
Annotated checklist of the lichens and lichenicolous fungi of Bhutan

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Aptroot, A. and Feijen, F.J. (2002). Annotated checklist of the lichens and lichenicolous fungi of Bhutan. *Fungal Diversity* 11: 21-48.

An annotated checklist is presented of the 287 lichens and lichenicolous fungi known from Bhutan. The vast majority (225) are new records for the country, based on recent collections of 264 species by the second author. Most species were previously known from the Himalayas, but some represent considerable range extensions. Noticeable examples are the rare *Ropalospora chlorantha*, so far only known from eastern North America, and the first report from the Northern Hemisphere of *Lepraria nigrocincta*. *Pyrrhospora bhutanensis* is described as new to science.

Key words: Bhutan, checklist, Himalaya, lichenicolous, lichens.

Introduction

The Kingdom of Bhutan is located in the eastern Himalayas. It stretches 300 kilometres from west to east, and about 150 kilometres from north to south. Bhutan has an extremely varied landscape, going from the high mountains (up to 7553 m) in the north to the lowland belt in the south (100-300 m altitude). A number of north-south running rivers created narrow valleys with each their own characteristics. The frontier between the Palaearctic and the Oriental biogeographical regions runs midway through the country. The country can be divided in three climatic zones: alpine, temperate and subtropical. Precipitation varies enormously within the country. In the subtropical south, monsoon rainfall reaches 5.5 m annually, while in the temperate foothills rainfall is moderate and both dry and wet valleys occur. In the Himalayas, rainfall increases towards the eastern part.

Bhutan is one of the ecological wonders of the world and has been marked as one of its biodiversity hot spots. Various types of forests cover over 72% of the country. By law, the government intends to keep at least 60% of the land permanently under forest cover. The nature parks and reserves cover 26% of the country. Much of the flora has remained undisturbed, so Bhutan most

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likely has the richest flora in the Himalayan region. The country counts, for instance, nearly 50 species of *Rhododendron* and even 620 orchid species. The fauna of Bhutan is also highly diverse, with many representatives of both biogeographical regions. Around 770 species of birds have been recorded. Mammals abound at over 100 species, ranging from snow leopard, takin, blue sheep, musk deer, wild pig and brown bear to golden langur, tiger, leopard, red panda, Himalayan black bear, Indian rhinoceros and Indian elephant. In line with its natural richness, the country is also rich in the number of lichens. From just below 3000 meter altitude, beard mosses form a dominant factor in the temperate forest. The lichens reported in this paper were collected by F.J. Feijen in 1999 and 2000. The lichens were mainly collected in the temperate regions of the western districts (Dzongkhags) of Thimphu, Paro, Punakha and Wangdue-Phodrang.

Bhutan is an independent kingdom in the eastern Himalayas. For centuries, it has been quite isolated from the outside world and until quite recently a restrictive visum policy was effectuated to prevent the country from large scale tourist invasion. As a result, few people visited the country and very few ever collected lichens.

Lichens are a conspicuous element of the biodiversity all over Bhutan, with a potentially rich alpine flora. Specimens from Bhutan are however only rarely mentioned in monographs, and only two lichenological publications exist in which the country appears in the title (Kashiwadani, 1988; Upreti and Ranjan, 1988), and the first only reports one species (*Ramalina hossei*), the second 46 macrolichens. In 1999, U. Söchting collected in Bhutan, and he put a paper on internet (Söchting, 1999) citing 21 lichen species from Bhutan. All published lichen reports from Bhutan are mentioned below with their respective references, so as to make the checklist complete.

Material and methods

All materials (in total *ca.* 800 collections) were collected by Fenna Feijen while she lived in Bhutan. During most of 1999 and 2000, the second author stayed in Bhutan. Some localities have been visited once, others repeatedly. The phanerogams have been identified by C. Feijen; nomenclature follows Polunin and Stainton (1984). The lichen species have been identified by André Aptroot in 2002 and are preserved in herbarium ABL.

Collecting localities

Materials were collected in Western Bhutan, at elevations between 1200 and 4500 m. Lichens were common at all localities, but most plentiful in the forests of the Dochola at an altitude of around 3000 m. For the localities the system of the Atlas of Bhutan (Ministry of Agriculture of Bhutan, 1997) is

followed. Bhutan is divided into 21 Dzongkhags (districts). Lichens were collected in the Dzongkhags of Thimphu, Paro, Punakha and Wangdue-Phodrang.

Thimphu District:

Thimphu, near transmission tower, 2600 m, 89°41'E; 27°26'N
 Dry pastureland and Blue Pine (*Pinus wallichiana*) forest (1999). (Fig. 1)

Lungtenphu, Tashi Pelkhil estate. 2300 m, 89°39'E; 27°25'N
 Relatively dry, narrow part of the valley. Banks of the Wang Chhu (Chhu = river); apple orchard and Blue Pine (*Pinus wallichiana*) forest (February, 1999, 2000).

Serbithang, 2500 m, 89°39'E; 27°24'N
 Blue Pine (*Pinus wallichiana*) forest, pasture land (1 November 1999, 21 November 1999).

Above Serbithang, 2600 m, 89°39'E; 27°24'N
 Blue Pine (*Pinus wallichiana*) forest (21 January 1999).

Khasadrapchung, 2600 m. 89°35'E; 27°23'N
 Pastures, Blue Pine (*Pinus wallichiana*) forest (14 May 2000).

Dochola area, 3000 m, 89°44'E; 27°29'N
 Mixed forest of *Tsuga dumosa*, *Acer campbelli*, *Juniperus recurva*, *Betula utilis*, *Picea spinulosa* and *Rhododendron* spp. Of the *Rhododendron* species, *R. arboreum*, *R. barbatum*, *R. falconeri* and *R. hodgsonii* are the most common species; *R. grande* also grows here at a very wet part of the forest. The forest is often covered in mist and clouds. In the winter months this forest is covered with snow for several weeks (1 October 1999, 31 October 1999, 18 January 2000, 5 March 2000, 9 March 2000, 9 April 2000).

Dochola area, Tashigang Gompa (Monastery). 2800 m, 89°44'E; 27°29'N
 Deciduous and mixed forest, like above, on southern slope of the mountain; species like *Betula utilis* and *Pinus wallichiana* are more common (5 December 1999, 9 April 2000).

Dolong Gompa, forest below Dolong, 3000 m, 89°38'E; 27°34'N
 Mixed forest on wet, north slope of the mountain with *Tsuga dumosa*, *Quercus semecarpifolia*, *Juglans regia*, *Rhododendron arboreum* (24 October 1999).

Path between Tango Monastery and Dolong Gompa, 2700 m, 89°38'E; 27°34'N
 Mixed forest with *Tsuga dumosa*, *Quercus semecarpifolia*, *Pinus wallichiana*, *Rhododendron arboreum* (1, 2 April 2000). (Fig. 2)

Phajoding, 3700 m, 89°34'E; 27°29'N
 Alpine meadows above *Juniperus recurva* forest and mixed forest of *Quercus semecarpifolia*, *Rhododendron arboreum* and *Acer campbelli* lower down (2 November 1999, 7 November 1999).

