

DIVERSITY OF LICHENS IN IDUKKI DISTRICT WITH NEW RECORDS TO FLORA OF KERALA

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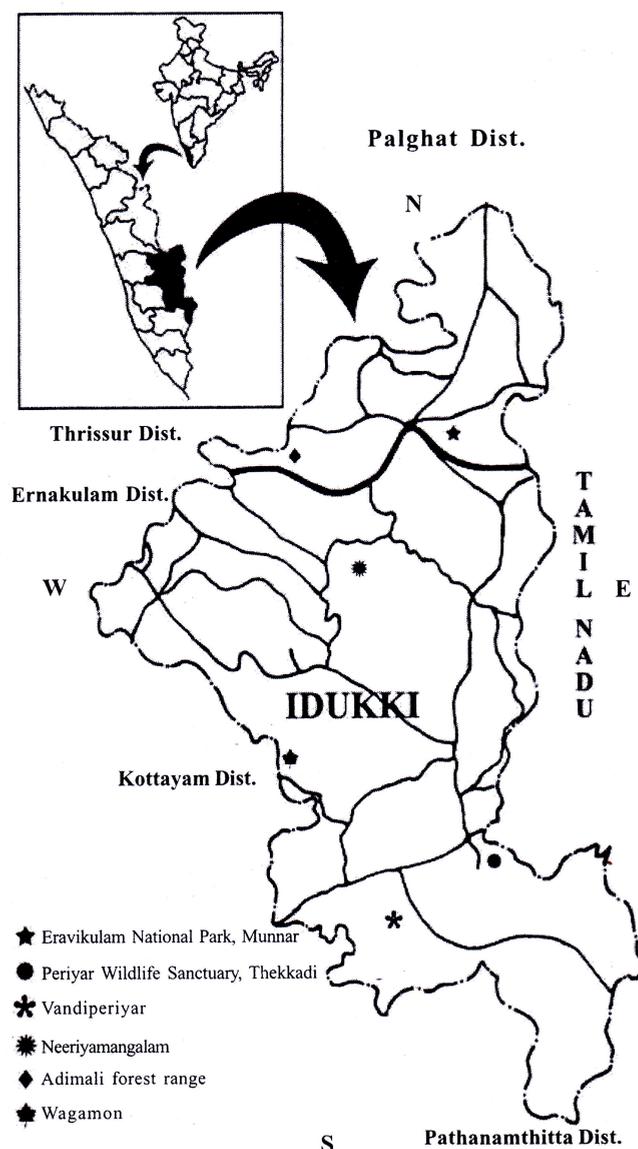
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ABSTRACT: This paper enumerates the occurrence of 136 species of lichens belonging to 45 genera and 24 families in the semi-evergreen, evergreen and deciduous forests of six major forest

INTRODUCTION

The hilly state of Kerala which lies isolated from the Deccan Plateau by the mountainous belt of the Western Ghats occupies a geographical area of 38,864 km². The state is, in fact a narrow strip with 32 to 120 km in width stretching for about 565 km along the Malabar Coast on the Western side of the Peninsular India (Nayar, 1995). Lying between the co-ordinates 8° 18' and 12° 48' N lat. and 74° 52' and 77° 22' E long., the boundaries of the state are Lakshadweep Sea in the West, Tamil Nadu in South and East and Karnataka in the North. The area of the state is 1.18 percent of the total area of the country and is administratively divided into 14 districts of which, Palakkad (Palghat), Wayanad, Pathanamthitta and Idukki are the four districts located in the high lands having montane forests.

