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Taxonomic Placement of *Prionitis microcarpa* (C. Agardh) J. Agardh (Halymeniaceae, Rhodophyta)[1]

Mitsuo KAJIMURA

Marine Biological Station, Faculty of Science, Shimane University, Kamo, Saigo, Oki-gun, 685 JAPAN
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An examination of the type collection of *Prionitis microcarpa* (C. Agardh) J. Agardh (*Sphaerococcus microcarpus* C. Agardh) revealed that it is representative of the genus *Polyopes*. A lectotype specimen was selected and a new combination proposed, *Polyopes microcarpus* (C. Agardh) Kajimura.

Key Index Words: *Halymeniaceae*—Polyopes microcarpus—Prionitis microcarpa—*Rhodophyta*.

Introduction

Sphaerococcus microcarpus was described by C. Agardh (1822, p. 255) on the basis of a collection from western Australia sent to him by Desfontaines. It was placed in the genus *Chondrus* Stackhouse, without comment, by Greville (1830, p. LV). J. Agardh (1847, p. 9) listed it as a species of *Phyllotylus* Kützing, a generic synonym of *Phyllophora* Greville. Later, J. Agardh (1849, p. 85) established the genus *Polyopes*, to which he assigned two species, *Fucus constrictus* Turner and *Sphaerococcus microcarpus*, but without making the appropriate nomenclatural combinations. Still later, J. Agardh (1851, pp. 187, 239) retained in *Polyopes* only one species, *P. constrictus*, transferring *Sphaerococcus microcarpus* to his new genus *Prionitis*. Kylin (1956, p. 221), who followed J. Agardh in recognizing only one species in *Polyopes*, commented that *Prionitis microcarpa* seems to be identical with *Polyopes constrictus*.

I have made *Prionitis microcarpa* a new combination of *Polyopes* this time, and the results of the comparison of species of *Polyopes* are presented in this paper.

Materials and Methods

The type collection of *Sphaerococcus microcarpus* comprises two specimens (Agardh Herbarium, LD, Nos. 22856 and 22858) (Figs. 1, 2), which were borrowed for examination.

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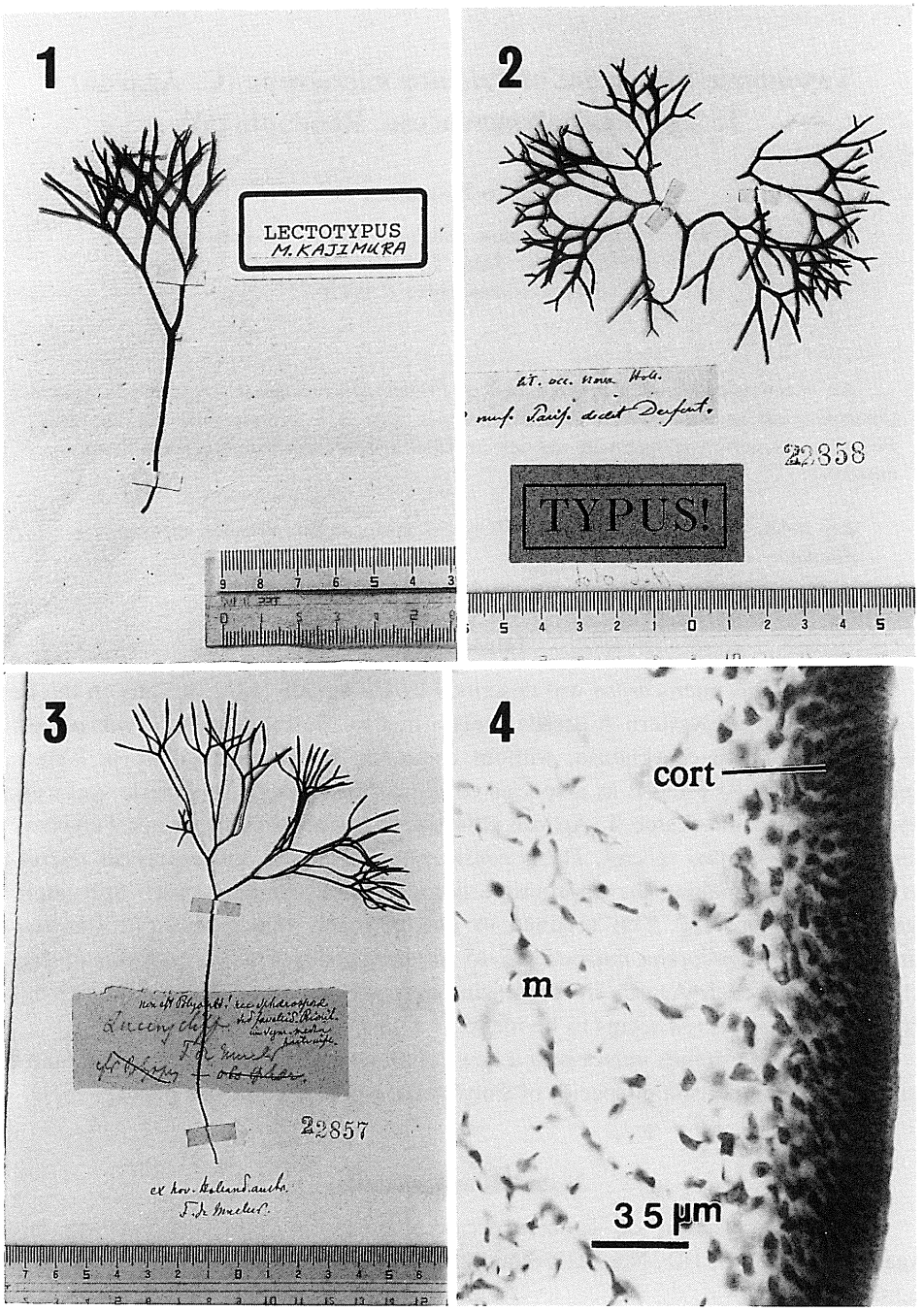
[1] Contribution No. 58 from Oki Marine Biological Station, Faculty of Science, Shimane University.



