PHYCOLOGICAL OBSERVATIONS I

BY

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(時　田　　郁)

(With Plate VIII and two Text-figures)

Rhododermis Georgii (BATT.) COLLINS

in COLLINS, HOLDEN et SETCHELL, Phycotheca Bor. Amer. No. 1299; COLLINS, Notes on Algae, III, Rhodora, Aug. 1906, p. 160.

Rhodophysema Georgii BATTERS, New or Critical British Marine Algae, p. 377, Pl. 414, Figs. 8–13, 1900.

var. ***fucicola*** var. nov.

Plate VIII

Frond epiphytic on other algae, of larger dimension than the typical form, 1–2.5 mm in diam., partly cushion-shaped and 20–80 μ high, partly inflated and 0.3–1 mm high; tetrasporangia cruciate, 39–42 μ long, 27–30 μ in diam.; paraphyses 6-celled, 5 μ thick, up to 60 μ long.[1]

Hab. On the fronds of *Iridaea pulchra* KÜTZ., *I. laminarioides* var. *cornucopiae* J. AG., *Gymnogongrus flabelliformis* HARV., *Chondrus pinnulatus* (HARV.) OKAMURA, and *Rhodomela Larix* (TURN.) AG. Japan Sea side of Hokkaido, at Oshoro, Prov. Shiribeshi (TOKIDA, No. 416, March 1930—*The type*; Nov. 1933), and Rumoe, Prov. Teshiwo (H. ÔTANI, April 1932).

The present new variety belongs to Rhodophysema of BATTERS (l. c.), because it has an inflated frond with an inner tissue composed of large parenchymatous

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1. *Rhododermis Georgii* var. *fucicola* TOKIDA, var. nov.—Fronde in aliis algis epiphytica, crassiore, 1–2.5 mm lata, partim pulvinata 20–80 μ alta, partim inflata 0.3–1 mm alta; tetrasporangiis 39–42 μ longis, 27–30 μ crassis, cruciatim divisis; paraphysibus 6-articulatis, usque ad 60 μ longis, 5 μ crassis.

cells. It resembles *Rhodophysema Georgii* BATTERS (=*Rhododermis Georgii* COLLINS) so closely that the dimensions and the habitat are the only differences between them. (Cf. Table I). *Rh. Georgii* has been reported from the European coasts and from the Atlantic side of North America, always growing on leaves, sometimes also on exposed roots, of Zostera. Our variety is epiphytic on other red algae as mentioned above. On *Iridaea pulchra* it grows on margins as well as on surfaces, and causes the malformation of the host. The attacked surface of the host is bent convexly.

Hairs were detected by some investigators (HEYDRICH, 1903[1], Taf. 17, Fig. 5; KYLIN, 1907[2], Fig. 41 d; ROSENVINGE, 1917[3], Fig. 119, B) in the typical form of this species, but they are lacking in our variety as far as the writer has examined.

In the inflated part of the frond the cells of the basal layer always remain unchanged, being in sharp contrast with enlarged cells of the overlying inner tissue. Sometimes the basal layer is composed of two to several layers of small cells similar in size and content. According to ROSENVINGE (1917[3], p. 200, Fig. 120, A, B), in *Rh. Georgii* the cells of the basal layer are partly enlarged at an early period, and partly necessarily left unchanged in size.

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1. HEYDRICH, F., Ueber Rhododermis CROUAN. Bot. Centralbl. Bd. XIV, p. 243.
2. KYLIN, H., Studien über die Algenflora der schwedischen Westküste.
3. ROSENVINGE, L. K., The Marine Algae of Denmark. Part II.

Table I. A list of the habitat, the size of frond, etc. of all the known species and varieties of the Genus Rhododermis.

