

The additional lichens in Mt. Deogyu

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덕유산 일대의 지의식물 분류

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ABSTRACT: The lichen species collected from Mt. Deogyu were identified as belonging to eleven genera in four families: *Anzia colpota*, *Cladonia bacillaris*, *Flavoparmelia caperata*, *Hypotrachyna physcioides*, *Nephromopsis asahinae*, *Parmelia fertilis*, *P. marmaiza*, *Parmotrema austrosinense*, *P. chinense*, *Xanthoparmelia mexicana*, *X. scabrosa*, *Anaptychia palmulata*, *Heterodermia hypoleuca* and *Physconia grumosa*. Among the fourteen lichens, the genus name of *Parmotrema austrosinense* and *Xanthoparmelia scabrosa* were changed by Hale, and *Hypotrachyna physcioides* was newly reported in Korea.

KEYWORDS: *Hypotrachyna physcioides*, *Parmotrema austrosinense*, *Xanthoparmelia scabrosa*

The studies of Korean lichens had been done by Japanese scientists since Hue had first reported *Leconora oriens* Ach. (Kim, 1981). However, he reported mainly North Korean lichens. Cho and Lee(1980) worked with 240 specimens of lichens collected from Mt. Deogyu and identified 20 species of genus *Parmelia*. Park(1982) investigated Korean lichens by Hale's system for identification and his checklists including 177 species, which he were deposited in Jeonbug National University. Herbarium Ban(1983) examined the taxonomical study of lichens in National Park, Mt. Deogyu area, during August, 1982, and identified 24 lichen species on the basis of the various phenotypical characters and thin layer chromatography for detection of chemical analysis of lichen substances. Lee(1987) reported a taxonomic survey of genus *Parmelia* collected from Mt. Chiri from April 27th to November 10th, 1986, and 39 species including four unidentified ones of genus *Parmelia* in his survey. Recently, Park(1990) investigated the foliose and fruticose lichen flora of South Korea including 189 species in forty-six genera. In this lichen flora of South Korea, the

species were described as their habitats and local ranges noted in Korea. Keys for identification of lichens were also provided in the paper.

In this study, twenty one specimens collected from Mt. Deogyu during a month of August 1986 were identified as four families, eleven genera and fourteen species. Among them, the genera "Parmotrema" and "Xanthoparmelia" identified here were defined again (Hale, 1974), and one species were newly recorded in Korean lichen flora.

Materials and Methods

For this study, the colour test and the thin-layer chromatography(TLC) was performed to identify lichen chemical compounds. The colour tests was followed by Nylander and Asahina (Hale, 1971). Ideally tests should be carried out on a separated fragment of thallus which should be discarded after treatment. The reagent should be applied with thin glass rod. Direct testing should involve the smallest amount of fluid to avoid unsightly stains on the specimen and must be carried out under dissecting microscope. For tests involving exami-

nations of the medulla, a small area of the overlying cortex should first be removed with a razor blade (Wliite, 1985).

For the thin-layer chromatography, Merck silica gel 60F₂₅₄ pre-coated aluminium TLC plates, TLC tanks, capillary tubes, UV lamp and solvents T.D. A., G and E.A. were employed. Select control substances to be placed at points 1, 10 and 19 on each plate. *Parmelia acetabulum*, *Platismatia glauca* and *Parmelia caperata* will give spots for norstictic acid (Rf value class 4), atranorin (Rf value class 7) and usnic acid (Rf value class 6) for each solvent system. Each plate was examined by UV light at two wave lengths (254 nm the 350 nm & Culberson, 1968, 1972).

Results and Discussion

Twenty-one species collected in Mt. Deogyu during a month of August 1986 were identified. These collections are stored in Sookmyung University Herbarium. As above results, four families, eleven genera and fourteen species were identified, and all species of these eleven species were previously described by Park (1990). Among them, *Parmotrema austrosinense* was a given new name from *Parmelia austrosinensis*, and *Xanthoparmelia scabrosa* was changed from *Parmelia scabrosa* by Hale (1974). However, *Hypotrachyna physcioides* was newly recorded in Korean lichen flora (Park, 1982, Park, 1990).

