



Diversity, utilization pattern and indigenous uses of plants in and around a cement factory in Bilaspur district of Himachal Pradesh, North-Western Himalaya

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ABSTRACT : Studies to assess the diversity, utilization pattern and indigenous uses of plants in and around a cement factory in Barmana region of Bilaspur district in Himachal Pradesh were carried out from September, 2007 to July, 2008. A total of 217 species of plants belonging to 68 families and 160 genera were recorded. Among these ecologically and economically important species, shrub (42 spp.), tree (56 spp.), herb (119 spp.) were present. The species were used as medicine (85 spp.), wild edible/food (86 spp.), fuel (54 spp.), fodder (71 spp.), ornamental (11 spp.) timber (9 spp.) and religious (5 spp.) by the inhabitants of the area. The paper gives scientific name of wild plants along with authority, local names, family, life form, indigenous uses and plant part used by the local people of the region. Different parts of these species, such as whole plants, roots (including rhizomes and tubers), leaves, flowers, fruits, seeds and stems are used by the inhabitants for curing various diseases.

Keywords : Diversity, indigenous uses, Himachal Pradesh, inhabitants, utilization pattern

INTRODUCTION

The Indian Himalayan Region (IHR) covers approximately 4, 19,873 km² area (Rodger & Panwar, 1988) and extends from Jammu & Kashmir in the North-West to the Arunachal Pradesh in the East, supports representative, natural, unique and socio-economically important floristic diversity. This may be due to unique topography; diverse habitats and large altitudinal range (200-8,000). This has been identified one of the mega biodiversity hotspots (Hasan et al., 2009) and supports 18,440 species of plants (Singh & Hajra, 1996; Samant et al., 1998) of which 25.3% are endemic to the Himalaya, 1748 medicinal plants (Samant et al., 1998), 675 wild edibles (Samant & Dhar, 1997), 279 fodder species (Samant et al., 1998), 155 sacred plants (Samant & Pant, 2003), 118 essential oil plants with medicinal values (Samant & Palni, 2000). Due to the dependence of local communities on plant resources for various purposes such as, medicine, food (wild edible), fodder, fuel, timber, making agricultural tools, fibre, religious, etc., the population of many economically important plants is depleting fast.

Himachal Pradesh very well known for its typical topography, large altitudinal range, diverse habitats and socio-economically important biodiversity, is also facing high pressures. Though, the official records show that of the total geographical area, about 66.45% area is under forests; 59.3% under protected forests and 3.41% under Reserve Forests and 32 notified protected areas (Singh et al., 1990). In Himachal Pradesh, also many developmental activities like development of hydroelectric projects, road construction, industrial setups, etc. are going on high momentum. These

activities are destroying biodiversity of the region many ways. The review of literature showed that the studies on impact of these developmental activities on biodiversity are very few in general (Samant et al., 2007) and such type of studies are not available in the study area. Therefore, present study focused to the assessment of diversity, utilization pattern and indigenous uses of plants in the study area.

MATERIAL AND METHODS

The nearby areas in and around the cement factory were surveyed for the collection and identification of plants from September, 2007 to July, 2008. The information about utilization pattern of medicinal plants was generated through Participatory Rural Appraisal (PRA) and Indigenous uses of plants were gathered from the secondary sources (Anonymous 1970-1983, Singh and Rawat 2000, Samant et al. 1998, Samant and Palni 2000). The samples of each plant species were collected and identified with the help of local flora (Chowdhery and Wadhwa 1984, Dhaliwal and Sharma 1999, Singh and Rawat 2000). For nomenclature of the species, Anonymous (1970-1983) and Samant et al. (1998) were followed.

STUDY AREA

Himachal Pradesh, includes parts of the Trans and Northwest Himalaya covers 55, 673 km²; 9% of the IHR. The state has a large altitudinal range (200-7109m), with diverse habitats, species, populations, communities and ecosystems. The Bilaspur district of Himachal Pradesh is

mostly hilly and climate of the region is generally temperate compared to the near plains of Punjab. The study area Barmana is about 18 Km north of Bilaspur. In the study area ACC Cement factory is situated at 31° 25.022' N Latitude and 76° 49.789' E Longitude at an altitude 547m amsl. The factory lies on the banks of river Satluj at a place Barmana. The total area covered by the factory is about 184 hectare. 15 villages are situated in the nearby area of the factory are affected both positively and negatively. The total population of the region is 7,930.

RESULTS AND DISCUSSION

Diversity

In the present study total number of 217 species of plants belonging to 68 families and 160 genera were recorded. Among these species shrub (42 spp.), tree (56 spp.), herb (119 spp.) were present. The families, Poaceae (18 spp.); Asteraceae (17 spp.); Fabaceae (16 spp.); Moraceae (9 spp.); Lamiaceae (9 spp.); Brassicaceae (8 spp.); Euphorbiaceae (7 spp.); Rosaceae (6 spp.) were species rich. Among genera, *Ficus* (7 spp.), *Brassica* (6 spp.), *Embllica* (4 spp.), *Ipomoea* (3 spp.), *Saccharum* (3 spp.), *Vigna* (3 spp.), *Trifolium* (3 spp.), *Debregeasia* (2 spp.) were the dominant genera. 25 species were of multipurpose utility and 26 families were monotypic.

