

Type Specimens of Marine Red Algae collected by the Empress Kojun from Hayama and its Vicinity, Sagami Bay, Japan

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Abstract Type specimens of marine red algae (Rhodophyceae) described by Yamada (1938, 1941, 1944) based on the Empress Kojun's collection from Hayama and its vicinity, Sagami Bay, Japan are listed. Holotypes of *Griffithsia venusta*, *Erythroglossum pulchrum* (= *Sorella pulchra*), *Hypoglossum sagamianum* and a lectotype of *Lophocladia japonica* are deposited in the Herbarium of Graduate School of Science, Hokkaido University (SAP). Holotype of *Rhodymenia parva* is deposited in the Herbarium of the Showa Memorial Institute, National Science Museum, Tokyo (TNS). Lectotypification of *Kallymenia oligonema* and *Myriogramme ciliata* are made.

Key words: *Erythroglossum pulchrum*, *Griffithsia venusta*, holotype, *Hypoglossum sagamianum*, *Kallymenia oligonema*, lectotypification, *Lophocladia japonica*, *Myriogramme ciliata*, red algae, *Rhodymenia parva*, taxonomy.

Her Late Imperial Majesty Nagako, the Empress Kojun (1903–2000) had a large collection of marine algae which she gathered vigorously from the area around Hayama and its adjacent areas, Kanagawa Prefecture, Sagami Bay, Japan during 1935–1941. The Empress' algal herbarium was managed independently in those days, and afterwards merged with the Emperor Showa's algal herbarium in the Biological Laboratory, Imperial Palace, Tokyo. Many specimens from greater part of her collection were sent several times to Yukio Yamada (1903–1975), professor of Department of Botany, Hokkaido Imperial University for identification until September 1941, just before the Pacific War. Yamada not only determined the scientific species names for her specimens, but also studied the materials taxonomically and published several new species in the "Scientific Papers of the Institute of Algological Research, Faculty of Science, Hokkaido Imperial University" (Yamada 1938, 1941, 1944). While most of the specimens was returned to the algal herbarium of the Biological Laboratory until 1944, several specimens were granted to Yamada's laboratory for their further investigation and at present deposited carefully in the Herbarium of Graduate School of Science, Hokkaido University (SAP). On the other hand, whole of the algal collection of the Biological Laboratory was transferred to the Showa Memorial Institute,

National Science Museum, Tokyo (TNS), Tsukuba in 1994.

In his papers, Yamada often cited locality and herbarium name only as “Hayama, Sagami Prov. (Herb. Biol. Labor., Imp. Palace, Tokyo)” without specifying specimen numbers. In 1940’s modern type method had not been popularized in Japan entirely. However, he showed good-quality photographs of specimens examined for each species and after also explained these specimens as “original specimens”. These information are valuable support for deciding which specimens were regarded by Yamada as plants typical for his new species.

We examined the algal collection originating from both of the Biological Laboratory, Imperial Palace in both Hokkaido University and the Showa Memorial Institute, the National Science Museum, referring to memorandums for specimens sent to Yamada and results of identifications by him, made by the Biological Laboratory and deposited now in the Showa Memorial Institute. As a result, we could select specimens which were considered to be appropriate for type on the Botanical Nomenclature because the notes on the sheets as ‘Yamada det. no. 000’ are identical to numbers recorded on the memorandums by the Biological Laboratory in order of dispatching them.

In Yamada’s paper, most of the collection locality was written as “Hayama, Sagami Prov.”, though in fact some of them include areas outside Hayama Town (e.g. Sajima, Yokosuka; Hatsuse, Mito, Miura). Probably he had considered area of “Hayama” widerly as Hayama Town and its adjacent areas or off Hayama. Thus we have to be careful in deciding the type locality.

Yoshida (1998) tried to make clear the location where the types of Japanese marine algae are housed, but he couldn’t do it enough in particular because of the insufficiency of the information about the algal herbarium in the Biological Laboratory including the Emperor Showa and the Empress Kojun. In the present paper, we make typifications for marine red algae collected by the Empress Kojun from Hayama and its adjacent areas. Lectotypification are made where necessary in accordance with the provisions of Article 9 of the Saint Louis Code (International Code of Botanical Nomenclature, Greuter et al. 2000). The arrangement of taxa follows that given in the most recent catalog of marine algae of Japan (Yoshida et al., 2000).

List of the type specimens

Order Gigartinales Schmitz
Family Kallymeniaceae Taylor

Kallymenia oligonema Yamada

Sci. Pap. Inst. Algol. Res. Hokkaido Imp. Univ. 2: 198. f. 5, pl. 41, f. 2 (1941).

