L.: MIYABE & KUDO, Fl. Hok. & Saghal. III. (1932), 355.

NOM. JAP. *Oh-kibana-atsumoriso*, *Karafuto-atsumoriso*.

HAB. *S. Saghalien*: Motodomari, Mt. Kashipo (G. TAKEE, H. ABUMIYA & Y. HOSHINO, VII. 25, 1932).

Remarks. New to the flora of S. Saghalien & HOKKAIDO.

25. *Epipogum aphyllum* SWARTZ: MIYABE & KUDO, Fl. Hok. & Saghal. III. (1932), 375.

NOM. JAP. *Torakichiran*.

HAB. *Yezo*: Mt. Oputateshike, Kutcharo, Prov. Kushiro (M. TATEWAKI & T. SASAKI, VIII. 17, 1933).

摘 要

北 日 本 植 物 誌 料 二

富 部 金 吾 館 脇 操

本報に於て著者等は北日本植物の新産地を報知す。

10. コケシノブ

本種は本邦特有种にして千島を除く北海道本島各地にも産することを知られしも、最近北緯太西海岸北緯五十度二十分より四十分の間に産するを報ぜられ、こゝに又緯太廳中央試験所吉川宥恭氏の標本を得たれば記録し、以て南緯太にも産するを明かにすべし。

11. チャセンシダ

本種は温帯各地及熱帯高山等に廣く分布するも、本邦に於ては、從來概ね中部以南に産するを知られたり。1932年石狩國空知川河岸金山附近に於て北大教授伊藤誠哉氏之を得たり。茲に本種が北日本に産するを報ず。

12. チャボミツデウラボシ

本種は従来北海道本島の西南部にのみ知られしも、今彼釧路屈斜路湖畔オブタシケ山にて之を得たり。

13. スギラン

本種は本邦深山に特有なる種類にして北海道に於ては極めて稀なり。渡島及日高に知られしのみなるも、本年國縫森林主事富堅錦吾氏之を膽振ロクツ山に得たり。

14. ツクモグサ

本道に於けるツクモグサの分布を茲に明かにせんに、日高山脈ピバヒロ岳、石狩國夕張山脈蘆別岳、中央山脈ニベツツ山、北見山脈ホロヌブリ、北見利尻富士等なり。未だカタアカサウは記録せられず。

15. キヨシサウ

本種は北太平洋岸に分布する種類にして本邦に於ては夙に千島に産することを知られ、又北海道本島東部にも産すること最近記録せられしも、今日迄これを樺太に得ざりき。然るに本夏北大農学部學生星野好博、岡田四五郎、杉山茂の三君南樺太北知床半島附近に於てこれを得たり。

16. シロバナユウバリリンダウ

ユウバリリンダウの白花品種にして、北海道廳技師原田泰氏夕張岳に之を採集せり。

17. シロバナチシマギキヤウ

チシマギキヤウの白花品種にして、北大理學部教授山田幸男氏中部千島得撫島にこれを採集す。

18. イハギキヤウ

本種は北太平洋沿岸地帯に産する植物にして、未だ樺太に未記録なりしを、蛭田清之助氏に依りて、南樺太敷香支廳保惠西方十餘里の中央分水嶺に採集せられしものなり。

19. ヲクイハインテン

本種は主として露領東亞に産する種類にして、樺太に於ては北樺太に産するを知られしのみなるを、今般蛭田清之助氏に依りて、南樺太敷香支廳新間山に於て之を得たり。北日本植物區系に新に加ふべきものなり。

20. ネヂリカハモツク

本屬は北日本に産することを知られざりしものなるも、1930年當時北大農学部學生なりし大谷廣直、今井勇三郎の兩君南樺太東タライカに本種を得たり。

21. キタイトクヅモ

本屬も北日本に未記録なりしを上記二君に依りて、東タライカに於て本種を得たり。

22. セキシヤウモ

本種は樺太に從來未記録なりしものなり。1930年チビサニ湖に於て樺太博物館菅原繁藏氏之を採集せり。

23. ミヤマサギスゲ

本種も樺太に未記録なりしも、北大農学部學生星野好博君本夏之を敷香支廳志文頃濕原に採集す。

24. オホキバナアツモリサウ

本種は歐亞溫帶北部に廣く分布し、露領北樺太に産するを報ぜられ、未だ北日本に自生の記録なかりしを、北大農学部學生竹江五郎、鍾谷大節、星野好博の三君に依り昨夏樺太樺保山にて採集せられたり。

25. トラキチラン

本種は北海道本島に未記録なりし珍稀種にして、本夏北大農学部學生佐々木友吉君及著者の一人、釧路屈斜路湖畔オプタテシケ山中に之を採集す

Errata

p. 1. line 6 *nuda* for *nutans*.

p. 1. line 29 2-3 mm for 2-3 cm.

A BRIEF NOTE ON THE CHROMOSOMES IN SOME *ACONITUM* SPECIES

BY

KAN-ICHI SAKAI

(With one plate)

On the chromosomes in the genus *Aconitum*, several studies have been made since the end of the last century, although most of the materials adopted were those under cultivation. E. OVERTON in 1893 was the first to deal with this problem, and following him, OSTERWALDER (1898), LANGLET (1927), G. A. LEWITSKY (1931), C. D. DARLINGTON (1932), and A. AFIFY (1933) should be mentioned.

Reviewing their reports, there can be found a polyploidal phenomenon in the chromosome number. The following list includes the plants, of which the chromosome number has already been counted.

Diploid ($n=8$, $2n=16$):

Aconitum Lycoctonum (LEWITSKY, AFIFY)

*A. barbatum*¹⁾ (DARLINGTON)

*A. vulparia*¹⁾ (DARLINGTON)

A. orientale (LEWITSKY, AFIFY)

A. luridum (AFIFY)

Triploid ($2n=24$):

A. Napellus (OVERTON, OSTERWALDER, LANGLET, and
DARLINGTON)

A. Stoekrianum (AFIFY)

Tetraploid ($n=16$, $2n=32$):

A. anglicum (DARLINGTON)

A. Anthora (LEWITSKY)

A. Napellus (LEWITSKY)

Octoploid ($n=32$, $2n=64$):

A. Wilsonii (LANGLET)

A. vulubile latiseatum (DARLINGTON)

1) These species are synonyms of *A. Lycoctonum* according to BAILEY (1930).

Some detailed morphological study of their chromosomes may be found, too.

Fortunately, the writer was able to gather a few wild species belonging to this genus from Hokkaido and Karafuto, and he wishes here to describe briefly the result of his observation on the number as well as on some morphological aspects of their chromosomes.

Here the writer ought to offer his heartfelt thanks to Mr. U. KIMOTO in Konuma, through whose kindness the two species from Karafuto have been handed to him.

Materials and Methods

Six wild species have been studied. Observations were made in the mitosis of the root-tip cells. After being fixed in NAWASCHIN's chromo-acetic-formalin, they were stained by RANDOLPH's iodine crystal-violet method. Thickness of the paraffin sections was 20-25 μ .

Results of Observation

The chromosome numbers counted in six species are as follows:

	Jap. Name	Obtained from	2n
<i>Aconitum umbrosum</i> KOM.	Ooreijinsō	Mt. Teine	16
<i>A. yuparense</i> TAKEDA	Yezo-hosoba-torikabuto	Mt. Daisetsu	16
<i>A. Fischeri</i> RCHB.	Oobushi	Konuma	32
<i>A. sachalinense</i> FR. SCHM.	Karafuto-bushi	Konuma	32
<i>A. subcuneatum</i> NAKAI	Oku-torikabuto	Zenibako	32
<i>A. yezoense</i> NAKAI	Yezo-torikabuto	Maruyama	32

The approximate lengths of each chromosome from one specimen measured with great care under the microscope is recorded in Table 1, and Fig. 7 is the chromosome-scheme founded on this table. These are made with the diploid species *A. umbrosum*.

TABLE 1. The approximate length of each chromosome of *A. umbrosum* in μ .

Chromosomes	IA	IB	IIA	IIB	IIIA	IIIB	IVA	IVB	VA	VB	VIA	VIB	VIIA	VIIIB	VIIIA	VIIIB
Long arms	7.0	6.9	6.0	5.8	5.5	5.5	5.0	5.0	5.0	5.0	5.0	4.9	4.0	4.0	2.9	2.8
Short arms	6.5	6.5	3.0	3.0	1.1	1.1	1.5	1.5	1.0	1.0	1.0	1.0	2.0	2.0	1.2	1.2
Whole length	13.5	13.4	9.0	8.8	6.6	6.6	6.5	6.5	6.0	6.0	6.0	5.9	6.0	6.0	4.1	4.0

In the chromosome-scheme (Fig. 7), one can recognize eight classes from the largest I-chromosomes with approximately median constriction, to the smallest VIII-chromosomes with subterminal constriction. Among these eight types, I-chromosomes may be fairly recognized in all the species, and especially the VIII-chromosomes may be identified at a glance. The five species are compared in respect to these I- and VIII-chromosomes. Here the former is called the M, and the latter, the s chromosomes.

	M	s
<i>Aconitum umbrosum</i>	2	2
<i>A. yuparense</i>	2	2
<i>A. sachalinense</i>	(2)	$2s_1 + 2s_2$
<i>A. subcuneatum</i>	(2)	4
<i>A. yezoense</i>	(2)	4

A. Fischeri is excluded from this comparison on account of their badly fixed or stained figures.

In the above list, the number put in parentheses means that there have been found two M chromosomes at least, and consequently there might exist in reality just two or more of them. A more detailed measurement or an exact judgement with good figures is necessary in order to make this point absolutely clear.

Proportional to the chromosome number, the number of the s chromosomes is multiplied: in the diploids, we can find two of them, and in the tetraploids, four. The four s's in the latter two species are all alike in their size and form, except in the one species *A. sachalinense*, in which the 4 s's consist of 2 s_1 's and 2 s_2 's. Each length of the s_1 and s_2 chromosomes is as follows:

	Long arms	Short arms
s_1	= ca. 1.5μ	+ ca. 0.5μ
s_2	= ca. 2.0μ	+ ca. 0.5μ

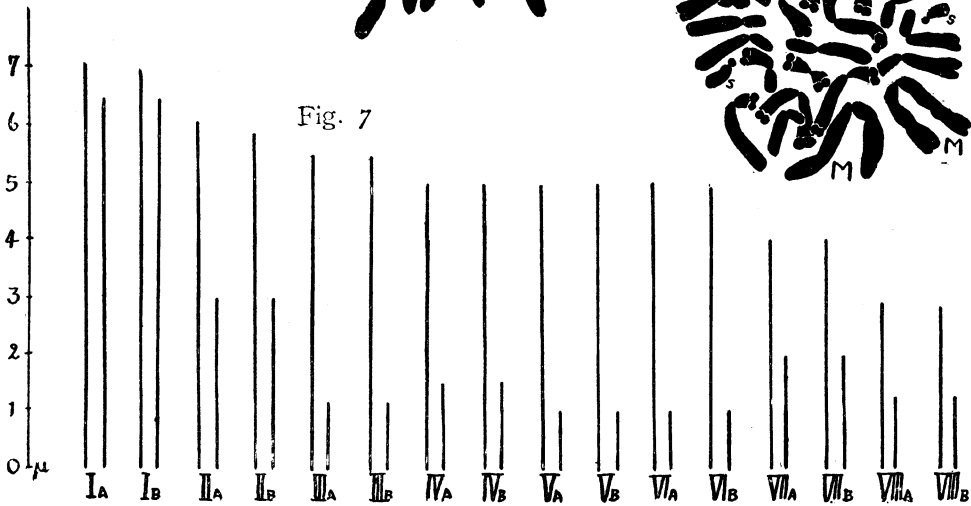
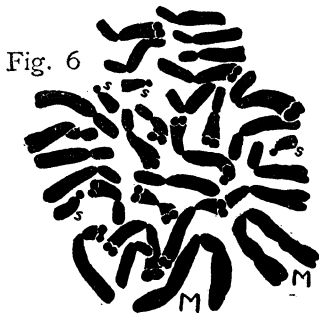
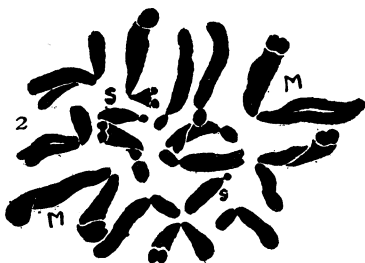
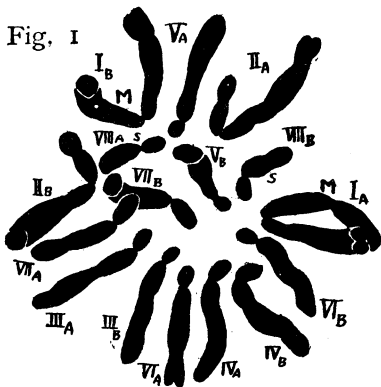
The difference between the length of their long arms is ca. 0.5μ .

