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Two new *Lecanora* species from India

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Abstract: The new species, *Lecanora luteomarginata* and *L. subpraesistens*, are described from northern India. The first is characterized by apothecia with dark brown discs and bright yellow margins, while *L. subpraesistens* is a multispored species that is readily distinguished by an egranulose epihymenium and a *melacarpella*-type amphithecium.

Key words: *Lecanorales*, *Lecanora*, new species, taxonomy, India

Introduction

The large, cosmopolitan genus *Lecanora* Ach. (*Lecanoraceae*) is characterized by having hyaline, usually non-septate ascospores, *Lecanora*-type asci, usually thalline apothecial margins and a crustose growth form. Molecular data (Arup & Grube 1998; Grube *et al.* 2004) suggest that it is a heterogeneous assemblage. However, a core group of *Lecanora* species related to the type of the genus *L. allophana* Nyl., can be distinguished (the *L. subfusca* group). This group is characterized by the presence of calcium oxalate crystals in the amphithecium, filiform conidia, and the production of atranorin and/or usnic acid in the cortex. The *L. subfusca* group has received considerable attention in recent decades (e.g. Brodo 1984; Brodo *et al.* 1994; Guderley 1999; Lumbsch 1994; Lumbsch *et al.* 1995, 1996; Miyawaki 1988), and the Indian species have also been studied (Upreti 1998; Upreti & Chatterjee 1997). One of us (SN) is currently revising *Lecanora* to allow a better understanding of the diversity of this genus in the Indian subcontinent. Among the material studied were specimens of two new species that are described below.

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Materials and Methods

Specimens are deposited in the herbarium LWG. Sections 16–20 µm thick of thalli and apothecia were cut using a freezing microtome and stained with lactophenol cotton blue. The chemical constituents were identified using thin-layer chromatography (TLC) and gradient-elution high performance liquid chromatography (HPLC) (Lumbsch 2002).

The Species

Lecanora luteomarginata Nayaka, Upreti & Lumbsch sp. nov.

Thallus crustaceus, continuus aut verruculosus vel verrucoso-areolatus, epruinosus, flavidogriseus vel griseofuscus. Prothallus non evolutus. Apothecia sessilia, ad basin constricta, 0·5–1·8 mm diametro, disci atrobrunnei vel griseo-brunnei, margines apotheciorum crassi, flexuosi, viridulo-lutei vel flavicanto-sulphurei. Amphithecium crystalla magna minutaque continens. Hypothecium hyalinum vel flavidum. Epihymenium rubrofuscum, egranulosum. Asci clavati, octospori, ascosporae ellipsoideae, 6–11 × 3·5–5·0 µm. Thallus arthothelinum, atranorinum, chloroatranorinum et acidum thiophanicum continens.

Typus: India, Uttaranchal, Chamoli district, Mandakini river valley, trail from Gaurikund to Rambara, 1980–2800 m, 18 Sept 1976, on boulders, *K. Dange* 76-165 (LWG-LWU—holotypus).

(Fig. 1A)

Thallus crustose, continuous to verruculose or verrucose-areolate, thin, opaque,

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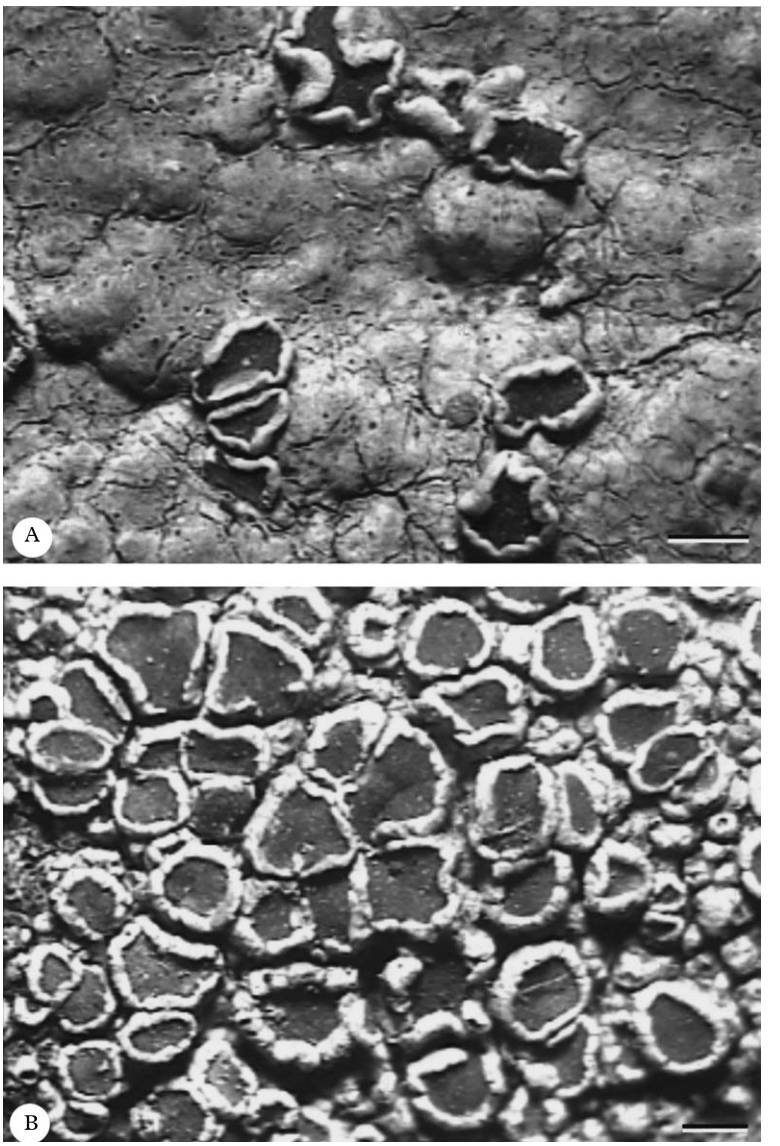


FIG. 1. Habit of two new *Lecanora* species. A, *L. luteomarginata* (holotype); B, *L. subpraesistens* (holotype). Scales: A & B = 1 mm.

epruinose, smooth, yellowish grey to greyish brown; margin indistinct; prothallus not visible; isidia and soredia absent.