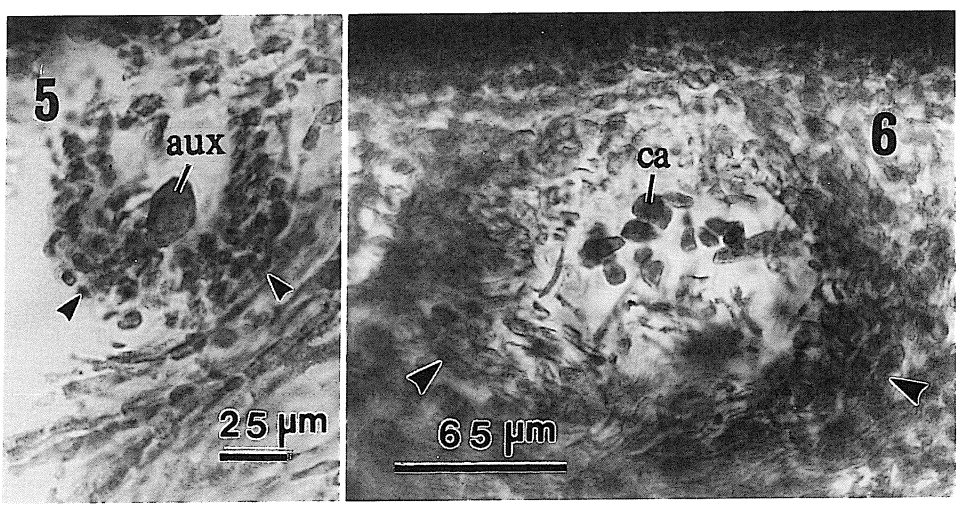
Figs. 1–4. *Polyopes microcarpus* (C. Agardh) Kajimura, comb. nov.
1. Lectotype (Agardh Herbarium, LD, No. 22856).

Small pieces of a frond were stained with a 1% aqueous solution of aniline blue acidified with acetic acid (9:1 v/v) for 10 minutes. They were then sectioned with a freezing microtome and by hand. Sections were mounted in a 50% aqueous solution of rice syrup acidified with acetic acid (33:1 v/v).

Observations and Conclusion

The thallus is rigid and without a midrib. The cortex comprises 10-15 layers of cells (Fig. 4). The medulla consists of many periclinal filaments. Refractive cells are absent. Auxiliary cell ampullae (Fig. 5) are profusely branched to the 5th order. The pericarp (Fig. 6) is somewhat thick and consists of persistent branches of the auxiliary cell ampulla, their derivatives, neighboring medullary filaments, and inner cortical cells.