Species	*R. parasitica* BATT.	*R. elegans* CRAU.	var. *polystromatica* BATT.	*R. Georgii* (BATT.) COL.	var. *fucicola* TOKIDA
Habitat	Stipe of *Laminaria hyperborea* (BATTERS, etc.)	Glass, porcelain (CROUAN). Stones, shells and carapaces of animals, Algae (ROSENV.). *Rhodymenia palmata* (Yendo).	Stone (BATTERS).	Leaf of Zostera (BATTERS, etc.). Uncovered roots of Zostera (ROSENVINGE).	Algae (*Iridaea pulchra*, *Rhodomela Larix*) (TOKIDA).
Size of Frond	0.3–4.5 cm. in diam., 0.1–0.2 mm. thick (BATTERS). 16–150 μ thick (KUCKUCK).	Marginal part 1-cell thick, inner part 2–5 cell thick (ROSENVINGE).	50–100 μ thick (BATTERS). [There is no reason to maintain the variety (ROSENVINGE)].	40–500 μ thick (HEYDRICH). 1/100–1 mm. in diam. (HEYDR.). 0.5 mm. diam. (KYLIN). rarely exceeds 300 μ in diam. (ROSENVINGE).	1–2.5 mm. in diam. 20–80 μ or 0.3 –1 mm. thick.
Size of Paraphyses	50–60 : 5 μ (BATTERS). 32–34.5 : 4–4.6 μ (KUCKUCK).	4–5-celled; 40–50 : 5–9 μ (ROSENVINGE). In some specimens paraphyses but few, or almost wanting. (ROSENVINGE).	50–64 : 5–7 μ (BATTERS).	4–6-celled; 50–70 : 5μ (KYLIN). 3–5-celled; 6 μ broad at the base (ROSENVINGE).	6-celled, 60 : 5 μ.
Size of Sporangia	28 : 12 μ (BATTERS). 32–36.8 : 18.4–20.7 μ (KUCKUCK).	24–32 : 16–20 (24) μ (ROSENVINGE). 20–21 : 18 μ (BOERGESEN).	26(–48) : 12(–21) (BATTERS).	24–30 : 14–20 μ (KYLIN). 26–32 : 21–24 μ (ROSENV.).	39–42 : 27–30 μ.
Hairs		Scattered hyaline hairs present between paraphyses or in sterile parts. (ROSENVINGE).		An älteren Exemplaren eine Menge Haare entstehen, bis 1 mm. lang (HEYDRICH). 6–8 μ thick (KYLIN). 5–7 μ thick near the base (ROSENVINGE).	
Locality	Berwick Bay, England. (BATTERS). Helgoland (KUCKUCK).	"Brest" Galliae (CROUAN). Denmark (ROSENVINGE). **Oshoro, Hokkaido** (YENDO).	Berwick Bay, England (BATTERS). Greenland (ROSENVINGE).	Scilly Island (GEORGE; BATTERS). Bai von St. Brelade auf der Insel Jersey (H. VAN. HEURCK; HEYDRICH). Sweden (KYLIN), Denmark (ROSENVINGE).	**Oshoro, and Rumoe in Hokkaido Japan.**

In 1915, *Rhododermis elegans* CROUAN was reported by K. YENDO (Notes on Algae New to Japan, III[1], p. 116) from the Bay of Oshoro near Otaru as to have been found on a two-year old segment of *Rhodymenia palmata*. Since 1930 at the same locality the writer has observed a Rhododermis, i. e. *Rh. Georgii* var. *fucicola*, which prefers to grow on a two-year old frond of *Iridaea pulchra*. As the writer has had no opportunity, unfortunately, to examine YENDO's specimen of *Rh. elegans*, nor could he collect *Rhodymenia palmata* attacked by a Rhododermis, he can say nothing about the identity of YENDO's plant with the variety in question.

Polycoryne denticulata sp. nov.

Text-figures 1 & 2

Frond pulvinate, parasitic on *Phycodrys fimbriata* (DELAPYL.) KYLIN; branches cylindrical, radiate, with a smooth surface while young, more or less denticulate or irregularly ramulose when matured; tetrasporiferous branches filiform, up to 3 mm in length and 0.6 mm in breadth, tetrasporangia oblong-obovate in shape, scattered over the surface, tetrad or obliquely cruciate in division; spermatangiferous branches filiform or clavate and denticulate, up to 3 mm in length, 0.15–0.57 mm in thickness; cystocarpiferous branches capitate with narrow pedicels up to 1.5 mm in length, 0.27–0.31 mm in diam. below, transformed into single or rarely two cystocarps above, cystocarps globose, 0.5–0.84 mm in diam[2].

