



Species Diversity of Lichens in Bhoranj Block of Hamirpur District, Himachal Pradesh

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ABSTRACT: During the present study sixty six specimens of lichens were collected from Bhoranj block of Hamirpur district, Himachal Pradesh. A total of twelve species of lichens belonging six genera and four families were recorded. All the species were identified on the basis of morphological and anatomical investigation. The ecological species diversity (α , β and γ diversity) of twelve species was calculated. *Physcia dubia* is most common species. All the taxa were deposited in CPUH (The Herbarium, Department of Biosciences, Career Point University, Hamirpur).

Keywords: Species; Diversity; Lichen; Bhoranj and Himachal Pradesh.

INTRODUCTION: Lichens are pioneer colonizers during plant succession. This property of lichens is mainly attributed to the unique symbiotic association between alga and fungus. In lichen thallus, fungus (mycobiont) contribute to about 90 percent part.¹ The mycobiont belong to 20 percent of all fungi and mostly comprises of 40 percent of ascomycetes.² Lichens play an important role both in ecosystem sustainability and human welfare.³ Lichens are used in various ways by the humans and also by the animals. Indian lichens are represented by 305 genera and 74 families which is about 10% of the 20,000 species of Lichens reported in all over the world. Out of 20,000 species 98.9% of the lichens belong to a separate group named Ascomycetes and the remaining species of lichens are placed in Basidiomycetes and Deuteromycetes groups represented by 0.1% and 1% respectively. India is rich centre of lichen diversity, contributing about 2080 species of lichen from the total expected 4000 species of which more than 500 taxa are endemic to the country.⁴

The diversity of lichens in North-Western Himalaya and India has been studied by a lot of researchers.⁵⁻¹⁸ The lichen diversity of Himachal Pradesh accounts for 503 species.¹⁹ The diversity of lichens in Hamirpur district of Himachal Pradesh is least explored. The review of literature reveals that twenty three species (*Bacidia medialis*, *Bacidia nigrofulva*, *Bacidia nigrostricta*, *Bacidia rosella*, *Bacidia rubella*, *Caloplaca*

malaensis, *Candelaria concolor*, *Chysothrix chlorina*, *Clathroporina anoptella*, *Dermatocarpon minutum*, *Dermatocarpon vellereum*, *Endocarpon subrossettum*, *Graphis duplicata*, *Hyperphyscia adglutinata*, *Lecanora alba*, *Lecanora flavidofusca*, *Lecanora* sp., *Lecanora tropica*, *Lepraria* sp., *Pheophyscia hispidula*, *Pheophyscia orbicularis*, *Pyxine cocoes*, *Pyxine petricola*) have been reported from district Hamirpur of Himachal Pradesh.²⁰ Owing to the ecological and economic importance and in contrast to the insufficient data available on the geographical distribution, the floristic investigations were initiated to describe and preserve lichen diversity of Bhoranj block of Hamirpur district during December 2018 to June 2019 with objectives to collect specimens of lichens from different localities and substrates, study morphology and anatomy of each specimen, identify species and preserve specimens for future reference and document species diversity and distribution of lichens in the study area.

MATERIALS AND METHODS: The present studies were conducted in eight localities namely Kharwar, Patta, Tarkwari, Tikker, Karha, Seu, Bhota and Ladraur of Bhoranj block in Hamirpur district of Himachal Pradesh. Bhoranj is one of the seven blocks of Hamirpur district. It lies in the subhumid and subtropical climatic zone of Shivalik hills in Western Himalaya.²¹ The specimens of macrofungi and related field data concerning their distribution, status, eco-

nomical and ecological values were collected throughout the research period from eight localities of the study area. The specimens were collected randomly and the field data such as texture, size, colour, macroscopic features and form was being noted in the field book during excursions. Fresh specimens were sun dried at the collection site and then brought to laboratory for further taxonomic studies. The morphological and anatomical details were compiled in the form of a description which was then being compared with the published literature, authenticated taxonomic keys and monographs. Identity of specimens was confirmed by comparing their morphology, anatomy and chemistry with authenticated taxonomic keys.²²⁻²⁵ Species diversity of eight locations was analysed.²⁶ For the preser-

vation of specimens, 1,4-dichlorobenzene crystals were put into each paper packet for protection from attack of worms, insects etc. After identification, the specimens were deposited in CPUH (The Herbarium, Department of Biosciences, Career Point University Hamirpur).

