



**An enumeration of epiphytic lichens from Hojai sub-division of Nagaon district, Assam, India**

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**Abstract**

The paper enumerates distribution of 31 species belonging to 16 genera and 11 families of lichens from seven forest sites of Hojai subdivision of Nagaon district, Assam. The area exhibits dominance of both crustose and foliose lichens represented by 16 and 14 species respectively, while a single fruticose *Ramalina hossei* Vain. species is recorded for the first time from the area. Out of the total, 52 % species are crustose, and 45% are foliose in growth form. The members of family Physciaceae exhibit their dominance with 4 genera and 9 species, followed by Parmeliaceae with 5 species in a single genus, and Graphidaceae with 2 genera representing 5 species.

**Keywords:** Diversity, distribution, lichens, Hojai, Assam

**Introduction**

The state of Assam mostly comprised of tropical evergreen, semi-evergreen, deciduous forest types and grass lands. Till now occurrence of 262 species of lichens, belonging to 76 genus and 33 families, from the state is available (Das 2008). The Central Assam district of Nagaon is one of the largest districts of Assam. It sprawls across almost four thousand square kilometers of fertile alluvial plains and thickly forested hills. The forest cover of the district is degrading at a fast pace and covers only 12 % of the total land. The forest condition clearly exhibits anthropogenic pressure due to thinning of forest for fuel and other developmental activities. Hojai sub divisional town is situated at a distance of 61 km from Nagaon town. The district is totally unexplored with respect to the lichens and hence provides good opportunity for the lichen diversity exploration and its application as an ecological indicator.

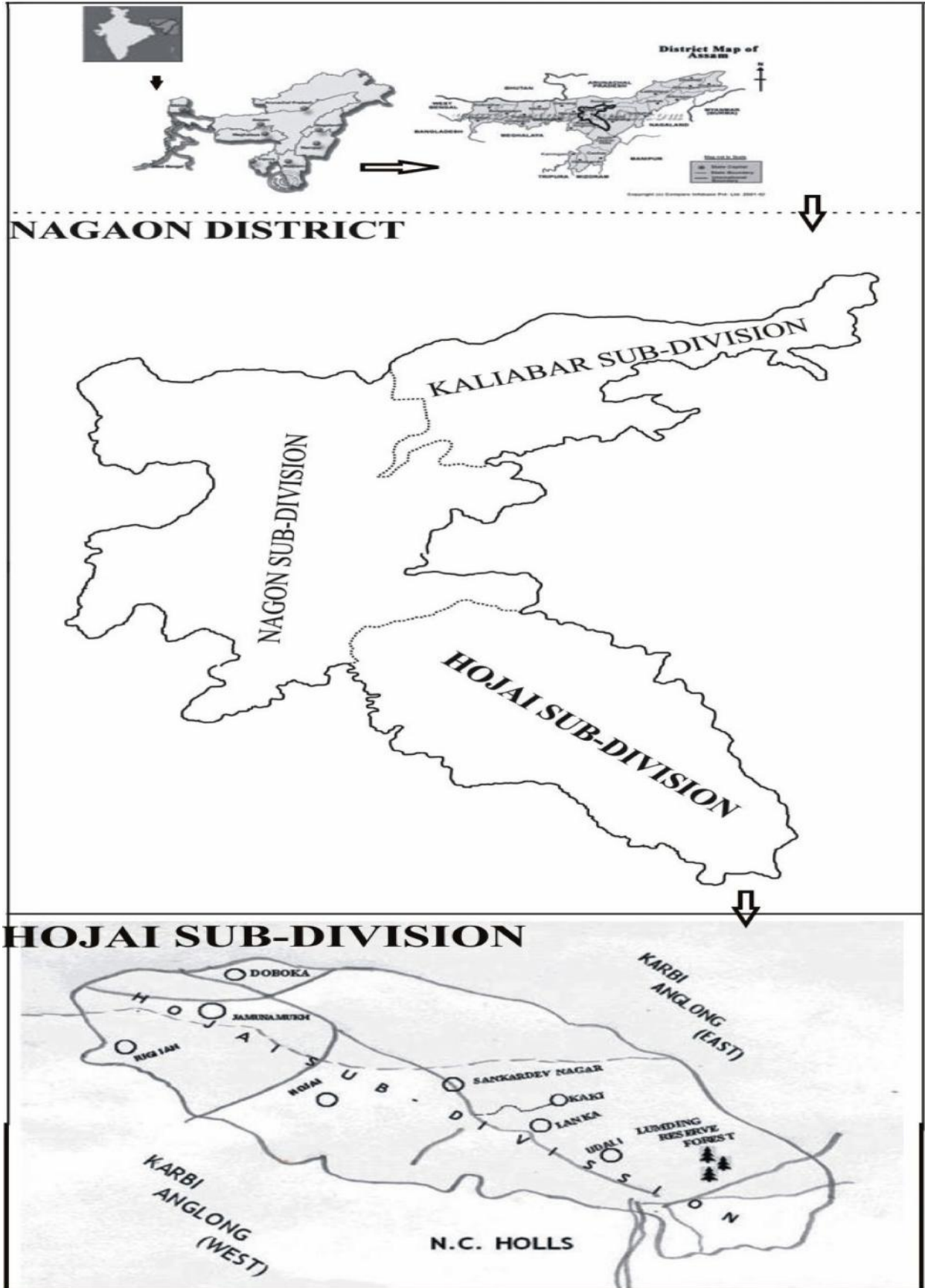
A large number of floristic studies regarding the Indian lichens have been carried out from the country in the past few decades. More systematic floristic studies on lichens of Northeast Indian regions initiated recently by Rout et al. (2005) & Singh et al. (2005).

