

## LICHENS FROM NORTHERN INDIA

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THE lichens enumerated were sent to me by Professor Chaudhuri, Lahore University. Most of them were collected by his student, G. L. Chopra in various districts of Northern India. They have been listed according to the arrangement and nomenclature adopted by A. Zahlbruckner in his *Catalogus universalis* in which full references will be found. Unusual value is given to the collection by the careful notes as to locality and habitat. It has been impossible, unfortunately, to identify all specimens. In some the material was too scanty, in others there was imperfect or no fructification.

## PYRENOCARPEAE

## DERMATOCARPAGEAE

- Dermatocarpon Moulinsii* A. Zahlbr. Col. A. C. Joshi, July 1929. On exposed stones, Kausernag, Kashmir, 12,000 ft. 34.—Col. H. Chaudhuri, June 1922. On exposed stones, Verinag, Kashmir, 7000 ft. 35 and 36.
- D. minutum* var. *complicatum* Th. Fr. Col. Rev. E. Blatter, March 1927. On soil, Wasirastan, 2650 ft. Colour grey-black. ? no fructification. 50.
- D. rufescens* Th. Fr. Col. Rev. E. Blatter, March 1927. On calcareous soil, Wasirastan, 4250 ft. No fructification. 44.—Not determinable, probably the same as 44. On soil, Wasirastan, 2650 ft. 48.
- Endocarpon pusillum* Hedw. Col. G. L. Chopra, 1927. On walls, Gujranwala, Panjab. 119.

## PYRENULACEAE

- Anthracothecium variolosum* Müll.-Arg. Col. G. L. Chopra, July 1930. On bark, Darjeeling and its suburbs, 6500 ft. 75.

## GYMNOCARPEAE

## CYPHELIACEAE

- Tylophoron moderatum* Nyl. Col. G. L. Chopra, 1930. On bark, Sikkim, on the banks of the river Timi, 800 ft. 100.

## GRAPHIDIACEAE

- Graphis scripta* Ach. Col. G. L. Chopra, July 1930. On bark, Darjeeling, 6500 ft. 83, 93.
- Graphina Acharii* Müll.-Arg. Col. G. L. Chopra, July 1929 and 1930. On bark, Darjeeling and suburbs, 6000–7000 ft. 43, 96.—Col. G. L. Chopra, July 1930. On bark, Martam, Gantok Road, Sikkim. 84.
- Phaeographina exserta* Müll.-Arg. Col. G. L. Chopra, July 1930. On bark, Darjeeling, 6500 ft. 99.

## CHIODECTONACEAE

- Chiodecton Philippinum* Vain. (?) Col. G. L. Chopra, July 1930. On bark, Calcutta (New Lake). 63.—On bark, Calcutta. 94.

Both specimens resembling *Chiodecton sanguineum*; they are faintly tinged rose-red at the edge.

*Lichens from Northern India. A. Lorrain Smith* 129

PYRENOPSIDACEAE

*Thyrea pulvinata* Massal. Col. Rev. E. Blatter, March 1927. On rocks, Wasirastan, 3000 ft. 46.

COLLEMACEAE

*Collema* sp. Col. Rev. E. Blatter, March 1927. On rock, Wasirastan, 2650 ft. Colour black. 51.

*Leptogium trichophorum* Müll.-Arg. Col. G. L. Chopra, July 1930. On rocks in moist situations, Tiger Hill, 7852 ft. 65.

*L. Menziesii* Mont. Col. H. Chaudhuri, June 1923. On bark near streams, Verinag, Kashmir, 7000 ft. 2.—Col. G. L. Chopra, July 1930. On rocks in moist situations, Tiger Hill, Darjeeling, 7852 ft. 66.—On moist stones, Maha Nadi, 4120 ft. 89.

— f. *fuliginosum* Müll.-Arg. Col. G. L. Chopra, July 1930. On moist stones, Maha Nadi, 4120 ft. 90.

*L. palmatum* Mont. Col. G. L. Chopra, July 1930. On moist stones, Maha Nadi, 4120 ft. 87.

*L. Moluccanum* Vain. (?) Col. G. L. Chopra, July 1930. No fructification, rather doubtful. On moist stones, Maha Nadi, 4120 ft. 88.

*L. caesium* Vain. Col. G. L. Chopra, July 1930. On bark, Darjeeling, 6500 ft. 92.

PANNARIACEAE

*Coccocarpia pellita* Müll.-Arg. Col. G. L. Chopra, July 1930. On rocks in moist situations and on trees, Maha Nadi, 4120 ft. 64.

STICTACEAE

*Lobaria pulmonaria* Hoffm. Col. G. L. Chopra, July 1929. On mortar, on stones in water, Darjeeling, 6000–7000 ft. 3.—On trunks of trees, Darjeeling (Tiger Hill), 7852 ft. 4.

