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Pilophorus fruticosus (*Cladoniaceae*), a new species from south-western China

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Abstract: *Pilophorus fruticosus* Li S. Wang & Xin Y. Wang is described from south-west China. It is characterized by the presence of densely dichotomously branched, partly decorticated pseudopodetia, and by having single, spherical apothecia on the apices of the pseudopodetia. The species grows on siliceous rocks in alpine regions of the Yunnan Province. A detailed description and illustrations are provided. The new taxon is compared with other *Pilophorus* species.

Key words: lichenized fungi, taxonomy

Introduction

Yunnan Province, situated in the south-west part of China, has always been a paradise for lichenologists. New species are described from this area regularly (Harada & Wang 2008; Wei *et al*. 2010), and still many remain to be discovered. During a field trip to Yunnan Province, a *Pilophorus* species was collected and identified in the field as *P. robustus* Th. Fr. Later critical examination in the laboratory, however, revealed it to be a different species, distinct from *P. robustus* and all other described species of this genus. After consulting the main accounts of this genus (Jahns 1970, 1981; Timdal 1988; Wang *et al*. 2010), we concluded that this specimen belonged to a previously unpublished species which we describe as *P. fruticosus* Li S. Wang & Xin Y. Wang. We provide here a detailed taxonomic description along with chemical and ecological data for this new taxon.

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Materials and Methods

Specimens for this study were collected during surveys in the Yunnan Province, China, in July 2006. These specimens have been deposited both in the herbarium of Kunming Institute of Botany, China (KUN) and the Korean Lichen Research Institute, Sunchon National University, South Korea (KoLRI).

The specimens were examined using standard microscopic techniques and hand-cut sections under NIKON C-PS 1068908 dissecting microscope. All measurements were made on material mounted in water and stained with lactophenol cotton blue (LCB). Anatomical descriptions are based on observations of these preparations under a NIKON Eclipse E 200 microscope. For the size of the thallus and apothecia, and the thickness of the epihymenium, hymenium and subhymenium, we recorded five measurements for each specimen. Ten measurements per specimen were recorded for ascospore dimensions. The dimensions of ascospores are presented as smallest single value recorded – largest single value recorded. We conducted spot test reactions on hand-cut sections of thalli and apothecia under an OLYMPUS BX 50 microscope. Secondary metabolites were identified by TLC as described by White & James (1985), Elix *et al.* (1987) and Orange *et al.* (2001). Terminology for tissues generally follows that of Jahns (1981).

The Species

Pilophorus fruticosus Li S. Wang & Xin Y. Wang sp. nov.

Mycobank No.: MB 519575

Similis *P. robusto*, sed differt in thallo dichotome ramoso, columella absenti et apotheciis solitariis.

