



***Wrightia tinctoria* (Roxb) R.Br. - An updated Review**

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ABSTRACT

Plan: The present study aims to facilitate an updated phytochemical and pharmacological activity study reports of various researchers pertaining to the plant *Wrightia tinctoria*.

Preface: *Wrightia tinctoria* (Roxb.) R. Br (Apocynaceae) is widely distributed in the plains and slopes of Shevaroy hills of Yercaud Town, situated in Salem district, Tamilnadu. *Wrightia tinctoria* is extensively used in a number of traditional medicines.

Outcome: Chemical constituents isolated from different parts of the plant *W. tinctoria* and their biological activities reported are summarised in this review.

Key words: *Wrightia tinctoria*. Biological activities, Phytoconstituents

1. INTRODUCTION

Wrightia tinctoria (Roxb.) R.Br belonging to family Apocynaceae is commonly known as Vetpala, Indrajava, Mitha - Indrajau (or) Indigo plant. Distributed throughout Rajputana, Central Provinces, Deccan, Konkan, Circars, Western Ghats of Madras Presidency, Ceylon and Burma - Timor¹. It is a small deciduous tree with scaly bark, elliptic lanceolate leaves, white fragrant flowers, fruits of 2 distinct pendulous follicles 25-50 cm by 6-8 mm and seeds are 1-2 cm long pointed at the apex with a deciduous coma often more than 3-8 cm long at the base.

It is widely used in Ayurvedic system of medicine for its various uses. The seeds are claimed to be useful as anthelmintic, antidiarrhoeal, antidysenteric, astringent, febrifuge, seminal weakness and as an aphrodisiac. The leaves and bark (decoction) are used, as febrifuge, in toothache, stomachic and tonic in bowel complaints. The bark is used as an antidysenteric, especially useful in piles, to treat skin diseases and biliousness in Ayurvedia².



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2. REVIEW RESULTS

2.1. Pharmacognosy

Preliminary pharmacognostical studies on the leaves of *Wrightia tinctoria* (Roxb) R.Br by various research groups^{3,5,6,7,13,31,33} throws light upon the Pharmacognostical standards such as ash values, extractive values, phytochemical tests and microscopical characters of leaf powder, phytoconstituents and fluorescence characters. The data generated for the Pharmacognostical evaluation on *Wrightia tinctoria* leaves may be useful for establishing the standardization protocols. The HPTLC analysis data indicated that the collected *Wrightia tinctoria* leaves contain 47.6mg of lupeol/ g of the total methanolic extract³.

2.2. Phytochemistry

Though a great deal of chemical investigation has been carried out on *Wrightia tinctoria*, no review on its complete chemical constituents is on record so far. Its constituents can be broadly categorized as steroids, triterpenoids, flavonoids, isoflavone etc.

The seed part of the plant afforded 9-hydroxy-cis-12 otadecenoic acid (isoricinoleic acid), 9-hydroxy stearic acid, tri- isoricinoleoyl glycerol, di-isoricinoleoylglycerols, tri-iso ricinoleoylglycerols, arachidic, linoleic, oleic, myristic, palmitic and stearic acid; sterols-14- α -methyl zymosterol (I) desmosterol, clerosterol-24-methylene-25 methyl-cholesterol, 24-dehydropollinastanol (m.p 145° - 148°), 24-methyl chloesterol; isoflavone-wrightiadione (II), 24-methylene cholesterol, 24-ethyl cholesterol and isofucosterol.

Lupeol (III) and Lupenone (IV) triterpenoid were isolated from the leaves. α -Amyrin, α -amyrin acetate, β -amyrin, taraxerol, taraxerol acetate and β -sitosterol were present in leaves. β -Sitosterol, α -amyrin and its acetate, lupeol benzoate, triterpenoids, steroids and saponins were in Bark. The Latex showed the protease - wrightin. Presence of oleanolic acid, ursolic acid, terpene and wrightial (V) were in pods whereas flavonoids- Quercetin (VI) and rutin was found in flowers.