Pinokiyo et al. (2008) studied the diversity and distribution of lichens at 10 sites within the Mehao Wildlife Sanctuary in Arunachal Pradesh, revealing 177 species, belonging to 71 genera and 35 families. Das (2008) enumerated 262 species from Cachar district of southern Assam. The present study is carried out with an aim to list the lichens from the region together with their distribution pattern in different localities to assess the status of environmental conditions the area.

**Materials and Methods**

More than 100 lichen specimens growing on bark of different trees were collected from seven forest sites of the area (Fig.1). The specimens were grouped together with details of locality, substrate, ecological notes, date of collection, altitude, name of collector and specimen number. Out of the seven localities, Kaki and Hojai localities experience more human activities for collection of timber wood, fuel wood, fodder and frequent animal grazing. Lumding forest, Doboka forest, Jamunamukh and Jugijan area have more or less undisturbed forest due to low human activities.

Fig 1. Map showing locations of collection sites in Hojai sub-division of Nagaon District, Assam



The specimens were studied morphologically, anatomically and chemically. The morphological structures were studied by a binocular microscope. The anatomical details of the thallus and fruiting bodies were studied in free hand section with water as mounting medium under compound microscope. The chemical substance in the thallus were identified through colour test technique by applying aqueous potassium hydroxide (K), Steiner's stable paraphenylenediamine (PD) and aqueous calcium hypochlorite (C) reagents. Thin layer chromatography of the specimen was carried out by using the standard solvent system TDA [Toulene (180); 1, 4- Dioxane (60): Acetic acid (8)] following the techniques of Walker and James (1980) was performed. The confirmations of the specimens are done by the consultation of literature (Awasthi, 1968, 1988, 2000a,b) and the specimens are preserved in the herbarium of the CSIR-National Botanical Research Institute, Lucknow (LWG), and of the Department of Ecology and Environmental Science, Assam University, Silchar, India.

### Results and Discussion

The Hojai sub division is represented by 31 species of lichens (Table 1). The area exhibits dominance of crustose lichens with 16 species followed by 14 foliose lichens and a single species of fruticose lichens. Among the crustose lichen, *Graphidaceae* family exhibits dominance, represented by 4 species,

whereas foliose lichens belonging to the *Physciaceae* family are represented by 9 species. *Physciaceae*, *Parmeliaceae* and *Graphidaceae* are dominant families in the area with 9, 5 and 5 species respectively. *Pyxine*, *Parmotrema* and *Diorygma* are the dominant lichens genera with 4, 5 and 3 species. *Cryptothecia lunulata* (Zahlbr.) Makw. & Patw., is the most common lichen species of both the reserve forest, followed by the species of *Parmotrema*, which generally prefer to grow in the moist shady places of the inner reserve forest exhibits maximum diversity in habitat, as it was found on all the seven sites on cashew nut and mango trees. The only fruticose lichen species *Ramalina hossei* is reported from Lumding forest from cashew nuts tree. The lichen species such as *Ramalina hossei*, *Parmotrema praesorediosum*, *Parmotrema saccatilobum*, *Thelotrema subtile*, *Caloplaca bassiae* and *Parmotrema erhizinosum*, were recorded only from the pollution free areas of the inner reserve forest. Sufficient past distribution data of the lichen taxa from the study area were not available; therefore it was not possible to draw any conclusion about the changes in the distribution pattern of lichen communities at present. Since the present investigation is of a preliminary nature, a more intensive and extensive survey will definitely add additional lichen taxa to the present inventory and can be used as a record for carrying out future biomonitoring studies in the area.