Hab. Parasitic on *Phycodrys fimbriata* (DELAPYL.) KYLIN. Robben Island, Saghalien (TOKIDA, No. 468, July 1930—*The type.*)

In the Genus Polycoryne there have been described only two species, viz., *P. radiata* SKOTTSBERG[3] and *P. Gardneri* SETCHELL[4]. The former was found at Maihafen in South Ceorgia Island in the Antarctic Ocean, parasitic on *Myriogramme sp.* (*M. Smithii* (HOOK. f. et HARV.) KYLIN ?), the latter at Point Cavallo, Marin County, California, on *Heteronema Andersoniana* (J. AG.) KYLIN. The present Ochotsk species differs from either of these in having denticulate or

1. in Bot. Mag., Tokyo, Vol. XXIX, No. 343.

2. *Polycoryne denticulata* TOKIDA, sp. nov.—Frondе parasitica, pulvinata; ramis teretibus, radiantibus, novellis superficis levi, maturis puls minus denticulatis aut irregulariter ramulosis, tetrasporiferis filiformibus, usque ad 3 mm longis et 0.6 mm crassis, tetrasporangiis oblongo-obovatis, per totam superficiem sparsis, triangule vel oblique cruciatim divisis, spermatangiferis filiformibus vel clavatis, usque ad 3 mm longis, 0.15-0.57 mm crassis, cystocarpiferis usque ad 1.5 mm longis, pedicellis 0.27-0.31 mm diam., apice in cystocarpia singula, raro bina, globosa, 0.5-0.84 mm crassa transformatis.

3. in KYLIN & SKOTTSBERG, Subant. und Ant. Meeresalg., II, p. 36, Figs. 17 e, 18, Tab. I, Fig. 4, 1919.

4. SETCHELL, Parasitic Florideae II, p. 395, 1923.

ramulose branches. As to the position of the cystocarp our species is allied to the Antarctic species, *P. radiata*, rather than to the Californian, *P. Gardneri*.

The pulvinate fronds of *P. denticulata* are formed on the veins as well as on the rest of the lamina of the host plant. Frequently two fronds are found

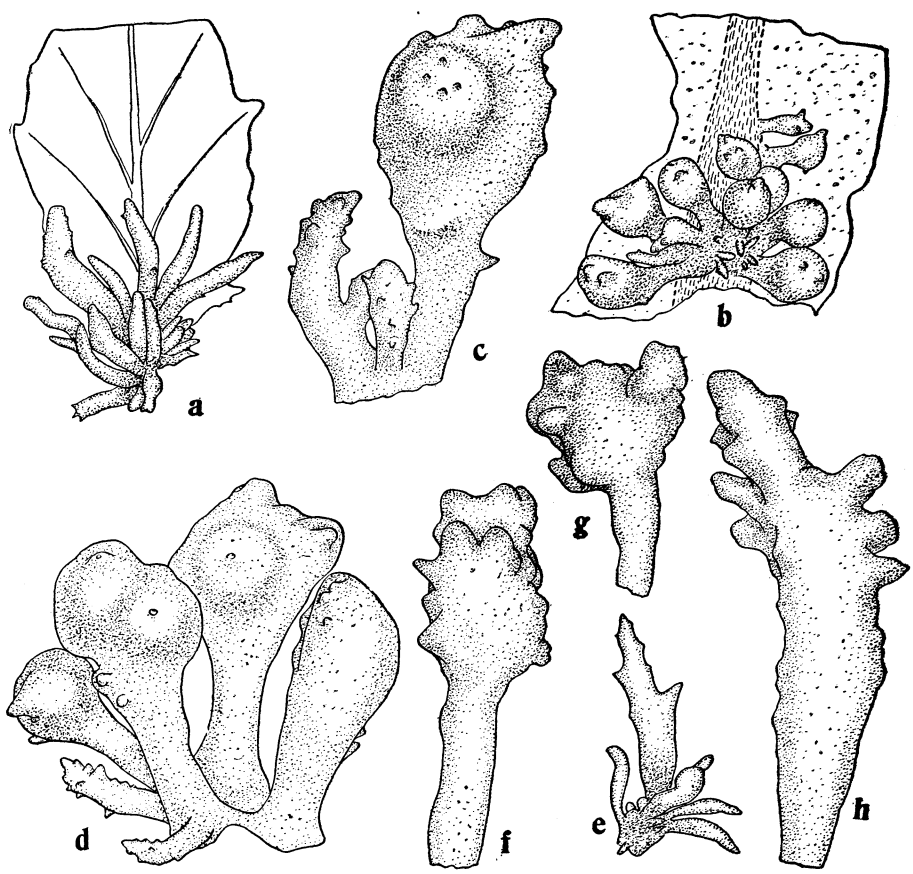

Fig. 1. *Polycoryne denticulata* TOKIDA. a. Tetrasporiferous frond on the basis of a leaflet of the host. b. Female frond on the midrib of the host. c & d. Cystocarpiferous branches. e. Male frond. f-h. Spermatangiferous branches.
a, b. ×10; e ×9; c, d, f, g, h ×25.