Path between Phajoding and Chokhortse, 3000 m, 89°34'E; 27°29'N
Mixed forest with *Rhododendron arboreum*, *Pinus wallichiana*, *Tsuga dumosa* (16 April 2000)

Pomela gumpa, 3600 m, 89°34'E; 27°29'N
Rhododendron forest with *Rhododendron cinnebarium*, *Juniperus recurva*, *Pinus wallichiana* (7 November 1999).

Thimphu, transmission tower, 2600 m, 89°41'E; 27°26'N
Dry pastures and Blue Pine (*Pinus wallichiana*) forest (1999).

Paro District:

Chilaila, 4000-4300 m. 89°20'E; 27°22'N
Alpine meadow above *Abies spectabilis* forest, area partly covered by *Rhododendron setosum*, *R. antepogon* and *R. aeruginosum*. Thickets of *R. lanatum*, *R. cinnebarium*, *R. triflorum*, *R. lanatum* and *R. wallichii* (12 Decemebr 1999, 13 April 2000, 23 April 2000)

Punakha District:

Amrimo, 1800 m, Jigme Dorji National Park, 89°46'E; 27°42'N
Dense subtropical forest (28 November 1999).

Wangdue-Phodrang District:

Bajo, banks of the Sankosh river, 1200 m, 89°53'E; 27°29'N
Dry pasture and agricultural land along the banks of the river (27 October 1999, 24 November 1999, 27 Novemebr 1999, 2 Janaury 2000).

Gogona, 3000 m, 90°10'E; 27°29'N
Alpine valley above *Abies densa* forest. Pasture land with *Rhododendron cinnebarium* forest, *Berberus* spp. (9 May 2000, 29 May 2000).

Chela, 3000 m, pass between Phobjika and Gogona valleys, 90°10'E; 27°28'N
Forest with *Abies densa*, *Tsuga dumosa*, *Pinus wallichiana* and *Rhododendron barbatum*, *R. hodgsonii*, *R. triflorum* and *R. arboreum* (27 November 1999).

Lawala, 3500 m, pass between Wangdue-Phodrang valley and Phobjika valleys, 90°10'E; 27°28'N
Alpine meadow with dwarf Bamboo (*Arundinaria maling*) above *Abies densa* forest mixed with *Rhododendron hodgsonii*, *R. falconeri* and *R. arboreum* (1999).

Phobjika valley, 3000 m, 90°10'E; 27°28'N
Glacial valley with dwarf bamboo (*Arundinaria maling*) and *Rhododendron thomsonii* (1999).

Phobjika valley, near bird observatory hut. 3000 m, 90°10'E; 27°28'N
Natural, dry grassland (28 May 2000).

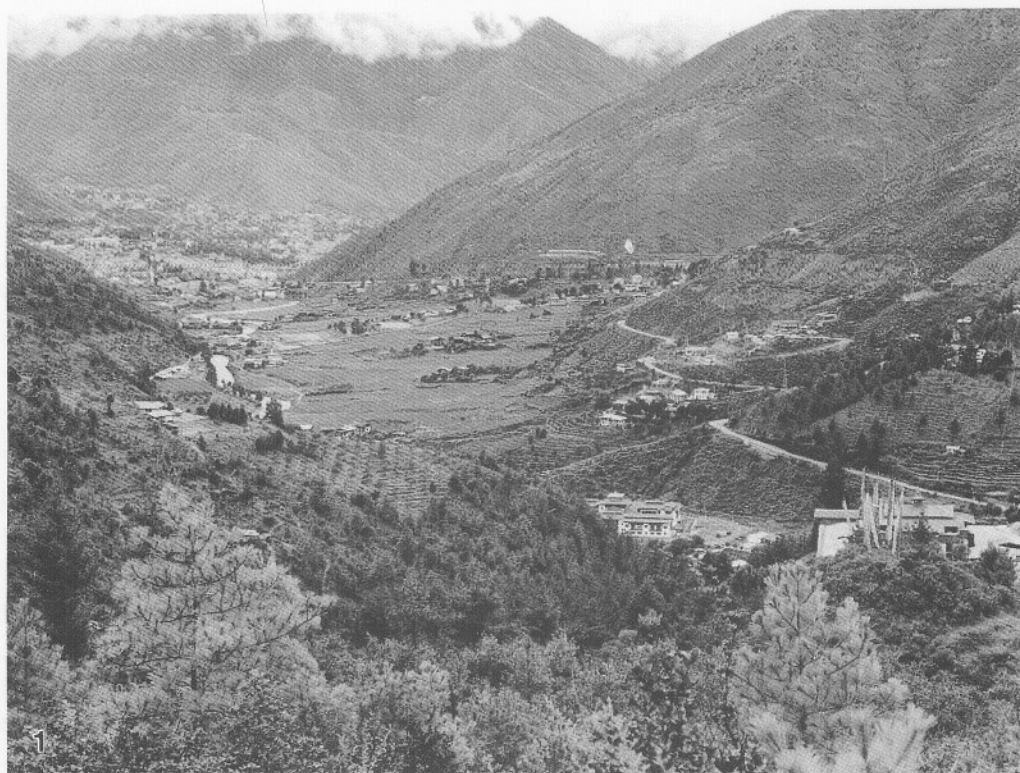


Fig. 1. View over the Thimphu valley: to the right Lungtenphu; to the left Tashi Pelkhil; in the background Thimphu city. **Fig. 2.** View in the mountains: to the right Tango Monastery; to the left Cheri.

Results

The lichen flora of Bhutan, as it emerges from these data, is mainly characterized by widespread temperate crustose taxa and macrolichens that are partly widespread and partly more restricted to alpine areas or even the Himalayas proper. There is a clear difference between the lichen flora at lower altitudes, with mainly subtropical species and a few tropical elements and many *Heterodermia* and *Parmotrema* species, and the lichen flora of the higher altitude localities, with more *Parmelia*, *Stereocaulon*, *Umbilicaria* and alpine soil crusts like *Arthrorhaphis*. The intermediate altitudes show a predominantly temperate lichen flora, with several *Calicium* species. The flora is definitely Northern as compared to the lichen flora of Taiwan, with relatively few *Menegazzia* species (none endemic) and many *Hypogymnia* species. The identifications of the *Hypogymnia* species below should be regarded as partly tentative, as more and more cryptic species are being discovered in the genus. Towards the Southern Hemisphere, the relative abundance of *Menegazzia* increases steadily. Most expected lichen groups are present in the Bhutan flora, but pyrenocarpous species are relatively rare (rarely collected?) and stipitate *Sticta* species, which are common in many surrounding areas, seem to be absent.

Most species were previously known from the Himalayas, but some represent considerable range extensions. Noticeable examples are the rare *Ropalospora chlorantha*, so far only known from eastern North America, and the first report from the Northern Hemisphere of *Lepraria nigrocincta*.

The collected material contained 259 species that could be identified to species level. In four additional genera, unidentified specimens, possibly representing undescribed taxa, are reported. One species, *Pyrrhospora bhutanensis*, is formally described as new to science. All identified species are mentioned below with (a selection of) the collecting localities and usually the substrate. Descriptions of the vast majority of the species can be found in Awasthi (1988, 1991) or Purvis *et al.* (1992). Unless explicitly mentioned, they are **new to Bhutan and marked with ***, but known from the Himalayas in a wide sense. All lichenicolous fungi are new reports for Bhutan. The result is an annotated checklist with the 287 lichens and lichenicolous fungi now known from Bhutan. The vast majority (225) are new records for the country.