Idukki district has many unique topographical and geographical characteristics. It is the largest district of Kerala with an area of 5105.22km². This district is located in the middle of Kerala state, bound on the East by Madurai District of Tamil Nadu State while the West by Ernakulam and Kottayam Districts of Kerala. In the South it is the Pathanamthitta District, while the North by Trichur and Coimbatore Districts of Kerala and Tamil Nadu States, respectively (Map). It lies between 9° 15' and 10° 21' of North latitude and 76° 37' and 77° 25' of East longitudes. The annual rainfall in the district varies from 250 to 425 cm. More than 50% of the area of the district is covered by



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rugged mountains and forests belonging to Evergreen/Semi-evergreen Forests (Dense and Degraded), Moist Deciduous Forests (Dense and Degraded), Dry Deciduous forests (Dense and Degraded), Montane Sub Tropical/Temperate Forests (Dense and Degraded), Grasslands and Forest Plantations. Floristic account of the district is dealt by Vivekananthan (1981). The high range in Idukki district with its deeply dissected valleys and massive peaks is yet another region in Southern Western Ghats that has rich endemic species including some with narrow distribution due to niche-specificity.

Towering 2695 above, from the smaller hills that constitute the high range is Anamudi, the highest peak in Peninsular India which lies within the boundaries of Eravikulam National Park also known as the Hamilton Plateau. The unique physiography, mountainous configuration coupled with high altitude, heavy rainfall and tropical humid climate, blessed the area highly congenial for plant growth and makes this as one of the botanically interesting areas of Western Ghats.

Unfortunately in Kerala, inventory of lichens has not received much attention when compared to other lower groups of plants. Only fragmentary work has been done in lichenology from this part of Kerala as there are several problems confronted regarding the identification of lichens, which is a difficult group to work with (Kumar and Stephen, 1997a). Vohra *et al.* (1982) collected 77 species from Silent Valley National Park in Kerala of which 11 were new additions to India. Kumar and Sequiera (1997a) reported 20 species of macrolichens as new records from Silent Valley National Park. Kumar and Sequiera (1997b) also published an appraisal of lichen flora of Western Ghats. Mukherji *et al.* (1999) published a book on lichens with valuable contributions from different authors on various aspects of lichen taxonomy and ecology of different phytogeographic regions of India. Kumar and Sequiera (1999) reviewed the work done in Western Ghat region and enlisted the species occurring in Western Ghats based on macro and microlichen keys of Awasthi (1988, 1991). In KFRI research report,

Kumar (2000) reported 253 macro lichens from Kerala with many new records. Kumar and Sequiera (2001, 2002, 2003) enumerated lichens from New Amarambalam Reserve Forest in Malappuram district, Chembra in Palghat district and Thirunelly in Wayanad district. Subsequently, Easa (2003) listed 299 species of both macro and micro lichens from Kerala based on the literature.

During a preliminary survey of lichen flora of Western Ghats of Kerala, the authors could collect about 800 specimens of both macro and micro lichens from six localities of Idukki district which covers wet evergreen forests, moist deciduous forests, dry deciduous forests, Montane subtropical forests and Montane temperate forests. Though the district is rich in lichen diversity, Adimali Forest range, Neeriyamangalam, Vandiperiyar, Periyar Wildlife Sanctuary in Thekkadi, Eravikulam National Park, Munnar and Wagamon play an important role in the distribution of lichens in its virgin microhabitats. Specimens were collected from ever green forest areas at an altitude of 700 m to 1840 m and the maximum altitude is at Rajamala in Munnar. The present paper is based on the authors own collection and observations made during the study and is an attempt to explore the occurrence of lichens in the district for the first time. The available information of lichens from the present study will serve as a database for carrying out further studies on the biodiversity of the area.

MATERIALS AND METHODS

The lichens were collected along with their substratum, irrespective of their growth form. Some of the species were found in more than one substratum. Only the lichens that are loosely attached to the substratum were scrapped out and collected. The corticolous lichens growing on tree trunks at reachable height were collected and canopy lichens found fallen on the ground also were collected. Superficial barks were removed with the help of chisel or knife in order to avoid damage to the trees. Sufficient amount of lichens were collected, as some materials will be consumed for chemical analysis for TLC and microscopic study. The collections were made in February, March and

July during the year 2006 from different forest areas of the district. Specimens collected were numbered and the field data such as altitude, date of collection, and locality were noted down in the field book. The survey and collection of specimens were made during all seasons. During rainy season, samples were air dried at room temperature. All the samples collected were sundried and deposited in the herbarium. All these specimens were studied according to well established lichenological methods.

