ENUMERATION OF MACROLICHENS FROM NILGIRI HILLS, INDIA

K. P. SINGH AND S. R. SINGH

Lichenology Laboratory, Department of Botany, Lucknow University, Lucknow

ABSTRACT

The paper lists 117 species of macrolichens from Nilgiri hills, India, arranged in a tabular form indicating the localities, habitat and frequency.

INTRODUCTION

Nilgiri hills consisting of spurs in the Western Ghats lie in the Nilgiri district of Tamil Nadu between 10° 1′ to 11° 45′ N latitude and 76° 00′ to 77° 15′ E longitude. The highest of these hills is Doddabetta (2621 m) and is situated at about 5 km. east of Ootacamund city. The average elevation of these hills is 1950 m above seal evel. The parent rocks are gneissic. The climate may be described as tropical montane to temperate type with an annual rain fall of 190.5 cm, average maximum temp. of 23.3°C and average minimum temp. of 7.2°C. The famous hill stations Ootacamund and Coonoor are situated in these hills.

The flora is rich in variety. The lichen flora though rich in variety, is not uniformly so due to the interpolation of plantations of exotic plants and interference by biotic factors. The macrolichen vegetation is generally absent or represented by few dispersed taxa in the foot hills below an altitude ca. 1200 m. The growth of these in variety and number is significantly abundant at an alt. of 1200-2400 m. Ootacamund, Coonoor, Kotagiri and villages such as Kilkotagiri, Sholurmatta, Kodanad, Emerald usually have very poor macrolichen flora within the town or village area due to human interference and cultivation of vegetable crops. But the road-side trees on connecting roads from different directions to these towns and villages are usually inhabited by good growth of macrolichen species belonging to genera *Leptogium*, *Parmelia*, *Heterodermia*, *Dirinaria*, *Physcia*, and *Usnea*. Parks and gardens within the towns also possess macrolichens, the growth of these macrolichen plants is usually stunted in comparison to the growth outside the towns. Terricolous *Stereocaulon austroindicum* and species of *Usnea* occur along the road sides of Ootacamund to Kilkotagiri and Ootacamund to Avalanche.

Macrolichens are more profuse in evergreen forest patches popularly called 'sholas' which occur along the water courses here and there and consist of members of the families Myrtaceae, Lauraceae, Styraceae and Ericaceae. Corticolous lichen taxa such as *Parmelia tinctorum*, *P. nilgherrensis*, *P. rudecta*, *Heterodermia comosa*, *H. coronata*, *H. isidiophora*, *H. obscurata*, *Pseudocyphellaria argyracea*, *Physcia integrata*, *Dirinaria confluens*, *Usnea flexilis*, *Ramalina farinacea*, *Pannaria leucosticta* grow on tree trunks in the sholas. Interior areas of the sholas near streams usually have species of *Collema* and occasionally species of *Leptogium* in the shady and dark places on tree trunks and on boulders. There are only few areas e.g. Doddabetta peak attaining an altitude of over 2400 m and in such areas there is often much interference due to visitors. The few trees that occur near about 2400 m are often inhabited by *Usnea* species, the other genera are scarce. The tree trunks of *Rhododendron nilagiricum* Zenk, a

common species in sholas and in open formations at these altitudes, are inhabited by the species of *Parmelia formosana*, *P. exsecta*, *P. texana*, *Hypogymnia pseudobetteriana*, *Heterodermia boryi*, *Usnea* and *Ramalina* species. *Stictafuliginosa* and species of *Cladonia* occur on ground at these altitudes.

The rapid progress in plantations of *Eucalyptus*, *Thea* and *Cinchona* may apparently have played an important role in lichen vegetation. Since no records are available to us of the types of the vegetation that existed before these plantations were resorted to, and since large areas are under these plantations, the following possibilities seem probable. If the areas were grassy, plantations of *Eucalyptus* have not much materially effected the lichen vegetation because grassy lands are devoid of lichens and even now except at the bases of *Eucalyptus* trees the lichens are absent else-where. If indigenous arboreal flora existed before, then plantations have had adverse effect on lichen growth. Tea bushes even now have good lichen vegetation. The lichen taxa which commonly grow on twigs are species of *Parmelia* and *Heterodermia*. *Cinchona* trees are grown in shady areas in Naduvattam and may be dense or sparse and these plants apparently help for the development of a more luxuriant growth of lichens. It may be partly due to the coarse bark of *Cinchona* affording a good scaffolding for the initiation of lichen growths of all the three (crustose, foliose, fruticose) types. The macrolichen species collected from trees of *Eucalyptus*, *Thea*, and *Cinchona* are presented in the Table 1.