Park's Key (1990) to the genera and species were mainly employed and Galloway (1985), Herre (1910), Taylor (1967) and Hale (1986) were partially referred for the identification of Korean lichens. Collection numbers for specimens cited are done by our own systems (Table 1).

Descriptions of species

Hypotrachyna physcioides (Nyl.) Hale, *Smithson, Contr. Bot.* 25: 54 (1975). *Parmelia physcioides* Nyl., *Flora* 48: 342 (1985). (Plate I)

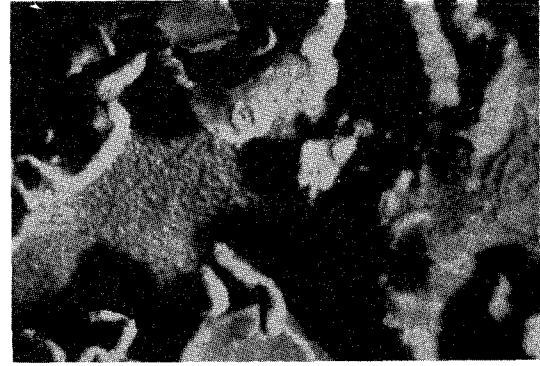
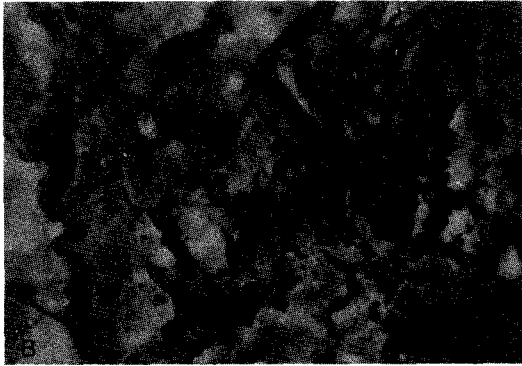
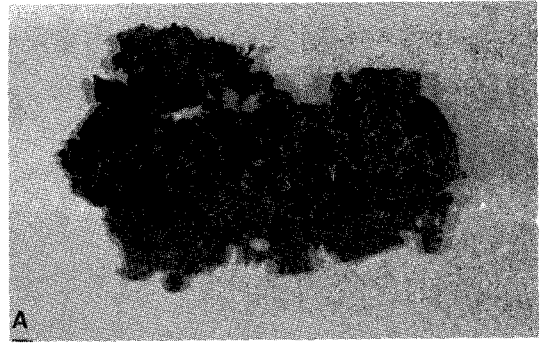
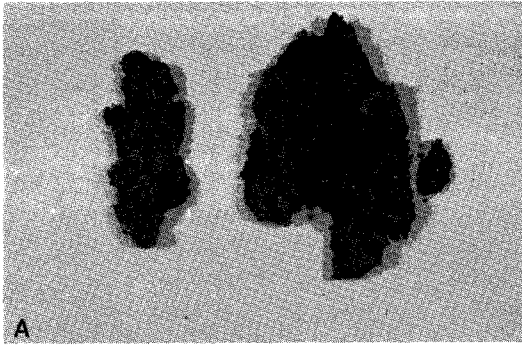
Thallus foliose, loosely to closely attached, corticolous or saxicolous, 6-15 cm diameter. Lobes narrow, divided sublinear, apically truncate, 2-6 mm

Table I. The lichens collected from Mt. Deogyu.

