A REVIEW ON PHARMACOLOGY AND PHYTOCHEMISTRY OF JUSTICIA TRANQUEBARIENSIS

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ABSTRACT
Medicinal plants are the native heritage with universal importance. World was precocious with a fashionable wealth of healthful plants. Herbs have continually been the principal supply of drugs in Asian country and presently they’re changing into in style throughout the globe. Justicia traquebariensis linn belongs to asteroid dicot family, referred to as sivavervembu in tamil. It’s big in deccan, msore Karnata, southward and additionally all told districts of ground Asian country. Justicia traquebariensis linn is one among the necessary flavorer being employed in ayurvedic system of drugs. Largely the leaves are used for the medical purpose. A large kind of biologically active constituents like Phytosterols, Flavonoids, Glycosides are gift during this plants.

INTRODUCTION
Justicia tranquebariensis is fast growing shrub principally found in damp areas and is widely distributed in peninsular and deccan region of India. This species is commonly found in vale of margin and vale of the cultivated fields. someday cultivated into decorative plants as hedges. The plant elements are helpful in chronic rheumatism, cephalalgia, hemiplegia, facial dysfunction, otalgia, hemicrania, cough, bronchitis, arthritis, internal haemorrhages and intermittent fevers.\(^1\)\(^2\)

The alcoholic extract of the aerial elements yields many liganhs, phytosterols, brassicasterol, campesterol, 7,22-ergostadienol, stigmasterol, sitosterol, spinasterol, 28-isofucostil and an alcoholic glycoside, beta-lariniciresinol. (+) – medioresinol. This plant exhibit Anti-inflammator, Hepatoprotective, Antihelmenth, Cardioprotective, Antiulcerogenic Respiratory illness, opposed Rheumatoic, Antimicrobial activities the current review aims to compile healthful values of Justicia traquebariensis generated through the analysis activity victimization fashionable scientific approaches and innovative scientific tools.

KEYWORDS: Justicia traquebariensis, pharmacology, phytochemistry.
Species: *Tranquebariensis*

Regional Names[10]

Sanskrit: Pindi.
Tamil: Sivanarvembu, tavashoomoorunghie, punnakupudi.
Oriya: Pindi.
Telugu: Pindikonda, Chikerachettu, Kondapindi, Redamandalam.
Kannada: Shiva naaru balli, Kaddiyarakina, Kaddiyarakina gida.

DISTRIBUTION

Andhra Pradesh- Chittoor district, Kadapa district, Visakhapatnam district.
Kerala- Palakkad district, Idukki district, Kollam district, Thriruvananthapuram district.
Tamil Nadu- Salem district, Dharmapuri district.


Macroscopic Characters

Stems are Whitish grey colour and branches are Stiff. The leaves ovate, simple, opposite and decussate. Stipules are absent.[12]

Microscopic Characters

The leaf is dorsiventral, athletic, hypostomatic and glanduliferous. Veins are projected outwards and has thick cone like adaxial hump and wide curving abaxial half. It additionally has thin dermal layer of little square cells. The adaxial cone like half has compact collenchyma cells. The abaxial half has circular, skinny walled compact cells. Vasculature is distinct cone like and collateral. (Fig. 2 & 3). Trichomes are seen on the cuticle of the plate. (Fig. 4). The glands are shield-shaped kind. They need a brief stalk cell and a circular plate of fluid body. The mesophyll tissue consists of higher zone of cylindrical palisade cells and lower wide zone of spongy parenchyma cells. These cells are extremely expanded into circular cavities possessing Cystoliths. (Fig. 5) The cystoliths are carbonate bodies, the cells possessing the cystoliths are known as lithocysts. The stalk is curved with flat adaxial aspect. Vascular tissue components are angular, thick walled and wide. The vascular bundle is single, wide and arc is formed. Besides the arc of vascular bundle, there are 2 little circular accessing strands, one on either aspect of the most strand. The accent strands also are collateral with a circular mass of vascular tissue. The stem is roughly circular and its wide dermal layer has rectangular cells with thick cuticle. The cortex is differentiated into outer collenchyma and inner skinny walled circular compact parenchyma cells. Trichomes are long pedunculate or subsessile. Vascular tissue segments at frequent intervals are angular, solitary and diffuse. vascular tissue cylinder additionally consists of skinny zone of fibres. Phloem consists ofcontinuous cylinder of uniform breadth. Pith is wide, parenchymatous and also the cells are massive, skinny walled, angular and compact (Fig. 6) These Microscopic options are helpful scientific tools to work out the genuineness of drug samples of plant origin and in police investigation adulterants and substituents.