Table 1

Name of the species	Cinchona bark	Thea bark	Eucalyptus bark
Coccocarpia pellita (Ach.) Müll Arg.	—	—	+
Collema nigrescens (Huds.) DC	—	—	+
Erioderma polycarpum Fée.	—	—	+
Heterodermia boryi (Fée) Singh et Singh	—	+	+
H. coronata (Kurok.) Awas.	+	—	—
H. dendritica (Pers.) Poelt	+	—	+
H. diademata (Tayl.) Awas.	+	—	—
H. hypoleuca (Müll. Arg.) Trev.	+	—	—
H. isidiophora (Nyl.) Awas.	—	+	+
H. pseudospeciosa (Kurok.) Culb.	+	—	—
Leptogium tremelloides (L. f.) S. Gray	—	—	+
Pannaria leucosticta Tuck.	—	—	+
Parmelia cirrhata Fr.	+	+	—
P. direagens Hale	—	+	—
P. exsecta Tayl.	+	—	+
P. hababiana Gyel.	—	+	—
P. koyaensis Asah.	+	—	—
P. mellissii Dodge	+	—	—
P. nepalensis Tayl.	+	—	+
P. nilgherrensis Nyl.	+	—	—
P. reticulata Tayl.	—	+	+
P. rudecta Ach.	—	+	—
P. wallichiana Tayl.	+	+	—
Ramalina subcomplanata Nyl.	—	—	+
Usnea flexilis Stirt.	—	—	+
U. spinosula Stirt.	+	—	+

The present study is based on investigations of collections made from different localities (marked I—X in the table II and detailed below), in Nilgiris during 1970-73 by D. D. Awasthi and K. P. Singh or K. P. Singh alone and specimens are preserved in LWU. All the taxa are listed in tabular form (Table 2), the families are arranged according to Zahlbruckner's (1926) system. Genera and species are arranged alphabetically. The taxa reported new to Indian flora are marked by an asterisk (*). Identifications have been done on the basis of authentic specimens preserved in Herb. Awasthi and also by literature dealing with macrolichens particularly by AWASTHI (1960, 1965, 1973), DEGELIUS (1954), HALE (1965, 1967), HALE AND KUROKAWA (1964), KUROKAWA (1962, 1973), MOTYKA (1936-1938), SIERK (1964) and YOSHIMURA (1971). The enumeration comprises 9 families, 21 genera and 117 species of lichens from the Nilgiri hills. It is hoped that several taxa would be added to this list in more exhaustive collections.

Table 2

Name of Families/Genera/ Species	Habitat	Localities										Distribution in the area
		I	II	III	IV	V	VI	VII	VIII	IX	X	
Fam. Collemataceae												
COLLEMA (Wigg.) Zahlbr.												
Collema nigrescens (Huds.) DC	C	+	+	+	—	+	+	+	+	—	—	A
C. subnigrescens Degel. ..	C	—	+	—	—	—	—	—	—	—	—	S_1
LEPTOGIUM S. Gray												
L. azureum (Sw.) Mont. ..	C	—	—	—	—	—	+	—	—	—	—	S_1
L. cyanescens (Ach.) Korb. ..	C	—	—	—	—	—	+	+	—	—	—	S_1
**L. denticulatum* Nyl. ..	C	+	—	—	—	—	—	+	—	—	—	S_1
**L. furfuraceum* (Harm.) Sierk	C	—	—	—	+	—	—	—	—	—	—	S_1
**L. inflexum* Nyl. ..	C	—	+	+	—	—	—	—	—	—	—	S_1
L. isidiosellum (Redd.) Sierk	C	+	+	—	—	—	—	—	—	—	—	S_1
L. saturninum (Dicks.) Nyl. ..	C, S	—	—	+	+	—	—	+	+	—	—	C_1
Fam. Pannariaceae ..												
COCCOCARPIA Pers.												
C. cronia (Tuck.) Vain. ..	C	—	—	—	+	+	+	+	—	—	—	C_1
C. pellita (Ach.) Müll. Arg.	C, S	+	+	—	+	—	—	+	—	—	—	C_1
ERIODERMA Fée												
E. polycarpum Fée ..	C	—	+	+	—	—	—	—	—	—	—	S_1
PANNARIA Ach.												
P. leucosticta Tuck. ..	C	—	+	+	—	—	+	—	—	—	—	S_1

Table 2—Contd.