Japanese name: Hime-tsukasanori.

Kamegisho, off Nagai, Yokosuka (18 m depth), 4 Aug. 1938, Yamada det. no.

1500(f) [SAP 051109=lectotype] (Fig. 1); Tegoshima, Najima, Hayama, 7 Aug. 1938, Yamada det. no. 1500(e) [TNS-AL R, paratype]

Notes: Yamada (1941) didn't designate holotype of this species, while he observed several specimens from "Hayama", which were spelled as "*Callymenia oligonema* Yamada species nov.," and returned to the Biological Laboratory, Imperial Palace before publication of the species. These specimens can be regarded as syntypes of *Kallymenia oligonema*. In the plate of his paper, he showed two photographs of the alga as "two original specimens" (pl. 41, f. 2). We could find one of them which accords with the below one in the plate in the herbarium of Hokkaido University. This specimen has a number of Yamada det. no. 1500(f), which was recorded in the document of Biological Laboratory as a specimen bestowed to Yamada on 27 March 1939. This plant of the specimen agrees with the original description in the fan shape of the thallus and the presence of a stipe. The other one's whereabouts is unknown. Thus we designate hereby the specimen deposited in Hokkaido University (SAP 051109) as the lectotype of the species.

Yoshida (1998, p. 757) wrote that the type locality is Akiya, Yokosuka, because he believed TNS-AL R 298, which was collected from Akiya on 15 August 1940, to be holotype. We amend it as Kamegisho, off Nagai, Yokosuka.

Order Rhodymeniales Schmitz
Family Rhodymeniaceae Harvey

Rhodymenia parva Yamada

Sci. Pap. Inst. Algol. Res. Hokkaido Imp. Univ. 2: 213. f. 14, 15. pl. 43, f. 1 (1941).

Japanese name: Himedarusu.

Kasagone, off Sajima, Yokosuka, (12 m depth), 6 Aug. 1939, Yamada det. no. 1886(a) [TNS-AL R 1021=holotype] (Fig. 2).

Notes: This species was described by Yamada (1941) based on the specimens from "Hayama, Sagami Prov." In the plate (pl. 43, f. 1) he showed a photographic figure of the two plants, which are corresponding with the ones of specimen TNS-AL R 1021 deposited in the Showa Memorial Institute. As there is a note as "y. No. 1886(a) type specimens" on the sheet and the plants agree with the original description in having a short stipe and an erect thallus dividing dichotomously, we conclude this is holotype.

Yoshida (1998, p. 859) regarded Hayama as type locality of the species according to Yamada's original description, while Kasagone, off Sajima, Yokosuka is precise as the type locality.

Order Ceramiales Oltmanns
Family Ceramiaceae Dumortier

Griffithsia venusta Yamada

Sci. Pap. Inst. Algol. Res. Hokkaido Imp. Univ. **3**: 15. f. 2, 3 (1944).

Japanese name: Tama-kazashigusa.

Nishinosaki, Mito, Hatsuse, Miura (13 m depth), 2 Sep. 1940, Yamada det. no. 2044 [SAP 051107=holotype (Fig. 3)].

Notes: In his description for this species Yamada (1944) mentioned “Hayama, Sagami Prov. Herb. Biol. Labor., Imp. Palace, Tokyo, Nos. 1921, c and S. 597” as materials observed. In the herbarium of Hokkaido University, only one specimen of the species with Yamada det. no. 2044 was detected. According to the memorandums in the Biological Laboratory, the specimen of Yamada det. no. 1921 was returned for a time, labelled with an identification as *Griffithsia japonica* Okamura on 31 October 1940, and then sent again to Yamada as no. 2044 on 4 December 1940. Judging from a note of “gift” on the sheet, this specimen was thought to be granted to Yamada. We could not find S. 597, which is presumed to be a liquid specimen of no. 2044. There is no specimen of the species in the Showa Memorial Institute. As this species is considered to have been described by Yamada based on this single specimen, we conclude that this specimen is holotype following Yoshida (1998, p. 911) and its type locality is not Hayama but Nishinosaki, Mito, Hatsuse, Miura.

Family Delesseriaceae Bory

Erythroglossum pulchrum Yamada

Sci. Pap. Inst. Algol. Res. Hokkaido Imp. Univ. **2**: 124. pl. 24, f. 1 (1938).

=*Sorella pulchra* (Yamada) Yoshida et Mikami, Jpn. J. Phycol. **39**: 129. f. 1–11 (1991).

Japanese name: Kushinoha-usubeni.