The immature pods showed the presence of cycloartanes cycloartenone and cycloeucalenol along with α -amyrin, β -amyrin, β -sitosterol, oleanolic acid, ursolic acid and a new terpene – wrightial⁴⁻¹⁰. The woody stem extract revealed the presence of lupeol, Stigmasterol (VII) and Campesterol¹¹ (VIII).

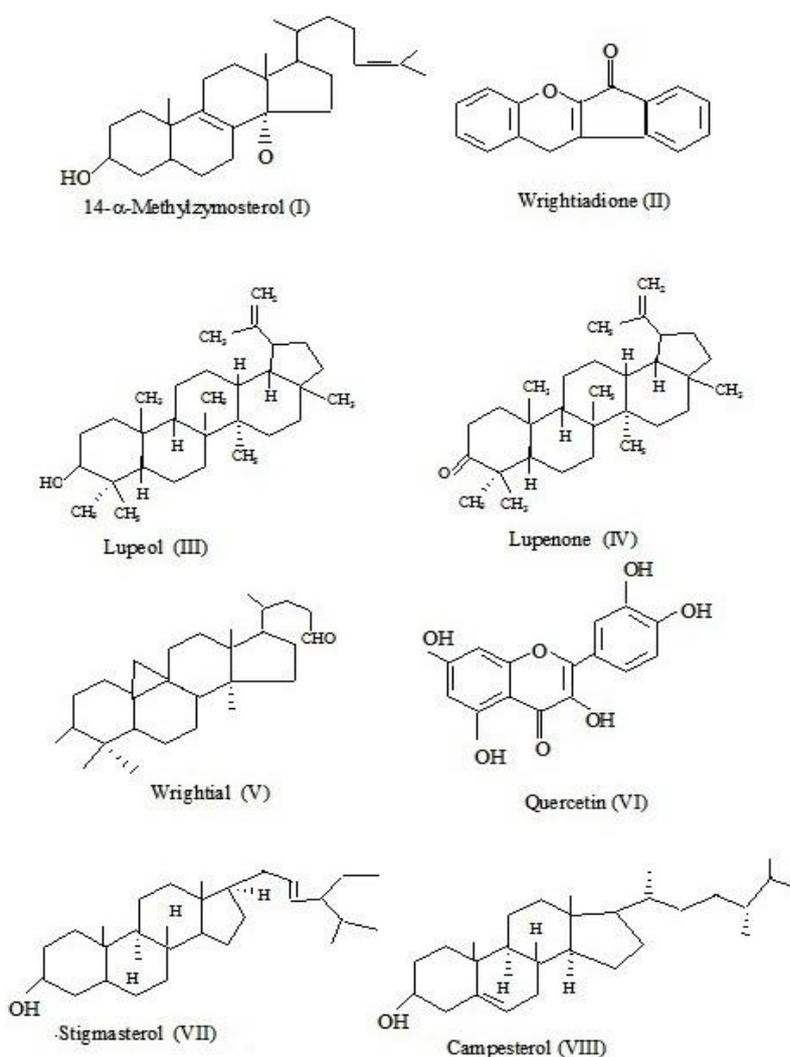
Reports^{12, 21, 34} on the comparative phytochemical and antibacterial activities of bark of *Wrightia tinctoria* and *Wrightia arborea* indicate that the bark extracts showed the presence of alkaloids, phenolics, saponins and tannins in both the species. The antibacterial activities of bark of *W. tinctoria* and *W. arborea* in successive different solvent were tested against gram +ve and gram -ve organisms. The chloroform extracts of *W. arborea* showed the broader spectrum of antibacterial activity when compared with *W. tinctoria*¹².

Also Rajani and Srivastava reported *Wrightia tinctoria* R. Br. belongs to family Apocynaceae commonly called as Sweet Indrajao, Pala Indigo Plant, Dyer's Oleander. "Jaundice curative tree" in south India.

Sweet Indrajao is a small, deciduous tree with a light gray, scaly smooth bark. Native to India and Burma, *Wrightia* is named after a Scottish physician and botanist William Wright (1740-1827). Sweet Indrajao is called dhudi (Hindi) because of its preservative nature.

