Some noteworthy additions to the lichen flora of India and Nepal

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SOME NOTEWORTHY ADDITIONS TO THE LICHEN FLORA OF INDIA AND NEPAL

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During the course of investigations on the lichens from India and Nepal preserved in the herbarium of the author, a large number of species have been found which were not reported from these countries in any of the earlier publications. The majority of these species are crustose types growing in saxicolous or corticolous habitats, while a few are foliicolous. The species fall into three principal distribution types: (1) those that occur in the moist temperate-alpine regions of the eastern and central Himalayas and show affinity with the boreal lichen flora, (2) those from the arid temperate-alpine regions of the North-Western Himalayas exhibiting affinity with the lichen flora from arid Central China and the arid Rocky Mountains of North America, and (3) those from the subtropical parts of India, widely distributed in the other pantropical regions of the world. Unless otherwise stated the number following the name of the collector(s) refers to the number the specimen bears in the herbarium of the author.

VERRUCARIACEAE


DIPLOSCHISTACEAE


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ASTEROTHYRIACEAE

Gyalectidium flicitum Muell. Arg. South India, Madurai district, below Sacred Heart College, Shembaganur, along the stream, alt. 5,800 ft., 1959, Awasthi 4381. On upper side of the leaves of shrubs in shade. Thallus minute, ca. 3 mm. in diam., pale waxy, smooth and shining, with a plectenchymatous cortex of a single cell layer; algal cells 4–6 μ. Apothecia immersed, 0.1–0.3 mm. in diam., concave, pale; hymenium 45–55 μ thick, with groups of algal cells within. Asci single-spored; spores colorless, many-celled, muriform, ovoid, 32–40 × 16–22 μ.

COLLEMACEAE


Collema subnigrescens Degel. South India, Ootacamund, Botanical Garden, alt. 7,000 ft., 1959, Awasthi 4444-A; S. W. India; Maharasthra, Panchgani near Poona, 1959, Awasthi 4054. Thallus thin, ridged-pustulate, non-isidiate. Spores elongate, broader at one end, 40–60 μ long. It is likely that some of the specimens reported in earlier publications from India under the name of Collema nigrescens may actually belong to C. subnigrescens.


Dendriscocaulon umhausensis (Auersw.) Degel. South India, Madurai district, Kodaikanal-Berijam road, alt. 7,500 ft., 1959, G. Foreau and Awasthi 4209. On tree trunk. Thallus fruticulose, caespitose; fronds terete cylindrical, dichotomously divided into short dendroid branchlets; pale grey below and bluish brown in apical regions. Sterile. Compares with the description of the var. dendroides (Nyl.)

PANNARIACEAE


Coccocarpia cronia (Tuck.) Vain. South India, Travancore, Quilon, 1953, O. A. Hoeg 2595; Madurai district, Kodaikanal, alt. 7,000 ft., 1959, G. Foreau
and Awasthi 4215. On bark of tree. Thallus bluish grey, isidiate, hypothallus blue-black, Sterile.

**LECIDEACEAE**


*Bacidia personata* Malme. South India, Madurai district, Kodaikanal-Berijam road, near 9th mile from Kodaikanal, alt. 7,500 ft., 1959, *G. Foreau and Awasthi 4190*. On bark of tree. Apothecia externally like *Megalospora versicolor*, but smaller (1 mm. in diam.); margin thick, persistent. Hypothecium hyaline; hymenium 90-110 μ thick; epithecium K + violet. Asci 8-spored; spores colorless, 16-22-celled, acicular, 50-70 × 3.5-4 μ.

*Catillaria intermixta* (Nyl.) Arn. South India, Ootacamund-Mysore road, at 8-9 miles from Ootacamund, alt. 7,000 ft., 1959, *Awasthi 4482*. On bark of tree. The specimen shows variation in the negative K-reaction in the thallus and slightly larger (20-25 × 7-9 μ) spores. The other characters, such as black apothecial margin, plane to convex disc, and red-brown hypothecium turning violet-purple by K, conform to the species.

*Catillaria semecarpi* Vain. South India, Madurai district, below Sacred Heart College, Shembaganur, along the stream, alt. 5,800 ft., 1959, *Awasthi 4383*. On upper side of the leaves of shrub in shade. Thallus in minute patches, thin, grey-white to brownish, non-sorediate. Apothecia 0.1-0.3 mm. in diam., constricted at base, pale orange to pale brown, smooth, epruinose. Spores colorless, 2-celled, ellipsoid, 12-15 × 4-5 μ.