Conclusion

The writer, working with six wild species from Hokkaido and Karafuto, found two diploids and four tetraploids.

According to the comparison of the s-chromosomes within these species, interspecific difference in the morphology of chromosomes should exist in some species.

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Explanation of Plate

Figs. 1-6. Chromosomes in root-tip cells, drawn with the aid of camera lucida under a magnification of $\times$ ca. 2300.

Fig. 1. *Aconitum umbrosum*

Fig. 2. *A. yufarense*

Fig. 3. *A. Fischeri*

Fig. 3. *A. sachalinense*

Fig. 5. *A. subcuneatum*

Fig. 6. *A. yezoense*

Fig. 7. Scheme showing the approximate length of each chromosome in *A. umbrosum* made from Table 1.

摘 要

トリカブト属数種の染色体に就て

酒 井 寛 一

北海道及樺太に野生するトリカブト属植物6種なとつてその染色体を観察した所、2種のダイプロイドと4種のテトラプロイドを發見した。トリカブト属植物の染色体の基本数は8である。ダイプロイド種なるオホレイジンサウ *Aconitum umbrosum* の各染色体の長さを測つた結果によれば(第一表及第七圖)、そこに8種の大きさ及び形の異なる染色体が見出される。その最小染色体なるVIII-染色体 即ち s-染色体に就て各種を比較するにこの s の数は全染色体数に比例してゐるが、 $4s$ をもつテトラプロイド種の中にはその4個が全く相同な $4s$ より成る場合と、相同ならざる $2s_1 + 2s_2$ よりなる場合とが見出された。

STUDIES ON THE AQUATIC CHYTRIDS OF JAPAN

II. Olpidiaceae

BY

YOSIO TOKUNAGA

(With one plate)

In the preceding number of the Transactions¹, the writer published the first paper of a series which recorded ten species of aquatic chytrids belonging to the Woroninaceae. The present paper successively deals with seven species of Olpidiaceae which were found newly by the writer in our country. Up to the present time a few species of *Olpidium* parasitic on phanerogamic plants have been reported from Japan and nine aquatic species belonging to the same genus and *Sphaerita* from Manchuria. All description of these species hitherto recorded is omitted here because some of them seem to be doubtful or invalid.

The writer wishes to express his sincere thanks to Prof. Emer. K. MIYABE for his valuable suggestions and to Profs. S. ITO and Y. TOCHINAI for their kind directions. He is also indebted to Mr. M. NAGAI for his kind help in the identification of the host plants.

Olpidium SCHRÖTER

in Krypt. Fl. Schlesien, III, 1, p. 180, 1886.

Syn. *Olpidium* A. BRAUN, Sulgenus of *Chytridium*, in Abhandl. Berl. Akad. Wissensch. p. 75, 1855; *Olpidiella* LAGERHEIM, in Journ. de Bot. II, 1888; *Reessia* FISCH, Beitr. Kenntn. Chytrid. 1884.

1. *Olpidium aggregatum* DANGEARD

(Pl. V, fig. 8)

in Le Botaniste, 2 sér. VI, p. 237, pl. XVI, figs. 25-26, 1891; A. FISCHER, in RABENHORST's Krypt. Fl. I, 4, p. 26, 1892.

Zoosporangia few to 20 or more in a host cell, long ellipsoidal to cylindrical, sometimes irregular in shape, 26.4-90 μ in length, 12-27.6 μ in width, vacuolated in younger stage, with smooth, hyaline membrane; exit-tubes single, 24-51.6 μ long; Zoospores small, long ellipsoidal, with a long cilium; resting spores unknown.

1) Vol. XIII, Pt. 1, p. 20-28, 1933.

[Trans. Sapporo Nat. Hist. Soc., Vol. XIII, Pt. 2, 1933]

Hab. In the cells of *Cladophora* sp. (marine species)

Hokkaido: Prov. Kushiro; Harutori (Aug. 23, 1931. Y. TOKUNAGA).

Distrib. Europe and Japan.

Since discovery of the species by DANGEARD in 1891, it seems not to have been reported from anywhere. In a botanical excursion at Harutori in Kushiro Province, the writer fortunately collected the fungus parasitic in the cells of *Cladophora* sp. Although cultured for some days in our laboratory, the resting spore of the fungus was not secured.

2. *Olpidium entophytum* A. BRAUN

(Pl. V, figs. 1-3)

in Monatsber. Berl. Akad. Wissensch. p. 589, 1856; A. FISCHER, in RABENHORST's Krypt. Fl. I, 4, p. 25, 1892; v. MINDEN, in Krypt. Fl. Mark Brand. V, p. 243, 1915.

Syn. *Olpidium endogenum* A. BRAUN, in Abhandl. Berl. Akad. Wissensch. p. 60, 1855, pro parte; *Reessia Cladophorae* FISCH, in Sitzungsber. Med. Phys. Soc. Erlangen, 1884.

Zoosporangia 1-5 in a vegetative cell, spherical or broad ellipsoidal, sometimes egg-shaped, usually 12-19.2 μ in diameter, with smooth membrane; exit-tubes single or rarely double, variable in length, never swollen in any part; zoospores globular, about 4.8 μ in diameter, with a single cilium; resting spores spherical or ellipsoidal, 12-18 μ in diameter, with smooth, thick membrane.

Hab. In the cells of *Spirogyra communis* (HASS.) KÜTZ.

Hokkaido: Prov. Ishikari; Sapporo (June 24, 1931. Y. TOKUNAGA).

In the cells of *Spirogyra* sp.

Hokkaido: Prov. Ishikari; Maruyama near Sapporo (July 4, 1932. Y. TOKUNAGA).

In the cells of *Aegagropila Sauteri* (NEES) KÜTZ.

Hokkaido: Prov. Kushiro; Lake Akan (Aug. 20, 1931. Y. TOKUNAGA).

Distrib. Europe, Manchuria and Japan.

The descriptions as above have been given of the fungus parasitic on *Spirogyra*. The fungus on *Aegagropila Sauteri* somewhat differs from the above description. Its sporangia are larger and widely variable in size, 19.2-62.4 μ in diameter. The exit-tubes are single and very thick, sometimes 9.6 μ in width. The zoospores are short elliptical, having a long cilium and a small globule. Pending the discovery of its resting spores, we would like to classify it under the present name.

3. *Olpidium gregarium* (NOWAK.) SCHRÖTER

(Pl. V, figs. 4-7)

in Krypt. Fl. Schlesien, III, 1, p. 182, 1886; BUTLER, in Mem. Dept. Agr. India, I, 5, p. 136, pl. VIII, figs. 13-18, 1907.

Syn. *Chytridium gregarium* NOWAK., in COHN's Beitr. Biol. Pfl. II, p. 77, pl. IV, fig. 2, 1876.

Zoosporangia solitary or gregarious, up to 15 in a rotifer, spherical or ellipsoidal, 19.2–52.8 μ in diameter, with a single, short, blunt exit-tube; zoospores formed in a spherical mucilaginous bladder at the mouth of exit-tube, then swim away by the dilution of mucus, globose in shape, containing a refractive body, with a long cilium; resting spores produced either in company with zoosporangia or independently, spherical, 20.4–48 μ in diameter, brownish, containing an eccentric reserve globule measuring 6–13 μ in diameter, with thick wall which consists of thin exospore and thick endospore and is about 6 μ thick, germination not observed.

Hab. In eggs of *Brachionus* sp.

Hokkaido: Prov. Ishikari; Bannosawa near Sapporo (June 21, 1931. Y. TOKUNAGA).

In *Euchlanis* sp.

Hokkaido: Prov. Ishikari; Takinosawa near Jozankei (July 12, 1931. Y. TOKUNAGA).

Distrib. Europe and Japan.

This fungus was noticed at first in eggs of *Brachionus* sp. collected with green algae in a ditch along rice-fields. One to seven zoosporangia or resting spores were observed per egg and the zoosporangia were 19.2 to 48 μ in diameter. In the next collection, the adult of *Euchlanis* sp. which were attacked by this fungus was obtained. In this case, the internal organs of the affected rotifers were severely destroyed and the zoosporangia and resting spores were enclosed in an ellipsoidal compartment. The measurement of the zoosporangia was somewhat larger than those found in eggs of *Brachionus* sp. This species has been known as a parasite of the eggs of certain rotifers up to the present. Hence it is very interesting to note here that this fungus infests not only the eggs of a rotifer but also the adult bodies.

4. *Olpidium rostriferum* TOKUNAGA, sp. nov.

(Pl. V, fig. 11)

Zoosporangiis in zygospora matricis solitariis vel 2–5 aggregatis, sphaericis vel ovoideis, 14.4–25.2 μ diam., membrana levi; tubulis exitus singulis, usque ad 70 μ longis, 3–4.2 μ interdum 6 μ crassis, in parte membranarum matricis perforantibus constrictis; zoosporis globosis, ca. 3.6 μ diam., antice uno cilio praeditis; sporis perdurantibus sphaericis, interdum ellipsoideis, 16.8–24 μ diam., in medio globulum olei continentibus, membrana levi, flava, 1.6 μ crassa tectis, germinatione nondum observata.

Hab. In zygosporis of *Spirogyra Jürgensii* Kütz.

Hokkaido: Prov. Ishikari; Bannosawa near Sapporo (June 21, 1931. Y. TOKUNAGA).

Distrib. Japan.

This fungus was found in the zygotes of *Spirogyra Jürgensii* collected in a ditch along rice-fields. The most part of zygotes formed in culture in a PETRI-dish were infected by the fungus. The zoosporangia are formed together with resting spores in a zygote and empty sporangia collapse from the outer pressure of growth of other sporangia or resting spores. The exit-tubes are very long and constrict at the parts where they perforate the wall of a zygote and vegetative cell. They sometimes swell at the outer part of a zygote, about 6μ in diameter. The resting spores are formed one to three in a zygote and they are mostly spherical or sometimes become ellipsoidal owing to the lateral compression of each other. The germination of resting spores was not observed.

Olpidium entophyllum A. BRAUN parasitic in the vegetative cells of *Spirogyra* and other green algae is one of the most closely related species to our fungus, but its sporangia have a short exit-tube which is not swollen and the resting spores are smaller in size.

5. *Olpidium Sphaeropleae* TOKUNAGA, sp. nov.

(Pl. V, figs. 9-10)

Zoosporangiis in oospora matricis plerumque solitariis, sphaericis, magnitudine variis, $12-24\mu$ diam., tubulo exitus singulo, brevi ornatis; zoosporis ellipsoideis vel ovoideis, ca. $4.8 \times 2.4\mu$, antice uno cilio praeditis; sporis perdurantibus in oospora matricis solitariis vel rarissime binis, sphaericis, $11.4-12.6\mu$ diam., membrana levi, subflava, ca. 1μ crassa tectis, germinatione nondum observata.

Hab. In oospores of *Sphaeroplea annulina* (ROTH.) AGARDH.

