Annals of
Plant Sciences
Vol. 9, Issue 3, (2020) pp. 3755-3760
ISSN: 2287-688X
Research Article

An account of the Gymnospermic flora of Himachal Pradesh and different uses in daily life of peoples

Priya Kumari[1], Mukesh Kumar Seth[2], Rakhi Geagotia[3*]
[1,2]Department of Biosciences, Himachal Pradesh University, Summer Hill, Shimla, Himachal Pradesh, India.
[3]Department of Botany, Gautam Group of Colleges, Hamirpur, Himachal Pradesh, India.

Abstract: Himachal Pradesh, the mountainous state of Indian Himalayan region is famous for its religious culture, traditions and its unique flora and fauna. Gymnosperms have different uses like lumber, paper production, resin, soap, varnish, nail polish, food, fuel, religious, gum, essence and perfumes. In this, 20 species, 13 genera and 6 families have been described with their different uses. Due to overexploitation, habitat destruction, urbanization and climatic changes, gymnosperms are decreasing day by day. The present study helps to understand the utilization of gymnosperms by different ways and there is urgent need to aware the peoples to protect the plants for future.

Keywords: Gymnosperms; Himachal Pradesh; Medicinal; Edible; Timber; Uses.

Introduction

Himachal Pradesh, the land of Gods, situated in the lap of the Western Himalayas, is considered to be a rich source of biodiversity. The varied agro-climatic and edaphic factors are responsible for a wide range of flora. The term "Gymnosperm" comes from the Greek word gymnos, "naked" and sperm, "seed", after the unenclosed condition of their seeds (Engler and Prantle, 1926). The Gymnosperms are a group of seed-producing plants that includes conifers, cycads, Ginkgo and Gnetales (Coutler and Chamberlain, 1910). The largest group of living gymnosperms are the conifers (pines, cypresses), followed by cycads, gnetophytes and *Ginkgo* (a single living species) (Sporne, 1965; Mc Loughlin and Vajda, 2005). Gymnosperms have a very important evolutionary, economic and the ecological significance. They are widely used in construction, furniture-building, paper-making, providing important solvent for Industrial and home use, cleaning agents, fuel, food and ornamental.

The present article provides information about their scientific name, families, common name, elevation and important uses of gymnosperms of Himachal Pradesh. The purpose of paper to aware the peoples about their importance and conservation because they are decreasing day by day due to overexploitation, pollution, habitat destruction, forest fires, commercial uses, climatic change, constructions, agricultural land, urban development, natural calamities etc.

Material and Methods

From the administrative point of view the Himachal Pradesh has been divided into twelve districts, namely Bilaspur, Chamba, Hamirpur, Kangra, Kinnaur, Kullu, Lahaul & Spiti, Mandi, Shimla, Sirmaur, Solan and Una. These districts cover the lower to higher altitude and due to variation in altitude and climatic conditions, vegetation of the state also diverse. The present study focuses on the gymnosperms of Himachal Pradesh. Field survey was carried out during

***Corresponding Author:**
Rakhi Gagotia,
E-mail: gagtiarakhi@gmail.com

2011-2017. Identification and evaluation of gymnosperms was done on the basis of morphological characters. The characteristic features of the plants were noted and their photographs were taken in the field. Herbarium mounts of these plants were also prepared for record and identification. Data were compiled with related literature and then report was documented. Information was composed from different floras namely: Flora Simlensis by Collet (1902, 1921), Flora of Lahaul & Spiti by Aswal and Mehrotra (2009), Flora of Kullu by Dhaliwal and Sharma (1999), Flora of Sirmaur by Kaur and Sharma (2004), Flora of Bushar Himalayas by Nair (1977), Flora of Himachal Pradesh by Chowdhury and Wadhwa (1984) and Flora of Chamba district by Singh and Sharma (2006).

Results and Discussions

In the present study, 20 species, 13 genera and 6 families were described with their scientific name, family, common name, elevation and uses (Table 1 and Figures). The genera represented by higher number of species were *Pinus* (4 species), *Abies* (2 species), *Cupressus* (2 species), *Ephedra* (2 species), *Juniperus* (2 species), *Araucaria*, *Cedrus*, *Cryptomeria*, *Cunninghamia, Picea, Platycladus*, *Podocarpus* and *Taxus* (1 species each). Families with higher number of species were Pinaceae (8 species), Cupressaceae (7 species), Ephedraceae (2 species), Araucariaceae, Podocarpaceae and Taxaceae (1 species each).

