

Full Length Research Paper

Diversity of lichens in Kollihills of Tamil Nadu, India

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An enumeration of 48 species belonging to 23 genera and 12 families of lichens from Kollihills, Namakkal District of Tamil Nadu is provided. Species of the lichen genera *Heterodermia*, *Parmotrema* and *Pertusaria* dominates the area.

Key words: Lichens, Kollihills, Easternghats, India.

INTRODUCTION

The symbiotic association between an alga and a fungus has resulted in a new life form called lichen. It is present in a wide range of habitats throughout the world and dominates terrestrial ecosystems (about 8%). 20,000 species of lichens have been reported globally. The Indian subcontinent has 2,450 species of lichens, of which India alone has about 2040 species (Awasthi, 2000). The Eastern Ghats of India is a broken chain of hills that extends from Orissa to Tamil Nadu and because of such topography; the hilly terrain and the surrounding planes are densely populated. Accessibility to the forest is rather easy. The forests in the Eastern Ghats are the most affected, compared to the Western Ghats and Himalayas, as they are experiencing heavy pressure on all sides (Jha et al., 2000) (human activities, exploitation of forest resources etc.). Though several studies have been carried out in Western Ghats and The Himalayas with respect to forest conservation and change detection, no reports are available about Eastern Ghats on the above aspects. Although Eastern Ghats are in a highly degraded stage (Jayakumar et al., 2002), it is absolutely essential to evaluate and reevaluate the biodiversity and species richness of all higher and lower plants and animals. The diversity of higher plant flora and fauna has

been studied in great detail since European colonization in India. Although, there has been substantial research in terms of medicinal and ecosystem values, lower plants such as lichens, bryophytes, pteridophytes, algae and fungi have not received the adequate attention even in Western and Eastern Ghats. Thus to get an idea about the diversity of lichens in the Eastern Ghats of Tamil Nadu, a random survey of lichens in this area has been started in the year 2000 to 2001, and the enumeration of lichens from the Kollihills is presented in the present communication.

MATERIALS AND METHODS

Collection area

Kollihills (Kollimalai) lies between 11°10'5" -11°30' 00" N latitude and 78°15' 00" E longitude. It is situated in the Namakkal district of TamilNadu above the river Cauvery, covering an area of about 503 km². Physiographically, it is a hilly region with altitude ranging from 180 m at the foothill to 1415 m at the plateau. The slope of this region varies from gentle to very steep. Geologically, the study area occupied by the hill is highly undulating, cut by a network of streams and most of them are semi-perennial and seasonal flowing in all directions, but mostly in the eastern and southeastern directions and ultimately draining into Ayyar river. The forest types located in Kollihills are:

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(1) Dry evergreen, (2) Semi evergreen (3) Dry deciduous

Table 1. The lichen flora of Kollihills.

S/No.	Name of lichen	Family	Collection area								
			1	2	3	4	5	6	7	8	9
1	<i>Canoparmelia ecaperata</i> (Müll. Arg.) Elix and Hale.	Parmeliaceae			+	+		+	+	+	
2	<i>Cetraria</i> sp.	Parmeliaceae	+		+	+					
3	<i>Cladonia cartilaginea</i> Müll. Arg.	Cladoniaceae				+					+
4	<i>Collema auriforme</i> (With.) Coppins and J.R. Laundon.	Collemataceae				+			+	+	
5	<i>Collema rugosum</i> Kremp.	Collemataceae					+				+
6	<i>Cryptothecia dispersa</i> Makhija and Patw.	Arthroniaceae	+			+					
7	<i>Diplotoma proximum</i> (Magnusson) Szat. ex D.D. Awasthi	Physciaceae			+						
8	<i>Dirinaria confluens</i> (Fr.) D.D. Awasthi	Physciaceae			+			+			
9	<i>Dirinaria consimilis</i> (Stirt.) D.D. Awasthi.	Physciaceae			+				+		
10	<i>Heterodermia angustiloba</i> (Müll. Arg.) D.D. Awasthi	Physciaceae			+		+				
11	<i>Heterodermia cosmosa</i> (Eschw.) Follm and Redon	Physciaceae			+		+				
12	<i>Heterodermia dendritica</i> (Pers.) Poelt	Physciaceae		+							+
13	<i>Heterodermia diademata</i> (Taylor) D.D. Awasthi	Physciaceae			+				+		
14	<i>Heterodermia dissecta var koyana</i> (Kurok) J.C. Wei	Physciaceae					+				
15	<i>Heterodermia hypocaesia</i> (Yasuda) D.D. Awasthi	Physciaceae		+				+			
16	<i>Heterodermia incana</i> (Stirt.) D.D. Awasthi	Physciaceae				+			+		
17	<i>Heterodermia isidiophora</i> (Vainio) D.D. Awasthi.	Physciaceae				+					+
18	<i>Heterodermia boryi</i> (Fée) Kr.P. Singh and S.R. Singh	Physciaceae				+		+		+	+
19	<i>Heterodermia speciosa</i> ((Wulfen) Trevis.	Physciaceae						+		+	
20	<i>Lecanora</i> sp.	Lecanoraceae	+	+							
21	<i>Lepraria</i> sp.	Imperfect fungi	+	+		+		+			
22	<i>Leptogium javanicum</i> Mont.	Collemataceae				+			+	+	
23	<i>Myriotrema microporum</i> (Mont.) Hale	Thelotremataceae		+							
24	<i>Ocellularia diacida</i> Hale	Thelotremataceae		+			+				
25	<i>Parmotrema austrosinense</i> (Zahlbr.) Hale	Parmeliaceae		+					+		
26	<i>Parmotrema crinitum</i> (Ach.) Choisy.	Parmeliaceae						+			+
27	<i>Parmotrema nilgherrense</i> (Nyl.) Hale.	Parmeliaceae			+		+		+		+
28	<i>Parmotrema praesorediosum</i> (Nyl.) Hale	Parmeliaceae						+	+	+	
29	<i>Parmotrema tinctorum</i> (Nyl.) Hale	Parmeliaceae		+		+				+	
30	<i>Pertusaria granulata</i> (Ach.) Müll. Arg.	Pertusariaceae			+						
31	<i>Pertusaria</i> sp. (Ach.)	Pertusariaceae			+						+
32	<i>Pertusaria leucosorodes</i> Nyl.	Pertusariaceae	+	+							
33	<i>Pertusaria melastomella</i> Nyl.	Pertusariaceae		+							
34	<i>Pertusaria pseudococcodes</i> Müll. Arg.	Pertusariaceae				+		+			
35	<i>Pertusaria</i> sp. (Taylor)	Pertusariaceae					+		+		

