

Ecology and Medicinal Uses of *Helminthostachys zeylanica* (L.) Hook. “An endangered flora of India” reported at Foothills of Kumaun Himalaya (Kashipur), Uttarakhand

Bhasker Joshi

Department of Botany, R. H. Govt. P. G. College Kashipur,
Kumaun University, Nainital, Uttarakhand-244713
E-mail- bhaskerjoshihd@in.com, bhaskerjoshihd@yahoo.com

Abstract: *Helminthostachys zeylanica* Linn commonly called “kamraj”. This is a pteridophyte and have high medicinal value and used in various parts of the world. The whole plant parts like roots and leaves use as medicine. It is an endangered flora of India therefore; less information is available about to this plant. The present article provides various information like distribution, description, cultivation, uses and conservation of this species.

[Bhasker Joshi. **Ecology and Medicinal Uses of *Helminthostachys zeylanica* (L.) Hook. “An endangered flora of India” reported at Foothills of Kumaun Himalaya (Kashipur), Uttarakhand.** Researcher. 2011;3(4):51-54]. (ISSN: 1553-9865). <http://www.sciencepub.net>.

Key Words: Ethnomedicinal uses, *Helminthostachys zeylanica* (L.) Hook., Kumaun Himalaya and Traditional medicine.

1. Introduction

India is the home of biological and cultural diversity. Different communities have used the rich plant biodiversity of India for various purposes such as food, medicine, fodder, fuel and religious proposes (Joshi, 2011). The Himalaya is considered as one of the most important botanical region of the world. In the Himalayan region, a chronic form of disturbance is found in which people remove only a small fraction of forest biomass in the form of grazing, lopping, surface burning and litter removal. The problem with this form of disturbance is that plants or ecosystems often do not get time to recover adequately because the human onslaught never stops (Singh, 2002; Singh and Singh, 1992; Singh and Hajara, 1996; Semwal *et al.*, 2007).

Foothills Kumaun region of Uttarakhand is a transition zone between hill and Gangetic plain, so this region have wide floristic diversity and the soils and climate of this region provide such an environment which has generated different types of vegetation which have great economic medicinal, aromatic and artistic value. However, due to heavy industrialization, urban expenditure, construction of roads the forest area are degenerated and many economical plants are facing danger of extinction. Therefore, the aim of this paper is to highlight the habitat, cultivation, collection, and medicinal uses of this endangered fern “*Helminthostachys zeylanica* (L.) Hook.” at foothills of Kumaun Himalaya, Uttarakhand.

2. Geographical Location

For the present study, the forests of Tarai and Bhawar area of Kumaun Himalaya adjacent to Kashipur were selected. The study sites situated in the foothills of Shivalik mountain of the Outer Himalaya

and south-east to Corbett National Park at (29° 14-43.6)–(29° 19-50.5) E longitude and (79° 03-22.6)–(79° 04-23.2) N latitude at an elevation of 253.4–265.5 meter above the sea level, in the district Udham Singh Nagar and occupies the middle reaches of the river Kosi and Dabaka. (Source: Office of Tarai West Forest Division, Kumaun, Ramnagar, Uttarakhand).

3. Material and Methods

For the present work, soil color was recorded by Munsell’s soil color chart, soil texture was recorded by hand touch, soil moisture and water holding capacity were estimated as methods described by Misra, (1968), soil pH was recorded by ELICO LI 613 pH meter, organic carbon was recorded by method given by Walkley and Black, (1934), organic matter was calculated as formula organic carbon x factor 1.724, total nitrogen was estimated by the Micro-Kjeldahl method Misra, (1968), available phosphorus and available potassium were estimated by Phosphomolybdic Blue Colorimetrically and Flame Photometer (Jackson, 1958) respectively.

4. Vernacular Name

In classical texts, it is popularly referred to as Kamraj and Tukod langit. The roots of this plant are a popular medicine in China, where it is known as “Di Wu Gong”.

5. Classification of *Helminthostachys zeylanica* (L.) Hook.

Kingdom: Plantae, Division: Pteridophyta, Class: Psilotopsida, Order: Ophioglossales, Family: Helminthostachyaceae, Genus: *Helminthostachys*, Species: *zeylanica*.

