

# COMMERCIAL AND ETHNIC USE OF LICHENS IN INDIA<sup>1</sup>

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**Upreti, Dalip K., Pradeep K. Divakar, and Sanjeeva Nayaka** (*Lichenology Laboratory, Plant Biodiversity and Conservation Biology Division, National Botanical Research Institute, Rana Pratap Marg, P.B. No. 436, Lucknow-226001, India; e-mail: upretidk@rediffmail.com*). COMMERCIAL AND ETHNIC USE OF LICHENS IN INDIA. *Economic Botany* 59(3):269–273, 2005. The diversity of Indian lichen flora has undergone a considerable decline in the last five decades. Among the various anthropogenic activities, overexploitation and selective removal of economically important lichens have become major threats to the lichen flora of the country. Commercial samples of lichens collected from different states of India were studied for their source and commercial use. Among samples offered for sale, 38 different lichen species were identified. The western Himalayas proved to be the main area for lichen collection, while some lichen species also come from the central and Western Ghats. Local traders coordinate the lichen collection and then sell the material to traders in the foothills, and from there it is processed and distributed to other parts of the country and abroad. Because lichens belonging to the families Parmeliaceae and Physciaceae are the ones most exploited commercially, they are recommended for inclusion in the CITES list.

**Key Words:** Lichen; commercial and ethnic use; conservation.

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Since ancient times, lichens have been a household item in India. Lichens collected from the temperate regions of the Himalayas are used indigenously and also exported. The Himachal Pradesh and Uttaranchal hills are the main areas of lichen collection in India. Few ethnic groups in the central Indian region of Madhya Pradesh and in certain localities of the western Ghats also collect these plants. The Indian subcontinent harbors a rich lichen flora representing about 2,450 species (Awasthi 2000). During the last 50 years, the lichen flora of India has declined considerably in diversity and abundance. Upreti (1995) assessed the different influences responsible for the loss of lichen diversity in India. Important variables include the change in ecological conditions, loss of forest cover and habitat, and growth of urban and industrial areas. In hilly regions of India, the various human activities such as *Jhoom* cultivation, agriculture, mineral extraction, tourism, hydroelectric and road-building projects, are leading to the rapid deterioration of lichen-rich habitats. The over-exploitation and selective removal of economically important lichens by local people have

now become the major threat to the lichen flora of India.

Kumar and Upreti (2001) compiled records of the early use of lichen in various cultural events in India. *Shipal* in Atharveda (1500 B.C.) is the first record of the use of a lichen as medicine. The vernacular name *Charila* is widely used in Ayurveda, an ancient system of medicine in India. The Sanskrit synonyms for lichens are *Shailaya* and *Shila Pushp* (*Shila*, rock; *Pushp*, flower).

At Kannauj, a town of Uttar Pradesh that has been famous for the past 800 years for its perfume production, lichens are today used in the preparation of an indigenous perfume named 'Otto' (the *Hina Attar*). Lichen powder or whole plants are a major ingredient of the common condiments used in food dishes, known as *Gharm Masala*, meat *Masala*, and *Sambar Masala*. Certain Ayurvedic and Unani medicines sold in Indian markets under the trade names *Charila* and *Ushna*, respectively, are composed of different species of lichens. Other species of lichens are burned in holy sacrificial fires known as *Hawan* or *Homa* often mixed with other aromatic herbs. Upreti (1996) reviewed ethnolichenology in India and listed the lichens used (Table 1).

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TABLE 1. LICHEN SPECIES USED BY DIFFERENT ETHNIC GROUPS IN INDIA AND NEPAL.

