

First Report of *Heterodermia squamulosa* (Lichenized Ascomycota, Physciaceae) in South Korea

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(Received August 18, 2008. Accepted September 12, 2008)

Heterodermia squamulosa (Degel.) W.L. Culb. was found in the mountain of Gariwang, Gangwon province, in 2008. It is characterized by numerous squamules along the margin, decorticate and white lower surface, rhizines along the margin, black and densely squarrosely branched, usually forming a dense mat under the thallus. Apothecia margins densely squamulose, ascospores 12~15 × 25~30 μm. Atranorin and zeorin contained in thallus. This is the first record of this species in South Korea.

KEYWORDS: Foliose lichen, Korea, Lichen-forming fungus, New record

The genus *Heterodermia* Trev. belongs to the lichenized ascomycete family *Physciaceae* Zahl., and is mainly characterized by the linear habitat of the thallus and Pachysporaria- or Polyblastidia-type spores (Poelt, 1965; Brodo *et al.*, 2001). *Heterodermia* was included in *Anaptychia* Körb (Kurokawa, 1962) until the former was separated in 1965 based on the characteristics of thick walled spores and the presence of atranorin (Poelt, 1965; Swinscow and Krog, 1976). According to the most recent checklist of Korean lichens (Hur *et al.*, 2005), there are 20 species of *Heterodermia* recorded in the Korean peninsula. This is the first record of this species in South Korea.

The specimens for this study were deposited in the Korean Lichen Research Institute (KoLRI) in Suncheon National University. The phenotypic characteristics were based on air-dried material. Morphological characteristics were observed using the dissecting microscope (Nikon SMZ 1500), and anatomy was examined using the compound microscope (Olympus BX 50). Lichen substances were detected by color reagents and thin-layer chromatography (Culberson, 1972; White and James, 1985).

Heterodermia squamulosa (Degel.) W.L. Culb. (1967). (Figs. 1A~1E).

Morphology. Thallus foliose, grayish white when dried, greenish when wet, 6~10 cm in diameter, lacinate; laciniae dichotomously or subirregularly branched, about 0.5~1.5 mm wide, with numerous squamules along the margin, sometimes also on the upper surface, lower surface of the squamule decorticate, with the same color of the thallus; lower surface of the thallus decorticate

and white. Rhizines along the margin, black and densely squarrosely branched, 1~1.5 mm long, usually forming a dense mat under the thallus. Apothecia laminal and sessile, dark reddish brown, 1~4 mm in diameter, margins densely squamulose; hymenium 140~150 μm thick; ascospores dark brown, two cells, 12~15 × 25~30 μm.

Chemistry. Cortex and medulla K+ yellow, P-, C-, KC-; containing atranorin and zeorin.

Distribution. This species mostly occurs in the woods and on rocks. It has previously been reported in Malaysia (Sipman, 1993), but not in South Korea.

Specimens examined. The sample location was Mt Gariwang (37°24'05.0" N, 128°32'39.5" E), on moss rock. Hur 080032, May 10, 2008.

Remarks. This species is very similar to *H. hypoleuca*, could be easily distinguished by the presence of the marginal squamules. It has another closely related species *H. microphylla* (Kurokawa, 1962). The latter contains soredia or granules among the squamules, and the spores, which measure about 10~20 μm, are smaller than those of *H. squamulosa*.

Acknowledgement

This work was supported by a grant from Korea National Research Resource Center Program (Grant R21-2007-000-10033-0), and Korean Forest Service Program (KNA 2008) through Korea National Arboretum.

