



Research article

Diversity and uses of medicinal plants in Chandra Prabha Wildlife Sanctuary, Chandauli district, Uttar Pradesh

Nitisha Srivastava and Achuta Nand Shukla*

Botanical Survey of India, Central Regional Centre, 10, Chatham Lines, Allahabad-211002, Uttar Pradesh, India

*Corresponding Author: achutbsi@gmail.com

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Abstract: Protected areas play a very significant role in the conservation of medicinal plants and traditional knowledge. Chandra Prabha Wildlife Sanctuary (CPWLS) is situated in the district Chandauli. The presented study was carried out in the area of CPWLS for survey and collection of medicinal plants. Information on medicinal properties of plants encountered in the present study was generated through surveys and relevant literature. A total of 121 medicinally important plant species were reported. The present study aimed to document the traditional uses of different plant parts of medicinal plants. Present study of diversity of medicinal plant in CPWLS is helpful for information on medicinal values of plant species will also be helpful in conservation of these plant resources.

Keywords: Chandra Prabha Wildlife Sanctuary - Medicinal plants - Traditional knowledge.

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INTRODUCTION

Sustainable use of natural resources refers to the process of making a balance between the unlimited desire of human being and limited natural resources. In order to obtain the greatest benefit for the present generation and maintaining the potential for future, conservation is the only way. Conservation of plant resources is of global concern because we don't know what we are losing and what we will need in the future. However, conservation methods may vary globally.

Medicinal plants are an important natural resource. To meet the requirements of expanding regional and international markets healthcare products and the needs of growing populations, large quantities of medicinal plants are harvested from forests (de Silva 1997). There are many factors which pose threat to many medicinal plants. The threats are degradation of habitat due to expanding human activity, decline of forest areas, destructive collections of plant species, invasion of exotic species, diseases, overexploitation, grazing by animals, industrialization, shifting cultivation, excessive use of fertilizers and agrochemicals, natural and manmade calamities, etc.

In India history of uses of medicinal plants goes back to 300 BC, in this year Charak Samhita, a document on herbal therapy by Charak reports on the production of 340 herbal drugs and their uses (Vedprakash 1991, Mehra *et al.* 2014). These herbal medicines always attracted peoples due to their low cost and minimal side effects (Bajpai *et al.* 2016). Medicinal plants which are in use traditionally by rural people for curing various diseases are now moving into mainstream. Other peoples are also aware of their therapeutic uses for treating various diseases as well as maintaining proper health conditions. Thus today not only the rural and ethnic peoples but peoples in urban areas also rely upon these medicinal plants. In the country, large numbers of medicinal plants are extracted from the wild to meet the increasing demand for increasing population and export business. This has created rapid loss of medicinal plant genetic resources (Gadgil 1989). Therefore it is very important to ensure conservation of knowledge of these traditional medicinal plants as well as it also very essential to conserve them for the betterment of our future (Deepa *et al.* 2016). For that, more information is required on medicinal plant production, utilization, trade, monitoring the stock of medicinal plants, development of sustainable harvesting practices, preservation of traditional knowledge and intellectual property rights.

Protected Areas are one of the most widely accepted and practical approaches to biodiversity conservation

worldwide. However *ex-situ* conservation methods such as plant tissue culture, seed storage and tissue banking etc. also play an important role in the conservation of plant genetic resources. Today almost every country in the world has designated protected areas for a range of conservation objectives, such as maintenance of the integrity and diversity of ecosystems, protection of flora and fauna, protection of cultural heritage and unique landscape, etc.

At present in India there are 104 designated national parks, 544 wildlife sanctuaries, which play a very significant role in the conservation of medicinally important plant species. As per Uttar Pradesh forest report, Uttar Pradesh shares one national park and 25 wildlife sanctuaries. Out of these 25 wildlife sanctuaries, Chandra Prabha Wildlife Sanctuary (CPWL) is the oldest and first declared wildlife sanctuary of Uttar Pradesh and was designated in 1957. Since wildlife sanctuaries play a very important role in the conservation of medicinal plants of the region, therefore it is important to study the medicinal wealth of these sanctuaries. The present study was undertaken to study the medicinal floristic diversity of Chandra Prabha Wildlife Sanctuary. The botanical explorations were done for study and collection of existing medicinal plant species. The study was focused on medicinal plant diversity, distribution and uses of medicinal plants and also on conservation status and preferences for the medicinal plants of the area.

MATERIAL AND METHODS

Study area

Chandra Prabha Wildlife Sanctuary (CPWLS) is situated in District Chandauli of Uttar Pradesh and covers an area of about 78 km² (Fig. 1). The area lies between the latitudes 24° 52'0'' N to 25° 3'55'' and 83° 03'24'' E to 83° 22'55'' longitudes. It was famous for the Asiatic Lion from 1957 to 1970. The place has also been gifted with attractive natural sceneries, picnic spots, intense forest, river and beautiful waterfalls. Two waterfalls namely Rajdari and Devdari are famous for the picnic spot. It lies on the Naugarh and Vijaygarh hillocks on the North Slope of the Kaimur range. The Karamnasha River, a tributary of the Ganges, flows through the sanctuary, as does the Chandraprabha River, a tributary of Karamnasha. Raj Dari waterfall is surrounded by the forest area, this stepped waterfall is the main attraction point for the tourists. Deodari water fall is about 500 m down the stream below Raj Dari waterfall. Chandra Prabha dam has been constructed by the Irrigation Department. Chandra Prabha dam is located upstream on Chandra Prabha River near the sanctuary and is the source of water for both the waterfalls. The sanctuary forest is the typically dry deciduous type with dominant shrubby vegetation.

