

LICHEN FLORA OF PINDARI GLACIER VALLEY, INDIA

DHARANI DHAR AWASTHI

Department of Botany, Lucknow University, Lucknow

ABSTRACT

The paper enumerates 122 species of lichens collected en route from Kapkote (altitude ca. 750 m). to the lateral left moraine of Pindari Glacier (altitude ca. 3750 m). Several taxa—*Peccania synaliza*, *Collema crispum*, *Lempholemna fasciculare*, *Leptogium hirsutum*, *Peltigera aphthosa* v. *variolosa*, *P. erumpens*, *P. praeextata*, *Lecidea lurida*, *Placopsis gelida*, *Parmelia pulla*, *Cetraria hepaticum* and *C. laureri* are being reported for the first time from India.

INTRODUCTION

Pindari Glacier situated at about 80° 2.0" E longitude and 30° 15.30" N latitude in the district of Almora, Uttar Pradesh has been visited for over a century by botanists, mountaineers and general tourists on account of its proximity, easy accessibility and scenic beauty. The glacier is fed by snow and avalanches flowing down from Nandadevi (alt. 7817 m) and Nandakot (6861 m) peaks of the Himalayas. The river Pindar originates from the mouth (alt. ca. 3600 m) of the glacier and it is met downstream at Dwali, at a distance of about six miles, by the rivulet originating from the Kaphini glacier. The river then flows westwards, ultimately meets Alaknanda river.

The route to Pindari Glacier is punctuated by comfortable rest houses at suitable distances from the bus terminus at Kapkote: Kapkote (alt. ca. 750 m) to Loharkhet (alt. ca. 1620 m) 14 km. Loharkhet to Dhakuri (alt. ca. 2600 m) 10 km. Dhakuri to Khati (1800 m alt.) 10 km. Khati to Dwali (alt. ca. 2400 m) 13 km. Dwali to Phurkia (alt. ca. 3210 m) 7 km. The glacier is at about 7 km. further on from Phurkia, and is best viewed by an early morning trip to the "zero milestone" situated on the ridge (alt. ca. 3750 m) of the left lateral moraine of the glacier. Below the left moraine and towards Phurkia is a trough like area with a rock cave and plain ground with a stream running past, and this area called Mirtoli has been the camping ground for the mountaineers going higher up in the Himalayas.

The general vegetation, beyond Loharkhet, typically comprises the temperate plants, the arboreal elements of which consist of *Quercus*, *Pieris*, *Rhododendron*, *Cedrus*, and interspersed by shrubby genera such as *Rosa*, *Crataegus*, *Berberis*, *Vaccinium* etc. At almost the same altitudes between Khati and Dwali, the additional arboreal members belong to *Juglans*, *Aesculus* and *Bambusa*. Beyond Dwali, the *Rhododendrons* are the predominant members of the vegetation and continue almost upto Mirtoli, though with the increase in elevation beyond Phurkia they tend to be scandent to sub-shrubby in nature. Scattered here and there are also found the trees of *Betula*, *Alnus*, *Salix* and *Quercus*.

The lichen vegetation between Loharkhet and Dhakuri consists chiefly of the genera *Stereocaulon*, *Parmelia*, *Lobaria*, *Sticta*, *Nephromopsis* and *Usnea*. *Solorina crocata* is conspicuous along the road-side in damp places from near Dwali to Phurkia. The region near Phurkia and upto the lateral left moraine via Mirtoli is especially rich in lichen taxa occurring on

ground, on rocks and boulders, and the *Rhododendron* bushes. The common genera are: *Cetraria*, *Lobaria*, *Peltigera*, *Stereocaulon*, *Lecidea*, *Lecanora*, *Rhizocarpon*, *Thamnolia* and *Cladonia*.

