

Collection and conservation of endangered medicinal plant species diversity for maintaining ecological balance

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Abstract

India is one of the 12 mega biodiversity centre. Chhattisgarh state located centrally in India has approx. 44% forest area are the principle repository of large number of medicinal and aromatic plants due to this C.G. is declared as herbal state in 2001. The flora of medicinal and aromatic plant is depleting quit fast due to use of forest land in other purpose and over exploitation of herbs. The state is dominated by tribal population and major tribal population depend on forest for fiber, food, fuel, fodder, medicine. Due to over exploitation of herbs and use of forest land in other purpose large number of plant species become rare and endangered. Thus collection of different made for the collection of multi crop collecting mission along with particular medicinal and aromatic plant from Achanakmarg, Lamni, Ataria, Keonchi, Dhamtari, Keregaon, singhpur medicinal and aromatic plant, its conservation and characterization for its various agro-morphological and quality traits will help in producing the quality product and for improvement in particular species genetically. With this objective exploitation was made Dugli, Nagri and near by places which are the hot spot of flora diversity and trading area of medicinal plants of C.G. The present investigation revealed that the forest are of Dhamtari Keregaon, South Singpur, Dugli and Nagri and near by places and Bilaspur District (Achanakmarg, Lormni, Ataria, Keonchi and near by place) was dominated by herbs 47%, trees 24%, climbers 14% and 15% shrubs were as 52% herbs, 16% shrubs, tree 19% trees and 12% climber, climbing shrus 1% respectively. The break up of medicinal plants by their plant parts utilized in general for the treatment of different diseases contains approximately 32% roots, 18% leaves, 12% bark, 9% stem, 9% seed, 8% fruit, 8% whole plant, 2% flower, 1% gum/ latex and 1% wood approximately. The different medicinal plants are utilized for fever, joint pain, diarrhaea, skin ailment, cough and cold, jaundice, bronchitis, liver problem etc. Many of the medicinal plant species are in list of endangered taxa of the state such as safed musli (*Chlorophytum borivillianum*), kali haldi (*Curcuma coesia*), van haldi (*Curcuma aromatic*), tikhur (*Curcuma angestifolia*), kalihari (*Gloriosa superb*), sarggandha (*Rouwalfia serpentina*), kalmegh (*Andrographis paniculata*) etc. are few of them were collected, multiplied and characterize in herbal garden of IGKV, Raipur. Hence conservation and its strategies cultivation of these plant species will help in maintaining ecological balance so that this heritage can be used and exploited wisely through judicious management for future generation.

Keywords: Biodiversity, medicinal plant, Endangered species.

INTRODUCTION

Medicinal and aromatic plants are gaining popularity now a days. The interest in biodynamic phytotherapy has increased many folds all over the world because of impressive record of safety and efficacy for many common diseases and several chronic ailments. The goal of "Health for All" by WHO cannot be achieved without herbal medicines. Approximately 90% of the ingredient used in Ayurveda, Unani, siddha and homeopathy medicines are plant based over in modern allopathic medical system has 25% of its formulation from herbal sources. The present export of ayush products has jumped to 190693.9 million INR in 2011-12 with an annual growth rate of 471% (AYUSH, 2013 official data). The demand of herbal medicines is growing in developing countries

indicate that consumers are becoming disillusioned with modern health care and seeking alternatives in traditional medicines. The WHO has estimated 80% of the world population are still development on traditional medicine and in India 65% of the population in the rural area used traditional from of medicine to meet their primary health needs. The massive demand of medicinal plants is depleting quiet fast due to use of forest land in other purpose and over exploitation and unscientific collection of flora of medicinal and aromatic plants. All these phenomena cause many of the wild and cultivated species to endangered and vulnerable categories and many of them are on the way to become rare and endangered.

