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Ethnobotanical importance of plants of family Apocynaceae

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ABSTRACT

Family Apocynaceae, also known as the dogbane or oleander family of flowering plants, belonging to the order Gentianales, is one of the large family of angiosperms that comprises approximately 5000 species and 415 genera all over the world. Members of this family exhibit their presence across the tropical and subtropical regions of the world, although some of its species also found in temperate regions. About 84 species and 30 genera have been reported in India from this family. Members of this family are found to have milky or watery latex and have abundant alkaloids which shows the significant therapeutic value. Many members of this family are ethnobotanically important and also in Siddha, Ayurveda, homoeopathy and Unani systems of medicines. Various plants of this family are known to be used to treat a variety of conditions such as digestive disorders, urogenital infections, cancer, kidney infections, cardiovascular issues, leprosy etc.

Keywords: *Apocynaceae, Tribal people, Etnobotany, Medicinal Plants.*

Introduction

As there is wide range of edaphic factors, climatic conditions, all over the world which support variety of flora and fauna in different different regions. Tribal people initially rely on the plants and animals for their food. People have been collecting plant resources like timber, gums, resins, dye, spices, food, medicinal products etc. to fulfill their basic needs of day to day life from the antiquity. These natural resources utilization from the beginning form a inseparable link between human and natural vegetation. Ancient people by trial and error, developed their own ways of treatment and diagnosis of various diseases and fulfill their basic requirements in this regard from the nearby forests.

On this planet earth, a huge variety of flora exists that serve mankind. As reported by APG IV classification, in angiosperms, 416 families of plants comprises about more than 2,95,000 species alone (APG IV, 2016). Therapeutic properties of plants is one of the major

aspect among all uses. The Indian subcontinent have Ayurveda, Siddha and Unani as Indian traditional system of medicine. In developing countries medicinal plants are collected for their cultural and economic reasons and also for plant based medicines for their primary health care. Tribal people have great knowledge about medicinal plants but it is not well documented. This knowledge is transferred only verbally from one generation to another. It is very important to document this traditional knowledge before it vanish.

In India, 12 biogeographical provinces, 5 biomes and 4 biodiversity hotspots are there which provide wide variety of climates that support different types of plants in existence. About 20,000 flowering plant species are present in India. The western ghats of India is one of the biodiversity hotspot, that supports numerous medicinal plant, comprises about 3000 species of plants (Venkatachalapathi *et al*., 2018). These medicinal plants consist several types of secondary metabolites such as alkaloids, phenols, tannins and oils with insecticidal and pesticidal properties (Krishnayya and Rao, 1996; Nivsarkar *et al*., 2001).

This paper is based on the family Apocynaceae, where it include approximately 366 genera and about 5000 species, as per updated classification (Endress *et al*., 2014). Endress and Bruyns (2000) merges the family Asclepiadaceae in Apocynaceae and accepted five subfamilies. Members of this family are native throughout Indian Subcontinents (Mahmood *et al.*,2011). About 84 species belonging to 30 genera of Apocynaceae family shows the dominance in India. Members of this family are herbs, shrubs and trees with milky or watery latex. These are rich in secondary metabolites due to which many may have medicinal properties. Various members of this family are known to be used to treat a variety of aliments such as digestive disorders, urogenital infections, cancer, kidney infections, cardiovascular issues, leprosy etc.

Material and Methods

A literature survey was conducted to identify various species of Apocynaceae found in India and to document their ethnobotanical uses for different purposes. The data was collected from existing literature and organized in a tabular format, which included the following parameters: scientific name, common name, plant habit, plant part used, ethnobotanical applications, method of administration, and diseases treated. The collected data was analyzed to identify trends and patterns in the uses of Apocynaceae plants. The results were then represented in the form of pie charts, which visually illustrated the percentage proportions of different applications and uses.