Strictly speaking the region from Kapkote to Dhakuri falls in the Saryu river valley, and the area beyond Dhakuri falls in Pindar river valley. However, I have included below all those lichen taxa that were collected from Kapkote onwards upto the lateral left moraine of Pindari glacier. The collection was made in 1970, under a grant from the University Grants Commission, New Delhi. Majority of the specimens have been identified, the few that remain need further work and will be published later. The general arrangement for the enumeration of the taxa, I have followed ZAHLBRUCKNER (1926) with slight modifications, and that the species within the genera are in alphabetical order. The numbers within parentheses refer to the collection numbers.

Dermatocarpaceae

1. *Dermatocarpon miniatum* (L.) Mann. Common on boulders, Dwali to Phurkia (7641, 7665).
Dermatocarpon miniatum var. *complicatum* (Lamy) Zahlbr. Frequent on boulders, Dwali to Phurkia (7651).
2. *Dermatocarpon vellereum* Zschacke. Common on boulders and rocks, Kapkote to Loharkhet (7510).

Diploschistaceae

3. *Diploschistes actinostomus* (Pers.) Zahlbr. Thallus thick, white, C+red, apothecia immersed, asci 8 spored, spores brown, muriform, $25-31 \times 8-12 \mu\text{m}$. On vertical face of boulders, Phurkia (7637).
4. *Diploschistes scruposus* (Schreb.) Norm. Thallus grey, C+red, KC+ bright red, spores brown, muriform. On siliceous boulders, Phurkia to Mirtoli (7668, 7723, 7804).

Pyrenopsidaceae

5. *Peccania synaliza* (Ach.) Forss. Thallus minute, black, subcoralloid branched, not pruinose, sterile. On conglomerate boulders along with mosses, at about 3 miles from Kapkote towards Loharkhet (7509). The taxon is a new report for India.

Collemaataceae

6. *Lempholemma fasciculare* (Wulf.) Zahlbr. Thallus foliose with minute lobules, attached by whole underside, noncorticated, apothecia lecanorine, spores simple, colourless. On soil over boulders, Phurkia to Mirtoli (7739). The genus and species are new reports for India.
7. *Collema crispum* (Huds.) G. H. Web. Thallus dark olive to blackish, profusely minutely lobulate, isidiate, isidia squamuliform, sterile. On schistose boulders, Mirtoli (7708). The taxon is a new report for India.
8. *Collema pulcellum* Ach. On rocks and boulders, Kapkote to Loharkhet (7522).
9. *Leptogium austro-americanum* (Malme) Dodge. Thallus wrinkled, isidiate, underside not tomentose, sterile. On tree trunks, Loharkhet (7526 B).
10. *Leptogium cyanescens* (Ach.) Körb. Thallus smooth, isidiate, underside nontomentose. On tree trunk, Loharkhet (7526).
11. *Leptogium delavayi* Hue. On tree trunks, Dhakuri ridge (7588)

12. *Leptogium furfuraceum* (Harm.) Sierk. Thallus wrinkled, isidiate, underside tomentose. On tree trunk, Kapkote-Loharkhet (7503, 7515, 7524).
13. *Leptogium hirsutum* Sierk. Thallus lead grey, isidiate, underside tomentose. On tree trunks, Loharkhet—Dhakuri (7549); on rocks, Khati-Dwali (7627). The taxon is a new report for India.
14. *Leptogium javanicum* Mont. On twigs of shrubs, Kapkote-Loharkhet (7508).
15. *Leptogium menziesii* (Sm.) Mont. A common species of *Leptogium*, thallus lead grey, underside tomentose, without isidia and soredia, surface smooth. On tree trunks, Loharkhet-Dhakuri-Khati (7548, 7597, 7616).
16. *Leptogium saturninum* (Dicks.) Nyl. Thallus brown black to black, thick, tomentose below, isidiate. Over boulders and ground, Loharkhet-Dhakuri (7543).
17. *Leptogium trichophorum* Müll. Arg. Thallus lead grey to darker, tomentose on underside, apothecial margin with white hairs (trichomes). On tree trunks, on ground or over stones, Loharkhet (7525); Loharkhet-Dhakuri (7539, 7544, 7561), Dhakuri ridge (7590), Dhakuri-Khati (7611).