Hokkaido: Prov. Ishikari; Takinosawa near Jozankei (July 12, 1931. Y. TOKUNAGA).

Distrib. Japan.

This fungus was found in the young oospores of *Sphaeroplea annulina* collected in a ditch in rice-fields. The zoosporangia mostly fill the cavity of oospore at maturity and are very irregular in size. The resting spores lie very laxly in an oospore. They are quite uniform in size, mostly 12μ in diameter, and contain a central reserve globule surrounded by granular protoplasm in which a small hyaline spot is embedded.

Pleolpidium A. FISCHER

in RABENHORST's Krypt. Fl. I, 4, p. 43, 1892.

Syn. *Rozella* CORNU, in Ann. Sci. Nat. 5 sér. XV, p. 148, 1872, pro parte.

6. *Pleolpidium cuculus* BUTLER

(Pl. V, fig. 12)

in Mem. Dept. Agr. India, I, 5, p. 124, pl. VII, figs. 22-25, 1907.

Zoosporangia produced in large swelling of host hyphae, spherical to sub-spherical, usually $19.2-24\ \mu$ in diameter, with a single exit-papilla; zoospores clavate or ovoid, with a cilium in larger end; resting spores single, free in swollen hyphae of the host, spherical, $12-18\ \mu$ in diameter, light yellow, with smooth, thick membrane, germination not observed.

Hab. In hyphae of *Pythium monospermum* PRINGSHEIM.

Hokkaido: Prov. Ishikari; Maruyama near Sapporo (June 5, 1932. Y. TOKUNAGA).

Distrib. Europe and Japan.

This species was described by BUTLER as a parasite in the sporangia of *Pythium intermedium*. Our fungus was found in the hyphae of *Pythium monospermum* whose sporangia are filamentous and apparently similar to the ordinary hyphae. The affected hyphae are expanded to globular form resembling the oogonia or sporangia of the species of *Pythium* which has sporangia of spherical type. *Pleolpidium irregulare* BUTLER parasitic on *Pythium vexans* also attacks the hyphae, but its resting spores are provided with short regular spines on their wall. After careful examination of the characteristics of our fungus, it was identified with *Pleolpidium cuculus* BUTLER.

Pseudolpidiopsis v. MINDEN

in Krypt. Fl. Mark Brand. V, p. 255, 1915.

Syn. *Pleocystidium* FISCH, Beitr. Kenntn. Chytrid. p. 42, 1884; *Diplophysa* SCHRÖTER, Subgenus of *Pleocystidium*, in Krypt. Fl. Schlesien, III, 1, p. 195, 1886, pro parte; *Olpidiopsis* (CORNU) A. FISCHER, in RABENHORST's Krypt. Fl. I, 4, p. 37, 1892, pro parte.

7. *Pseudolpidiopsis Schenkiana* (ZOPF) v. MINDEN

(Pl. V, fig. 13)

in Krypt. Fl. Mark Brand. V, p. 257, 1915.

Syn. *Olpidiopsis Schenkiana* ZOPF, in Nova Acta Acad. Leop. XLVII, p. 168, pl. XV, figs. 1-32, 1884; BUTLER, in Mem. Dept. Agr. India, I, 5, p. 135, pl. X, figs. 11-13, 1907.

Zoosporangia solitary or gregarious in a vegetative cell of the host, ellipsoidal or elongated, sometimes spherical, variable in size, $30-81.6\ \mu$ long, $21.6-26.4\ \mu$ wide, with smooth membrane; exit-tubes single, irregular in length, rarely $60\ \mu$ long, sometimes swollen at inside of host wall; zoospores globular $4-5.4\ \mu$ in diameter, with a long cilium; resting spores formed one or two in a vegetative cell of the host, spherical or ellipsoidal, $30-42\ \mu$ in diameter, with

smooth, thick, brownish-yellow membrane and a large oil drop; companion cells single, hyaline, spherical, $16.8-21.6\mu$ in diameter.

Hab. In vegetative cells of *Spirogyra* sp.

Hokkaido: Prov. Ishikari; Sapporo (July 2, 1931; June 26, 1932. Y. TOKUNAGA); Bannosawa near Sapporo (June 5, 1932. Y. TOKUNAGA).

Distrib. Europe, India and Japan.

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摘 要

日本産水生壺状菌に就て

II. 油壺菌科

徳 永 芳 雄

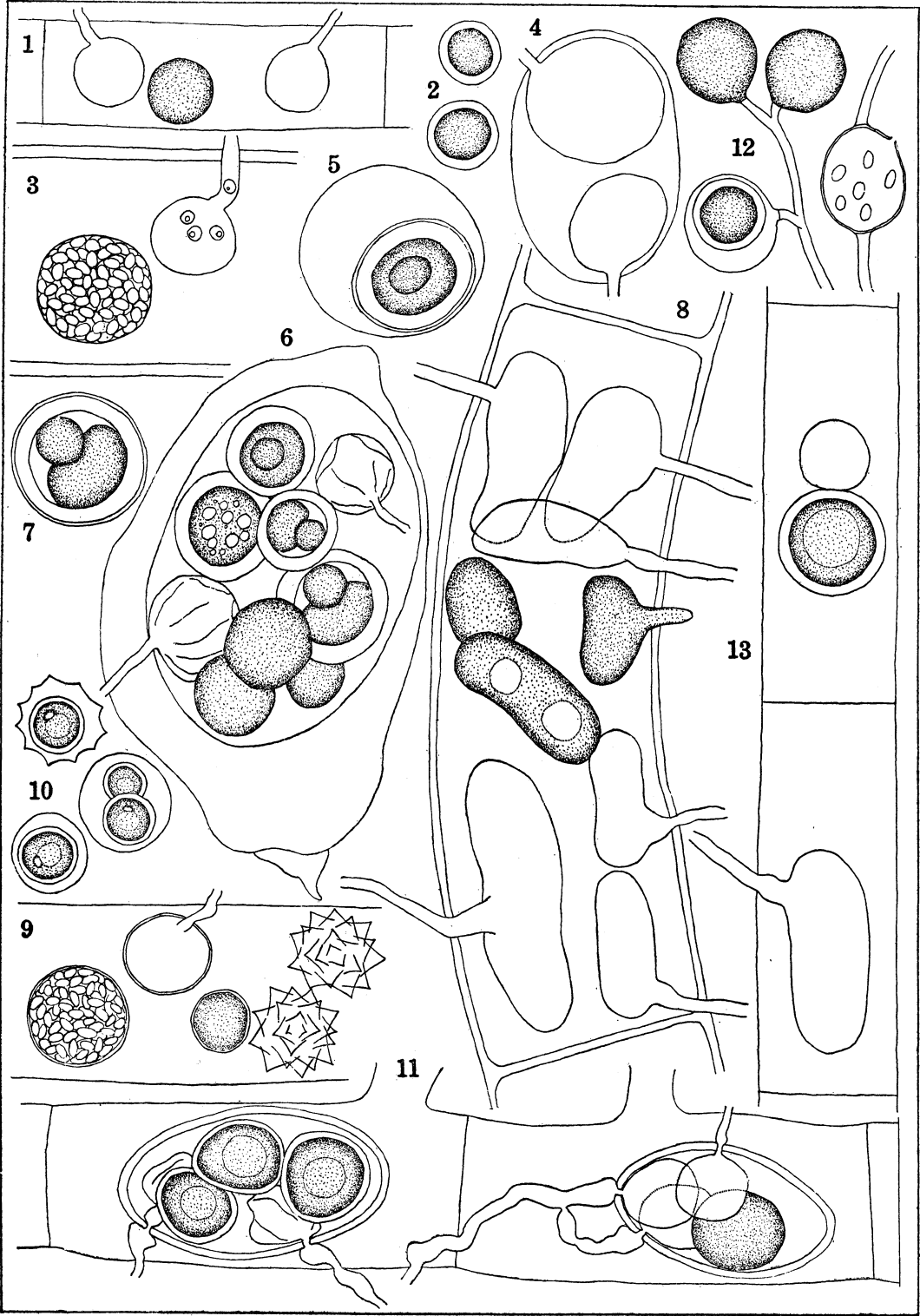
前號に於て著者は日本産水生壺状菌中ボロニ菌科に屬する10種を報告せり。今回油壺菌科に屬する下記の7種を報告せんとす。

1. *Olpidium aggregatum* DANGEARD
海産 *Cladophora* sp. の細胞に寄生す。
2. *Olpidium entophytum* A. BRAUN
Spirogyra communis (HASS.) KÜTZ., *Spirogyra* sp. 及び *Aegagropila Sauteri* (NEES) KÜTZ. の細胞に寄生す。
3. *Olpidium gregarium* (NOWAK.) SCHRÖTER
Brachionus sp. の卵及び *Euchlanis* sp. の成虫に寄生す。
4. *Olpidium rostriferum* TOKUNAGA (新種)
Spirogyra Jürgensii KÜTZ. の接合胞子に寄生す。
5. *Olpidium Sphaeropleae* TOKUNAGA (新種)
Sphaeroplea annulina (ROTH.) AGARDH. の卵胞子に寄生す。
6. *Pleolpidium cuculus* BUTLER
Pythium monospermum PRINGSHEIM の菌絲に寄生す。
7. *Pseudolpidiopsis Schenkiana* (ZOPF) v. MINDEN
Spirogyra sp. の細胞に寄生す。

Explanation of Plate

The magnifications of figures are $\times 400$ in Fig. 6 and $\times 650$ in the others.

- Figs. 1-3. *Olpidium entophytum*: 1. Zoosporangia in a cell of *Spirogyra communis*. 2. Resting spores formed in *Spirogyra communis*. 3. Zoosporangia in a cell of *Aegagropila Sauteri*.
- Figs. 4-7. *Olpidium gregarium*: 4. Zoosporangia in an egg of *Brachionus* sp. 5. Resting spore in an egg of *Brachionus* sp. 6. Zoosporangia and resting spores in an adult of *Euchlanis* sp. 7. Resting spore formed in the adult of *Euchlanis* sp.
- Fig. 8. *Olpidium aggregatum*: Zoosporangia in a host cell.
- Figs. 9 & 10. *Olpidium Sphaeropleae*: 9. Zoosporangia of fungus and healthy oospores of host. 10. Resting spores in oospores of the host.
- Fig. 11. *Olpidium rostriferum*: Zoosporangia and resting spores in zygotes of the host.
- Fig. 12. *Pleolpidium cuculus*: Zoosporangia and resting spore in the host hyphae.
- Fig. 13. *Pseudolpidiopsis Schenkiana*: Zoosporangium and resting spore in the cells of the host.



LAMINARIACEAE OF THE KURILE ISLANDS

BY

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The first contribution to our knowledge of the Kurile Laminariaceae was made in 1840 by POSTELS and RUPRECHT, who in "Illustrationes Algarum Oceani Pacifici imprimis septentrionalis" described *Alaria fistulosa* POST. et RUPR. growing in Kamtschatka and distributing from Saghalien to the Kuriles. Then, in 1848, RUPRECHT established *Arthrothamnus kurilensis* RUPR., taking as the type of the genus, from the Island of Urup of the Kuriles. In 1896, OKAMURA described *Laminaria gyrata* KJELLM. (= *Kjellmaniella gyrata* MIYABE) in his "On Laminaria of Japan", with the range of distribution from the Islands of Shikotan, Etorofu and Urup to Akkeshi in the Province of Kushiro. In 1902, MIYABE, the senior author reported in his "Laminariaceae of Hokkaido" the following species from the Kuriles: *Laminaria ochotensis* MIYABE, *L. diabolica* MIYABE (= *L. longipedalis* OKAM., var. *diabolica* MIYABE), *L. cichorioides* MIYABE (var. *sachalinensis* MIYABE = *L. sachalinensis* MIYABE), *L. longissima* MIYABE, *L. Ruprechtii* MIYABE (= *L. platymeris* DE LA PYL.), *L. yezoensis* MIYABE, *Kjellmaniella gyrata* MIYABE, *Arthrothamnus bifidus* J. AG., *Arth. kurilensis* RUPR., *Costaria Turneri* GREV. (= *C. costata* SAUNDERS), *Alaria fistulosa* POST. et RUPR., *A. corrugata* MIYABE (= *A. macroptera* YENDO), *A. macrophylla* MIYABE (= *A. macroptera* YENDO) and *Thalassiophyllum Clathrus* POST. et RUPR. In this and next year YENDO visited these islands (Etorofu in 1902, Shumushu in 1903) and reported nine species and two forms in several papers published in from 1903 to 1919. They are as follows: *Laminaria longipes* BORY, *L. dentigera* KJELLM., *L. bullata* KJELLM. f. *subsimplex* SETCH. et GARDN. (= *L. subsimplex* MIYABE et NAGAI), *L. bullata* f. *amplissima* SETCH. et GARDN., *Cymathaere triplicata* J. AG., *Hedophyllum Bongardianum* YENDO, *Alaria angusta* KJELLM., *A. lanceolata* KJELLM. (= *A. angusta* KJELLM.), *A. dolichorhachis* KJELLM. and *A. macroptera* YENDO.