Observation Table

On the basis of literature and our own observations plants of this family were organized in ethnobotanical table. This table includes scientific name, common name, plant habit, plant part used, ethnobotanical applications, method of administration, and diseases treated.

Name of the plant	Common Name	Habit	Plant part used	Ethnobotanical use	Disease treated	Way of Administration	References
Alstonia scholaris (L.) R. Br.	Saptaparna	Tree	Stem bark	To control Gonorrhoea infection dried stem, bark powder taken orally Bark is orally chewed in snake bite	Sexually transmitted infections Snake bite	Orally Orally	Sahu (2011) Prakasha et al. (2010)
Catharanthus roseus (L.) G.Don	Sadabahar	Herb or sub-shrub	Whole plant, flowers leaves and roots	Boiled roots administered anally in Gonorrhoea infection	Sexually transmitted infections	Anally	Pereira et al. (2010)
Carissa carandas L.	Karonda	shrub	Root and root bark	In joint pain and rheumatism root bark and root extracts are used	Rheumatism	Root and root bark extract	Upadhyay et al. (2007)
Calotropis procera (Aiton) W.T.Aiton	Aak	Small shrub	Petals, Latex, roots, leaves	Petals of flower are employed in asthma, cold, cough and sore throat. Latex applied on boils and sore and as antidote to scorpion sting	Asthma, cold, cough, sore throat, sore, boils, swellings		Bhatt, D.C. (2002)

				Root powder cures muscular swelling, cough, asthma Leaves warmed with cow's butter and wrapped on swelling		1 tsp twice a day root powder Wrapped twice a day	Singh, G. S. (2002)
Calotropis gigantea (L.) W.T. Aiton	Safed aak	Shrub	Root	Root bark crushed in fine powder and taken with a cup of water for a week against dysentery.	Dysentery	Orally (5gm twice a week)	Sharma, N. K. (2002)
Holarrhena pubescens Wall. Ex G. Don	Indrajava, Kutaj	Shrub or small tree	Leaf, seed, bark	Powder of leaf, seed, bark consumed orally for stomach ache	Stomach ache	Orally (1 tsp 2 times daily)	Singh, G. S. (2002)
Ichnocarpus frutescens (L.) R. Br.	Kali-dudhi	Climber	Stem, leaves	In fever decoction of leaves and stem used Useful in insect bites, abdominal and glandular tumors Root powder taken with honey to reduce	Fever, insect bites, abdominal and glandular tumors, excess body heat, blood sugar level, skin disease.	Orally(several months)	Rahman and Akter. (2016) Rao, Kavita et al, (2025)