Pannariaceae

18. *Coccocarpia pellita* (Ach.) Vain. On rocks and stones, Dwali-Phurkia (7649).
Coccocarpia pellita var. *atrocaesia* Räs. Thallus grey black. On ground and on boulders, Phurkia-Mirtoli (7686, 7765).

Stictaceae

19. *Lobaria fuscotomentosa* Yoshim. Thallus pale brown to brownish, ± tomentose above, non scrobiculate and nonisidiate, medulla KC+reddish, spores fusiform to acicular, 35-40×7-9 μm. On *Quercus* tree trunks, Loharkhet-Dhakuri (7538). The taxon is a new report for India.
20. *Lobaria isidiosa* (Müll. Arg.) Vain. Thallus scrobiculate with isidia on ridges, medulla K+reddish, P+orange. On tree trunks, on ground and over boulders, Loharkhet-Dhakuri (7540, 7571), near Mirtoli (7795).
21. *Lobaria kurokawae* Yoshim. Thallus scrobiculate, dark brown to brown black, soredia and isidia absent. Over boulders under shrubs, Phurkia-Mirtoli (7745, 7793).
22. *Lobaria quercizans* Michx. Thallus yellowish grey, extensive, medulla KC+reddish, spores linear acicular 50-60×6-7 μm. On *Quercus* tree trunks, Dhakuri-Khati (7617).
23. *Lobaria retigera* (Bory) Trevis. Thallus large expanded, scrobiculate, isidiate on ridges and along margins, medulla K—, P—. On tree trunks, on ground and over boulders, Loharkhet-Dhakuri (7542, 7576), Dhakuri ridge (7589), Dhakuri-Khati (7621), Dwali-Phurkia (7638).
24. *Sticta platyphylloides* Nyl. Thallus extensive, dichotomously divided, lobes 5-10 mm wide, underside with wide white cyphellae, endotrophic cephalodia in medulla, cortex K+yellow, medulla K—, C—, P—. On *Quercus* tree trunks, Loharkhet-Dhakuri (7546).

Peltigeraceae

25. *Solorina saccata* (L.) Ach. Thallus brownish, adpressed to substratum (ground), apothecia rounded, immersed, laminal, asci 4-spored, spores brown 2-celled, 35-45×18-22 μm. On ground along road-side in moist situations and in shade, near Dwali (7624), over boulders, near Phurkia (7656).

26. *Nephroma helveticum* Ach. Thallus with squamulose isidia on upper side, large nephromoid marginal apothecia. On twigs of shrubs, Dhakuri ridge (7587), over boulders, Phurkia-Mirtoli (7750).
27. *Nephroma parile* (Ach.) Ach. Thallus small, dark brown, sorediate, sterile. On soil over boulders, Phurkia-Mirtoli (7743).
28. *Peltigera aphthosa* (L.) Willd. var. *variolosa* (Mass.) Thomson. Thallus extensive, with minute brownish cephalodia on upper surface, black reticulate veins on underside. On ground or on soil over boulders, Phurkia-Mirtoli (7753). The species and the variety are new reports for India.
29. *Peltigera canina* (L.) Willd. On ground, Dhakuri-Khati (7622).
30. *Peltigera dolichorhiza* (Nyl.) Nyl. On ground, Loharkhet-Dhakuri (7545).
31. *Peltigera erumpens* (Tayl.) Vain. Thallus small with rounded rigid lobes, underside with brown veins, soralia laminal and marginal. Over boulders near Mirtoli (7714). The taxon is a new report for India.
32. *Peltigera leptoderma* Nyl. Over boulders among mosses, Phurkia-Mirtoli (7767).
33. *Peltigera praetextata* (Floerke) Zapf. Thallus large, spreading with wide lobes, margins with isidia and lobules, underside not distinctly veined. On ground, Khati (7612).
34. *Peltigera rufescens* (Weis.) Humb. Thallus large, thick, rigid, margins fimbriate, upperside tomentose, whitish veins on underside. Over boulders, near Mirtoli (7681).
35. *Peltigera spuria* (Ach.) DC. Over boulders, Mirtoli—left lateral moraine (7698).

