

K. P. SINGH

Botanical Survey of India, Eastern Circle, Shillong

ABSTRACT

The paper reports the occurrence of 145 microlichen taxa belonging to 43 genera from Manipur. *Huelia granifera* (Ach.) Singh (Basionym *Lecanora granifera* Ach.) is made a new combination and 17 species marked with an asterisk (*) are new records for Indian flora.

INTRODUCTION

The paper presents an account of microlichens occurring in Manipur. The microlichen-flora and its phytogeographical account has earlier been completed (Singh, *in press*). The microlichen-flora like that of macrolichen is rich and diverse in variety.

The topography of the Manipur State can be divided into the valley, the foot-hills (up to the altitude of 1900 m) and the hills (alt. 1900-2900 m). The valley region seems to be rich in corticolous species of *Lecanora*, *Graphis* and *Lecidea*. The foot-hills of Kabrau, Kongpokpi, Litan, Moreh and Singhat show preference to the corticolous species of graphidaceous lichens, *Bacidia*, *Haematomma*, *Lecanora*, *Lecidea*, etc. The microlichens, however, have their maximum abundance in the hill region. In the forests of Mao, Tegnoupal, Ukhrul and Siroi, one encounters the usual common lichens such as *Pyrenula aducta*, *Graphina obtecta*, *Bombyliospora leprolyta*, *Lecidea russula*, *Lopadium vulpinum*, *Lecanora chlarotera*, *L. chlarona*, *Caloplaca aurantiaca*, *Huelia granifera*, *Phyllopsora parvifolia*, etc. Saxicolous species of *Buellia* and *Verrucaria* are quite common here. Several other saxicolous species, such as *Diploschistes actinostomus*, *Lecanora gangalizodes*, *L. crenulata*, *Caloplaca cerina*, *C. vitellinula*, etc. on roadside rocks and boulders along rivers and streams were observed. The moist and shady places in the forests have an abundance of taxa of Pyrenulaceae and Arthopyrangiaceae.

The study is primarily based on the investigations of collection made by the author during the years 1976-79. Earlier reports by MÜLL. ARG. (1892), PATWARDHAN AND NAGARKAR (1979) and SINGH (1980 a, b, c) have also been incorporated. The total number of microlichen-taxa from Manipur, thus, comes to be 145, belonging to 43 genera. The taxa have been arranged according to ZAHLBRUCKNER (1926) system of classification. Seventeen taxa, marked by an asterisk (*), are new records from India and have been taxonomically treated in detail. Others, that have been reported earlier—either from Manipur or elsewhere in India and now forming part of Manipur's Lichen-flora in this study, have simply been listed. Special mention has been made to this effect for the last category of above mentioned taxa and field-numbers given in case of each of them. The specimens studied are deposited at the Central National Herbarium, Howrah (CAL).

VERRUCARIACEAE

Awasthiella Singh**Awasthiella indica** Singh

See SINGH (1980a).

Staurothele (Norm) Th. Fr.

***Staurothele septentrionalis** Lynge, Lich. Nov. Zemlya, p. 35. 1928.

Thallus crustose, thin, brown, cracked, areolate; perithecia black, immersed to partially erumpent, globose, 0.2-0.3 mm diam.; wall not differentiated, black; hymenial algae present; algal cells present in vertical rows, quadrangular; asci 1-2-spored; spores colourless, muriform, transversely 6-9-septate, longitudinally 1-3-septate, oblong, $24-30 \times 9-12 \mu\text{m}$; paraphyses absent. Saxicolous. Tegnoupal, Moreh, Singh 550841.

Verrucaria aethiobola Wahlbg. ex Ach.

See AWASTHI AND SINGH (1970), reported from Jammu and Kashmir. First record from Manipur. Saxicolous. Korong, Hippi, near Setikala river, Singh 550179.

***V. cincta** (Flag.) Hepp. Flora 41 : 538. 1858.

Amphoridium cinctum Flagey, Rev. Mycol. 17 : 112. 1895.

Thallus epilithic, whitish grey, cracked, areolate, smooth; perithecia black, immersed to partially erumpent, 0.15-0.3 mm diam.; wall not differentiated, black above, colourless below; spores ellipsoid, $24-30 \times 9-12 \mu\text{m}$. Saxicolous. Korong, Kongpokpi Mission Hospital, Singh 550228, 550255.

***V. coerulea** (Ram.) DC. in Lam et DC., Fl. Franc. 2 : 318. 1805.

Lichen coeruleus Ram. ex DC., Fl. Franc. 2 : 318. 1805.