PARMELIELLA Müll. Arg.													
**P. corallinoides* (Hoff.) Zahlbr.	C	—	—	—	—	—	—	+	—	—	—		S_1
P. microphylla (Sw.) Müll. Arg.	S	—	—	—	—	—	—	+	—	—	—		S_1
**P. plumbea* (Lightf.) Müll. Arg.	C	—	—	—	—	—	—	—	+	—	—		S_1
Fam. Stictaceae													
LOBARIA (Schreb) Zahlbr.													
L. adscripturiens (Nyl.) Hue.	C	—	—	—	—	—	—	+	—	—	—		S_1
L. retigera (Bory) Trev. ..	C	—	—	—	—	—	—	—	+	—	—		S_1
PSEUDOCYPHELLARIA Vain.													
P. argyracea (Bory) Vain. ..	C	—	—	—	+	—	+	+	+	—	—		C_1
P. aurata (Ach.) Vain. ..	C	+	—	—	—	—	—	—	—	—	—		S_1
P. crocata (L.) Vain. ..	C, T	—	—	—	—	—	—	+	+	—	—		S_1
STICTA Schreb.													
**S. cyphellulata* (Müll. Arg.) Hue. ..	C, T	—	—	—	—	—	—	+	—	+	—		S_1
S. fuliginosa (Dicks) Ach ..	C, T	—	+	+	+	—	—	+	+	—	—		C_1
S. weigelii Isert apud Ach. ..	C	—	+	+	—	—	+	+	+	—	—		C_1
Fam. Cladoniaceae.													
CLADONIA (Hill.) Vain.													
C. coneocraea Flk. ..	T	—	—	—	+	—	—	—	—	—	—		S_1
**C. crispata* (Ach.) Fw. ..	T	—	—	—	—	—	—	+	—	—	—		S_1
C. fimbriata (L.) Fr. ..	C	—	—	—	—	—	—	+	—	—	—		S_1
C. furcata (Huds.) Schrad. ..	T	—	—	—	—	—	—	+	—	—	—		S_1
C. pityrea (Floerke) Schaer.	T	—	+	—	—	—	—	+	—	—	—		S_1
C. scabriuscula (Coem.) Sandst.	T	—	—	—	—	—	—	+	—	—	—		S_1
Fam. Stereocaulaceae													
STEREOCAULON (Schreb.) Hoff.													
S. austroindicum Lamb (unpublished)	S, T	+	+	+	+	+	+	+	+	+	+		A
Fam. Parmeliaceae ..													
HYPOGYMNIA (Nyl.) Nyl.													
H. pseudobitteriana (Awas.) Awas.	C	—	+	—	—	—	—	+	—	—	—		S_1

Table 2—Contd.