Table 1. Continued.

36	<i>Phaeophyscia</i> sp.	Physciaceae	+	+			+	+			
37	<i>Phyllopsora corallina</i> (Eschw.) Müll. Arg	Biatoraceae		+							
38	<i>Physcia integrata</i> Nyl.	Physciaceae			+						
39	<i>Physcia tribacoides</i> Nyl.	Physciaceae					+			+	
40	<i>Phyllopsora parvifolia</i> (Pers.) Müll. Arg.	Biatoraceae				+					
41	<i>Pseudocephalaria arggraceae</i> (Bory.) Vain..	Lobariaceae								+	
42	<i>Ramalina pacifica</i> Asahina	Ramalinaceae							+	+	
43	<i>Rimelia clavulifera</i> (Räsänen) Kurok.	Parmeliaceae							+	+	
44	<i>Rimelia reticulata</i> (Taylor) Hale and Fletcher	Parmeliaceae							+	+	
45	<i>Teloschistes flavicans</i> (Sw.) Norman	Teloschistaceae			+		+	+	+	+	
46	<i>Tephromela atra</i> (Huds.) Hafellner	Lecanoraceae			+						
47	<i>Usnea stigmatoides</i> G Awasthi	Parmeliaceae							+	+	
48	<i>Usnea undulata</i> Strit.	Parmeliaceae							+	+	
Total			6	13	13	13	10	10	11	17	12

1. Kottar – 600 m; 2. Kovilur – 1000 m; 3. Arapaleeswarar temple area – 1148 m; 4. Kulivalavu area – 1300 m; 5. Vasalur area – 1300 m; 6. Peramparappapatti – 1316 m; 7. Chemmedu – 1325 m; 8. Cholakkadu – 1400 m; 9. Sengarai – 1415 m+ = indicates the presence.

(4) Tropical riverine (5) Southern thorn (6) Euphorbia scrub and (7) Man made forests.

Samples were collected randomly from different altitude across the hills: Kottar – 600 m, Kovilur – 1000 m, Arapaleeswarar temple area – 1148 m, Kulivalavu area – 1300 m, Vasalur area – 1300 m, Peramparappapatti – 1316 m, Chemmedu – 1325 m, Cholakkadu – 1400 m, Sengarai – 1415 m. As showed in Table 1.

The present study is based on intensive collection of lichens made from January 2000 to February 2001 at various altitudes and across the Kollihills. Lichens were collected along with substratum using sharp knife. Much care was taken to collect the specimen without any damage to the thallus margin. Fruticose lichens were collected with their holdfasts intact on the substratum. The specimens were cleaned by careful removal of debris, sun dried and deposited in the herbaria of Department of Microbiology, Bharathidasan University, Trichirapalli, Tamil Nadu.

The morphological features were studied using trinocular zoom dissection microscope (Meiji optics, Japan). Anatomy of the samples was studied with the help of a compound

microscope. The sections were obtained with a microtome, at a thickness up to 15 µm. The K, C, KC P tests and TLC analysis (Culberson and Kristinsson, 1970; Culberson, 1972; Santesson, 1973; Awasthi, 1988, 1991), which are important for identification of chemical substance in lichen, were made on thallus cortex and medulla.

RESULTS

The Kollihills exhibit good growth of almost all the growth forms of lichens. Twenty seven species of foliose lichens dominates over the three fruticose and eighteen crustose and squamulose lichens. Lichen family Physciaceae dominates the area with 16 species followed by the members of Parmeliaceae and Pertusariaceae. The cyanophycean lichens exhibit their poor growth as represented by three species only. Among the different genera *Heterodermia* with 10 species

dominates the area.

DISCUSSION AND CONCLUSION

Most of the localities situated above an altitude of 1000 m exhibit rich diversity of lichens. The Cholakkadu area at an altitude of 1400 m exhibit occurrence of 17 species has the maximum diversity of lichens followed by Kovilur, Arapaleswarar temple area, Kulivalavu, Vasalur, Peramparappapatti, Chemmedu, and Sengarai with 10 to 13 lichen species. The only locality at an altitude of 600 m, (Kottar) has the poor growth of lichens represented by six species of crustose lichen genera *Pertusaria* and *Cryptothecia*. The probable reason for poor diversity of lichens in the Kottar area may be due to a number of factors influencing the abundance and richness of lichens, such as temperature, moisture, altitude,

forest type and Human activities. Among the various places surveyed, the Cholakkadu area has thick moist forest vegetation which provide suitable habitat for colonization of a number of lichen groups on different substrates. The lichen flora of Kollihills exhibit similarity with the lichen flora of the nearby areas of Tamil Nadu, such as Megamali Wild life Sanctuary, Kambam district (Nayaka et al., 2001) and Shervaroy hills (Hariharan et al., 2004) the members of the lichen family Physciaceae and Parmeliaceae dominates the Kollihills too.

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