The juice of the tender leaves is used efficaciously in jaundice. Crushed fresh leaves when filled in the cavity of decayed tooth relieve toothache. In Siddha system of medicine, it is used for psoriasis and other skin diseases. Oil 777 prepared out of the fresh leaves of the plant has been assigned to analgesic, anti-inflammatory, and anti-pyretic activities and to be effective in the treatment of psoriasis. The plant is reported to contain presence of flavonoid, glycoflavones-iso-orientin, and phenolic acids.

The various chemical constituents isolated from various parts of the plant are reported as 3,4-Secolup-20 (29)-en-3-oic acid, lupeol, stigmasterol and campesterol, Indigotin, indirubin, tryptanthrin, isatin, anthranillate and rutin Triacontanol, Wrightial, cycloartenone, cycloeucalenol, β -amyrin, Alpha-Amyrin, and β -sitosterol, 14 α -methylzymosterol. Four uncommon sterols, desmosterol, clerosterol, 24-methylene-25-methylcholesterol, and 24-dehydropollinastanol, were isolated and identified in addition to several more common phytosterols.



The triterpenoid components of the leaves and pods of *Wrightia tinctoria* also isolated. This article intends to provide an overview of the chemical constituents present in various parts of the plants and their pharmacological actions and pharmacognostical evaluation¹³.

2.3. Synthesis of silver nano particles

In this study the conventional (physical and chemical) method of nano particles synthesis was replaced with biological synthesis of silver nanoparticles by using the leaf extract of *Wrightia tinctoria*. New drug delivery system has been enhanced with novel techniques like nano particle synthesis and its role in drug delivery system, by exploiting the nanotechnology in particle synthesis. The aqueous extract of *Wrightia tinctoria* leaves was prepared and mixed with 1mM AgNO₃ solution. After 48 hours the reduction of silver nitrate to silver nanoparticles (AgNPs) was confirmed by UV-visible spectrophotometer.

The size of Silver nanoparticles were characterized by XRD and FTIR and the size were of 19 – 68nm. The biosynthesis of AgNPs using *Wrightia tinctoria* leaf extract is very simple and economic. This green chemistry approach is amenable to large scale commercial production. The use of environmentally benign and renewable plant material offers enormous benefits of eco-friendliness¹⁴.

2.4. Pharmacological activity

2.4.1. Wound healing activity

Wound healing activity was evaluated by 70% ethanolic and methanolic extracts of leaves of *Wrightia tinctoria* (Roxb.) R. Br (Apocynaceae) using incision and excision wound models on Wistar rats. Wound contraction and period of epithelization were assessed in excision wound model whereas wound tensile strength was determined in case of incision wound model. 4% *Wrightia tinctoria* methanolic leaf extract phytosome exhibited significant wound healing potential when compared with standard 0.2% nitrofurazone ointment¹⁵. Similarly the ethanol extract of bark of *Wrightia tinctoria* was found to have significant wound healing activity¹⁶.

2.4.2. Post coital interceptive activity

The ethanolic extract of *Wrightia tinctoria* stem bark and its serial fractions were administered to female rats on days 1-7 or 1-5 postcoitum (Day 1: day of sperm - positive vaginal smear) by the oral route. At autopsy on day 10 postcoitum, the number and status of corpora lutea and implantations were recorded. For estrogen- agonistic activity, immature rats ovariectomized 7 days earlier received the test extract or the vehicle once daily for 3 days and, at autopsy on day 4, uterine weight, status of vaginal opening and extent of vaginal cornification were recorded.

The ethanolic extract of the stem bark of *Wrightia tinctoria* R.Br. inhibited pregnancy in 100% of rats when administered orally at a 250 mg/kg dose on days 1-7 or 1-5 postcoitum. On fractionation, the hexane - soluble, chloroform- soluble, water - soluble and water - insoluble fraction showed 100% anti- implantation effect, while n- butanol- soluble fraction intercepted pregnancy in 75% of animals when administered in the days 1-5 postcoitum schedule.

In immature rat bioassay, the active ethanolic extract and its fractions exhibited moderate to potent estrogen - agonistic activity, which might be responsible for their contraceptive action in this species.

