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Research Article

PHARMACOLOGICAL REVIEW ON JUSTICIA TRANQUEBARIENSIS LINN

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A B S T R A C T

Medicinal plants are the local heritage with universal importance. World was gifted with a rich wealth of medicinal plants. Herbs have always been the principal source of medicine in india and presently they are becoming popular throughout the world. *Justicia tranquebariensis* linn belongs to family acanthaceae, known as sivanervembu in tamil,. It is grown in deccan, mysore, karnataka, southwards and also in all districts of peninsular india and in srilanka. *Justicia tranquebariensis* linn is one of the important herbal being used in ayurvedic system of medicine. Mostly the leaves are used for the medical purpose. A wide variety of biologically active constituents such as phytosterols, flavonoids, glycosides are present in this plant. The aerial parts of *justicia tranquebariensis* contains lignans, (-)-β-cubebin, (+)-lariciresinol, (+)-isolariciresinol, (+)-medioresinol. This plant exhibits anti-inflammatory, hepatoprotective, antihelmenthic, cardioprotective, antiulcerogenic, bronchial asthma, anti arthritic, antimicrobial activities. The present review aims to compile medicinal values of *justicia tranquebariensis* generated through the research activity using modern scientific approaches and innovative scientific tools.

INTRODUCTION

Justicia tranquebariensis is a small shrub, which is widely distributed in southern parts of India. In this genus about 20 species have been chemically investigated and major secondary metabolites isolated were ligans, flavonoids, steroids and tri terpenes. The juice of small and somewhat fleshy leaves of genus *justicia* is considered by natives of india as cooling and aperients, and is prescribed for the children in the smallpox.

Some species of the genus *justicia* have been used in the traditional system of medicines for the treatment of fever, pain, inflammation,diabetes, diarrhoea and liver diseases.they also possess anti- inflammatory, anti-allergic, anti-tumoral, anti-viral and analgesic activities. The leaf juice *justicia tranquebariensis* has been used to treat jaundice and leaf paste is applied over affected area to treat skin diseases[1].

Plant information

Plant name : *justicia tranquebariensis*
Family : acanthaecea
Parts used : root, leaves

Taxonomy

Taxonomic classification[2]

Kingdom : plantae
Division : magnoliophyta
Class : magnoliopsida
Order : scrophulariales
Family : acanthaceae
Subfamily : acanthoideae
Genus : *justicia*
Species : *tranquebariensis*

Regional names[3,4]

Sanskrit : pindi
Tamil : sivanarvembu, tavashoomoorunghie, punnakupudi, tavacumurunkai, tavicimurunkai, kakanacam, niyakkiyam, niyakkiyamaram, pilavumurunkai, pinnakkucceti, punakuppuntu, punnakkuppuntu, putanayaki, putanayakicceti, taciver, tavaci, tavacimurunkaicceti, tavamurunkai, tavattumurunkai, mutaliyar, narimurunkai, narimurunkaicceti, vankanattam, mozhimurungai
Oriya : pindi
Telugu : pindikonda, chikerachettu, kondapindi, redamandalam
Kannada: shiva naaru balli, kaddiyarakina, kaddiyarakina gida

Description

subshrubs, leaves 2.5-3×2cm ,obovate –orbicular , apex obtuse, base cuneate, membraneous , pubescent; petiole 1.5cm. Spikes terminal and axillary, to 10 cm ;bracts 1 × 0.7 cm , broadly ovate ; calyx teeth 5mm ,lanceolate , 3-nerved; corolla bilabiate , tube 5 mm , villous inside , upper lobe 7×5 mm, lower narrow, white with pink blotches; filaments dilated, 2 mm; ovary 1.5 mm, ciliate along themargins, style ciliate. Capsule 8 mm, widened above the middle, puberlulus.

Habit : herb
Flowering & fruiting : november – february
District : palakkad , kollam , idukki , thiruvananthapuram .
Habitat : deciduous forests
Distribution : peninsular india and sri lanka
Aquatic : no
Epiphytes : no
Saprophytes : no
Stem parasite : no
Root parasite : no
Flower colour : white
Weed : no
Monocot / dicot : dicotyledonous plants
Exotic : no
Garden : no
Edible : no
Vegetable : no
Localities : alampetty , chinnar , kuchumudi

Phytochemical constituents

phytochemicals studies of leaf of the plant of *justicia tranquebariensis* revealed the presence of phytosterols flavonoids, glycosides and absence of triterpenoids, alkaloids, saponins and tannins[5]. From aerial parts of *justicia tranquebariensis* l.

Lignans such as aryltertralin is isolated and characterized as (-)-beta-cubebin, (+)-lariciresinol, (+)-isolariciresinol, (+)-lyoniresinol and (+)- medioresinol[6,7,8] (fig.7). Lariciresinol and isolariciresinol is proven to be anti-inflammatory, antinociceptive, antiulcerogenic, antimicrobial, cytotoxic and antioxidant activites[9]. Cubebin possess anti-inflammatory activity[10]. Lyoniresinol reveals antioxidative and also antimutagenetic activity[11].
The alcoholic extract of the aerial part of *justicia tranquebarensis* yielded phytosterol, brassicasterol, campesterol, 7, 22-ergostadienol, stigmasterol, sitosterol, spinasterol, 28-isofucosterol and betasitosterol-3-o-glucoside[12].

