

Contributions to the Lichen Flora of the Mariana Islands, Micronesia (3). The Family Thelotremataceae (Graphidales)

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Abstract Two species of the lichen family Thelotremataceae are determined among the collection made during the expedition to the Mariana Islands, Micronesia in 1992. They are *Thelotrema porinoides* Mont. & Bosch and *Ocellularia meiosperma* (Nyl.) Hale, which are widely distributed in the tropics. These specimens slightly differ in morphology from the typical ones. A detailed description, figure and taxonomic remarks are provided for each species on the basis of those specimens.

Key words: lichens, lichenized Ascomycota, Thelotremataceae, *Thelotrema*, *Ocellularia*, Micronesia, Mariana Islands, flora.

In 1992, the Biological Expedition to the northern Mariana Islands was conducted by the Natural History Museum and Institute, Chiba, in cooperation both with the Department of Natural Resources, the Commonwealth of the Northern Mariana Islands, and the Marine Laboratory of Guam University (Asakura *et al.*, 1994). During this expedition, two specimens belonging to the Thelotremataceae were collected and reported as *Ocellularia cf. meiosperma* and *Thelotrema* sp. in the preliminary list of lichens (Harada, 1994). A re-examination of these two specimens has now been conducted, and they were identified as *Ocellularia meiosperma* and *Thelotrema porinoides*, respectively. In this paper, a description, figures, taxonomic remarks etc. are provided for each of these species based on the specimens from the Marianas.

Materials and Methods

Air-dried herbarium specimens deposited in the Natural History Museum and Institute, Chiba (CBM) were examined. The type specimens were loaned from the herbaria, FH and L for comparison. Methods of external, anatomical, and chemical studies followed

Matsumoto and Deguchi (1999).

The Species

1. *Thelotrema porinoides* Mont. & Bosch in Junghuhn (Fig. 1A, 2)

Enum. Pl. Insul. Java Sumatra: 151 (1855); Matsumoto, J. Hattori Bot. Lab. (88): 38 (2000). = *Ocellularia porinoides* (Mont. & Bosch) Zahlbr., Catal. Lich. Univ. 2: 599 (1923). Type: Java, Junghuhn 151 (L-lectotype!).

Thelotrema sp. in Harada, Nat. Hist. Res., Special Issue (1): 101 (1994).

Thallus crustose, hypophloeodal, whitish gray, dull, continuous; cortex lacking; algal layer scattered in patches of superficial medullary hyphae; medulla mostly hypophloeodal but often developed near apothecia. Apothecia common, solitary, more or less immersed to semi-emergent, to 0.7–1.0 mm diam.; thalline exciple usually erect, sometimes flaring; exciple free from thalline exciple and distinctly incurved to form an inner pore; outer pore round, 0.2–0.4 mm diam., inner pore 0.08–0.25 mm; hymenium 180–220 μ m high; paraphyses simple; asco-

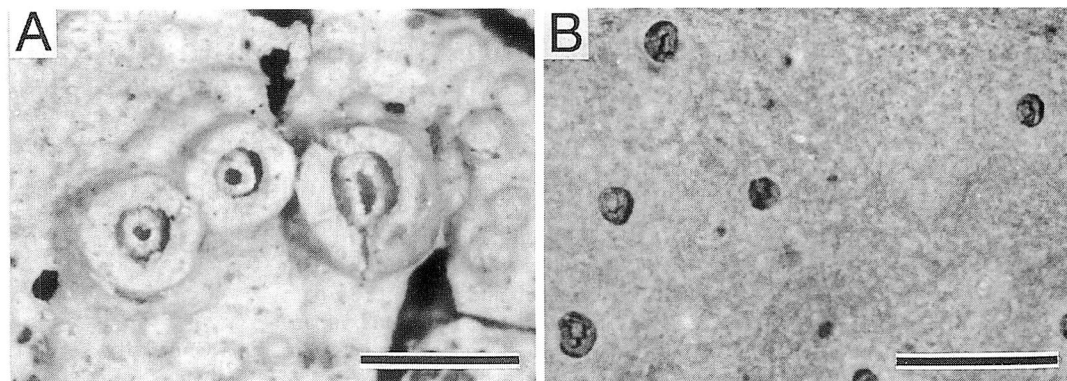


Fig. 1. Habit. A, *Thelotrema porinoides* Mont. & Bosch; B, *Ocellularia meiosperma* (Nyl.) Hale. (A, Harada 12983; B, Harada 12997. A, B, air-dried materials) Bars: 1mm.

spores 4/ascus, spirally stacked, $10\text{--}17 \times 65\text{--}120\ \mu\text{m}$, colorless, transversely septate, 22–24-loculate, I+purple. Pycnidia not found in this specimen.