Utilization Pattern

The plant diversity is used as medicine (85 spp.), wild edible/food (86 spp.), fuel (54 spp.), fodder (71 spp.), ornamental (11 spp.), timber (9 spp.) and religious purpose (5 spp.). Various notable medicinal plants species were *Ajuga bracteosa*, *Mentha arvensis*, *Ageratum conyzoides*, *Ocimum sanctum*, *Vitex negundo*, *Viola pilosa*, *Urtica dioica*, *Cannabis sativa*, *Nicotiana tabacum*, *Cassia fistula*, *Momordica charantia*, *Foeniculum vulgare*, *Colocasia esculenta*, *Chenopodium album*, *Curcuma longa*, *Zingiber officinale*, *Adhatoda vasica*, *Yucca aloifolia*, *Calotropis gigantea*, etc.; edible/food species were *Allium cepa*, *Allium sativum*, *Colocasia esculenta*, *Spinacia oleracea*, *Cucurbita maxima*, *Momordica charantia*, *Juglans regia*, *Solanum tuberosum*, *Lycopersicon esculentum*, *Saccharum officinarum* and *Pisum sativum*, etc.; fuel species were *Dendrocalamus strictus*, *Toona ciliata*, *Albizia lebbek*, *Eucalyptus hybridus*, *Pinus roxburghii*, *Dodonaea*, etc.; fodder species were *Bauhinia variegata*, *Ehretia laevis*, *Trifolium alexandrum*, *Listea monopetala*, *Albizia lebbek*, *Albizia chinensis*, *Morus alba*, *Avena sativa*, *Randia tetrasperma*, etc.; ornamental species were *Tagetes erecta*, *Ipomoea carnea*, *Salvia coccinea*, *Hibiscus rosa-sinensis*, *Callistemon citrinus*, etc.; timber species were *Dalbergia sissoo*, *Albizia lebbek*, *Grevillea robusta*, *Melia azedarach*, etc., and religious species were *Asparagus racemosus*, *Ocimum sanctum*, *Ficus religiosa*, *Cynodon dactylon*, etc.

Indigenous Uses

Among 217 species of economically important plants, indigenous uses of the plant resources for medicine, edible, fodder, fuel, timber, ornamental, religious and various other purposes is very well known. Among medicinal plants, the whole plant of *Ajuga bracteosa* used in fever, malaria, blood purifier, burns, cold; the leaves of *Mentha arvensis* are used in stomachache, *Ocimum sanctum* in bronchitis, cholera, cold, constipation, cough, diarrhoea, headache, leprosy; the leaves of *Vitex negundo* are used in bodyache, blisters, cold, diarrhoea, cough, fever, piles, swellings, skin diseases, ulcers and wounds; *Viola pilosa* used as antipyretic, cold, cough, fever and lung disorder; *Urtica dioica* as antiseptic, boils, wounds, dandruff, diarrhoea, gout, rheumatism, jaundice, nephritis, sprain, swell and throat disorder; leaves of *Cannabis sativa* used in appetite, bowel complaints, bronchitis, cough, convulsions, cramps, ear complaints, eye disorder, gonorrhoea, hydrocele, piles, sores and tetanus; *Nicotiana tabacum* used in itching, food poisoning, haemostatic, snake bite, toothache and wounds; *Cassia fistula* in abdominal pain, antifertility, antiseptic, asthma, blindness, burns, cancer, chest infections, constipation, cough, jaundice, leprosy, pimples, toothache and swelling of throat; *Berberis asiatica* used in snake bite, eye complaints, malaria and piles; *Momordica charantia* used in excess bile, diabetes, eczema, malaria and sores; Bark and leaves of *Juglans regia* are used as astringent, rheumatism, sores of toes, toothache; the fruit of *Luffa acutangula* used in cramps, fever, jaundice, madness, scabies and syphilis, tetanus and snake bite (tendrill); *Foeniculum vulgare* used in burning sensation in body, carminative, chest disorder, colic, cough, dysentery, fever, flatulence, headache, kidney, menstrual complaints, thirst, toothache and wounds; *Chenopodium album* used in skin disorders, urine complaints; *Curcuma longa* in atrophy, antifertility, blindness, bronchitis, carbuncle, cholera, cold, cough, dyspepsia, eye disorder, fever, fistula, headache, indigestion, leprosy, pain in body, migraine, scabies, sores, syphilis and wounds; *Zingiber officinale* used in asthma, bronchitis, cholera, constipation, diarrhoea, cough, indigestion, insect stings, phthisis, postnatal, puerperal fever, scabies, scorpion sting, snake bite and soar; *Helianthus annuus* in bone fracture, carbuncle, colic disorder, diarrhoea, dysentery, eye complaints, fever, nose bleeding, snake bite, sores, spleen complaints, wounds and toothache.

Bark of *Grewia oppositifolia* is used for making ropes, leaves/twig of *Ficus religiosa* is used for religious purposes (burnt at the time of Havan) and wood of *Melia azedarach* is used to prepare agricultural tools such as plough. 25 species have multipurpose utility e.g. *Bauhinia variegata* is used as edible, fodder and fuel; *Ocimum sanctum* for medicine, religious and edible leaves; *Cynodon dactylon* for medicine, fodder and leaves used in the religious purposes; *Eucalyptus hybridus* is used medicine, fodder, fuel and

timber in making many agricultural tools; *Vitex negundo* is used as fuel, fodder, medicine and twig of this plants used as brush for cleaning the teeth, Seeds of *Helianthus annuus* are used for making edible oil, leaves of *Brasica campestris* used as vegetable. Underground stem of *Curcuma domestica* used to make turmeric (*Haldi*) and serves as blood purifier and tuber of *Zingiber officinale* used as condiment in dishes.

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