For four years from 1929, the junior author visited these islands and collected the abundant materials of marine algae. Among these specimens, some algae of special interest belonging to the Laminariaceae have been several times reported by us until the present time. In this paper, we intend to enumerate all the species of the Laminariaceae thus far known from the Kuriles. The

authors wish to acknowledge their indebtedness for the fund granted by the Imperial Academy for carrying out this research.

Laminariaceae REICHENB.

Laminaria LAMOUR. (in part)

Key to the species

- A. Blade entire
 - a. Frond arising from creeping "rhizome" 1. *L. longipes*
 - b. Frond without creeping "rhizome"
 - α. Mucilage lacunae absent from stipe
 - I. Blade very long and tenaceous 2. *L. longissima*
 - II. Blade shorter and coriaceous 3. *L. coriacea*
 - β. Mucilage lacunae present in both stipe and blade
 - I. Hapteres in whorls 4. *L. sachalinensis*
 - II. Hapteres mostly in longitudinal rows
 - 1. Blade very broad (about 40 cm.) and rounded at the base ... 5. *L. longipediata*
 - 2. Blade narrower (15-20 cm.) and cuneate at the base 6. *L. ochotensis*
- B. Blade split into a few or several segments
 - a. Blade simple and more or less split at the outer end
 - α. Blade split into a few linear lobes at the upper end 7. *L. taeniata*
 - β. Blade split into two or more broad segments, sometimes nearly to the base
 - 8. *L. subsimplex*
 - b. Blade palmate
 - α. Holdfast composed of many branched hapteres
 - I. Stipe cylindrical to near the apex 9. *L. dentigera*
 - II. Stipe compressed upwards from $\frac{1}{4}$ - $\frac{1}{3}$ of the distance from the base
 - 10. *L. platymeris*
 - β. Holdfast scutate 11. *L. yezoensis*

1. *Laminaria longipes* BORY

in Dict. Class., IX, p. 189, 1826—J. AG., Sp. Alg. I, p. 133—Kütz., Spec. Alg., p. 574—ARESCH., Obs. Phyc. IV, p. 15—KJELLM., Beringhafv. Algfl., p. 43—SETCH., Alg. Pribilof Isl., p. 591, pl. 95; Kelps U. S. & Alaska, p. 150—SETCH. & GARDN., Alg. N. W. Amer., p. 260; Mar. Alg. Pacific Coast N. Amer. III, p. 597—YENDO, Notes Alg. new to Jap. I, p. 125; Kaisan Shokubutsugaku, p. 295—OKAM., Enum. Jap. Alg. 2nd Ed., p. 172—NAGAI, Seaweeds from the Kuriles, p. 43, pl. 1—MIYABE & NAGAI, Hedophyllum & Laminaria from N. Kuriles, p. 196.

Laminaria sacharina, f. *angustifolia* POST. et RUPR., Ill. Alg., p. 10, Tab. 11, 1840.

Lessonia repens RUPR., Tange des Och. Meer., p. 350, 1851.

Laminaria Ruprechtiana LE JOLIS, Examen, p. 71, 1855.

Arthrothamnus ? *longipes* J. AG., De Lamin., p. 26, 1867—DE TONI, Syll. Alg. III, p. 370.

JAP. NAME. *Hime-kombu*.

HAB. *Shimushir*: Broughton Bay (M. NAGAI, 1930). *Ketoi*: Minami-ura (M. TATEWAKI & K. TAKAHASHI, 1929). *Paramushir*: (Western Coast) Kaku-mabetsu (NAGAI, 1930, 1932), Kurosaki (NAGAI, 1932); (Northern Coast) Mura-

kami-wan (NAGAI, 1930); (Eastern Coast) Suribachi-wan (NAGAI, 1932). *Shu-mushu*: (Southern Coast) Kataoka-wan (NAGAI, 1930), Nagasaki (NAGAI, 1930); (W. C.) Tenjin-iwa (NAGAI, 1932); (E. C.) Kosekigawa (NAGAI, 1932). *Alaid*: Minami-ura (NAGAI, 1930).

DISTR. Saghalien, Bering Island, Aleutian Islands and Alaska.

2. *Laminaria longissima* MIYABE

Lamin. Hokkaido, p. 37, pl. 4, 1902—YENDO, Kaisei Shokubutsugaku, p. 367—OKAM., Enum. Jap. Alg. 2nd Ed., p. 173—NAGAI, Seaweeds from the Kuriles, p. 43.

JAP. NAME. *Naga-kombu*.

HAB. *Kunashiri*: (E. C.) Pontomari (NAGAI & SHIMAMURA, 1929), Seseki (NAGAI & SHIMAMURA, 1929), Chinomichi (J. TOKIDA, 1925; NAGAI & SHIMAMURA, 1929), Idashibenai (NAGAI & SHIMAMURA, 1929).

DISTR. Yezo.

3. *Laminaria coriacea* MIYABE

Lamin. Hokkaido, p. 40, pl. 11, 1902—OKAM., Enum. Jap. Alg. 2nd Ed., p. 173—NAGAI, Seaweeds from the Kuriles, p. 43.

JAP. NAME. *Gakkara-kombu*, *Atsuba-kombu*.

HAB. *Kunashiri*: (E. C.) Furukamap (NAGAI, 1930), Pontomari (NAGAI & SHIMAMURA, 1929), Seoi (NAGAI & SHIMAMURA, 1929), Chinomichi (TOKIDA, 1925; NAGAI & SHIMAMURA, 1929).

DISTR. Yezo.

4. *Laminaria sachalinensis* MIYABE, sp. nov.

Radice ramosa, ramis cylindraceis vel sensim complanatis et multis dichotome ramosis, duplice vel triplice verticillatis; stipite brevi, 3.5–6.5 cm. longo, tereti et superne paulatim complanato, 4–6 mm. diametro, lacunis muciferis infra stratum corticale dense dispositis; lamina simplici, lineari-lanceolata, 54–128 cm. longa, in parte latissima 13–23 cm. lata, basi rotunda, ad fasciam mediam crassa et coriacea, bullis magnis longitudinaliter biserialiter insignentibus, ad marginem membranacea, subter plana et a medio valde undulata, lacunis muciferis in interiore cortice serialiter dispositis; fuliginose colorata; soro laminae a basi sursum ad partem mediam in irregulares vittas extendente.

The holdfast consists of two sometimes three, alternating whorls which are several times dichotomously branched. The branches are cylindrical below, becoming flattened gradually towards the tip and fastened to the substratum by their lower surface. The stipe is terete and somewhat compressed upwards, short, commonly 3.5 to 6.5 cm. long, 4 to 6 mm. in diameter. The mucilage

lacunae in the stipe are narrow and closely arranged just beneath the periphery. The blade is simple, linear-lanceolate with rounded base, and coriaceous in substance, thickened in the median fascia, but membranaceous on outer portions. Even in matured individuals, there appear often two rows of distinct, large bullae extending in the full length on the median portion. The membranaceous portions are often plane below, but become much undulated in the middle and upper regions. In the adult ones the blade is 54 to 128 cm. long, and 13 to 23 cm. wide at the broadest part, with the median portion of 5 to 8 cm. in width. The color is darkish brown. The mucilage lacunae in the blade are moderately large, and arranged in a row in the outer portion of the cortex. The sori are extended in patches on the median portion of the blade from near the base.

Laminaria cichorioides MIYABE, var. *sachalinensis* MIYABE, in Proc. 3rd Pan-Pacific Sci. Congr., p. 957, 1926—TOKIDA, Mar. Alg. Robben Isl., p. 9.

JAP. NAME. *Karafuto-tororokombu*.

HAB. *Kunashiri*: (W. C.) Nikishiro (NAGAI & SHIMAMURA, 1929), Shibetoro (NAGAI, 1931), Sokobetsu (NAGAI, 1931); (N. C.) Atoiya (NAGAI & SHIMAMURA, 1929).

DISTR. Saghalien and Yezo.

We are inclined at present to consider this alga as an independent species rather than as a variety of *Laminaria cichorioides* MIYABE, which is familiar to us on the western coast of Hokkaido. The present species differs from it by its blade being not crispate at the margin of the lower half and by its larger size. The blade attains often to the size of *L. ochotensis* MIYABE and resembles closely that species, when the bullations appear less distinctly in some cases. The present species, however, differs from it in having the verticillate hapteres and narrower stipe.

5. *Laminaria longipedalis* OKAM.

Laminaria Japan, p. 29, pl. 7, fig. 1-3, 1896; Enum. Jap. Alg. 2nd Ed., p. 170 (p. p.)—MIYABE, *Lamin. Hokkaido*, p. 30, pl. 8.

var. *diabolica* MIYABE

in Proc. 3rd Pan-Pacific Sci. Congr., p. 956, 1926.

Laminaria diabolica MIYABE, l. c., p. 29, pl. 7, 1902—NAGAI, *Seaweeds from the Kuriles*, p. 43.

JAP. NAME. *Oni-kombu*.

HAB. *Etorofu*: (W. C.) Rubetsu (NAGAI, 1930), Bettobu (NAGAI, 1930), Shibetoro (NAGAI, 1930).

DISTR. Yezo and Saghalien.

6. *Laminaria ochotensis* MIYABE

Lamin. Hokkaido, p. 23, pl. 2, 1902—YENDO, Kaisan Shokubutsugaku, p. 364, fig. 114—OKAM., Enum. Jap. Alg. 2nd Ed., p. 170.

JAP. NAME. *Rishiri-kombu*.

HAB. *Kunashiri*: (W. C.) Nikishiro (NAGAI & SHIMAMURA, 1929), Sokobetsu (NAGAI, 1931); (N. C.) Atoiya (NAGAI & SHIMAMURA, 1929). *Etorofu*: (W. C.) Rubetsu (NAGAI, 1930), Shibetoro (NAGAI, 1930).

DISTR. Yezo and Saghalien.

7. *Laminaria taeniata* POST. et RUPR.

Ill. Alg., p. 10, Tab. 38, fig. f, 1840—MIYABE & NAGAI, Hedophyllum & Laminaria from N. Kuriles, p. 197, fig. 1.

Laminaria Bongardiana POST. et RUPR., f. *taeniata* KJELLM., Beringhafv. Algfl., p. 44, 1889.

Laminaria platymeris DE LA PYL., f. *taeniata* SETCH. et GARDN., Mar. Alg. Pacific Coast N. Amer. III, p. 606, 1925.

JAP. NAME. *Hosoba-chasenkombu*.

HAB. *Paramushir*: (E. C.) Suribachi-wan (NAGAI, 1932), Chitose-wan (NAGAI, 1930). *Shumushu*: (S. C.) Nagasaki (NAGAI, 1930); (W. C.) Tenjin-iwa (NAGAI, 1932).

