Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
https://www.phytojournal.com
JPP 2023; 12(6): 321-324
Received: 21-10-2023
Accepted: 25-11-2023

Chaudhari Akanksha Daulat
Final Year, B. Pharmacy, Shri Swami Samarth Institute of Pharmacy, Malwadi (Bota), Maharashtra, India

Dr. Dukre Tushar Pradip
Guide & H.O.D, Shri Swami Samarth Institute of Pharmacy, Malwadi (Bota), Maharashtra, India

Corresponding Author:
Chaudhari Akanksha Daulat
Final Year, B. Pharmacy, Shri Swami Samarth Institute of Pharmacy, Malwadi (Bota), Maharashtra, India

A review on commercial cultivation and collection aspects of *Wrightia tinctoria*

Chaudhari Akanksha Daulat and Dr. Dukre Tushar Pradip

DOI: https://doi.org/10.22271/phyto.2023.v12.i6d.14798

Abstract
Wrightia tinctoria R.Br. (*Wt*) belonging to the family Apocynaceae is a small deciduous tree founds in central and peninsular India. The plant is used in the treatment of jundice, seizures, wounds, leukaemia, gynaecological disorders, toothache, headache, dandruff, diarrhea and skin disorders like psoriasis, eczema, scabies etc. It is mainly distributed in India, Australia, Myanmar, Nepal, and Timor, Views. *Wt* is described as tikta, kashaya, rooksha, sita and katu. The toxicological profile shows this plant to be safe and tolerable which substantiates its usage as traditional medicine in for anticancer activity along with other broad indications including in snake and scorpion bites, renal complications and menstrual disorders. The present study was carried out to analyse the seed oil of *Wrightia tinctoria* and *W. Arborea* by GC-MS technique .Till date, there is avoid in comprehensive knowledge on *Wrightia tinctoria R.Br.* A thorough literature survey was done on all aspects and the available information was collected via electronic search which roughly covers literature from 1960 to 2012. The aim of this review is to provide comprehensive information on the phytoconstituents, toxicological profile, General aspects of cultivation *wt* harvesting, role of medicine and serve as a common platform for further scientific research.

Keywords: *Wrightia tinctoria*, cultivation, collection, harvesting, applications of medicinal plants, etc.

Introduction
Wrightia tinctoria R.Br. (Family: Apocynaceae) commonly called "Indrajau" is distributed throughout the world and occurs abundantly in India [1]. The *Wrightia tinctoria* other species name is *W. tinctoria ssp* and *W. Tinctoria rothii.* These W. tinctoria ssp. tinctoria was distributed in western southern and western, southern and eastern India while at the time *W. tinctoria ssp. rothii* is found in northern and central India. Nerium *tinctorium* hort. ex. Sweet [2]. The common name of India (Sanskrit- Hyamaraka, stri kutaja; English-Sweet Indrajao, Dyer's oleander, Pala indigo Marathi-Kalakuda, Indrajava, Gujarati-Mitha Indrajava, Dudhi /Dudhalo, kuruchi, Malayalam-Bhanth Appala Kampippaala, Kota Kappala; Tamil-Vetpala Virai, Veppalai, Telugu Ankuduchettu, Kondajemudu , Amkuda).[3] These plant are used in the treatment diarrhoea, toothache, headache, jaundice, gynecological disorders, piles, ringworm and other skin disease, the seed of *W.tinctoria* in Chhattisgarh. It is used to conventional cure of jaundice [4]. In south India it is common Known as "jaundice alkaloids, triterpenoids, lipids, carbohydrates, steroids, flavonoids. *W. tinctori* widely produced hepatoprotective, anti-helminthic, antidiarrhoeal, anti-psoriatic, diuretic, anti-cancer, anti-ulcer, analgesic and anti-oxidant properties. *Wrightia tinctoria* was distributed into unani formulation know as Hab-e-Jund which is being used to treat febrile convulsions and also is being proposed for the treatment of generalized tonic-clonic seizure and absence seizure [5].

Plant profile
Botanical Study

Table 1: Botanical study of *Wrightia tinctoria* [6].

Wrightia tinctoria	
Kingdom	Plantae
Order	Gentianales
Family	Apocynaceae
Genus	*Wrightia*
Species	*W. tinctoria*

Macroscopy: Transverse section of leaf. The leaves are dorsiventral and transcurrent.

Midrib: The midrib of *Wrightia tinctoria* is broadly hemispherical on the abaxial side with short lump on the adaxial side.

Lamina: Epidermal cells of the lamina are square shaped with outer convex wall and thin cuticle.