*Lobaria* sp. Not determinable. *K* + yellow then rubescens, no spores. 9.

PELTIGERACEAE

*Solorina crocea* Ach. Col. G. L. Chopra, July 1928. On soil, Dalhousie, Chamba Road, 7000 ft. 8.

*Nephroma* sp. Col. H. Chaudhuri, July 1922. On bark, Verinag, Kashmir, 7000 ft. Too little material for accurate determination. The specimen resembles most nearly *N. expallidum* Nyl. but differs in several particulars: the hymenium is up to 100  $\mu$  high, the spores vary from 22–27  $\mu \times$  7–8  $\mu$ .

*Peltigera venosa* Hoffm. Col. G. L. Chopra, July 1928. On ground among mosses, Dalhousie, Chamba Road, 7000 ft. 5.

LECIDEACEAE

*Lecidea (Psora) decipiens* Ach. Col. Rev. E. Blatter, March 1927. On soil, Wasirastan, 4250 ft. 45.

*Bacidia (Weitenwebera) hunana* A. Zahlbr. *Sym. Sinicae*, III (1930), 113, var. *rugosa* A. L. Sm.

Thallus minute rugulosus. Apothecia saepe conferta, usque ad 1.5 mm. lata; sporae nonnunquam longiores, ca. 27–40  $\mu$ .

On soil, Darjeeling, 6500 ft. Col. G. L. Chopra. 40.

*B. luteola* Mudd. Col. G. L. Chopra, July 1930. On bark, Darjeeling, 6500 ft. 97.

CLADONIAACEAE

*Baeomyces roseus* Pers. Col. G. L. Chopra. On mossy ground in moist shady places, Darjeeling (Tiger Hill), 6500 ft. 39.

*Cladonia pyxidata* Hoffm. Col. A. C. Joshi, June 1929. On mossy ground in shady places, Kausernag, Kashmir, 12,000 ft. 38.

- C. furcata* var. *pinnata* Vain. Col. G. L. Chopra, July 1929. Moist conditions on ground, Darjeeling, 6500 ft. 37.—Col. G. L. Chopra, July 1930. Shady soil, Darjeeling (Tiger Hill), 7852 ft. 54 and 76.
- C. squamosa* var. *muricella* Vain. Col. G. L. Chopra, July 1930. On soil, Darjeeling (Tiger Hill), 7852 ft. 56.
- C. pityrea* Fr. Col. G. L. Chopra, July 1930. On soil, Sikkim, 4000 ft. 60.—On soil, Darjeeling (Tiger Hill). 61.
- Stereocaulon ramulosum* Ach. Col. G. L. Chopra. On exposed stones, Darjeeling and Sikkim, 400 and 7000 ft. 41.
- S. quisquillare* Hoffm. Col. G. L. Chopra, July 1929. On bark, Darjeeling, 6500 ft. 42.

## GYROPHORACEAE

- Gyrophora cylindrica* Ach. Col. G. L. Chopra, July 1929. On exposed stones, Darjeeling (Tiger Hill), 7852 ft. 33.

## PERTUSARIACEAE

- Pertusaria multipuncta* Nyl. Col. G. L. Chopra, July 1930. On bark, Darjeeling, 6500 ft. 67 and 98.

## LECANORACEAE

- Lecanora subfusca* Ach. Col. G. L. Chopra, July 1930. On bark, Darjeeling, 6500 ft. 106.
- L. subfusca* var. *chlarona* Ach. Col. G. L. Chopra, July 1930. On bark of *Excrea aglauca*, Calcutta (salt marshes). 109.
- L. rugosa* Nyl. Col. G. L. Chopra, July 1930. On bark, Darjeeling, 6500 ft. 86.
- L. carnulenta* Nyl. Col. G. L. Chopra, July 1930. On stones, Darjeeling, 6500 ft. 104.
- L. coilocarpa* Nyl. Col. G. L. Chopra, July 1930. On bark, Darjeeling, 6500 ft. 105.
- L. (Placodium) chrysoleuca* Ach. Col. G. L. Chopra, July 1929. On rocks, Kashmir, Kausernag, 12,000 ft. 18.
- Lecanora* sp. Col. G. L. Chopra, July 1929. On bark, Darjeeling, 6000–7000 ft. 30.
- Haematomma puniceum* Vain. Col. G. L. Chopra, July 1929. On bark, Darjeeling, 6000 to 7000 ft. 31.—Col. G. L. Chopra, July 1930. On bark of *Araucaria*, Darjeeling, 6500 ft. 107.