DISTR. Kamtschatka, Bering Island and Alaska.

8. *Laminaria subsimplex* MIYABE et NAGAI, sp. nov.

Radice ramosa, ramis cylindraceis vel sensim complanatis verticillatis et multis dichotome ramosis; stipite brevi, 3–8 cm. longo, infra tereti, supra paulatim complanato, 4–6 mm. diametro, lacunis muciferis inaequimagnis in orbem sub-corticalem secundum ambitum dispositis; lamina crassa, coriacea, late lineari, in basi cuneata vel raro plus minus rotundata, plana vel raro bullis longitudinalis secundum utrumque regionem mediam seriatim insigni, tota vel in duos plurasve latas lacinias ad tertiariam usque dimidiam distantiam ad basin vel profunde ad basin fissa, margine plus minusve undulata, 12–25, saepe 18–23 cm. lata, 76–219, saepe 88–128 cm. longa, lacunis muciferis in interiore cortice seriatim dispositis; fuliginose colorata; soro ad partem externam laminae ab medio usque superne in irregulares vittas extendente.

Laminaria cuneifolia J. AG., f. *subsimplex* SETCH. et GARDN., Mar. Alg. Pacific Coast N. Amer. III, p. 602, 1925—MIYABE & NAGAI, Hedophyllum & Laminaria from N. Kuriles, p. 199, fig. 2.

Laminaria bullata KJELLM., f. *subsimplex* SETCH. et GARDN., Alg. N. W. Amer., p. 257, 1903—YENDO, Notes Alg. new to Jap. I, p. 124—OKAM., Enum. Jap. Alg. 2nd Ed., p. 174.

JAP. NAME. *Chishima-satsumatakombu*.

HAB. *Shimushir*: (N. C.) Broughton Bay (NAGAI, 1930). *Paramushir*: (W. C.) Kakumabetsu (NAGAI, 1930), Kamogawa (NAGAI, 1932), Arakawa (NAGAI, 1932); (N. C.) Murakami-wan (NAGAI, 1930); (E. C.) Suribachi-wan

(NAGAI, 1932). *Shumushu*: (S. C.) Kataoka-wan (NAGAI, 1930); (W. C.) Tenjin-iwa (NAGAI, 1932).

DISTR. Washington State.

We are now of an opinion that the present alga should better be treated as an independent species rather than as a form of *L. cuneifolia* J. AG. The present species differs from the latter in having the blade splitting often into two, three or more segments and with the scanty formation of the bullation.

9. *Laminaria dentigera* KJELLM.

Beringhafv. Algfl., p. 45, Tab. 2, fig. 10-14, 1889—DE TONI, Syll. Alg. III, p. 341—SETCH. & GARDN., Alg. N. W. Amer., p. 259; Mar. Alg. Pacific Coast N. Amer. III, p. 604—YENDO, Notes Alg. new to Jap. I, p. 124; Kaisan Shokubutsugaku, p. 293, fig. 95—SETCH., Kelps U. S. & Alaska, p. 151—OKAM., Enum. Jap. Alg. 2nd Ed., p. 174—MIYABE, in Proc. 3rd Pan-Pacific Sci. Congr., p. 955—MIYABE & NAGAI, Hedophyllum & Laminaria from N. Kuriles, p. 202, fig. 4.

Laminaria bullata NAGAI (not KJELLM.), Seaweeds from the Kuriles, p. 44, pl. 3, 1931.

JAP. NAME. *Kumade-kombu*.

HAB. *Paramushir*: (W. C.) Kakumabetsu (NAGAI, 1930, 1932), Kamo-gawa (NAGAI, 1932); (E. C.) Suribachi-wan (NAGAI, 1932). *Shumushu*: (E. C.) Kosekigawa (NAGAI, 1932). *Alaid*: Sekinezaki (H. ITO & G. KOMORI, 1926), Minami-ura (NAGAI, 1930).

DISTR. Saghalien, Bering Island and Alaska.

10. *Laminaria platymeris* DE LA PYL.

Fl. Terre-Neuve, p. 52, 1829—SETCH., Kelps U. S. & Alaska, p. 151 (p. p.)—SETCH. & GARDN., Mar. Alg. Pacific Coast N. Amer. III, p. 605 (excl. syn. *Laminaria Bongardiana* POST. et RUPR., *L. taeniata* POST. et RUPR., *L. fissilis* J. AG.)—NAGAI, Seaweeds from the Kuriles, p. 44, pl. 2—MIYABE & NAGAI, Hedophyllum & Laminaria from N. Kuriles, p. 201, fig. 3.

Laminaria Ruprechtii MIYABE (not ARESCH.), Lamin. Hokkaido, p. 42, pl. 14, 1902.

Laminaria dentigera KJELLM., f. *longipes* SETCH. et GARDN., Alg. N. W. Amer., p. 259, 1903; Mar. Alg. III, p. 604.

JAP. NAME. *Chishima-goheikombu*.

HAB. *Etorofu*: (E. C.) Chikohai (NAGAI, 1931), Moyoro (NAGAI, 1931), Hitokap-wan (NAGAI, 1930). *Shimushir*: (N. C.) Broughton Bay (NAGAI, 1930). *Ketoi*: Minami-ura (TATEWAKI & TAKAHASHI, 1929). *Paramushir*: (E. C.) Chitose-wan (NAGAI, 1930), Suribachi-wan (NAGAI, 1932). *Shumushu*: (E. C.) Kosekigawa (NAGAI, 1932). *Alaid*: Minami-ura (NAGAI, 1930), Sekinezaki (ITO & KOMORI, 1926).

DISTR. Alaska to Washington State and Arctic Region of Atlantic Ocean.

11. *Laminaria yezoensis* MIYABE

Lamin. Hokkaido, p. 41, pl. 12-13, 1902—OKAM., Enum. Jap. Alg. 2nd Ed., p. 174—NAGAI, Seaweeds from the Kuriles, p. 44.

Laminaria palmaeformis OKAM., in Records Oceanogr. Works in Japan I, p. 53, pl. 14, 1928—ARWIDSON, Higher Mar. Alg. hitherto known from Kamtschatka, p. 153.

JAP. NAME. *Gohei-kombu*, *Heisoku-kombu*.

HAB. *Etorofu*: (E. C.) Hitokap-wan (NAGAI, 1930). *Paramushir*: (E. C.) Chitose-Wan (NAGAI, 1930).

DISTR. Yezo and Kamtschatka.

Laminaria bullata KJELLM.

f. *amplissima* SETCH. et GARDN.

in YENDO Notes Alg. new to Jap. I, p. 125, 1909—OKAM., Enum. Jap. Alg. 2nd Ed., p. 174.

In the literature above noted, YENDO reported this alga as growing in Shumushu Island and he stated that "The present species resembles to a young stage of *Hedophyllum spirale* YENDO, from which, however, may be distinguished by the continuous circular arrangement of the lacunae in the stipe. The splitting of the lamina in this species seldom goes down till to the transition region." We have a specimen of this alga from Alaska, which was kindly distributed by Prof. GARDNER of the Department of Botany, California University. In this specimen, the blade is broad, ovate, 80 cm. long and 58 cm. wide; the stipe 2 cm. long in measurement. The bullations appear not in a row within each margin, but excessively all over the whole surface of the blade. So far as we have examined, however, we cannot find any specimen referable to the present alga among our collections.

Cymathaere J. AG.

Key to the species

- A. Blade membranaceous
 - a. Holdfast composed of branched hapteres; stipe with abundant mucilage lacunae 1. *C. fibrosa*
 - b. Holdfast scutate; stipe without mucilage lacunae 2. *C. triplicata*
- B. Blade coriaceous 3. *C. crassifolia*

1. *Cymathaere fibrosa* NAGAI

in Proc. Imp. Acad. IX, p. 521, fig. 2-6, 1933.

JAP. NAME. *Edane-misujikombu*.

HAB. *Etorofu*: (E. C.) Chikohai (NAGAI, 1931), Moyoro (NAGAI, 1931). *Urup*: (W. C.) Tokotan (NAGAI, 1930). *Shimushir*: (N. C.) Broughton Bay (NAGAI, 1930). *Paramushir*: (E. C.) Chitose-wan (NAGAI, 1930); (W. C.) Kakumabetsu (NAGAI, 1932). *Alaid*: Minami-ura (NAGAI, 1930).

DISTR. Endemic ?

2. *Cymathaere triplicata* (POST. et RUPR.) J. AG.

De Lamin., p. 30, 1867—ARESCH., Obs. Phyc. IV, p. 21—KJELLM., Beringhafv. Algfl., p. 43—DE TONI, Syll. Alg. III, p. 360—SAUNDERS, Alg. Harriman Exp., p. 430—SETCH. & GARDN., Alg. N. W. Amer., p. 264; Mar. Alg. Pacific Coast N. Amer. III, p. 608—GRIGGS, Cymathaere, p. 89, pl. 7—YENDO, Notes Alg. new to Jap. I, p. 123—SETCH., Kelps U. S. & Alaska, p. 154—OKAM., Enum. Jap. Alg. 2nd Ed., p. 177—NAGAI, Seaweeds from the Kuriles, p. 44, pl. 13, fig. A.

Laminaria triplicata POST. et RUPR., Ill. Alg., p. 10, pl. 10, 1840—J. AG., Spec. Alg. I, p. 136.

JAP. NAME. *Misuji-kombu*.

HAB. *Urup*: (W. C.) Tokotan (NAGAI, 1930), Ikema (Iema?) (K. JIMBO, 1891). *Shimushir*: (N. C.) Broughton Bay (NAGAI, 1930). *Paramushir*: (W. C.) Kurosaki (NAGAI, 1932). *Shumushu*: (S. C.) Kataoka-wan (K. YENDO, 1903), Nagasaki (NAGAI, 1930). *Alaid*: Uomizaki (ITO & KOMORI, 1926), Minami-ura (NAGAI, 1930).

DISTR. Bering Island, Aleutian Islands, Alaska and Vancouver Island.

3. *Cymathaere crassifolia* (POST. et RUPR.) DE TONI

Syll. Alg. III, p. 360, 1895—MIYABE & NAGAI, in Proc. Imp. Acad. VIII, p. 123, fig. 1-4.

Laminaria crassifolia POST. et RUPR., Ill. Alg., p. 10, Taf. 38, fig. d, 1840—J. AG., Sp. Alg. I, p. 136—KÜTZ., Sp. Alg., p. 574—LE JOLIS, Genre Lamin., p. 311—ARWIDSON, Higher Mar. Alg. hitherto known from Kamtschatka, p. 156.

JAP. NAME. *Atsuba-misujikombu*, *Umanokarwa*.

HAB. *Kunashiri*: (E. C.) Seoi (NAGAI & SHIMAMURA, 1929), Odaibake (TOKIDA, 1925; NAGAI, 1931).

DISTR. Kamtschatka.

Kjellmaniella MIYABE

Kjellmaniella gyrata (KJELLM.) MIYABE

Lamin. Hokkaido, p. 44, pl. 15-16, 1902—YENDO, Kaisan Shokubutsugaku, p. 373, fig. 117-118—OKAM., Enum. Jap. Alg. 2nd Ed., p. 175; Icon. Jap. Alg. V, p. 88, pl. 223—NAGAI, Seaweeds from the Kuriles, p. 45.

Laminaria gyrata KJELLM., Ny Organisationstyp inom slägt. Lamin., p. 16, Taf. 1, 1892—DE TONI, Syll. Alg. III, p. 348—OKAM., Laminaria Jap., p. 91, pl. 7, fig. 6-10.

Kjellmaniella crassifolia NAGAI (not MIYABE), l. c., p. 44.

JAP. NAME. *Tororo-kombu*.

Key to the forms

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|----------------------------|--------|-----------------------|
| A. Blade linear-lanceolate | | |
| a. 7-8 cm. in width | | 1. f. <i>linearis</i> |
| b. 10-17 cm. in width | | 2. f. <i>latioris</i> |
| B. Blade obovate | | 3. f. <i>obovata</i> |

f. *linearis* (OKAM.)