Ethnomedicinal Uses

Tribal Claims

Local people use this plant drug for inflammation[3].

Siddha Uses

Leaf is used as expectorant, cold, cough and nasal disorder[3].

Medicinal Uses

Leaf juices is act as a cooling agent and aperients and also given to children in small pox. Crushed leaves applied to contusions[13]. Leaf paste is applied externally on the swelling to reduce the pain. Root paste is applied for tooth ache[14]. About 15-20ml of leaf juice is administered orally for every one hour up to half of the day and keeping of leaf paste externally on the sight of snake bite, it will work as an antidote for cobra bite[15]. Leaf juice is given orally to treat jaundice and was effective for the treatment of bronchial asthma[16]. Leaf paste is applied over affected area to treat skin diseases[1]. The plant extract is used in the management of inflammation and arthritis confirming the use of medicinal plants[17]. Leaf extract is proved to be used as cardio protection[18] and also used to treat gastric ulcer[19]. The combination of plants used to treat wssv infection[20].

Various proved therapeutic values of plant

Anti-inflammatory activity

Akilandeswari *et al*., (2001) studied anti inflammatory activity of leaf extracts of *justicia tranquibariensis*. Ethanolic extract of the plant showed significant anti inflammatory activity when compared to the standard drug sample[21].

Cardioprotective activity

Radhika *et al*., (2013) reported cardioprotective role of *justicia tranquibariensis* leaf extract in isoproterenol induced myocardial infarction in albino rats. Oral administration of aqueous extracts of *justicia tranquibariensis* proved the protective role of the plant[18].

Anti arthritic activity

Senthamari *et al*., (2013) reported anti arthritic activity of *justicia tranquibariensis* in the treatment of rheumatism. The ethanolic plant extract of *cissus quadrangularis* and *justicia tranquebariensis* was investigated to evaluate its anti-arthritic activity by freund's adjuvant induced arthritis model and the plant extracts significantly reduced the arthritis of the affected joint when compared with the controlled rats[17].

Antiulcerogenic activity

Shabana *et al*., (2008) reported the efficacy of the leaf extract of *justicia tranquebariensis* in hci-ethanol induced gastric ulceration in albino mice. Investigated that *justicia tranquebariensis* leaf extract (jtle) in restraining oxidation process produced in gastric tissue. The animals of the experimental group were pretreated with the aqueous leaf extract of *justicia tranquebariensis* (jt) for 15 days. The result suggested that jtle possesses antioxidant properties and provides protection against ethanol induced gastric injury[19].

Hepatoprotective activity

Shabana *et al*., (2011) reported protective and curative effects of *justicia tranquibariensis* leaves in acetaminophen induced hepatotoxicity. The leaf extract at dosage of 500 and 1000 mg/kg exhibited significant protective effect against acetaminophen induced hepatotoxicity. *Justicia tranquibariensis* leaf extract significantly suppressed increase in plasma activities of ast, alt, alp and tb concentrations which confirmed its curative and protective effects[22].

Bronchial asthma

Velpandian *et al*., (2014) reported the use of *justicia tranquibariensis* in the management of bronchial asthma. The present study suggested a treatment trial with *justicia tranquibariensis* for asthma. The herbal juice has proven to lower symptom scores and improve lung function. Further large scale, trials are needed to further evaluate the efficiency of the drug[16].

Antihelmenthic activity

jiju *et al*., (2015) reported 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 group. The anthelmintic activity of *justicia tranquibariensis* root extract has therefore been demonstrated for the first time[23].

Antioxidant activity

Krishnamoorthi *et al*., (2015) studied the antioxidant potential using dpph method. Among all the extracts ethyl acetate and ethanolic extract showed better antioxidant activity at the concentration of 75µg/ml when compared to hexane extract[24].

Antibacterial activity

Shabana *et al*., (2008) evaluated the antibacterial activity of leaves of *justicia tranquebariensis* linn., against 10 pathogenic bacteria strains. 25mg/ml showed more level of activity than 5mg/ml against all the tested micro organisms in a dose dependent manner. Both chloroform as well as ethanol extract were found to possess antibacterial activity. But chloroform extract showed beter activity than ethanolic extract against a range of bacteria, as revealed by in vitro agar well diffusion method. The inhibitory effect of the extract was compared with standard antibiotic amoxicillin[25].

CONCLUSION

Herbal medicine plays a major role in the development of modern civilization. *Justicia tranquebariensis* is an interesting example of plant having traditional medicinal value. This review article briefly explains the medicinal uses, phytochemical and pharmacological actions of *justicia tranquebariensis*. The plant was found to have broad spectrum of activities due to the presence of active constituents like phytosterols, flavonoids, glycosides. The plant have reported to have variety of pharmacological actions like antioxidant, anti inflammatory, hepatoprotective, antihelmenthic, cardioprotective, antiulcerogenic, bronchial asthma, anti arthritic and antimicrobial. So much work is required with the *justicia tranquebariensis* to investigate the mechanism of actions with other therapeutic activities.

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