The India is one of the twelve mega biodiversity of the centre. The state of Chhattisgarh located centrally in India covered more than 44% with forest. The two hot spot of Chhattisgarh plain of floral biodiversity of medicinal plant viz. Bilaspur District (Achanakmarg, Lormni, Ataria, Keonchi and near by place) located between 22°44' North latitude and 81°54' East longitude and of Dhamtari District (Keregaon, South Singpur, Dugli and Nagri and near by places) located between lies between latitude 21°-1' North to 30°-3' North and the longitude 81°-28' East and 82°-15' East was explored for collection of multicrop collecting mission along with particular medicinal plant species diversity. A need of immediate collection,

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conservation, multiplication and characterization of different flora of medicinal plants was undertaken and large numbers of accession were collected which include endangered, vulnerable and low risk list concern for its various agro morphological and quality traits and for improvement in particular species genetically.

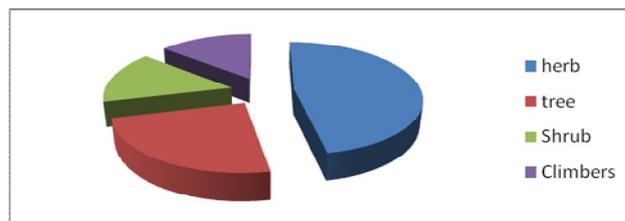
METHODOLOGY

The present survey was undertaken in the 2012-13 from two district of C.G. known for hot spot of flora of different medicinal plants and these area also known for trading of medicinal and aromatic plant in the state. Bilaspur and Dhamtari district is dominant by tribal population. The information on folklore uses of medicinal plant were recorded with help of tribal head, baiga, vaidhya and village head. The detail about plant parts used and distribution of medicinal plants by habits were recorded during the exploration. A structured questionnaire was made to collect data, plant parts used mode of application, passport data was prepared during collection of medicinal plants. The *ex situ* conservation method were applied for genetic material.

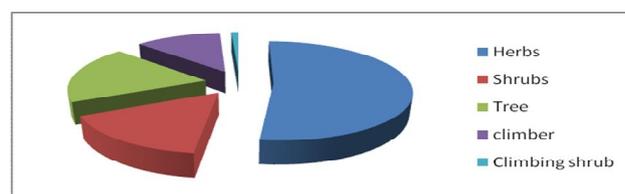
RESULT AND DISCUSSION

The present investigation revealed that the forest are of Dhamtari Keregaon, South Singpur, Dugli and Nagri and near by places and Bilaspur District (Achanakmarg, Lormni, Ataria, Keonchi and near by place) was dominated by herbs 47%, trees 24%, climbers 14% and 15% shrubs were as 52% herbs, 16% shrubs, tree 19% trees and 12% climber, climbing shrub 1% respectively. The break up of medicinal plants by their plant parts utilized in general for the treatment of different diseases contains approximately 32% roots, 18% leaves, 12% bark, 9% stem, 9% seed, 8% fruit, 8% whole plant, 2% flower, 1% gum/ latex and 1% wood approximately. The plant species use by local people for fiber, fuel, food, fodder and as medicine such as fever, joint pain, diarrhea, skin disease, cough and cold liver problem, snake bite etc. The knowledge of tribal communities are limited with their own community and ends with their life. The brief account of ethanomedicinal uses was documented. The genetic resources of medicinal and aromatic plants were collected, conserved, multiplied and characterized which also