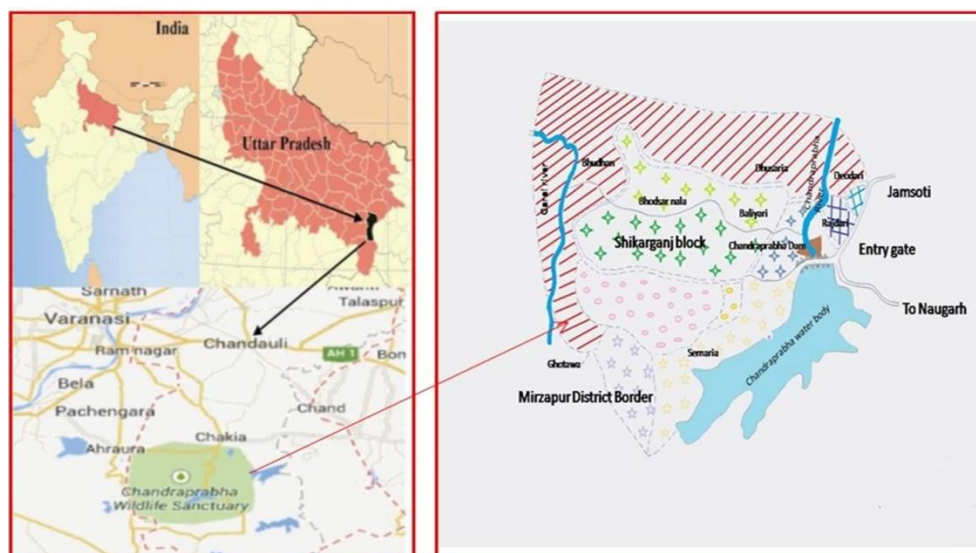


Figure 1. Location of study area (Chandra Prabha Wildlife Sanctuary, Chandauli, Uttar Pradesh).

Data collection

In present work the study materials consists of medicinal plant diversity of Chandra Prabha Wildlife Sanctuary. Besides the specimens collected from the sanctuary some information was also taken from previously collected specimens and related documentation about the sanctuary (Maurya *et al.* 2015). Extensive survey has been carried out to record the information and the specimens were identified with the help of herbarium and published literature. The voucher specimens were deposited in the herbarium of Botanical Survey of India, Central Regional Centre, Prayagraj (BSA).

RESULTS

During the botanical excursion, the sanctuary area was explored for medicinal floristic diversity. After critical examination 121 medicinal plants (Table 1) belonging to 51 families were reported with scientific names, common names, habit, life form and their medicinal uses. Among these 5 species belong to Pteridophyta group. Out of total 116 Angiosperms 10 genera and 10 species belongs to monocot and 106 species and 86 genera belongs to dicot families. Fabaceae (13 species), Caesalpiniaceae (11 species), Rubiaceae (07 species), Malvaceae (6 species), Poaceae (06 species) were the most dominant medicinal plant families of the area. The medicinal plants were dominant in low altitude areas. Other families are Cucurbitaceae, Acanthaceae, Asclepiadaceae, Rutaceae, Rhamnaceae, etc. The pteridophyte belongs to 5 families viz., Sellaginellaceae, Isoetaceae, Schizaceae, Pteridaceae and Marsiliaceae. Monocot families were represented by only Poaceae, Araceae, Asparagaceae, Hypoxidaceae and Hydrocharitaceae. Some of the important medicinal plants in Chandra Prabha Wildlife Sanctuary shown in figure 2.

Table 1. List of medicinal plants of Chandra Prabha Wildlife Sanctuary with their medicinal uses, habit, life form, local names and parts used.

S.N.	Name	Field number	Family	Habit	Life form	Local Name	Medicinal Uses	Plant parts used
1.	<i>Selaginella bryopteris</i> (L.) Baker	76376	Selaginellaceae	Herb	Th	Sanjeevani	Anti-inflammatory and cures venereal disease	Leaf
2.	<i>Calamaria coromandelina</i> (L.f.) Kuntze	75082	Isoetaceae	Herb	Cry	Quilworts	Spleen and liver disease	Corm
3.	<i>Lygodium flexuosum</i> (L.) Sw.	76278	Schizaeaceae	Climber	Ph	-	Roots are used in rheumatism, sprains, scabies, eczema and cut wounds	Root
4.	<i>Ceratopteris thalictroides</i> (L.) Brongn.	76210	Pteridaceae	Herb	Cry	Indian fern	Leaf and roots are used in skin diseases	Leaf, Root
5.	<i>Marsilea minuta</i> L.	76295	Marsiliaceae	Herb	Cry	Susnisak	For the treatment of psychopathy, diarrhea, respiratory diseases, and skin diseases.	Fron
6.	<i>Tinospora cordifolia</i> (Willd.) Miers	Maurya <i>et al.</i> (2015)	Menispermaceae	Vine	Ph	Giloe	Used in debility, dyspepsia, fever and urinary diseases.	Twig, Bark
7.	<i>Nymphaea nouchali</i> Burm.f.	75050	Nymphaeaceae	Herb	Cry	Berra	Seeds used in cutaneous diseases. Rhizomes used in dysentery, diarrhea, dyspepsia.	Seeds, Rhizome
8.	<i>Cleome viscosa</i> L.	75039	Capparaceae	Herb	Th	Hulhul, Hurhur	Whole herb is used in the treatment of ringworm, flatulence, colic, dyspepsia, cough, bronchitis, cardiac disorders.	Whole plant
9.	<i>Hybanthus enneaspermus</i> (L.) F.Muell.	75131, 75013, 75106	Violaceae	Herb	Ch	Ratan purus	Used in urinary affections and bowel complaints of children.	Roots
10.	<i>Polygala chinensis</i> L.	75090, 75055, 75162	Polygalaceae	Herb	Th	Meradu	Leaves used in asthma and chronic bronchitis.	Leaf
11.	<i>Abutilon indicum</i> (L.) Sweet	76334	Malvaceae	Small Shrub	Ph	Kanghi	Used in urinary troubles. Roots used as nervine tonic and also used in piles.	Root
12.	<i>Sida acuta</i> Burm.f.	Maurya <i>et al.</i> (1.c.)	Malvaceae	Herb	Th	Bariara	Leaves demulcent and diuretic, used in Elephantiasis. Roots in urinary disorder and bowel disorder.	Leaf, Root

