



Studies on the Threatened Biodiversity of Wild Medicinal Flora and its Conservation in Nashik District, North Sahyadri, Maharashtra

D. N. Khairnar, A. B. Khairnar and A. S. Kelhe

Life Sciences Department, K.A.A.N.M.S. Arts, Commerce and Science College, Satana-423 301, Maharashtra, India

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ABSTRACT

One hundred thirty five wild medicinal plant species belonging to 69 families have been considered as rare (04), vulnerable (94), endangered (13), extinct (01) and endemic (03) on the basis of frequent floristic surveys carried out in North Sahyadri region of Nashik district during last two decades. The probable reasons for decrease of their population are destruction of natural habitats consequent upon increasing illegal acquiring of forest land, massive deforestation, encroachment of forest land for agriculture, urbanization and medicinal purposes. Suggestions for their efficient regular monitoring and proper conservation, preservation and protection have been suggested.

INTRODUCTION

It has been universally recognized that with the increase of population there has been a constant degeneration of natural resources. Several species of plants are already extinct or on verge of extinction. Many plant species are under constant anthropogenic pressure on account of their economic value. With population explosion, grazing, and encroachment for agriculture, the natural vegetation has been cleared for acquiring forest lands for various purposes.

Medicinal plants are nature's gift to mankind and are rich ancient heritage of India. About 8,000 plants are recognized as medicinal plants that are being used by various traditional systems of medicines such as ayurveda, hom, sdha, folk, Tibetan, modern and Unani. These traditional treatments have been largely eroded due to lack of encouragement, and recognition as well as rapid destruction of wild population of medicinal plants is absolutely critical. Chopra et al. (1956, 1958), Mitra & Jain (1991) and Nair & Mohan (1998) have provided a glossary of Indian medicinal plants. Jain et al. (1973, 1994) published the use of medicinal plants among certain adivasis in India and gave a list of major medicinal plants of India. Khairnar (2005) has studied medico-ethnological aspects of North Sahyadri.

Plants of high medicinal value, which were abundant in the recent past, are now threatened of their very existence and survival because of irrational exploitation to meet the ever increasing demand of these plants in the preparation of different medicines. Some species are critically endangered

in the wild and therefore it is essential to take urgent steps to conserve the wealth of medicinal plants.

MATERIALS AND METHODS

The District Nashik is located between latitudes 19°35' and 20°50' and the longitudes 73°30' and 74°55' and extends over an area of 15,582 sq.km. The forests of the district cover an area of 3,446.28 sq.km.

The vegetation of the Nashik region is semi-moist to dry deciduous forest type but mixed with the members of thorny stunted plants in moderate rainfall zone (600-1000 mm). The tree vegetation is sparse with low density and stunted growth mainly restricted to valleys and slopes. The present investigation is undertaken mainly to survey the threatened medicinal plants of North Sahyadri of Nashik district.

The authors have been working on the floristics of this region for the last two decades. During regular observations it has been observed that the medicinal plant species, which were once very common, have become most uncommon. The plants, which were not common have become rare and rare ones and have almost disappeared or at the verge of disappearance. There is need to make efforts for their conservation. During field visits in different seasons survey was conducted. Herbarium collection of all the medicinal plants was made and the plants were identified with the help of recognized floras and by interviewing experienced tribal people and medicine men to know the uses of medicinal plants. The

Table 1: Threatened and endemic medicinal flora of North Sahyadri, Nashik district.

