



Floristic Studies on Cryptogams of Sujampur-Tihra region of Himachal Pradesh

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ABSTRACT: Cryptogams play an important role in maintaining the quality of habitat. These include lower plants such as algae, bryophytes, lichens and pteridophytes. Cryptogams are the least explored plants in the Sujampur-Tihra region of Himachal Pradesh. The floristic studies to explore cryptogams of this region were conducted and two hundred specimens of cryptogams were collected from eighteen localities. These specimens were identified on the basis of available literature after detailed morphological investigations at laboratory. A total of forty five species of cryptogams were identified which includes nine algae, ten bryophytes, seven lichens and nineteen pteridophytes. Most of these cryptogams are medicinally important.

Keywords: Cryptogam; Floristic; Habitat; Sujampur-Tihra and Taxa.

INTRODUCTION: Cryptogams include lower plants such as algae, bryophytes, lichens and pteridophytes as these reproduce by means of spores rather than seeds as in case of higher plants such as gymnosperms and angiosperms. Cryptogams are the spore producing plants. These grow in moist and shady habitats and are also found on the trees, rocks and soil. These play vital role in substrate formation on the soil surface which is known as cryptogamic crust.¹ The cryptogamic crust provides protection to the soil surface by preventing the soil erosion. The cryptogamic crust is composed of group of cryptogamous plants.² These play significant ecological role in different types of ecosystems.³ Cryptogams are present in all terrestrial ecosystem. They can be used for treating microbial infection.⁴ Cryptogams hold key position in variety of ecosystem and are very useful for the ecosystem because they provide food and shelter for different species of organisms. Cryptogams have various medicinal values and many bioactive compounds like tannin, phenolic, flavonoids and alkaloids etc. are obtained from them. Many cryptogams are used for curing different types of diseases like asthma, typhoid, tuberculosis and cough.⁵ They have important biochemical properties like antifungal, cytotoxic and anti-microbial properties and some species are the indicators of biodiversity richness and can be used as important tool in nature based solutions in conservation process.⁶ Cryptogams are primary colonizer. These are specialized diverse group which contain organisms that varies from single celled algae to complex and large colonies of fungi and lichens. The detailed

review of published record of floristic diversity and distribution of plant biodiversity in Hamirpur district of Himachal Pradesh revealed that there are very scanty studies on the cryptogams of Sujampur-Tihra region of this district.⁷⁻²⁶ So, floristic enumerations of cryptogams from Sujampur-Tihra region of Hamirpur District were conducted during August, 2019 to February, 2020 to identify the specimens of cryptogams and prepare species database.

MATERIALS AND METHODS: During the present study the specimens of algae, bryophytes, pteridophytes and lichens were collected from in and around Sujampur-Tihra. It is located on the bank of river Beas. Climate varies all through from hot summer to cold winter. Being on the bank of Beas River, the winter is quite severe. The temperature varies from 38°C in summer to almost 0°C in winter. Sujampur-Tihra is well connected to all major towns of Himachal Pradesh and of the country in all directions through road network. About three decades ago, Sainik School was inaugurated in Sujampur-Tihra which is located in the green ground in the middle of the town. This has increased the importance of the town. The major vegetation of the study area comprises of subtropical pine forest. Cryptogams were collected from different regions of study area. Cryptogams growing on different substrata such as on rocks, on the bark of trees, on soil were collected. All the specimens were dried and mounted on herbarium sheets of standard size with the help of cello-tape and glue. Specimens were collected during the study peri-

od and were identified in the laboratory of Career Point University Hamirpur. Specimens are identified on the basis of anatomy and morphology. Labels were pasted on the lower right hand corner. Labels should indicate the information about the habitat, locality, and altitude, name of collector, date and time of collection. During the field collection a sharp knife, a hammer, labeling, a field note book, pen, pencil was used. The different specimens were recorded, photographed and identified on the basis of morphological, anatomical and micro-chemical characteristics after consulting latest literature.²⁷⁻³² Every possible area which supports the growth of cryptogams was visited. All the taxa have been deposited in CPUH (The Her-

barium, Department of Biosciences, Career Point University Hamirpur).