Taxa

Acrosyphus sphaerophoroides Lév.

Chilaila, on soil in alpine area. Previously reported from Bhutan by Søchting (1999).

- **Anisomeridium polypori* (Ellis & Everh.) M.E. Barr
Dochola, on smooth-barked tree. A cosmopolitan species not previously recorded from the Himalayas. The specimen was richly fertile.
- **Anzia physoidea* A.L. Smith
Dochola, on tree.
- **Arthonia pelvetii* (Hepp) Arnold
Phajoding, lichenicolous on *Hypogymnia hypotrypa*.
- **Arthrorhaphis alpina* (Schaerer) R. Sant.
Chilaila, on soil in alpine area.
- **Arthrorhaphis citrinella* (Ach.) Poelt
Phajoding and Phobjika, on soil.
- **Aspicilia caesiocinerea* (Nyl. ex Malbr.) Arnold
Lungtenphu, on rock.
- **Bacidia friesiana* (Hepp) Koerber
Phajoding, on tree. Not previously reported from the Himalayas.
- **Baeomyces placophyllus* Ach.
Chilaila, Dochola and Chela, on soil. Not previously reported from the Himalayas.
- **Baeomyces rufus* (Hudson) Rebert.
Dochola and Dochola-Tashigang, on soil. Not previously reported from the Himalayas.
- **Biatora efflorescens* (Hedl.) Räs.
Dochola, on tree. Not previously reported from the Himalayas.
- **Bryoria lactinea* (Nyl.) Brodo & D. Hawksw.
Rather common, Chela, Chilaila, Dochola and above Serbithang, on trees.
- **Bryoria nepalensis* Awas.
Rather common, Dochola, Dolong-Tango, Khasadrapchung, Phajoding-Chokhortse and Tashigang, on trees.
- **Bryoria nitidula* (Th. Fr.) Brodo & Hawksw.
Common, Chela, Chilalila, Dochola, Gogona, Lawala, Phajoding and Serbithang, mostly on trees.
- **Bryoria smithii* (DR.) Brodo & Hawksw.
Dochola, Lawala and Phajoding-Chokhortse, on trees.
- **Buellia erubescens* Arnold
Lungtenphu, on tree. Not previously reported from the Himalayas.
- **Buellia griseovirens* (Turner & Borre ex Sm.) Almb.
Phajoding-Chokhortse, on branch. Not previously reported from the Himalayas.

- **Buellia polyspora* (Willey) Vainio
Dochola, on tree.
- **Buellia punctata* (Hoffm.) Massal.
Lungtenphu and Serbithang, on trees.
- **Calicium adpersum* Pers.
Dochola, on tree.
- **Calicium glaucellum* Ach.
Dochola, on trees.
- **Calicium salicinum* Pers.
Dochola, on trees and wood.
- **Calopadia* sp.
Dochola, on tree. An unexpected species with aeruginose campylidia with conidia *ca.* 5 × 3 µm, unidentifiable due to the lack of apothecia.
- Caloplaca biatorina* (Massal.) Steiner
Reported from Bhutan by Søchting (1999). Not found in the present material.
- **Caloplaca cerina* (Ehrh. ex Hedwig) Th. Fr.
Chilaila, Phajoding-Chokhortse and Serbithang, on branches and on mosses in alpine area.
- **Caloplaca ferruginea* (Hudson) Th. Fr.
Bajo, on branches.
- **Caloplaca holocarpa* (Hoffm.) Wade
Serbithang, on branches.
- **Caloplaca pulicarioides* Aptroot
Lungtenphu, on tree. A surprising record, as this species was only recently described (Aptroot and Seaward, 1999). It is now known from Hong Kong, Taiwan and the Seychelles.
- **Caloplaca rubelliana* (Ach.) Lojka
Lungtenphu, on pebbles.
- **Candelaria concolor* (Dickson) B. Stein
Dochola and Lungtenphu, on trees.
- **Candelaria indica* (Hue) Vainio
Rather common, Amrimo, Chilaila, Khasadrapchung, Lungtenphu and Serbithang, mostly on trees, but also on rock.
- **Candelariella himalayana* Poelt & Reddi
Chela and Chilaila, on soil. One of the few crustose alpine species restricted to the Himalayas.

- **Candelariella reflexa* (Nyl.) Lettau
Lungtenphu, Phajoding and above Serbithang, on trees. Not previously reported from the Himalayas.
- **Canomaculina subtinctoria* (Zahlbr.) Elix
Lungtenphu, on rock.
- **Canoparmelia crozalsiana* (B. de Lesd.) Elix & Hale
Lungtenphu, on tree.
- Cetraria laevigata* Rass.
Reported from Bhutan by Söchting (1999). Not found in our material.
- Cetraria leucostigma* Lév.
Reported from Bhutan by Randlane *et al.* (2002). Not found in our material.
- Cetraria melaloma* (Nyl.) Krempelh.
Reported from Bhutan by Söchting (1999) and Randlane *et al.* (2002). Not found in our material.
- **Cetrelia braunsiana* (Müll. Arg.) Culb. & C. Culb.
Rather common, Dochola, below Dolong, Lawala, Phajoding-Chokhortse and Tashigang, on trees.
- **Cetrelia cetrarioides* (Delise ex Duby) Culb. & C. Culb.
Chilaila, Chela and Phajoding, on trees.
- **Cetrelia collata* (Nyl.) Culb. & C. Culb.
Chilaila, on *Rhododendron*.
- Cetrelia olivetorum* (Nyl.) Culb. & C. Culb.
Rather common, Chela, Dochola, Gogona and Phajoding, on trees. Reported from Bhutan by Söchting (1999).
- Cetreliaopsis asahinae* (M. Satô) Randlane & A. Thell
Reported from Bhutan by Randlane *et al.* (2002). Not found in our material.
- Cetreliaopsis rhytidicarpa* (Mont. & v.d. Bosch) M.-J. Lai
Reported from Bhutan by Upreti and Ranjan (1988, as *Cetraria*). Not found in our material.
- **Chaenotheca brunneola* (Ach.) Müll. Arg.
Dochola, on tree.
- **Chaenotheca chrysocephala* (Turner ex Ach.) Th. Fr.
Dochola, on trees.
- **Chrysothrix candelaris* (L.) Laundon
Khasadrapchung, on *Cupressus*.

Cladia aggregata (Sw.) Nyl.

Dochola and Phobjika, near bird observatory hut, on soil. Reported from Bhutan by Upreti and Ranjan (1988) and Söchting (1999).

**Cladonia borealis* Stenroos

Chela, on soil. Not previously reported from the Himalayas, but probably confused with *C. coccifera* or possibly previously mentioned from the Himalayas as *C. esorediata*.

Cladonia carneola (Fr.) Fr.

Reported from Bhutan by Upreti and Ranjan (1988). Not found in our material.

Cladonia coccifera (L.) Willd.

Rather common, Dolong-Tango, Chela, Phajoding, Pomela, Serbithang and Tashigang, on soil. Reported from Bhutan by Upreti and Ranjan (1988).

**Cladonia coniocraea* (Floerke) Sprengel

Rather common, below Dolong, Dolong-Tango, Lungtenphu and Serbithang, usually on rotten wood.

