

Noteworthy species of lichens found in Taiwan

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Abstract. *Gymnoderma insulare* Yoshim. & Sharp, *Phaeographis laevigata* (M. Nakan.) M. Nakan. & Kashiw. and *Platygramme pseudomontagnei* (M. Nakan.) M. Nakan. & Kashiw., very rare species in East Asia, are newly found in Taiwan. The occurrence of *Gymnoderma coccocarpum* Nyl. is confirmed and the second locality of *Siphula decumbens* Nyl. is reported for Taiwan. All of them were found in *Chamaecyparis formosensis* forest in Tashueshan Mountains, central Taiwan at elevations between 2100 to 2300 m.

Key words: *Gymnoderma coccocarpum*, *Gymnoderma insulare*, *Phaeographis laevigata*, *Platygramme pseudomontagnei*, *Siphula decumbens*, lichen, Taiwan.

Under the project of the Biodiversity inventory in the Western Pacific region organized by the National Museum of Nature and Science, we made field trips in central Taiwan in October 2007 and 2008. Among lichens collected at sub-alpine regions in Tashueshan Mountains, the following interesting species are found; *Gymnoderma coccocarpum*, *G. insulare*, *Phaeographis laevigata*, *Platygramme pseudomontagnei* and *Siphula decumbens*. *G. insulare*, *Phaeographis laevigata* and *Platygramme pseudomontagnei* are new to Taiwan. The occurrence of *Gymnoderma coccocarpum* in Taiwan is confirmed through the present survey, even though Yoshimura (1982) was doubtful on Sato's report. *Siphula decumbens* is reported here as a second record of the species in Taiwan. It is noteworthy that all of these species are found in *Chamaecyparis formosensis* forest mixed with *Cinnamomum* and *Quercus* in rather restricted area at elevations between 2100 to 2300 m and are sporadically distributed in the warm temperate zone and rare in East Asia.

The specimens used for the present study are kept in the herbarium of the National Museum of Nature and Science, Tsukuba (TNS).

Gymnoderma coccocarpum Nyl., Syn. Lich. 2: 26. 1863. (Fig. 1A)

The genus *Gymnoderma* was taxonomically well revised by Yoshimura and Sharp (1968), and the present species is characterized as follows; thallus foliose, consisting of wide wavy lobes (6–10 mm wide, 12–30 mm long), greenish yellow to bluish green above and whitish below; isidia or soredia absent; apothecia marginal or submarginal, solitary or crowded, pale brown, 3–4 mm in diameter; spores colorless, oblong, 8–12×2.5–3 μm long; and contains the unknown substance shown by Yoshimura (1982).

This species is widely distributed in Asia, having been reported from Borneo, China, India, Japan, Java, Malaysia and the Philippines (Groenhardt 1954, Kashiwadani & Gradstein 1982, Yoshimura 1982, Zahlbruckner 1956). This is the second report for Taiwan, since Sato (1941) reported the occurrence of it in Taiwan. However, the report was not confirmed by Yoshimura (1982), since the specimen had been destroyed by fire. During the present study, it was actually found in Taiwan where it grew on a mossy trunk base of *Cinnamomum* sp. at one locality.