Family name	Scientific name	Collection NO.
Anziaceae	<i>Anzia colpota</i> Vain	SUL D4
Cladoniaceae	<i>Cladonia bacillaris</i> Nyl.	SUL D7
Parmeliaceae	<i>Flavoparmelia caperata</i>	SUL D3
	(L.) Hale	
	<i>Hypotrachyna physcioides</i>	SUL D1
	(Nyl.) Hale	
	<i>Nephromopsis asahinae</i>	SUL D12
	(Sato) Rasanen	
	<i>Parmelia fertilis</i>	SUL D13
	Mull. Arg.	
	<i>P. marmorata</i> Nyl.	SUL D14
	<i>Parmotrema austrosinense</i>	SUL D11
(Zahlbr) Hale		
<i>P. chinense</i> (Osbeck)	SUL D2	
Hale & Ahti		
<i>Xanthoparmelia mexicana</i>	SUL D16	
(Greln.) Hale		
<i>X. scabrosa</i> (Taylor) Hale	SUL D5	
Physciaceae	<i>Anaptychia palmulata</i>	SUL D18
(Michx.) Vain.		
<i>Heterodermia hypoleuca</i>	SUL D8	
(Muhl.) Trev.		
<i>Physconia grumosa</i>	SUL D6	
Kashiw. & Poelt		

long, margins pruinous. Upper surface whitish-grey to yellowish, shining, corticated. Medulla white. Lower surface blackish-brown, shining, rhizinate, margins ciliate or unbranched rhizinate. Rhizines black, simple, dichotomously. Apothecia disc 2-3 mm diameter, reddish brown, shining, lecanorine, adnate stalked. Ascospores colourless, simple, ellipsoid, 3-4×9-2 μm, biseriate. Chemistry: Cortex K⁺ yellow; medulla K⁻, C⁻, KC⁺ orange, P⁻. Barbatic acid, atranorin, no usnic acid.

Remark: This species is very similar to *H. ducalis* in the shape, but it differs from *H. ducalis* in the upper surface morphology and in its chemical compounds. In the specimens of *H. physcioides*, the margin of upper cortex was pruinose and at-



The Explanation of Plate I

- A. External morphology of *Hypotrachyna physcioides*
 B. Thallus with apothecia ($\times 10$)

ranorin was found reliability on the TLC plates. But atranorin was revealed only trace and the pruina was not seen in the specimens of *H. duccalis*.

Specimen examined.: SUL D12

Parmotrema austrosinense (Zahlbr) Hale, *Phytologia* 28: 335 (1974). *Parmelia austrosinensis* Zahlbr., *Symb. sin.* 3: 192 (1930). (Plate 2)

Thallus foliose, loosely to closely attached, 6-8 cm diameter. Lobes broad and rounded, about 5-10 mm long, 6-8 mm wide, suberect, margins sore-diate. Upper surface pale-grey or pale-yellow, smooth, without margin cilia, shining, cracked, some part maculate. Medulla white. Lower surface black at the center, but with a broad white margin or pale brown, shining, wrinkled, center rhizinate. Rhizines black, simple. Apothecia not seen. Chemistry: Cortex K^+ yellow; medulla K^- , C^+ red, P^- . Atranorin, lecanoric acid (Table II).



The Explanation of Plate II

- A. External morphology of *Parmotrema austrosinense*
 B. Thallus with soredia ($\times 10$)
 C. Lower surface with rhizines ($\times 20$)

Remark: This species may be considered the sore-diate counterpart of *P. andinum*. It is closely related to *P. defectum* but differs from *P. defectum* in the upper cortex morphology. The Upper cortex of *P. austrosinense* is faintly maculate. On the other hand, the upper cortex of *P. defectum* is emaculate.

Table 2. Substances of extracted by thin layer chromatography (TLC)

Scientific name	Chemical compounds
<i>Hypotrachyna physcioides</i>	Atranorin
<i>Parmotrema austrosinense</i>	Atranorin and Lecanoric acid
<i>Xanthoparmelia scabrosa</i>	Usnic acid

Specimen examined.: SUL D11

Xanthoparmelia scabrosa (Taylor) Hale, *Phytologia* 28: 488 (1974). *Parmelia scabrosa* Taylor, *Hook. Lond. J. Bot.* 6: 162 (1847). (Plate 3)

