

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.

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, epruinus, 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 crystallina 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 acidium thiophanicum continens.

Typus: India, Uttarakhand, 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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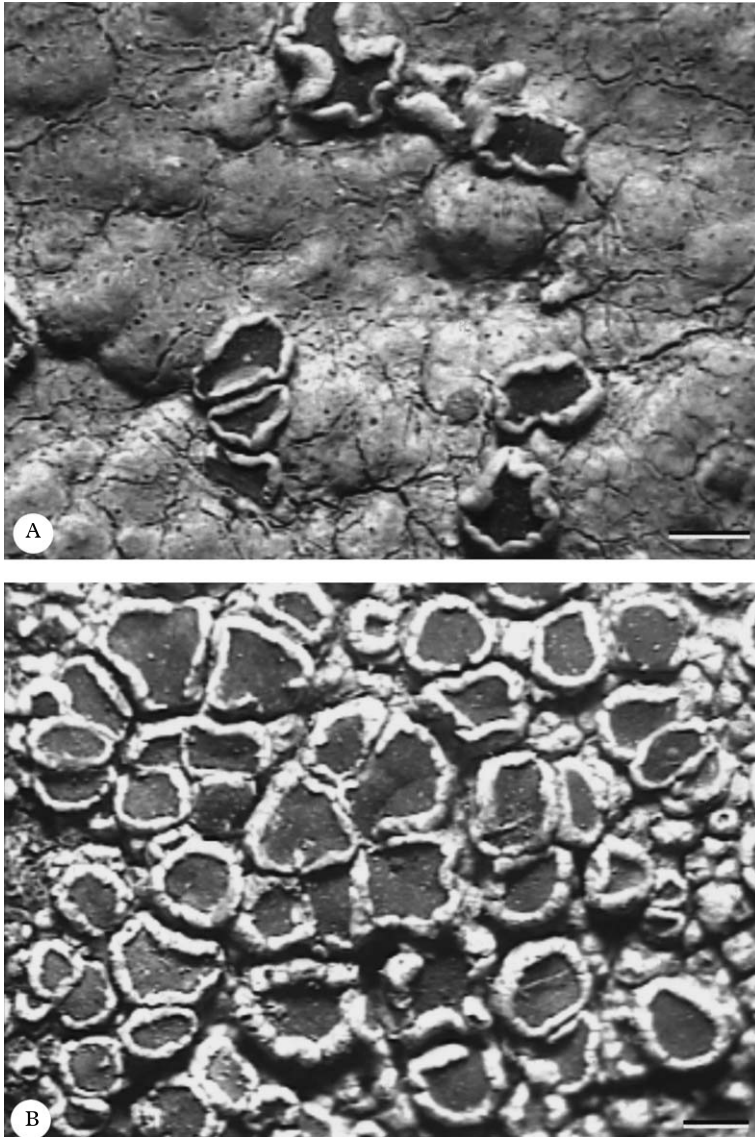


FIG. 1. Habit of two new *Lecanora* species. A, *L. luteomarginata* (holotype); B, *L. subpraesistens* (holotype). Scales: A & B=1 mm.

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*

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 \times 6–8 μm , 8-spored. *Ascospores* ellipsoid, 6–11 \times 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 \times 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 xanthenes. It is very distinctive and the only species that is morphologically similar is *L. hensseniae* Vanska, 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; Vanska 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, epruinus, 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 crystallina magna continens. Hypothecium hyalinum. Epihymenium rubrofusum, egranulosum. Asci clavati, 12–16-sporei. Ascosporeae late ellipsoideae,

8–16 \times 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 verrucoso-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 \times 16–25 μm , 12–16-spored. *Ascospores* broadly ellipsoid to ellipsoid, 8–16 \times 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* Mull. 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,

1999). Another multisporous 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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