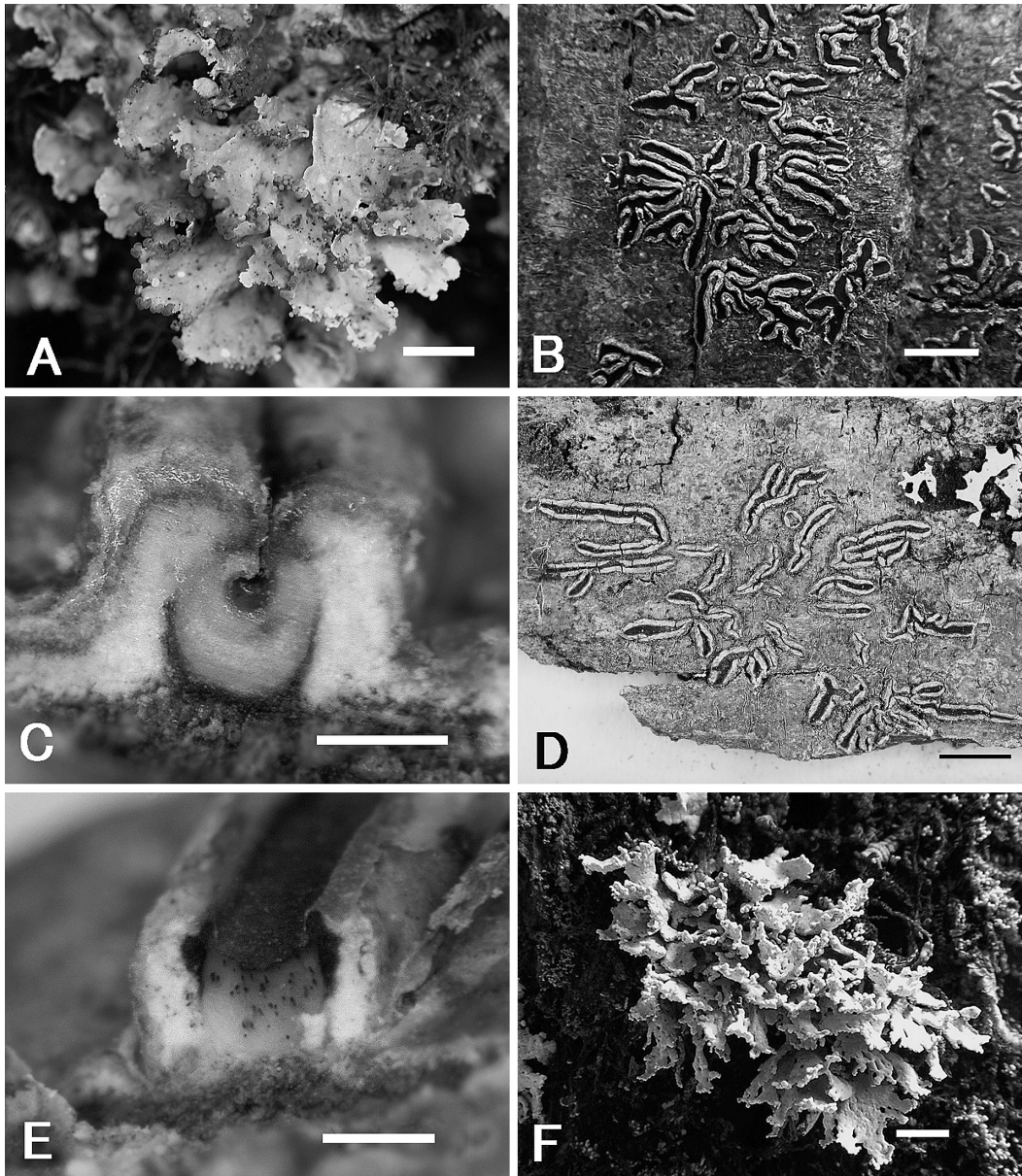


Fig. 1. A: *Gymnoderma coccocarpum* Nyl., H. Kashiwadani 48894. B, C: *Phaeographis laevigata* (M. Nakan.) M. Nakan. & Kashiw., H. Kashiwadani 48891, general view (B) and cross section of a lirellae, showing non-carbonized exciples (C). D, E: *Platygramme pseudomontagnei* (M. Nakan.) M. Nakan. & Kashiw., Y. Asahina F-344, general view (D) and cross section of a lirellae, showing carbonized exciples on both sides (E). F: *Siphula decumbens* Nyl., H. Kashiwadani 48892. (Scales A & F=1 cm, B & D=5 mm, C & E=0.5 mm.)

Specimen examined. Taiwan. Taichung Co.: Tashueshan Forest Park, below Hsiaoshuehshan Hostel, Hopen Hsiang, on mossy trunk of *Cinamomum* sp., elevation about 2200 m, October

27, 2007, H. Kashiwadani 48894 (TNS).

Gymnoderma insulare Yoshim. & Sharp, Am. J. Bot. 5: 638. 1968.

Gymnoderma insulare was described from Japan [Type collection: Prov. Kii (Pref. Wakayama), Mt. Koya, Okunoin, Y. Asahina 2776—holotype in TNS!] and have been considered to be endemic to Japan (Yoshimura 1982). During our field survey, however, we found a specimen of this species growing on bark of *Chamaecyparis formosensis* at elevation about 2200 m. It is quite identical with the type specimen in morphologically and chemically. New to Taiwan.

Specimen examined Taiwan. Taichung Co.: Tashueshan Forest Park, ca 1 km N of Hsiaoshuehshan Hostel, near by giant *Chamaecyparis formosensis*, Hopen Hsiang, on bark of *Chamaecyparis formosensis*, elevation about 2200 m, October 27, 2007, H. Kashiwadani 48895(TNS).