Laminaria Jap., p. 92; Enum. Jap. Alg. 2nd Ed., p. 175.

HAB. *Kunashiri*: (E. C.) Furukamap (NAGAI, 1930), Wennai (NAGAI & SHIMAMURA, 1929), Chinomichi (TOKIDA, 1925); (N. C.) Atoiya (NAGAI & SHIMAMURA, 1929). *Etorofu*: (W. C.) Rubetsu (YENDO, 1902), Bettobu (NAGAI, 1930); (E. C.) Hitokap-wan (NAGAI, 1930).

DISTR. Yezo.

f. *latioris* (OKAM.)

l. c., p. 92, fig. 6; Enum., p. 175.

Kjellmaniella gyrata MIYABE, var. *crispata* MIYABE, Lamin. Hokkaido, p. 45, pl. 16.

HAB. *Kunashiri*: (W. C.) Seseki (NAGAI & SHIMAMURA, 1929), Chinomichi (NAGAI & SHIMAMURA, 1929); (N. C.) Atoiya (NAGAI & SHIMAMURA, 1929). *Etorofu*: (W. C.) Rubetsu (YENDO, 1902; NAGAI, 1931), Arimoe (NAGAI, 1930), Bettobu (NAGAI, 1930), Shibetoro (NAGAI, 1931), Toshirari (NAGAI, 1931); (E. C.) Hitokap-wan (NAGAI, 1930), Moyoro (NAGAI, 1931). *Shikotan* (OKAMURA). *Urup* (OKAMURA).

f. *obovata* (OKAM.)

l. c., p. 93; Enum., p. 175.

HAB. *Kunashiri*: (W. C.) Chinomichi (NAGAI & SHIMAMURA, 1929), Shiranuka (NAGAI & SHIMAMURA, 1929). *Etorofu*: (W. C.) Rubetsu (NAGAI, 1930), Shana (S. FUJIMURA, 1890). *Shikotan* (OKAMURA). *Urup* (OKAMURA).

Costaria GREV.**Costaria costata** (TURN.) SAUNDERS

in Bot. Gaz. XX, p. 57, 1895—SETC., Kelps U. S. & Alaska, p. 154—SETC. & GARDN., Mar. Alg. Pacific Coast N. Amer. III, p. 610, pl. 56 B, 79 A.

Fucus costatus TURN., Fuci IV, p. 72, pl. 226, 1819.

Costaria Turneri GREV., Alg. Brit., p. xxxix, 1830—POST. et RUPR., Ill. Alg., p. 12, pl. 24—J. AG., Sp. Alg. I, p. 139—ARESCH., Obs. Phyc., p. 20—DE TONI, Syll. Alg. III, p. 361—SAUNDERS, Alg. Harriman Exp., p. 431—MIYABE, Lamin. Hokkaido, p. 50, pl. 20—COLLINS, Mar. Alg. Vancouver Isl., p. 109—OKAM., Enum Jap. Alg. 2nd Ed., p. 176; Icon. Jap. Alg. V, p. 99, pl. 226.

Costaria Mertensii J. AG., Sp. Alg. I, p. 140, 1848.

JAP. NAME. *Sujime*.

HAB. *Kunashiri*: (E. C.) Furukamap (NAGAI, 1930), Wennai (NAGAI & SHIMAMURA, 1929), Seseki (NAGAI & SHIMAMURA, 1929), Pontomari (NAGAI & SHIMAMURA, 1929), Chinomichi (TOKIDA, 1925; NAGAI & SHIMAMURA, 1929), Idashibenai (NAGAI & SHIMAMURA, 1929); (W. C.) Toshoro (NAGAI, 1931), Shibetoro (NAGAI, 1931), Sokobetsu (NAGAI, 1931). *Etorofu*: (W. C.) Rubetsu

(NAGAI, 1930), Shibetoro (NAGAI, 1930); (E. C.) Moyoro (NAGAI, 1931).

DISTR. Yezo, Saghalien, Honshu, Korea, Aleutian Islands and Alaska to California.

Agarum (BORY) POST. et RUPR.

Agarum cribrosum BORY

in Dict. Class. IX, p. 193, 1826 (p. p.)—SETCH., Kelps U. S. & Alaska, p. 155—MÜNSCHER, Key to Phaeophyceae, p. 260, fig. 12—SETCH. & GARDN., Mar. Alg. Pacific Coast N. Amer. III, p. 615, pl. 63—TOKIDA, Mar. Alg. Robben Isl., p. 10—ARWIDSSON, Higher Mar. Alg. hitherto known from Kamtschatka, p. 153.

Fucus Agarum TURNER, Fuci II, p. 10, pl. 75, 1809.

Fucus cribrosum MERTENS, in Linnaea IV, p. 52, 1829.

Agarum Gmelini POST. et RUPR., Ill. Alg., p. 11, pl. 20-21, 1840—J. AG, Sp. Alg. I, p. 141—SAUNDERS, Alg. Harriman Exp., p. 430, pl. 61.

Agarum Turneri POST. et RUPR., l. c., p. 12, pl. 22—J. AG., l. c., p. 141—RUPR., Tange d. och. Meer., p. 353—ARESCH., Obs. Phyc. IV, p. 17—KJELLM., Alg. Arct. Sea, p. 222; Beringhafv. Algfl., p. 42—SAUNDERS, l. c., p. 431—MIYABE, Lamin. Hokkaido, p. 59, pl. 27—OKAM., Enum. Jap. Alg. 2nd Ed. p. 167; Icon. Jap. Alg. V, p. 90, pl. 225; Alg. from Kamtschatka, p. 53—WORONICHIN, Meeresalg. Kamtschatkas (Transl. in Jap.), p. 133—NAGAI, Seaweeds from the Kuriles, p. 46, pl. 11.

JAP. NAME. *Aname*.

HAB. *Kunashiri*: (W. C.) Furukamap (NAGAI & SHIMAMURA, 1929), Chinomichi (NAGAI & SHIMAMURA, 1929), Shiranuka (NAGAI & SHIMAMURA, 1929); (N. C.) Atoiya (NAGAI & SHIMAMURA, 1929). *Etorofu*: (W. C.) Rubetsu (NAGAI, 1930, 1931), Shana (NAGAI, 1930), Bettobu (NAGAI, 1930), Shibetoro (NAGAI, 1930, 1931); (E. C.) Moyoro (NAGAI, 1931).

DISTR. Yezo, Saghalien, Kamtschatka, Aleutian Islands, Alaska, Arctic Sea and Atlantic coast of N. America.

Hedophyllum SETCH.

Hedophyllum Bongardianum (POST. et RUPR.) YENDO

Notes Alg. new to Jap. II, p. 269, 1909 (excl. syn. *Hafgygia Ruprechtii* ARESCH., *Laminaria Ruprechtii* DE TONI, *L. Ruprechtii* MIYABE, *L. crassifolia* POST. et RUPR., *L. nigripes* KJELLM.)—OKAM., Enum. Jap. Alg. 2nd Ed., p. 168 (excl. syn. *Laminaria Ruprechtii* MIYABE)—NAGAI, Seaweeds from the Kuriles, p. 45, pl. 4—MIYABE & NAGAI, Hedophyllum & Laminaria from N. Kuriles, p. 194, pl. 5.

Laminaria Bongardianum POST. et RUPR., Ill. Alg., p. 10, Tab. 13-14, 1840—KJELLM., Beringhafv. Algfl., p. 43 (excl. f. *taeniata* KJELLM.).

Hafgygia Bongardianum KÜTZ., Spec. Alg., p. 577, 1849—ARESCH., Obs. phyc. IV, p. 5.

Laminaria digitata RUPR., Tange d. och. Meer., p. 352, 1851 (p. p.).

Arthrohamnus Bongardianus J. AG., De Lamin., p. 28, 1867—DE TONI, Syll. Alg. III, p. 370.

Hedophyllum subsessile (ARESCH.) SETCH., Notes on Algae I, p. 122, 1901—SAUNDERS, Alg. Harriman Exp., p. 430—SETCH. & GARDN., Alg. N. W. Amer., p. 263, pl. 20; Mar. Alg. Pacific Coast N. Amer. III, p. 618.

Hedophyllum spirale YENDO, in Bot. Mag. XVIII, p. 165, pl. 6, fig. 1-6, 1903—OKAM., Alg. from Kamtschatka, p. 54, fig. 1, pl. 15.

JAP. NAME. *Nejire-kombu*.

HAB. *Paramushir*: (W. C.) Kakumabetsu (NAGAI, 1930), Arakawa (NAGAI, 1932); (N. C.) Murakami-wan (NAGAI, 1930); (E. C.) Chitose-wan (NAGAI, 1930), Suribachi-wan (NAGAI, 1932). *Shumushu*: (S. C.) Kataoka-wan (NAGAI, 1930); (W. C.) Tenjin-iwa (NAGAI, 1932).

DISTR. Kamtschatka, Bering Island, Aleutian Islands, Alaska and Washington State.

Arthrothamnus RUPR.

Key to the species

- A. Stipe standing, long, cylindrical; holdfast of branched hapteres, which are borne verticillately at the very base of the stipe as in *Laminaria* 1. *A. kurilensis*
- B. Stipe decumbent, short, complanate; holdfast of branched hapteres, which are borne on both outer-sides of the basal part of the stipe 2. *A. bifidus*

1. *Arthrothamnus kurilensis* RUPR.

Bemerk. d. Bau. u. Wachstum Alg.-Stämme, p. 67, Taf. 6, 1848—DE TONI, Syll. Alg. III, p. 369—MIYABE, Lamin. Hokkaido, p. 49, pl. 19—YENDO, Kaisan Shokubutsugaku, p. 407—OKAM., Enum. Jap. Alg. 2nd Ed., p. 178; Icon. Jap. Alg. V, p. 103, pl. 228—NAGAI, Seaweeds from the Kuriles, p. 45, pl. 6.

JAP. NAME. *Chishima-nekoashikombu*.

HAB. *Etorofu*: (W. C.) Bettobu (NAGAI, 1930), Shibetoro (NAGAI, 1931), Toshirari (NAGAI, 1931); (E. C.) Hitokap-wan (NAGAI, 1930), Moyoro (NAGAI, 1931). *Urup*: (W. C.) Tokotan (NAGAI, 1930). *Shimushir*: (N. C.) Broughton Bay (NAGAI, 1930).

DISTR. Saghalien.

2. *Arthrothamnus bifidus* (GMEL.) J. AG.

De Lamin., p. 28, 1867—DE TONI, Syll. Alg. III, p. 369—MIYABE, Lamin. Hokkaido, p. 47, pl. 18—SETCH. & GARDN., Alg. N. W. Amer., p. 267; Mar. Alg. Pacific Coast N. Amer. III, p. 620—YENDO, Kaisan Shokubutsugaku, p. 407, fig. 127—OKAM., Enum. Jap. Alg. 2nd Ed., p. 178; Icon. Jap. Alg. V, p. 100, pl. 227—NAGAI, Seaweeds from the Kuriles, p. 45, pl. 5.

Fucus bifidus GMEL., Hist. Fuc., p. 201, pl. 29, fig. 2, 1768.

Laminaria bifida AG., Sp. I, p. 122, 182c—POST. et RUPR., Ill. Alg., p. 10, pl. 15—J. AG., Sp. Alg. I, p. 131.

Arthrothamnus radicans RUPR., Bemerk. d. Bau u. Wachstum Alg.-Stämme, p. 68, 1848.

JAP. NAME. *Nekoashi-kombu*.