Lecideaceae

36. *Lecidea* (Psora) *decipiens* (Ehrh.) Ach. On soil over boulders, near Mirtoli (7707).
37. *Lecidea* (Psora) *lurida* (Sw.) Ach. Thallus squamulose, squamules small, dark brown, much imbricated. On decaying mosses over boulders, Phurkia-Mirtoli (7760). The taxon is a new report for India.
38. *Lecidea macrocarpa* (DC.) Steud. Thallus thin to thick, apothecia ultimately large, plane to convex, up to 3 mm in diam., black, spores $18-30 \times 8-12 \mu\text{m}$, thallus and medulla K—, C—, P—. Common on siliceous rocks, boulders and stones, Phurkia-Mirtoli area (7667, 7737, 7751, 7752, 7754, 7802).
Lecidea macrocarpa f. *oxydata* (Körb.) Vain. Thallus deep yellow to orange, spores $22-25 \times 8-9 \mu\text{m}$. On siliceous boulders, Phurkia-Mirtoli (7719, 7762).
39. *Toninia* sp. Thallus bullate squamulose, squamules diffract, grey brown, K—, C+ red, KC+ red, P—. Spores not developed. On boulder, Mirtoli (7705).
40. *Rhizocarpon ferax* H. Magn. Thallus minute, up to 1 cm in diam., surrounded by *R. tinei*, areoles crescent shaped, medulla I+blue, P+yellow, on siliceous boulders, Mirtoli (7689).
41. *Rhizocarpon tinei* (Tornab.) Rune. Thallus extensive, deep yellow, medulla I+blue, P+orange, spores brown, muriform, $50-55 \times 17-20 \mu\text{m}$, common in the area, on quartzite and siliceous boulders, near Mirtoli (7691, 7694, 7700, 7703, 7733).

Cladoniaceae

42. *Cladonia chlorophaea* (Floerke) Spreng. On soil over boulders, near Mirtoli (7794).
43. *Cladonia furcata* (Huds.) Schrad. On ground, Phurkia—Mirtoli (7706, 7790).
44. *Cladonia pityrea* (Floerke) Fr. On ground, Loharkhet-Dhakuri (7566), Khati-Dwali (7632, 7633).
45. *Cladonia pyxidata* (L.) Fr. On soil over boulders, Phurkia-Mirtoli (7701, 7742, 7798).

46. *Cladonia scabriuscula* (Del.) Leight. On ground with mosses, Phurkia-Mirtoli (7757).
 47. *Cladonia verticillata* Hoffm. On ground, Dhakuri ridge (7601).

Stereocaulaceae

48. *Stereocaulon foliolosum* Nyl. On boulders and stones, Dhakuri-Khati (7620), Dwali-Phurkia (7646, 7647, 7648), near Phurkia (7671), near Mirtoli (7728).
Stereocaulon foliolosum var. *botryophorum* (Müll. Arg.) M. Lamb. On stones and boulders, Mirtoli (7718, 7724, 7729).
Stereocaulon foliolosum var. *strictum* (Bab.) M. Lamb. On stones and boulders, Dhakuri ridge (7573, 7582, 7606, 7607, 7608), Mirtoli (7726, 7727, 7778, 7779, 7780, 7781, 7786).
 49. *Stereocaulon myriocarpum* Th. Fr. On boulders, stones and on ground, Phurkia-Mirtoli (7679, 7680), on ridge of moraine (7684, 7685, 7725), Phurkia-Mirtoli (777, 7783, 7784, 7785).
 50. *Stereocaulon piluliferum* Th. Fr. On boulders and stones, Loharkhet-Dhakuri (7560, 7577), Dhakuri ridge (7605).
 51. *Stereocaulon pomiferum* Duvig. On boulders and stones, Phurkia-Mirtoli (7605), scarce. (N.B.—Representative specimens of some of the above taxa had kindly been determined by Dr. I. M. Lamb).