**Table 1. Distribution of lichens in different localities of Hojai sub division and their growth forms.**

Sl. No	Name of species	Family	Growth Forms	Localities								
				1	2	3	4	5	6	7	8	9
1	<i>Arthonia arctata</i> Stirton	Arthoniaceae	Crustose	-	-	+	+	-	-	-	-	-
2	<i>Arthonia tumidula</i> (Ach.) Ach.	"	Crustose	+	+	-	+	-	-	+	+	+
3	<i>Arthonia recedens</i> Stirton	"	Crustose	-	-	-	-	-	-	+	-	-
4	<i>Cryptothecia lunulata</i> (Zahlbr.) Makw. & Patw.	"	Crustose	-	+	+	-	+	-	-	-	+
5	<i>Brigantiaea leucoxantha</i> (Sprengel) R. sant & Haf.	Brigantiaceae	Crustose	-	+	-	-	-	-	+	+	-
6	<i>Diorygma circumfusum</i> (Stirt.) Kalb, Staiger & Elix	Graphidiaceae	Crustose	-	+	-	-	-	-	-	-	-
7	<i>Diorygma</i> sp1	"	Crustose	-	+	-	-	-	-	-	+	+

8	<i>Diorygma</i> sp2	"	Crustose	-	-	-	+	-	-	-	+	-
9	<i>Diorygma</i> sp3	"	Crustose	+	-	-	+	-	+	-	-	-
10	<i>Graphis garoana</i> Nabarkar & Patw.	"	Crustose	-	-	+	-	-	-	-	+	-
11	<i>Lecanora achroa</i> Nyl.	Lecanoraceae	Crustose	-	+	-	-	-	-	+	-	-
12	<i>Lecidea granifera</i> (Ach.) Vain.	Lecideaceae	Crustose	-	-	-	-	-	-	-	-	+
13	<i>Parmotrema austrosinense</i> (Zahlbr.) Hale	Parmeliaceae	Foliose	-	+	-	-	-	-	-	-	-
14	<i>Parmotrema erhizonosum</i> (D.D. Awasthi) Hale ex De Priest & B. W. Hale	"	Foliose	-	+	-	-	-	-	-	-	+
15	<i>Parmotrema praesorediosum</i> (Nyl.) Hale	"	Foliose	-	+	-	-	-	-	-	-	-
16	<i>Parmotrema saccatilobum</i> (Taylor) Hale	"	Foliose	-	+	-	-	-	-	-	-	-
17	<i>Parmotrema tinctorum</i> (Desper.ex Nyl.) Hale	"	Foliose	-	+	-	-	-	-	-	-	+
18	<i>Dirinaria aegialita</i> (Afz. In Ach) Moore	Physciaceae	Foliose	+	-	-	-	-	-	-	-	-
19	<i>Dirinaria applanata</i> (Fée) D. D. Awasthi	"	Foliose	-	-	-	+	+	-	-	-	-
20	<i>Dirinaria consimilis</i> (Stirton) D. D. Awasthi	"	Foliose	-	-	-	-	-	-	+	-	-
21	<i>Heterodermia diademata</i> (Taylor) D.D. Awasthi	"	Foliose	-	-	-	-	+	-	-	-	+
22	<i>Hyperphyscia adglutinata</i> (Flörke) H. Mayrhofer & Poelt	"	Foliose	-	+	-	-	-	+	-	-	-
23	<i>Pyxine cocoes</i> (Sw.) Nyl.	"	Foliose	+	+	+	+	+	+	+	+	+
24	<i>Pyxine meissneria</i> Nyl.	"	Foliose	-	-	-	-	+	+	-	-	-
25	<i>Pyxine reticulata</i> (Vain.) Vain.	"	Foliose	+	-	-	-	+	-	-	-	-
26	<i>Pyxine sorediata</i> (Ach.) Mont.	"	Foliose	-	-	+	-	-	-	-	-	+
27	<i>Anthracothecium assamiense</i> (Stirton) A. Singh	Pyrenulaceae	Crustose	-	-	-	+	-	-	-	-	-
28	<i>Anthracothecium borbonicum</i> (Nyl.) Müll Arg.	"	Crustose	-	-	-	-	+	-	-	-	-

29	<i>Ramalina hossei</i> Vain.	Ramalinaceae	Fruticose	-	-	+	-	-	-	-	-	-
30	<i>Caloplaca bassiae</i> (Ach.) Zahlbr.	Telschistaceae	Crustose	-	+	-	-	-	-	-	-	-
31	<i>Thelotrema subtile</i> Tuck.	Thelotremaceae	Crustose	-	+	-	-	-	-	+	-	+
			<b>Total</b>	<b>5</b>	<b>15</b>	<b>6</b>	<b>7</b>	<b>7</b>	<b>4</b>	<b>7</b>	<b>6</b>	<b>10</b>

(Abbreviations - = Absent & + = Present; Locality Name: 1 = Kaki, 2 = Lumding Reserve Forest, 3 = Lumding town, 4 = Lanka, 5 = Udali, 6 = Hojai, 7 = Jugijan, 8 = Jamunamukh, 9 = Doboka forest.)

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