RESULTS AND DISCUSSION: During the present study, twelve species of lichens have been enumerated from eight localities in Bhoranj block of Hamirpur district in Himachal Pradesh (Table 1). The alpha diversity of lichens in various localities has been presented in Table 2. The β diversity of the species was 15 whereas γ diversity was 12. Three species of lichens are economically important (Table 3).

Table 1: List of species of Bhoranj Block of Hamirpur district, Himachal Pradesh.

Sr. No.	Species	Family	Substrate
1.	<i>Chrysothrix candelaris</i>	Chrysothricaceae	Corticolous
2.	<i>Chrysothrix chlorina</i>	Chrysothricaceae	Corticolous
3.	<i>Lecanora chlorotera</i>	Lecanoraceae	Saxicolous, Corticolous
4.	<i>Canoparmelia pustulescens</i>	Parmeliaceae	Saxicolous
5.	<i>Parmotrema andinum</i>	Parmeliaceae	Corticolous, Saxicolous
6.	<i>Parmotrema mesotropum</i>	Parmeliaceae	Corticolous
7.	<i>Pheophyscia hispidula</i>	Physciaceae	Corticolous
8.	<i>Physcia crispa</i>	Physciaceae	Corticolous
9.	<i>Physcia dubia</i>	Physciaceae	Corticolous
10.	<i>Physcia integrata</i>	Physciaceae	Corticolous
11.	<i>Physcia jackii</i>	Physciaceae	Corticolous
12.	<i>Physcia solediosa</i>	Physciaceae	Corticolous

Table 2: Diversity of lichens in eight localities of study area.

Sr. No.	Locality	Alpha (α) Diversity
1.	Bhota	7
2.	Karha	5
3.	Kharwar	3
4.	Ladrour	7
5.	Patta	4
6.	Seu	8
7.	Tarkwari	2
8.	Tikkar	3

Table 3: Economically important lichen species of the study area.

S.N.	Species	Economic Importance
1.	<i>Lecanora chlorotera</i>	It is found in different parts of the world. Earth bread is prepared from its flour and powder. It also covers the soil.
2.	<i>Parmotrema andinum</i>	These have antimicrobial properties against fungal as well as human pathogenic bacteria.
3.	<i>Phaeophyscia hispidula</i>	It is pollution tolerant and can resist emission from vehicle exhaust.

CONCLUSION: During the present study about sixty six specimens were collected from eight localities (Bhota, Karha, Kharwar, Ladrou, Patta, Seu, Tarkwari, and Tikker) and different substrates of the study area. We recorded twelve species of lichens belonging six genera with four families. Out of these ten species are corticolous (*Physcia soledisa*, *Physcia jackii*, *Physcia integrata*, *Physcia dubia* and two species are saxicolous (*Lecanora chlorotera* and *Canoparmelia pustulescens*). The study area was dominated by both crustose and foliose lichens species while fruticose lichen species were absent. All the species were identified on the basis of morphological and anatomical investigation. The species diversity (α , β and γ diversity) of twelve species is calculated. The highest α diversity was recorded at Seu (8). The lowest α diversity was at Tarkwari (2). *Physcia dubia* is most common species and is found in all the eight localities of Bhoranj block in Hamirpur district. Beta diversity is fifteen and gamma diversity is twelve. The specimens were deposited in CPUH (The Herbarium of Department of Bio-sciences career point university, Hamirpur).

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