Fig 2: T.S. of the leaf through midrib with lamina.

Fig 3: T.S. of lamina through lateral vein with leaf margin.


Fig 4: T.S. of the lamina s showing a glandular trichome on the adaxial epidermis.

Fig 5: T.S. of lamina showing cystolith in the adaxial and abaxial epidermis.
Abs- Abaxial side, AdE- Adaxial Epidermis, Cy- Cytostolith, GTr- Glandular trichome, Lc- Lithocyst, PM- Palisade mesophyll, SM- Spongy mesophyll, St- Stomata.

**Phytochemical Constituents**

Phytochemical studies of leaf of the plant of Justicia tranquabariensis disclosed the presence of phytosterols, flavonoids, Glycosides and absence of triterpenoids, alkaloids, saponins and tannins.[14] From Aerial elements of Justicia tranquabariensis L. Lignans like aryl tetralin were isolated and characterised as (±)-beta-Cubebin, (±) Lariciresinol, (±) isoarliciresinol, (±) Lyoniresinol and (±) Medioresinol.[15,16,17] (Fig. 7) Lariciresinol and Isolariciresinol were tested to be anti-inflammatory, antinoiceptive, opposed – ulcerogenic, antimicrobial, cytotoxic and inhibitor activities.[18] Cubebin possess anti-inflammatory activity.[19] Lyoniresinol reveals antioxidative and conjointly antimutagenic activity.[20] The alcoholic extract of the aerial part of justicia tranquabariensis yielded phytosterol, brassicasterol, campesterol, 7, 22-ergostadienol, stigmasterol, sitosterol, spinasterol, 28-isofucosterol and betasitosterol-3-ol glucoside.[21]

**Uses**

**Tribal claims**

Local folks use this plant drugs for inflammation.[22]

**Siddha uses**

Leaf is employed as medication in cold, cough and nasal disorders.[23]

**Medicinal Uses**

Juices of leaves act as cooling agent and aperients and additionally given to kids in small pox. Crushed leaves applied to contusions.[24] Paste product of the leaves applied outwardly on the swelling to cut back the pain. Root paste applied for tooth ache.[25] Leaf juice about 15-20 ml can be taken orally for each one hour up to half of the day and keeping of leaf paste outwardly on the site of snake bite work as curative for elapid snake bite.[26] Leaf juice is also given orally to treat jaundice and leaf paste is applied over affected space to treat skin diseases.[27]

**Pharmacological Action**

1. **Anti-inflammatory activity**

Justicia tranquabariensis L., leaf extract (200mg/kg) was screened to test its medicinal drug potential in adult anomaly rats using Irish moss elicited paw dropsy technique. The ethanolic extract showed important anti-inflammatory activity which was similar to NSAID.[28]

2. **Antioxidant activity**

The antioxidant potential was studied using dpdp technique. Among all the extracts ester and ethanolic extract showed better antioxidant activity at the concentration of 75μg/ml compared to solvent extract.[29]

3. **Hepatoprotective activity**

Ethnobotanical analysis in folk-lore medication has been carried out in Coimbatore district of Tamil Nadu and Palakkad district of Kerala. Out of the twenty remedies for jaundice, 2 were found to be new reports and few others showed fascinating results. The specimens were known to be at the biological science Survey of India, Coimbatore, and preserved within the herbarium of the ethnobiology, Department of the International Institute of written material, Coimbatore. Among the 2 recently reportable plants for jaundice, one is Alysicarpus vaginalis DC. and the other one is that the plant chosen for this study was Justicia tranquabariensis L.[30]