*Lecidea atrobrunnea* (Ram.) Schaer. N. W. Himalayas, Kangra district, Spiti and Chandra valleys, alt. 11,500-14,000 ft., 1952, *O. A. Hoeg 1593, 1683, 1685 and 1720*. On quartzite stones. Thallus variable in the size of the squamules and the lacunose tubercled condition on the surface in the different specimens and in the same specimen at centre and periphery. Thalli abundantly fertile. Medulla 1+ blue. Spores colorless, single-celled, 7-10 × 4-5 μ.

*Lecidea auriculata* Th. Fr. E. Nepal, Topkegola, Thagalabhanjyang, alt. 15,500 ft., 1953, *Awasthi 2363*. On quartzite stones. Thallus restricted in the cracks and crevices of the stone, somewhat depauperate, and eventually leading to evanescence. Apothecia up to 1.5 mm. in diam., plane to convex, black; exciple red-brown, K+ violet. Spores colorless, single-celled, ellipsoid, 7-8 × 4 μ.

*Lecidea coarctata* (Turn.) Nyl. N. W. Himalayas, Almora district, Askote,
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near Barakote, alt. 5,500 ft., 1954, Awasthi 2697. On siliceous stones. Thallus whitish grey, fissured-areolate; medulla K—, Cl+ orange-red, I—. Apothecia numerous, sunken to sessile, up to 0.4 mm. in diam., often covered with a fleck of thalline tissue; disc red-brown when moist, epruinose. Spores colorless, single-celled, ovoid-ellipsoid, 15–18 × 8–10 μ. The species has been treated as a Lecanora by various workers including Zahlbruckner. The author has followed Th. Fries, Vainio, and Hillmann and Grummann in treating it as a Lecidea. The above-named specimen resembles var. elactista (Ach.) Th. Fr.


Lecidea macrocarpa (DC.) Steud. E. Nepal, Rakshe-Ethung, near hilltop, alt. 9,000 ft., 1953, Awasthi 2126. On gneiss. Thallus cracked areolate, ashy grey to dark-bluish grey, K—, Cl—, I—. Apothecia up to 1.2 mm. in diam., eventually convex, black, smooth, epruinose. Epithecium bluish olive-brown; hypothecium demarcated into an upper (subhymenial) hyaline part and a lower, thicker, brown-black part. Spores colorless, single-celled, ovoid-ellipsoid, 16–18 × 8–10 μ.

Lopadium leucoxanthoides (Vain.) A. Zahlbr. South India, Madurai district, Kodaikanal-Berijam road, at 8 miles from Kodaikanal, alt. 7,500 ft., 1959, G. Foreau and Awasthi 4189, 4193 and 4196; Ootacamund-Mysore road, at 8–9 miles from Ootacamund, alt. 7,000 ft., 1959, Awasthi 4470. On bark of tree. Thallus crustose, ashy grey, K+ yellow. Apothecia 1.5 (2) mm. in diam., Epithecium pale brown, K+ violet; exciple red-brown, with dense, brown, irregular inclusions, K+ blue to violet-blue. Asci single-spored; spores colorless, muriform with 15–25 transverse septa and 4–8 longitudinal septa, ovoid, 60–90 × 20–40 μ.

Lopadium subcoerulescens A. Zahlbr. South India, Madurai district, below Sacred Heart college, Shembaganur, along the stream, alt. 5,800 ft., 1959, Awasthi 4384. On upper side of leaves of shrubs in shade. Thallus scaly, crust-like, easily separable as papery sheet from the substratum, smooth, greyish white. Apothecia sessile, up to 0.4 mm. in diam.; disc plane, bluish black to black; margin thick, entire, inflexed in young stages. Epithecium partially bluish-aeruginose and partially hyaline, the aeruginose parts projecting into the hymenium; hypothecium 60–70 μ, aeruginose-brown; exciple thick, plectenchymatous; central part of apothecial base blue. Asci single-
spored; spores colorless, many-celled, muriform, ovoid-ellipsoid, 40–90 × 12–24 μ. The above-mentioned specimen shows resemblance to *Lopadium puiggarii* Muell. Arg. in the thickness of the hypothecium and the bluish coloration at the base of the apothecium.