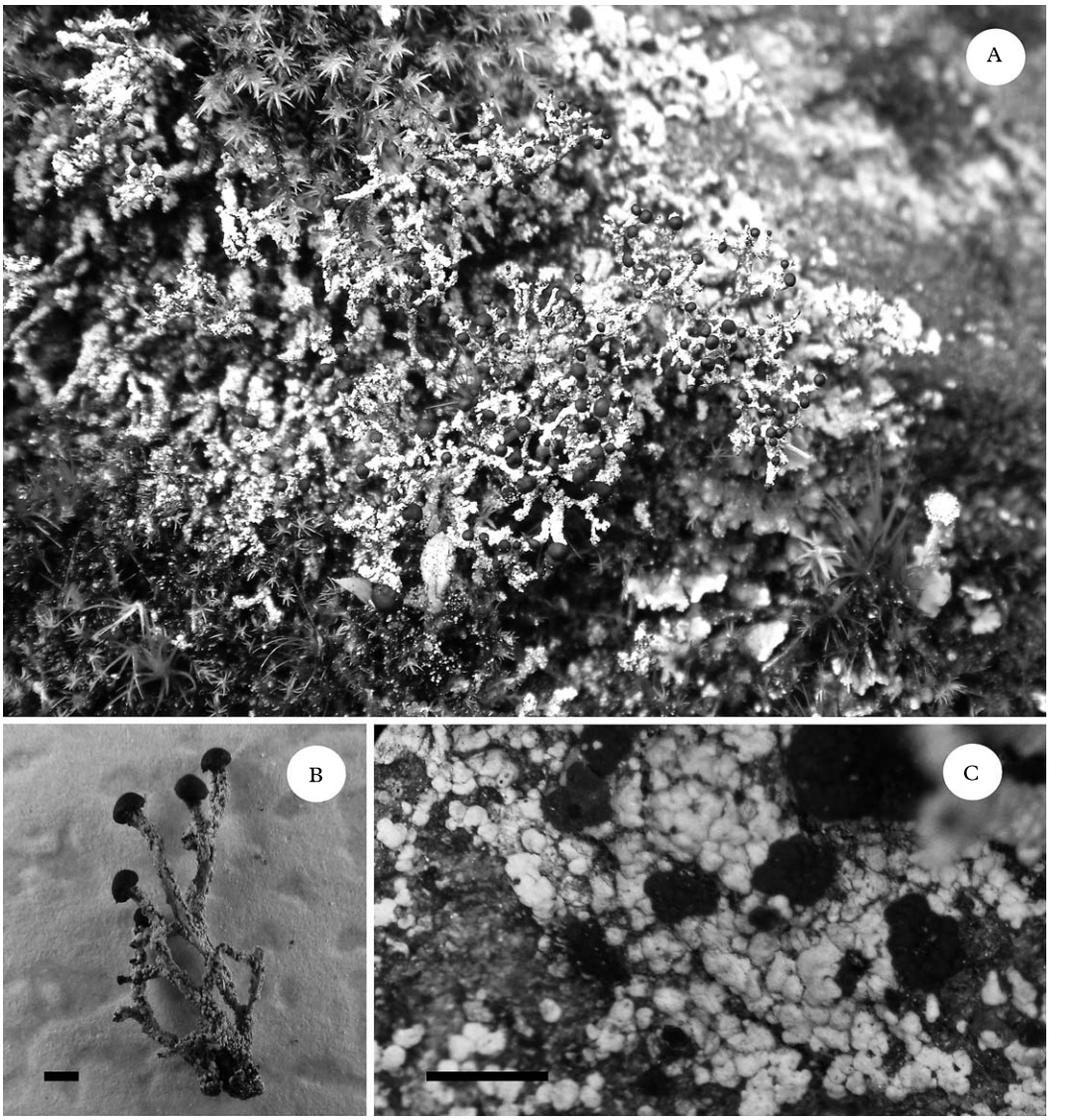

FIG. 1. *Pilophorus fruticosus*. A, habit; B, pseudopodetia; C, primary thallus and cephalodia. Scales: B & C = 1 mm.

Typus: China, Yunnan Province, Dali Co., Cangshan Mt., 25° 40′ 47·5″ N, 100° 06′ 02·8″ E, alt. 3570 m, on rock, 28 July 2006, *L. S. Wang* 06-26204 (KUN—holotypus; KoLRI—isotypus).

(Fig. 1)

Primary *thallus* persistent, tightly attached to the substratum, consisting of small granules (0·1–0·2 mm diam.) that usually become aggregated to form squamules (*c*. 1 mm diam.), grey to whitish grey when dry. *Pseudopodetia* dichotomously branched (from base to apex), 0·5–1 cm high and with branches less than 1 mm wide. Surface of the pseudopodetia covered with small granules, which are concolorous with the primary thallus. *Pseudopodetia* sometimes largely decorticate, exposing brown to dark brown

medulla. Internal part of pseudopodetia solid, composed of strongly gelatinized hyphae, forming a dark pigmented central region. *Photobiont* green. *Cephalodia* frequent, sessile, mostly growing on the primary thallus but sometimes also present on the lower part of the pseudopodetia, 1–2 mm diam., verrucose to cerebriform, brown to dark brown, containing *Nostoc*.

Apothecia solitary and growing on the apices of the mature pseudopodetia, spherical, black, *c*. 1 mm diam. *Epihymenium* bluish green, *c*. 5 μm high. *Hymenium* non–amyloid, non-pigmented, 80–100 μm high. *Subhymenium* non-pigmented, 25–30 μm high. *Excipulum* absent. Vegetative and generative tissue separated by black to dark brown pigmented boundary. Columella absent. Boundary texture present. *Asci* clavate, with a well-developed amyloid tholus containing a darker-straining amyloid tube, 8-spored. *Ascospores* spindle-shaped, 18·0–22·5 × 5·0–7·5 μm.

Pycnidia numerous, cylindrical, in clumps (2–3), growing at the apex of the pseudopodetium, up to 0·3 mm long. *Pycnoconidia* sickle shaped, 4–5 × 1 μm. *Photobiont* green.

Chemistry. Spot test reactions: thallus K+ yellow, C−, P−. Secondary metabolites: atranorin and zeorin.

Etymology. The specific epithet *fruticosus* refers to the morphology of the pseudopodetia.

Ecology and distribution. The new species has been observed growing on siliceous rocks along with species of *Cladonia* and *Stereocaulon* in the alpine region, at altitudes of approximately 3500 m. The surrounding forest is dominated by *Rhododendron* and *Abies georgei*. We have observed this species only at two localitites in Yunnan Province.

Discussion. *Pilophorus fruticosus* can be easily identified by the dichotomously branched pseudopodetia, the partly decorticated surface of the pseudopodetia, the solitary apothecia at the apices of pseudopodetia, the presence of a boundary texture and the lack of a columella in the apothecia. It is not likely to be confused with *P. robustus*, which differs in having umbellately branched, massive and stout pseudopodetia; a well-developed columella, and in the lack of a boundary texture. Also the primary thallus in *P. robustus* is pulverulent or granular and usually evanescent. The occasional dichotomous branching of *P. acicularis* (Ach.) Th. Fr. and *P. awasthianus* Räsänen can make them easily mistaken for this new taxon. However, *P. acicularis* differs from *P. fruticosus* by having simple pseudopodetia that are occasionally forked at the tips, taller pseudopodetia (more than 1 cm), higher hymenium (up to 240 μm) and larger spores (21–29·5 μm long), whereas *P. awasthianus* differs by having a loosely, scattered primary thallus, aggregated apothecia, the lack of a boundary texture and in its restricted distribution in India.

Additional specimen examined. **China:** *Yunnan Province*: Dali Co., Cangshan Mt., 25° 40′ 49·8″ N, 100° 06′ 04·0″ E, alt. 3543 m, on rock, 2006, *Hur* Ch060323 (KoLRI).

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