

Five new lichen records from India

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ABSTRACT

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Lichen specimens were collected from all available substrates, including bark of trees and shrubs, dead wood, rocks and mosses, in Chamoli district, Uttarakhand. The collected specimens were dried and preserved for identification. A voucher specimen of each species was deposited in the National Repository at CSIR-National Botanical Research Institute, Lucknow (LWG). Study of the lichen assemblage reveals that the following five species are new records to the Indian lichen flora: *Acarospora saxicola* Fink ex Hedrick, *Candelariella reflexa* (Nyl.) Lettau, *Chaenotheca furfurcea* (L.) Tibell, *Fuscopannaria praetermissa* (Nyl.) P. M. Jorg., and *Lepraria caesiaalba* (B. de Lesd.) J. R. Laundon.

Key-words: Lichens, new records, Nanda Devi Biosphere Reserve, Chamoli district, Uttarakhand, India.

INTRODUCTION

Chamoli district, lying in the north-eastern part of the Garhwal tract of Uttarakhand, covers an area of 7520 km². Of this, the actual dense forest cover is 2115 km² and the open forest cover is 468 km². Nanda Devi Biosphere Reserve in the Chamoli district shows altitudinal variations, viz. sub-tropical, tropical, temperate and alpine regions. Major vegetation of Nanda Devi Biosphere Reserve comprises trees of *Pinus wallichiana* A. B. Jacks., *Abies pindrow* (Royle ex D. Don) Royle, *Taxus baccata* L., *Cedrus deodara* (Roxb.) Loud., *Betula utilis* D. Don. and *Rhododendron campanulatum* D. Don. The vegetation and altitudinal range make this district rich in lichen diversity. The present

communication enumerates five lichen records, new to India, from Nanda Devi Biosphere Reserve in Chamoli district, Uttarakhand.

MATERIAL AND METHODS

More than 150 lichens specimens were collected from the Nanda Devi Biosphere Reserve (alt. 1000-3600 m). The specimens were identified in respect of their morphology, anatomy and chemistry. All the specimens were investigated using colour spot tests (K, C, Pd) followed by thin layer chromatography (TLC) (Walker & James 1980). The chromatograms were developed in solvent A (Toluene: 1-4 dioxane: acetic acid 180: 60: 8 ml). The specimens examined in the

Table 1. New records of lichens from India.

S. No.	Lichen Species	Localities	Altitude	Date of Collection	Packet No.	Substratum	Collector
1	<i>Acarospora saxicola</i> Fink ex. Hedrick	Chopta	3000m	05.12.2006	06-006699	on rock	S. Rawat
2	<i>Candelariella reflexa</i> (Nyl.) Lettau	VOF	3000m	21.09.2006	06-007223	on bark	S. Rawat
3	<i>Chaenotheca furfurcea</i> (L.) Tibell	NDBR	3700m	06.05.2008	08-011426	on <i>Betula utilis</i>	S. Rawat
4	<i>Fuscopannaria praetermissa</i>	NDBR	3600m	06.06.2008	08-011137	on soil	S. Rawat
5A	<i>Lepraria caesioalba</i> (B. de Lesd.) J. R. Laundon	NDBR	3600m	06.08.2008	08-011175	on soil	S. Rawat
5B	<i>Lepraria caesioalba</i> (B. de Lesd.) J. R. Laundon	NDBR	3300m	06.06.2008	08-011027	<i>Pinus wallichiana</i>	S. Rawat

present paper are preserved in the Herbarium of National Botanical Research Institute, Lucknow (LWG) (Table 1).

NEW LICHEN RECORDS FOR INDIA

1. *Acarospora saxicola* Fink ex Hedrick; Mycologia 26: 159. 1934.

Plate 1, figure 1

Description: Thallus saxicolous, squamulose, greyish or dirty white crust; squamules small to middle-sized, irregular sometimes lobed, becoming imbricate, irregular, areolate, more or less closely attached to the substratum; apothecia small to middle sized, 0.4-1.2 mm across, immersed to adnate, flat to slightly convex, brown to brownish black like the thallus, entire to slightly irregular and crenulated; spores spherical, 2.5-4.5 μm in diam. irregularly arranged.

Chemistry: Thallus K-, C-, KC-. Pd-; no chemical present in TLC.

Specimen examined: Valley of Flowers Gangharia, alt. 3000 m, on rock, 06-007132.

2. *Candelariella reflexa* (Nyl.) Lettau; Hedw. 52: 196. 1912.

Lecanora vitellina var. *reflexa* Nyl. Lettau in Hedw. LII. 1912.

Plate 1, figure 2

Description: Thallus saxicolous, crustose, of dispersed or \pm contiguous or minute squamules, \pm sorediate, sometimes entirely finely sorediate; squamules to 1 mm diam., usually smaller, rounded or lobed to sub-stellate, mostly \pm flattened-

adpressed, dull yellow-green to citrine-yellow; soredia 0.05-0.07 mm diam., spherical, bright yellow, often coalescing and covering the entire upper surface of the squamules, then tending to form a continuous, leprose crust; apothecia 0.5-1 mm diam.; margin smooth or partly sorediate; disc pale yellow to bright orange-yellow; asci 8-spored; spores 10-16 x 4.5-5.5 μm , oblong-ellipsoid, slightly curved, simple.

Chemistry: Thallus K-.

Specimen examined: Valley of Flowers, alt. 3000 m, on bark, 06-007223.

3. *Chaenotheca furfurcea* (L.) Tibell; Beih. Nova Hedw. 79: 664. 1984.

Mucor furfuraceus L. Sp. Pl. 2: 1185. 1753.