Umbilicariaceae

52. *Umbilicaria dwaliensis* (Räs.) Awas. On boulders, Dwali-Phurkia (7644), Phurkia-Mirtoli (7687).
 53. *Umbilicaria himalayensis* (Räs.) Awas. On boulders, Khari-Dwali (7628, 7629).

Acarosporaceae

54. *Acarospora veronensis* Mass. Thallus squamulose to squamulose—areolate, red brown to dark brown, K—, C—, KC—. On sloping micaschist boulders, near Mirtoli (7709).

Lecanoraceae

55. *Lecanora atra* (Huds.) Ach. Thallus thick, crustose, white to grey, verrucose, apothecial disc black, margin thick, spores $12 \times 6 \mu\text{m}$, thallus K+yellow, C—, P—. On vertical face of rocks, near Phurkia (7672, 7731).
 56. *Lecanora frustulosa* (Dicks.) Ach. Thallus yellow, squamulose verrucose, K—. On siliceous rocks, near Mirtoli (7717).
 57. *Lecanora* (*Aspicilia*) *hoffmanni* (Ach.) Müll. Arg. Thallus grey, apothecia pruinose, asci (3)-4-spored, spores $24-28 \times 14-16$ (20) μm . On siliceous stones near Phurkia (7674).
 58. *Lecanora khatiensis* Räs. Spores $14-16 \times 6-7 \mu\text{m}$. On boulders, Loharkhet-Dhakuri (7547).
 59. *Lecanora* (*Placodium*) *muralis* (Schreb.) Raben. On siliceous boulders, Phurkia-Mirtoli (7746).
 60. *Lecanora* (*Placodium*) *phaedrophthalma* Poelt. On stones and boulders, near zero milestone, on ridge of left lateral moraine, scarce (7713).
 61. *Lecanora* (*Placodium*) *praesorediosa* Nyl. Thallus placodioid, bluish brown with convex lacinae, lacinae solid K+purple red. Common on rocks near zero milestone on ridge of left lateral moraine (7688, 7693, 7715, 7748).

62. *Lecanora* (Placodium) *rubina* (Ach.) Vill. Thallus umbilicate, yellowish green to yellow grey, under-side blackish, apothecia rose to pale red coloured. Common on boulders, near zero mile-stone on ridge of left lateral moraine (7688).
63. *Placopsis gelida* (L.) Nyl. Thallus whitish grey, placodioid, sorediate, cephalodia grey brown, radiating, thallus K—, C+orange, P—. On siliceous boulders, Phurkia—Mirtoli (7756). The taxon is a new report for India.
64. *Ochrolechia yasudae* var. *corallina* Poelt. Thallus crustose, isidiate, isidia coralloid, thallus KC+red, margin and disc KC+red, spores 50-65 × 30-35 μm.
65. *Candelariella vitellina* (Ehrh.) Müll, Arg. Thallus yellow, squamulose. On mossy soil over boulders, Phurkia-Mirtoli (7721, 7759).