Fig 1: Plant profile of *Wrightia tinctoria*

Chemical Constituents: The mature powdered pods of *Wrightia tinctoria* showed co-occurrence of β-amyrin, ursolic acid and olianolic acid along with β- sitosterol, cycloeucalenol, β-sitosterol and a new terpene cholesterol, 24methylene-25-methylcholesterol and 24-dehydropollina-stanol.

Traditional uses: Bark and seeds are used in bilous infections 19 Flowers are used as vegetable. The wood is used for all classes of turnery. The leaves are a fodder for the cattle, goat and sheep. In Nepal milky juice is used to stop bleeding. The leaves are pounded with water for the treatment of fever. 20 the leaves are applied as a poultice for mumps and herpes [7].

Materials and Methods

General aspects of cultivation of Medicinal plants: The cultivation of medicinal plants, exemplified by the unique qualities. Wringhti tinctoria, involves a comprehensive approaches encompassing various key aspects.

Factor affecting the cultivation of crude drug

- **Leaves:** Leaves are simple with opposite leaf arrangement, petiolate, glands axillary and glabrous ovate, obtusely acuminate and are 10-20 cm long and 5cm width.
- **Bark:** It is smooth and yellowish-brown coloured and about 10 mm thick Producing Milky-white latex pubescent beneath [8].
- **Inflorescence:** Inflorescence is terminal and flowers are white, bisexual, actinomorphic hypogynous [9].
- **Fruits:** Fruiting is in august and fruit is cylindrical, blackish-green speckled with white long horn like and united at the tip of Seeds.
- **Pollination:** Pollination is entemophilous without any direct contact of the biotic factor with pollen or stigma [10, 11].

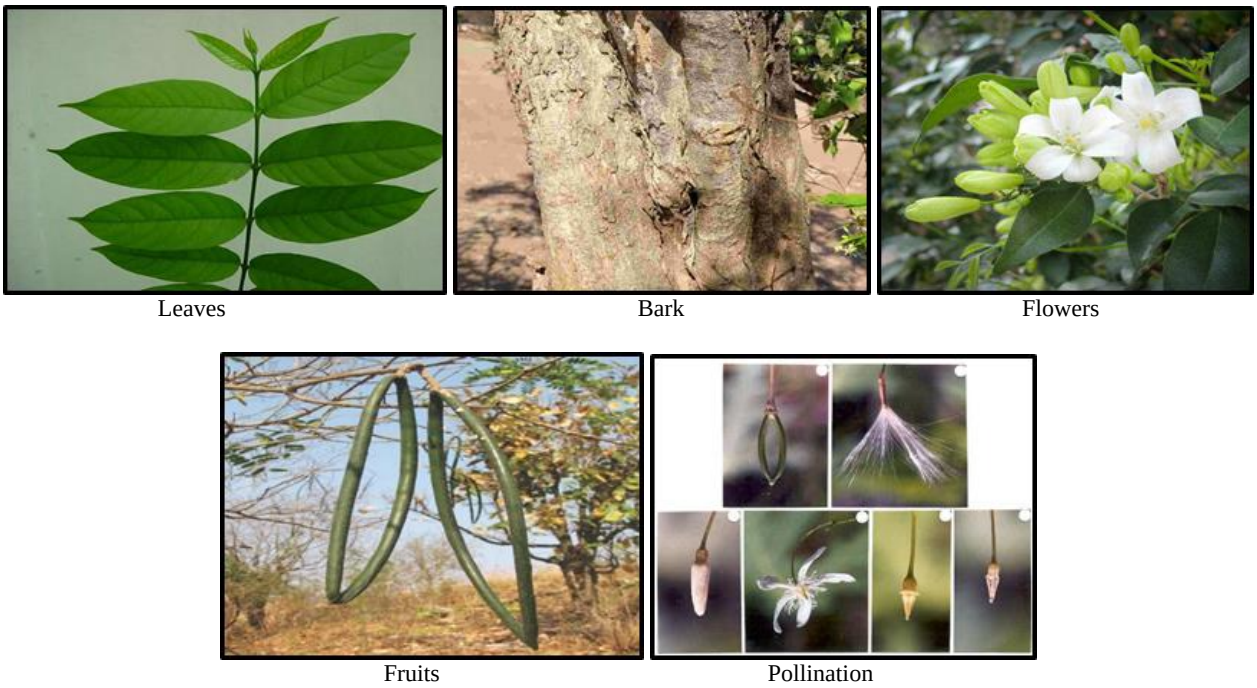

Fig 2: Factor affecting the cultivation of crude drug

Exogenous factor: *Wrightia tinctoria*, phytochemicals of leave showed alkaloids, cardiac glycoside, flavonoids, tannins, terpenoids further details studies of phytochemicals tricontanol and tryptanthrin, isatin, idoxyl-yeilding glycoside, rutin, anthranilate dried leaves are not freshly collected ones [12]. Matured powder pod showed β-amyrin, ursolic acid and oleanolic acid along with β sitosterol was isolated from immature seed pod.