Apothecia sessile, constricted at base, 0·5–1·8 mm diam., lecanorine; disc dark brown to dark grey-brown, shiny, plane or concave, epruinose; margin greenish yellow to dark sulphur-yellow, prominent, thick, smooth, entire, flexuose. *Amphithecial cortex* uniform, gelatinous, interspersed with crystals, hyaline, 25–35 µm thick. *Amphithecium* with small and large crystals (=*melacarpella*-type); crystals in groups forming a fine network. *Hypothecium* hyaline to yellowish, 20–25 µm high; parathecium hyaline, without crystals, 7–18 µm thick. *Hymenium*

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hyaline, clear, 50–60 µm high. *Epihymenium* red-brown, 10–15 µm thick, egranular; crystals absent; pigmentation not dissolving in K (=*glabrata*-type). *Paraphyses* sparingly branched, apically slightly swollen, hyaline. *Asci* clavate, 30–35 × 6–8 µm, 8-spored. *Ascospores* ellipsoid, 6–11 × 3·5–5·0 µm, with obtuse ends.

Pycnidia numerous, immersed, pyriform; conidiophores belonging to type III after Vobis (1980); *conidia* filiform, curved, 16–25 × 0·5–1·0 µm.

Chemistry. Thallus and apothecial margin K+ yellow, C+ orange, KC −, PD+ pale yellow, UV+ yellow, containing arthothelin, atranorin, chloroatranorin, thiophanic acid, and traces of unidentified terpenes.

Etymology. The species name refers to the characteristic dark sulphur-yellow apothecial margins.

Notes. Lecanora luteomarginata is characterized by a smooth, thin thallus, dark brown apothecia with bright yellow margin, *melacarpella*-type amphithecia and *glabrata*-type epihymenia, and the presence of xanthones. It is very distinctive and the only species that is morphologically similar is *L. hensseniae* Vänskä, known from Brazil and India. However, that species is readily distinguished by having paler apothecial margins, a *pulicaris*-type epihymenium and a dark hypothecium (Lumbsch *et al.* 1996; Upreti & Chatterjee 1997; Vänskä 1986).

At present *L. luteomarginata* is known only from its type locality in Uttaranchal, where it grows on siliceous rocks at an elevation that experiences a temperate climate.

Lecanora subpraesistens Nayaka, Upreti & Lumbsch sp. nov.

Thallus crustaceus, verruculosus vel verrucoso-areolatus, epruinosus, albido-griseus vel luteo-griseus. Prothallus non evolutus. Apothecia sessilia, 0·5–1·5 mm in diametro, disci fuscobrunnei, margines apotheciorum tenues, laeves vel verruculosi. Amphithecium crystalla magna continens. Hypothecium hyalinum. Epihymenium rubrofuscum, egranulosum. Asci clavati, 12–16-spori. Ascosporae late ellipsoideae, 8–16 × 6–9 µm. Thallus atranorinum, chloroatranorinum et zeorinum continens.

Typus: India, Jammu and Kashmir, Gulmarg, on south-east side, 2500–2800 m, on bark of tree trunk, 2 July 1977, *K. Dange* 77-466 (LWG-LWU—holotypus).

(Fig. 1B)

Thallus crustose, verruculose to verrucose-areolate, moderately thick, opaque, epruinose, smooth, whitish grey to yellowish grey; margin indistinct; prothallus not visible; isidia and soredia absent.

Apothecia sessile, 0·5–1·5 mm diam., lecanorine; disc red-brown, plane to slightly convex, epruinose, shiny; margin concolorous with thallus, prominent, thin, entire to verruculose, slightly flexuose. *Amphithecial cortex* uniform, hyaline, gelatinous, interspersed with small crystals, 10–20 µm thick. *Amphithecium* with large crystals (=*pulicaris*-type). *Hypothecium* hyaline; parathecium hyaline, without crystals, 10–15 µm thick. *Hymenium* hyaline, 60–80 µm high. *Epihymenium* reddish brown, without granules, pigmentation not dissolving in K (=*glabrata*-type), 10–15 µm thick. *Paraphyses* sparingly branched, apically slightly swollen; apices reddish brown. *Asci* cylindrical-clavate, 40–60 × 16–25 µm, 12–16-spored. *Ascospores* broadly ellipsoid to ellipsoid, 8–16 × 6–9 µm.

Pycnidia not seen.

Chemistry. Thallus and apothecial margin K+ yellow, C −, KC+ yellow, PD+ pale yellow, UV −, containing atranorin, chloroatranorin, zeorin, and traces of unidentified terpenes.

Etymology. The species is named after the similar species *L. praesistens.*

Notes. This new species is characterized by a *pulicaris*-type amphithecium, *glabrata*-type epihymenium and 16-spored asci. It is similar to *L. japonica* Müll. Arg., in having multispored asci and a *glabrata*-type epihymenium. The latter, however, has an *allophana*-type amphithecium and lacks secondary metabolites apart from the atranorin chemosyndrome (Guderley & Lumbsch,

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1999). Another multispored species, *L. praesistens* Nyl., is morphologically similar to *L. subpraesistens*, but differs in having a granulose epihymenium.

At present *L. subpraesistens* is known only from the type locality in northern India, where it grows on the bark of trees at high altitudes.

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