growing back to back, so to speak in an antipodal position, on both sides of a lamina. The identity in kind of the reproductive organs of two antipodal fronds seems to be an evidence of their development from one and the same origin immersed in the host tissue.

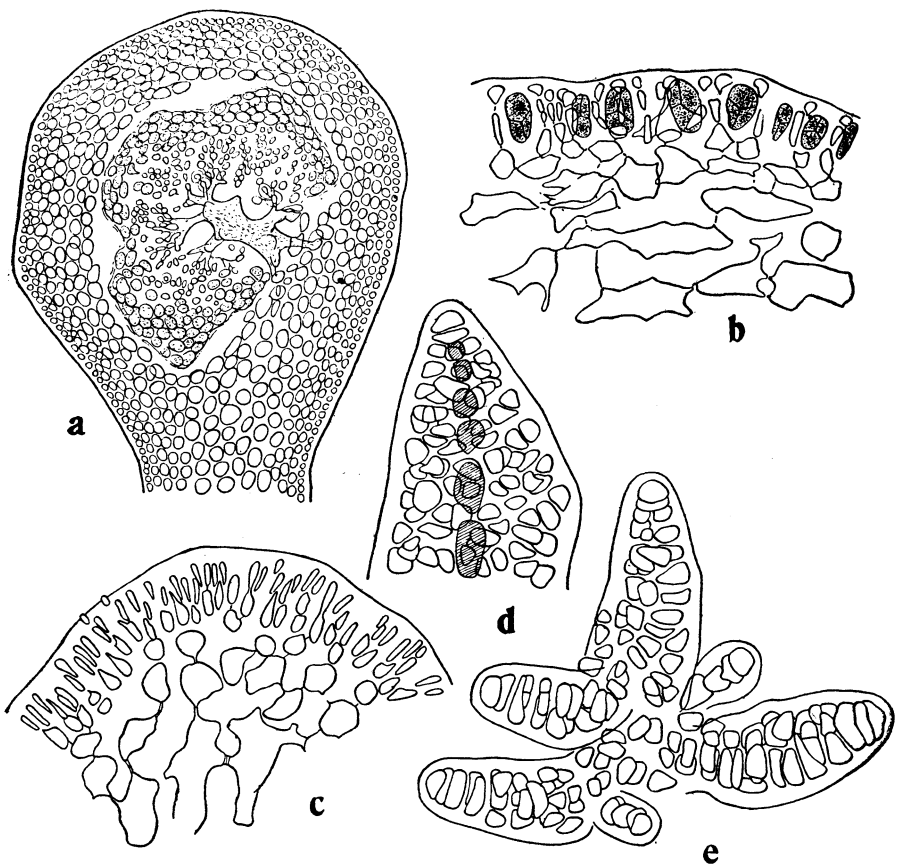

Fig. 2. *Polycoryne denticulata* TOKIDA. a. Longitudinal section of a cystocarp. b. Longitudinal section of a tetrasporiferous branch. c. Cross section of a spermatangiferous branch. d & e. Surface view of young branches; in d the axial cells shaded. a, b ×156; c, d, e ×276.

Here the writer wishes to acknowledge his indebtedness to Emeritus Prof. K. MIYABE and Prof. S. ITO for their constant advices and encouragements in the course of his phycological investigations.