Lichen species	Ethnic group	Uses
<i>Buellia subSORORIOIDES</i> S. Singh & Awasthi	Garhwal herdsmen	As substitute for 'henna'
<i>Cetrelia collata</i> (Nyl.) Culb. & C. Culb.	Gaddi tribe of Kangra valley	Material for sacrificial fire ( <i>Havan</i> )
<i>Everniastrum cirrhatum</i> (Fr.) Hale	Gaddi tribe of Kangra valley	Material for sacrificial fire ( <i>Havan</i> )
	Bhaiga, Bhil, Bhilala, Gond, Kor- ka, Muria of Madhya Pradesh	As spice and flavoring agent for meat and vegetables
	Lepchas and Nepalese of Sakyong valley, North Sikkim	As vegetables
<i>Heterodermia diademata</i> (Taylor) Awasthi	Nepalese of Sikkim	Thalli applied on cuts for protecting from wetting and infection
<i>Heterodermia tremulans</i> (Müll. Arg.) W. Culb.	Bhaiga, Bhil, Bhilala, Gond, Kor- ka, Muria of Madhya Pradesh	As spice and flavoring agent for meat and vegetables
<i>Melanelia infumata</i> (Nyl.) Essl.	Gaddi tribe of Kangra valley	Material for sacrificial fire ( <i>Havan</i> )
<i>Parmotrema nilgherrense</i> (Nyl.) Hale	Gaddi tribe of Kangra valley	Material for sacrificial fire ( <i>Havan</i> )
<i>Parmotrema sanctae-angelii</i> (Lynge) Hale	Gond and Oran of Madhya Pra- desh	For ringwormlike skin disease
<i>Parmotrema tinctorum</i> (Nyl.) Hale	Bhaiga, Bhil, Bhilala, Gond, Kor- ka, Muria of Madhya Pradesh	As spice and flavoring agent for meat and vegetables
<i>Peltigera polydactyla</i> (Neck.) Hoffm.	Lepchas Sakyong valley, North Sikkim	To stop bleeding from cuts
<i>Ramalina subcomplanata</i> (Nyl.) Kashiw.	Bhaiga, Bhil, Bhilala, Gond, Kor- ka, Muria of Madhya Pradesh	As spice and flavoring agent for meat and vegetables
<i>Rimelia reticulata</i> (Taylor) Hale & Fletcher	Bhaiga, Bhil, Bhilala, Gond, Kor- ka, Muria of Madhya Pradesh	As spice and flavoring agent for meat and vegetables
<i>Stereocaulon himalayense</i> Awasthi & Lamb	Lepchas Sakyong valley, North Sikkim	As antidote for urinary trouble
<i>Thamnomlia vermicularis</i> (Swartz) Ach. in Schaer.	Bhotias of Nanda Devi Biosphere Reserve	Smoke of the lichen used as vermicide
<i>Usnea longissima</i> Ach.	Bhotia and Garhwalis of Uttaran- chal	As stuffing material, spice, and ingredi- ent of a poultice for bone setting

The amount of raw material required in India for the various uses of lichens is quite large. The lichens weigh very little when dry, hence a large volume of these plants is required. There are 320 tons of lichens used annually for various purposes in Nepal and the adjoining regions of India (Moxham 1986). The lichens are picked by hand, or sometimes scraped, from the lower branches, trunks, and fallen twigs of trees.

The lichens exploited in India grow at rates from 5 mm/year to about 2 cm/year for the most rapidly growing leafy (foliose) or shrubby (fruticose) lichens.

### METHODS

Commercial samples of lichens were collected, along with information on local names, sort-

ing, grading and sampling methods, commerce, and resources at various trade centers and markets in the various states of India (Table 2). The samples were segregated and identified in the laboratory. The identified specimens have been placed in the lichen herbarium of the National Botanical Research Institute, Lucknow (LWG).

### RESULTS AND DISCUSSION

Commercial samples of lichens collected from seven states of India belong to 38 species from 23 genera. They were mostly members of the families Parmeliaceae and Physciaceae.

The traditional collection of these plants is coordinated by small local contractors who employ local villagers, or, in the Himalayas, Nepali laborers. Sometimes villagers of various ethnic

TABLE 2. COMMERCIAL SAMPLES OF LICHENS FROM DIFFERENT STATES THAT ARE SOLD AS SPICE.