6. Habitat

The habitat of this plant constitutes deciduous forest in plain areas. The plant prefers shade and grows in moist localities. These moist locations are rich in humus and decayed organic matter. It flourishes well as undergrowth, chiefly in the forest of Teak (*Tectona grandis*), Safada (*Eucalyptus hybrid*), mixed forest of Rohini (*Mallotus philippenensis*), Khair (*Acacia catechu*), and Shisham (*Dalbergia sisso*). It is also associated with species of Lasura (*Cordia myxa*), Duddhi (*Holarrhina antidysentrica*), and Siris (*Albizia procera*). Nevertheless, in study site it shows best in specific habitats with *Mallotus philippenensis* – *Dalbergia sisso* and *Eucalyptus hybrid*- *Mallotus philippenensis*.

7. Distribution

Helminthostachys zeylanica (L.) Hook. is a monotypic genus found only in Indo-malesia regions and the Polynesian Islands including New Zealand. Also grows abundantly in North Australia. In India, it is mostly found in Eastern U.P., Uttarakhand, Bengal plains, Assam, and South India.

8. Description

Helminthostachys zeylanica (L.) Hook. is an annual plant belonging to family Helminthostachyaceae. It is well reported in month of middle June to late September in an altitude of 235 to 275 meter. The plant measures a height to 10.5 to 2.0 feet long. The basal area is 0.55 to 0.85cm. It has clusters of sporangia on stems of fertile spike like fronds. The rhizome is short, creeping, underground and stout. They can bear either solitary fronds or several fronds. Leaves are lanceolate with the margins entire or irregular serrate. Only one leaf on folds is one in one season so that it is monophyllous. The spike is 12 to 15 cm long and arises from the base of the leaves with its own stripe. Below the spike is a sterile leaf segment called trophophore. Both sporophore and trophophore arise from a common petiole.

9. Cultivation

This plant grows in wet season of June to September. It grows best in light brownish gray type soil and sandy loam soil texture with a pH of 6.5. The moisture content is 16.65 ± 5.85 to $17.25 \pm 1.95\%$, water-holding capacity of soil 34.10 ± 5.42 to $36.22 \pm 5.76\%$, organic carbon is 0.28 ± 0.09 to $0.59 \pm 0.06\%$, organic matter is 0.49 ± 0.17 to $1.01 \pm 0.10\%$, total nitrogen is in range of 0.003 ± 0.001 to $0.007 \pm 0.007\%$, available

phosphorus is in range of 6.00 ± 2.12 to 6.38 ± 1.43 kg/ha and available potassium is in range of 83.99 ± 59.14 to 248.41 ± 78.62 kg/ha. It usually grows quickly during rainy season. For cultivation, purposes the roots (rhizomes) should be harvested during the wet season in July to August.

10. Uses

Whole parts of this plant are used as various medicinal purposes in not only India as well as different areas of abroad based on literature available as discussed. The decoction of rhizome is used for curing impotency. The leaf juice relieves blisters on the tongue. The powdered 5.00 gm rhizome along with cow's milk is used for vitality and brain tonic (Srivastava, 2007). Rhizome of the plant is cleaned thoroughly with water, crushed and deeply boiled along with cow's milk and decoction given with black pepper (*Piper nigrum*) to the patient for two months in curing leucorrhoea (Bhatt *et al.*, 2010) also its rhizome with about 5.00 gm of rhizome of safed musli (*Chlorophytum tuberosum* Roxb. Baker.) and root of semul (*Bombax ceiba* Linn.), are made into paste which is given for one month for waist pain as tonic in India (Singh *et al.*, 1989). This species is an important village medicine in Moluccas with a decoction being used to treat boils and ulcers (Peny and Metjger, 1980). It is used as slight aperients in the Moluccas (Kirtikar and Basu, 1975). This plant is also used for vitality and brain tonic. (Vasudeva, 1999). The young leaves are cooked as vegetable. Rhizome powder is given for spermatorrhoea and for improving memory power (Benjamin and Manickam, 2007).