Thallus brownish grey, smooth, cracked areolate; hypothallus black; perithecia brown black, immersed, 0.1-0.15 diam.; involucrellum black, exciple brown; spores ellipsoid, $12-15 \times 6-7 \mu\text{m}$. Saxicolous. Korong, Kongpokpi Mission Hospital, Singh 55030.

V. elaeomelaena (Mass.) Arn., Verhandl. Zool-Bot. Gesellsch. Wien 18 : 958. 1868.

Thallus epilithic, grey, cracked, smooth; hypothallus absent; perithecia completely immersed, appearing as brownish black spots, 0.3-0.4 mm diam.; involucrellum indistinct; exciple black laterally and apically, colourless to brownish below; spores ellipsoid, $18-26 \times 8-11 \mu\text{m}$. Saxicolous. Korong, Hippi, near Setikala river, Singh 550198.

***V. margacea** (Wahlbg. ex Ach.) Wahlbg. Flora Leppon. p. 465. 1812.

Thelotrema margaceum Wahlbg. ex Ach. Method. Lich. Suppl. p. 30. 1803.

Thallus epilithic, greenish grey, smooth; hypothallus absent; perithecia black, scattered, immersed, but upper portion bare and sometimes projecting, 0.2-0.4 mm diam.; involucrellum black, spreading laterally; exciple, colourless below and brown laterally; spores ellipsoid, $18-36 \times 9-12 \mu\text{m}$. Saxicolous. The spores in our specimen are narrower. Korong, Hippi, near Setikala river, Singh 550160; Ukhrul, Singh 55094.

***V. transiliens** Arn. Denksch. K. Bayr. Bot. Gesellsch., 6 : 42. 1890.

Thallus partially epilithic, grey to brown, cracked, areolate, smooth, perithecia half globose, 0.3-0.4 mm diam.; wall black, not differentiated; spores ellipsoid, $24-30 \times 9-11 \mu\text{m}$. Saxicolous. Korong, Mao, Singh 550326.

***V. pinguicula** (Nyl.) Mass.. Lotos, 6 : 80. 1856.

V. plumbea var. *pinguicula* Nyl. Mémoir. Soc. Sci. Nat. Cherbourg, 5 : 137. 1857.

Thallus partially epilithic, brown, continuous, cracked, areolate ; perithecia minute, brownish, immersed, 0.1-0.2 mm diam., hemispherical, apex prominent, wall not differentiated, blackish near mouth and colourless below ; spores small, ellipsoid, 12-15 × 6-7 μ m. Saxicolous. Korong, Hippi, near Setikala river, Singh 550187.

DERMATOCARPAGEAE

Endocarpon pusillum Hedw.

See PATWARDHAN *et al.*, (1977), reported from south-western India. First report from Manipur. Saxicolous. Korong, Toribari, Singh 550093.

PYRENULACEAE

Anthracothecium manipurens Müll. Arg.

See MÜLL. ARG. (1892).

A. variolosum (Pers.) Müll. Arg.

See MÜLL. ARG. (1892).

Pyrenula aducta Fée

See MÜLL. ARG. (1892). Corticolous. Korong, Kabrau, Singh 55030 ; Ukhrul, Tongau, Singh 54858 ; no precise locality, Watt 6963.

***P. mamillana** (Ach.) Trevis, Conspect. Verruc. p. 13. 1860.

Verrucaria mamillana Ach. Method. Lich. p. 120. 1803.

Thallus greyish brown ; perithecia black, subglobose, up to 1 mm wide, base spreading ; ostiole conical ; wall not differentiated, black ; spores brown, ellipsoid, oblong, transversely 4-celled, 15-21 × 6-9 μ m. Corticolous. Korong, Kabrau, Singh 55039.

TRYPETHELIACEAE

Trypethelium inamoenum Müll. Arg.

See MÜLL. ARG. (1892).

T. refertum Stirt.

See STIRTON (1879), reported from Assam. First report from Manipur. Corticolous (Citrus tree). Tegnoupal, Moreh, Singh 550850.

MYCOPORACEAE

Dermatina deplanata (Müll. Arg.) Zahlbr.

See MÜLL. ARG. (1892).

D. indica (Müll. Arg.) Zahlbr.

Thallus whitish grey, minutely granular ; pseudothecia black, resembling perithecia, rounded to irregular ; sometimes elongated, 0.2-1.0 mm in diam., wall black, grouped in up to 4 pseudothecia with many ostioles ; asci 4-8-spored ; spores colourless to pale, muriform, oblong-ellipsoid, 32-48 × 16-20 μ m. Corticolous. No precise locality. Watt 6983 (Isolectotype : CALI)

CALICIACEAE

***Sphinctrina leucopodoides** Nyl. Lich. Nov. Zealand p. 12, 1888.

Thallus embeded, not visible externally ; fruiting bodies pedicellate, 0.6-0.8 mm long ; stipe above 0.5 mm long, internally K + violet below the hypothecial region ; disc black, 0.2-0.5 mm wide ; asci 8-spored, uniseriately arranged ; spores simple, greenish brown, \pm thick walled, ovoid to ellipsoid, 12-16 (17) \times 8-9 μ m. Parasite on *Pertusaria* spp. Ukhrul, Lungshongkhong 550912.