Tegoshima, Najima, Hayama (11–16 m depth), 26 Aug. 1936, Yamada det. no. 102 [SAP 048988=holotype (Fig. 4)]; Yamada det. no. 889 [TNS-AL R 1161=isotype]; Near Wareshima, Najima, Hayama, 7 Jul. 1937, Yamada det. no. 896(a) [SAP 048986=paratype].

Notes: In his original description, Yamada (1938) showed a figure of the whole of a single plant (pl. 24, f. 1), which corresponds with one of the specimens of the species in SAP. According to the record of request for identification, this specimen was granted to Yamada for his study. Thus we considered this specimen as the holotype (Fig. 4). The specimen of TNS-AL R 1161, which has Yamada's determination number '889', is treated as isotype.

Although Yoshida (1998, p. 995) wrote that TNS-AL R 299 is type of the

species, we think now Yamada must not have observed this material before publishing his paper about this new species in the first issue of 1938 because the specimen was collected at off Sajima, Hayama in August 1938.

Since the specimens sent from the Biological Laboratory did not contain female gametophyte plant, Yamada (1938) placed this new species in *Erythroglossum* judging from only morphology of tetrasporophytes. In 1943, however, a new genus *Sorella* was established by Hollenberg based upon *Erythroglossum delicatulum* Gardner, whose tetrasporangial sori are formed on the central portion of the thallus. Mikami (1987) examined the holotype and paratype specimens in SAP and recognized that the Yamada's species has *Sorella*-type tetrasporangial sori structures. After that therefore this species was transferred to *Sorella* by Yoshida and Mikami (1991) showing also *Polyneura*-type procarp structures in newly collected female plants of the species.

Hypoglossum sagamianum Yamada

Sci. Pap. Inst. Algol. Res. Hokkaido Imp. Univ. 2: 208. pl. 41, f. 1 (1941).

Japanese name: Suji-benihanori.

Ogashima, Hayama (12m depth), 18 Apr. 1939, Yamada det. no. 1791(d) [SAP 048987=holotype] (Fig. 5); Yamada det. no. 1791 (a-c, e) [TNS-AL R 1213=isotype].

Notes: As Yamada (1941) showed a photographic figure (pl. 41, f. 1) of a specimen containing five plants for this species in his original paper, he made an explanation as "Five original specimens". In the herbarium of Hokkaido University there is a specimen which accords with the figure. According to the memorandums in the Showa Memorial Institute, this specimen, which has Yamada det. no. 1791(d), is the specimen bestowed from the Biological Laboratory to Yamada on 2 October 1939. Thus we agree to Yoshida (1998, p. 977) in that this specimen, SAP 048987 is regarded as the holotype of the species.

Myriogramme ciliata Yamada

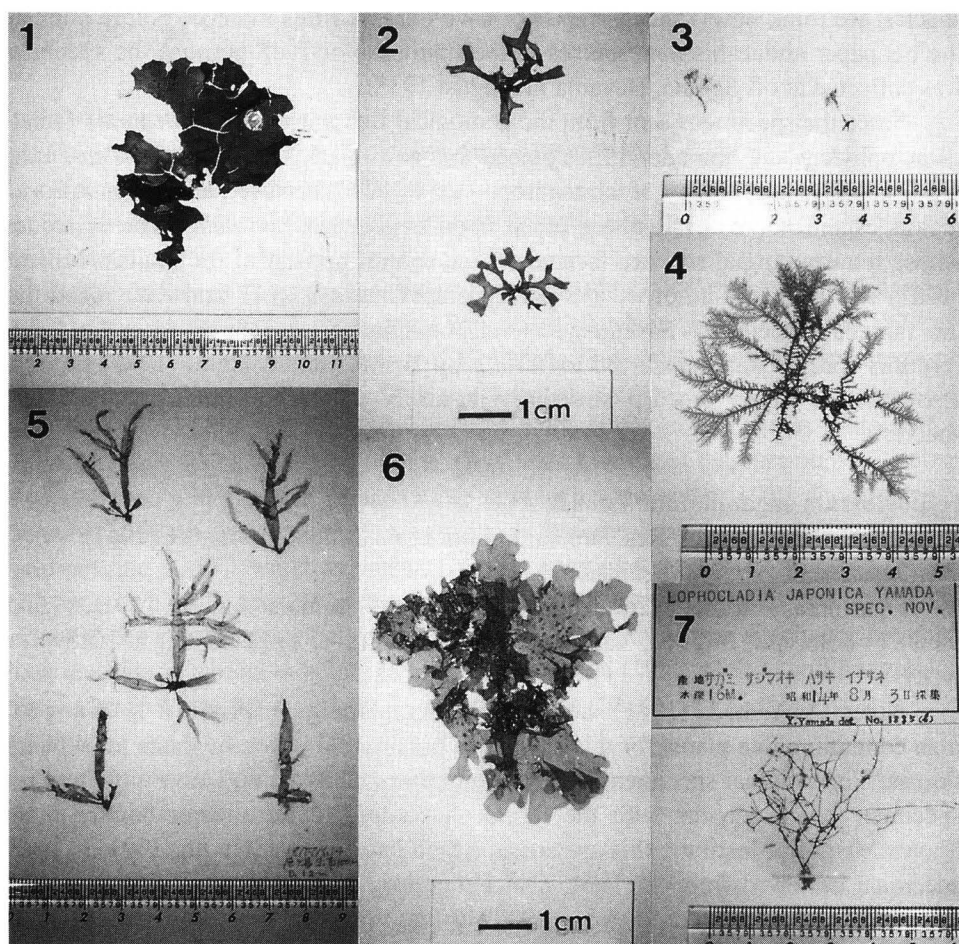
Sci. Pap. Inst. Algol. Res. Hokkaido Imp. Univ. 2: 212. pl. 42, f. 2 (1941).