The vegetative characters listed above are shared by *Prionitis* and *Polyopes*, these similar-appearing genera being distinguished by reproductive characters. In *Prionitis* the ampulla is simpler than that of *Polyopes*, comprising only a single primary ampullar filament and two or three 7- to 13-celled secondary ampullar filaments (Chiang 1970).



Figs. 5, 6. *Polyopes microcarpus* (C. Agardh) Kajimura, comb. nov.

5. Profusely branched auxiliary cell ampulla (arrowheads) (Agardh Herbarium, LD, No. 22856). aux, auxiliary cell.

6. Mature cystocarp with somewhat thick pericarp (arrowheads) in cross section (Agardh Herbarium, LD, No. 22856). ca, carposporangium.

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2. Another specimen of the type collection (Agardh Herbarium, LD, No. 22858).

3. Specimen collected by F. von Mueller at Queenscliff, Victoria (Agardh Herbarium, LD, No. 22857).

4. Cross section of a sterile region of thallus (Agardh Herbarium, LD, No. 22856). cort, cortex; m, medulla.

Table I. Comparison of species of *Polyopes*.

Species	Height of thallus (cm)	Width of branches (mm)	Habit	Position of tetrasporangial nemathecia	Position of cystocarps	Distribution
P. microcarpus (C. Agardh) comb. nov.	9–14	*Ca.* 2	Dichotomous, occasionally trichotomous, without proliferations and constriction	Unknown	In terminal segments	Australia
P. constrictus (Turner) J. Agardh	4–16	1–2	Dichotomous, occasionally secund, opposite, patent, with proliferations and constriction	In terminal or penultimate segments	In terminal segments or proliferations	Australia, South Africa
P. intricatus Schmitz	6–7	2–3	Repeatedly dichotomous, flabellate-fastigiate or dichotomo-pinnate, with proliferations and no constriction	Unknown	Unknown	Kenya
P. polyideoides Okamura	5–15	1–2	Irregularly dichotomous, often constricted, with proliferations	In terminal or penultimate segments	In terminal segments	Japan
P. ligulatus (Harvey) De Toni	*Ca.* 6	1–4	Subdichotomous to dichotomo-pinnate, with proliferations and rare constriction	In terminal or penultimate segments	Unknown	Ceylon
P. hawaiiensis Kajimura	1–5	0.5–1	Regularly dichotomous, terminal segments forked, with proliferations, constriction uncommon	On entire thallus surfaces	On entire thallus surfaces	Hawaii

In *Prionitis*, although a rather thick pericarp is formed around the young carposporophyte mainly from the persistent branches of the auxiliary cell ampulla and their newly produced lateral branches, at maturity the pericarp is scarcely detectable, its cells having degenerated after supplying nutrition to the developing carposporophyte (Kawaguchi 1989). In *Polyopes* the mature pericarp is rather thick and complex (Chiang 1970).

It is clear that *Sphaerococcus microcarpus* should be assigned to *Polyopes*, as was done by J. Agardh when that genus was established (J. Agardh 1849), rather than to *Prionitis*, as was done in a later work by J. Agardh (1851). Kylin (1956) commented that *Prionitis microcarpa* seems to be identical with *Polyopes constrictus*, however the former is considered to be distinct from the latter at the specific level in habit and the position of cystocarp formation. *P. microcarpa* is also distinct from all the other known species of *Polyopes*, namely, it is distinct from *P. intricatus*, *P. polyideoides* and *P. ligulatus* in habit, on the other hand it is distinct from *P. hawaiiensis* in both habit and position of cystocarp formation (Table I). Because J. Agardh failed to make an appropriate nomenclatural combination, I do so now:

Polyopes microcarpus (C. Agardh) Kajimura, comb. nov.
Basionym: *Sphaerococcus microcarpus* C. Agardh 1822, p. 255.
Lectotype: Agardh Herbarium, LD, No. 22856 (Fig. 1).

Of the two specimens that apparently represent the type collection, I have chosen No. 22856 (Fig. 1) rather than No. 22858 (Fig. 2) for the lectotype because cystocarps in the former are better developed than those of the latter. The auxiliary cell ampullae of this species are profusely branched to the 5th order and cystocarps have a rather thick pericarp. These characters are typical of *Polyopes*. No. 22857 (Fig. 3) was collected by F. von Mueller at Queenscliff, Victoria, according to its label.

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