This species resembles *S. microcephalum* (Sm.) Nyl. in spore characters, but stipe in *S. microcephalum* is K —.

ARTHONIACEAE

Arthonia polymorpha Ach.

See MÜLL. ARG. (1892).

Arthothelium erumpens Müll. Arg.

See MÜLL. ARG. (1892).

A. pycnocarpoides Müll. Arg.

Thallus whitish grey to dirty grey, farinose ; apothecia black, adnate to immersed but open, 0.2-1 mm in size, rounded to irregular, or elongated, asteroid ; margin indistinct ; disc \pm pruinose ; spores brown, muriform ; ovoid-oblong, transversely 8-9 septate, longitudinally 2-3-septate, 30-36 \times 12-15 μ m. Corticolous. No precise locality, Watt 6962 (Isolectotype CAL!)

A. nemorale (Stirt.) Zahlbr.

See STIRTON (1881); reported from Assam. First report from Manipur. Corticolous. Ukhrul, Tolloi, Singh 54654.

Cryptothecia candida (Krempelh.) Sant.

See AWASTHI AND AGARWAL (1969), reported from Darjeeling, West Bengal. First report from Manipur. Corticolous. Churachandpur, Koblong, Singh 55072 ; Korong, Kabrau hill, Singh 55056.

C. stirtonii Smith.

See AWASTHI AND AGARWAL (1969), reported from Darjeeling, West Bengal. First report from Manipur, Corticolous. Ukhrul, Nagaingu, Singh 54636.

C. subnidulans Stirt.

See AWASTHI AND AGARWAL (1969), reported from Darjeeling, West Bengal, and Nilgiri hills. First report from Manipur. Corticolous and saxicolous. Ukhrul, Sarai-khong, Litan, Singh 54783 ; Tongau, Singh 54874.

C. phlyctidiformis (Müll. Arg.) Awasthi & Singh

See AWASTHI AND SINGH (1973a).

GRAPHIDACEAE

Graphina fasciata (Eschw.) Müll. Arg.

See MÜLL. ARG. (1892).

G. obtecta (Nyl.) Müll. Arg.

See MÜLL. ARG. (1892).

G. oligospora (Müll. Arg.) Awasthi & Singh.

See AWASTHI AND SINGH (1973a).

G. petricosa (Krempell.) Zahlbr.

See PATWARDHAN AND NAGARKAR (1979).

G. platycarpa (Eschw.) Zahlbr. var. *parallela* (Müll. Arg.) Zahlbr.

Exciple black, open ; spores muriform, oblong, $40-50 \times 10-12 \mu\text{m}$. Corticolous.
No precise locality, Watt 6985. (Isolectotype CAL!).

G. semirigida Müll. Arg.

See MÜLL. ARG. (1892).

Graphis contortuplicata Müll. Arg.

See AWASTHI AND SINGH (1978).

G. duplicata Ach.

See MÜLL. ARG. (1892) Corticolous. No precise locality. Watt 6984.

G. duplicata var. *peruviana* (Fée) Zahlbr.

See MÜLL. ARG. (1892). Corticolous. No precise locality. Watt 6986.

G. longiramoa Müll. Arg.

See AWASTHI AND SINGH (1978).

G. rimulosa Trev. var. *parallela* Müll. Arg.

See MÜLL. ARG. (1892).

G. stritula. (Ach.) Spreng.

See MÜLL. ARG. (1892).

G. supertecta Müll. Arg.

See MÜLL. ARG. (1892).

G. verminosa Müll. Arg.

See AWASTHI AND SINGH (1978).

Phaeographina caesiopruinosa (Fée) Müll. Arg.

See AWASTHI AND SINGH (1973b).

P. chrysentera (Molt.) Müll. Arg.

See AWASTHI AND SINGH (1973b). Corticolous. Watt 6652.

P. pyrrochroa (Mont. et v. d. Bosch.) Zahlbr.

See AWASTHI AND SINGH (1973b).

P. wattiana Müll. Arg.

See AWASTHI AND SINGH (1973b).

Phaeographis exaltata (Mont. et v. d. Bosch.) Müll. Arg.

See SINGH AND AWASTHI (1981).