*Sporopodium xantholeucum* (Muell. Arg.) A. Zahlbr. South India, Madurai district, below Sacred Heart College, Shembaganur, along the stream, alt. 5,800 ft., 1959, *Awasthi 4382*. On upper side of leaves of shrubs in shade. Thallus thin, smooth to minutely verrucose; often thalli confluent. Apothecia numerous, up to 1 mm. in diam., plane to convex, dark red-brown, pruinose; pruina denser in young stages; margin in early stages verrucose pruinose, later somewhat thinner and ± crenulate. Epithecium with sparsely distributed algal cells. Asci single-spored; spores colorless, many-celled, muriform, ovoid-ellipsoid, 60–104 × 12–16 μ. The verrucose margin in mature stages appears somewhat crenulate and may thereby be confused with the crenulate margin of *S. argillaceum* (Muell. Arg.) A. Zahlbr., which however has epruinose apothecia and nonverrucose thallus.

*Toninia coeruleonigricans* (Lightf.) Th. Fr. X. W. Himalayas, Kashmir, Srinagar, Shankaracharya hill, near temple, alt. 6,000 ft., 1953, *Awasthi 2640*. On sloping ground among mosses. Thallus forming suborbicular patches with the variously lobed imbricated, olive-brown to bluish olive-brown lobules, thinly pruinose. Apothecia frequently present. Spores colorless, 2-celled, elongate-fusiform, 14–18 × 3–4 μ. This is the first record of the genus from India.


*Acarospora strigata* (Nyl.) Jatta. N. W. Himalayas, Kangra district, Spiti, Dankar Gompha and Po village, alt. 12,000 ft., 1952, *O. A. Hoeg 1551 and 1562*. On calcareous stones. Thallus subsquamulose areolate, bluish white, thickly pruinose, often reticulately deeply fissured, K−, Cl−, Pd−. Apothecia few, ± immersed. Spores many in the ascus, colorless, single-celled, 4–5 × 3 μ. This species is considered by Dr. W. A. Weber as merely an environmental modification of the cosmopolitan *A. smaragdula* (Wahlenb.) Th. Fr.

*Glypholecia scabra* (Pers.) Muell. Arg. N. W. Himalayas, Kangra district, Pin and Spiti river valleys, alt. 12,000 ft., 1952, *O. A. Hoeg 1580 and 1583*. On stones. The two specimens show marked variation in their habits. Specimen number 1583 is typically peltate, up to 4 cm. in diam.; lobes are thick, rimu-
lose, and fertile with mature apothecia. The thallus is much thicker in com-
parison to the specimens of this species from Rocky Mountains and Arizona.
The other specimen (no. 1580) has its thallus somewhat effigurate, adnate to
the substratum for the greater part on the underside. This difference may be
due to habitat conditions only. The genus is here reported for the first time
from India.

PERTUSARIACEAE

_Pertusaria bryontha_ (Ach.) Nyl. E. Nepal, Topkegola-Thagalabhanjyang,
alt. 14,000-14,500 ft., 1953, _Awasthi_ 2357. Over decaying mosses. Thallus
granular verrucose, white, _K_—, _Cl_—. Apothecia up to 1.5 mm. in diam.;
disc brown to dark brown. Asci single-spored; spores colorless, single-celled,
oblong-ovoid, 155–270 × 40–70 μ.

LECANORACEAE

_Haematomma ventosum_ (L.) Mass. E. Nepal, Sajupokhari near Topkegola,
alt. 15,000 ft., 1953, _Awasthi_ 2426. On sheltered side of non-calcareous boulder.
Thallus distinctively thick, wrinkled-warty-verrucose, greyish sulphur-
colored. Apothecia crowded, semi-immersed; disc red to red-brown; epithecium
_K_+ violet-purple.

_Lecanora alphoplaca_ (Wahlenb.) Ach. N. W. Himalayas, Kangra district,
Kulu, alt. 4,500 ft.; Chandra valley, alt. 11,000 ft., 1952, _O. A. Hoeg_ 1460
and 1740; Kashmir, Srinagar, Shankaracharya hill, alt. 6,000 ft., 1953, _Awasthi_
2637. On stones, chiefly on micaschistose. Thallus rosette-like, effigurate
laciniate, the peripheral lacinia subcylindrical, elongated and narrow, ashy
grey to ochraceous red-brown, pruinose, _K_+ scarlet-red (with formation of
stellate crystals). Apothecia initially aspicilioid. Spores colorless, single-celled,
11–13 × 6–8 μ.