H. zeylanica (Sant.) Awas. et Singh	C	—	+	—	—	—	—	—	—	—	—	S_1
PARMELIA (Ach.) De Not.													
P. aurulenta Tuck. ..	C	—	+	+	—	—	—	—	—	+	—	C_1
P. borreri Turn. ..	C, S	+	—	—	+	—	—	—	—	—	+	C_1
P. caperata (L.) Ach. ..	C	—	—	—	+	+	+	—	—	—	—	C_1
P. carneopruinata Zahlbr. ..	C	+	—	—	—	—	—	—	—	—	—	S_1
P. cinerascens Lynge ..	C	+	—	—	—	—	—	—	—	—	—	S_1
P. cirrhata Fr. ..	C, T	—	—	+	—	—	—	+	—	+	+	C_1
**P. congensis* Stein. ..	S	—	—	—	—	—	—	+	—	—	—	S_1
**P. cooperi* Stein and Zahlbr.	C	+	—	—	—	—	+	—	—	—	—	S_1
P. crozalsiana B. de. Lesd ..	C	+	—	—	—	—	+	—	—	—	—	S_1
P. direagens Hale ..	C	—	—	+	—	—	—	—	—	—	—	S_1
P. dissecta Nyl. ..	C	+	—	—	—	—	+	—	—	+	—	C_1
P. ecaperata Müll. Arg. ..	C	—	—	—	—	—	+	—	—	—	—	S_1
**P. euneta* Stirt. ..	C	+	—	—	—	—	—	—	—	—	—	S_1
P. exsecta Tayl. ..	C	—	+	+	—	+	+	+	—	+	+	A
P. formosana Zahlbr. ..	C	—	—	—	+	+	—	—	—	—	+	C_1
P. grayana Hue ..	S	+	—	—	—	—	—	+	—	—	—	C_1
P. hababiana Gyel. ..	C	+	+	—	+	—	—	—	—	—	—	C_1
P. imbricatula Zahlbr. ..	C	+	+	—	+	—	—	+	—	—	—	C_1
P. koyaensis Asah. ..	C	—	—	—	—	—	—	—	—	—	+	S_1
P. mellissii Dodge ..	C	+	—	+	—	—	—	+	—	—	+	C_1
P. nepalensis Tayl. ..	C	—	+	+	—	—	—	+	+	+	+	A
P. nilgherrensis Nyl. ..	C	—	+	+	—	—	—	+	+	+	+	A
P. perforata (Jacq) Ach. ..	C	+	—	—	—	—	—	+	—	—	—	S_1
P. perlata (Huds.) Ach. ..	C	—	—	+	—	—	—	—	—	—	—	S_1
P. pseudonilgherrensis (Willd.) Vain.	C	—	—	+	—	—	—	+	+	—	—	C_1
P. quercina (Willd.) Vain ..	C	—	—	—	+	—	—	—	—	—	—	S_1
P. rampoddensis Nyl. ..	C	—	—	—	+	—	—	—	—	—	—	S_1
P. reticulata Tayl. ..	C	+	+	+	—	+	—	+	—	—	—	C_1
P. revoluta Floerke ..	C	—	+	—	+	—	—	—	—	—	—	S_1
P. rudecta Ach. ..	C, S	+	+	+	+	+	+	+	—	—	—	A
P. sancti-angelii Lynge ..	C	—	—	—	—	—	+	—	—	—	—	S_1
P. stuppea Tayl. ..	C, S	—	—	—	+	—	+	+	—	—	—	C_1

Table 2—Contd.

P. subsumpta Nyl. ..	C	—	—	—	—	—	+	—	—	+	—	S_1
P. subtinctoria Zahlbr. ..	C	—	—	—	+	+	—	—	—	—	—	S_1
P. texana Tuck... ..	C	+	—	—	+	+	—	—	—	—	—	C_1
P. tinctorum Nyl. ..	C	+	—	—	+	+	+	+	—	—	—	C_1
P. vexans Zahlbr. ..	C, T	—	—	—	—	—	—	+	+	+	+	C_1
P. wallichiana Tayl. ..	C	—	—	+	—	+	+	—	—	+	+	C_1
Fam. Usneaceae												
RAMALINA Ach.												
R. farinacea (L.) Ach. ..	C	—	—	—	—	—	—	+	—	+	—	S_1
R. fraxinea (L.) Ach. ..	C	—	—	—	+	—	—	—	+	—	—	S_1
R. geniculata Hook. et Tayl.	C	—	—	—	—	—	—	—	—	—	+	S_1
R. inflata Hook. et Tayl ..	C	—	—	—	+	—	+	+	—	—	—	C_1
R. subcomplanata Nyl. ..	C	—	—	—	+	—	+	—	+	—	—	C_1
USNEA Wigg. em Ach.												
U. baileyi (Stirt.) Zahlbr. ..	C	—	—	—	—	—	—	—	+	—	—	S_1
U. bicolorata Mot. ..	C	—	—	—	—	—	—	+	—	—	+	S_1
U. cfr. *ceylonica* Mot. ..	C	—	+	—	—	—	—	+	—	—	—	S_1
U. flexilis Stirt. ..	C	—	+	+	—	—	+	+	+	—	—	C_1
U. florida (L.)Wigg. ..	C	—	+	+	—	—	—	—	—	—	—	S_1
U. fragilis Stirt. ..	C	—	—	—	—	—	—	—	+	—	—	S_1
U. meyeri (Stein) Mot. ..	C	—	+	+	—	—	—	+	+	—	—	C_1
U. pseudocyphellata Mot. ..	C	—	—	—	—	—	—	+	—	—	—	S_1
U. rubicunda Stirt. ..	C	—	—	—	—	—	+	—	—	—	—	S_1
U. spinosula Stirt. ..	C	—	—	—	+	—	+	+	—	—	—	C_1
U. stigmata Mot. ..	C	—	—	—	—	—	—	+	+	—	—	S_1
U. stirtoniana Zahlbr. ..	C	—	—	—	—	—	—	—	—	—	+	S_1
U. subflorida (Zahlbr.) Hat.	C	—	+	—	—	—	—	+	—	—	+	C_1
Fam. Teloschistaceae												
TELOSCHISTES Norm.												
T. flavicans (Sw.) Norm. ..	C	—	+	—	—	—	—	+	+	—	—	C_1
Fam. Physciaceae												
DIRINARIA Tuck.												
D. aegialita var. *angolica* Awas.	C	+	—	—	—	—	—	—	—	—	—	S_1
D. applanata (fée) Awas. ..	C	+	—	—	—	—	—	—	—	—	—	S_1