13.	<i>Sida cordata</i> (Burm.f.) Borss. Waalk.	75063, 75145, 75172, 75004, 76292, 76241	Malvaceae	Herb	Th	Bhumi-bariara	Plant extract used in Dysentery. Leaves in leucorrhoea. Roots used in joint pains and weakness.	Whole plant
14.	<i>Sida cordifolia</i> L.	Maurya <i>et al.</i> (l.c.)	Malvaceae	Sub Shrub	Th	Kungyi	Diuretic, used in jaundice, urinary problems.	Whole plant
15.	<i>Sida rhombifolia</i> L.	76327	Malvaceae	Herb	Th	Lalbarela	Used in rheumatism and tuberculosis	Whole plant
16.	<i>Urena lobata</i> L.	76275, 76318	Malvaceae	Shrub	Ph	Bachita	Used as expectorant in sore throat	Flower
17.	<i>Helicteres isora</i> L.	75044	Sterculeaceae	Shrub	Ph	Marorphali	Fruits used in colic diarrhoea, dysentery and improve appetite.	Fruit
18.	<i>Waltheria indica</i> L.	75095, 76264	Sterculeaceae	Shrub	Ph	-	Analgesic, anti-inflammatory, antibacterial, antifungal, antimalarial, anti-anemic, anti-oxidant, sedative and anticonvulsant activities.	Whole plant
19.	<i>Corchorus capsularis</i> L.	75128	Tiliaceae	Shrub	Ph	Jute	Leaves used in dysentery. Roots and unripe fruits in diarrhoea.	Leaf, Root, Fruit
20.	<i>Grewia hirsuta</i> Vahl	75153, 76365	Tiliaceae	Shrub	Ph	Sita-Chabeni	Twig used in stomachache. Fruits used in diarrhoea and dysentery. Powdered roots used in leucorrhoea.	Whole plant
21.	<i>Grewia tiliifolia</i> Vahl	75002	Tiliaceae	Tree	Ph	Dhamni	Bark used in dysentery.	Bark
22.	<i>Tribulus terrestris</i> L.	Maurya <i>et al.</i> (l.c.)	Zygophyllaceae	Herb	Ch	Gokhru	Used in diabetic mellitus, cardiac disorders, anticancer & anti-infertility agent.	Whole plant
23.	<i>Biophytum sensitivum</i> (L.) DC.	75103	Oxalidaceae	Herb	Th	Lakhshan	Plant decoction used in asthma, diabetes, Roots used in Fever and urinary disorders	Whole plant
24.	<i>Aegle marmelos</i> (L.) Corrêa	75003	Rutaceae	Tree	Ph	Bel	Unripe or half-ripe fruits astringent, digestive and used for diarrhea and dysentery.	Fruit
25.	<i>Murraya paniculata</i> (L.) Jack	76357	Rutaceae	Tree	Ph	Kamini	Leaves used in diarrhea and dysentery, applied on cuts, and also in cough and rheumatism	Leaf
26.	<i>Naringi crenulata</i> (Roxb.) Nicolson	76341	Rutaceae	Tree	Ph	Belsaundha	Fruit pulp used in dysentery	Fruit
27.	<i>Ailanthus excelsa</i> Roxb.	Maurya <i>et al.</i> (l.c.)	Simaroubaceae	Tree	Ph	Ajan, Arua	Leaves used in cuts, sores and used as antiseptic. Bark is anthelmintic.	Leaf, Bark

28.	<i>Azadirachta indica</i> A.Juss. <i>et al.</i> (l.c.)	Maurya	Meliaceae	Tree	Ph	Nim	Bark used in skin trouble. Leaves considered antiseptic, decoction given for ulcers and eczema. Flowers tonic and stomachic.	Whole plant
29.	<i>Celastrus paniculatus</i> Willd.	76361	Celastraceae	Shrub	Ph	Malkangni	Fruit paste used as stimulant nerve tonic, rejuvenant, sedative, tranquilizer and diuretic. Seeds used in cough and cold.	Bark, Fruit, Seed
30.	<i>Ventilago denticulata</i> Willd.	76221	Rhamnaceae	Climber	Ph	Karia bouri	Bark paste used in dyspepsis and fever. Stem pulp in eye inflammation. Roots used in Snake bites.	Whole plant
31.	<i>Ziziphus jujuba</i> Mill.	76206, 75054	Rhamnaceae	Shrub	Ph	Pitni-ber, ban-ber	Used in treatment of chronic fatigue, loss of appetite, diarrhea, anemia, irritability and hysteria.	Fruit
32.	<i>Ziziphus oenopolia</i> (L.) Mill.	75045, 76226	Rhamnaceae	Shrub	Ph	Makai	Roots anthelmintic. Fruits are used in coryza, aphrodisiac, tonic and fevers.	Whole plant
33.	<i>Ampelocissus latifolia</i> (Roxb.) Planch.	75066	Vitaceae	Vine	Ph	Panibel	Juice of leaves are used in dental problems and roots used in dysentery.	Leaf, Root
34.	<i>Cayratia trifolia</i> (L.) Domin	75032	Vitaceae	Vine	Ph	Amal-bel, Ramchana	Roots astringent, ground with pepper applied to boils.	Root
35.	<i>Abrus precatorius</i> L.	75096, 75137, 76375	Fabaceae	Climber	Ph	Gunchi, Rati	Roots diuretic, tonic and emetic. Seeds used in affections of nervous system and stiffness of shoulder, joints	Root, Seed
36.	<i>Aeschynomene indica</i> L.	75138, 75130	Fabaceae	Shrub	Ph	Phulan	Plant extract has spermicidal activity	Whole plant
37.	<i>Alysicarpus vaginalis</i> (L.) DC.	75099	Fabaceae	Herb	Th	Chukalai	Anti-inflammatory in stomachache, used in skin diseases and as a diuretic. Leaves used in fever, jaundice.	Leaf
38.	<i>Butea monosperma</i> (Lam.) Taub.	76291, 76374	Fabaceae	Tree	Ph	Dhak	Leaves used in dysentery, heat stroke, Gums used in diarrhoea and dysentery. Fruit extract used in urinary troubles.	Whole plant
39.	<i>Cajanus scarabaeoides</i> (L.) A.Thouars	75104, 75141, 76326, 76358	Fabaceae	Climber	Ph	Bankulthi	Plant decoction used for dysentery.	Whole plant