Apart from examining the morphology of the thallus, micro chemical colour tests were also carried out by the direct application of the reagents on the lichen thalli. An aqueous solution of Potassium hydroxide (K); Steiner's stable solution of Para phenylene diamine (P); 1 % of Potassium iodide (I); freshly prepared aqueous solution of Calcium hypochlorite or bleaching powder or modern commercial bleaching fluids containing active chlorine (C) were used for cortex and medullary colour tests. Sometimes, many lichen substances are undetectable in colour tests or it may not give proper result. In such cases, thin layer chromatography (TLC) was also carried out for some of the species. The chromatograms were developed in the solvent containing TDA (180 toluene: 60 dioxane: 8 acetic acid). Merck Silica gel pre coated aluminum plates were used for spotting the lichen fragment. The spots were identified as different lichen substances by noting its colour and measuring the distance moved by it. The identification of all the taxa were done based on Awasthi (1988, 1991 and 2007), Awasthi (1986) and Walker and James (1980). Some specimens were also identified by matching with types and lichen exsiccates available at herbarium of National Botanical Research Institute, Lucknow. Specimens referred in the text are deposited at herbaria of Jawaharlal Nehru Tropical Botanic Garden and Research Institute (TBGT) and National Botanical Research Institute (LWG).

RESULTS AND DISCUSSION

The major portion of the Eravikulam National Park is covered with grasslands. There are several

patches of sholas with *Actinodaphne bourdilloni*, *Microtropis ramiflora*, *Pittosporum tetraspermum*, *Syzygium arnottianum*, *Chrysopogon zeylanicus*, *Eupatorium adenophorum*, *Strobilanthus kunthianus*, *Eulalia phaeothrix*, *Tripogon bromoides*, *Arundinella fuscata* and *Cynotis* sp. The Evergreen Forest in the Periyar Wildlife Sanctuary has high trees of soft wood species forming a closed canopy. The major species found are *Mesua ferrea*, *Elaeocarpus tuberculatus*, *Canarium strictum*, *Cullenia exarillata*. The deciduous vegetation is limited with *Tectona grandis*, *Dalbergia latifolia*, *Lagerstroemia lanceolata*, *Pterocarpus marsupium*. Vagamon has been identified as a biodiversity 'hotspot'. Urban development in the area is generally low as the major portion is covered with grasslands. Eight species of trees were identified. *Memecylon lawsonii* and *Cinnamomum malabratrum* had the highest frequency of occurrence followed by *Syzygium cumini* with lesser frequency of occurrence. The other tree species include *Maesa indica*, *Symplocos cochinchinensis*, *Olea dioica*, *Litsea floribunda* and a Rubiaceae member.

Out of the 800 specimens identified from the study area, a total of 136 lichen species belonging to 45 genera and 24 families of were recorded and among them 102 were macro lichens and 34 were micro lichens. The district showed the dominance of foliose lichens represented by 72 species followed by 34 crustose and 30 fruticose lichens. The Parmeliaceae is the dominant family represented by 47 species belonging to 8 genera. The lichen genus *Parmotrema* exhibits its dominance represented by 18 species followed by *Usnea* and *Heterodermia* with 16 species each. *Parmotrema tinctorum* (Nyl.) Hale, *Heterodermia comosa* (Eschw.) Follmann & Redon and *Heterodermia japonica* (M. Sato) Swinsc. & Krog. are the common lichen species of the district. The lower altitudes in the district shows a dominance of crustose lichens while the higher altitude harbour more by foliose and fruticose lichens. The dominance of virgin forest areas and less tourist disturbance in the area leads to the thriving growth of lichens in the sites. The reason for scarce growth of lichens in the areas may probably be the disturbed condition of forest by the human activity.