Parmeliaceae

66. *Parmelia* cfr. *bostrychodes* Zahlbr. On tree trunk, Loharkhet—Dhakuri (7558), Dwali-Phurkia (7645).
67. *Parmelia cirrhata* Fr. On shrubs and trees, Dhakuri (7603), Phurkia-Mirtoli (7761).
68. *Parmelia koyaensis* Asah. Thallus densely isidiate, medulla white, K—, C—, KC —, P+yellow. On tree trunks, near Loharkhet (7528).
69. *Parmelia meizospora* (Nyl) Nyl. Common on tree trunks and over boulders, Loharkhet (7529, 7533).
70. *Parmelia nepalensis* Tayl. On twigs of shrubs and trees, Loharkhet-Dhakuri (7567, 7613).
71. *Parmelia nilgherrensis* Nyl. Common on tree branches, Loharkhet-Dhakuri (7562, 7594), Dwali-Phurkia (7636).
72. *Parmelia pseudosinuosa* Asah. Thallus sorediate, medulla K—, C—, P+orange. On tree trunk, Loharkhet-Dhakuri (7551). The taxon is reported for the first time from India.
73. *Parmelia praesorediosa* Nyl. Over stones and boulders, Loharkhet (7520).
74. *Parmelia pulla* (Ach.) Acn. Thallus brown, with minute depressions and reticulations, medulla K—, C—, KC—, P+orange red. Over boulders, Dwali-Phurkia (7643), Mirtoli (7749). The taxon is a new report for India.
75. *Parmelia reticulata* Tayl. On *Quercus* tree trunks, and over stones, common, Loharkhet-Dhakuri (7541, 7575).
76. *Parmelia sancti-angelii* Lyngé. On tree trunks, Loharkhet—Dhakuri (7557).
77. *Parmelia saxatilis* (L.) Ach. Over boulders, Phurkia-Mirtoli (7772).
78. *Parmelia stygia* (L.) Ach. Over boulders, near Mirtoli (7697).
79. *Parmelia subaurulenta* Nyl. On tree trunk, Loharkhet-Dhakuri (7553), Khati-Dwali (7631).
80. *Parmelia tinctorum* Nyl. On tree trunk and over boulders, Kapkote-Loharkhet (7506, 7519).
81. *Parmelia wallichiana* Tayl. Over stones, near Dwali (7630).
82. *Cetraria ambigua* Bab. On ground under *Rhododendron* trees, near Mirtoli (7695, 7775).
83. *Cetraria everniella* (Nyl.) Kremp. Common on ground under *Rhododendrons*, Phurkia-Mirtoli (7744), near zero mile on ridge of left lateral moraine (7683, 7690).
84. *Cetraria hepaticum* (Ach.) Vain. Thallus brown black, narrow laciniate, sterile. On soil over boulders with mosses, Phurkia-Mirtoli (7799).
85. *Cetraria islandica* (L.) Ach. var. *maculata* Vain. On ground, Phurkia—Mirtoli (7792), on ridge of moraine (7692).

86. *Cetraria laureri* Kremp. Thallus yellowish grey, suborbicular, laciniate lobate, lacinae subcanaliculate, marginally soresiate, underside with white pseudocyphellae, sterile. On bark of *Rhododendron* trees, Dhakuri ridge (7569). The taxon is a new report for India.
87. *Cetraria leucostigma* Lév. Thallus large, thick, coriaceous, yellowish green to brownish, with plug like protuberances on underside, plugs with white pseudocyphellae, apothecia small along the margin, medulla K—, C—, P—. On *Quercus* and *Rhododendron* trees, Dhakuri ridge (7568, 7593).
88. *Cetraria thomsonii* (Stirt.) Müll. Arg. On branches of *Rhododendron* and *Quercus* trees, Dhakuri ridge (7572, 7596).
89. *Cetraria wallichiana* (Tayl.) Müll. Arg. On trees of *Rhododendron* and *Quercus*, Dhakuri ridge (7592, 7619).
90. *Cetrelia cetrarioides* (Del.) Culb. and Culb. On tree trunks, Loharkhet-Dhakuri (7559 pr. p.)
91. *Cetrelia braunsiana* (Müll. Arg.) Culb. and Culb. On *Rhododendron* trunks, and over stones and boulders, Loharkhet-Dhakuri (7559 pr. p.), 7574, 7595, 7615), Phurkia (7673).
92. *Nephromopsis stracheyi* (Bab.) Müll. Arg. Medulla KC+red. On tree trunks, Dhakuri (7591).
Nephromopsis stracheyi f. *ectocarpisma* Hue. Medulla KC—. Dhakuri ridge (7570).