**Cladonia cornuta* (L.) Hoffm.

Chilaila, on soil.

**Cladonia corymbescens* Nyl.

Rather common, Chela, Lawala, Phajoding, Phobjika, near bird observatory hut and Tashigang, on soil.

**Cladonia decorticata* (Floerke) Sprengel

Serbithang, on soil.

Cladonia farinacea (Vainio) Evans

Reported from Bhutan by Upreti and Ranjan (1988). Not found in our material.

Cladonia fimbriata (L.) Fr.

Reported from Bhutan by Upreti and Ranjan (1988). Not found in our material.

**Cladonia floerkeana* (Fr.) Floerke

Khasadrapchung, on soil.

**Cladonia fruticulosa* Krempelh.

Amrino, Gogona, Lungtenphu and Phajoding, on soil. Present in two chemical varieties, with either fumarprotocetraric or psoromic acid.

Cladonia furcata (Hudson) Schrader

Reported from Bhutan by Upreti and Ranjan (1988). Not found in our material.

**Cladonia glauca* Floerke

Chilaila and Lungtenphu, on soil.

Cladonia grayi G.K. Merrill ex Sandst.

Tashigang, on soil. This species is treated here in a chemically wide sense. Reported from Bhutan by Upreti and Ranjan (1988, as *C. cryptochlorophaea*).

Fungal Diversity

Cladonia macilenta Hoffm.

Rather common, Gogona, Khasadrachung, Lungtenphu and Tashigang, usually on rotten wood. Reported from Bhutan by Upreti and Ranjan (1988, as *C. bacillaris*).

**Cladonia mitis* Sandst.

Chilaila, Lungtenphu and Phobjika, near bird observatory hut, on soil.

Cladonia parasitica (Hoffm.) Hoffm.

Reported from Bhutan by Upreti and Ranjan (1988). Not found in our material.

**Cladonia phyllopoda* (Vainio) Stenroos

Dochola, Lawala, Serbithang and Tashigang, on soil.

**Cladonia pocillum* (Ach.) O.-J. Rich.

Gogona, Lungtenphu, Phajoding and Phobjika, on soil. Not previously reported from the Himalayas, but probably confused with *C. pyxidata*.

**Cladonia pseudogymnopoda* Asah.

Lungtenphu, Lawala, Phobjika, Serbithang and Tashigang, on soil. Reported from Bhutan by Upreti and Ranjan (1988, as *C. verticillata*).

Cladonia ramulosa (With.) Laundon

Reported from Bhutan by Upreti and Ranjan (1988, as *C. pityrea*). Not found in our material.

**Cladonia rangiferina* (L.) Wigg.

Chilaila and Tashigang, on soil.

Cladonia rei Schaerer

Reported from Bhutan by Upreti and Ranjan (1988, as *C. nemoxyna*). Not found in our material.

**Cladonia scabriuscula* (Delise) Leight.

Dochola, Lungtenphu, Phajoding and above Serbithang, on soil.

**Cladonia squamosa* (Scop.) Hoffm.

Dochola and Lungtenphu, on soil.

**Cladonia stellaris* (Opiz) Pouzar & Vezda

Chilaila, on soil.

**Cladonia yunnana* (Vainio) des Abb.

Rather common, Chilaila, Dochola and Phajoding, on soil.

**Coccocarpia erythroxyli* (Sprengel) Swinsc. & Krog

Phajoding and above Serbithang, on trees and rock.

Coccocarpia palmicola (Sprengel) Arvidss. & D. Galloway

Amrimo, on rock. Reported from Bhutan by Upreti and Ranjan (1988).

**Coccocarpia pellita* (Ach.) Müll. Arg.

Serbithang, on rock.

- **Collema subnigrescens* Degel.
Rather common on trees, Bajo, Chilaila, Dochola & Lungtenphu.
- **Coriscium viride* (Ach.) Vainio
Dochola, on mosses. Only the squamulose thallus found, not the basidiocarps. The lichen name is used here, in the absence of a valid name for the basidiomycete genus *Phytoconis*.
- **Dendriscoaulon* sp.
Above Serbithang, on tree. No name is available for this cyanophilic element of a *Sticta* photosymbiodeme.
- **Dermatocarpon miniatum* (L.) Mann.
Lungtenphu, on rock.
- **Dibaeis pulogensis* (Vainio) Kalb & Gierl
Dochola, on soil.
- **Dibaeis soreciata* Kalb & Gierl
Lungtenphu, on soil.
- **Dimerella lutea* (Dickson) Trev.
Dochola, on mosses.
- **Diploschistes actinostomus* (Pers. in Ach.) Zahlbr.
Serbithang, on rock.
- **Diploschistes gypsaceus* (Ach.) Nyl.
Serbithang, on soil.
- **Diploschistes muscorum* (Schreber) Norman
Lungtenphu, on soil.
- **Diplotomma himalayense* S. Singh & Awas.
Dochola, on trees.
- Evernia mesomorpha* Nyl.
Chilaila, on trees. Reported from Bhutan by Søchting (1999).
- Everniastrum cirrhatum* (Fr.) Hale ex Sipman
Common in all localities on various substrates. Reported from Bhutan by Upreti and Ranjan (1988) and Søchting (1999).
- Everniastrum nepalense* (Taylor) Hale ex Sipman
Common in all localities on various substrates. Reported from Bhutan by Upreti and Ranjan (1988) and Søchting (1999).
- **Everniastrum sorocheilum* (Vainio) Hale ex Sipman
Lawala, on trees.

- **Flavoparmelia caperata* (L.) Hale
Rather common, Chela, Lungtenphu, Phobjika, near bird observatory hut and Serbithang; on trees but also on soil and rock.
- **Flavopunctelia flaventior* (Stirton) Hale
Lungtenphu and Serbithang, on trees, with apothecia, which is infrequent in this species.
- **Flavopunctelia soledica* (Nyl.) Hale
Serbithang, on tree.
- **Fuscopannaria caerulescens* P.M. Jørg.
Phajoding, on tree.
- **Fuscopannaria leucophaea* (Vahl) P.M. Jørg.
Dochola, on tree.
- **Graphina anguina* (Mont.) Müll. Arg.
Dochola, on tree trunks and branches.
- **Graphis elegans* (Borrer ex Sm.) Ach.
Dochola and Dolong-Tango, on tree trunks and branches.
- **Graphis scripta* (L.) Ach.
Dochola, rather common on branches.
- **Haematomma africanum* (Steiner) Dodge
Chilaila, Dochola and Dolong-Tango, on tree trunks and branches.
- Haematomma wattii* (Stirton) Zahlbr.
Reported from Bhutan by Søchting (1999). Not found in the present material.
- **Heterodermia comosa* (Eschw.) Follm. & Redon
Rather common, Lungtenphu, Serbithang and Bajo, on branches and shrubs.
- Heterodermia diademata* (Taylor) Awas.
Common in nearly all localities, on various substrates. Reported from Bhutan by Søchting (1999).
- **Heterodermia dissecta* (Kurok.) Awas.
Amrimo, on rock.
- **Heterodermia galactophylla* (Tuck.) Trev.
Amrimo, on branch. Not previously reported from the Himalayas but probably confused with related species.
- **Heterodermia himalayensis* (Awas.) Awas.
Lungtenphu, Phajoding-Chokhortse and Phobjika, on rock.
- **Heterodermia japonica* (M. Satô) Swinscow & Krog
Chilaila and Lungtenphu, on rock.