Japanese name: Nedashi-sujiginu.

Hasaki, off Sajima, Yokosuka (14m depth), 26 Jul. 1939, Yamada det. no. 1915(a)(b) [TNS-AL R 295=lectotype] (Fig. 6); Hasaki, off Sajima, Yokosuka, 28 Jul. 1939, Yamada det. no. 1915(a)(b) [TNS-AL R 1215=paratype].

Notes: When Yamada (1941) made this new species based on the specimens from Hayama, he put a question mark after the generic name indicating hesitation in using *Myriogramme* for the species because he could not examine any cystocarpic plant, whose morphological characters are necessary for identification of genera in the family Delesseriaceae.

Although Yamada showed a photograph of two plants of *Myriogramme ciliata* as



- Fig. 1. *Kallymenia oligonema* Yamada. Lectotype (SAP 051109).
 Fig. 2. *Rhodymenia parva* Yamada. Holotype (TNS-AL R 1021).
 Fig. 3. *Griffithsia venusta* Yamada. Holotype (SAP 051107).
 Fig. 4. *Erythroglossum pulchrum* Yamada [= *Sorella pulchra* (Yamada) Yoshida et Mikami]. Holotype (SAP 048988).
 Fig. 5. *Hypoglossum sagamianum* Yamada. Holotype (SAP 048987).
 Fig. 6. *Myriogramme ciliata* Yamada. Lectotype (TNS-AL R 295).
 Fig. 7. *Lophocladia japonica* Yamada. Lectotype (SAP 051108).

“original specimens” in the plate (pl. 42, f. 2) for this species, their whereabouts are unknown in both Hokkaido University and the Showa Memorial Institute. There are only a few specimens which are considered as syntypes of the species in the Showa Memorial Institute. The plant of lectotype specimen, which we selected from the syntypes, is tetrasporangial and agrees well with the original description in expanding of

the thallus composed of single cell layer on the substratum by issuing rhizoidal filaments from the margin.

Family Rhodomelaceae Areschoug

Lophocladia japonica Yamada

Sci. Pap. Inst. Algol. Res. Hokkaido Imp. Univ. **2**: 210. f.11, 12 (1941).

Japanese name: Yoremigusa.

Hasaki, off Sajima, Yokosuka (16 m depth), 3 Aug. 1939, Yamada det. no. 1885(b) [SAP 051108=lectotype] (Fig. 7); Yamada det. no. 1885(a) [TNS-AL R 1295=paralectotype].

Notes: In the description of *Lophocladia japonica*, Yamada (1941) did not show a photograph of the specimen. Yoshida (1998, p. 1046) selected a specimen in the herbarium of Hokkaido University, SAP 051108, which is an imperial grant bestowed on 30 December 1940 to Yamada, as the lectotype. According to the memorandum in the Biological Laboratory, this specimen is thought to be Yamada det. no. 1885(b), which is a part of material sent from the Biological Laboratory as no. 1885. In the Showa Memorial Institute several specimens with a note of "Yamada det. no. 1885(a)", which correspond to duplicates of the lectotype, are deposited. Type locality of the species was exactly Hasaki, off Sajima, Yokosuka, although Yamada stated "Hayama, Sagami Prov. (Herb. Biol. Labor., Imp. Palace, Tokyo)" in the description.

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