Table 2—Contd.

L. confusa (Fr.) Awas. ..	C	+	—	—	+	—	—	—	—	—	—	—	C_1
HETERODERMIA Trev. em Poelt													
H. beryi (Fée) Singh et Singh Comb. nov. *Borrera beryi* Fée, Ess. Crypt. Ecorc. Offic., Introduction 96 et tab II, fig. 23. 1824. ..	C, T	—	—	—	—	—	—	+	+	+	+		A
H. comosa (Eschw.) Awas. ..	C	—	—	—	—	—	+	—	—	—	—		S_1
H. coronata (Kurok.) Awas.	C	—	—	—	—	—	—	+	—	+	+		C_1
H. dendritica (Pers.) Poelt ..	C, T	—	—	+	—	—	+	+	+	+	+		A
H. diademata (Tayl.) Awas.	C	—	+	+	+	—	—	—	—	—	+		A
H. dissecta (Kurok.) Awas.	C	—	—	—	—	—	+	+	—	—	—		S_1
H. flabellata (Fée) Awas. ..	C	—	—	—	+	—	—	—	—	+	—		S_1
H. hypocarnea (Yasuda) Awas.	C	+	+	—	—	—	+	+	—	—	—		C_1
H. hypoleuca (Müll. Arg.) Trev.	C	—	—	—	—	—	—	+	—	—	+		C_1
H. incana (Stirt.) Awas. ..	C	—	—	—	—	—	—	+	—	—	—		S_1
H. isidiophora (Nyl.) Awas.	C	+	+	+	+	+	+	+	+	+	—		A
H. obscurata (Nyl.) Trev. ..	C	+	—	+	+	+		+	+	—	—		A
H. pseudospeciosa (Kurok.) Culb.	C, S	—	—	—	—	—	—	+	—	—	+		S_1
H. speciosa (Wulf.) Awas. ..	C	—	—	—	—	+	—	—	—	—	—		S_1
H. togashii (Kurok.) Awas.	C	—	—	—	—	—	—	—	—	+	—		S_1
H. tremulans (Müll. Arg.) Culb.	C	+	—	—	+	—	—	+	—	—	—		S_1
PHYSCIA (Ach.) Vain.													
P. alba Müll. Arg. ..	C	—	—	—	—	—	+	—	—	—	—		S_1
P. ciliata f. *fibrillosa* oThams.	C	—	—	—	—	—	+	—	—	—	—		S_1
P. integrata Nyl. ..	C, T	+	—	+	—	+	—	+	—	—	—		C_1
P. setosa (Ach.) Nyl. ..	C	+	—	—	+	+	—	+	—	—	—		C_1
P. setosa Var. *virella* B. de Lesd.	C, T	+	—	—	+	+	—	+	—	—	—		C_1
PHYSCIOPSIS													
P. elaina var. *pyrithrocardia* (Müll. Arg.) Awas. et Singh	C	+	—	—	—	—	—	—	—	—	—		S_1
PIXINE Fr.													
P. berteriana (Fee) Imsh. ..	C	—	—	—	+	—	—	—	—	—	—		S_1
P. cocoidata (Ach.) Mont. ..	C	—	—	—	+	—	—	—	—	—	—		S_1