- Heterodermia leucomelos* (L.) Poelt ssp. *boryi* (Fée) Swinscow & Krog
Rather rare, Chilaila, Dochola, Chela and Tashigang, often confused with *H. verruculifera*. Reported from Bhutan by Upreti and Ranjan (1988, as *H. neoleucomelaena* f. *sorediosa*) and Söchting (1999).
- **Heterodermia microphylla* (Kurok.) Skorepa
Gogona, on rock.
- **Heterodermia obscurata* (Nyl.) Trev.
Rather common, Chela, Dochola, Lungtenphu and Serbithang, on trees, soil and rock.
- **Heterodermia pellucida* (Awas.) Awas.
Chilaila, on *Rhododendron*.
- **Heterodermia podocarpa* (Bél.) Awas.
Dochola, Khasadrapchung and Lungtenphu, on *Cupressus* and other trees.
- Heterodermia speciosa* (Wulfen) Trev.
Rather common, Amrimo, Bajo, Lungtenphu and above Serbithang, on trees and rock.
Reported from Bhutan by Upreti and Ranjan (1988, as *H. tremulans*).
- **Heterodermia togashii* (Kurok.) Awas.
Dochola, on tree.
- **Heterodermia verruculifera* (Kurok.) W.A. Weber
Rather common, Chilaila, Chela, Dochola, Dolong-Tango, Lawala, Serbithang and Tashigang, on various substrates.
- **Homostegia piggotii* (Berk. & Broome) P. Karst.
Chilaila and below Dolong, lichenicolous on *Cetrelia olivetorum* and *Parmotrema* cf. *crisiferum*.
- **Hyperphyscia adglutinata* (Floerke) Mayrh. & Poelt
Bajo, on branches.
- **Hypogymnia delavayi* (Hue) Rass.
Phajoding-Chokhortse, on tree.
- **Hypogymnia hypotrypa* (Nyl.) Rass.
Rather common, Chela, Chilaila, Dochola, below Dolong, Lawala, Pomela and above Serbithang, mostly on trees.
- Hypogymnia physodes* (L.) Nyl.
Reported from Bhutan by Upreti and Ranjan (1988). Not found in our material.
- **Hypogymnia pseudobitteriana* (Awas.) Awas.
Phobjika, near bird observatory hut, on trees.
- **Hypogymnia pseudoenteromorpha* M.-J. Lai
Chela and Dochola, on trees. Identity not fully certain, but material has been compared to Taiwanese specimens.

- **Hypogymnia pseudophysodes* (Asah.) Rass.
Above Serbithang, on trees.
- Hypogymnia vittata* (Ach.) Parr.
Rather common, Chilaila, Dochola, below Dolong, Gogona, Lawala, Phajoding and Phobjika, mostly on trees. Reported from Bhutan by Upreti and Ranjan (1988).
- **Hypotrachyna scytophylla* (Kurok.) Hale
Chela, Lawala and Phobjika, on trees and rock.
- **Hypotrachyna sinuosa* (Sm.) Hale
Chilaila and Dochola, on branches.
- **Icmadophila ericetorum* (L.) Zahlbr.
Dochola and Lungtenphu, on soil.
- Ioplaca pindarensis* (Räs.) Poelt & Hinteregger
Reported from Bhutan by Søchting (1999). Not found in our material.
- **Lasallia pertusa* (Rass.) Llano
Chilaila and Pobjika, near bird observatory hut, on rock.
- **Lecanora albella* (Pers.) Ach.
Chilaila, Dochola, Khasadrapchung and Lungtenphu, on trees.
- **Lecanora argentata* (Ach.) Malme
Chilaila and Serbithang, on branches.
- **Lecanora chondroderma* Zahlbr.
Chilaila, on soil in alpine area.
- **Lecanora fimbriatula* Stirton
Dochola, on tree. So far only known from India (Lumbsch *et al.*, 1996).
- **Lecanora flavidorufa* Hue
Rather common, Chilaila, Dochola, below Dolong and Phobjika, on trees. So far only known from China (Lumbsch *et al.*, 1996).
- **Lecanora leprosa* Fée
Dochola, Khasadrapchung, Lungtenphu and wangli, on trees.
- Lecanora sommervellii* Paulson
Reported from Bhutan by Søchting (1999). Not found in our material.
- **Lecanora symmicta* (Ach.) Ach.
Dochola, on trees.
- **Lecidea hypomela* Nyl.
Dochola, on tree.
- **Lecidea paraclita* Nyl.
Dochola, on wood. Apparently new to the Himalayas.

- **Lepraria nigrocincta* Diederich, Sérusiaux & Aptroot
Dochola, on trees. This is the first report of this species from the Northern Hemisphere.
- **Leprocaulon arbuscula* (Nyl.) Nyl.
Bajo, on trees.
- **Leptogium asiaticum* P.M. Jørg.
Rather common, Chela, Dolong-Tango, Lawala, Lungtenphu, Serbithang and Tashigang, on trees and shrubs.
- **Leptogium austroamericanum* (Malme) Dodge
Arimo, on tree.
- Leptogium burnetiae* Dodge
Rather common, Dolong-Tango, Lungtenphu, Phajoding-Chokhortse, above Serbithang and Tashigang, on trees and rock. Reported from Bhutan by Upreti and Ranjan (1988).
- **Leptogium cyanescens* (Rabenh.) Koerber
Amrimo, on soil.
- **Leptogium denticulatum* Nyl.
Amrimo, on branch.
- **Leptogium laceroides* B. de Lesd.
Chilaila, on tree.
- **Leptogium moluccanum* (Pers.) Vainio
Chela and Dolong-Tango, on trees and rock.
- **Leptogium pedicellatum* P.M. Jørg.
Rather common, Chilaila, Phajoding, Phajoding-Chokhortse and Lungtenphu, on trees.
- **Leptogium phyllocarpum* (Pers.) Mont.
Bajo, on tree.
- Leptogium trichophorum* Müll. Arg.
Rather common, Dolong-Tango, below Dolong, Lawala, Phajoding-Chokhortse and above Serbithang, on trees. Reported from Bhutan by Upreti and Ranjan (1988) and Söchting (1999).
- **Lobaria fuscotomentosa* Yoshim.
Amrimo, on tree.
- **Lobaria kurokawae* Yoshim.
Dochola, where it is abundant on trees, and Phajoding-Chokhortse.
- **Lobaria meridionalis* Vainio
Rather common, Chilaila, Gogona and Serbithang, on trees.

Lobaria pindarensis Räs.

Common, on nearly all localities, mostly on trees but also on rock. Reported from Bhutan by Reported from Bhutan by Upreti and Ranjan (1988).

**Lobaria quercizans* Michaux

Common, on nearly all localities, mostly on trees but also on rock.

Lobaria retigera (Bory) Trev.

Rather common, Amrimo, Dochola, below Dolong, Dolong-Tango, Phajoding and Phajoding-Chokhortse. Reported from Bhutan by Upreti and Ranjan (1988) and Söchting (1999).