P. inusta (Ach.) Müll. Arg. var. *parallela* Müll. Arg.

See MÜLL. ARG. (1892).

P. manipurensis Müll. Arg.

See SINGH AND AWASTHI (1981).

Opegrapha subsulcata Müll. Arg.

See MÜLL. ARG. (1892).

CHIODECTONACEAE

Chiodecton flavicans Müll. Arg.

See MÜLL. ARG. (1892).

DIRINACEAE

Dirina byssiseda Müll. Arg.

It is a doubtful taxon and appears to be a fungal parasite. Asci and spores are not seen. Corticolous. No precise locality. Watt 6961 (Isolectotype CAL!)

LECANACTIDACEAE

Schismatomma cinerum (Müll. Arg.) Zahlbr.

Thallus whitish grey; pseudothecia blackish, immersed to slightly erumpent, rounded to irregular, up to 0.5 mm diam.; exipulum present laterally, not much distinct; spores colourless, fusiform with pointed ends, often curved, sickle shaped, transversely (6)-8-celled, $48-60(65) \times 3.5-6 \mu\text{m}$. Thallus K + Yellow-red, P+ yellow. Corticolous. No precise locality. Watt 6980 (Isolectotype CAL!)

S. gregantulum (Müll. Arg.) Zahlbr.

See MÜLL. ARG. (1892).

BYSSOLOMACEAE

Byssoloma rotuliforme (Müll. Arg.) Sant.

See AWASTHI AND SINGH (1972), reported from Palni Hills over leaves. First report from Manipur. Corticolous and Saxicolous. Tegnoupal, Moreh, Singh 550852, 550865, 550867, 550868; Ukhrul, Mapith hill range peak, Singh 54936.

THELOTREMACEAE

Leptotrema wightii (Tayl.) Müll. Arg.

See MOREAU AND FERNAUD (1952), reported from Palni Hills, South India, First report from Manipur. Corticolous. Tegnoupal, Moreh, Singh 550823.

DIPLOSCHISTACEAE

Diploschistes actinostomus (Pers.) Zahlbr.

See MÜLL. ARG. (1892). Very common. Saxicolous. Ukhrul, Litansaraikhong, Singh 54881; Gungbi, Singh 55083; Hundung, Singh 55188.

D. rampoddenis (Nyl.) Zahlbr.

See AWASTHI AND SINGH (1975), reported from Palni Hills. First report from Manipur. Saxicolous. Korong, Hiphi, near river, Singh 550176; Tegnoupal, Singh 550952.

EPHEBACEAE

Zahlbrucknerella indica Awasthi & Singh.

See AWASTHI AND S. R. SINGH (1979), reported from Mount Abu, Rajasthan. First report from Manipur. Saxicolous. Korong, Kalapahar, Singh 550115.

PYRENOPSISIDACEAE

Phylliscum sp.

Our specimen is sterile. But it is close to *P. testudineum* Henss, in habit appearance. Saxicolous. Tegnoupal, Moreh, Singh 550832.

LECIDEACEAE

Bacidia americana var. **lividonigricans** (Müll. Arg.) Awasthi.

Patellaria americana var. *lividonigricans* Müll. Arg.

See MÜLL. ARG. (1892).

B. alutacea (Krempelh.) Zahlbr.

See AWASTHI AND SINGH (1975), reported from Palni Hills. First report from Manipur. Corticolous. Korong, Kabrau, Singh 55007.

B. convexula (Müll. Arg.) Zahlbr.

See MÜLL. ARG. (1892). Corticolous. Ukhrul, Tollii, Singh 54704.

***B. cf. endoleuca** (Nyl.) Kieckx. Flore Cryptog. Fland. 1 : 261.1867.

Biatora luteola f. endoleuca Nyl., Bot. Notiser p. 98. 1853.

Thallus whitish grey, scurfy, apothecia black, 0.5-0.8 mm diam.; disc convex, epruinose; hypothecium and exciple K+ violet; spores transversely 3-6-septate, 25-45 × 3 μm. Corticolous. Ukhrul, Ngaigu, Singh 54636.

***B. cf. hakonensis** (Müll. Arg.) Zahlbr. Cat. Lich. Univ. 4 : 114. 1927.

Patellaria hakonensis Müll. Arg. Nuou. Giorn. Bot. Ital. 24 : 198. 1892.

Thallus whitish grey disappearing, cracked; apothecia black, up to 1.2 mm diam.; margin entire to irregular; hypothecium, brown; spores fusiform, transversely 3-5 septate 18-27 × 5-6 μm. Saxicolous. In our specimen spores are smaller. Ukhrul, Siroi Hill, Singh 54815.

