

A new species of *Leiorreuma* Eschw. from India

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Abstract: *Leiorreuma subpatellulum* is described as new to science. The new species has a completely carbonized exciple, an inspersed hymenium and brown ascospores with 6–12 locules, tapering at one end.

Key words: corticolous, crustose lichen, *Graphidaceae*, lichenized fungi

Introduction

The lichen genus *Leiorreuma* Eschw. (*Graphidaceae*) is represented by 19 species world-wide of which *Leiorreuma exaltatum* (Mont. & Bosch) Staiger and *L. melanostalzans* (Leight.) A. W. Archer, are found in India (Archer 2006). The genus is characterized by an off-white to pale olive-green thallus with a smooth to dull surface; lirellate, conspicuous, sessile apothecia with epruinose to weakly pruinose discs, a poorly to well-developed exciple, an inspersed hymenium; pale brown, elongate, ellipsoid and I+ red-brown ascospores, with or without secondary metabolites. During the course of lichenological studies in the Upper Siang district of Arunachal Pradesh, eastern India, a number of graphidaceous lichens were collected and among them a new species of *Leiorreuma* was found which is described here.

Materials and Methods

Morphological characters were examined on dry material under a stereo-zoom microscope and anatomical details were examined with a compound microscope. The hand-cut sections of lirellae and thallus were mounted in water, 10% KOH (K), Lugol's solution (I)

and cotton blue. All the measurements were made on material mounted in water. Secondary metabolites were sought by TLC (Orange *et al.* 2001)

The New Species

Leiorreuma subpatellulum Dubey, Upreti & Nayaka sp. nov.

Mycobank No.: 518121

Thallus crustaceus, corticola, ascomata lirellata (0.5–3.0 × 0.3–0.5 mm) vel rotundata (0.25–1.0 × 0.3–0.5 mm), primum immerge deinde adnata, discus pruinosis. Excipulum nigrum, hymenium inspersum, asci claviformes, 4–8 spori, 60–70 × 15–18 μm, ascospores fusiformes, 40–46 × 8–10 μm, 6–12 septatae, brunneae.

Typus: India, Arunachal Pradesh, Upper Siang District, Jengging, near circuit house, 28° 54' N 95° 06' E, 900 m, on bark, 30 October 2007, U. Dubey 07-011897 (LWG—holotypus).

(Fig. 1 A–D)

Thallus corticolous, crustose, olive-green to yellow-brown or pale brown, smooth, ecarticate.

Ascomata numerous, crowded, rounded (0.25–1.0 × 0.3–0.5 mm) to lirellate (0.5–3.0 × 0.3–0.5 mm), immersed to adnate, simple to branched. *Disc* broad, pruinose, plane. *Margin* persistent, covered densely with white pruina, up to 75 μm thick, with crystals, Pd–. *Exciple* well developed, completely carbonized, convergent, K–, 25–50 μm thick. *Hymenium* hyaline, 80–130 μm thick, inspersed with oil, I+ reddish brown. *Subhymenium* pale brown to dark brown,

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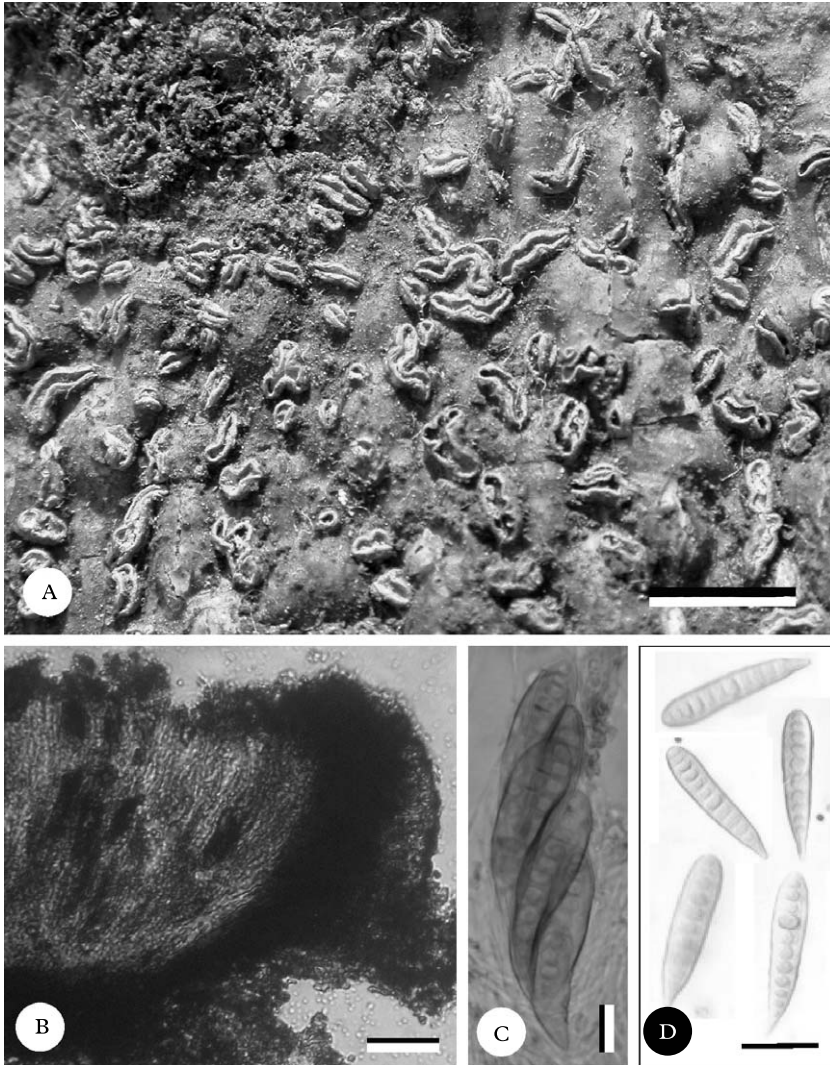