40.	<i>Desmodium triflorum</i> (L.) DC.	75065, 76300, 76328, 76300	Fabaceae	Herb	Ch	Kudaliya	Plants used in toothache. Leaves used in dysentery and diarrhoea.	Whole plant
41.	<i>Indigofera cassioides</i> Rottler ex DC.	75181	Fabaceae	Shrub	Ph	Kathi	Roots used in the treatment of coughs.	Roots
42.	<i>Indigofera tinctoria</i> L.	Maurya et al. (1.c.)	Fabaceae	Herb	Th	Nil	Extract used in epilepsy and other nervous disorders, in form of ointment used for sores, old ulcers, and piles. Roots used in urinary complains	Whole plant
43.	<i>Pongamia pinnata</i> (L.) Pierre	Maurya et al. (1.c.)	Fabaceae	Tree	Ph	Karanja	Used in cutaneous diseases. Juices of roots used for cleaning ulcers, sores and also for cleaning teeth.	Seed, Root
44.	<i>Pterocarpus marsupium</i> Roxb.	Maurya et al. (1.c.)	Fabaceae	Tree	Ph	Beejasal	Leaf paste used in skin disease. Heartwood used in asthma and diabetes. Bark used in dysentery	Leaf, Heart wood, Bark
45.	<i>Rhynchosia minima</i> (L.) DC.	75135	Fabaceae	Herb	Ph	Tinpatia	Leaves used on wounds. Roots used in urinary diseases	Leaf, Root
46.	<i>Tephrosia purpurea</i> (L.) Pers.	Maurya et al. (1.c.)	Fabaceae	Shrub	Th	Dhamasia, Sarphonka	Used in Bronchitis, pimples, boils. Roots and seeds are insecticidal. Decoction of roots are given in dyspepsis, diarrhea, rheumatism, asthma and urinary disorders.	Whole plant
47.	<i>Uraria picta</i> (Jacq.) Desv.	Maurya et al. (1.c.)	Fabaceae	Shrub	Ph	-	Leaves used on wounds. Powdered root used in bodyache.	Leaf, Root
48.	<i>Bauhinia purpurea</i> L.	76204	Caesalpiniaceae	Tree	Ph	Khairwal	Bark used in diarrhea. Flower buds eaten as pot-herb, laxative and antihelmintic	Whole plant
49.	<i>Bauhinia racemosa</i> Lam.	75048, 76237	Caesalpiniaceae	Tree	Ph	Kachnal	Bark astringent, used in dysentery. Leaves used for diarrhoea.	Bark, Leaf
50.	<i>Bauhinia vahlii</i> Wight & Arn.	76262	Caesalpiniaceae	Tree	Ph	Mahurayan	Bark used in chronic stomach pain, dysentery and cholera. Roots used in syphilis	Bark, Root
51.	<i>Bauhinia variegata</i> L.	76204	Caesalpiniaceae	Tree	Ph	Kachnar	Twigs in diarrhoea, toothache and mouth ulcer. Barks used in dysentery. Roots in dyspepsia.	Flower, Twig, Bark, Root
52.	<i>Cassia fistula</i> L.	Maurya et al. (1.c.)	Caesalpiniaceae	Tree	Ph	Amaltas	Leaves used in burn and skin diseases, Fruit in dysentery; Ash used in cough, fever, gastritis, liver disorder. Root used in fever.	Leaf, Fruit, Seed, Root