***B. herrmanii** Zahlbr. Archiv für Hydrobiol. 12 "Tropische Binnengewasser" 4 : 736. 1934.

Thallus white, cracked; apothecia black, rounded to irregular, constricted below, 0.6-1.5 mm diam.; margin entire to irregular; disc flat to convex, epruinose; hymenium yellowish, 90-120 μm high; hypothecium brown blackish, 90-100 μm thick; exciple almost brown; spores fusiform, colourless, transversely 3-4-septate, 18-27 × 5-9 μm; paraphyses furcated above. Saxicolous. Korong, Hippi, near river, Singh 550170.

B. hunana Zahlbr.

See CHOPRA (1934), reported from Darjeeling, West Bengal, First report from Manipur. On hard soil, along the road side. Ukhrul, Singh 54679, 55013.

B. luteola (Schrad.) Mudd.

See MÜLL. ARG. (1892). Corticolous. Ukhrul, Makkuchapu, Singh 54924.

B. medialis (Tuck.) Zahlbr.

See NYLENDER (1867), reported from Calcutta, West Bengal. First report from Manipur. Corticolous. Ukhrul, Siroi Hill, Singh 54840.

B. philippina (Vain.) Zahlbr.

See SINGH (1980c).

B. rufescens (Müll. Arg.) Zahlbr.

See MÜLL. ARG. (1892). Corticolous. Ukhrul; Tollii, Singh 54687.

Catillaria endochroma (Fée) Zahlbr.

See SINGH (1973). Corticolous. Churachandpur, Singh 550674.

C. leptocheila (Tuck.) Ridd.

See SINGH (1980c).

C. leptocheiloides (Nyl.) Zahlbr.

See MÜLL. ARG. (1892). Corticolous. Churachandpur, Singh 550672 ; Ukhrul, Lungshongkhong, Singh 55113, 550518 ; Siroi Hill, Singh 55518.

***C. vernalis** (Fée) Zahlbr. Cat. Lich. Univ., 4 : 84. 1927.

Lecidea vernalis Fée, Éssai Cryptog. Ecorc Officin p. 110. 1824.

Thallus ashy grey, thin ; apothecia brown, rounded, 0.2-0.3 mm wide ; epithecium, yellowish green, hymenium and hypothecium colourless ; spores transversely 2-celled, ellipsoid, $6-8 \times 3-4 \mu\text{m}$. Corticolous. Ukhrul, Mapith Hill range peak, Singh 54946.

***C. yezoensis** Zahlbr. Bot. Magaz. Tokyo 41 : 332. 1927.

Thallus pale brownish, granular, cracked ; apothecia black, up to 1.5 mm diam. ; margin thin, entire ; disc plane to concave, epithecium black ; hypothecium brown, K+ violet ; spores transversely 2-celled, $12-18 \times 6-8 \mu\text{m}$. Thallus K+ yellow-orange, P+ yellow. Corticolous. Ukhrul, Lungshongkhong, Singh 550430.

Huelia albocoerulescens (Wulf.) Hert. var. **polycarpiza** (Vain.) Hert.

See HERTEL (1977). Reported from Manipur as *Lecidea albocoerulescens* (Wulf.) Ach. (Müll. Arg. 1892). Saxicolous. Korong, Mao, Singh 550320, 550329, 550369, 550375 ; Tegnoupal, Singh 550965.

H. granifera (Ach.) Singh comb. nov.

Basionym—*Lecanora granifera* Ach. Synops. Lich. 2 : 424. 1901.

The species is characterised by the granular to subverrucose thallus, medulla K+ orange-red, dark-brown to black apothecium with entire to crenate margin, dark-brown to black hypothecium and simple ellipsoid spores. Corticolous. Imphal, Avankhul, Singh 550996 ; Korong, Kabrau, Singh 55061 ; Mao, Singh 550404 ; Ukhrul, Sarai-khong, Litan, Singh 54734 ; Siroi, Singh 550498.

Ledidea manipurensis (Müll. Arg.) Zahlbr.

See MÜLL. ARG. (1892).

L. parasema Ach.

See BELANGER (1838), reported from Peninsular India. First report from Manipur. Corticolous. Ukhrul, Mapith Hill range, Singh 54957.

L. parasema var. **mulleri** Zahlbr.

See MÜLL. ARG (1892) reported as *L. parasema* var. *microcarpa* Müll. Arg.

L. permutabilis Müll. Arg.

Thallus whitish grey, uneven to cracked ; K+ yellow-reddish, P+ faint yellow ; apothecia brown to blackish, 0.4-0.8 mm diam. ; disc flat to convex, epruinose ; hypothecium and exciple colourless ; spores ellipsoid, $8-12 \times 4-6 \mu\text{m}$. Corticolous. No precise locality, Watt 6975 (Isolectotype CAL !), poor specimen.