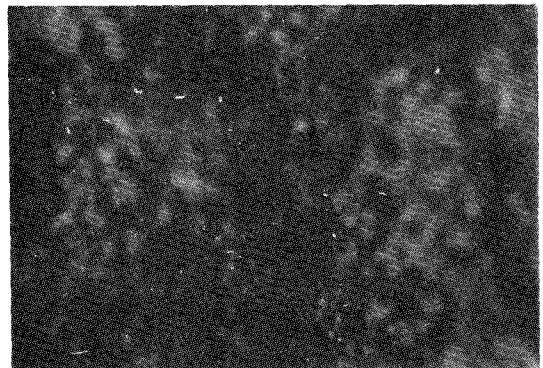
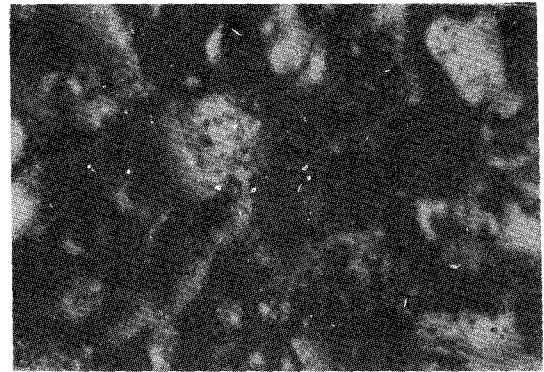
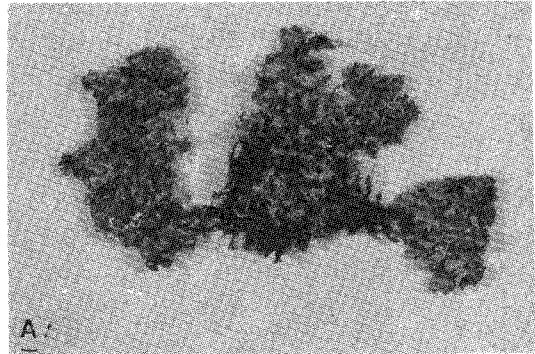
Thallus foliose, closely attached, and more or less loosely attached, with about 8 cm diameter thick. Lobes very variable, sublinear-elongate, complex, margins entire or variously incised. Upper surface yellowish-green, smooth, shining, densely isidiate, soredia absent. Isidia small, simple to coralloid-branched. Lower surface pale brown, pinkish or creamish-white, smooth to subcorrugate. Rhizines sparse, simple, pale brown. Apothecia not seen. Chemistry : Cortex K^- ; medulla K^- , C^- , KC^+ orange, P^- . Usnic acid, norlobaridone (Table II).

Remark: This species is closely similar to *X. mexicana*, but also differs from *X. mexicana* on the isidia morphology and on its chemical combinations. The isidia of *X. scabrosa* is globose, but the isidia of *X. mexicana* is barrel-shaped to somewhat cylindrical form. In the chemical combinations, usnic acid is found in *X. scabrosa* and *X. mexicana*, but norlobaridone in *X. scabrosa* only.

Specimen examined: SUL D5

摘 要

1986년 8월의 1개월간 덕유산 국립공원에서 자생하는 한국산 지의식물 21종을 채집하여 동정한 결과, *Anzia colpota*, *Cladonia bacillaris*, *Flavoparmelia caperata*, *Hypotrachyna physcioides*, *Nephromopsis asahinae*, *Parmelia fertilis*, *P. marmaiza*, *Parmotrema austrosinense*, *P. chinense*, *Xanthoparmelia mexicana*, *X. scabrosa*, *Anaptychia palmulata*,



The Explanation of Plate III

- A. External morphology of *Xanthoparmelia scabrosa*
 B. Tallus with isidia (×6)
 C. Isidia (×20)

Heterodermia hypoleuca, 및 *Physconia grumosa*로 분류되었다. 그 중에서 한국산 미기록종으로 확인된 것은 *Hypotrachyna physcioides* 이고, Hale (1974)에 의해 속명이 개명된 것은 *Parmotrema austrosinense* 와 *Xanthoparmelia scabrosa* 였다.

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