_Lecanora atra_ (Huds.) Ach. South India, Madurai district, Kodaikanal-
Berijam road, nearly 8 miles from Kodaikanal, alt. 7,500 ft., 1959, _G. Foreau
and Awasthi_ 4198. On bark of tree. Thallus ashy grey to pale grey, soft ver-
rucose, not areolate, hypothallus whitish. Apothecia numerous, sessile, up to
1.5 mm. in diam., black, smooth and shining, epruinose; margin prominent,
entire to sulcate. Epithecium violet-brown; hymenium reddish violet (pale-
reddish in thin section), _K_+ violet; hypothecium violet-brown. Spores color-
less, single-celled, ovoid-ellipsoid, 10–14 × 6–8 μ. This specimen is identical
with a specimen from Mexico collected by C. G. Pringle, no. 36 (in Herb.

_Lecanora caesiocinerea_ Nyl. N. W. Himalayas, Kangra district, Chandra
valley, Chatru, alt. 11,000 ft., 1952, _O. A. Hoeg_ 1741. On rocks. Thallus ashy
grey to bluish ashy grey, lightly pruinose, areolate; areoles unequally thickened, 0.5–1 mm. thick; medulla K—, I—. Apothecia up to 0.7 mm. in diam., dark brown to black, pruinose. Spores colorless, single-celled, ovoid, 18–24 × 10–13 μ.

*Lecanora flavida* Hepp. N. W. Himalayas, Tehri Garhwal, near Purola, alt. 5,500 ft., 1951, Awasthi 881. On calcareous sandstone. Thallus rimulose-areolate, smooth, pale to pale grey. Apothecia numerous, initially sunken, later erumpent, up to 0.3 mm. in diam., pruinose; disc brown-black. Spores colorless, single celled, oval-ellipsoid, 10–13 × 5–6 μ. The specimen agrees well with Malme Lich. Suec. Exsic. no. 847. The spores in this Indian specimen are slightly smaller in comparison to the dimensions (12–18 × 7–11 μ) given by Migula (1929, p. 252) for European specimens.


*Lecanora melanophthalma* (Ram.) Ram. N. W. Himalayas, Kangra district, Spiti and Chandra valleys, alt. 11,500–14,000 ft., 1952, O. A. Hoeg 1591, 1674 and 1709. On siliceous stones. Thallus initially monophyllous, later subpolyphyllous by lobing and convolutions of the lobes, pale to pale brown above and bluish brown underneath; the thickness variable, depending on the age and part of the thallus. Medulla Pd+ yellow. Apothecia greenish brown to brown-black, pruinose.

*Lecanora peltata* (Ram.) Steud. N. W. Himalayas, Kangra district, Chotai Sigri, alt. 12,000 ft., 1952, O. A. Hoeg 1542. On stones. Thallus monophyllous, peltate, with a thick umbilicus, broadly lobed, up to 3.5 cm. in diam., often convoluted and folded and seemingly polyphyllous; thickness centripetally more, at periphery 0.5 mm.; greyish-pale above and blue-black underneath. Apothecia numerous, initially sunken, later erumpent, sessile, 0.5–1 (2.5) mm. in diam.; disc dark brown. Spores colorless, single-celled, subglobose to oval, 7–9 × 6–7(8) μ. This specimen with broad lobes and subglobose spores compares favorably with the description of a Central Chinese species, *Lecanora regalis* H. Magn., which has been retained by Poelt (1958) within the variability of *L. peltata*.

**CALOPLACACEAE**

*Caloplaca cerina* var. *stillicidiiorum* (Vahl) Th. Fr. Kashmir, Srinagar, Shankaracharya hill, alt. 6,000 ft., 1953, Awasthi 2640-A. Over decaying mosses, associated with *Toninia coeruleonigricans*. Thallus ashy white to grey, apothecia pale brown, pruinose, with persistent pruinose margin.
Caloplaca murorum (Hoffm.) Th. Fr. N. W. Himalayas, Kangra district, Spiti, Pin and Taktsi river valleys, alt. 12,000 ft., 1952, O. A. Hoeg 1584, 1654, and 1675. On stones and rocks, some calcareous; associated with Acarospora species. Closely related to C. elegans but distinguished by the much smaller thallus; centrally areolate verrucose; marginal laciniae minute, plane, smooth, subpruinose, and adnate to the substrate.