Sr. No.	Name of Plant family with Botanical name	Marathi name	Habit	Threatened Medicinal Plant Species				
				Rare	Vulnerable	Endangered	Extinct	Endemic
1.	Acanthaceae							
	<i>Adhatoda vasica</i>	Adulsa	Shrub	-	+	-	-	-
	<i>Barleria prinitis</i>	Piwlakoranta	Herb	-	+	-	-	-
	<i>Astracantha longifolia</i>	Kalesunda	Herb	-	+	-	-	-
	<i>Carvi callosa</i>	Karvi	Shrub	-		-	-	+
2.	Adiantaceae							
	<i>Adiantum capillus</i>	Hansraj	Herb	-	+	-	-	-
3.	Amranthaceae							
	<i>Achyranthus aspera</i>	Aghada	Herb	-	+	-	-	-
	<i>Celosia argentia</i>	Kurdu	Herb	-	+	-	-	-
4.	Amaryllidaceae							
	<i>Crinum asiaticum</i>	Nagdaun	Herb	-	+	-	-	-
5.	Anacardiaceae							
	<i>Lannea coromandelica</i>	Mohadal	Tree	-	+	-	-	-
	<i>Semecarpus anacardium</i>	Bibba	Tree	+	-	-	-	-
6.	Annonaceae							
	<i>Annona squamosa</i>	Sitaphal	Shrub	-	+	-	-	-
7.	Apiaceae							
	<i>Apium graveolens</i>	Ova	Herb	-	+	-	-	-
	<i>Hydrocotyle asiaticum</i>	Bramhi	Herb	-	+	-	-	-
8.	Apocynaceae							
	<i>Alstonia scholaris</i>	Sativin	Tree	-	+	-	-	-
	<i>Carrisa congesta</i>	Karavand	Shrub	-	+	-	-	-
	<i>Holarrhena antidysenterica</i>	Dahikuda	Tree	-	+	-	-	-
	<i>Rauwolfia serpentina</i>	Sarphganda	Shrub	-		-	+	-
9.	Araceae							
	<i>Arisaema marrayi</i>	Nagphani	Herb	-	+	-	-	-
	<i>A.sahydricum</i>	Nagphani		-	-	-	-	+
10	Araceae							
	<i>Colocasia esculenta</i>	Ahlu	Herb	-	+	-	-	-
11.	Aristolochiaceae							
	<i>Aristolochia bracteolata</i>	Kidmari	Herb	-	+	-	-	-
12.	Asclepiadaceae							
	<i>Calatropis gigantea</i>	Rui	Shrub	-	+	-	-	-
	<i>C. procera</i>	Deo Rui	Shrub	+	-	-	-	-
	<i>Daemia extensa</i>	Utran	Climber	-	+	-	-	-
13.	Asteraceae							
	<i>Artemisia indica</i>	Dordavana	Herb	-	+	-	-	-
	<i>Catharanthus tinctorius</i>	Khursani	Herb	-	+	-	-	-
	<i>Echinops echinatus</i>	Udkata	Herb	-	+	-	-	-
	<i>Tridax procumbens</i>	Akdandi	Herb	-	+	-	-	-
	<i>Xantium strumarium</i>	Shankshwar	Herb	-	+	-	-	-
14.	Balanitaceae							
	<i>Balanites roxhurghii</i>	Hinganbet	Tree	-	+	-	-	-
15.	Balsaminaceae							
	<i>Impatiens balsamina</i>	Balsum	Herb	-	+	-	-	-
16.	Bambusaceae							
	<i>Bambusa arundinacea</i>	Bamboo	Tree	-	+	-	-	-
17.	Bignoniaceae							
	<i>Dolichandrone falcata</i>	Medsingi	Tree	-	+	-	-	-
18.	Bombaceae							
	<i>Bombax ceiba</i>	Shemal	Tree	-	+	-	-	-
19.	Boraginaceae							
	<i>Cordia dichotoma</i>	Bhokar	Tree	-	+	-	-	-
20.	Burseraceae							
	<i>Boswellia serrata</i>	Salai	Tree	-	+	-	-	-
21	Cactaceae							

Table cont....

Cont. Table...