References

Brodo, I. M., Sharnoff, D. S. and Sharnoff, S. 2001. Lichens of

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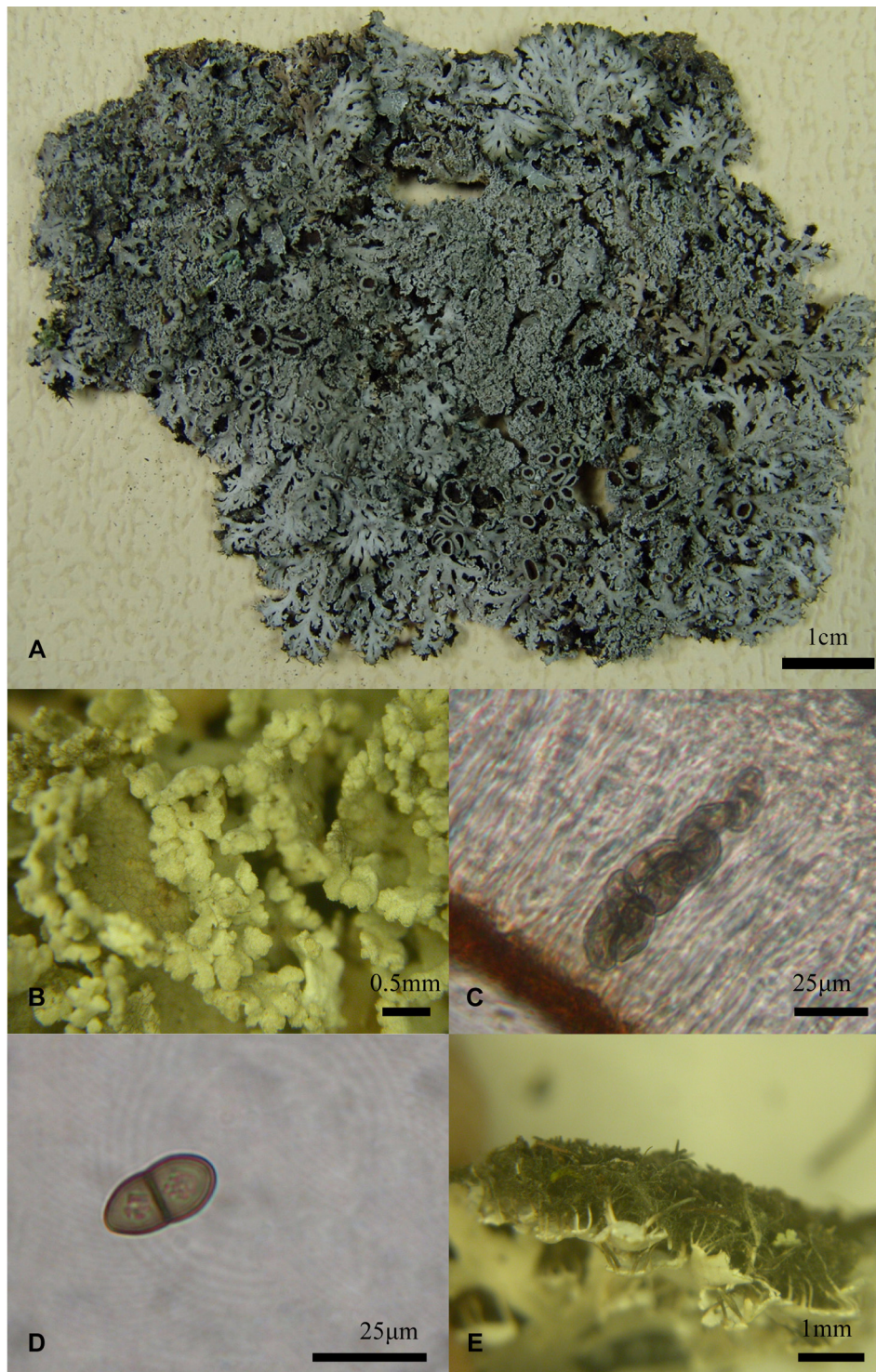


Fig. 1. Appearance of *Heterodermia squamulosa*. A, upper surface of the thallus; B, lobes with dense squamules on the margin; C, anatomical structure of the apothecia, showing ascus and ascospores; D, dark brown ascospore; E, rhizines that are squarrosely branched and which forming a dense mat in the lower surface.

North America, pp. 334-341. Yale University Press, New Haven and London.
Culberson, C. F. 1972. Improved conditions and new data for the identification of lichen products by a standardized thin-layer chromatographic method. *J. Chromatography* 72:113-125.

Hur, J. S., Koh, Y. J. and Harada, H. 2005. A checklist of Korean lichens. *Lichenology* 4:65-95.
Kurokawa, S. 1962. A monograph of the genus *Anaptychia*. *Nova Hedwigia* 6:1-115.
Park, Y. S. 1990. The Macrolichen flora of South Korea. *Bryolo-*

- gist* 93:105-160.
- Poelt, J. 1965. Zur Systematik der Flechtenfamilie Physciaceae. *Nova Hegwigia* 9:21-32.
- Sipman, H. J. M. 1993. Lichens from Mount Kinabalu. *Trop. Bryol.* 8:288.
- Swinscow, T. D. V. and Krog, H. 1976. The genera *Anaptychia* and *Heterodermia* in East Africa. *Lichenologist* 8:103-138.
- White, F. J. and James, P. W. 1985. A new guide to microchemical techniques for the identification of lichen substances. *Brit. Lichen Soc. Bull.* 57:1-41.