Phaeographis laevigata (M.Nakan.) M.Nakan. & Kashiw., Bull. Nat. Sci. Mus., Tokyo, ser. B, 29: 88. 2003. (Fig. 1B & 1C)

Diagnostic characteristics for this species are 1) the corticolous habit, 2) the well developed lirellae (up to 12 mm long, 1.2 mm wide) with open discs and distinct labia, 3) the non-carbonized exciples, 4) the 1-spored asci, 5) muriform spores 120–160×20–30 μm in size and 6) the presence of echinocarpic acid as a major chemical substance.

Phaeographis laevigata was described from Japan [Type collection: Japan, Shikoku, Prov. Tosa (Pref. Kochi): Nakatsugawa, Hata-gun, on bark of *Chamaecyparis obtusa*, elevation 500 m, April 30, 1962, M. Oshio 7602—holotype in HIRO!, isotype in TNS!]. It is easily distinguished from the allied species of the genus by having brown, muriform spores and in producing echinocarpic acid.

During the present survey, this species was found on bark of old trees of *Chamaecyparis formosensis*. New to Taiwan.

Taiwan. Taichung Co.: Anmasan Forest Station, Mt. Tashueshan (Daisetsusan), Hopen Hsiang, on bark of *Chamaecyparis formosensis*, elevation about 2300 m, October 27, 2008, H. Kashiwadani 48891(TNS).

Platygramme pseudomontagnei (M. Nakan.) M. Nakan. & Kashiw., Bull. Nat. Sci. Mus., Tokyo, ser. B, 29: 89. 2003. (Fig. 1D & 1E)

Platygramme pseudomontagnei was described from Japan (Type collection: Japan, Pref. Wakayama: Nachi, Katsu-ura, on bark of *Cryptomeria japonica*, M. Nakanishi 5324—holotype in HIRO!; *tlc* echinocarpic acid as a major chemical substance). It might be confused with *Phaeographis laevigata* in having similar external morphology of lirellae (1B & 1D) with muriform spores and in producing echinocarpic acid as a major substance. However, it can be distinguished from the latter by the exciple carbonized at the upper half (1E); the exciple of *Phaeographis laevigata* is never carbonized (1C).

This species was found on bark of *Chamaecyparis formosensis* at one locality during our field studies. In addition, we found another specimen identical with this species collected at Mt. Ali (Ari-san) by Y. Asahina. New to Taiwan.

Specimens examined. Taiwan. Taichung Co.: Tashueshan Forest Park, below Hsiaoshuehshan Hostel, Hopen Hsiang, on trunk base of *Chamaecyparis formosensis*, elevation about 2100 m, October 27, 2007, H. Kashiwadani 46916 (TNS). Chia Co.: Nimandaira, Mt. Ari-san, on bark, December 26, 1925, Y. Asahina F-344 (TNS).

Siphula decumbens Nyl., Lich. Nov. Zel.: 14. 1888. (Fig. 1F)

The genus *Siphula* was taxonomically well revised by Kantvilas (2002) and the occurrence of the present species was reported from central Taiwan (Kantvilas et al. 2005), basing on a collection made by S. Kurokawa (Prov. Taitung ‘Taichung’, Mt. Lachialachiaerh, 1800–2200 m, 21 January 1965, S. Kurokawa 2355, TNS!). During the present survey, we found it in Tashueshan mountains, where it grew on bark of *Chamaecyparis formosensis* at ca 3 m high from the ground. This is the second report of the species for Taiwan.

Specimens examined. Taiwan. Taichung Co.: Anmasan Forest Station, Mt. Tashueshan (Daisetsusan). On bark of *Chamaecyparis formosensis*,

elevation about 2300 m, October 27, 2008, H. Kashiwadani 48892 (TNS).

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台湾で見つかった地衣類の注目種

柏谷博之・文 光喜

ツブミゴケ *Gymnoderma insulare*, *Phaeographis laevigata*, *Platygramme pseudomontagnei* が台湾にも産することが明らかになった。ツブミゴケはこれまでに日本、インド、ジャワ島、フィリピンなどに分布することが知られていたが、台湾からは初めての報告である。*Phaeographis laevigata* と *Platygramme pseudomontagnei* はモジゴケ科の固着地衣類で、日本固有種と考えられていたが、日本以外からは初めての報告である。オオツブミゴケ *Gymnoderma coccocarpum* はかつて台湾から報告された記録がある。しかし、引用された標本が焼失してしまったために台湾での分布は疑問視されていたが、今回の調査中に再発見された。*Siphula decumbens* Nyl. は過去に台湾で一度だけ採集された記録があるが、今回の調査で第二の産地が見つかった。ここに報告した種は、いずれも台湾中部脊梁山地の雪山で見つかったもので、産地は海拔2100–2300 m 付近の紅檜 (*Chamaecyparis formosensis*) が優占する林の中である。