Table-1: Distribution of lichens in various localities of Idukki district with their growth forms

Taxa	Adima Iforest range	Neeriyam angalam	Periyar Wildlife Sanctuary Thekkadi	Vandiperiyar	Eravikulam National Park, Munnar	Wagamon	Growth form	Specimens Examined (TBGT No.)
	1	2	3	4	5	6	7	8
ARTHONIAACEAE								
<i>Cryptothecia</i> sp.	-	-	+	-	-	-	Cr	314
<i>C. lunulata</i> (Zahlbr.) Makhija & Patw.	-	-	+	-	-	-	Cr	213,373
BRIGANTIAACEAE								
<i>Brigantiaea leucoxantha</i> (Spreng.) R. Sant. & Hafellner	-	-	+	-	-	-	Cr	265
CANDELERIAACEAE								
<i>Candelaria concolor</i> (Dicks.) B. Stein	-	-	+	-	-	-	Fo	208b
CATILLARIAACEAE								
<i>Catillaria leptocheiloides</i> (Nyl.) Zahlbr.	-	-	-	-	+	-	Cr	920
CLADONIAACEAE								
<i>Cladonia</i> sp.	-	-	-	-	+	-	Fr	960
<i>C. chlorophaea</i> (Flörke ex Sommerf) Spreng.	-	-	-	-	+	-	Fr	964
<i>C. coniocraea</i> (Flörke) Spreng.	-	-	-	-	+	-	Fr	1005
<i>C. corniculata</i> Ahti & Kashiwadani	-	-	-	-	+	-	Fr	946,947,998
<i>C. didyma</i> (Fée) Vainio	-	-	-	-	+	-	Fr	968,969
<i>C. fenestralis</i> Nuno	-	-	-	-	+	+	Fr	397,995
<i>C. fruticulosa</i> Kremp.	-	-	-	-	+	-	Fr	896
<i>C. furcata</i> (Huds.) Schrader	-	-	-	-	+	-	Fr	891
<i>C. macilenta</i> Hoffm.	-	-	-	-	+	-	Fr	894,982,989
<i>C. scabriuscula</i> (Delise) Leight.	-	-	-	-	+	-	Fr	1000
<i>C. subsquamosa</i> Kremp.	-	-	-	-	+	-	Fr	921
COCCOCARPIACEAE								
<i>Coccocarpia palmicola</i> (Sprengel) Arvid & D.J. Galloway	-	-	+	-	+	-	Fo	198,347,890
<i>C. pellita</i> (Ach.) Müll. Arg. emend R. Sant	-	-	+	-	-	-	Fo	224
COLLEMATAACEAE								
<i>Collema</i> sp.	-	-	-	-	+	-	Fo	966
<i>Leptogium</i> sp.	-	-	-	-	+	-	Fo	912
<i>Leptogium austroamericanum</i> (Malme) Dodge	+	-	-	-	-	-	Fo	162
<i>Leptogium burnetiae</i> Dodge	-	-	-	-	+	-	Fo	50,1002,1003
<i>Leptogium chloromelum</i> (Swartz ex Ach.) Nyl.	-	-	-	-	-	+	Fo	413
<i>Leptogium corticola</i> (Taylor) Tuck.	-	-	-	-	+	+	Fo	336,953
<i>Leptogium denticulatum</i> Nyl.	+	-	-	-	+	-	Fo	127,941
<i>Leptogium ulvaceum</i> (Pers.) Vainio	+	-	-	-	-	-	Fo	131
GOMPHILLACEAE								
<i>Aulaxiana</i> sp.	+	-	-	-	-	-	Cr	164
GRAPHIDACEAE								
<i>Diorygma</i> sp.	+	-	+	-	+	+	Cr	158,391, 402,845
<i>Diorygma junghuhnii</i> (Mont. & Bosch) Kalb, Staiger & Elix	+	-	-	-	-	-	Cr	180
<i>Graphis grammatica</i> Nyl.	+	-	-	-	-	-	Cr	175
<i>Graphis scripta</i> (L.) Ach.	+	-	-	-	-	+	Cr	92,160,392,393
<i>G. sikkimensis</i> Nag. & Patw.	+	-	-	-	-	-	Cr	171b,172b
<i>Hemithecium aphanes</i> (Mont. & Bosch)	+	-	-	-	-	-	Cr	116
<i>Phaeographis</i> sp.	-	-	+	-	-	-	Cr	273,274
<i>Phaeographis scalpturata</i> (Ach.) Staiger	+	-	-	-	-	-	Cr	161,1276
<i>Platygramme pudica</i> var. <i>platyloma</i> (Müll. Arg.) V. Tewari & Upreti	+	-	-	-	-	-	Cr	951,1287
LOBARIAACEAE								
<i>Pseudocyphellaria argyracea</i> (Bory) Vain.	-	-	-	-	+	-	Fo	962a,963a