	<i>Opuntia ficus-idea</i>	Nivdung	Shrub	-	+	-	-	-
22.	Caesalpinaceae							
	<i>Bauhinia racemosa</i>	Apta	Tree	-	+	-	-	-
	<i>Caesalpinia bonduce</i>	Sagar gota	Shrub	-		+	-	-
	<i>Cassia auriculata</i>	Avali	Shrub	-	+		-	-
	<i>C. fistula</i>	Bahava	Tree	-	-	+	-	-
	<i>C.tora</i>	Tarota	Herb	-	+	-	-	-
23.	Capparidaceae							
	<i>Capparis deciduas</i>	Habad	Shrub	-	+	-	-	-
	<i>C.spinosa</i>	Waghata	Shrub	-	+	-	-	-
24.	Celastraceae							
	<i>Celastrus paniculatus</i>	Malcanguni	Shrub	-	+	-	-	-
25.	Combrataceae							
	<i>Anogeissus latifolia</i>	Dhamda	Tree	-	+	-	-	-
	<i>Terminalia arjuna</i>	Aruun sadada	Tree	-	+	-	-	-
	<i>T. bellirica</i>	Behada	Tree	-	+	-	-	-
	<i>T. catappa</i>	Badam	Tree	-	+	-	-	-
	<i>T.chebula</i>	Hirda	Tree	-		+	-	-
	<i>T. crenulata</i>	Sadada	Tree	-	+	-	-	-
26.	Convolvulaceae							
	<i>Evovulus alsioides</i>	Shankveli	Climber	-	+	-	-	-
27.	Cucurbitaceae							
	<i>Citrullus colocynthis</i>	Indrayani	Climber	-	+	-	-	-
	<i>Momordica dioca</i>	Katorle	Climber	-		+	-	-
28.	Cyperaceae							
	<i>Cyprus rotundes</i>	Lavhali	Herb	-	+	-	-	-
29.	Dioscoreaceae							
	<i>Discorea bulbifera</i>	Kadukand	Climber	-		+	-	-
30.	Ebnaceae							
	<i>Diospyrous melanoxylon</i>	Temburni	Tree	-	+	-	-	-
31.	Euphorbiaceae							
	<i>Euphorbia anticorum</i>	Nivdung	Shrub	-	+	-	-	-
	<i>E. nerifolia</i>	Saber	Shrub	-	+	-	-	-
	<i>Jatropha curcus</i>	Mogli arend	Shrub	-	+	-	-	-
	<i>Mallotus philippensis</i>	Kunku	Tree	-	+	-	-	-
	<i>Phyllanthus emblica</i>	Avla	Tree	-	+	-	-	-
32.	Fabaceae							
	<i>Abrus precatorius</i>	Gunj	Climber	-	+	-	-	-
	<i>Butea monosprma</i>	Palas	Tree	-	-	+	-	-
	<i>Ougenia oojenensis</i>	Tivis	Tree	-	-	+	-	-
	<i>Sesbania grandiflora</i>	Agasta	Tree	-	+	-	-	-
33.	Gentianaceae							
	<i>Conscora deccusate</i>	Shankpushpi	Herb	-	+	-	-	-
34.	Laminaceae							
	<i>Mentha arvensis</i>	Pudina	Herb	-	+	-	-	-
	<i>Oscimum basilicum</i>	Sabja	Herb	-	+	-	-	-
	<i>O. sanctum</i>	Tulas	Herb	-		-	-	-
35.	Liliaceae							
	<i>Aloe vera</i>	Korpad	Herb	-	+	-	-	-
	<i>Asparagus racemosus</i>	Shtavari	Climber	-	+	-	-	-
	<i>A.africanus</i>	Ran Shatavri	Climber	-	-	-	-	+
	<i>Gloriosa superba</i>	Kal lavi	Climber	-	-	+	-	-
	<i>Urginea indica</i>	Pankanda	Herb	-	+	-	-	-
36.	Loranthaceae							
	<i>Dendrophthoe falcate</i>	Bandgul	Shrub	-		-	-	-
37.	Lythraceae							
	<i>Woodfordia fruticosa</i>	Dhayti	Shrub	-	+	-	-	-
38.	Magnoliaceae							
	<i>Michelia champaca</i>	Sonchapha	Tree	+		-	-	-
38.	Malvaceae							
	<i>Abutilon indicus</i>	Mudra	Shrub	-	+	-	-	-

Table cont....