## PARMELIACEAE

- Parmelia Camtschadalis* Eschw. Col. G. L. Chopra, July 1929. On bark, Darjeeling, 6000–7000 ft. (also on rocks). 19.
- P. cetrarioides* Del. Col. G. L. Chopra, July 1930. On trunks of trees, Darjeeling (Tiger Hill), 7852 ft. 55.
- P. cristifera* Tayl. (?) no soredia. Col. G. L. Chopra, July 1929. On rocks near water, Darjeeling (Kurseong spring), 7000 ft. 14.
- P. latissima* Fee (?). Col. G. L. Chopra, Darjeeling, Kurseong spring, 7000 ft. 11.  
—And f. *isidiosa* Müll.-Arg.  
— var. *sorediata* Hue. Darjeeling, Kurseong spring, 7000 ft. 12.  
The determination of these three specimens is doubtful as there are no fructifications; the colour is peculiar and also the habitat “on rocks.” All the specimens give a very distinct reaction. Medulla KOH ± red, a characteristic of *P. latissima*.
- var. *marmoriza* Nyl. Col. G. L. Chopra. On rocks, Darjeeling (Kurseong spring), 7000 ft. A very distorted form. 13.
- P. Nilgherriensis* Nyl. Col. G. L. Chopra. On rocks, Kurseong spring (or suburbs). Darjeeling, 7000 ft. 15, 17 and 79.—On rocks, Gangtok, Sikkim, 5500 ft. 73.
- P. tinctorum* Despr. Col. G. L. Chopra, July 1930. On trees, Sikkim, 5000 ft. 57.
- Parmelia* sp. Col. G. L. Chopra, July 1930. On trees, Gangtok, Sikkim, 5500 ft. 70.  
This specimen is deep red in colour somewhat resembling *P. acetabulum* or *P. tabacina* to which it is also very similar, but, whereas *P. tabacina* has a colourless medulla the plant from Gangtok has a brown “tabacine” medulla. The

spores measure ca.  $25 \times 10 \mu$  and are too large for *P. acetabulum*. As in other specimens it is impossible to decide if the colour is normal. There is a red reaction with KOH, and the medulla yellow then red.

*Parmelia* sp. Col. G. L. Chopra, July 1930. On rocks, Sikkim, 3500 ft. 72.

*Parmelia* sp. Col. G. L. Chopra, July 1930. On trees, Timi, Sikkim, 4370 ft. 74.  
The latter possibly new. No reactions with K or CaCl. Spores ca.  $16-20 \times 10 \mu$ .

*P. conspersa* Ach. Col. A. C. Joshi, July 1929. On rocks, Kashmir, Kausernag, 12,000 ft. 16. The determination of this specimen is also somewhat uncertain: the material is too scanty.

*P. homogenes* Nyl. var. *vestita* A. Zahlbr. *Symb. Sin.* III (1930), III, 183. Col. G. L. Chopra, July 1930. On rocks, Sikkim, 5000 ft. 58. The medulla is tinged pale yellow. In parts the thallus is densely isidiose. No fructification.

*Anzia physioidea* A. L. Sm.

Thallus cinereo-glaucescens, decumbens, lineari-laciniatus; laciniae elongatae, usque ad 5 cm. longae, ca. 2 mm. latae, sparse et divaricati-ramosae, ad apices crenatae, ad marginem leniter incurvae; subtus albus, nudus vel pulvinulis spongioso-pannosis, fusco-atris sparse tectus; rhizinae sparsae vel crebrae, ad 5 mm. longae, ca.  $135 \mu$  latae ex hyphis valde tenuibus conglomeratis formatae, ca.  $5.5 \mu$  crassae omnino dense spongioso-pannosae. Apothecia non visa. Ad cortices supra muscineas emortuas.

Darjeeling, Tiger Hill, 7852 ft. 53. Col. G. L. Chopra, July 1930.

This species more or less resembling *Parmelia physodes* in colour and form is distinguished by the long rhizinae completely clothed by the spongy hyphal network characteristic of the genus, the whole about 0.5 mm. thick. It creeps loosely over straggling dead mosses and hepatics and the long rootlets serve as very efficient organs of attachment and possibly as water-holders. In the absence of fructification, the species has been placed under the older genus *Anzia* rather than under *Pannoparmelia*, the number of spores in the ascus being the distinction between the two.

#### USNEACEAE

*Ramalina farinacea* Ach. Col. G. L. Chopra, July 1929. On bark, Darjeeling, 6000-7000 ft. 20.

*Usnea florida* Wigg. Col. G. L. Chopra, July 1929. On bark, Darjeeling (Tiger Hill), 7852 ft. 21.

*U. comosa* Vain. Col. A. C. Joshi. On trees, Kashmir. 23.

*Usnea* sp. Col. G. L. Chopra, July 1929. On trees, Darjeeling (Tiger Hill), 7852 ft. 22.