Chemistry. Stictic acid and constictic acid.

Habitat. On bark of evergreen hardwood.

Distribution. Mariana Islands (Rota Isl.), Solomon Islands, Hawaii, Philippines, Sabah, Java, Sri Lanka, India, Japan, West Indies, Central America.—Widely distributed in the Tropics.

Remarks. *Thelotrema porinoides* is characterized by (1) the erect thalline exciple, (2) the long colorless transversely septate ascospores, and (3) the presence of stictic acid.

The specimen from the Marianas slightly differs in morphology from the typical *Thelotrema porinoides*. Locules of the ascospores are slightly less in number than the previous records for *T. porinoides* (i.e. 26–29 locules for the Japanese specimens, according to Matsumoto, 2000), although ascospore size falls in the same range. *T. porinoides* usually has two or three aggregated ascomata in a single thalline exciple, whereas each thalline exciple constantly surrounds a single ascoma in this specimen. We consider these as representing variation within this species, since these characters tend to vary in some extent with the age or developmental stage, for example. The diagnostic characters mentioned above support the placement of this specimen in *T. porinoides*.

Specimen examined: Micronesia, Mariana Island, Rota Isl., Uyulan Hulo, 280 m alt., 13 June 1992, coll. H. Harada, no. 12983.

2. *Ocellularia meiosperma* (Nyl.) Hale (Fig. 1B, 3)

Mycotaxon 11: 137 (1980). = *Thelotrema meiospermum* Nyl., Ann. Sci. Nat., Bot., ser. 4., 19: 333 (1863). = *Phaeotrema meiospermum* (Nyl.) Müll. Arg., Flora 69: 311 (1886). Type: Cuba, Wright 136 (FH-Tuck. 2312-lectotype!).

Thallus crustose, hypophloeodal, whitish mineral gray, dull, continuous; cortex not clearly developed, covered by a thin polysaccharide layer; algal layer scattered among medullary hyphae; medulla $25\text{--}30\ \mu\text{m}$ thick, with crystals. Apothecia abundant, solitary, immersed, $0.7\text{--}0.9\ \text{mm}$ diam., thalline exciple distinct, margin incurved to form a discrete pore; pore round to irregular, $0.15\text{--}0.3\ \text{mm}$ diam., the exciple carbonized, fused with thalline exciple; central columella carbonized, broad, $0.25\text{--}0.3\ \text{mm}$ diam., becoming somewhat reticulated at maturity; hymenium $90\text{--}120\ \mu\text{m}$ high; paraphyses simple, $0.8\text{--}1.0\ \mu\text{m}$ thick; ascospores 8/ascus, uniseriate, $6\text{--}8 \times 13\text{--}16\ \mu\text{m}$, brown, transversely septate, 5–7-loculate, I–. Pycnidia not found.

Chemistry. No lichen substances detected.

Habitat. On bark of evergreen hardwood.

Distribution. Mariana Islands (Rota Isl.), Philippines, Sarawak, Java, Sri Lanka, U. S. A., West Indies, Central America.—Widely distributed in the Tropics.

Remarks. *Ocellularia meiosperma* is characterized by (1) the immersed apothecia with broad columella, (2) the small, brown, transversely septate ascospores, (3) the ecorticate thallus, and (4) the lack of lichen substance.