Usneaceae

93. *Alectoria smithii* DuR. On twigs of shrubs, Loharkhet-Dhakuri (7563, 7602).
94. *Alectoria sulcata* (Lév.) Nyl. On tree branches, Dhakuri ridge (7583).
95. *Ramalina sinensis* Jatta. On trees, Dhakuri ridge (7598), Dwali-Phurkia (7635).
96. *Ramalina subcomplanata* Nyl. On trees, Dhakuri ridge (7600).
97. *Usnea longissima* Ach. Central axis I+blue. On trees, Dhakuri (7584), Phurkia (7730).
98. *Usnea mekista* Stirt. On trees, Dhakuri ridge (7585).
99. *Usnea sordida* Mot. On trees, Dhakuri ridge (7586, 7614).
100. *Usnea subsordida* Stirt. On trees, Dhakuri Khati, (7599, 7623).
101. *Usnea thomsonii* Stirt. On trees, Dwali-Phurkia (7634).
102. *Thamnotia vermicularis* (L.) Schaer. Thallus P+orange, On ground, common, Phurkia-Mirtoli and on ridge of lateral moraine (7692, 7696, 7791).

Caloplacaceae

103. *Caloplaca decipiens* (Arn.) Stein. On boulders, Phurkia-Mirtoli, common (7660, 7704, 7760).
104. *Caloplaca murorum* (Hoffm.) Th. Fr. On boulders, near Phurkia (7659).
105. *Caloplaca pindarensis* (Räs.) Awas. On rocks and boulders, Dhakuri ridge (7580).

Teloschistaceae

106. *Xanthoria elegans* (Link.) Th. Fr. On stones and rocks, Phurkia-Mirtoli (7734).

Physciaceae

107. *Pyxine berteriana* (Fée) Imash. On bark of trees, Kapkote-Loharkhet (7502, 7514).
108. *Pyxine endochrysoides* (Nyl.) Degel. On tree trunks near Loharkhet (7527).

109. *Pyxine soredata* (Ach.) Mont. On bark of trees and over stones, Loharkhet-Khati (7552, 7610).
110. *Dirinaria consimilis* (Stirt.) Awas. On bark of tree, Kapkote-Loharkhet (7501).
111. *Physcia albinea* (Ach.) Nyl. On soil over boulders, Phurkia-Mirtoli and on ridge of moraine (7702, 7776).
112. *Physcia ciliata* (Hoffm.) DuR. On soil over boulder, Phurkia to Mirtoli (7722, 7774).
113. *Physcia endococcina* (Körb.) Th. Fr. Over stones, Kapkote-Loharkhet (7521), on twigs of shrubs, Phurkia-Mirtoli (7789).
114. *Physcia setosa* (Ach.) Nyl. On boulders, Loharkhet (7518), Dwali-Phurkia (7652).
115. *Physciopsis minor* (Fée) B. Moore. On bark of trees, Kapkote-Loharkhet (7523).
116. *Heterodermia albidiflava* (Kurok.) Awas. Over stones, Loharkhet (7535).
117. *Heterodermia diademata* (Tayl.) Awas. On tree trunks, Loharkhet (7530).
Heterodermia didamata f. *brachyloba* (Müll. Arg.) Awas. On tree trunks, Loharkhet (7531, 7537).
118. *Heterodermia neoleucomelaena* (Kurok.) Awas. On ground and on twigs of shrubs, Loharkhet-Dhakuri (7565, 7604), Phurkia-Mirtoli (7773).
119. *Heterodermia obscurata* (Nyl.) Trevis. Over stones, Khati-Dwali (7625).
120. *Heterodermia pseudospeciosa* (Kurok.) W. Culb. Over stones, Loharkhet (7534).
121. *Heterodermia punctifera* (Kurok.) Awas. Over stones, Loharkhet (7536).
122. *Heterodermia tremulans* (Müll. Arg.) W. Culb. Over boulders, Phurkia-Mirtoli (7764).

REFERENCES

- ZAHLBRUCKNER, A. (1926). Flechten (Lichens) B. Spezieller Teil. In Engler and Prantl, *Die natürlichen Pflanzenfamilien*. 8. Leipzig.