Findings demonstrate the antifertility activity of the ethanolic extract of the stem bark of *Wrightia tinctoria* and its hexane - soluble, chloroform - soluble, water - soluble and water - insoluble fractions. Studies that pursue promising natural products (to identify contraceptive agents from natural sources lacking potent estrogenic activity) towards a fruitful conclusion for development/lead generation should continue¹⁷.

2.4.3. Antinociceptive activity

The ethyl acetate, acetone and methanol extracts of *Wrightia tinctoria* bark showed antinociceptive activity on acetic acid - induced writhing test in mice, their effects being comparable to that of acetyl salicylic acid¹⁸.

2.4.4. Parakeratosis

An experimental histological evaluation on reversal of parakeratosis to ortho-keratosis based on mouse tail test utilises *Wrightia tinctoria* applied as an emulsion to mouse tail, showed nearly 90% reversal of parakeratosis to ortho keratosis, a better result when compared with the treatment using retinoid and betamethasone¹⁹.

2.4.5. Anti - Pityrosporum oval activity

Wrightia tinctoria and *Hibiscus rosasinensis* against the isolates of pityrosporum oval recovered from dandruff. The drug combination exhibited fungicidal activity at a concentration ranging between 500 - 1000 g/ml²⁰.

2.4.6. Anti-dandruff activity

The antidandruff efficacy of the oil (Dano) prepared from the bark of *Hibiscus rosasinensis*, *Wrightia tinctoria* (Indrajau), *Cassia alata* (Dadmari) and bitter fraction of *Azadiracta indica* (Neem or Nimba) in *Oleum cocos* nucifera oil. Microbiological and clinical efficacy of Dano, a Siddha hair oil preparation was studied using *in vitro* assay, Methylene blue reductase test and reduction of severity of dandruff symptom - scaling post use. The study findings showed that Dano is the best drug of choice for the management of dandruff²¹.

2.4.7. Anti Psoriasis activity and Antioxidant activity

The hydro alcoholic extract of *Wrightia tinctoria* was evaluated for antipsoriatic activity by mouse tail test. It was performed at a dose 200 mg / kg body weight in mice (25-30g). Isoretinoic acid (0.5 mg/kg) was used as the standard. Degree of orthokeratosis, drug activity and the relative epidermal thicknesses were calculated and statistically analyzed. The extract was also evaluated for 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 and the drug activity was found to be 70.18% which is more potent than the standard (57.43%).

The extract showed prominent antioxidant activity in all the assays. The study concludes that the selected plant has antipsoriatic activity and can be used for psoriasis treatment²². Similarly Baktha Reddy reported a study on clinical and histopathological evaluation of the effect of *Wrightia tinctoria* formation on psoriasis vulgaris²³.

2.4.8. Clot inducing activity

A study conducted by Rajesh *et al.*, were compared the clot inducing and is solving properties of *Calotropis gigantea* R. Br. (Asclepidaceae), *Synadenium grantii* Hook. F (Euphorbiaceae) latex extracts. All the three latex extracts hydrolyzed casein, fibrinogen and crude fibrin dose - dependently.

The proteolytic action on fibrinogen sub unity was in the order of Alpha>Beta>Gama. All extracts exhibited procoagulant activity as assayed by re-calcification time. However, thrombin like activity is restricted to *Calotropis gigantea*. In addition, the extracts dose - dependently hydrolyzed blood and plasma clots. Furthermore, the hydrolyzing pattern of fibrin in the plasma clot was substantiated by SDS-PAGE. The extracts hydrolyzed all the subunits (Alpha polymer, alpha - chains, gamma - gamma dimer and beta-chain) of fibrin efficiently.

Both fibrinogenolytic and fibrinolytic activity potency of the extracts were in the order of *Calotropis gigantea* > *Synadenium grantii* > *Wrightia tinctoria*. Among the 3 latices, *Calotropis gigantea* is toxic with a minimum hemorrhagic dose (MHD) of >75 microg, whereas *Synadenium grantii* and *Wrightia tinctoria* latex extracts were non toxic and did not induce any hemorrhagic effect at the tested dose (>200 microg). The proteolytic activity of *Calotropis gigantea latex* extract on different substrates was inhibited by IAA. On the other hand the proteolytic activities of *Synadenium grantii* and *Wrightia tinctoria* were inhibited by PMSF. Thus the study provides the basis for the probable action of plant latex proteases to stop bleeding and effect wound healing as exploited in folk medicine²⁴.