*Siphula ceratites* Fr. Col. G. L. Chopra, July 1930. On soil, Timi, Gangtok, 533 ft. to 5500 ft. 116. Primary thallus a green crust on the soil.

#### BUELLIACEAE

*Rinodina sophodes* Th. Fr. Col. G. L. Chopra, July 1930. On bark of *Excrea aglauca*, Salt marshes, Calcutta. 101.

*Pyxine coccifera* Nyl. Col. G. L. Chopra, July 1930. On *Ficus elastica*, Parabatipur, D. H. Rly. 108.

*P. retirugella* Nyl. var. *subtestacea* A. L. Sm.

Thallus laciniatus, levis, subtestaceus, plagas adpressas formans, KOH—vel leviter flavescens, laciniae ca. 1.5 mm. latae elongatae subradiantes, inter se arcte adherentes, in centro breviores et subimbricatae, ca. 200 altae; thallus subtus nigricans, ad ambitum albo-testaceus, rhizinis nigris, minutis, sparse obsitus; medulla alba vel subtestacea KOH—rubescens. Apothecia sat crebra dispersa, adpressa, lecideina, brunneo-nigra, usque ad 1.5 mm. lata, hymenium superne nigro-fuscum, KOH tarde purpurascens; sporae  $21-27 \times 9-11 \mu$ .

On exposed rocks, Darjeeling, 6500 ft. 68. Col. G. L. Chopra, July 1930.

Differs from the species in the non-rugulose thallus, and the testaceous colouring (which may, however, be accidental) in the red reaction of the subgonidial layer with KOH and in the somewhat larger spores.

*P. retirugella* Nyl. var. *macrotheca* A. L. Sm.

Thallus KOH—, medulla + rubescens. Apothecia usque ad 3 mm. lata, acetate frequenter rotundo-lobata; epithecium tarde K purpurascens; sporae ca.  $22-24 \times 9 \mu$ . The thallus of this variety is similar to that of the species; the apothecia are larger and lobate and the spores larger. In both varieties the red reaction of the medulla with KOH is immediate, the cortex is scarcely tinged yellow. The slight purple reaction of the epithecium appears only after many hours.

Sikkim, 4000 ft. Col. G. L. Chopra, July 1930. 69.

My first intention was to describe these two varieties as new species and investigation of more specimens may prove them to be distinct though in most characters they resembled *Pyxine retirugella*.

PHYSICIACEAE

- Anaptychia leucomelaena* Massal. Col. G. L. Chopra, July 1929. On mosses and mountains, Darjeeling, 6000–7000 ft. 24.
- A. hypoleuca* Vain. Darjeeling, 6000–7000 ft. 29, 32.—Col. G. L. Chopra, July 1930. 110, 111.—On rocks, Gangtok (Sikkim), 5500 ft. 112.
- A. hypoleuca* var. *sorediifera* Vain. Col. G. L. Chopra, July 1929. On rocks, Darjeeling, 6000–7000 ft. 25, 27.—Col. G. L. Chopra, July 1930. On rocks, Sikkim, 4000 ft. 71. The specimens have well-marked soredia. The two former are here and there tinged with reddish brown; the latter (71) is a very striking specimen, it is densely sorediate in the centre tinged with a rubescent colouring, and the outer rim of the grey lacinae yellowish-red to a depth of about 2 mm. It would be interesting to know the cause of the colouring. There is a slight indication of similar colouring in some herbarium specimens in the British Museum, but nothing so well marked.
- A. podocarpha* Trev. Col. G. L. Chopra, July 1930. On rocks, Gangtok, Sikkim, 5500 ft. 113.
- A. Corallophora* Vain. Col. G. L. Chopra, July 1930. On rocks, Sikkim, 4000 ft. 52.
- A. speciosa* Vain. Col. G. L. Chopra, July 1929. On rocks, Darjeeling, 6000–7000 ft. 26, 28.—Col. G. L. Chopra, July 1930. On rocks, Darjeeling, 6500 ft. 110.
- Physcia hispida* Frege. Col. G. L. Chopra, July 1930. On rocks, Gangtok, Sikkim, 5500 ft. 115.
- P. hispida* Frege (with *Anaptychia hypoleuca*). Col. G. L. Chopra, July 1930. On rocks, Timi Road, Gangtok. 114.
- P. setosa* Nyl. Col. G. L. Chopra, July 1929. On trees, Darjeeling (Kurseong spring), 7000 ft. 10.—Col. G. L. Chopra, July 1930. On trees, Tiger Hill, Darjeeling, 7852 ft. 77.—Col. G. L. Chopra, July 1930. On rocks or trees, Sikkim, 3000–5000 ft. 59, 78.