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Taxa	1	2	3	4	5	6	7	8
<i>P. aurata</i> (Ach.) Vain.	-	-	+	-	-	-	Fo	238b
<i>P. crocata</i> (L.) Vain.	-	-	+	-	-	-	Fo	262,318
<i>Sticta limbata</i> (Sm.) Ach.	-	-	-	-	+	-	Fo	936a,945, 962b,963b
<i>S. weigelii</i> (Ach.) Vain.	+	-	+	-	+	-	Fo	121,129,138, 232,954,958, 979
MEGALOSPORACEAE								
<i>Megalospora sulphurata</i> Meyen	-	-	+	-	-	-	Cr	320
OPHIOPARMACEAE								
<i>Hypocenomyce</i> sp.	+	-	+	-	+	-	Cr	111,113,167, 177,388,972
<i>Hypocenomyce sorophora</i> (Vain.) P. James & Poelt	+	-	-	-	-	-	Cr	168,169
PARMELIACEAE								
<i>Bulbothrix isidiza</i> (Nyl.) Hale	+	-	+	-	-	-	Fo	149a,188
<i>Everniastrum cirrhatum</i> (Fr.) Hale ex Sipman	-	-	-	-	+	-	Fo	851,855, 874,882
<i>E. nepalense</i> (Taylor) Hale ex Sipman	-	-	-	-	+	-	Fo	992
<i>Hypotrachyna exsecta</i> (Taylor) Hale	-	-	-	-	+	-	Fo	987
<i>H. infirma</i> (Kurok.) Hale	+	-	-	-	-	-	Fo	96,125,135,178
<i>H. radiculata</i> (Kurok.) Elix	-	-	+	-	-	-	Fo	365
<i>H. thryptica</i> (Hale) Hale	+	-	-	-	-	-	Fo	120
<i>Myelochroa indica</i> (Hale) Elix & Hale	-	-	-	-	+	-	Fo	937a
<i>M. irrugans</i> (Nyl.) Elix & Hale	-	-	-	-	+	-	Fo	866,973
<i>M. perisidians</i> (Nyl.) Elix & Hale	-	-	-	-	+	-	Fo	936b
<i>M. xantholepis</i> (Mont. & Bosch) Elix & Hale	-	-	-	-	+	-	Fo	904,905, 925a,942
<i>Parmelinella wallichiana</i> (Taylor) Elix & Hale	-	-	+	-	-	-	Fo	246a,253a,325
<i>Parmelinopsis expallida</i> (Kurok) Elix & Hale	-	-	-	-	+	-	Fo	892
<i>Parmotrema austrosinense</i> (Zahlbr.) Hale	-	-	+	-	-	-	Fo	294c
<i>P. crinitum</i> (Ach.) Choisy	-	-	+	-	-	-	Fo	253c,349
<i>P. cristiferum</i> (Taylor) Hale	-	-	-	-	-	+	Fo	348a
<i>P. dilatatum</i> (Vain.) Hale	-	-	-	+	-	-	Fo	328a
<i>P. grayanum</i> (Hue) Hale	-	-	-	-	+	+	Fo	359,847,1001
<i>P. hababianum</i> (Gyelink) Hale	-	-	+	-	-	+	Fo	183,205
<i>P. indicum</i> Hale	-	-	+	-	+	-	Fo	206,254,296, 353,981
<i>P. mellissii</i> (Dodge) Hale	-	-	-	-	+	-	Fo	898a
<i>P. planatilobatum</i> (Hale) Hale	+	-	-	-	-	-	Fo	150
<i>P. praesorediosum</i> (Nyl.) Hale	-	-	+	-	-	-	Fo	245a,246b,253b
<i>P. pseudocrinitum</i> (Abbayes) Hale	-	-	+	-	-	-	Fo	211a
<i>P. pseudonilgherrense</i> (Asahina) Hale	-	-	-	-	+	-	Fo	994
<i>P. rampoddense</i> (Nyl.) Hale	-	-	-	-	+	-	Fo	983
<i>P. reticulatum</i> (Taylor) Choisy	-	-	+	-	+	+	Fo	222,223,226, 230,268,345, 361,898c,939, 940,943,970
<i>P. robustum</i> (Degel.) Hale	-	-	+	-	-	-	Fo	191b
<i>P. sancti-angelii</i> (Lynge) Hale	-	-	-	+	-	-	Fo	327a
<i>P. stuppeum</i> (Taylor) Hale	-	-	+	-	+	-	Fo	191a,235, 248,927
<i>P. tinctorum</i> (Nyl.) Hale	-	-	+	+	+	+	Fo	197b,242,258, 279a,295a, 303c,319b, 327c,337a, 348b,352, 394a,898b