FIG. 1. *Leiorreuma patellulum*. A, habit (holotype); B, cross section of ascomata; C, ascus; D, ascospores. Scales: A = 5mm; B = 20 µm; C & D = 10 µm.

20–30 µm thick. *Paraphyses* up to 2.0 µm thick, branched and anastomosing, not widened at the apices. *Asci* cylindrico-clavate, 4–8 spored, 60–70 × 15–18 µm. *Ascospores* hyaline when young, pale brown at maturity, oblong, ellipsoid, 6–12 transversely septate, 40–46 × 8–10(–12) µm, one end tapering with locules in the centre larger, irregular in shape, I+ reddish brown.

Pycnidia not seen.

Chemistry. Thallus K+ red, KC+ yellow turning red, Pd–; no lichen substances detected by TLC in solvent system A.

Etymology. The epithet *subpatellulum* is a reference to the similarity of the new species with *Leiorreuma patellulum* (Fée) Staiger.

Ecology and distribution. The species is so far known only from its type locality in the

Jengging area in the Upper Siang District of Arunachal Pradesh where it grows in moist, humid conditions in association with *Sarcographa labyrinthica* (Ach.) Müll. Arg., and other members of the *Graphidaceae*.

Remarks. The new taxon is characterized by rounded to lirellate ascomata, 6–12-septate, $40\text{--}46 \times 8\text{--}10 \mu\text{m}$ ascospores with one end tapering. The well-developed exciple is similar to that in *L. patellulum*, but the latter species has larger ascospores measuring $60\text{--}80 \times 7\text{--}8 \mu\text{m}$, 12–18 locular ascospores and in addition contains norstictic acid. *Leiorreuma patellulum* is distributed in South America.

The two other Indian species *L. exaltatum* and *L. melanostalazans* differ in having poorly developed exciples, immersed lirellae and smaller 4–6 locular ($20\text{--}30 \times 7\text{--}9 \mu\text{m}$) and 7–9-locular ($25\text{--}37 \times 8\text{--}10 \mu\text{m}$) ascospores respectively. The other species of *Leiorreuma*, *L. nornotaticum* (A. W. Archer & Elix) A. W. Archer, *L. dilatatum* (Vain.) Staiger *L. sericeum* (Eschw.) Staiger *L. ellipticum* (Müll. Arg.) Staiger and *L. lyellii* (Sm.) Staiger all differ in having poorly developed exciples.

In its morphology and well-developed proper exciple the new taxon is close to the other graphidaceous lichen genera, *Thecographa* and *Thecaria*. However, *Thecaria* differs in having a proper exciple covered by a thalline layer up to the top whereas *Thecographa* has completely naked lirellae. In *L. subpatellulum*, the thalline layer covers only the lateral side of the exciple leaving the top portion completely naked. Such a condition is also observed in *L. patellulum*. Further, in

Thecaria the disc is usually sunken and all the species reported so far have muriform ascospores.

The species of *Phaeographis*, another graphidaceous genus, can be confused with the new species in the shape and size of the lirellae. However, most species of *Phaeographis* can be distinguished by a poorly developed exciple. *Phaeographis fusca* Staiger, *P. lepreurii* (Mont.) Staiger and *P. patagonia* Zahlbr. all have a well-developed exciple similar to that in the new taxon. *Phaeographis fusca* differs in having muriform spores whereas *P. patagonica* is characterized by 6-locular ascospores measuring $20\text{--}30 \times 6\text{--}9 \mu\text{m}$ and a poorly developed exciple on lateral sides. *Phaeographis lepreurii* can be distinguished by having a non-carbonized exciple at the base, 6-locular ascospores measuring $17\text{--}25\text{--}(30) \times 6\text{--}9 \mu\text{m}$ and a non-inspersed hymenium. *Phaeographis lobata* (Eschw.) Müll. Arg. resembles the new species in shape, size and colour of ascospores but differs in having exciples carbonized only at the apices and oval shaped lirellae.

Platygramme reticulata (Fée) Fée resembles the new taxon in having a carbonized excipular base, similar chemistry and a well-developed exciple, but it differs by the wedge-shaped apices and muriform spores.

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