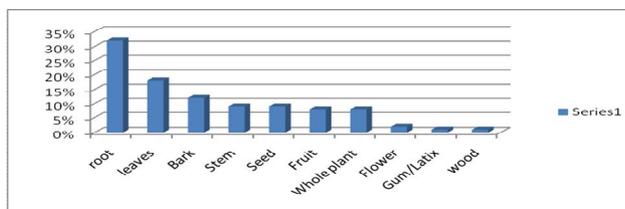
include endangered flora like safedmusli (*Chlorophytum tuberosum*), Kalihari (*Gloriosa superba*), Vanhaldi (*Curcuma aromatica*), Tikhur (*Curculigo angustifolia*), Kalimusli (*Curculigo orchoides*), Sarpghandha (*Rouvolfia serpentina*), Akarkara (*Spilanthus calva*), Anantmol (*Tylophora indica*), Kalmegh (*Andrographis paniculata*) and Vulnerable species Ramdatoon (*Smilax zeylanica*) low risk list concern Nirgundi (*Vitex negundo*) are few of them. The *ex situ* conservation method was applied and the genetic material is conserved in herbal garden of Indira Gandhi Krishi Vishwavidyalaya, Raipur (C.G.).



Distribution of medicinal plant in Dhamtari by habits



Distribution of medicinal plant in Bilaspur by habits



Medicinal plants by their part utilized

Table 1. List if medicinal plants used by tribal population

S.No.	Common name	Scientific name	Family	Use
1	Baryari khasaiti	<i>Sida acuta</i>	Malvaceae	Tonic and fever
2	Jangli sanai	<i>Cratolaria sericea</i>	Leguminaceae	Plant extract used for the treatment of impetigo, scabies, antiseptic and treat intestinal worms.
3	Jangli jimikand)	<i>Amorphophilus campamulatus</i>	Areaceae	Snake bite
4	Safed dhatura	<i>Dhatura spp.</i>	Solanaceae	Asthma, Swelling in respiratory canal
5	Manjistha	<i>Rubia corclifolia</i>	Rubiaceae	Use to treat blood disorder, excess heat in lungs, blood.
6	Gorakhmundi	<i>Salvia phebeja</i>	Libiateae	Tonic, Vitiligo, Hypoglycaemic, Eye Diseases
7	Mamri	<i>Salvia phebeja</i>	Libiateae	Tonic, Eye Diseases
8	Hathjod	<i>Equiselum diffusum</i>		Bone fracture, healing of wounds.
9	Kaekand (En.)	<i>Costus speciosus</i>	Zingiberaceae	Acidity, anti-inflammatory, stimulant
10	Pashanbhadi	<i>Coleus forskholli</i>	Lamiaceae	Digestion, weight loss, asthma, high blood pressure, skin diseases
11	Sidab	<i>Ruta chalepensis</i>	Rutaceae	Antispasmodic, irritant, stimulant, antirheumatic, antihysterical, colic
12	Nirgundi (LRLC)	<i>Vitex negundo</i>	Verbenaceae	Eye inflammation
13	Punarva	<i>Boerhavia diffusa</i>	Nyctaginaceae	Eye disease jaundice, asthma, skin disease, snake bite, anemia, body inflammation, antiviral
14	Adusa	<i>Adhatoda nasica</i>	Acanthaceae	Bronchitis, asthma, blood pressure, cough and cold, respiratory troubles.
15	Isharmool	<i>Aristolochia indica</i>	Aristolochiaceae	Snake bite, malaria fever, cough, cold stomach pain, adenocarcinoma
16	Lajwanti	<i>Mimosa pudica</i>	Mimosaceae	Dressing for sinus, sores and piles, urinary complaints
17	Pithavan	<i>Uraria picta</i>	Fabaceae	Antitode in snake bite