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Taxa	1	2	3	4	5	6	7	8
<i>Usnea bismolliuscula</i> Zahlbr.	-	-	+	-	-	+	Fr	275a,334
<i>U. eumitriodes</i> Mot.	-	-	+	-	-	+	Fr	275b,333a
<i>U. fragilis</i> Stirton	-	-	-	-	+	+	Fr	333b,862a, 895,923
<i>U. gigas</i> Mot.	-	-	-	-	+	-	Fr	875a
<i>U. nilgirica</i> G. Awasthi	-	-	+	-	-	-	Fr	300
<i>U. orientalis</i> Mot.	-	-	+	-	+	-	Fr	231,860
<i>U. pangiana</i> Stirton	-	-	-	-	+	-	Fr	961
<i>U. pseudosinensis</i> Asahina	-	-	-	-	+	-	Fr	850,857,859, 861,876,878, 880,952
<i>U. rigidula</i> (Stirton) G. Awasthi	-	-	+	-	-	-	Fr	354a
<i>Usnea</i> sp.	-	-	+	-	-	-	Fr	260
<i>U. spinosula</i> Stirton	-	-	-	-	+	-	Fr	875b,1077
<i>U. stigmatoides</i> G. Awasthi	-	-	+	-	-	-	Fr	190
<i>U. subflorida</i> (Zahlbr.) Mot.	-	-	+	-	+	-	Fr	356,881a,917
<i>U. subfloridana</i> Stirton	-	-	+	-	-	-	Fr	326,354b
<i>U. thomsonii</i> Stirton	-	-	+	-	-	-	Fr	854,877,879
<i>U. undulata</i> Stirton	-	-	+	-	+	-	Fr	272,301, 862b,885
PERTUSARIACEAE								
<i>Pertusaria albescens</i> (Huds.) M. Choisy & Werner	-	-	-	-	+	-	Cr	902,903,924
<i>P. leucosoroides</i> Nyl.	+	-	+	-	-	-	Cr	108,271
<i>P. punctata</i> Nyl.	-	-	-	-	-	+	Cr	405
PHYSICIACEAE								
<i>Dirinaria</i> sp.	-	-	-	-	-	+	Fo	337a
<i>Heterodermia</i> sp.	-	-	-	-	+	-	Fo	899,993
<i>H. comosa</i> (Eschw.) Follmann & Redon	-	-	+	-	+	+	Fo	250,346, 8932b,986
<i>H. dendritica</i> (Pers.) Poelt	-	-	-	-	-	+	Fo	209
<i>H. diademata</i> (Taylor) Awasthi	+	-	+	-	+	+	Fo	49b,208a,261, 342400,401, 404,864
<i>H. incana</i> (Stirton) Awasthi	-	-	+	-	+	-	Fo	264,868, 919,990
<i>H. leucomela</i> subsp. <i>boryi</i> (Fée) Swinsc. & Krog.	-	-	+	-	+	-	Fo	184b,237b, 870,871,918, 26,932,988
<i>H. leucomela</i> subsp. <i>leucomela</i> (L.) Poelt	-	-	+	-	-	-	Fo	241,257,306,363
<i>H. microphylla</i> (Kurok.) Skorepa	-	-	-	-	+	-	Fo	889,975
<i>H. obscurata</i> (Nyl.) Trevisan	-	-	+	-	+	+	Fo	251,399a,888, 938a,980,985b
<i>H. pellucida</i> (Awasthi) Awasthi	-	-	-	-	+	-	Fo	869,872,883, 974,984
<i>H. pseudospeciosa</i> (Kurok.) Culb	-	-	-	-	+	-	Fo	886,897
<i>H. rubescens</i> (Räsänen) Awasthi	+	-	-	-	-	-	Fo	140,141
<i>H. speciosa</i> (Wulfen) Trevisan	-	-	-	-	+	+	Fo	399b,929a,967b
<i>H. togashii</i> (Kurok.) Awasthi	-	-	-	+	+	-	Fo	199b,848, 911,996
<i>Phaeophyscia hispidula</i> (Ach.) Essl.	-	-	-	-	+	-	Fo	914a,915a, 925b,931b,934
<i>Physcia dimidiata</i> (Arnold) Nyl.	-	-	+	-	-	-	Fo	317
<i>Pyxine austroindica</i> Awasthi	-	-	+	-	-	-	Fo	366
PYRENULACEAE								
<i>Anthracotheicum indicum</i> A. Singh	+	-	-	-	-	-	Cr	93