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Explanation of Plate

Microphotographs of

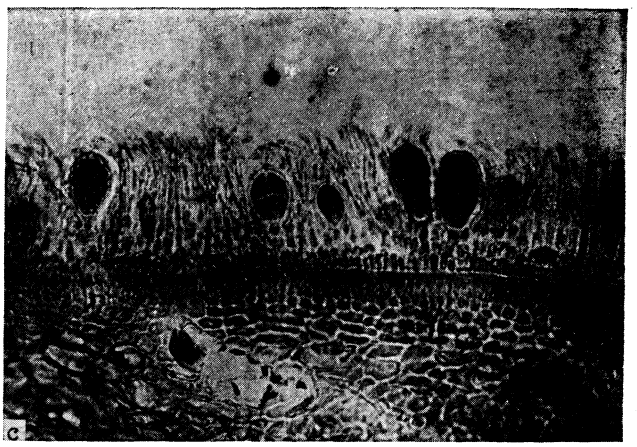
Rhododermis Georgii var. *fucicola* var. nov.

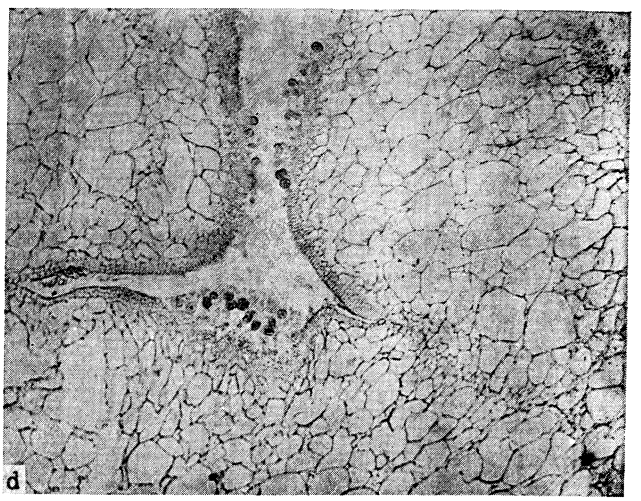
a, b and e. Vertical sections of inflated fronds epiphytic on *Rhodomela Larix*. In Fig. e the basal layer composed of one layer of small cells is shown.

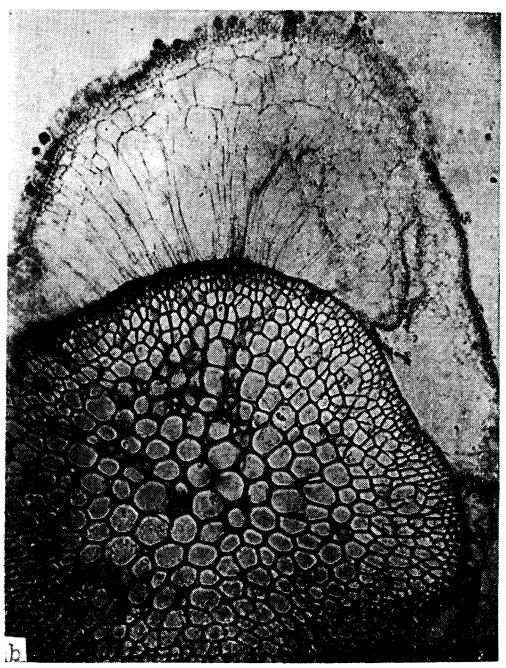
c. Section of a cushion shaped fertile frond epiphytic on *Iridaea pulchra*.

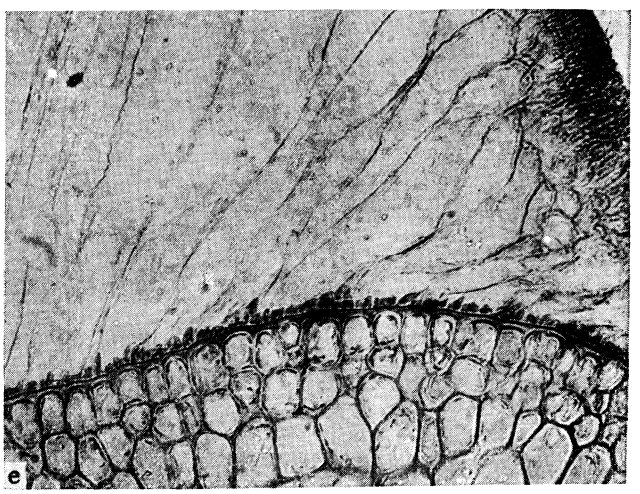
d. Eccentric section of inflated fronds (epiphytic on *Iridaea pulchra*), showing the inner tissue.

a, c & e ×273; b & d ×62.









J. TOKIDA Photo.