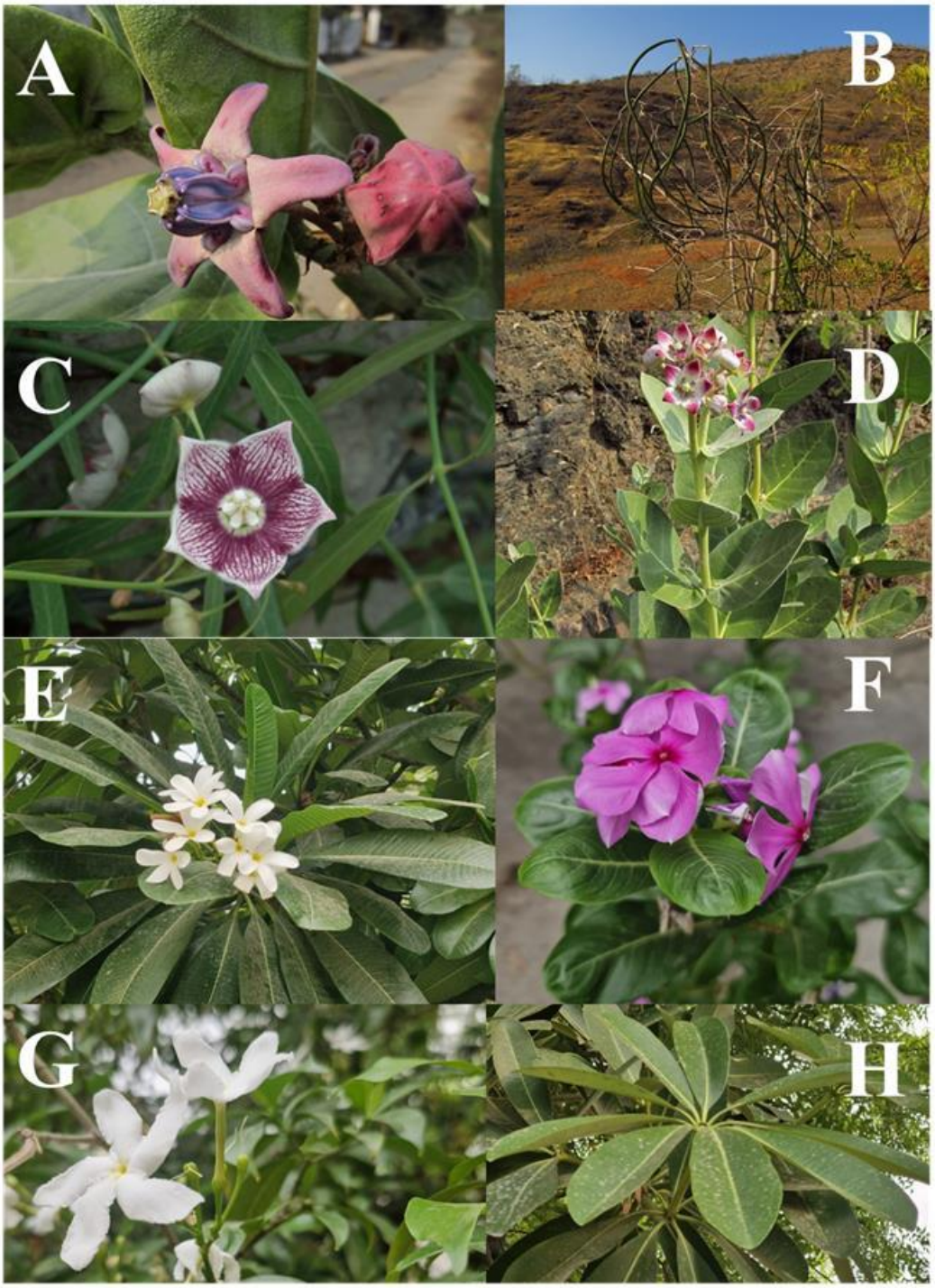
				excess body heat. Fresh flower or flower juice to regulate blood sugar level. Stem and leaf decoction combination in skin treatment.		Orally (daily routine) Decoction	
Leptadenia pyrotechnica (Forssk.) Decne.	Kheemp	Climber	Leaves	Leaf juice taken for snake bite	Snake bite	Juice (1 tsp every 4 hours)	Singh, G. S. (2002)
Nerium oleander L.	Kaner	Shrub	Leaves and roots	Paste of leaves and roots used against ringworm Root extract used for abortion	Skin infection Contraceptive/ birth control	Paste Root extract	Upadhyay et al. (2007)
Oxystelma esculentum (L.f.)Sm.	Dudhi, rosy milkweed vine	Climber	Roots, Fruits	Roots used by Odisha tribe for throat infections, skin diseases, and in hepatitis. Fruits used in many skin ailments.	throat infections, skin diseases, and hepatitis. skin	Roots and fruits	Rao, Kavita et al. (2025)