2.4.9. Anti-Inflammatory, Antinociceptive activity and Diuretic activity

The objective of this study was to investigate the pharmacological profile of hydro-alcoholic extract of *Wrightia tinctoria* (Roxb.) R.Br. Linn., (family - Apocynaceae) in mice and rats using various models. The effects of the extracts were observed in three different dose levels 300, 500 and 1000 mg / kg as extract does not show any sign a of toxicity upto 3000 mg/ dose. Investigations were carried out against thermal, chemical and mechanical noxious stimuli to study antinociceptive activity and on pentobarbitone induce hypnosis. Carrageenan - induced paw edema and cotton pellet induced granuloma model were employed to test anti - inflammatory activity. The parameters taken for diuretic activity were urine volume and renal excretion of Na⁺, CC⁻ and K⁺ ions.

Study revealed moderate analgesic effect against thermal (P<0.001 to 0.01) and chemical (P<0.05) noxious stimuli and anti- inflammatory activity (P<0.001 to 0.01) at the 1000 mg/ kg dose. Extract is devoid of sedative activity. *Wrightia tinctoria* extract considerably increases urine volume, acting as kaliuretic²⁵.

2.4.10. Antiviral activity and Cytotoxicity

Different extracts of leaf parts of *Wrightia tinctoria* and fruits powder of *Morinda citrifolia* have been studied against replication of HIV -1 (111B) in MT-4 cells and HCV in Huh 5.2 cells. Chloroform extract of *Wrightia tinctoria* exhibited a maximum protection of 48% against the cytopathic effect of HIV -1 (IIIB) in MT-4 cells. Fruit juice of *Morinda citrifolia* exhibited a displayed marked cytotoxic activity in lymphocyte (MT-4) cells (CC 50 : 0.19 µg/ml). The 50% effective concentration for inhibition of HCV subgenomic replicon replication in Huh-5-2 cells by *Morinda citrifolia* was 0.98 µg/ml and by chloroform extract of *Wrightia tinctoria* was 10 µg/ml. The concentration that reduced the growth of exponentially proliferating Huh - 5-2 cells by 50% was greater than 50 µg/ml²⁶.

Similarly Satyanarayana *et al.* and his colleagues investigated preliminary phytochemical analysis and characterization by various instrumental techniques for isatin, induribine, tryphanthrine and fatty acid. Also methanolic extract of leaf of *Wrightia tinctoria* have been studied against antiviral and cytotoxic activity. Methanolic extract of leaf parts of *Wrightia tinctoria* (WT) have been studied against replication of HCV in Huh 5.2 cells. The 50% effective concentration for inhibition of HCV in RNA subgenomic replicon replication in huh 5-2 cells (luciferase assay) by CWT was found to be 15 <g/mL. The concentration that reduced the growth of exponentially proliferating Huh 5-2 cells by 50% was greater than 50 <g /mL²⁷.

Also Ramalakshmi *et al.*, investigated the total phenols, flavonoids, carotenoids, antioxidant activity, antimicrobial and cytotoxic activity of *Wrightia tinctoria* flower extract. Methods: Total phenols, flavonoids, carotenoides content, DPPH scavenging activity, the reducing power activity, phosphomolybdenum activity, metal chelating activity, Hydrogen peroxide radical scavenging activity of crude extract, Cytotoxicity activity, GC-MS analysis and Antibacterial screening were evaluated.

Total phenols, flavonoids, carotenoides in the extract was found to be 55.29±0.45 mg GAE, 370.53±1.213 mg QE and 1.825±0.321 mg/g respectively, where the reducing power, phosphomolybdenum activity and metal chelating activity were increasing with increasing concentration of the flower extract. The antioxidant activity (IC50) of the flower extract was said to be 43.16 µg/mL by 2, 2-Diphenyl-1-Picrylhydrazyl method and 124.07 mg AAE/100g of plant extract by phosphomolybdenum method. The antibacterial studies of the ethanolic flower extract tested at different concentration of extracts, where 250mg/mL concentration of extract showed good inhibitory activity against all the test pathogens compared with standard antibiotics like streptomycin and penicillin. The cytotoxic activity of flower extract was evaluated by brine shrimp lethality bioassay method and the LC50 value found to be 3.544 mg/mL.