Serial no.	Species	Uttaranchal and Uttar Pradesh	Maharashtra	Karnataka and Tamil Nadu	Himachal Pradesh	Madhya Pradesh	Sikkim	Andman Islands
1.	<i>Bulbothrix meizospora</i> (Nyl.) Hale	+	-	-	-	-	-	-
2.	<i>Canomaculina subtinctoria</i> (Zahlbr.) Elix	+	-	+	-	-	-	-
3.	<i>Canoparmelia texana</i> (Tuck.) Elix & Hale	+	-	-	-	-	-	-
4.	<i>Cetraria</i> sp.	-	-	+	-	-	-	-
5.	<i>Cetrelia collata</i> (Nyl.) Culb. & C. Culb.	-	-	-	+	-	-	-
6.	<i>Everniastrum cirrhatum</i> (Fr.) Hale <sup>a</sup>	+	-	-	-	-	+	-
7.	<i>E. nepalense</i> (Taylor) Hale <sup>a</sup>	+	-	-	-	-	-	-
8.	<i>Flavopunctelia flaventior</i> (Stirton) Hale	+	-	-	-	-	-	-
9.	<i>Heterodermia diademata</i> (Taylor) Awasthi <sup>a</sup>	+	-	-	-	-	+	-
10.	<i>H. leucomela</i> (L.) Poelt	+	-	-	-	-	-	-
11.	<i>H. tremulans</i> (Müll. Arg.) W. Culb.	-	-	-	-	+	-	-
12.	<i>Hypotrachyna</i> sp.	-	-	+	-	-	-	-
13.	<i>Leptogium</i> sp.	+	-	-	-	-	-	-
14.	<i>Lobaria retigera</i> (Bory) Trevisan	+	-	-	-	-	-	-
15.	<i>Melanelia infumata</i> (Nyl.) Essl.	-	-	-	+	-	-	-
16.	<i>Myelochroa aurulenta</i> (Tuck.) Elix & Hale	+	-	-	-	-	-	-
17.	<i>Nephromopsis pallescens</i> (Schaer. In Moritzi) Park.	+	-	-	+	-	-	-
18.	<i>Parmelaria subthomsonii</i> Awasthi	+	-	-	-	-	-	-
19.	<i>Parmelinella wallichiana</i> (Taylor) Elix & Hale	-	+	-	-	-	-	-
20.	<i>Parmotrema austrosinense</i> (Zahlbr.) Hale	-	+	-	-	-	-	-
21.	<i>P. hababianum</i> (Gyeln.) Hale	-	-	-	-	-	-	+
22.	<i>P. nilgherrense</i> (Nyl.) Hale <sup>a</sup>	+	-	-	+	-	-	-
23.	<i>P. praesorediosum</i> (Nyl.) Hale	-	-	+	-	-	-	-
24.	<i>P. pseudonilgherrense</i> (Asahina) Hale	-	-	-	+	-	-	-
25.	<i>P. sanctae-angelii</i> (Lynge) Hale	-	+	+	-	+	-	-
26.	<i>P. tinctorum</i> (Nyl.) Hale <sup>a</sup>	+	+	+	-	+	-	+
27.	<i>Peltigera polydactyla</i> (Neck.) Hoffm.	-	-	-	-	-	+	-
28.	<i>Ramalina</i> sp.	+	-	-	-	-	-	-
29.	<i>Ramalina conduplicans</i> Vainio	-	-	-	+	-	-	-
30.	<i>Ramalina sinensis</i> Jatta	+	-	-	+	-	-	-
31.	<i>Ramalina subcomplanata</i> (Nyl.) Kashiw.	-	-	-	-	+	-	-
32.	<i>Rimelia reticulata</i> (Taylor) Hale & Fletcher <sup>a</sup>	+	+	+	+	+	-	+
33.	<i>Stereocaulon himalayense</i> (Awasthi) Lamb	-	-	-	-	-	+	-
34.	<i>Thamnolia vermicularis</i> (Swartz) Schaer.	+	-	-	-	-	-	-
35.	<i>Usnea austroindica</i> G. Awasthi	+	-	-	-	-	-	-
36.	<i>U. longissima</i> Ach.	-	-	-	+	-	-	-
37.	<i>U. orientalis</i> Mot.	+	-	-	+	-	-	-
38.	<i>U. thomsonii</i> Stirton	+	-	-	-	-	-	-