Conclusion

The rapid industrialization and urbanization is the main factor for the degradation of the plants form the earth. The anthropogenic factors have very negative consequences on the succession of the plants as well as other living organisms. Well gymnosperms have a very important evolutionary, economic and the ecological signify-cance. All the pant parts are the reservoirs of the many kinds of the complex metabolites which have very important economic as well as ecological significance. Conifers have been used from centuries for many purposes. Sustainable uses of the plants are essential features for the conservation of this remarkable group of the plants. In addition, a number of the environ-mental problems also exist, due to rapid industrialization, so they can be used for solution of the many environmental problems. Overall human need is to be saved with these groups of the plants and helpful for saving of vegetation and other species on the planet. Some of the factors which are responsible for the degradation of that group can be elucidated as, Overcutting of the forest for the different purposes, degradeation of the forest ecosystem, habitat destructtions, some of the diseases are the main factors for the degradation of the many genera, changes in the climate and the other evolutionary reasons these plants cannot be acclimatize with the environment. Unplanned uses of the gymnosperms by the tribal communities and other peoples are also the main reasons for the degradation of the gymnosperms.

Table 1: List of Gymnosperms of Himachal Pradesh and Uses

S.No.	Plant Name	Family	Common Name	Elevation	Uses
1	***Abies pindrow* (Royle ex D. Don) Royle**	Pinaceae	West Himalaya Low Level Silver Fir	2100-3600 m	Timber, construction work, paper pulp, fuel
2	***Abies spectabilis* (D. Don) MIrb.**	Pinaceae	High Level Himalayan Silver Fir	2600-3800 m	Building material, packing cases, fruit crates

3	***Araucaria columnaris* (G. Forst.) Hook.**	Araucariaceae	Christmas Tree, Cook-Pine, Coral Reef Araucaria	1000-1500 m	Ornamental, carpentry work, indicator of lead for environmental monitoring
4	***Cedrus deodara* (Roxb. ex D. Don) G. Don**	Pinaceae	Devdar, Deodar Cedar, Himalayan Cedar	1200-3300 m	Useful in insomnia, inflammations, cough, fever, bronchitis, itching, ophthalmia, skin diseases; construction work, oleoresin
5	***Cryptomeria japonica* (Thunb. ex L.F.) D. Don**	Cupressaceae	Japanese Red Cedar, Sugi	2600 m	Resin is used in gonorrhea. Wood is used for furniture, paper manufacture. Leaves are used as incense sticks. Ornamental
6	***Cunninghamia lanceolata* (Lamb.) Hook.**	Cupressaceae	Chinese Fir	2800 m	Construction work and charcoal. Bark is used to treat burns and wounds and cone decoction in treatment of cough
7	***Cupressus sempervirens* L.**	Cupressaceae	Pencil Pine, Pyramidal Cypress	900-2400 m	Ornamental, perfumery and soaps. Leaves are used for whooping cough. Wood is used for furniture, boxes, astringent and anthelmintic. Seed oil is used for massaging in muscle pains
8	***Cupressus torulosa* D. Don**	Cupressaceae	Bhutan Cypress, Himalaya Cypress	1800-3000	Antiseptic, cosmetics; planted as a wind-break. Construction, fence posts, poles
9	***Ephedra gerardiana* Wall. ex Stapf.**	Ephedraceae	Indian Jointfir, Somlata	2400-5000 m	Ephedrine is used in treatment of asthma and catarrh. Fruits are edible and used to treat respiratory affections
10	***Ephedra intermedia* Schrenk & C.A. Mey.**	Ephedraceae	Zhong Ma Huang	4500 m	Fruits are edible. Ephedrine is used in treatment of asthma and catarrh. Root is antihydrotic, lowers the blood pressure and stems are antidote, diaphoretic and diuretic
11	***Juniperus recurva* Buch.-Ham. ex D. Don**	Cupressaceae	Himalayan Juniper, Drooping Juniper	3000-4000 m	Wood and leaves are used as an incense; smoke from green wood is emetic

12	***Juniperus squamata* Buch.-Ham. ex D. Don**	Cupressaceae	Flaky Juniper	1600-4900 m	Leaves and wood is used as incense. It is used as a fuel. Ornamental.
13	***Picea smithiana* (Wall.) Boiss.**	Pinaceae	Himalayan Spruce, Morinda Spruce	1800-3600 m	Furniture, packing cases, construction work. Leaves yield an essential oil used in deodorants and room sprays; manure and litter for cattle
14	***Pinus gerardiana* Wall. ex D. Don**	Pinaceae	Chilgoza Pine, Himalayan Edible Pine	1500-3600 m	Seeds are edible and used for making garlands; fuel
15	***Pinus patula* Schiede ex Schltdl. & Cham.**	Pinaceae	Mexican Weeping Pine, Spreading-Laeved Pine	3000 m	Rheumatic affections, respiratory diseases, skin complaints, herbal steam bath and inhalers.
16	***Pinus roxburghii* Sarg.**	Pinaceae	Chir Pine, Long-Leaved Pine, Three-Leaved Pine	450-2400 m	Resin and turpentine oil are used in pharmaceutical preparations, disinfectants and insecticides. Wood is used for construction work, cough and seeds are edible; fuel
17	***Pinus wallichiana* A.B. Jacks.**	Pinaceae	Blue Pine, Himalayan Blue Pine	1200-3800 m	Intestinal antiseptic, diseases of the eye, ear, throat and skin. Wood is used in furniture, match boxes, construction purposes; charcoal; resin is purgative, carminative, expectorant and diuretic; seeds are edible
18	***Platycladus orientalis* (L.) Franco**	Cupressaceae	Oriental Thuja, Peacock Feathers	900-2800 m	Leaves oil used as tonic, diuretic and antipyretic.
19	***Podocarpus neriifolius* D. Don**	Podocarpaceae	Brown Pine, Oleander Podocarp	1000 m	Leaves decoction has been used in rheumatism and arthritis, maggot infested sores. Paper making, furniture, musical instrument.
20	***Taxus wallichiana* Zucc.**	Taxaceae	Himalayan Yew	900-3700 m	Medicinal use in Ayurveda and Tibetan medicine. Anticancer drug *paclitaxel*. Fuel, tannins, red dye, incense, door frames, cabinet work.