The presence of major bioactive compound, hexadecanoic acid justifies the use of the whole plant for various ailments by traditional practitioners. Further studies are needed to explore the potential phenolics, flavonoid compounds from *W. tinctoria* for application in drug delivery, nutritional or pharmaceutical fields²⁸.

2.4.11. Anti-ulcer activity:

The purpose of the study was aimed at evaluating the antiulcer activity on leaves of *Wrightia tinctoria* (Roxb.) R. Br. (Family Apocynaceae) on albino rat.

The antiulcer activity of the *Wrightia tinctoria* methanolic extract (TM) and *Wrightia tinctoria* 70% ethanolic extract (T70E) were compared with Carboxy Methyl Cellulose (CMC), Pylorus control, Aspirin and Standard Famotidine which was evaluated by employing aspirin plus pylorus ligation induced ulcer mode. The biochemical parameters like volume of gastric juice secretion, pH, free acidity, total acidity, ulcer index and percentage inhibition were studied at the concentration of 200 mg/kg body weight. The plant methanolic extract showed significant gastro protective activity of 65.89%. When compared with the standard drug famotidine (20 mg/kg) which showed 75.34%. The result suggested that the methanolic extract of *Wrightia tinctoria* leaves possess anti-ulcer effect. The observed effect may be due to the presence of bioactive constituents²⁹.

2.4.12. Anti-diabetic activity

The investigation has been carried out to evaluate the effect of the different extracts of the leaves of *Wrightia tinctoria* on alloxan induced diabetic rats of *wistar* strain. The experiment was carried out using six groups of albino rats. Chloroform extract showed a significant anti-diabetic activity when compared to the standard drug glibenclamide³⁰.

2.4.13. Antimicrobial activity

The dried leaves of *Wrightia tinctoria* R.BR were subjected to successive extraction using the solvents methanol and water. The prepared extracts were then subjected to preliminary phytochemical analysis. It was found that the plant possesses steroids, alkaloids, carbohydrates, flavonoids, tannins and phenols, saponins and proteins in varying concentration. The methanol and aqueous extracts were selected for further study. They were tested against six bacteria; three Gram-positive bacteria (*Staphylococcus aureus*, *Staphylococcus pyogenes* and *Leuconostoc lactis*) and three Gram - negative bacteria (*Escherichia coli*, *Pseudomonas aeruginosa* and *Salmonella typhi*) and against four Fungi (*Aspergillus niger*, *Aspergillus flavus*, *Rhizopus indicus* and *Mucor indicus*). For antimicrobial test, well diffusion technique was used and the zone of inhibition of microorganisms was measured in mm. the pattern of inhibition varied with the solvent used for extraction and the microorganism tested. Among these extracts aqueous extract showed significant antibacterial activity against most of these bacteria but in case of fungus against methanol extract showed some result. The most susceptible microorganism was *Leuconostoc lactis* (32 mm) followed by *Pseudomonas aeruginosa* (31 mm zone of inhibition in aqueous extract) and *Mucor indicus* (32 mm zone of inhibition in methanol extract)³¹.

Similarly Vijayaragavan Thangaraj studied³¹ Pharmacognostical and antimicrobial studies on the leaf of *Wrightia tinctoria*, Br., belongs to the Family of Apocynaceae. The plant is commonly known as vey *Wrightia tinctoria* pale in Tamil Language, in Telugu: ankuduchettu, chiti-anikudu, kondajemudu and Indrajau in Hindi Language. It has been used for many diseases and disorders. Particularly the *Wrightia tinctoria*, Br., Bark is used for anti dysenteric, Flatulence, bilious affection dropsy and the leaves has been using for relieving toothache, and proteolytic activity. But there is little evidence of leaf on Antimicrobial studies. In present study we have attempt was made to study its pharmacognostical features including Macroscopic, Microscopic Features, Physio-Chemical parameters and Phyto chemical studies, little extensive of Anti-Microbial studies. The study on pharmacognostical characters and Anti microbial activities of *Wrightia tinctoria*, Br., leaf has given useful information in regard to its correct identity and help to differentiate from the closely related other species of *Wrightia*³².