53.	<i>Chamaecrista absus</i> (L.) H.S. Irwin & Barneby	75151	Caesalpiniaceae	Herb	Th	Bhatwas	Leaves used in cough. Seed in skin diseases.	Leaf, Seed
54.	<i>Senna alata</i> (L.) Roxb. <i>et al.</i> (1.c.)	Maurya	Caesalpiniaceae	Shrub/Sm all Tree	Ph	Ergaj	Used in ringworms, goiter, hook worm infestation, sexually transmitted diseases, constipation and other skin diseases.	Leaf, Root Bark, Flower
55.	<i>Senna obtusifolia</i> (L.) Irwin & Barneby	75185	Caesalpiniaceae	Herb	Th	Panevar	Leaves used in ulcer. Roots in ringworm.	Leaf, Root
56.	<i>Senna occidentalis</i> (L.) Link <i>et al.</i> (1.c.)	Maurya	Caesalpiniaceae	Herb	Th	Kasondi	Leaves and seeds purgative, used in skin troubles.	Leaf, Seed
57.	<i>Senna tora</i> (L.) Roxb. <i>et al.</i> (1.c.)	Maurya	Caesalpiniaceae	Herb	Th	Chakunda	Leaves are purgative and used in skin troubles.	Leaf
58.	<i>Tamarindus indica</i> L.	75168	Caesalpiniaceae	Tree	Ph	Imli	Leaves used in injury, ringworm, leucoderma and eye inflammation. Seeds used in snake bites.	Leaf, Seed
59.	<i>Acacia catechu</i> (L.f.) Willd.	75016, 75140, 76339	Mimosaceae	Tree	Ph	Kattha	Plants used in diarrhoea, sore throat. Bark used in skin diseases. Kattha from heartwood is used in wounds.	Bark, Heart wood
60.	<i>Albizia lebbek</i> (L.) Benth.	76202	Mimosaceae	Tree	Ph	Shirisha	Antitoxic and antiallergic.	Bark
61.	<i>Anogeissus latifolia</i> (Roxb. ex DC.) Wall. ex Bedd.	76254	Combretaceae	Tree	Ph	Dhaw	Bark used in diarrhoea, headache, scorpion bite. Roots used in toothache	Bark, Root
62.	<i>Combretum album</i> Pers.	76273	Combretaceae	Large shrub	Ph	Paibal	Leaves are used in diarrhoea, acne, eczema and other skin diseases.	Leaf
63.	<i>Terminalia arjuna</i> (Roxb. ex DC.) Wight & Arn.	75015, 76346	Combretaceae	Tree	Ph	Arjuna	Styptic, tonic, febrifuge and antidyseric, pulverized bark relieves hypertension and act as diuretic in liver cirrhosis. Leaves used in ear-ache.	Leaf, Bark
64.	<i>Terminalia bellirica</i> (Gaertn.) Roxb.	Maurya <i>et al.</i> (1.c.)	Combretaceae	Tree	Ph	Bahera	Bark used in fever, cold, cough, cholera. Fruits used in stomachache, liver diseases, pilesdiarrhoea, fever and rheumatic pain.	Bark, Fruit
65.	<i>Terminalia chebula</i> Retz.	Maurya <i>et al.</i> (1.c.)	Combretaceae	Tree	Ph	Harra	Fruits form a constituent of triphala, fruit used in dentifrices, fruit powder smoked in asthma, Bark diuretic and cardiogenic.	Fruit, Brak

66.	<i>Syzygium cumini</i> (L.) Skeels	76218	Myrtaceae	Tree	Ph	Jaman	Decoctions of bark and that of powdered seeds are used in diabetes.	Fruit, Bark
67.	<i>Barringtonia acutangula</i> (L.) Gaertn.	Maurya <i>et al.</i> (1.c.)	Lecythidaceae	Tree	Ph	Injar	Decoction in blood deficiency and vitality.	Bark, Stem
68.	<i>Woodfordia fruticosa</i> (L.) Kurz	Maurya <i>et al.</i> (1.c.)	Lythraceae	Shrub	Ph	Dawi	Used in bowel complaints, hemorrhages, menorrhagia.	Flower, Flower bud, Fruit
69.	<i>Ludwigia octovalvis</i> (Jacq.) P.H.Raven	76234, 76301	Onagraceae	Herb	Th	Tilijuria	Plants astringent, laxative, diuretic, used in leucorrhoea and diarrhoea.	Whole plant
70.	<i>Diplocyclos palmatus</i> (L.) C.Jaffrey	76332	Cucurbitaceae	Climber	Th	Ban-Kakra	Plant paste used in rheumatism. Leaves used in fever, seeds used in paralysis.	Whole plant
71.	<i>Mukia maderaspatana</i> (L.) M. Roem.	75038	Cucurbitaceae	Climber	Th	Madras pea pumpkin	Leaves used in diabetes.	Leaf
72.	<i>Trichosanthes cordata</i> Roxb.	Maurya <i>et al.</i> (1.c.)	Cucurbitaceae	Climber	Ph	-	Roots used as tonic, given in enlargement of liver, spleen and disorder of other viscera.	Root
73.	<i>Trichosanthes cucumerina</i> L.	75035	Cucurbitaceae	Climber	Ph	Jangali-Chichinda	Roots used in bronchitis, headache and boils.	Root
74.	<i>Mollugo pentaphylla</i> L.	75108	Molluginaceae	Herb	Th	-	Leaves are stomachic, antiseptic, also used for poultices for sore legs.	Leaf
75.	<i>Ceriscoides turgida</i> (Roxb.) Tirveng.	75075, 76364	Rubiaceae	Tree	Ph	Kharhar	Roots used in toothache.	Root
76.	<i>Gardenia gummifera</i> L.f.	75067	Rubiaceae	Small Tree	Ph	Dikamali	Used in nervous disorder of children during dentition, used for dyspepsis.	Young shoots
77.	<i>Gardenia latifolia</i> Sol.	75037, 75047, 76303	Rubiaceae	Tree	Ph	-	Used in treatment of a wide range of ailments such as snake bite, skin diseases, stomach pains, inflammatory pain, caries, haemorrhages.	Whole plant
78.	<i>Haldina cordifolia</i> (Roxb.) Ridsdale	76285	Rubiaceae	Tree	Ph	Haldu	Bark is used as antiseptic for killing worms in sores and also used in malarial fever and dysentery.	Bark
79.	<i>Hymenodictyon orixense</i> (Roxb.) Mabb.	75049, 76230	Rubiaceae	Tree	Ph	Bhaultan	Bark paste used is swelling and pain. Fruits used in asthma.	Bark, Fruit
80.	<i>Mitragyna parvifolia</i> (Roxb.) Korth.	75160, 76236, 76349	Rubiaceae	Tree	Ph	Kadamb	Bark and roots used to treat fever, colic, muscular pain, burning sensation, poisoning, gynecological disorders, cough, edema.	Bark, Root and Leaf