**Menegazzia dissecta* (Rass.) Hafellner

Dochola, Gogona, Phobjika, Serbithang and Tashigang, on trees and rock. A rarely reported taxon that has only recently been raised to species level. It grows sometimes side-by-side with the next species in Bhutan, retaining its characteristic morphology.

**Menegazzia terebrata* (Hoffm.) Massal.

Chela, Chailila, Dochola and above Serbithang, on trees and rock.

**Micarea misella* (Nyl.) Hedl.

Dochola, on wood. Not previously reported from the Himalayas, but probably overlooked or confused. The material is richly fertile.

**Micarea pycnidiophora* Coppins & P. James

Dochola, on branch. Apparently new to the Himalayas, but doubtlessly overlooked.

**Mycoblastus fucatus* (Stirton) Zahlbr.

Dochola, on tree. Apparently new to the Himalayas, but doubtlessly overlooked.

**Mycoblastus sanguinarius* (L.) Norman

Dochola, on tree.

**Myelochroa aurulenta* (Tuck.) Elix & Hale

Amrimo, Chela and below Dolong, on trees and soil.

**Nephroma helveticum* Ach.

Rather common, Dolong-Tango, Khasadrapchung, Lawala, Phajoding, Phajoding-Chokhortse and Pomela, on trees, rock and soil.

**Nephroma isidiosum* (Nyl.) Gyelnik

Rather common, Amrimo, Lawala, Phajoding-Chokhortse and above Serbithang, on trees, rock and soil.

**Nephroma nakaoui* Asah.

Dochola and above Serbithang, on trees.

**Nephromopsis morrisonicola* M.-J. Lai

Lawala, on tree.

- Nephromopsis nephromoides* (Nyl.) Ahti & Randle
Rather common and locally abundant, below Dolong, Dochola and Lawala. Reported from Bhutan by Randle *et al.* (2002).
- Nephromopsis pallescens* (Schaerer) S.Y. Park
Common and locally abundant, Dochola, below Dolong, Lawala, Lungtenphu, Phobjika and Serbithang, mostly on trees. Reported from Bhutan by Upreti and Ranjan (1988, also as *Cetraria wallichiana*) and Søchting (1999).
- Nephromopsis stracheyi* (Church. Bab.) Müll. Arg.
Reported from Bhutan by Randle *et al.* (2002). Not found in the present material.
- **Normandina pulchella* (Borrer) Nyl.
Phajoding-Chokhortse, on tree.
- **Ochrolechia africana* Zahlbr.
Rather common, Chilaila, Dochola, Gogona and Phajodong, on trees.
- **Ochrolechia rosella* (Müll. Arg.) Verseghy
Dochola, on tree.
- **Ochrolechia yasudae* Vainio var. *corallina* Poelt
Phajoding, on rock. A rarely reported taxon endemic to the Himalayas that might need recognition at species level.
- **Ophioparma ventosum* (L.) Norman
Chilaila, on rock.
- Pannaria emodii* P.M. Jørg.
Described from Bhutan by Jørgensen (2001). Not found in our material.
- **Parmelia fraudans* (Nyl.) Nyl.
Chilaila, on rock. New to the Himalayas.
- **Parmelia marmorata* Nyl.
Chilaila and Dochola-Tashigang, on rock.
- **Parmelia masonii* Essl. & Poelt
Chela and Chilaila, on rock.
- **Parmelia meiophora* Nyl.
Chilaila, on rock.
- **Parmelia ricasolioides* Nyl.
Chilaila, Dochola and Phajoding-Chokhortse, on trees. A conspicuous species, endemic to the Himalayas.
- **Parmelia squarrosa* Hale
Dolong-Tango and above Serbithang, on trees. Apparently new to the Himalayas.

- **Parmelia submutata* Hue
Rather common, Dochola, below Dolong, Dolong-Tango, Phajoding and above Serbithang, on rock.
- **Parmelia sulcata* Taylor
Tashigang, on tree.
- **Parmotrema austrosinense* (Zahlbr.) Hale
Amrimo, Bajo, Lungtenphu and Serbithang, on rock, tree trunks and branches.
- **Parmotrema cristiferum* (Taylor) Hale
Amrimo, on rock.
- **Parmotrema nilgherrense* (Nyl.) Hale
Dolong-Tango and Gogona, on trees.
- Parmotrema praesorediosum* (Nyl.) Hale
Amrimo, Lungtenphu and Phobjika, near bird observatory hut, on rock. Reported from Bhutan by Upreti and Ranjan (1988, as *Parmelia*).
- **Parmotrema rampoddense* (Nyl.) Hale
Amrimo, on rock.
- Parmotrema tinctorum* (Nyl.) Hale
Amrimo and Bajo, on branches and rock. Reported from Bhutan by Upreti and Ranjan (1988, as *Parmelia*).
- Peltigera canina* (L.) Willd.
Reported from Bhutan by Upreti and Ranjan (1988). Not found in our material.
- **Peltigera cichoracea* Jatta
Phajoding-Chokhortse, on soil.
- Peltigera dolichorrhiza* (Nyl.) Nyl.
Dochola, Phajoding-Chokhortse, Serbithang and above Serbithang, on soil. Reported from Bhutan by Upreti and Ranjan (1988).
- **Peltigera dolichospora* (Lu) Vitik.
Lawala, Phajoding and Phajoding-Chokhortse, on tree and soil.
- **Peltigera horizontalis* (Hudson) Baumg.
Chela, on soil in forest.
- **Peltigera membranacea* (Ach.) Nyl.
Dochola, Lawala and above Serbithang, on soil.
- **Peltigera pindarensis* Awas. & Joshi
Dochola, on soil.
- **Peltigera polydactylon* (Necker) Hoffm.
Dochola, on soil.

- **Peltigera praetextata* (Floerke ex Sommerf.) Zopf
Chilaila, Dochola, serbithang and above Serbithang, on trees and soil.
- **Peltigera rufescens* (Weiss) Humb.
Chilaila and Lungtenphu, on soil.
- **Pertusaria albescens* (Hudson) M. Choisy & Werner
Dochola and Khasadrapchung, on trees.
- **Pertusaria amara* (Ach.) Nyl.
Chela and Lawala, on trees.
- **Pertusaria pertusa* (Weigel) Tuck.
Dochola, on trees.
- **Pertusaria velata* (Turner) Nyl.
Dochola, on trees.
- **Phaeophyscia endococcinodes* (Poelt) Essl.
Chilaila, on branches.
- Phaeophyscia hispidula* (Ach.) Moberg
Rather common, Amrimo, Dochola, Gogona, Lungtenphu, Phajoding and above Serbithang, on trees and rock. Reported from Bhutan by Upreti and Ranjan (1988).
- **Phaeophyscia limbata* (Poelt) Kashiw.
Chela, Chilalila, Dochola, Lungtenphu and above Serbithang, on trees and rock.
- **Phaeophyscia primaria* (Poelt) Kashiw.
Lungtenphu, on rock.
- **Phaeophyscia trichophora* (Hue) Essl.
Bajo, on branches.
- **Phlyctis argena* (Sprengel) Flotow
Dochola, on trees. Not previously reported from the Hirnalayas, but this sterile taxon has probably been overlooked.
- **Phyllopsora* sp.
Chilaila and Dochola, on trees. Sterile, but rather conspicuous with white-felty, deeply liner-divided lobes.
- **Phycia aipolia* (Ehrh.) Fürnrrohr
Serbithang, on branches.
- **Phycia caesia* (Hoffm.) Fürnrrohr
Chilaila, on rock.
- **Phycia tribacoides* Nyl.
Serbithang, on rock.