HAB. *Kunashiri*: (E. C.) Chinomichi (TOKIDA, 1925), Rebun-iso (NAGAI & SHIMAMURA, 1929), Idashibenai (NAGAI & SHIMAMURA, 1929); (N. C.) Atoiya (NAGAI & SHIMAMURA, 1929). *Shimushir*: (N. C.) Broughton Bay (NAGAI,

1930). *Ketoi*: Minami-ura (TATEWAKI & TAKAHASHI, 1929). *Paramushir*: (W. C.) Kakumabetsu (NAGAI, 1930, 1932), Kamogawa (NAGAI, 1932); (N. C.) Murakami-wan (NAGAI, 1930); (E. C.) Chitose-wan (NAGAI, 1930), Suribachi-wan (NAGAI, 1932). *Shumushu*: (S. C.) Kataoka-wan (NAGAI, 1930); (E. C.) Kosekigawa (NAGAI, 1932). *Alaid*: Uomizaki (ITO & KOMORI, 1926), Minami-ura (NAGAI, 1930).

DISTR. Yezo, Kamtschatka, Bering Island and Aleutian Islands.

Thalassiophyllum POST. et RUPR.

Thalassiophyllum Clathrus POST. et RUPR.

Ill. Alg., p. 11, pl. 18-19, 1840—J. AG., Sp. Alg. I, p. 139—KJELLM., Beringhafv. Algfl., p. 42—SETCH., Alg. Pribilof Isl., p. 592; Post-emb. Stages, p. 123, pl. 13, fig. 6-13; Kelps U. S. & Alaska, p. 156—MIYABE, Lamin. Hokkaido, p. 60, pl. 28—SETCH. & GARDN., Alg. N. W. Amer., p. 266; Mar. Alg. Pacific Coast N. Amer. III, p. 613, pl. 72—OKAM., Enum. Jap. Alg. 2nd Ed., p. 168; Icon. Jap. Alg. V, p. 104, pl. 229; Alg. from Alaska, p. 87—WORONICHIN, Meeresalg. Kamtschatkas (Transl. in Jap.), p. 135—NAGAI, Seaweeds from the Kuriles, p. 47, pl. 12.

Fucus Clathrus GMEL., Hist. Fuc., p. 211, pl. 33, 1768.

JAP. NAME. *Kikuishi-kombu*.

HAB. *Urup*: (W. C.) Tokotan (NAGAI, 1930). *Shimushir*: (N. C.) Broughton Bay (NAGAI, 1930). *Paramushir*: (W. C.) Kakumabetsu (NAGAI, 1932); (N. C.) Murakami-wan (NAGAI, 1930); (E. C.) Chitose-wan (NAGAI, 1930), Suribachi-wan (NAGAI, 1932). *Shumushu*: (S. C.) Kataoka-wan (NAGAI, 1930). *Alaid*: Uomizaki (ITO & KOMORI, 1926).

DISTR. Kamtschatka, Aleutian Islands, Alaska and Bering Island.

Alaria GREV.

Key to the species

- A. Midrib fistulose at intervals 1. *A. fistulosa*
- B. Midrib solid throughout
 - a. Sporophylls narrow
 - α. Sporophylls usually fasciculate on short rhachis 2. *A. angusta*
 - β. Sporophylls usually pinnate on longer rhachis 3. *A. doichorhachis*
 - b. Sporophylls broader
 - α. Sporophylls mostly fasciculate on rather short rhachis 4. *A. macroptera*
 - β. Sporophylls usually pinnate on rather long rhachis 5. *A. tenuifolia*

1. *Alaria fistulosa* POST. et RUPR.

Ill. Alg., p. 11, Tab. 16, 1840—J. AG., Spec. Alg. I, p. 144—KJELLM., Beringhafv. Algfl., p. 40—SAUNDERS, Alg. Harriman Exp., p. 426, pl. 57—MIYABE, Lamin. Hokkaido, p. 52, pl. 21—SETCH. & GARDN., Alg. N. W. Amer., p. 275; Mar. Alg. Pacific Coast N. Amer. III, p. 644—YENDO, Kaisan Shokubutsugaku, p. 405; Monogr. Alaria, p. 76, pl. 1—SETCH., Kelps U. S. & Alaska, p. 163—XIBBE,

Structure of *Alaria fistulosa*, p. 43, pl. 7-9—OKAM., Enum. Jap. Alg. 2nd Ed., p. 164—NAGAI, Seaweeds from the Kuriles, p. 46, pl. 10.

Phasganon fistulosa RUPR., Tange d. och. Meer., p. 355, 1851.

JAP. NAME. *Oni-wakame*, *Kairoppa*.

HAB. *Etorofu*: (W. C.) Toshirari (NAGAI, 1931); (E. C.) Hitokap-wan (NAGAI, 1930), Chikohai (NAGAI, 1931), Moyoro (NAGAI, 1931). *Urup*: (W. C.) Tokotan (NAGAI, 1930). *Shimushir*: (N. C.) Broughton Bay (NAGAI, 1930). *Paramushir*: (W. C.) Kakumabetsu (NAGAI, 1930, 1932); (N. C.) Murakami-wan (NAGAI, 1930); (E. C.) Chitose-wan (NAGAI, 1930), Suribachi-wan (NAGAI, 1932). *Shumushu*: (E. C.) Kosekigawa (NAGAI, 1931). *Alaid*: Minami-ura (NAGAI, 1930).

Key to the forms

- A. Sporophylls short, obovate 1. f. *stenophylla*
 B. Sporophylls long, narrow 2. f. *platyphylla*

f. *stenophylla* SETCH.

in SETCH. & GARDN. Alg. N. W. Amer., p. 276; Mar. Alg., p. 645.

HAB. *Etorofu*: (E. C.) Moyoro. *Urup*: (W. C.) Tokotan. *Paramushir*: (N. C.) Murakami-wan.

f. *platyphylla* SETCH.

in SETCH. & GARDN., l. c.

HAB. *Shimushir*: (N. C.) Broughton Bay. *Paramushir*: (W. C.) Kakumabetsu. *Alaid*: Minami-ura.

DISTR. Saghalien, Bering Island, Aleutian Islands and Alaska.

2. *Alaria angusta* KJELLM.

Beringhafv. Algfl., p. 38, Tab. 3, fig. 1-4, 1889—YENDO, Monogr. Alaria, p. 123, pl. 15—NAGAI, Seaweeds from the Kuriles, p. 46, pl. 9.

Alaria lanceolata KJELLM., l. c., p. 39, Tab. 5, fig. 1-3—SAUNDERS, Alg. Harriman Exp., p. 426, pl. 53—SETCH. & GARDN., Alg. N. W. Amer., p. 275; Mar. Alg. Pacific Coast N. Amer. III, p. 642—SETCH., Kelps U. S. & Alaska, p. 162—YENDO, l. c., p. 129, pl. 17.

Alaria laticosta KJELLM., l. c., p. 40, Tab. 6—DE TONI, Syll. Alg. III, p. 331—SAUNDERS, l. c., p. 425, pl. 55.

Alaria esculenta POST. et RUPR., Ill. Alg., p. 11, 1840 (p. p.).

Alaria dolichorhachis COLLINS, HOLDEN & SETCHELL, Phyc. Bor.-Amer. (Exsicc.), No. XLI (not KJELLM.).

JAP. NAME. *Hosoba-wakame*.

HAB. *Etorofu*: (W. C.) Toshirari (NAGAI, 1931), Kamuiwakka (Collector unknown, 1894); (E. C.) Chikohai (NAGAI, 1931), Ukaboi (Collector unknown, 1894). *Urup*: (W. C.) Tokotan (NAGAI, 1930). *Shimushir*: (N. C.) Brough-

ton Bay (NAGAI, 1930). *Ketoi*: Minami-ura (TATEWAKI & TAKAHASHI, 1929). *Paramushir*: (W. C.) Kakumabetsu (NAGAI, 1930, 1931); (N. C.) Murakami-wan (NAGAI, 1930). *Shumushu*: (S. C.) Kataoka-wan (NAGAI, 1930); (W. C.) Tenjin-iwa (NAGAI, 1932). *Alaid*: Minami-ura (NAGAI, 1930), Sekinezaki (ITO & KOMORI, 1926).

DISTR. Saghalien, Bering Island, Aleutian Islands and Alaska.

In 1889, KJELLMAN reported on nine species of *Alaria* in "Beringhafvets Algflora". Among these species, *Alaria angusta* KJELLM. that bears narrow, metasoric and fasciculate sporophylls and also *A. lanceolata* KJELLM., similiar to the former, but having more long sporophylls are noted. According to KJELLMAN, the blade of the former species is narrow lanceolate, measuring 1 meter in length, only 7 cm. in width, while that of the latter lanceolate, and 1.25 meter in length and 15 cm. in width, in a specimen of each species. The sporophylls of the former are characteristic in the slenderness and measuring 10 to 15 cm. long in ordinary sizes, and never exceeding over 1 cm. in width. They are lanceolate, linear-spathulate in shape, petiolate at the base and having rather long sterile portions upwards. In the latter species, they are usually very long, and comparatively narrow, and in measurement, they reach even to 1 meter in length and 3 to 4 cm. in width. They are covered with sori on nearly the whole surface except the terminal portion and the narrow border along the margin. These species are enumerated by YENDO in his monograph of the genus *Alaria* as growing also in the North Kuriles. In the North as well as in the southern Kuriles, but limited to the region washed by the cold current, the junior author found also an *Alaria* that bears the fasciculate narrow sporophylls growing on the reefs exposed at ebb-tide. The blade is linear or linear-lanceolate with acute or cuneate base, and much narrower, but rather shorter than in the other species. It is often split and sometimes decaying in the upper portion, retaining the midrib behind. The stipe is short. The sporophylls are linear or rarely linear-lanceolate, narrow, usually fasciculate, and having sterile portions upwards. The sterile portions are rather long and sometimes attain even to a half or two thirds of the full length of the sporophylls, but rarely the sori extend further upwards, leaving rather short sterile portions on the tip. The sporophylls are at least 11 cm., mostly 20 to 50 cm. and rarely up to 74 cm. in length. In width they are measured mostly 1.5 to 3 cm., but sometimes in the younger specimens 4 to 5 mm. wide even at the broadest parts. Among the abundant specimens from the Kurile Islands, there are found many individuals according well with *A. angusta*, as well as also with *A. lanceolata*. There are also found the intermediate forms between them. After the consideration, we came to the conclusion that these two species should

better be amalgamated into one species. As to the other synonyms, we follow here tentatively the opinion of YENDO and SETCHELL and GARDNER.

3. *Alaria dolichorhachis* KJELLM.

Alg. Arct. Sea, p. 217, pl. 20-21, 25, fig. 11-18, 1883; Beringhafv. Algfl., p. 36—DE TONI, Syll. Alg. III, p. 328—SETCH. & GARDN., Alg. N. W. Amer., p. 272; Mar. Alg. Pacific Coast N. Amer. III, p. 642—SETCH., Kelps U. S. & Alaska, p. 162.

Alaria elliptica KJELLM., Alg. Arct. Sea, p. 221, pl. 23, 25, fig. 25-26—DE TONI, l. c., p. 329.

Alaria crispa KJELLM., Beringhafv. Algfl., p. 37, Tab. 3, fig. 5-7—DE TONI, l. c., p. 330.

Alaria taeniata SETCH. (not KJELLM.), Kelps, p. 162, 1912.

Alaria proelonga NAGAI (not KJELLM.), Seaweeds from the Kuriles, p. 46, pl. 7, 1931.

JAP. NAME. *Enaga-wakame*.

HAB. *Etorofu*: (W. C.) Rubetsu (YENDO, 1902; NAGAI, 1930), Arimoe (NAGAI, 1930), Shana (YANAGAWA, 1895), Bettobu (NAGAI, 1930), Shibetoro (NAGAI, 1930, 1931), Toshirari (NAGAI, 1931); (E. C.) Hitokap-wan (NAGAI, 1930). *Urup*: (W. C.) Tokotan (NAGAI, 1930). *Paramushir*: (W. C.) Kurosaki (NAGAI, 1932); (N. C.) Murakami-wan (NAGAI, 1930); (E. C.) Chitose-wan (NAGAI, 1930), Suribachi-wan (NAGAI, 1932). *Shumushu*: (S. C.) Kataoka-wan (NAGAI, 1930); (W. C.) Tenjin-iwa (NAGAI, 1932).