81.	<i>Oldenlandia corymbosa</i> L.	76216, 76369	Rubiaceae	Herb	Th	Pitpapra	Used in Jaundice, and other diseases of the liver, heat eruptions.	Leaf
82.	<i>Caesulia axillaris</i> Roxb.	76249	Asteraceae	Herb	Th	Phulave	Flowers used in boils. Roots used in mouth sore.	Flower, Root
83.	<i>Eclipta prostrata</i> (L.) L.	76315	Asteraceae	Herb	Th	Bhangra, Bhringraj	Plant paste used in Elephantiasis, leucoderma, liver and spleen diseases, Leaves used in treatment of dandruff, wounds, snake bites, migraine, high blood pressure.	Whole plant
84.	<i>Sphaeranthus indicus</i> L.	Maurya <i>et al.</i> (l.c.)	Asteraceae	Herb	Th	Gorakhmundi	Plant paste used in leucorrhoea. Leaves used in eye diseases. Roots used in madness.	Whole plant
85.	<i>Tridax procumbens</i> L.	75113	Asteraceae	Herb	Th	Mewadi	Plant paste used in cuts, wounds, scorpion bites, Leaves used in cuts and leucorrhoea.	Whole plant
86.	<i>Calotropis gigantea</i> (L.) R.Br.	75121	Asclepiadaceae	Shrub	Ph	Akauva	Warmed leaves used in skin inflammation, flowers used in mental disorders, latex used in snake bites and roots in jaundice.	Leaf, Flower, Root, Latex
87.	<i>Calotropis procera</i> (Aiton) W.T.Aiton	Maurya <i>et al.</i> (l.c.)	Asclepiadaceae	Shrub	Ph	Akauva, Madar	Leaves used in sores, skin diseases. Juice in mouth ulcer and asthma, flowers used in epilepsy, cholera, cough, cold.	Leaf, Flower, Root, Latex
88.	<i>Gymnema sylvestre</i> (Retz.) R.Br. ex Schult.	75037, 75184	Asclepiadaceae	Woody vine	Ph	Gurmar	Leaves used in diabetes, asthma, cough and cold.	Leaf
89.	<i>Hemidesmus indicus</i> (L.) R.Br. ex Schult.	76325, 76335	Asclepiadaceae	Semierect Shrub	Cry	Anantmool, Kali papri	Plant paste in leucoderma, psoriasis and rheumatism. Leaves used in cough and gonorrhoea. Roots in eczema, snake bites, diabetes, ringworm infection and fever.	Whole plant
90.	<i>Heliotropium strigosum</i> Willd.	75110	Boraginaceae	Herb	Th	-	Powdered plants used in mothers for increasing lactation.	Whole plant
91.	<i>Evolvulus alsinoides</i> (L.) L.	75026, 75034, 75070, 75148, 75157	Convolvulaceae	Herb	Cha	Sankh- pushpi	Plants ash used in dermatitis, used as nerve tonic, vermifuge, antispasmodic, Powdered leaves used in bronchitis, asthma, bleeding and for hair growth.	Whole plant

92.	<i>Ipomoea carnea</i> Jacq.	75101	Convolvulaceae	Shrub	Ph	Behaya	Powdered plants used in conception. Leaves paste used as an antidote to scorpion sting. Warm leaves used in rheumatism and gout.	Whole plant
93.	<i>Merremia hederacea</i> (Burm.f.) Hallier f.	76280	Convolvulaceae	Herb	Th	-	Leaves used for preparing poultice.	Leaf
94.	<i>Datura innoxia</i> Mill.	76286	Solanaceae	Shrub	Ph	Datura	Leaves paste used in boils, pimples and asthma. Seeds used in arthritis.	Leaf, Seed
95.	<i>Solanum americanum</i> Mill.	76246	Solanaceae	Herb	Th	Kali Makoi	Decoction of root is used in fever.	Root
96.	<i>Solanum virginianum</i> L.	75094	Solanaceae	Herb	Th	Berkateli	Fresh root are applied with lemon for preventive measure of cataract.	Root
97.	<i>Scoparia dulcis</i> L.	75006, 76331	Scrophulariaceae	Herb	Th	Meethi patti, Ban mircha	Plant extract used in toothache, diabetes. Leaves in diarrhea and irregular menstruation. Fruits in headache and roots in menorrhagia and in excessive menstruation.	Whole plant
98.	<i>Oroxylum indicum</i> (L.) Kurz	Maurya et al. (l.c.)	Bignoniaceae	Tree	Ph	Arlu, Sheonak	Bark decoction used in jaundice and bone fracture. Leaves in diarrhea and rheumatism. Roots in stomachache, dysentery, and powder for snake bites.	Bark, Leaf, Root
99.	<i>Sesamum indicum</i> L.	75068, 75177	Pedaliaceae	Herb	Th	Til	Powdered seeds in increasing lactation and spermatorrhoea and oil in urinary troubles.	Seed
100.	<i>Andrographis paniculata</i> (Burm.f.) Nees	Maurya et al. (l.c.)	Acanthaceae	Herb	Th	Kalmegh	Plant paste used for blood purification, dysentery, diarrhea, piles, jaundice, bronchitis, liver diseases.	Whole plant
101.	<i>Barleria cristata</i> L.	76281	Acanthaceae	Herb	Cha	Subhaga	Plants used in cough and bronchitis. Leaves in toothache. Roots and leaves in bronchial problems. Stem used as toothbrush in gummosis.	Whole plant
102.	<i>Barleria prionitis</i> L.	Maurya et al. (l.c.)	Acanthaceae	Herb	Cha	Katsaraya	Plant used in boils, glandular swelling and cough, cancer. Leaves in toothache and rheumatism.	Whole plant