RESULTS AND DISCUSSION: During the investigation a total of two hundred specimens of the cryptogams (algae, bryophyte, lichens and pteridophytes) were collected from the Sujampur-Tihra region and forty five species of cryptogams have been identified (Table 1). The cryptogams were collected during August 2019 to February 2020 from eighteen localities (Chabutra, Dhanotu, Bhalet, Dosarka, Doli, Sujampur, Tihra, Plahi, Bagehra, Bheri, Jangal, Bagh, Karot, Kutheda, Dogarbain, Sakoh, Gander, Paragay da Galoo).

Table 1: List of cryptogams of Sujampur-Tihra region of Himachal Pradesh.

Sr. No.	Cryptogram Group	Species
1.	Algae	<i>Cladophora glomerata</i>
2.	Algae	<i>Melosira granulata</i>
3.	Algae	<i>Oedogonium australes</i>
4.	Algae	<i>Oscillatoria princeps</i>
5.	Algae	<i>Pseudo nitzschia</i>
6.	Algae	<i>Spirogyra porticalis</i>
7.	Algae	<i>Spirogyra variance</i>
8.	Algae	<i>Tabellaria flocculosa</i>
9.	Algae	<i>Tribonema vulgare</i>
10.	Bryophyte	<i>Anthoceros erectus</i>
11.	Bryophyte	<i>Barbula spadicea</i>
12.	Bryophyte	<i>Bryum capillare</i>
13.	Bryophyte	<i>Funaria hygrometrica</i>
14.	Bryophyte	<i>Marchantia polymorpha</i>
15.	Bryophyte	<i>Physcomitrium pyriforme</i>
16.	Bryophyte	<i>Plagiochasma appendiculatum</i>
17.	Bryophyte	<i>Plagiothecium denticulatum</i>
18.	Bryophyte	<i>Reboulia hemisphaerica</i>
19.	Bryophyte	<i>Tortula muralis</i>
20.	Lichen	<i>Chrysothrix candelaris</i>
21.	Lichen	<i>Chrysothrix chlorina</i>
22.	Lichen	<i>Parmotrema austrosinense</i>
23.	Lichen	<i>Pheophyscia hispidula</i>
24.	Lichen	<i>Physcia caesia</i>
25.	Lichen	<i>Physcia stellaris</i>
26.	Lichen	<i>Pyxine subcinerea</i>
27.	Pteridophyte	<i>Adiantum capillus-veneris</i>
28.	Pteridophyte	<i>Adiantum caudatum</i>
29.	Pteridophyte	<i>Adiantum incisum</i>
30.	Pteridophyte	<i>Adiantum lunulatum</i>
31.	Pteridophyte	<i>Asplenium dalhousiae</i>
32.	Pteridophyte	<i>Cheilanthes albomarginata</i>
33.	Pteridophyte	<i>Cheilanthes bicolor</i>
34.	Pteridophyte	<i>Cheilanthes farinosa</i>
35.	Pteridophyte	<i>Christella parasitica</i>
36.	Pteridophyte	<i>Dryopteris cochleata</i>
37.	Pteridophyte	<i>Equisetum arvense</i>

38.	Pteridophyte	<i>Hypodematum crenatum</i>
39.	Pteridophyte	<i>Lygodium flexuosum</i>
40.	Pteridophyte	<i>Marselia minuta</i>
41.	Pteridophyte	<i>Polystichum braunni</i>
42.	Pteridophyte	<i>Pteris cretica</i>
43.	Pteridophyte	<i>Pteris vittata</i>
44.	Pteridophyte	<i>Pyrosia flocculosa</i>
45.	Pteridophyte	<i>Sellaginella chrysocaulos</i>

CONCLUSION: A total of about forty-five species of cryptogams were identified on the basis of botanical description. Many species of cryptogams are used for the treatment of various diseases like fever, asthma, typhoid, stomach ulcer etc. Cryptogams are used as medicine in the form of paste, powder and extract. The documentation, preservation and recording of medicinally important cryptogam's species should be the necessary step for conservation of cryptogam species. The traditional knowledge associated with them must pass to future generation. The taxa are deposited in CPUH (The Herbarium of Department of Bio-Sciences Career Point University, Hamirpur).

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