**Physconia detersa* (Nyl.) Poelt
Phajoding-Chokhortse, on tree.

**Physconia grisea* (Lam.) Poelt
Lawala, on rock.

**Platismatia erosa* Culb. & C. Culb.
Chela, Chilaila and Dochola, on trees.

**Porpidia crustulata* (Ach.) Hertel & Knoph
Chilaila, on pebbles.

**Pseudocyphellaria aurata* (Ach.) Vainio
Amrimo, on trees.

**Punctelia borreri* (Sm.) Krog
Lungtenphu, on trees.

**Pyrenula dermatodes* (Borrer) Schaerer
Dochola, on tree.

***Pyrrhospora bhutanensis* Aptroot, sp. nov.** (Figs. 3-6)

Type: BHUTAN, Thimphu Distr., Dochola area, 89°44'E; 27°29'N, 3000 m, on tree trunk, 31 Oct. 1999, leg. F.J. Feijen (ABL, holotype).

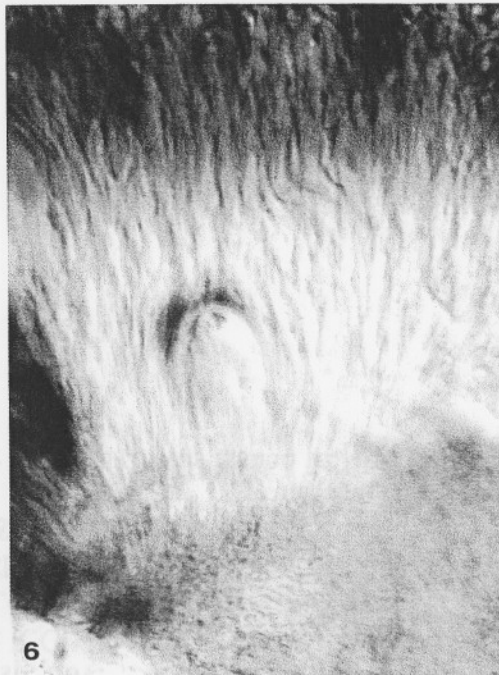
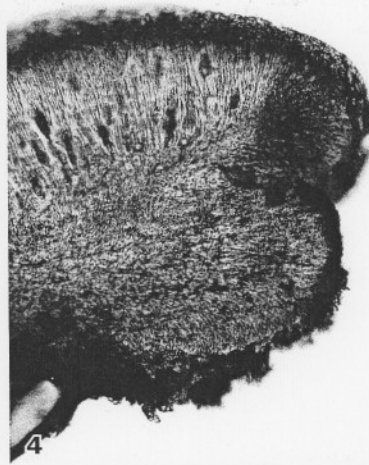
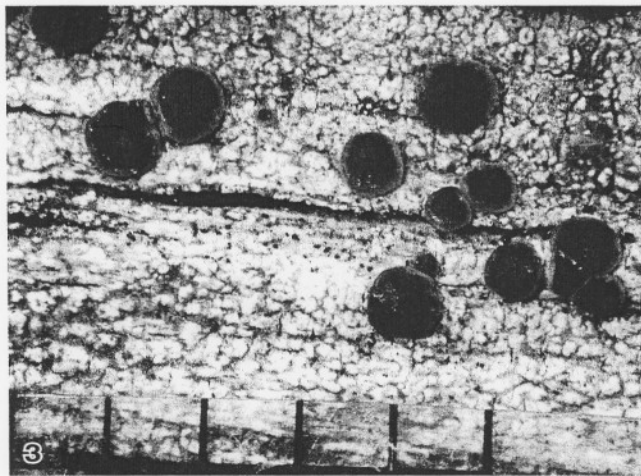
Pyrrhospora thallo ut in *Lecidello elaeochromo*, C+rubescens, K+flavescens. *Apothecia* convexa, rubiginosa, marginata. *Asci* typo *Lecanora*. *Ascosporis* simplicis, 18-23 × 9-12 μm magnis.

Thallus (Fig. 3) yellowish grey, granular areolate to scurfy, thinly corticate, areoles surrounded by a darker, grey, corticate matrix. *Algae* chlorococcoid. *Apothecia* (Fig. 4) common, redbrown with paler margin, round, flat to usually convex, up to 1.5 mm diam. *Excipulum* (Fig. 5) massive, sometimes even in two layers, hyaline, interspersed with minute oil droplets, consisting of radial, anastomosing hyphae. *Hypothecium* hyaline, ca. 200 μm thick. *Epihymenium* fine granular, reddish brown, not dissolving in KOH. *Paraphyses* simple, slender. *Asci* (Fig. 6) *Lecanora*-type, containing 8 ascospores. *Ascospores* simple, ellipsoid, hyaline, 18-23 × 9-12 μm. Chemistry of the thallus: C+orange, K+yellow, UV-negative (xanthone present, probably arthothelin).

Additional specimen: Tashigang Gompa, 2800 m, on branch, 5 Decemebr 1999, leg. F.J. Feijen (ABL).

This species is characterized by the large ascospores, massive, interspersed excipulum and C+ orange thallus. It superficially resembles a *Biatora*, but differs by the firm excipulum. The thallus bears a strong resemblance to *Lecidella elaeochroma*, but the apothecia are convex and redbrown.

**Pyxine minuta* Vainio
Phobjika, near bird observatory hut, on rock.



Figs. 3-6. *Pyrrhospora bhutanensis*, holotype. 3. Habitat. 4. Section through apothecium. 5. Excipulum. 6. Hymenium with ascus, stained in IKI (Lugol).

**Pyxine philippina* Vainio

Rather common, Amrimo, below Dolong, Phajoding, Phajoding-Chokhortse and Tashigang, on trees and rock.

Fungal Diversity

**Pyxine soredata* (Ach.) Mont.

Amrimo, Lungtenphu, Serbithang and above Serbithang, on trees and rock.

Ramalina confusa Awas.

Rather common, Chilaila, Dochola, below Dolong, Dolong-Tango, Lawala, Lungtenphu, Phobjika, near bird observatory hut, above Serbithang, on trees and shrubs. Reported from Bhutan by Upreti and Ranjan (1988).

**Ramalina angulosa* Laurer

Tashigang, on tree.

Ramalina farinacea (L.) Ach.

Rather common, Chilaila, Dochola, below Dolong, Dolong-Tango, Lawala, Lungtenphu, Phobjika, near bird observatory hut, above Serbithang, on trees and shrubs. Reported from Bhutan by Upreti and Ranjan (1988).

Ramalina hossei Vainio

Rather common, Amrimo, Chela, Chilaila, Dochola, Dolong-Tango, Lungtenphu and Phajoding, on trees and shrubs. Reported from Bhutan by Kashiwadani (1988).

**Ramalina inflata* (J.D. Hooker & Taylor) J.D. Hooker & Taylor

Chilaila, on tree.

**Ramalina sinensis* Jatta

Rather common, Chilaila, Dochola, Dolong-Tango, Tashigang and Thimphu, transmission tower, on trees and branches.

