

Pharmacological Evaluation of *Wrightia tinctoria* – A Review

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Abstract—*Wrightia tinctoria* R.Br (Apocynaceae) in South India is known as Jaundice curative tree. This plant is commonly called as sweet indrajao, pala indigo plant, dyer's oleander etc. Phytochemical studies have shown the presence of alkaloids, triterpenoids, steroids, flavonoids, phenolics, carbohydrates, lipids etc. It is having the activities such as analgesic, antiinflammatory, antipyretic and effective in the treatment of psoriasis. This article intends to provide an overview of the pharmacological evaluation of the plant.

Keywords— *Wrightia tinctoria*, Antipsoriatic activity, cytotoxic activity.

I. INTRODUCTION

W*rightia tinctoria* is a small, deciduous tree with a light grey, scaly smooth bark with white fragrant flowers distributed throughout the world and occurs abundantly in India. The fruits pendulous, long- paired follicles joined at their tips. The seeds are hairy and released as the fruit dehisces. The leaves of this tree give a blue dye called pala indigo.^{1,2}

Different parts of *Wrightia tinctoria* R.Br have been extensively used in Indian system of medicine such as ayurveda, unani and siddha. The plant is used as stomachic, antidiarrhetic, carminative, astringent, aphrodisiac, diuretic, used in the treatment of abdominal pain, skin diseases and bilious affections. This plant is reported to have wound healing, antiulcer, fungicidal, antinociceptive, and immunomodulatory activity also.^{3,4}

PLANT PROFILE

Scientific Classification

Kingdom: Plantae

Order: Gentianales

Family: Apocynaceae

Genus: *Wrightia*

Species: *Tinctoria*



Fig. 1. Plant picture of *Wrightia tinctoria*.

II. PHARMACOLOGICAL EVALUATION

1. Antipsoriatic Activity

Mouse tail test⁵ is used to evaluate the antipsoriatic activity^{6,7} of hydroalcoholic extract of *Wrightia tinctoria* leaves. Dose of 200mg/kg body weight in mice (25-30g), isotretinoin acid (0.5mg/kg) –as standard. Degree of orthokeratosis, drug activity, and the relative epidermal thickness were calculated and it is statistically analyzed. The extract is evaluated with its antioxidant potential by DPPH, nitric oxide, and hydrogen peroxide radical scavenging assays. The extract produced significant ($p < 0.01$) degree of orthokeratosis compared to control. Drug activity is found to be 70.18%, is more potent than the standard (57.43%). Thus the extract shows prominent antioxidant activity in all the assays and the selected plant has antipsoriatic activity and can be used for psoriasis treatment.

2. Cytotoxic Activity

Some of the traditional plants of Chhattisgarh state, India is used to treat cancer because of the cytotoxic activity of the alcoholic extract. Five plants⁸ taken are *Artocarpus heterophyllus*, *Alangium salvifolium*, *Buchanania lanzan*, *Sesbania grandiflora* and *Wrightia tinctoria*. *In vitro* cytotoxic activity of alcoholic extracts of these plants were studied against human breast cancer (MCF-7) and human leukemia (HL-60) tumor cell lines using the MTT assay.⁹ From the result, it is found that the *Sesbania grandiflora* extract has potent *in vitro* cytotoxic activity.^{10,11,12}

3. Anthelmintic Activity

Using *Pheretima posthuma*, the anthelmintic activity of chloroform and crude petroleum ether extracts of leaves of *Wrightia tinctoria* can be determined. Here the time of paralysis and time of death of the worms are studied using three concentrations (2.5, 5.0, 7.5 mg/ml) of each extracts. Standard taken is piperazine citrate and the control is normal saline. From this study it is concluded that *wrightia tinctoria* leaves has potential anthelmintic activity.^{13,14,15,16}

4. Antidiabetic Activity

Alloxan induced diabetic rats¹⁷ of wistar strain is taken. Different extracts are prepared using *Wrightia tinctoria* leaves and its effects evaluated in these rats. Six groups of albino rats are considered for the experiment. Compared to the standard drug glibenclamide, chloroform extract of wrightia tinctoria shows significant antidiabetic activity.¹⁸

5. Antiinflammatory Activity

By cotton pellet induced granuloma method and carrageenan induced rat paw edema, is anti-inflammatory activity is determined in the bark of *Wrightia tinctoria*. Inhibition of rat paw edema is shown by various extracts. Compared to control group, percent granuloma changes at dose of 200 mg/kg. Diclofenac sodium (13.5mg/kg/bw.p.0) is used as standard drug and the activity was compared. Thus the antiinflammatory activity was investigated in the bark of *Wrightia tinctoria*.

6. Wound Healing Activity

Evaluate the wound healing activity of *Wrightia tinctoria* leaves²¹ using the 70% of ethanolic and methanolic extracts. Wistar rats are used for incision and excision models. In incision wound models, wound tensile strength is determined. In excision wound models, period of epithelization and wound contraction are noted. Compared with the standard 0.2% nitrofurazone ointment, 4% *Wrightia tinctoria* methanolic leaf extract phytosome exhibited significant wound healing activity²². The significant wound healing potential was also determined in the ethanolic extract of bark of *Wrightia tinctoria*.²³

7. Diuretic Activity

Carbohydrates, phytosterols, tannins and lignins are identified by various phytochemical analysis of water and alcoholic extract of leaves of *Wrightia tinctoria*. Diuretic activity is determined in both of the extract. To do the experimental work on each rat, parameters such as total urine volume and the concentration of potassium, sodium and chloride ions are considered. Compared with the standard drug (frusemide) activity in albino rats, the leaf extract showed a potent diuretic activity with increase in electrolyte concentration in urine.

III. CONCLUSION

Wrightia tinctoria is an important medicinal plant having diverse pharmacological activities such as antipsoriatic, cytotoxic, anthelmintic, antidiabetic, antiinflammatory, wound healing and diuretic activity. Further evaluation can be carried out on this plant for the usefulness of mankind.

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