Plate 1, figure 3

Description: Thallus leprose, soft and ecorticate, usually well developed, thin, bright yellow-green, occasionally almost immersed; apothecia scattered to grouped, 1.6-2.7 mm tall, slender; head and stalk, covered by a yellowish green pruina, black beneath; stalk 0.06-0.10 mm in diam., upper part with often branched, laterally projecting hyphae; densely covered by yellow crystal; lower part sometime epruinose and black; capitulum spherical, 0.1-0.2 mm in diam., pale brown, strongly convex, knob-like, consisting of intricately interwoven hyphae; asci 12-15 x 2-3 μm , many spored; spores hyaline or pale yellowish, spherical, 2-3 μm in diam.

Chemistry: Thallus K-, C-, KC-, Pd-; vulpinic acid present in TLC.

Specimen examined: Lata Khark, alt. 3600 m, on *Betula utilis*, 08-011426.

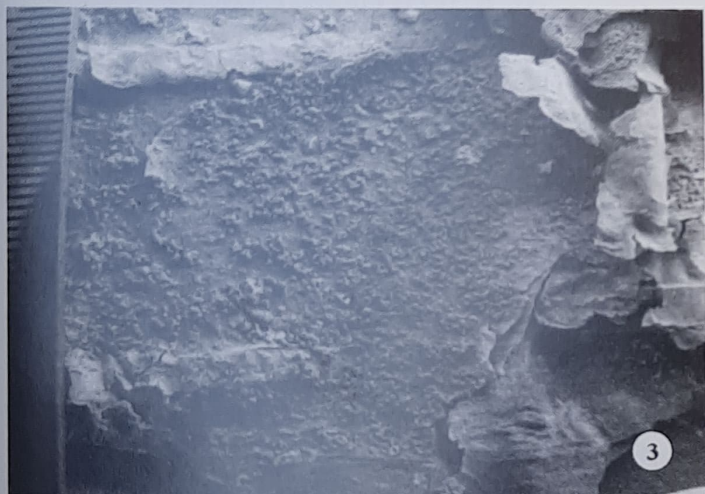
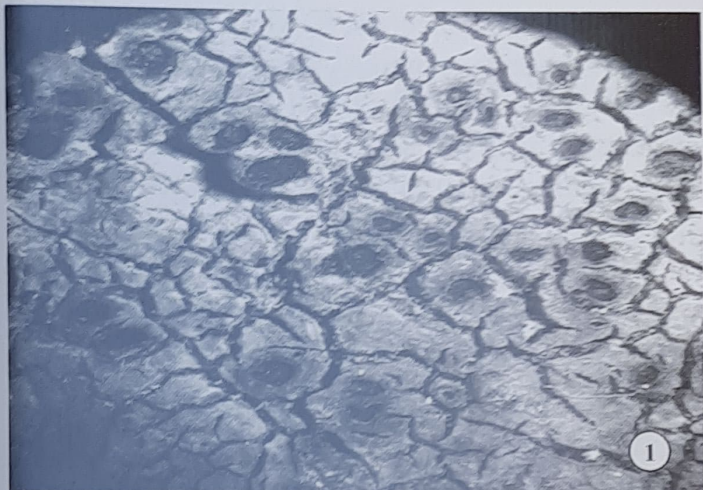


Plate 1

1. *Acarospora saxicola* Fink ex Hedrick. 2. *Candelariella reflexa* (Nyl.) Lettau. 3. *Chaenotheca furfurcea* (L.) Tibell. 4. *Fuscopannaria praetermissa* (Nyl.) P. M. Jorg. 5. *Lepraria caesia* (B. de Lesd.) J. R. Laundon,

4. *Fuscopannaria praetermissa* (Nyl.) P. M.

Jorg.; J. Hatto. Bot. Lab. 76: 205. 1994.

Pannaria praetermissa Nyl. In Chydeninse and Furuhjelm, Sällsk Faun. Fl. Femm. 4: 97. 1858.

Plate 1, figure 4

Description: Thallus muscicolous, squamulose, forming a continuous crust over the substrate, several cm in diam.; usually lacking a hypothallus; squamules: up to 0.4 mm wide and up to 3 mm diam.; rounded, incised, densely compacted or imbricate; lobes ascending and digitate, appearing like soralia or isidia; upper surface, dark brown; margin often white; apothecia brown, up to 1.5 mm diam.; disc convex, brown; exciple sub-parplectenchymatous, 60-80 μm thick; hymenium: I+ blue-green and turning red brown; asci clavate to subcylindrical, 8-spored; spores, simple, colourless, ovoid, 18-22 x 9-11 μm , with a distinct epispore, often with one large oil droplet.

Chemistry: Thallus K-, C-, KC-, Pd-; aliphatic and triterpenoids present in TLC.

Specimen examined: Lata Khark, alt. 3600 m, on soil, 08-011137.

5. *Lepraria caesioalba* (B. de Lesd.) J. R. Laundon; Lichenologist 24: 324. 1992.

Crocynia caesioalba de Lesd., Bull. Soc. Bot. Fr. 61: 84. 1914.

Plate 1, figure 5

Description: Thallus terricolous, leprose, diffuse, obscure, minute lobes present, medulla

present, inconspicuous, white; hypothallus usually absent; soredia abundant, coarse or variably sized, typically 100-150 (-200) μm diam., projecting hyphae sometimes present, usually short, consoredia frequent, typically 200-300 μm ; apothecia absent.

Chemistry: Thallus K+ yellow, C-, KC-, Pd+ yellow-red; atranorin, fumarprotocetraric acids present in TLC.

Specimen examined: Lata Khark, alt. 3600 m, on soil, 06-011175.

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REFERENCES

- Walker F. G. & James P. W. 1980. A revised guide to microchemical techniques for the identification of lichen products. Bull. British Lichen Soc. (Suppl.) 46: 13-29.