					ailments		
Pentatropis capensis (L.f.) Bullock	Salt killer vine, Shigroti	Climbing subshrub	Leaves	Juice of leaves given in erysipelas, diarrhea and sore throat	Erysipelas, diarrhea, sore throat	Juice of leaves	Bhatt, D.C. (2002)
Plumeria rubra L.	Champa	Small deciduous tree	Bark	Juice extracted from bark taken in Jaundice	Jaundice	Extract	Rahman and Akter. (2016)
Rauvolfia serpentina (L.)	Sarpagandha	Herb	Leaf extract, Roots	Decoction is admistered orally Leaf extract applied on skin for wound healing and also used in eye infections and better eye sight Squeezed roots tied on bitten area	Fever Wound healing Eye care Snake bite	Decoction Leaf extract Squeezed roots	Roy et al. (2022)
Rauvolfia tetraphylla L.	Devil - pepper	Woody shrub	Root	dry root bark crushed and administered in small doses to relieve body pain and fever Decoction is employed to increase uterine contractions	Root extracts are valued in diarrhoea, dysentery, cholera, colic and	Decoction	Rahman and Akter (2016)

					fever		
Tabernaemontana divaricata (L.) R. Br ex Roem	Chandni	Small shrub	Roots	Paste of roots given orally in water of buttermilk	Snake bite, also used to treat hypertension, headache and scabies	Orally	Prakasha et al. (2010)
Thevetia peruviana (Pers) K. Schum.	Yellow oleander	Evergreen shrub	Seed	Seeds are abortifacient; used for suicidal and homicidal purposes.	abortion		Rahman and Akter (2016)
Vallaris solanacea (Roth ex Roem. & Schult.)	Dudhi ki bel	Climber	Leaf and bark extract, Bark	Reduce body temperature during febrile condition. Bark chewed by the Kols to fix loose teeth.	Fever, loose teeth	Leaf and bark extract chewed	Rao, Kavita et al. (2025)
Wrightia tinctoria (Roxb.) R. Br.	Sweet indrajao	Tree	Fruits Oil and latex	Raw fruits are eaten Liquid latex used in dandruff control	Fever Skin care and Skin infections	Raw Latex	Muthu et al. (2006)
Wrightia arborea (Dennst.) Mabb.	Daira, Dudhlo	Deciduous tree or shrub	Seeds, bark	Seeds given in dysentery Bark decoction in diarrhoea	Dysentery, diarrhoea	Decoction	Bhatt, D.C. (2002)

Wrightia tinctoria (Roxb.) R. Br.	Dudhi	Small sized deciduous tree	Bark, pod	Bark powder mixed with milk of goat is drunk to cure constipation and tonic Pod powder used to remove fever of goats	Constipation, tonic, fever	Orally (2 tsp twice a day)	Singh, G. S. (2002)

Table 1. Various members of family apocynaceae showing the Ethnobotanical data.



A) Calotropis gigantea
B) Wrightia tinctoria
C) Oxystelma esculantum
D) Calotropis procera
E) Plumeria rubra
F) Catharanthus roseus
G) Tabernaemontana divaricata
H) Alstonia scholaris

Result and Discussion

On the basis of observations, fig 1 represent the habit of plants observed during this study in the form of pie chart. Fig 2 represent proportion of plant part used from the plants includes in this study. Similarly, fig 3 indicate the number of disease treated by plants used.