18	Brahmi	<i>Bacopa mnieri</i>	Acrofolareceae	Snake bite, Brain tonic, Leprosy, Leuciderma, Eiepsy,
19	Bringraj	<i>Eclipta alba</i>	Asteraceae	Snake bite, Chronic skin disease, blackening of hair, liver problem ,wound.
20	Jangli piyaj	<i>Urginea indica</i>	Liliaceae	Digestion, heart ailment, cough, bronchitis
21	Pipli	<i>Piper longum</i>	Piperaceae	Fever, Cough, Gastritic, Chronic diarrhoea, Anorexia, Flatulent colic, Dysentry,
22	Chitawar	<i>Baliospermum montanum</i>	Euphorbiaceae	Roots used to treat piles, calculus, scabies, ulcers, leaves to treat asthma and snakebite.
23	Manduke parni	<i>Centella asiatica</i>	Apiaceae	Leprosy, dermatitis, indigestion
24	Sindoor	<i>Bixa orellana</i>	Bixaceae	Edible colour
25	Chitrak	<i>Plumbago zeylanica</i>	Plumbaginaceae	Dyspersia, fever, rheumatism
26	Baichandi	<i>Dioscorea hispida</i>	Dioscoreaceae	Tuber is used as remedy for piles, applied in skin to reduce swelling from insect bite or sting.
27	Jangli Dhania	<i>Eryngium foetidum</i>	Apiaceae	High blood pressure, kidney troubles, bladder problem
28	Akarkara (En.)	<i>Spilanthes radicans</i>	Asteraceae	Digestion, rheumatism
29	Hasia dhapar	<i>Leea robusta</i>	Vitaceae	Body ache
30	Bhringraj peela	<i>Eclipta spp.</i>	Asteraceae	Snake bite, Chronic skin diseases, Blackening of hair, Increase sexual vigour, Wound, liver problem
31	Bhringraj safed	<i>Eclipta spp.</i>	Asteraceae	Snake bite, Chronic skin diseases, Blackening of hair, Increase sexual vigour, Wound, liver problem
32	Sudarshan	<i>Crinum asiaticum</i>	Amaryllidaceae	Root is crushed and applied to a bruise, chewed as an antidote for wounds of poisoned arrow, poisonous reptiles, fish.
33	Talimakhana	<i>Hygrophila schulli</i>	Acanthaceae	Jaundice, dropsy and rheumatism, cough
34	Kalihari	<i>Glorisa superb</i>	Liliaceae	Snake bite, Leprosy, Skin diseases, Scorpion bite, Leucoderma
35	Vidhara	<i>Argyreia nervosa</i>	Convolvulaceae	Gonorrhoea, gleet, strangury, chronic ulcers, wound, skin diseases
36	Ram daton(VN)	<i>Smilax zeylanical</i>	Liliaceae	Skin diseases, swelling, abscesses
37	Gugul	<i>Commiphora wightti</i>	Bruceaceae	Arthritis, rheumatism, hyperlipidemia, thrombosis
38	Pathar chatta	<i>Kalanchoe pinnata</i>	Cassulaceae	Leaves are used for the treatment such as infection, rheumatism and inflammation, hypertention and kidney stone.
39	Badi chandrika	<i>Rauwalfia tetraphylla</i>	Apocynaceae	Skin ailment, nervous disorder, hypertension, epilepsy , intestinal troubles
40	German chamali	<i>Matricaria chamonilla</i>	Asteraceae	Cosmetics, cough and cold, hair dye
41	Jangli arwi	<i>Colocasia esculanta</i>	Euphorbiaceae	Leaves are rich in vitamins and minerals.
42	Kapur kachri	<i>Hedychium acuminatum</i>	Zingiberaceae	Snake bite
43	Malkangni	<i>Celastrus paniculatus</i>	Celastraceae	Abortion, leprocy, paralysis, body pain, fever, dysentery, diarrhoea
44	Jangli sanai	<i>Chrotolaria seresia</i>	Leguminaceae	Plant extract used for the treatment of impetigo, scabies, antiseptic and treat intestinal worms.
45	Stevia	<i>Stevia reudaiana</i>	Asteraceae	Diabetes
46	Kalmegh	<i>Andrographis paniculate</i>	Acanthaceae	Snake bite, typhide, and malaria, dysentery, gastritis
47	Safed musli (En.)	<i>Chlorophytum borivilianum</i>	Liliaceae	Diabetes,sterility, post deliveryproblems , milk increase in mother,Tonic
48	Kalimusli (En.)	<i>Curcoliga orchoides</i>	Amaryllidaceae	Leucoderma, manhood, vigour, fever, cough