The protecting and curative impact of Justicia tranquabariensis leaf extract was evaluated in acetaminophen induced liver injury in mice. The leaf extract of 500 and 1000 mg/kg exhibited significant protecting impact against acetaminophen induced hepatotoxicity. Level of liquid body substance markers like aspartate transaminase (AST), amino alkanoic acid transaminase (ALT), alkaline enzyme (ALP), and total bilirubin (TB) were considerably hyperbolic in acetaminophen treated mice. At the same time, Justicia tranquabariensis leaf extract considerably suppressed the main rise in plasma activities of AST, ALT, ALP and TB concentration, that are thought to be as markers of liver purposeful state. The results of this study confirmed the protecting and curative impact of the liquid leaf extract of Justicia tranquabariensis.[31]

4. **Free radical scavenging activity**

The ethanolic extract of the aerial components of Justicia tranquabariensis L. showed the numerous free radical scavenging activity against mistreated one, one Diphenyl Picryl Hydrazyl radicals.[32]

5. **Bronchial asthma**

Justicia tranquabariensis was used in the management of asthma attack. The present study trial with justicia tranquabariensis for asthma. The herbal juice has proven to less symptom scores and improve lung function.
Further large scale, trials are required to further evaluate the efficiency of the drug.\[33\]

6. Antimicrobial activity

The aerial parts of the plant Justicia tranquebariensis Linn. were in turn extracted with chloroform and grain alcohol by soxhlet extraction technique. The extracts were vacuum dried and subjected to antibacterial (Staphylococcus aureus, Bacillus subtilis, Escherichia and enteric bacteria pneumoniae) and antifungal (Aspergillus niger and fungus albicans) screening mistreatment agar disc diffusion technique. Minimum Inhibitory Concentration needed for stop of microorganism growth was evaluated by Agar streak dilution method.\[34\]

The in vitro medicinal drug activity of various extracts obtained from roots and rhizomes of Justicia tranquebariensis against different organisms particularly Bacillus subtilis, staphylococi aureus, Escherichia and enteric bacteria pneumoniae are carried out. The ready extracts of crude oil ether and hydro alcohol (50:50) were investigated with completely different concentrations. Findings showed that each extract had highest antibacterial activity among gram positive strains compared to gram negative strains. Increase in concentration of every extract increases the medicinal drug activity. Each extract showed important broad spectrum anti-bacterial activity.\[35\]

The medicinal drug activity of leaves of Justicia tranquebariensis L were evaluated against ten infective bacteria strains. 25mg/ml showed higher activity than 5mg/ml against all the treated organism during a dose dependent manner. Grain alcohol extract were found to possess medicinal drug activity, but chloroform extract showed higher activity than ethanolic extract against a spread of microorganism, as revealed by in vitro Agar well diffusion technique. The antimicrobial activity of the extract was compared with normal antibiotic amoxicillin.\[36\]

7. Cardioprotective activity

Cardioprotective role of justicia tranquiliariensis leaf extract in drug induced myocardial infarction in anomaly rats. Oral administration of aqueous extracts of justicia tranquiliariensis proven the protective role of the plant.\[37\]

8. Anti-arthritis activity

Anti-rheumatoid activity of justicia tranquiliariensis within the treatment of rheumatism. The ethanolic plant extract of cissus quadrangularis and justicia tranquiliariensis was investigated to evaluate its anti-arthritis activity by freund’s adjuvant induced arthritis model and also the plant extracts considerably reduced the arthritis of the affected joint compared with the controlled rats.\[38\]

9. Wound healing

This specific study focussed on the in vivo wound healing and in vitro medicinal drug activity of herbal lotions prepared from Ethanolic extract of Justicia tranquiliariensis, burnt plant and herbaceous plant. Results: Complete wound healing was ascertained with lotion formulation I and II treated rats within fifteen days compared to that of Soframycin ointment. These findings were further confirmed by histologic examination of connective tissue with a lesser quantity of collagen and absence of inflammatory cells.\[39\]