<sup>a</sup>Lichen taxa extensively exploited.

groups in the area also collect lichens in their leisure time and sell it to local traders or contractors at the very low price of 10–15 rupees/kg; the traders then pass on the material to traders in the foothills of the Himalayas. It is here that the material is dried, sorted, graded, labeled, and then distributed throughout the country and abroad. The trading centers are located in Kotdwara, Ramnagar, Kathgodam, and Tanakpur in Uttaranchal and Jalandhar in Punjab. Atkinson

(1882) mentioned that the lichens from the Uttar Pradesh (now Uttaranchal) hills were traded in the plains of the country for medicinal uses as tonics, febrifuges, and antipyretics. Shah (1997) recorded that approximately 750 metric tons of lichens are brought in annually from the Uttaranchal hills and 800 metric tons from other regions of India, including Himachal Pradesh, Sikkim, and Assam; of this, about 50–80 metric tons are exported.

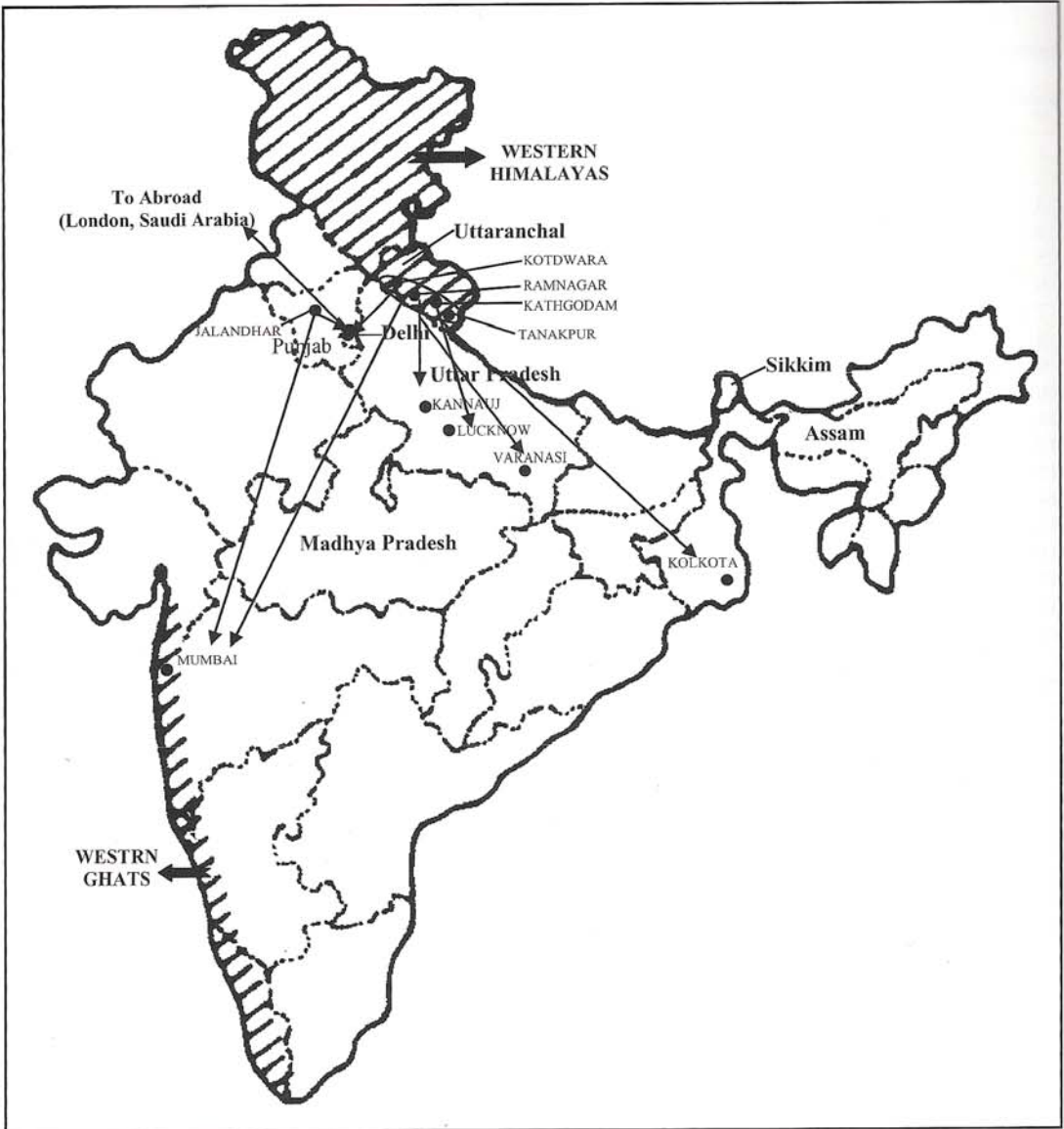


Fig. 1. Lichen trading centers in India and their commercial supply to different cities.

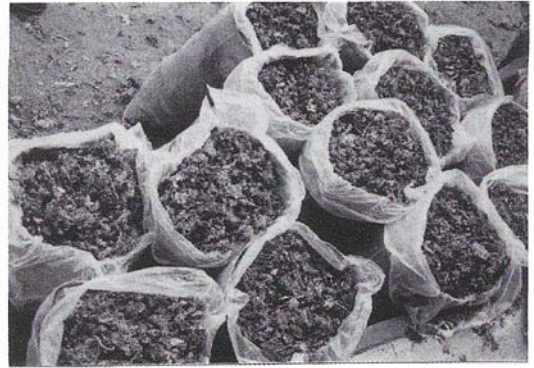
Shah (1997) mentioned four commercial grades of lichens in India. Grade I, which is the highest quality lichen for export, for extraction of resinoids, and which is essential for use in high-grade perfumery, consists of *Parmotrema nilgherrense* (Nyl.) Hale. Grade II consists of a mixture of *P. nilgherrense* with species of *Everniastrum* Hale ex Sipman, while grades III and IV generally consist of *Usnea longissima* Ach. and a mixture of other *Usnea* species, *Ramalina*, and *Heterodermia*, together with small amounts of other lichen species.