Soil and Soil Fertility: Soil is the most important natural resources as it support growth of all plant. It is a slow to moderate growing plant. Commence flowering when about 5–8 years old. It grows in a wide range of soil types ranging from arid, semi-arid, gravely or rocky soils and moist regions, especially on dry sandy sites or hillsides and valleys. The tree responds well to coppicing, and also produces root suckers [13].

Pest and Pest Control: Population increases in arithmetic progression, whereas the agricultural produced is enhanced in geometric progression at the same time, further yield must be improved but, unfortunately this is not so because, between the time a medicinal crop is harvested and consumed by man, considerable quantity of crude drug is wasted or destroyed by pests.

Types of Pests

- **Fungi and Viruses:** Cercospora atropae causes round to angular brown spot with chestnut coloured margins on both sides of leaves
- **Insect:** *W. tinctoria* where in the leaf exact of this plant possess lavicidal activity against the plarvae of Aedes aegypti and CX. Quinquefasiactus [14].

(a)

(b)

Fig 3: Types of Pests on *Wrightia tinctoria*

Pest Control

1. **Mechanical Method:** The simple techniques used are hand - picking, Pruning, burning, and trapping of pests.
2. **Agricultural Method:** Plant breeding techniques capable of inducing genetic manipulation resulting in production of pest resistance species.
3. **Biological Control:** This method is practice by combating the, pests, mostly the insect, with other living organisms.
4. **Chemical Control:** The pest control is use chemical pesticides, which insecticide, fungicide, herbicide and rodenticide.

Plant growth regulators

Plant growth regulators are organic compounds, other than nutrients which affects the Morphology structure and physiological process of plants in low concentration. Phytohormones or plant hormone are naturally occurring growth regulators which in low Concentration control physiology process in plants. More commonly, the plant growth Regulators is used, because it includes both the native (endogenous) and the synthetic (exogenous) substance; which modify the plant growth. As native plant growth regulators, Five major kind of substance are reported,

1. Auxins
2. Gibberellins
3. Cytokinins
4. Abscisic Acid [15]

Post harvesting technology of medicinal plants

Harvesting: Harvesting is an important operation in cultivation technology. Medicinal plants should be collected/ harvested during the appropriate season or time period to ensure the best possible quality of both source materials and finished products. The tree is harvested from the wild as a medicine and source of a dye and wood. Leaves are extracted as fodder for livestock. The leaves, flowers, fruits and roots are sources of indigo-yielding glucoside, which produces a blue dye or indigo like dye. About 100– 200 kilos of leaves are needed to prepare 1 kilo of dye.

Drying: Drying is the most common way to preserve quality of medicinal plants. The physical and chemical properties of medicinal plants are determined by their moisture content. The first step in many postharvest operations is removal of water that is drying. Drying is In India, herbs are dried either in sun or shade depending upon the requirements. However, drying methods, such as drying in the shade or in the sun, have many drawbacks due to the inability to handle large capacity of mechanical harvesters and to achieve the high quality standards required for medicinal plants. High ambient air temperature and relative air humidity during the harvesting season promote insect and mould development in harvested crops. Furthermore, intensive solar radiation adversely affects quality, causing losses in essential oils or colour changes in dried plants.

Packaging of medicinal products: Processed curative plant stuff ought to be packaged in clean, dry boxes, luggage or different vessels in accordance with customised demand, requirement and national and /or regional laws of the manufacturer and consequently the end-user nation. Medicinal plant packaging material ought to be non-polluting, clean, dry and good condition and will change to the quality. Rigid containers ought to be used for fragile medicinal plant materials. The wrapping stuff ought to be kept in a pest free dry clean environment. To avoided confusion medicinal plant drug material should be well labelled to the packaging with clear indication about botanical name, biological source, plant structure its assortment site, dates name of grower, collector and processor with its quantity.

Storage and preservative of medicinal plants: Packed dried crop should be stored in a dry, well ventilated building, with minimal variation in diurnal temperature and with good air ventilation. It is necessary to equipped with air conditioning and humidity control equipment as well as facilities to protect against rodents, insects and livestock. Shutter and door

openings should be protected by wire screens to keep out pests and farm and domestic animals. Floor should be tidy, without cracks and easy to clean. Plant material should be stored on shelves which keep the material a sufficient distance from the walls; measures should be taken to prevent the occurrence of pest infestation, mould formation, rotting or loss of oil and inspections should be carried out at regular intervals. Medicinal plant materials should be stored at low temperatures 28°C; frozen products should be stored at less than -20°C [16].