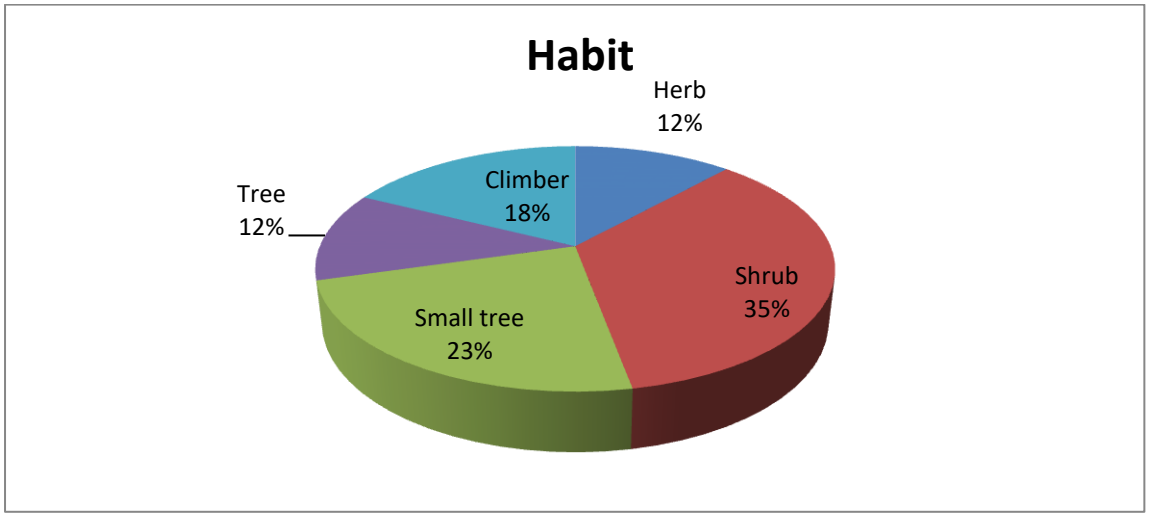


Fig. 1 On the basis of habit of plants

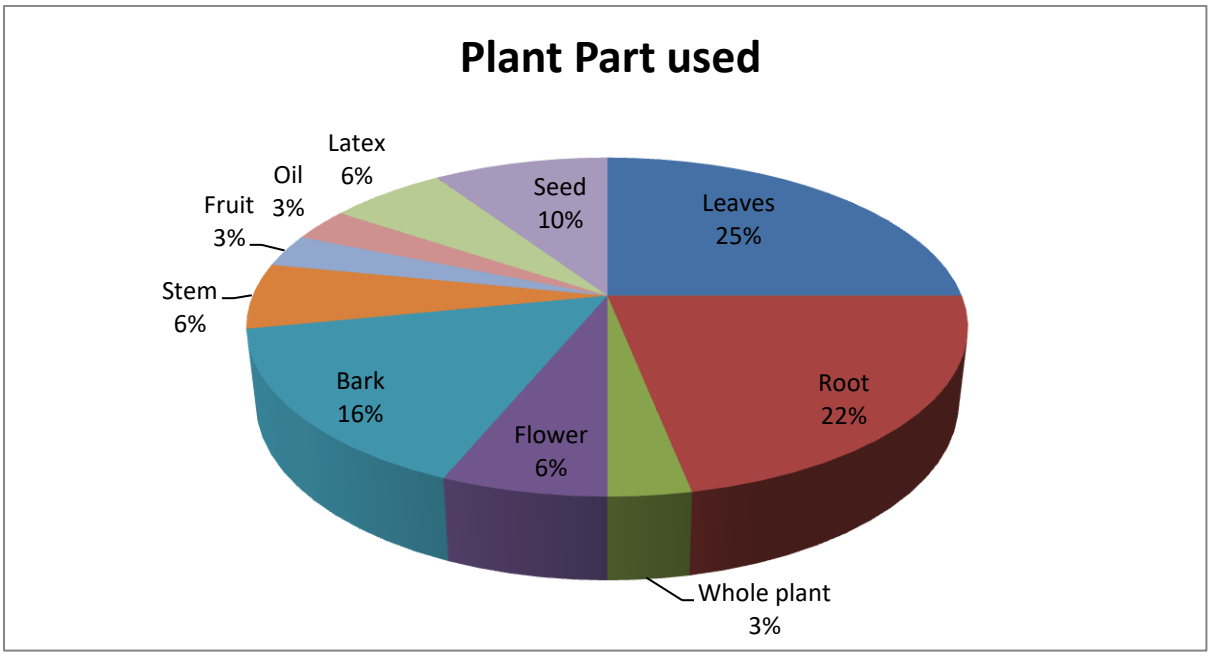


Fig. 2 On the basis of Plant Part used

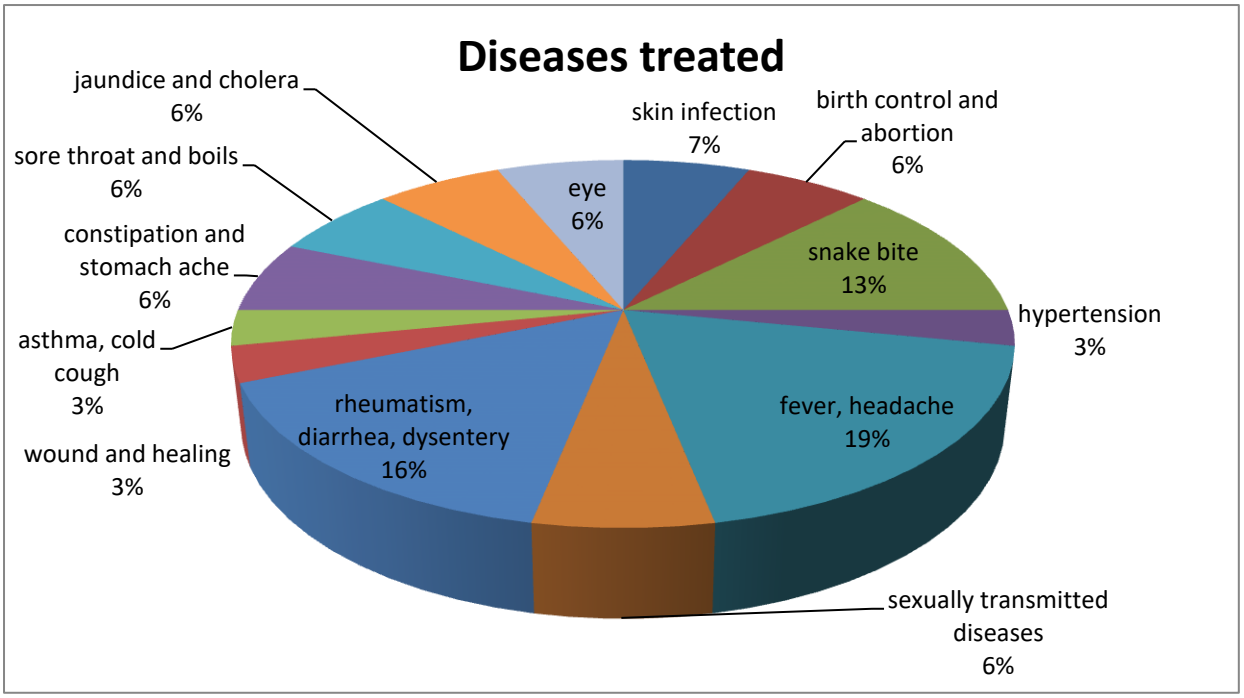


Fig. 3 On the basis of Diseases treated by these plants.

Conclusion

Plants of this family have significant medicinal properties. Traditionally, Indian people depend on plant based medicines for their primary health. It is also observed that although modern medical facilities are available at most places in our country but many places are still far away from medical facilities, at such places people use herbal drugs owing to their belief and confidence in treatment of common aliments. Now a days, people shifted towards plant based medicines for their treatment. Indian tribal people also have great interest and knowledge about medicinal plants and uses them for variety of health related purposes. This folk knowledge is inherited verbally and it is not well documented. This is very important to conserve biological resources and indigenous traditional knowledge.

Plant parts of members of this family have been utilized to treat variety of diseases including kidney stones, cysts, kidney infections, respiratory infections, digestive disorders, diabetes mellitus, metabolic disorders etc. due to the presence of various secondary metabolites in them. This indicate that this family is one of the important family having many importance.

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