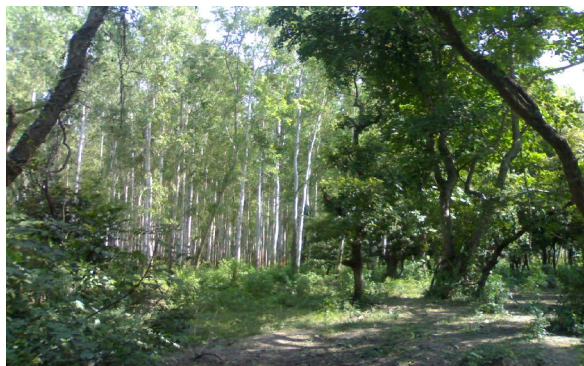


Plate: 1.00. A Sub-tropical forest of Ramnagar Range of outer Himalaya



Plate: 2.00 Germinating Plant



Plate: 3.00 Young Plant



Plate: 4.00 Young Plants in Colony



Plate: 5.00 Young Plant



Plate: 6.00 Mature plant with fertile spike



Plate: 7.00 Fertile spike

11. Threats and Conservation

The world's forests are under pressure destroyed for timber by paper industries and local natives for fuel. The subtropical zone of Uttarakhand highly rich is floristic diversity and forest resources, so many timber, medicinal, aromatic, gum, resin and volatile oil producing plants located here. Therefore, overutilization of these plants many species are in danger of being eliminated from nature. In recent past the frequency of this species in nature has declined considerably because of its exploitation to meet the over grazing in forests. In natural habitat,

germination of this plant is very poor and propagation is mostly through rhizomes. Because this species is already endangered, it needs immediate attention for conservation for research and researchers in future.

Acknowledgement

I am grateful to Dr. S.C. Pant, Principal, Govt. Degree College, Gairsain (H.N.B. University, Garhwal, Srinagar) for their valuable suggestions in this study and the department of Tarai West Forest Division, Ramnagar, Uttarakhand. Grateful thank is

due to Prof. Y. P. S. Pangtey, Kumaun University, Nainital for the identification of plant and encouragement in this study.

Correspondence Address

Bhasker Joshi
Kashipur, Uttarakhand. 244713.
Phone: +091-9760358365
E-Mail: bhaskerjoshiphd@in.com
bhaskerjoshiphd@yahoo.com

References

- [1] Benjamin A, Manickam VS. Medicinal pteridophytes from the Western Ghats. Indian Journal of Traditional Knowledge 2007: 6(4): 611-618.
- [2] Bhatt D, Joshi GC, Tewari LM. *Helminthostachys zeylanica* (L.) Hook: an important therapeutic herb form leucorrhoea among the Tharu community of Udham Singh Nagar District, Uttarakhand. Souvenir, National seminar on Medicinal Plants of Himalaya: Potential and Prospect 2010: 137-143.
- [3] Jackson ML. Soil Chemical analysis. Prentice Hall Englewood Cliffs, New York. 1958: 498.
- [3] Joshi B. The Magical Herb "*Euphorbia hirta* L." An Important Traditional Therapeutic Herb for Wart Disease among the Vangujjars of Forest near Kashipur, Uttarakhand. New York Science Journal 2011: 4(2): 96-97.
- [4] Kirtikar KR, Basu BD. Indian Medicinal Plants, 1975: Vol. IV, 2750-2753.
- [5] Misra R. Ecology Work Book. Oxford and IBH Publication. Co. Calcutta. 1968.
- [6] Penny LM, Mettger J. Medicinal plants of east and south East Asia attributed properties and uses. The Mit Press, Cambridge, Massachusetts & London, England. 1980.
- [7] Semwal DP, Pardha Saradhi P, Nautiyal BP, Bhatt AB. Current status, distribution and conservation of rare and endangered medicinal plants of Kedarnath Wildlife Sanctuary, Central Himalayas, India. Current Science 2007: 92(12): 1733-1738.
- [8] Singh DK, Hajra PK. Floristic diversity. In Changing Perspective of Biodiversity Status in the Himalaya (eds Gujral, G. S. and Sharma, V.), British Council Division, British High Commission Publ. Wildlife Youth Services, New Delhi. 1996: 23-28.
- [9] Singh JS. The biodiversity crisis: A multifaceted review. Curr. Sci. 2002: 82: 638-647.
- [10] Singh JS, Singh SP. Forests of Himalaya: Structure, Functioning and Impact of Man, Gyanodaya Prakashan, Nainital. 1992.
- [11] Singh KK, Saha S, Maheswari JK. Ethnomedicinal uses of ferns. Indian Fern J. 1989: 6 (1-2) 63-67.
- [12] Srivastava K. Ethnobotanical Studies of Some Important Ferns. Ethnobotanical Leaflets 2007: 11: 164-172.
- [13] Vasudeva SM. Economic importance of Pteridophytes. Indian Fern J. 1999: 16(1-2): 130-152.
- [14] Walkley AE, Black JA. An examination of the Degtjareff method for determining soil organic matter and proposed modification of the chromic acid titration method. Soil Sci. 1934: 37: 29.

Date of Submission: 18/03/2011