Application of Medical Plants:

1. Medicinal Uses
2. Ornamental Purposes
3. Landscaping
4. Dyeing and Tanning
5. Research and Development

Role of medicinal plants in national economy

Wrightia tinctoria with its profound medicinal properties, assumes a crucial role in national economy through its integration into the herbal medicine sector. Thereby enhancing livelihoods. The potential for the export of traditional remedies containing *Wrightia tinctoria* further positions the plant as a valuable commodity in international markets, bolstering foreign exchange reserves [16]. Additionally, the sustainable cultivation and preservation of this medicinal plant align with biodiversity conservation, fostering environmental equilibrium.

Results and Discussion

Biologically active compounds from the natural source have attracted the scientist working on the health problems. *W. tinctoria* is one of the plants, with a great medicinal potential clamind to contain the varieties of phytochemicals, which play an important role in one or other way in different biological activities. W. tinctoria should be harvested during appropriate season or time period to ensure the best possible quality of both source material and finished product. Open air drying is most common way to preserve quality of medicinal plants.

Conclusion

Our nature has provided a very good source of drugs and especially plants have contributed most of these potential therapeutic agents. Plant kingdom still holds a very good potential medicinal value, which have are yet to be completely discovered. The cultural price attributed to medicinal plants can be used as associate argument to support the conservation of diversity. Such cultural values are not essentially identical for wild and cultivated plants, and it is necessary to tell apart between cultural aspects regarding the employment of the plants and cultural values relating to their cultivation. Traditional and Ayurvedic practitioners use medicinal plants and their parts as raw materials for the Preparations of various types of traditional medicinal formulations.

References

1. Patil NV, Bhosale AV, Ubale MB. An Overview of Pharmacologically and Phytochemically Significant Plant *Wrightia tinctoria*. IJPPR. 2019;15(1):336-343.
2. Jain PS, Bari SB. Anti-inflammatory effects of wood stem extracts of *Wrightia tinctoria*. Asian J Tradit Med. 2010;5(3):132-137.
3. Singh B, Gupta V, Bansal P, Singh R, Kumar D. Pharmacological potential of plants used as aphrodisiacs. Int J Pharm Sci Rev Res. 2010;5(4):104-113.
4. Harborne JB. *Phytochemical Methods*: A Guide to Modern Techniques of Plant Analysis. Springer, UK, 2012, 1.
5. Joshi SG. *Medicinal Plants*. Oxford & IBH Publishing Co. Pvt. Ltd., New Delhi, 2000, 51-52.
6. Krishnamoorthy JR, Ranganathan S, Gokul Shankar S, Ranjith MS, Dano. A herbal solution for dandruff. Afr J Biotechnol. 2006;5(10):960-962.
7. Singh B, Gupta V, Bansal P, Singh R, Kumar D. Pharmacological potential of plants used as aphrodisiacs. Int J Pharm Sci Rev Res. 2010;5(4):104-113.
8. Ghosh A, Sarkar A, Mitra P, Banerji A, Banerji J. Crystal structure and DFT calculations of 3,4-seco-lup-20(29)-en-3-oic acid isolated from *Wrightia tinctoria*: Stacking of supramolecular dimers in the crystal lattice. J Mol Struct. 2010;980:7-12.
9. Brown R. *Wrightia*. Flora of China. 1995;13:174-175.
10. Hattacharjee SP. *Handbook of Medicinal Plants*. Jaipur: Pointer Publishers; 2000:60.
11. Thass JJ. Siddha medicine-background and principles and the application for skin disease. *Clin Dermatol*. 2008;18.
12. Ayyanar M, Sankarasivaraman K. Ethnobotanical study of medicinal plants used by Paliyar tribals in Theni district of Tamil Nadu, India. Fitoterapia. 2008;21:562-568.
13. Anubuganapathi G, Ponneelan KTPB, Suchitra R. Antibacterial and Antifungal effect of leaves of *Wrightia Tinctoria*. J Ecotoxicol Environ Monit. 2002;27(4):299-304.
14. Orwa. Agroforestree Database: A tree reference and selection guide version 4.0. World Agroforestry Centre. Retrieved 21 April 2016:28.
15. Pandey AK, Mandal AK. Sustainable Harvesting of *Terminalia arjuna* (Roxb.) Wight & Arnot (Arjuna) and *Litsea glutinosa* (Lour.) Robinson (Maida) bark in central India. J Sus For. 2012;31(3):294-309.
16. Evans WC. *Trease and Evans, Pharmacognosy*. 16th Ed. New York: Elsevier, 2009, 32.