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	<i>Sida cordifolia</i>	Bala	Herb	-	+	-	-	-
	<i>S. spinosa</i>	Atibala	Herb	-	+	-	-	-
39.	Marslieaceae							
	<i>Marsilea quadrifolia</i>	Zar-Zury	Herb	-	+	-	-	-
40.	Martyniaceae							
	<i>Martynia anuna</i>	Hatjodi	Herb	-	+	-	-	-
41.	Meliaceae							
	<i>Azadiracta indica</i>	Kadunim	Tree	-	+	-	-	-
42.	Menispermaceae							
	<i>Tinospora cordifolia</i>	gulvel	Climber	-	+	-	-	-
43.	Mimosaceae							
	<i>Acacia catechu</i>	Khair	Tree	-	+	-	-	-
	<i>A. leucophloea</i>	Hivar	Shrub	-	+	-	-	-
	<i>Albizia lebbek</i>	Shirish	Tree	-	+	-	-	-
44.	Moraceae							
	<i>Ficus bengalensis</i>	Vad	Tree	-	+	-	-	-
	<i>F. religiosa</i>	Pimpal	Tree	-	+	-	-	-
	<i>F. rcemosa</i>	Umber	Tree	-	+	-	-	-
45.	Moringaceae							
	<i>Moringa oleifera</i>	Shevga	Tree	-	+	-	-	-
46.	Myrtaceae							
	<i>Syzygium cumini</i>	Jambul	Tree	-	+	-	-	-
47.	Nyctaginaceae							
	<i>Boerhavia diffusa</i>	Punernava	Herb	-	+	-	-	-
48.	Nymphaceae							
	<i>Nelumbo mucifera</i>	Kamal	Herb	-	+	-	-	-
49.	Oleaceae							
	<i>Jasminium angustifolium</i>	Ranjai	Climber	-	+	-	-	-
	<i>J. multiflorum</i>	Ranmogra	Climber	-	+	-	-	-
50.	Orchidaceae							
	<i>Habenaria intermedia</i>	Orchid	Herb	-		+	-	-
	<i>Vanda roxburghii</i>	Rasna	Epiphyte	-		+	-	-
51.	Oxillidaceae							
	<i>Oxalis corniculata</i>	Ambushi	Herb	-	+	-	-	-
52.	Pandanaceae							
	<i>Pandanus odoratissimus</i>	Kavda	Shrub	-	+	-	-	-
53.	Passifloraceae							
	<i>Passiflora foetida</i>	Velishani	Climber	-	+	-	-	-
54.	Plumbaginaceae							
	<i>Plumbago indica</i>	Chitrak	Herb	-	+	-	-	-
55.	Poaceae							
	<i>Cymbopogon citratus</i>	Gavtichaha	Herb	-	+	-	-	-
	<i>C. martini</i>	Rohisha	Herb	-	+	-	-	-
56.	Polygonaceae							
	<i>Polygonium aviculare</i>	Machoti	Herb	-	+	-	-	-
60.	Primuliaceae							
	<i>Anagallis arvensis</i>	Jonkmari	Herb	-	+	-	-	-
61.	Punicaceae							
	<i>Punica granatum</i>	Dalimb	Shrub	-	+	-	-	-
62.	Ranunculaceae							
	<i>Clematis triloba</i>	Ranjai	Climber	-	+	-	-	-
63.	Rhamnaceae							
	<i>Ziziphus mauritiana</i>	Bor	Tree	-	+	-	-	-
64.	Rubiaceae							
	<i>Haldina cordifolia</i>	Haldu	Tree	-	+	-	-	-
65.	Rutaceae							
	<i>Aegle marmelos</i>	Bel	Tree	-	+	-	-	-
56.	Santalaceae							
	<i>Santalum album</i>	Chandan	Tree	+	-	-	-	-
57.	Sapindaceae							
	<i>Cordiospermum helicacabum</i>	Kapalphodi	Climber	-	+	-	-	-

Table cont....

Cont. Table...