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Taxa	1	2	3	4	5	6	7	8
<i>A. thwaitesii</i> (Leighton) Müll. Arg.	+	-	-	-	-	-	Cr	94
RAMALINACEAE								
<i>Phyllopsora</i> sp.	-	-	-	-	+	-	Fo	909,910
<i>P. buettneri</i> (Müll. Arg.) Zahlbr.	-	-	+	-	-	-	Fo	411,412
<i>P. corallina</i> (Eschw.) Müll. Arg.	-	-	+	-	-	-	Fo	219
<i>P. furfuracea</i> Zahlbr.	-	-	+	-	-	-	Fo	368
<i>Ramalina conduplicans</i> Vain.	-	-	+	-	-	-	Fr	277,278
<i>R. hossei</i> var. <i>divaricata</i> H. Magn. et G. Awasthi	-	-	+	-	+	-	Fr	185,192,220, 239,270,298, 302a,863
<i>R. nervulosa</i> (Müll. Arg.) Abbayes	-	-	+	-	-	+	Fr	184a,229,233, 234,243,256, 263,305,339, 341,355,360
ROCCELLACEAE								
<i>Chiodecton leptosporum</i> Müll. Arg.	+	-	+	-	-	-	Cr	101,103,109, 153,157, 186,371,376
STEREOCAULACEAE								
<i>Lepraria</i> sp.	+	-	-	-	-	-	Cr	130
STRIGULACEAE								
<i>Strigula smaragdula</i> Fr.	+	-	+	-	-	-	Cr	105,384
TELOSCHISTACEAE								
<i>Teloschistes flavicans</i> (Swartz) Norm.	-	-	+	-	+	+	Fo	202,218,240, 276299, 302b,884
THELOTREMATAACEAE								
<i>Diploschistes rampoddensis</i> (Nyl.) Zahlbr.	-	-	-	-	+	-	Cr	959
<i>Myriotrema minutulum</i> (Hale) Hale	+	-	-	-	-	-	Cr	100
<i>M. subconforme</i> (Nyl.) Hale	+	-	-	-	-	-	Cr	112
<i>Ocellularia leucina</i> (Müll. Arg.) Hale	-	+	-	-	-	-	Cr	104
<i>O. polillensis</i> (Vain.) Hale	+	-	-	-	-	-	Cr	117,118,119
<i>Stegobolus fissus</i> (Nyl.) Frisch	-	-	+	-	-	-	Cr	351
<i>Thelotrema kamatii</i> (Patw. & C.R. Kulk.) Hale	-	-	+	-	-	-	Cr	343
TRICHOHELIAACEAE								
<i>Porina interstes</i> (Nyl.) Harm.	+	-	-	-	-	-	Cr	110,381
<i>P. subcutanea</i> Ach.	+	-	+	-	-	-	Cr	14,409