**Rhizocarpon geographicum* (L.) DC.

Chilaila, on rock.

**Rhizoplaca chrysoleuca* (Sm.) Zopf

Lungtenphu and Phobjika, on rock.

**Rimelia cetrata* (Ach.) Hale & A. Fletcher

Amrimo, Dolong Tango and Phajoding-Chokhortse, on trees and rock.

Rimelia reticulata (Taylor) Hale & A. Fletcher

Rather common, Amrimo, Bajo, Khasadrachung and Lungtenphu, on trees and rock. Reported from Bhutan by Upreti and Ranjan (1988, as *Parmelia*).

**Rinodina conradii* Koerber

Dochola, on tree.

**Rinodina exigua* S.F. Gray

Phajoding-Chokhortse, on tree.

**Ropalospora chlorantha* (Tuck.) S. Ekman

Dochola, on smooth-barked trees. So far only known from eastern North America, representing a considerable range extension.

- **Sclerophora farinacea* (Chevall.) Chevall.
Dochola, on trees. Not previously reported from the Himalayas.
- **Stereocaulon foliolosum* Nyl.
Chela and Gogona, on soil.
- **Stereocaulon himalayense* Awas. & Lamb
Gogona, on soil.
- **Stereocaulon massartianum* Hue
Gogona, Phajoding, Pomela and Serbithang, on soil.
- **Stereocaulon myriocarpum* Th. Fr. s.l.
Rather common, Chilaila, Gogona, Phobjika and Pomela, on rock and soil.
- **Stereocaulon piluliferum* Th. Fr.
Pomela, on soil.
- Stereocaulon pomiferum* Duvign.
Chilaila, on rock. Reported from Bhutan by Söchting (1999).
- Sticta henryana* Müll. Arg.
Reported from Bhutan by Upreti and Ranjan (1988).
- **Sticta limbata* (Sm.) Ach.
Belong Dolong and Lungtenphu, on trees.
- Sticta nylanderiana* Zahlbr.
Rather common, Dochola, Gogona and Phajoding-Chokhortse, on trees. Reported from Bhutan by Upreti and Ranjan (1988).
- Sticta platyphylloides* Nyl.
Rather common, Chilaila, Dochola, Dolong-Tango, Lawala, Phobjika, Pomela and above Serbithang, on trees. Reported from Bhutan by Söchting (1999).
- Sticta praetextata* (Räs.) Awas.
Above Serbithang, on tree. Reported from Bhutan by Söchting (1999).
- **Sticta weigeli* Isert
Amrimo, on rock.
- **Strangospora* sp.
Dochola, on tree. Possibly an undescribed species with rather large ($7 \times 5 \mu\text{m}$) ascospores, ca. 50/ascus, paraphyses and excipulum greenish, branched and more or less interspersed and hypothecium black.
- Sulcaria sulcata* (Lév.) Bystrek
Rather common, Chela, Dochola, Dolong-Tango, Gogona, Phajoding-Chokhortse and Tashigang, on trees. Reported from Bhutan by Upreti and Ranjan (1988).

- Sulcaria virens* (Taylor) Bystrek
Chela, Dochola and Lawala, on trees. Reported from Bhutan by Søchting (1999).
- **Tephromela atra* (Hudson) Hafellner ex Kalb
Dochola, on tree.
- Thamnolia vermicularis* (Sw.) Ach. ssp. *subuliformis* (Ehrh.) Schaerer
In high altitudes only, Chilaila, on soil. Reported from Bhutan by Søchting (1999).
- **Thelotrema subtile* Tuck.
Dochola, on tree.
- **Thyrea confusa* A. Henssen
Chilaila, on rock.
- **Trapelia coarctata* (Sm.) M. Choisy
Serbithang, on rock.
- **Trapelia mooreana* (Carroll) P. James
Dochola, on rock.
- **Trapeliopsis granulosa* (Hoffm.) Lumbsch
Dochola, Lungtenphu and Tashigang, on wood, soil and mosses. Part of the material is non-sorediate but richly fertile.
- **Tremella lobariacearum* Diederich & M.S. Christ.
Chela, Phajoding-Chokhortse and above Serbithang, lichenicolous on respectively *Lobaria pindarensis*, *Lobaria kurokawae* and *Sticta praetextata* on trees.
- **Tremella parmeliarum* Diederich
Bajo, lichenicolous on *Parmotrema austrosinense*.
- Tuckneraria ahtii* Randlane & Saag
Chilaila and Tashigang, on Rhododendron. Reported from Bhutan by Upreti and Ranjan (1988, as *Cetraria delavayi*) and Randlane *et al.* (2002).
- Tuckneraria laureri* (Kremp.) Randlane & Saag
Chilaila, Lawala, Phajoding-Chokhortse and above Serbithang, on trees. Reported from Bhutan by Upreti and Ranjan (1988, as *Cetraria*) and Randlane *et al.* (2002).
- **Umbilicaria badia* Frey
Pobjika, near bird observatory hut, on rock.
- **Umbilicaria indica* Frey
Rather common, Chilaila, Chela, Dolong-Tango and Phajoding, on rock.
- **Umbilicaria thamnoides* Hue
Tashigang, on rock.
- **Umbilicaria vellea* (L.) Ach.
Lungtenphu, on rock.



Fig. 7. *Usnea longissima* on flowering *Rhododendron wightii* in Chilaila at 4000 m.

Fungal Diversity

- **Usnea bismolliuscula* Zahlbr.
Bajo, Chilaila, Dochola, below Dolong and Dolong-Tango, on tree trunks and branches.
- **Usnea dasaea* Stirton
Dochola, on tree.
- **Usnea dendritica* Stirton
Dochola, on tree.
- Usnea eumitrioides* Motyka
Reported from Bhutan by Upreti and Ranjan (1988). Not found in the present material.
- **Usnea fulvoreaegens* (Räs.) Räs.
Chilaila, below Dolong, Gogona and Phobjika, near bird observatory hut, on trees.
- Usnea himalayana* Church. Bab.
Dochola, Lawala and Tashigang, on trees. Reported from Bhutan by Upreti and Ranjan (1988).
- **Usnea hirta* (L.) Wigg.
Chilaila, below Dolong and Lungtenphu, on trees.
- Usnea longissima* Ach. (Fig. 7)
Common on nearly all localities, on trees. Reported from Bhutan by Upreti and Ranjan (1988) and Söchting (1999).
- **Usnea orientalis* Motyka
Rather common, Chilaila, Dochola, below Dolong, Lawala and Tashigang, on trees.
- **Usnea picta* (Steiner) Motyka
Below Dolong, Gogona and Phajoding, on trees.
- Usnea splendens* Stirton
Reported from Bhutan by Upreti and Ranjan (1988). Not found in the present material.
- Usnea subfloridana* Stirton
Reported from Bhutan by Upreti and Ranjan (1988). Not found in the present material.
- **Verrucaria aethiobola* Wahlenb.
Chilaila, on rock.
- **Xanthoparmelia tinctina* (Maheu & Gillet) Hale
Lungtenphu, on rock.
- **Xanthoria ulophyllodes* Räs.
Serbithang, on branches.
- **Xanthoria fallax* (Hepp) Arnold
Phobjika, near bird observatory hut, on tree.

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(Received 4 April 2002; accepted 16 July 2002)