Abbreviations used in the table:—

I	Denotes for	=Coonoor area, alt. ca. 1200-2010 m.
II	,, ,,	=Doddabetta peak area, alt. ca. 2250-2592 m.
III	,, ,,	=Ootacamund-Kotagiri road and Doddabetta tea estate area alt. ca. 1500-1800 m.
IV	,, ,,	=Kilkotagiri area, Konada tea estate area, alt. ca. 1500-1800 m.
V	,, ,,	=Sholurmatta alt. ca. 1500-1650 m.
VI	,, ,,	=Kodanad area and Kodanad tea estate, alt. ca. 1500-1950 m.
VII	,, ,,	=Avalanche area, Hatchery shola, Kolabibetta, Lakaribetta, Deverbetta, Emerald, alt, ca, 2100-2580 m.
VIII	,, ,,	=Pykara forest range area, alt, Ca, 2100-2250 m.
IX	,, ,,	=Carriat shola in way of Nilgiri peak, alt, ca. 1650-2250 m.
X	,, ,,	=Naduvattam and Cinchona plantations, alt. ca. 1500-1650 m.
C	,, ,,	=Corticolous.
S	,, ,,	=Saxicolous.
T	,, ,,	=Terricolous.
C_1	,, ,,	=Common.
S_1	,, ,,	=Scarce.
A	,, ,,	=Abundant.
+	,, ,,	=Present.
—	,, ,,	=Absent.

ACKNOWLEDGEMENTS

The collection of specimens were made under a research project entitled "Lichen flora of Nilgiri and Palni hills" under the supervision of Dr. D. D. Awasthi, financed by C. S. I. R., New Delhi. The investigations have been completed during the course of U. G. C. research fellowship to one of the authors (K. P. Singh). The authors are grateful to Dr. D. D. Awasthi, Reader, Department of Botany, Lucknow University, Lucknow, for his guidance and help.

REFERENCES

Awasthi, D. D. (1960). Contribution to the lichen flora of India and Nepal I. The genus *Physcia* (Ach.) Vain. *J. Indian bot. Soc.* **39**: 1-21.

Awasthi, D. D. (1965). Catalogue of lichens from India, Nepal, Pakistan and Ceylon. *Beihefte Zur Nova Hedwigia*. **17**: 1-137.

Awasthi, D. D. (1973). On the species of *Anaptychia* and *Heterodermia* from India and Nepal. *Geophytology*. **3**(1): 113-116.

Degelius, G. (1954). The lichen genus *Collema* in Europe. *Symbolae Bot. Upsal.* **13**(2): 1-499.

Hale, M. E. (1965). A monograph of *Parmelia*, subgenus *Amphigymnia*. *Contri. U. S. Nat. Herb.* **36** (5): 193-358.

Hale, M. E. (1967). *The Biology of lichens*: 176, William Clowes & Sons. London.

Hale, M. E. & Kurokawa, S. (1964). Studies on *Parmelia*, subgenus *Parmelia*. *Contri. U. S. Nat. Herb.* **36** (4): 121-191.

Kurokawa, S. (1962). A monograph of genus *Anaptychia*. *Beihefte Zur Nova Hedwigia*. **6**: 1-125.

Kurokawa. S. (1973). Supplementary notes on the genus *Anaptychia*. *J. Hattori Bot. Lab.* **37**: 563-607.

Motyka, J. (1936-38). *Lichenum generis Usnea Studium monographicum Pars. Systematice*: 651. Leopoli.

Sierk, H. A. (1964). The genus *Leptogium* in North America, north of Mexico. *Bryologist*. **67** (3): 245-317.

Yoshimura, I. (1971). The genus *Lobaria* of Eastern Asia. *J. Hattori. Bot. Lab.* **34**: 231-364.

Zahlbruckner, A. (1926). Flechten (Lichens) B. Spezieller Teil. In Engler und Prantal, *Die naturlichen Pflanzenfamilien*. **8**: 270.