Abbreviations: + Present, - Absent, Cr - Crustose, Fo - Foliose, Fr - Fruticose

Among the six different localities surveyed, Eravikulam National Park in Munnar recorded maximum number of lichens with 66 species followed by Periyar Wildlife Sanctuary in Thekkadi with 60 species and Wagamon forest area with 22 species respectively. The major portion of the Eravikulam National Park is covered with grasslands. There are several patches of sholas with *Actinodaphne bourdilloni*, *Microtropis ramiflora*, *Pittosporum tetraspermum*, *Syzygium arnottianum*, *Chrysopogon zeylanicus*, *Eupatorium adenophorum*, *Strobilanthus kunthianus*, *Eulalia phaeothrix*, *Tripogon bromoides*, *Arundinella fuscata* and *Cynotis* sp. The Evergreen Forest in the Periyar Wildlife Sanctuary has high trees of soft wood species forming a closed canopy. The major species found are *Mesua ferrea*,

Elaeocarpus tuberculatus, *Canarium strictum*, *Cullenia exarillata*. The deciduous vegetation is limited with *Tectona grandis*, *Dalbergia latifolia*, *Lagerstroemia lanceolata*, *Pterocarpus marsupium*.

Most of the species are found in more than one substratum. The lichen flora of Idukki district has unique and interesting elements as new records to both Kerala and Peninsular India. Of these, *Cladonia fenestralis*, *C. furcata*, *Heterodermia rubescens*, *Hypotrachyna radiculata*, *Myriotrema subconforme*, *Parmotrema pseudocrinitum* and *P. robustum* were new to Peninsular India while, *Anthracotheceum thwaitesii*, *Candelaria concolor*, *Chiodecton leptosporum*, *Cladonia chlorophaea*, *C. subsquamosa*, *Cryptothecia lunulata*,

Diploschistes rampoddensis, *Myelochroa indica*, *M. perisidians*, *Pertusaria albescens*, *Phyllopsora buettneri*, *P. corallina*, and *Ramalina hossei* var. *divaricata* were new additions to Kerala lichen flora.

The present exploration to the six areas in the district is the first attempt to get a clear picture on the species richness of lichens in the area and forms baseline information for the future bio monitoring studies. It is clear from the above observations that Idukki district provides many suitable habitats for a variety of lichens to grow. More intensive survey will definitely add additional lichen taxa to the district. The species and genera recorded from the district are given under Table-1 and are arranged alphabetically with in the different families.

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