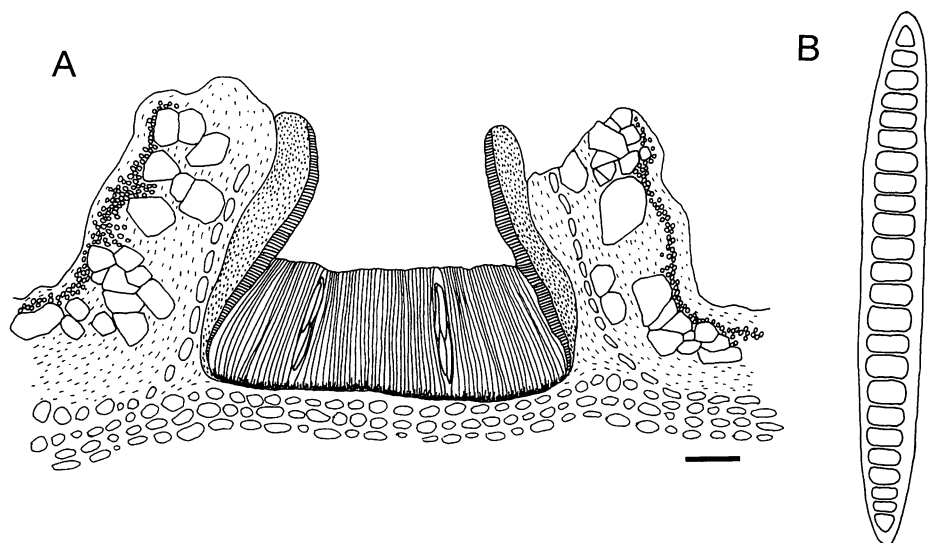


Fig. 2. Anatomy of *Thelotrema porinoides*. A, Vertical section of apothecium with colorless exciple and periphysoids; B, large, colorless, and transversely septate ascospore. (A, B, LPCB preparations from Harada 12983) Bars: A, 100 μ m; B, 10 μ m.

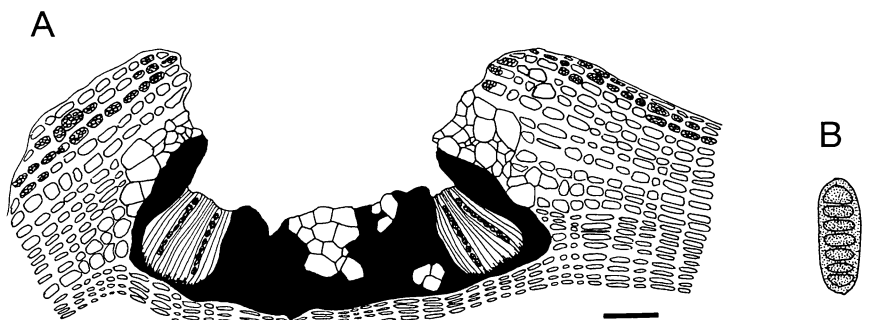


Fig. 3. Anatomy of *Ocellularia meiosperma*. A, Vertical section of apothecium with blackish exciple and columella; B, small, brown, and transversely septate ascospore. (A, B, LPCB preparations from Harada 12997) Bars: A, 100 μ m; B, 10 μ m.

The specimen from the Marianas superficially differs from the typical *Ocellularia meiosperma* and may be even confused with the species of *Thelotrema* that have pruinose disc, due to the following characters. The pore is more or less smaller (0.15–0.3 mm) than previously known for *O. meiosperma* (0.2–0.4 mm according to Hale, 1981; 0.3–0.5 mm by our own observation on the type specimen). The tip of the columella is slightly concave, covered with pruina, and lower than the surface of the thallus, whereas in the typical form it is convex and filling the pore. We consider these as representing variation within this species, since these characters tend to vary in some extent with the age or

developmental stage, for example. However, the above-mentioned diagnostic characters support the placement of this specimen in *O. meiosperma*.

Specimen examined: Micronesia, Mariana Islands, Rota Isl., Uyulan Hulo, 280 m alt., 13 June 1992, coll. H. Harada, no. 12997.

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マリアナ諸島産の地衣類について (3). チブサゴケ科 (モジゴケ目)

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千葉県立中央博物館が中心となって1992年に挙行した北マリアナの生物相調査 (Asakura *et al.*, 1994) とそれに伴うグァム・ロタ・サイパン島での調査により、約900点の地衣類標本が得られ、その資料を基にした仮目録を既に発表した (Harada, 1994). 今回このうちチブサゴケ科を再検討し、*Thelotrema porinoides* Mont. & Bosch と *Ocellularia meiosperma* (Nyl.) Hale の2種を認めた。いずれも熱帯に広く分布する種で、前者はマリアナ諸島では初めての記録となる。それぞれの種について詳細な記載と図を示し、ノートを付けた。