L. russula var. **leprosa** Hue

See MÜLL. ARG. (1892). Corticolous, Ukhrul, Litan, Singh 54730 ; Tongau, Singh 54871.

Lopadium vulpinum (Tuck.) Zahlbr.

See MÜLL. ARG. (1892), Corticolous. Korong, Kabrau, Singh 55036 ; Tegnoupal, Singh 550760 ; Ukhrul, Sarai-khong, Litan, Singh 54787.

PHYLLOPSORACEAE

Phyllopsora parvifolia (Pers.) Müll. Arg.

See MÜLL. ARG. (1892), reported as *Psora parvifolia* (Pers.) Müll. Arg. Corticolous Korong, Kongpokpi, Singh 550200, 550224; Ukhrul, Tollii, Singh 54683.

P. parvifolia var. **subgranulosa** (Tuck.) Müll. Arg.

See MÜLL. ARG. (1892)

ACAROSPORACEAE

Acarospora indica (Müll. Arg.) Hue

See MÜLL. ARG. (1892) reported as *Placodium indicum* Müll. Arg.

Maronea manipurensis Magn.

See SINGH (1980b)

M. melanocarpa (Müll. Arg.) Zahlbr.

See SINGH (1980b).

PERTUSARIACEAE

Pertusaria fulvescens (Müll. Arg.) Vain.

See MÜLL. ARG. (1892.), reported as *P. wattiana* f. *fulvescens* Müll. Arg.

P. hakkodensis Yasuda

See SINGH (1980c).

P. leioplaca var. **octospora** Nyl.

See MÜLL. ARG. (1892.) Corticolous. Ukhrul, Carnations Avenue, Singh 55140.

P. leioplaca v. **turgida** Müll. Arg.

See MÜLL. ARG. (1892).

P. melaleuca (Turn et Borr.) Duby

See MÜLL. ARG. (1892).

P. melaleuca var. **tetramera** Müll. Arg.

See MÜLL. ARG. (1892).

P. multipuncta (Turn.) Nyl.

See Müll. Arg. (1892), no precise locality, Watt 6970.

***P. obsolescens** Nyl. Lich. Japan, p. 54. 1890.

Thallus yellowish grey, chinky, verrucae scattered, base spreading, up to 1 mm diam.; apex \pm convex; ostiole dark brown, many; asci 4-8 spored; spores simple, oblong, ellipsoid, $45-60 \times 18-30 \mu\text{m}$; thallus K+yellow, C—, KC+yellow-orange, P—. Corticolous. Churachandpur, Kolbung, Singh 550720. This species is close to *P. alpina* which has black ostioles.

P. pertusella Müll. Arg.

See MÜLL. ARG. (1892).

P. rigida Müll. Arg.

See MÜLL. ARG. (1892). Corticolous, Ukhrul, Siroi 54842; Samsai Singh 550853.

P. velata (Turn) Nyl.

See MÜLL. ARG. (1892).

P. velata var. **microcephala** (Fée) Zahlbr.

See MÜLL. ARG. (1892). reported as *P. velata* var. *variolosa* Müll. Arg.

Pertusaria wattiana Müll. Arg.

See MÜLL. ARG. (1892) Corticolous. Tegnoupal, Singh 550922.

P. wattiana f. **fulvescens** Müll. Arg.

See MÜLL. ARG. (1892).

LECANORACEAE

Haematomma puniceum (Sw.) Mass.

See MÜLL. ARG. (1892) Corticolous. Ukhrul, Lungshongkhong, Singh 550469; Ngaingu, Singh 54626; Siroi, Singh 550501.

Lecania erysibe (Ach.) Mudd.

See SINGH (1980c).

L. expallecens (Nyl.) Smith

See SINGH (1980c).

L. umbraticula (Nyl.) Smith

See SINGH (1980c).

Lecanora allophana (Ach.) Rohl.

See AWASTHI & SINGH (1975), reported from Palni Hills. First report from Manipur. Corticolous, Ukhrul, Singh 55096, 55102.

L. allophana var. **glabrata** (Ach.) Stein.

See MÜLL. ARG. (1892) reported as *L. subfusca* var. *glabrata* Ach.

L. atra var. **americana** Fée.

See MÜLL. ARG. (1892).

L. cenisia Ach.

See MÜLL. ARG. (1892). Saxicolous. Tegnoupal, Moreh, Singh 550829; Ukhrul, Siroi Hill, Singh 54816.

L. chlarona (Ach.) Nyl.

See MÜLL. ARG. (1892) reported as *Lecanora subfusca* v. *chlarona* Ach. Corticolous. Churachandpur, Singh (550717); Korong-Toribari, Singh 550039.