103. <i>Justicia adhatoda</i> L.	Maurya <i>et al.</i> (l.c.)	Acanthaceae	Shrub	Ph	Adusa, Arusa	Leaves used as expectorant, antispasmodic, in chronic bronchitis, asthma and tuberculosis	Leaf
104. <i>Gmelina arborea</i> Roxb.	Maurya <i>et al.</i> (l.c.)	Verbenaceae	Tree	Ph	Gumare	Leaves carminative. Bark antiviral used in swelling, choak throat, rheumatism. Roots used in weakness and constipation	Bark, Leaf, Root
105. <i>Ocimum americanum</i> L.	75119, 76248	Lamiaceae	Herb	Th	Bantulsa, Mamari	Leaves juice used in headache. Seed paste in animal ulcer to kill worm	Leaf, Seed
106. <i>Amaranthus spinosus</i> L.	Maurya <i>et al.</i> (l.c.)	Amaranthaceae	Herb	Th	Kateli-chauli	Fresh leaves used in spermatorrhoea. Stem in rheumatic pain. Roots in gonorrhoea, diarrhoea.	Whole plant
107. <i>Euphorbia hirta</i> L.	75024	Euphorbiaceae	Herb	Th	Dudhi	Plant paste used for killing stomach worm, in dysentery, viral fever and cough. Latex in snake bite and in wounds.	Whole plant
108. <i>Jatropha curcas</i> L.	Maurya <i>et al.</i> (l.c.)	Euphorbiaceae	Tree	Ph	Ratanjot	Leaves in inflammation of body and chest congestion. Twig in toothache and gummosis. Bark is dysentery and tuberculosis	Leaf, Seed, Twig, Bark
109. <i>Mallotus philippensis</i> (Lam.) Müll.Arg.	76266	Euphorbiaceae	Tree	Ph	Rohini, Sinduri	Bark used in abdominal pain and jaundice. Seeds in rheumatism. Roots used as antiseptic. Powdered seeds in dysentery and constipation.	Bark, Leaf, Seed
110. <i>Ricinus communis</i> L.	Maurya <i>et al.</i> (l.c.)	Euphorbiaceae	Shrub	Ph	Arandi	Leaves used in pneumonia fever, jaundice and menstrual disorder. Seeds in rheumatism and constipation. Roots in boils.	Leaf, Seed, Root
111. <i>Ficus racemosa</i> L.	Maurya <i>et al.</i> (l.c.)	Moraceae	Tree	Ph	Gular	Leaves used in boils, paralysis. Leaves and latex in fever and dysentery. Fruits in sunstroke, diarrhoea, leucorrhoea and diabetes. Roots sap in diabetes.	Leaf, Latex, Fruit, Root

112. <i>Hydrilla verticillata</i> (L.f.) Royle	76245	Hydrocharitaceae	Herb	Cry	-	Improves gastrointestinal, blood circulatory problems. Helps in detoxification and neurological disorders	Whole plant
113. <i>Curculigo orchioides</i> Gaertn.	75074, 75167	Hypoxidaceae	Herb	Cry	Kali-musli	Anticancer activity. Plant paste used in gonorrhoea, asthma, jaundice, diarrhoea,. Seeds in body pain. Rhizome paste in itching and other diseases.	Whole plant
114. <i>Asparagus racemosus</i> Willd.	76368, 75109	Asparagaceae	Herb	Cry	Satawar	Roots in nervous disorder, jaundice, diabetes, leucorrhoea, night blindness and rheumatic pains.	Root
115. <i>Amorphophallus paeoniifolius</i> (Dennst.) Nicolson	Maurya <i>et al.</i> (l.c.)	Araceae	Herb	Cry	Oal, Sooran	Used in piles, dyspepsia, dysentery, boils.	Bulb
116. <i>Apluda mutica</i> L.	76344	Poaceae	Herb	Hemi	Sutara	Plant juice used in dysentery	Whole plant
117. Root	75087, 76283	Poaceae	Herb	Cha	Khas, Barhni	Roots in menstrual disorders, conceptions, headache.	Root
118. <i>Cynodon dactylon</i> (L.) Pers.	75165	Poaceae	Herb	Hemi	Doob ghas	Roots used in leucorrhea	Root
119. <i>Desmostachya bipinnata</i> (L.) Stapf	75014	Poaceae	Herb	Th	Dhab	Roots used in jaundice and urinary troubles	Root
120. <i>Oplismenus burmannii</i> (Retz.) P.Beauv.	76220, 76348	Poaceae	Herb	Th	-	Used in epilepsy	Root
121. <i>Saccharum spontaneum</i> L.	Maurya <i>et al.</i> (l.c.)	Poaceae	Herb	Cry	Kans	Extract expels abdominal worms	

DISCUSSION

These plants are reported to cure various diseases such as asthma, bronchitis, tuberculosis, headache, rheumatic pains, jaundice, constipation, diarrhoea, diabetes, leucorrhoea, urinary troubles, epilepsy, fever, elephantiasis, skin diseases, snake bites, cough, gummosis, gastritis, liver disorder, scorpion bites, eczema, cholera, cold, menorrhagia, boils, dysentery, sore, toothache, cardiac disorders, cancer, inflammation. And there are many plant species with antibacterial, antifungal, anti-inflammatory, antioxidant, laxative, antiseptic and sedative properties as also observed by other workers (Yadav *et al.* 2012, Chakraborty *et al.* 2013, Srilatha & Ananda 2014, Arya *et al.* 2016, Choudhary & Jain 2016, Dutta *et al.* 2016, Singh *et al.* 2016, Sarkar & Devi 2017, Umadevi & Srinathrao 2017, Sundar & Habibur 2018, Venkanna *et al.* 2018). It was also a common observation that many plants are used to treat the same diseases.

