Identification of *Sculptolumina japonica* (Physciaceae) in South Korea

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The paper describes identification of new microlichen (*Sculptolumina japonica*) in South Korea. A detailed taxonomic description and comments are presented for the taxa studied. Lichen genus *Sculptolumina* is reported for the first time for this country.

KEYWORDS : *Buellia*, Geographical distribution, Lichens, New records, Taxonomy

The lichen genus *Sculptolumina*, which was segregated from *Buellia* by Marbach, is characterized by crustose thallus, lecideine apothecia with epruinose discs, poorly developed excipulum lacking secondary metabolites, interspersed hymenium, brown hypothecium, paraphyses with long and weakly expanded apical cells, *Bacidia*-type asci, ascospores with small, funnel shaped or rounded lumina (with thickened inner walls, of *Mischoblastia*- or *Pachysporaria*-types), and long, filiform conidia [1]. The genus represented by only two species in the world - *S. japonica* (Tuck.) Marbach and *S. serotina* (Malme) Marbach, is found growing on lignum, bark, or decaying plants in tropics and subtropics north to the Macaronesian regions and Eurosiberian regions that are under oceanic influence.

While studying the lichen samples lodged in the herbarium of Lichen and Allied Bioresource Center, Korean Lichen Research Institute (KoLRI), the authors found some unidentified specimens of *Buellia* and *Sculptolumina*. Careful examination of these species led to the identification of *S. japonica*, which is new to South Korea. Detailed taxonomic description along with chemistry, ecology and illustrations are provided for the taxa.

Specimens were examined using standard microscopic techniques and were hand-sectioned under the NIKON C-PS 1068908 dissecting microscope (Tokyo, Japan). All measurements were made on material mounted in water and lactophenol cotton blue (LCB) was used. For characters such as size of thallus, ascomata and thickness of the hymenium, hypothecium, exciple, ascospores dimension, ten measurements were recorded per specimen. Only free ascospores lying outside the asci were measured. The dimensions of ascospores are generally presented as smallest mean recorded largest mean recorded. Spot test reactions were carried out on hand sections of thalli and apothecia under the OLYMPUS BX 50 microscope

(Olympus, Tokyo, Japan). Thin layer chromatography (TLC) was performed in solvent system C (Toluene : Acetic acid :: 85 : 15 v/v) as described previously [2, 3]. Mycological terminology generally follows previous publications [4, 5]. The terminology used for the asci follows the previous description [6], while that of ascospore-type and ontogeny follows another publication [7]. The lichen specimens are lodged at the herbarium of Lichen & Allied Bioresource Center, Korean Lichen Research Institute (KoLRI), Suncheon National University, Korea.

Taxonomic Treatment of the Species

Sculptolumina japonica (Tuck.) Marbach (Fig. 1A)
Bibliotheca Lichenologica 74: 297 (2000). Type: JAPAN: U.S. Navy Pacif. Explor. Exped., *C. Wright* (holotype-not seen).

Basionym: *Lecidea japonica* Tuck., Proc. Amer. Acad. Arts 5: 421 (1862).

Synonyms: *Buellia japonica* (Tuck.) Tuck., Lich. Calif. 25 (1866); *Buellia atrofusca* Vain., Acta Soc. Fauna Fl. Fenn. 7: 169 (1890); *Buellia conformis* Vain., Acta Soc. Fauna Fl. Fenn. 7: 168 (1890); *Rinodina saillensis* Aptroot, Proc. Kon. Ned. Akad. Wetensch. C. 90: 241 (1987).

Diagnostic characters. Thallus corticolous, crustose, continuous, indeterminate, inconspicuous to thin, endoxyllic or of discrete, minute verrucae or lobules, becoming continuous, gray to olive brown, minutely orange spotted in places. Prothallus and vegetative propagules are absent.

Ascomata apothecia, lecideine, numerous, sessile, contiguous or not, 0.3–0.5 mm diam., rounded, solitary to rarely marginally fused. Disc dark brownish black, plane to convex; margin concolorous with the disc, flush, entire, becoming ± excluded at maturity; thalline exciple absent; proper exciple poorly developed (Fig. 1B), 15–30 µm wide; hymenium 80–100 µm high, interspersed with abun-

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dant oil droplets; hypothecium 20–60 μm high; paraphyses conglutinate, apices heavily pigmented forming a dark brown epihymenium; asci *Bacidia*-type. Ascospores 8 per ascus, ontogeny of type-B, *Mischoblastia*-type (Fig. 1C), 18–21 $\times$ 9–12 μm , lumina becoming inflated, torus absent or poorly developed in oldest spores, spore walls clearly ornamented.

Pycnidia not seen (when present they have a straight to slightly curved or irregularly curved filiform conidia, 11–21 $\times$ 1 μm).

Chemistry. Spot test reactions: thallus K or pale purple (at orange regions), C- or pale pinkish to orangish, P-. Secondary metabolites: not detected by TLC.

Ecology. At the collection site the species was found growing over the bark of *Quercus* and other trees between elevations of 73–210 m.

Geographical distribution. The taxon was previously reported out from Europe, North America, Central and

South America, tropical Australia, China, Japan, Philippines and Sri Lanka [8, 9]. It is new to South Korea and is found growing over bark in the Jeollanam and Gyeongsangnam Provinces (Fig. 1D).

Remarks. The species is characterized by a thin, crustose, olive brown thallus; minutely orange spotted upper surface; lecideine apothecia; poorly developed proper exciple; hymenium with numerous oil droplets; brown hypothecium; *Bacidia*-type asci; *Mischoblastia*-type ascospores with type-B ontogeny and long, filiform conidia. It is not to be confused with *S. serotina*, the only other known species of this genus, as the latter has *Pachysporaria*-type rather than *Mischoblastia*-type ascospores and contains lobaric acid rather than anthraquinones. Based on external appearance the species is often confused with *Bacidia*, but can easily be demarcated by the presence of brown *Mischoblastia*-type ascospores. The ascospores of *Bacidia* are 3 to multiseptate and always hyaline.

Specimens examined: South Korea, Jeollanam Prov., Suncheon-si, Songgwang-myeon, Sinpyeong-ri, Mt. Jogye, Songgwang-sa, N 34°00'13.7", E 127°16'16.3", alt. 210 m, on *Quercus* bark, 11 October 2005, L. Lökös 050699 (KoLRI); Jangheung-gun, Gwansan-eup, Mt. Cheongwan, N 34°32'50.6", E 126°55'43.4", alt. 207 m, on bark, 07 October 2005, L. Lökös 050638 (KoLRI); Gyeongsangnam Prov., Tongyeong, Sarang Island, N 34°50'10.6", E 128°10'47.6", alt. 73 m, on bark, 17 March 2007, HUR 070015 (KoLRI).

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Fig. 1. Habit and apothecial anatomy of the newly identified *Sculptolumina japonica*. (A) Habit of *Sculptolumina japonica* (Tuck.) Marbach (scale bar = 5 mm). (B) V.L.S. of apothecia (scale bar = 80 μm). (C) *Mischoblastia*-type ascospores (scale bar = 20 μm). (D) Distribution of *Sculptolumina japonica* in South Korea.

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