L. chlarotera Nyl.

See JATTA (1905), reported from Darjeeling. First report from Manipur. Corticolous. Korong, Toribari, Singh 550037; Tegnoupal, Moreh, Singh 550705; Ukhrul, Singh 553287; Siroi, Singh 54808.

L. coilocarpa (Ach.) Nyl.

See MÜLL. ARG. (1892), reported as *L. subfusca* var. *coilocarpa* Ach. Corticolous. Ukhrul. Tongau, Singh 54649.

L. crenulata (Dicks.) Hook.

See AWASTHI & SINGH (1975), reported from Palni Hills. First record for Manipur. Saxicolous. Korong, Hhiphi, Singh, 550249; Siroi, Singh 54822.

L. distans (Pers.) Nyl.

See MÜLL. ARG. (1892). reported as *L. subfusca* var. *distans* Ach.

L. emergens Müll. Arg.

See MÜLL. ARG. (1892). Corticolous. Tegnoupal. Moreh, Singh 550799.

***L. gangalizodes** Nyl. Bull. Linn. Soc. London Bot. 20:52. 1883.

Thallus whitish grey, cracked areolate, K + yellow; apothecia immersed, brownish black 0.5-0.6 mm diam.; margin indistinct; spores 12-15 × 6-8 μ m. Saxicolous. It resembles *L. gangaliza* Nyl. in nature of thallus, but apothecia are blackish-brown in the latter species. Ukhrul, Litan, Sakkibung, near riverside, Singh (54884, 54888) Malacca, Puloundaus, A.C. Maingay, no number, (Isolectotype CAL!).

L. leprosa Fée.

See MÜLL. ARG. (1892), reported as *L. subfusca* var. *carneo-cinereocarnea* Eschew. Corticolous. Korong, Kabraulakha, Singh 55091; Watt 6969.

L. pallida (Ach.) Rabenh.

See MOREAU AND FERNAUD (1952), reported from Palni Hills. First report from Manipur. Corticolous. Ukhrul, Tongau (54875).

L. sambuci (Pers.) Nyl.

See QURAIHI (1928), reported from Mussoorie. First report from Manipur. Corticolous. Ukhrul, Singh 55145.

L. subfusca (L) Ach.

See SMITH (1931) reported from Darjeeling. First report from Manipur. Corticolous. Tegnoupal, Singh 550909, 550911.

L. subfusca var. **argentata** (Ach.) Ach.

See MÜLL. ARG. (1892).

L. subfusca var. **lainea** (Fr.) Körb.

See MÜLL. ARG. (1892).

L. varia (Ehrh.) Ach.

See BABINGTON (1852), reported from Kumaon as *Parmelia varia* (Ach.) Bab. First report from Manipur. Corticolous. Ukhrul, Carnations Avenue, Singh 55135.

Ochrolechia pallescens (L.) Mass.

See MÜLL. ARG. (1892).

O. subpallescens Vers.

See AWASTHI AND SINGH (1971) reported from Tamil Nadu. First report from Manipur. Corticolous. Tegnoupal, Moreh, Singh 550798.

CALOPLACACEAE

Bombyliospora cocodes (Bel.) Mass.

See HUE (1892), reported from Peninsular India. First report from Manipur. Corticolous. Ukhrul, Nigaingu, Singh 54638.

B. leprolyta (Nyl.) Zahlbr

See MÜLL. ARG. (1892) Corticolous. Korong, Hiphi, Singh 550113, 550128.

B. tuberculosa (Fée) Mass.

See JATTA (1911) and MOREAU AND FERNAUD (1952), reported from Malabar and Palni Hills. First report from Manipur. Corticolous. Ukhrul, Hundung, Singh 55297.

***Blastenia handelii** Zahlbr. Symbol. Sinic. pars 3, p. 209, 1930.

Thallus crustaceous, epilithic, whitish grey to yellowish, cracked, K + yellowish; apothecia adpressed, rounded, 0.3-0.6 mm diam.; constricted, carneous brown; thalline margin without algal cells; epithecium K + violet; spores colourless, polar-bilocular, rounded to oblong, isthmus indistinct, $9-12(15) \times 6-8 \mu\text{m}$. Saxicolous. Tegnoupal, Moreh, Singh 550835

Caloplaca aurantiaca (Leight.) Th. Fr.

See NYLENDER (1867), reported from Calcutta. First report from Manipur. Corticolous. Churachandpur, Singh 550755; Ukhrul, Sakkibung, Singh 54936.