Vedhanarayanan *et al.*, investigated³², the antibacterial activity of different extracts (Chloroform, ethanol and methanol) of *Wrightia tinctoria* against the human pathogenic bacterial strains, *Escherichia coli*, *Bacillus subtilis*, *Staphylococcus aureus* and *Pseudomonas aeruginosa* by disc diffusion method on agar. The findings showed potential antibacterial properties of the extracts against the organisms tested. Among the three solvents tested, ethanol extract of leaf showed higher inhibition zone. Ethanol extract of *Wrightia tinctoria* exhibits maximum zone of inhibition against *Escherichia coli* (29 mm), *Bacillus subtilis* (24 mm) *Staphylococcus aureus* (30 mm) and *Pseudomonas aeruginosa* (24 mm).

Preliminary phytochemical analysis of *Wrightia tinctoria* showed the presence of alkaloids, flavonoids, phenols, saponins, steroids and tannins³³. Lakshmi Devi *et al* (2009)³⁴ investigated the antibacterial activity of different extracts of *Wrightia tinctoria* (Roxb.) R.Br., against three Gram positive bacteria, viz. *Staphylococcus aureus*, *Bacillus subtilis* and *Staphylococcus epidermidis* and two Gram negative bacteria viz. *Escherichia coli* and *Pseudomonas aeruginosa*. Methanolic extract showed antibacterial activity only against Gram positive bacteria, which was less than that of the standard drug Ciprofloxacin³⁵.

2.4.14. Immunomodulatory Activity

Wrightia tinctoria (Roxb.) R.Br. (WT) has been reported to exhibit number of therapeutic uses such as astringent, stomachic, febrifuge, skin diseases and tonic in India. The objective of the present study was to investigate the immunomodulatory activity of the bark extracts of WT using delayed type hypersensitivity reaction and carbon clearance assay. Powdered dried barks of WT were extracted with petroleum ether 60 - 80°C (PEWT), alcohol (ALWT) and aqueous alcohol (AQWT) (60% water + 40% ethanol) successively. PEWT and ALWT extracts (200,400mg/kg, p.o) produced a significant increase in delayed type hypersensitivity in response to sheep red blood cells (SRBC). PEWT showed better activity than ALWT in delayed type hypersensitivity response. ALWT (200 and 400mg/kg, p.o) in dose dependent manner have shown significantly increase in the phagocytic activity. The above results reveal that ALWT possesses immunostimulant activity in carbon clearance assay whereas PEWT and ALWT showed Immunomodulatory activity in delayed type hypersensitivity model³⁵.

2.4.15. Diuretic activity

Water and alcoholic extract of leaves of *Wrightia tinctoria* (Apocynaceae) were subjected to various phytochemical analysis to identify carbohydrates, phytosterols, tannins and lignin. Both the extracts were investigated for diuretic activity. Total urine volume and the concentration of sodium, potassium and chloride ions in the urine those Parameters are taken into account during the experimental work on each rat. The extracts showed a potent diuretic effect with increase in electrolyte concentration in urine, when compared with standard drug (frusemide) in albino rats³⁶.

3. CONCLUSION

The main constituents present in *Wrightia tinctoria* are triterpenoids namely lupeol and lupenone. Flavonoids quercetin and rutin mostly from flowers. A terpene known as Wrightial from immature pods. Sterols 14 α -methyl zymosterol and desmosterol from seeds.

Wrightia tinctoria possess multiple pharmacological activities such as Wound healing, Anti-inflammatory, Antipsoriatic, Postcoital interceptive, Antinoceptive, Parakeratosis, Antipityrosporum, Antidandruff, Antioxidant, Clot inducing, Diuretic, Antiviral, Cytotoxicity and Antiulcer activity. The studies thus substantiate the traditional use of the plant *Wrightia tinctoria* in treatment of liver disorders. Specially the triterpenoids deserves detailed preclinical evaluation in order substantiate its therapeutic potential and mechanism of action.

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