Figure 1: Photographs of Gymnosperms of Himachal Pradesh

Figure. 1. *Abies pindrow* (Royle ex D. Don) Royle; **2.** *Abies spectabilis* (D. Don) MIrb.; **3.** *Cedrus deodara* (Roxb. ex D. Don) G. Don; **4.** *Cryptomeria japonica* (Thunb. ex L.F.) D. Don; **5.** *Cupressus sempervirens* L.; **6.** *Cupressus torulosa* D. Don; **7.** *Ephedra gerardiana* Wall. ex Stapf.; **8.** *Ephedra intermedia* Schrenk & C.A. Mey; **9.** *Juniperus recurva* Buch.-Ham. ex D. Don; **10.** *Juniperus squamata* Buch.-Ham. ex D. Don; **11.** *Picea smithiana* (Wall.) Boiss; **12.** *Pinus gerardiana* Wall. ex D. Don ;**13.** *Pinus patula* Schiede ex Schltdl. & Cham.; **14.** *Pinus roxburghii* Sarg.; **15.** *Pinus wallichiana* A.B. Jacks.; **16.** *Taxus wallichiana* Zucc.

References

1. Aswal, B.S. and Mehrotra, B.N. Flora of Lahaul-Spiti (A cold desert in North West Himalaya). Bisen Singh Mehendra Pal Singh, Dehradun, India. 2009. 761pp.
2. Chowdhery, H.J. and Wadhwa, B.M. Flora of Himachal Pradesh: An analysis". Department of Environment, Government of India, Botan-ical Survey of India, Howrah, India; 1984. 1-3: 860pp.
3. Collett, H. Flora Simlensis, A handbook of flowering plants of Simla & the neighbour-hood. 1st Edn.by Thacker, Spink and Co., London, 2nd Edn. by Thacker, Spink and Co., Calcutta and Simla. (1902, 1921) 652 pp. Bishen Singh, Mahendra Pal Singh, Dehradun, India.
4. Coulter J.M. and Chamberlain, C.J. Morpho-logy of gymnosperms. Chicago: Univ. Press. (1910)
5. Dhaliwal D.S. and Sharma, M. Flora of Kullu district (Himachal Pradesh). Bishen Singh Mahendra Pal Singh Dehradun, India. (1999) 744 pp.
6. Engler, A. and Prantl, K. Die naturlichen Pfla-nzenfamilien 2, 1, pp. 6-127 (1887); 2nd edn., Vol.13. Leipzig: W. Engelmann. 1926. 447 pp.
7. Kaur, H. and Sharma, M. Flora of Sirmaur district (Himachal Pradesh). Bishen Singh Mahendra Pal Singh, Dehra Dun, India. 2004. 770pp.
8. Mc Loughlin and Vivi Vajda. Ancient Wollemi Pines Resurgent. Amer. Scien. 2005. 93: 540-547pp.
9. Nair, N.C. Flora of Bushahr Himalaya. Inter-national Bio-Science Publishers, Hisar, Mad-ras. 1977. 360 pp.
10. Singh, H. and Sharma M. Flora of Chamba district (Himachal Pradesh). Bishen Singh Pal Singh, Dehradun, India. 2006. 881pp.
11. Sporne, K.R. The morphology of gymnos-perms. London. Hutchinson University Libr-ary; Edn. H. Munro Fox. Hutchinson & Co. (Publishers) Ltd. "J. Nat. Hist.,1965. 8(91): 447-448pp.

Cite this article as:

Priya Kumari, Mukesh Kumar Seth, Rakhi Gagotia. An account of the gymnospermic flora of Himachal Pradesh and different uses in daily life of peoples. *Annals of Plant Sciences*. 9.3 (2020) pp. 3755-3760.

http://dx.doi.org/10.21746/aps.2020.9.2.2

Source of support: Nil; **Conflict of interest:** Nil.