Caloplaca trachyphylla (Tuck.) A Zahlbr. N. W. Himalayas, Kangra district, Kaze, alt. 12,000 ft., 1952, O. A. Hoeg 1650. On calcareous stones. This species was originally described as a variety of C. elegans by Tuckerman and has so far been known from the Rocky Mountain area only. He distinguished it on the basis of intermediate characters between C. elegans and C. murorum. The Rocky Mountain specimens have a well-developed suborbicular thallus, closely adnate to the substrate. The upper side is tuberculate verrucose, and laciniae are radiating but compact and adglutinated. The specimen from N. W. Himalayas does not show a good development but agrees well in the tuberculate nature of the laciniae and adnation to the substrate. The spores of the Rocky Mountain specimens have rounded cell lumina and a thick middle septum, while the Himalayan specimen has oblong cell lumina. This variation, however does not seem of much taxonomic importance as in Caloplaca such variations are frequently observed in the same species or same specimen. In the light of the similarity of the lichen flora of Central China and Rocky Mountains, it may be worth while to remark here that the description of Caloplaca hedini H. Magn. from Central China compares favorably with that of C. trachyphylla.

BUELLIACEAE

Buellia aethalea (Ach.) Th. Fr. N. W. Himalayas, Tehri Garhwal, Sirasu hill top, near Purola, alt. 7,000 ft., 1951, Awasthi 924; Simla, Jakhu hill top, alt. 7,500 ft., 1952, Awasthi 1434. On siliceous stones. Thallus grey to dark grey, cracked areolate; medulla K+ red (followed with the formation of stellate crystals), 1+ blue, or — (in form a), Pd+ yellow. Apothecia sunken, 0.2-0.6 mm. in diam., brown black, epruinose. Spores brown, 2-celled, ovoid-ellipsoid, 16-18 × 7-9 μ. The medulla in specimen no. 1434 is 1—, and thereby is comparable to f. sororvidoides (Erichs.) Grummann.


Buellia papillata (Sommerf.) Tuck. E. Nepal, Topkegola, Sajupokhari, alt. 15,500 ft., 1953, Awasthi 2420. On ground among mossy or humus soil over

_Buellia pulchella_ (Schrad.) Tuck. E. Nepal, Topkegola, Sajupokhari, alt. 15,500 ft., 1953, _Awasthi_ 2416. On humus soil along with mosses. Thallus greenish pale, squamulose; squamules turgid, thick, crowded, and imbricated, K—, Cl—, Pd—; hypothallus thick, brown-black. Apothecia numerous, up to 3 mm. in diam., plane to convex, eventually lobed and tubercled, epruinose. Spores brown, 2-celled, ovoid-ellipsoid, 12-16 × 7-9 μ.

_Rinodina kansuensis_ H. Magn. N. W. Himalayas, Kangra district, Junction of Pin and Spiti valleys, alt. 12,000 ft., 1952, O. A. Hoeg 1566. On calcareous stone. Thallus of small fragments only, effigurate, ashy white, pruinose. Apothecia up to 1 mm. in diam., black, sparingly pruinose. Spores brown, 2-celled, ovoid-ellipsoid, 18-20 × 9-11 μ, a raised triangular band-like thickening at the septum, which becomes distinct in K.

_Rinodina turfacea_ (Wahlenb.) Koerb. E. Nepal, Topkegola, Thagalabhanjyang, alt. 14,500-15,000 ft., 1953, _Awasthi_ 2376. On ground and on decaying parts of grasses and mosses. Thallus granulose, ashy white to grey, K—. Apothecia crowded, up to 0.7 mm. in diam.; disc concave to plane, dark red to brown-black; margin entire, persistent, without oxalate crystals within. Spores brown, 2-celled, ovoid, 22-32 × 12-16 μ.

**Summary**

This paper deals with 43 species of lichens from India and Nepal which have been discovered as new reports for the area. Three genera — _Staurothele_, _Toninia_ and _Glypholecia_ — are also reported for the first time from India.

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