	<i>Sapindus laurifolius</i>	Ritha	Tree	-	+	-	-	-
58.	Sapotaceae							
	<i>Madhuca indica</i>	Moha	Tree	-	-	+	-	-
59.	Simaroubaceae							
	<i>Alanthus excelsa</i>	Maharukh	Tree	-	+	-	-	-
60.	Solanaceae							
	<i>Solanum nigrum</i>	Kamony	Herb	-	+	-	-	-
	<i>S. xanthocarpum</i>	Ranvange	Herb	-	+	-	-	-
	<i>Withania somnifera</i>	Ashwaganda	Herb	-	+	-	-	-
61.	Sterculiaceae							
	<i>Sterculia foetida</i>	Janglihadam	Tree	-	+	-	-	-
	<i>S. urens</i>	Kad	Tree	-	+	-	-	-
62.	Tiliaceae							
	<i>Grewia tilliaefolia</i>	Dhaman	Tree	-	+	-	-	-
63.	Typhaceae							
	<i>Typha angustifolia</i>	Pankanis	Herb	-	+	-	-	-
64.	Ulmaceae							
	<i>Holoptelea integrifolia</i>	Vavli	Tree	-	+	-	-	-
65.	Verbanaceae							
	<i>Clerodendron inerme</i>	Arni	Shrub	-	+	-	-	-
	<i>Lantana camera</i>	Gangoti	Shrub	-	-	-	-	-
	<i>Tectona grandis</i>	Sag		-	+	-	-	-
	<i>Vitex negundo</i>	Nirgudi	Shrub	-	+	-	-	-
67.	Vitaceae							
	<i>Vitis quadrangulris</i>	Hadjodi	Climber	-	+	-	-	-
68.	Zingiberaceae							
	<i>Curcuma longa</i>	Halad	Herb	-	-	+	-	-
69.	Zygophyllaceae							
	<i>Fagonia cretica</i>	Dumasa	Herb	-	+	-	-	-
	<i>Tribulus terrestris</i>	Ghokru	Herb	-	+	-	-	-

+ = Present; - = Absent

plant species that are of medicinal value have been carefully studied. There is a need to make efforts for their conservation. The following lists of plants have been prepared and includes category of rare, vulnerable, endangered, extinct and endemic species which need to be observed to avoid their total appearance from the district. It can be noted that most of the plants are of high medicinal value and their indiscriminate overexploitation by the people has lead to such dreadful situation. If timely action for their conservation is not taken, it will result in disappearance of many of these highly valuable species in coming times. The threatened medicinal plant species of the North Sahyadri of Nashik district are given in Table 1.

DISCUSSION

In Nashik district certain observations have been made, which provide examples of the regional status of various medicinal plant species. A list of 135 plant species belonging to 69 families has been made, out of which 04 species have been found to be rare, 13 endangered, 01 extinct, 94 vulnerable and 02 endemic. It is based on the basis of frequent floristic surveys carried out in Nashik region during two decades. The probable reasons for decrease of the medicinal plant population are destruction of natural habitats consequent

upon increasing illegal acquiring of forest land, massive deforestation, heavy exploitation of plant parts for medicinal value and uncontrolled grazing. Once upon a time this district was known for its teak forest abundance with mixed luxuriant flora. Now a days after 2-3 decades most of the plants have become endangered.

It is suggested that there should be a monitoring committee to monitor the status of plant species year after in the area. The task should be made for the conservation, some species, which are very rare, should also be cultivated in protected habitats and even in botanical gardens.

CONSERVATION

Conservation of the country's medicinal flora will not only serve national interests but also the global needs. We should preserve and protect the medicinal flora by following methods:

1. Prevent the exploitation and destruction of natural habitats where medicinal plants are growing.
2. Prevent the forest from deforestation and forest fires.
3. Imposing ban on exploitation or destructive of medicinal plants from the wide.

4. Plantation of native medicinal plants on degraded lands.
5. Creating awareness in the society on uses and importance of medicinal plants in health-care system and developing interest in conservation and sustainable use of medicinal plants.
6. Introduction of Joint Forest Management (JFM) programmes in villages.
7. Educating and motivating tribals to protect and cultivate the medicinal plants of economic importance so as to promote the biodiversity and generate income.
8. Preservation of medicinal plants in natural forests and creation of medicinal plants conservation areas.
9. Establishing medicinal plant gardens, which help *ex-situ* and *in-situ* conservation and cultivation of medicinal plants.
10. Establishment of medicinal plant nurseries around the local areas for their primary health-care needs and also those of high economic value.
11. Encouraging the use of herbal drugs as they are effective

and safe for many incurable diseases.

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