Out of total 121 medicinal plant species collected from the sanctuary the most commonly used parts of medicinal plants are leaves (in 78 species), roots (in 75 species) and bark with 22 species only. The 78 species of leaves includes the plants whose whole plant and twigs are used and 75 species of roots also includes the plants whose whole plant is used for therapeutic treatment. Most of the medicinal plants are herb followed by tree, shrub, climber and vine. The study indicated that Chandra Prabha Wildlife Sanctuary is rich in medicinal plant diversity and it is an urgent need to conserve them. Uncontrolled human interference in sanctuary may lead to great loss of medicinal biodiversity of the area. The traditional knowledge of medicinal plant species and their therapeutic uses is also vanishing rapidly; therefore it is important to study their medicinal properties which will definitely increase their conservation processes.

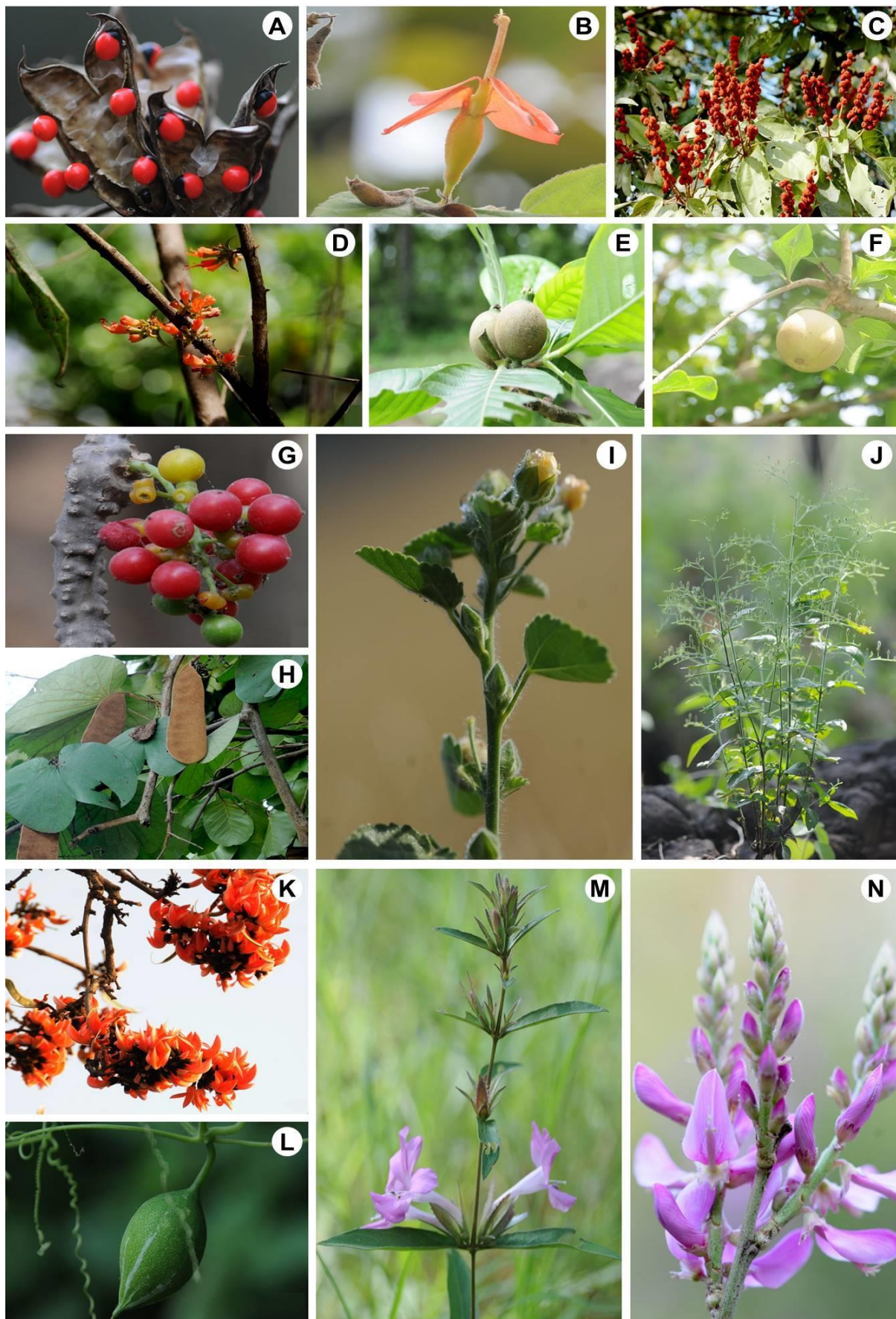


Figure 2. Some medicinal plants of Chandra Prabha Wildlife Sanctuary: **A**, *Abrus precatorious* L.; **B**, *Helicteres isora* L.; **C**, *Mallotus philippensis* (Lam.) Mull. Arg.; **D**, *Woodfordia fruticosa* (L.) Kurz; **E**, *Gardenis latifolia* Sol.; **F**, *Aegle marmelos* (L.) Correa; **G**, *Tinospora cordifolia* (Willd.) Miers; **H**, *Bauhinia vahlii* Wight & Arn; **I**, *Sida cordifolia* L.; **J**, *Andrographis paniculata* (Burm. F.) Nees; **K**, *Butea monosperma* (Lam.) Taub.; **L**, *Trichosanthes cucumerina* L.; **M**, *Barleria cristata* L.; **N**, *Indigofera cassoides* Rottler ex DC.

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