***C. caesiorufa** (Wibel) Flag. Rev. Mycolog. 17:104. 1895.

Lichen caesiorufus Ach. Lichenogr, Succ. Prodr. p. 45.1798.

Thallus grey, cracked, areolate; K —; apothecia numerous, aggregated, 0.5-0.6 mm diam.; orange dark brown, pruinose; epithecium K + violet; spores $12-16 \times 7-10 \mu\text{m}$. Silicicolous. Ukhrul, Samsai, Singh 550615.

C. cerina (Ehrh ex Hedw.) Th. Fr.

See POELT (1961), reported from N. W. Karakorum. First report from Manipur. Silicicolous. Korong, Hippi, near river, Singh 550184; Mao, Singh 550380.

***C. viridirufa** (Ach.) Zahlbr. Cat. Lich. Univ 7 : 198, 1931.

Lecidea viridirufa Ach., Lichenogr. Univers. p. 204, 1810.

Thallus blackish, thin, cracked, areolate, K + faint purple; hypothallus prominent; apothecia adnate, upto 1 mm diam.; reddish brown, margin entire; spores, $12-18 (21) \times 6-8 \mu\text{m}$. Silicicolous. Korong, Mao. Singh 550327.

C. vitellinula (Nyl.) Liv.

See AWASTHI AND SINGH (1975), reported from Tamil Nadu. First report from Manipur. Saxicolous. Ukhrul, Lungshongkhong, Singh 54818, 550496.

BUELLIACEAE

Buellia aethalea (Ach) Th. Fr.

See AWASTHI (1963), reported from N. W. Himalayas. First report from Manipur. Saxicolous, Korong, Mao, Singh 550370; Ukhrul, Samsai, Singh 550616.

B. alboatra (Hoffm.)

See SINGH (1980c).

B. ceylanensis Zahlbr.

See AWASTHI AND SINGH (1971), reported from Tamil Nadu. First report from Manipur. Saxicolous. Korong, Mao, Singh 550368.

B. chlorophaea (Hepp ex Leight) Lett.

See SINGH AND SINGH (in Press), Saxicolous, Korong, Mao, Singh 550271.

B. conspirans (Nyl.) Vain.

See SINGH AND SINGH (in Press) Saxicolous. Tegnoupal, Moreh, Singh 550330, 550333, 550836, 550834.

B. curtisii (Tuck.) Imsh. in Brodo

See S. SINGH & AWASTHI (1981). Corticolous. Churachandpur, Kolbung, Singh 550712, Ukhrul, Carnations Avenue, Singh 55149.

B. diorista (Nyl.) Zahlbr.

See S. SINGH & AWASTHI (1981). Corticolous. Churachandpur, Singh 550673.

B. disciformis (Fr.) Midd.

See MÜLL. ARG. (1892).

B. glaucotheca (Fr.) Malme

See S. SINGH & AWASTHI (1981). Corticolous. Ukhrul, Mapith Hill range peak, Singh 54943.

B. inornata (Stirt.) Zahlbr.

See STIRTON (1881), reported from Assam. First report from Manipur. Corticolous. Tegnoupal, Singh 550914.

B. lauri-cassiae (Fée.) Müll. Arg.

See STIRTON (1876), reported from Calcutta as *Lecidea triphragmia* Nyl. First report from Manipur. Corticolous. Churachandpur, Singhat, Singh 550676, 550601, 550679.

B. meghalayaensis Awasthi & Singh.

See S. SINGH & AWASTHI (1981). Saxicolous, Ukhrul, Siroi, Singh 550753.

B. montana Magn.

See MAGNUSSON (1954), reported from Nainital. First report from Manipur. Corticolous. Korong, Toribari, Singh 550035.

B. palniensis Awasthi & Singh.

See S. SINGH & AWASTHI (1981) Saxicolous, Ukhrul, Siroi, Singh 550576.

B. placodiomorpha Vain.

See S. SINGH & AWASTHI (1981). Corticolous. Korong, Toribari, Singh 550047, 550921.

B. posthabita (Nyl.) Zahlbr.

See S. SINGH & AWASTHI (1981), Saxicolous. Ukhrul, Sakkibung, Litan, Singh 54879.

B. proximata Magn.

See S. SINGH & AWASTHI (1981), Corticolous. Korong, Kongpokpi Mission Hospital, Singh 550038, 550208.

B. punctata (Hoffm.) Mass.

See S. SINGH & AWASTHI (1981). Corticolous. Tegnoupal, Singh 550905.

B. stellulata (Tayl.) Mudd.

See MÜLL. ARG. (1892).

B. subdisciformis (Leight) Vain.

See S. SINGH & AWASTHI (1981).

Rinodina exigua (Ach.) Gray.

See MÜLL. ARG. (1892).

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