DISTR. Saghalien, Bering Island, Aleutian Islands, Kamtschatka, Alaska and Spitzbergen.

f. *longipes* MIYABE

in Proc. 3rd Pan-Pacific Sci. Congr., p. 957, 1926.

HAB. *Etorofu*: (W. C.) Rubetsu. *Paramushir*: (W. C.) Kurosaki. *Shumushu*: (W. C.) Tenjin-iwa.

DISTR. Saghalien.

4. *Alaria macroptera* (RUPR.) YENDO

Monogr. Alaria, p. 79, pl. 2, fig. 1-5, 1919.

Phasganon macropterum RUPR., Tange d. och. Meer., p. 353, 1851.

Phasganon longipes RUPR., l. c., p. 353.

Alaria esculenta, f. *latifolia* POST. et RUPR., Ill. Alg., p. 11, pl. 17, 1840.

Alaria esculenta, f. *pinnatifida* POST. et RUPR., l. c., p. 11 (p. p.).

Alaria corrugata MIYABE, Lamin. Hokkaido, p. 55, pl. 24, 1902—YENDO, Kaisan Shokubutsu-gaku, p. 405.

Alaria macrophylla MIYABE, l. c., p. 56, pl. 25—NAGAI, Seaweeds from the Kuriles, p. 46.

JAP. NAME. *Chishima-wakame*.

HAB. *Kunashiri*: (E. C.) Chinomichi (NAGAI & SHIMAMURA, 1929), Idashibenai (NAGAI & SHIMAMURA, 1929); (N. C.) Atoiya (NAGAI & SHIMAMURA, 1929). *Etorofu*: (W. C.) Rubetsu (NAGAI, 1930), Arimoe (NAGAI, 1931), Shana

(FUJIMURA, 1890), Bettobu (NAGAI, 1930), Shibetoro (I. ÔNO, 1929), Toshirari (NAGAI, 1931), Kamuiwakka (Collector unknown, 1894); (E. C.) Chikohai (NAGAI, 1931), Moyoro (NAGAI, 1931), Ukaboi (Collector unknown, 1894). *Urup*: (W. C.) Tokotan (NAGAI, 1930). *Paramushir*: (N. C.) Murakami-wan (NAGAI, 1930); (E. C.) Chitose-wan (NAGAI, 1930). *Shumushu*: (S. C.) Kataoka-wan (NAGAI, 1930).

DISTR. Kamtschatka.

5. *Alaria tenuifolia* SETCH.

in COLLINS, HOLDEN & SETCHELL, Phyc. Bor.-Amer., No. XLV—SETCHELL & GARDN., Alg. N. W. Amer., p. 272; Mar. Alg. Pacific Coast N. Amer. III, p. 638—SETCHELL, Kelps U. S. & Alaska, p. 162.

Alaria Pylaii YENDO (not GREV.) Monogr. Alaria, p. 97, pl. 7, 1919.

Alaria corrugata NAGAI (not MIYABE), Seaweeds from the Kuriles, p. 46, pl. 8, 1931.

f. *typica* SETCH.

in COLLINS, HOLDEN & SETCH., l. c.—SETCHELL & GARDN., Alg. N. W. Amer., p. 273, pl. 22; Mar. Alg., p. 638—WORONICHIN, Meeresalg. Kamtschatkas (Transl. in Jap.), p. 128—NAGAI, Meeresalg. aus Kamtschatka, p. 15.

JAP. NAME. *Maruba-chishimawakame*.

HAB. *Etorofu*: (E. C.) Wenbetsu (ÔNO, 1929), Moyoro (NAGAI, 1931). *Shimushir*: (N. C.) Broughton Bay (NAGAI, 1930). *Paramushir*: (E. C.) Chitose-wan (NAGAI, 1930).

DISTR. Kamtschatka, Aleutian Islands and Alaska.

We have obtained the present species in the localities above noted from the Kuriles. The stipe is 7.5 to 11.5 cm. long, cylindrical at the base, becoming flattened gradually upward towards the rhachis of about 2 to 6 cm. in length. The sporophylls are linguiform to obovate, and taper evenly towards the base. They are 5 to 20 cm. long, 3 to 5 cm. wide at the broadest part. They are commonly produced more or less separately from each other in alternate or subopposite arrangement on the rhachis and usually 14 to 32 in number in an individual. The sori occupy both surfaces of the lower half or two thirds of the full length of the sporophylls. The blade is linear-oblong with broadly cuneate to rounded base, membranaceous and more or less richly plicated on the surface. It is measured 50 to 150 cm. in length and 7 to 14 cm. in width. Our specimens are compared with the specimen in the Exsiccatae of COLLINS, HOLDEN and SETCHELL and accord with it very well in important characters.

Pleuropterum MIYABE et NAGAI

Pleuropterum paradiseum MIYABE et NAGAI

in Proc. Imp. Acad. VIII, p. 127, fig. 1-2.

Key to the forms

- A. Stipe long 1. *f. typica*
 B. Stipe short 2. *f. brevipes*

f. typica MIYABE et NAGAI, f. nov.

Stipite 40–60 cm. longo; lamina 7–15 cm. lata, 80–135 cm. longa; sporophyllis et sterilibus pinnis normalibus.

JAP. NAME. *Fūcho-wakame*, *Alaid-wakame*.

HAB. *Urup*: (W. C.) Tokotan (NAGAI, 1930). *Alaid*: Sekinezaki (Iro & KOMORI, 1926), Minami-ura (NAGAI, 1930).

DISTR. Endemic.

This form is based upon the original specimens from the Island of Alaid.

f. brevipes MIYABE et NAGAI, f. nov.

Stipite brevi, ca. 15 cm. longo; lamina latiore, 15–17.5 cm. lata, 300–370 cm. longa; sporophyllis aequae in *f. typica* formantibus; sterilibus pinnis paucis.

HAB. *Shimushir*: (N. C.) Broughton Bay (NAGAI, 1930).

In this form, the stipe is shorter than that of *f. typica*, and measures about 15 cm. in length. The blade is rather wider and not much split on the upper and middle portions. It measures 15 to 17.5 cm. in width and 200 to 370 cm. in length. The sporophylls are formed more or less fasciculately on rather short rhachis of the stipe. The sterile pinnae are mostly found less in number compared with *f. typica*.

摘 要

千 島 産 昆 布 科 植 物

宮 部 金 吾・永 井 政 次

著者の一人永井は1929より4年間千島列島の各地に航し、海藻類の採集研究に従事せり。其の得たる標品中特に昆布科植物に就き學術上興味深きものに關しては既に數回著者等の研究發表せる處あり。今回夫等の種類及其他の總てを取り纏め茲に報告せんとす。尙本研究を遂行するに當り必要なる補助を與えられたる帝國學士院に對し深く感謝の意を表す。

千島産昆布科植物の種類は次の如し。

- 1 ヒメコンブ (*Laminaria longipes* BORY)
- 2 ナガコンブ (*L. longissima* MIYABE)
- 3 ガツカラコンブ (*L. coriacea* MIYABE)
- 4 カラフトトロロコンブ (*L. sachalinensis* MIYABE) 本種は國後西岸及樺太に産し、從來北海道西岸に普通見らるゝチマミコンブの一變種とせられたりしが、今回別種として取扱ふに至當と考へ茲に一新種として發表せり。

- 5 オニコンプ (*L. longipedalis* OKAM., var. *diabolica* MIYABE)
- 6 リシリコンプ (*L. ochotensis* MIYABE)
- 7 ホソバチャセンコンプ (*L. taeniata* P. et R.)
- 8 チシマサツタコンプ (*L. subsimplex* MIYABE et NAGAI) 本種は北及中部千島に産し、曩に著者等は北米西岸に産する *L. cuneifolia*, f. *subsimplex* SETCH. et GARDN. に當てたるものなり。其後 *L. cuneifolia* の一變種として取扱ふよりも獨立種と爲すに至當と考へ茲に一新種として記述せり。
- 9 クマデコンプ (*L. dentigera* KJELLM.)
- 10 チシマゴヘイコンプ (*L. platymeris* DE LA PYL.)
- 11 ゴヘイコンプ (ヘイソクコンプ) (*L. yezoensis* MIYABE)
- 12 *L. bullata* KJELLM., f. *amplissima* SETCH. et GARDN. 本種は曩に遠藤博士が占守島に産する事を報ぜられしが、著者の採集標品中是れに該當するものを得ざりき。此處には單に博士に従ひて其の種名を收録せり。
- 13 エダネミスチコンプ (*Cymathaere fibrosa* NAGAI) 本種は体脆弱、根は糸狀、莖に細小なる粘液腔導を有す。糸狀根は屢々充分に發達せずして二三の微小なる糸狀突起に終る事あり。北及中部千島に産し、又次のミスチコンプ下に記述せる事實に依り恐らく北米沿岸にも分布せるに非らざるやと考へらる。
- 14 ミスチコンプ (*C. triplicata* J. AG.) 本種は前種同様体脆弱、根は盤狀、莖に粘液腔導を缺く。本邦にては前種と同一區域内に産し、ベーリング島、アリウシヤン群島、アラスカ、バンクーバー島に分布す。北米産のものに於て GRIGGS, SETCHELL 及 GARDNER 氏等の莖の粘液腔導存否に就きて論争あり。著者等は教室指葉庫所蔵のアラスカ産及千島産の標品を検せる結果、本種には全く粘液腔導の存せざる事を知れり。唯本種の盤狀根は通常ゴヘイコンプの如く高度の發達を爲さずして、其の發育不充分なるものにては屢々小豆大の塊に過ぎざる事あり。而も千島にては屢々前種と共に發見せらるゝを以て、斯かるものは前種の根部發育不良なるものに一見よく類似し是れを誤認し易し。
- 15 アツバミスチコンプ (*C. crassifolia* DE TONI)
- 16 トロロコンプ (*Kjellmaniella gyrata* MIYABE) 本種は千島産のものに三變種あり。
- 17 スヂメ (*Costaria costata* SAUNDERS)
- 18 アナメ (*Agarum cribrosum* BORY)
- 19 ネジレコンプ (*Hedophyllum Bongardianum* YENDO)
- 20 チシマネコアシコンプ (*Arthrohammus kurilensis* RUPR.)
- 21 ネコアシコンプ (*A. bifidus* J. AG.)
- 22 キクイシコンプ (*Thalassiphyllum Clathrus* P. et R.)
- 23 オニワカメ (カイロツバ) (*Alaria fistulosa* P. et R.) 本種は千島産のものに二變種あり。
- 24 ホソバワカメ (*A. angusta* KJELLM.) KJELLMAN 氏が初めて記述せる *A. lanceolata* KJELLM. は後に遠藤博士が北千島にも産する事を報ぜしが、著者等は千島産の多數の標品に依りて全く本種の一形態なりと考へ是れを本種に編入せり。但し *A. lanceolata* の形態は本種の正常形にして *A. angusta* は其の異常形と思考せらるれども、命名規約法に従ひ止むを得ず上記の種名を採用せり。
- 25 エナガワカメ (新稱) (*A. doichorhachis* KJELLM.) 本種は其の正常形以外他に一變種あり。
- 26 チシマワカメ (*A. macroptera* YENDO)
- 27 新バチシマワカメ (新稱、本邦新産) (*A. tenuifolia* SETCH., f. *tyfica* SETCH.) 本種は樺提、新知、幌筵島に産し、樺提、アリウシヤン群島、アラスカに分布す。
- 28 フウチヨウワカメ (アライトワカメ) (*Pleuropterum paradiseum* MIYABE et NAGAI) 本属本種は北千島阿頼度島に初めて發見せられ、その後新知島にも産する事を知れり。但し新知産のものは莖部短く、不稔性小葉の數割合に少く、是れを原産地のものゝ一變種とせしめし。

注 意

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