49	Satawer	<i>Asparagus racemes</i>	Liliaceae	Tonic, increase milk of feeding mothers, diarrhoea, skin wrinkling, galactogenic
50	Vanhaldi (En.)	<i>Curcuma aromatic</i>	Zingiberaceae	Blood purifier, aromatic stimulents, tonic , hysteria, intestinal disorder, cough and cold
51	Aloe vera	<i>Aloe barbadance</i>	Liliaceae	Burn, cosmetics vitality, colic, liver disorder, teethache, pile, liver swelling
52	Thikhur(En.)	<i>Curcuma angestifolia</i>	Zingiberaceae	Aromatic stimulants, tonic, worms anemia, asthma
53	Kali haldi (VU)	<i>Curcuma coesia</i>	Zingiberaceae	Leprosy and cancer
54	Van adrak	<i>Zingiber rosemum</i>	Zingiberaceae	Cough and cold
55	Gudmar	<i>Gymnema sylvestre</i>	Asclepidaceae	Snake bite, diabetes
56	Giloy	<i>Tinospora corollifolia</i>	Menispermaceae	Diphtheria
57	Buch	<i>Achorus calamus</i>	Areaceae	Diarrhoea, leucamea, waist pain, paralysis, skin disease, brain tonic,cold and cough
58	Ashwagandha	<i>Withania somnifera</i>	Solanaceae	Low blood pressure, tonic, barronness, scabies, sore eyes, debility,tuberculosis
59	Tulsi	<i>Ocimum spp.</i>	Lamiaceae	Cold fever, cancer, loss of manhood, digestion , chronic fever.
60	Sarpgandha (En.)	<i>Rouwalfia serpentine</i>	Apocynaceae	Snake bite, blood pressure, fever, wound, colic, opacity in cornia
61	Anant mool (En.)	<i>Hemidesmus indicus</i>	Asclepidaceae	Blood purification
62	Ratanjot	<i>Jatropha curcus</i>	Euphorbiaceae	Indigestion , cancer
63	Akarkara (En.)	<i>Spilanthus oleraceae</i>	Asteraceae	Digestion, rheumatism
Aromatic Plants				
1	Khas	<i>Vetivaria zizarioides</i>	Poaceae	Liver disorder, constipation
2	Lemon grass	<i>Cymbopogon flexuosus</i>	Poaceae	Cold, vit.A, cosmetics gastric irritation, bronchitis , sprain , fever
3	Lata Kasturi	<i>Abelmoschus moschus</i>	Malvaceae	Antibiotic in snake bite, perfume, cosmetics, flavouring in tobacco, tea and medicine
4	Ceteronella	<i>Cymbopogon winterianus</i>	Poaceae	Mosquito repellent, anticeptic, cosmetics
5	Pacholi	<i>Pogostemon cablin</i>	Lamiaceae	Use as masking agent fof alcoholic breath, soap, cosmetics, tobacco and incense
Betel vine				
1.	Green gold	<i>Peper betle</i>	Piperaceae	Leaf contain astringent, aromatic, carminative properties and chewing of leaves act as gental stimulant, sweeten breath, improves digestion.

CONCLUSION

The safety and affordable remedies in biodynamic phytotherapy has attracted the interest of the people worldwide. The developing countries like India the indigenous system of medicine with folklore continue to play a significant role in the health care system of the population. The over exploration or use of forest land for other purpose of wealth of medicinal and aromatic flora of C.G. from the wild causing long term negative impact on environment and availability of certain medicinal plant species due to this many plant species become endangered, vulnerable, rare etc. The conservation of medicinal and aromatic plant genetic resources includes their augmentation safe holding for preservation or protection in natural habitat. Hence *Ex situ* conservation, multiplication, characterization and its strategic cultivation of this plant species will help in maintaining ecological balance so that this heritage can be used and exploited wisely through judicious management for future generation.

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