The graded lichen (Figs. 2–4) is transported in 10 to 15 kg bags to various cities in India such as Lucknow, Kannauj, Bombay, Delhi, Varanasi, and Kolkota, as well as abroad to Saudi Arabia or London (Richardson 1991). Lichens can be found for sale in grocery shops as *Charila* in most cities in India.

From Tables 1 and 2, it is clear that species of the lichen genera *Everniastrum*, *Parmotrema*, and *Rimelia* are exploited exhaustively in the Indian subcontinent. Moxham (1986) states that, despite the large quantity of lichens processed,



**Fig. 2.** Lichens collected from the Himalayan foothills.



**Fig. 4.** Graded lichens in 10- to 15-kg bags for supply to different cities of India.

their abundance in the preferred collecting areas and reasonably rapid growth seem to indicate that conservation measures are not necessary at the moment, although transboundary air pollution may be a long-term threat. Alternately, Shah (1997) has documented the need for protection and conservation of lichens in India because of their intense exploitation, but conservation has not received the desired attention. To limit the trade of endangered lichens, the species in lichen genera *Parmotrema*, *Everniastrum*, and *Rimelia* should be included in the CITES (Convention of



**Fig. 3.** Lichen materials sorted, graded, and baled at Ramnagar.

International Trade in wild species of Endangered Fauna and Flora) list.

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