10. Antiulcerogenic activity

The effectiveness of the leaf extract of justicia tranquiliariensis in HCl-ethanol induced stomach ulceration in albino mice. Investigated that justicia tranquiliariensis leaf extract (jle) in restraining oxidation process produced in visscus tissue. The animals of the experimental cluster were pre-treated with the aqueous leaf extract of justicia tranquiliariensis (jt) for fifteen days. The result suggested that jle possesses antioxidant properties and provides protection against ethanol induced gastric injury.\[40\]

11. Anti-psoriatic activity

Skin disorder characterised by abnormal keratinocyte hyper proliferation leads to the thickening of the stratum. Anti-psoriasis treatments available these days square poorly economical, having several side effects, creating them unsuitable for therapeutic use. Hence, the seek for safer and simpler medicine from natural resources is essentially guaranteed. Within the gift study, the leaves of Justicia tranquiliariensis Linn. are evaluated for its associate anti-psoriatic activity to substantiate the standard claim as an anti-psoriatic agent scientifically, in addition, associate degree EJTL ointment was developed for the in vivo anti-psoriatic analysis in BALB/c mice beside its histopathological study. The obtained results disclosed the presence of primary phytochemicals, like flavonoids and lignans with the fermentation alcohol extract of the leaves of J. tranquiliariensis L. (EJTL). UV-Visible and Fourier remodel Infrared Spectrums confirmed the existence of Isolariciresinol within the EJTL fermentation alcohol extract. In vivo analysis of the EJTL ointment showed the outstanding anti-psoriatic activity in BALB/c mice with imiquimod (IMQ) evoked psoriasis-like inflammation. The histopathological study results revealed important improvement in skin lesion in comparison to the positive management cluster. The anti-psoriatic activity further confirmed by observing the conspicuously bated white corpuscle and keratinocyte infiltration within the stratum. a short phytochemical characterization showed the presence of the active biology ingredient, Isolariciresinol, assumed to possess the anti-psoriatic property. The EJTL can be a possible drug for skin disorder either one by one or synergistically with alternative herals or anti-psoriatic agents.\[41\]
12. **Antibacterial activity**

The medicine activity of leaves of justicia tranquibariensis linn., against 10 pathogenic microorganism strains was studied. 25mg/ml showed more activity than 5mg/ml against all the tested microorganisms in a dose dependent manner. Both chloroform as well as ethanol extract were found to possess medicinal activity. But chloroform extract showed better activity than ethanolic extract against a range of microorganisms, as disclosed by in vitro agar well diffusion technique. The inhibitory impact of the extract was compared with standard antibiotic amoxicillin.\[42\]

13. **Anthelmintic activity**

The ethanolic extract of Justicia tranquibariensis was taken for anthelmintic activity against Indian earthworm (pheretima posthuma), roundworm (ascaridia galli) and tapeworms (raillietina spiralis). Four different concentrations (20, 40, 80 and 100 mg/ml) of ethanolic extracts were tested and results were expressed in terms of time for paralysis and time for death of worms. Piperazine citrate (10 mg/ml) was used as reference standard and double distilled water as a control cluster. The anthelmintic activity of justicia tranquibariensis root extract has so been demonstrated for the primary time.\[43\]

**CONCLUSION**

Herbal medication plays a significant role within the developments of contemporary civilization. Justicia tranquibariensis is a remarkable example of plants having ancient healthful price. This literary criticism shortly explains the healthful uses, phytochemical and pharmacological action of Justicia tranquibariensis. The plant was found to own broad spectrum of activities because of the presence of active constituents like Phytosterols, Flavonoids, Glycosides. The plant have rumoured to own type of pharmacological actions like Inhibitor, Anti-inflammatory, Hepatoprotective, Anti-helmenthic, Cardioprotective, Anti-ulcerogenic, Asthma, opposed unhealthy and anti-microbial. Such a lot work is needed with the Justicia tranquibariensis to research the mechanism of action with alternative therapeutic activities.

**REFERENCE**

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