

## Review on therapeutic effectiveness of *Justicia tranquebariensis*

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### ABSTRACT

Health considered as a precondition for achieving the superlative abilities of the human being consisting of morality, prosperity, artistic values and sacred freedom. The main components of the model of positive healthiness are preventative and curative aspects of disease. Therapeutic plants engaged with major important role in the socio-cultural, spiritual and medicinal field of rural people of India. Recent development of research has focused on traditional herbal remedies as a potential source for new and more effective medicinal therapies. Numerous plants have been identified as the potential source of drugs in Indian system of Ayurveda medicine for the treatment of many ailments. One such medicinal plant is *Justicia tranquebariensis* also known as Sivanarvembu, tavashoomoorunghai, punnakupoodu etc., and it belongs to the acanthaceae family. The various therapeutic effects of *Justicia tranquebariensis* is, it exhibits antioxidant, hepatoprotective, anthelmintic, cardioprotective, antiulcerogenic, bronchial asthma, anti-arthritic and antimicrobial activities. Research works are going on to explore the wide area of applications of *Justicia tranquebariensis*. This review article unveils the therapeutic effectiveness *Justicia tranquebariensis*.

**Keywords:** *Justicia Tranquebariensis*, Antioxidant, Hepato protective eetc.

### 1. INTRODUCTION

Traditionally, plants are used by the native people in every part of the world as natural remedy for various health disorders. Isolated chemical compounds from therapeutic plants are the basis of modern medicine and have been used to treat human health issues since the beginning of human era [1]. Over the last few years, researchers have aimed at identifying and validating plant-derived substances for the treatment of various diseases. Interestingly it is estimated that more than 25% of the modern medicines are directly or indirectly resulting from plants [2]. An extensive pharmacological effects are exerted by various plants including anticancer, antioxidant, hepatoprotective, anti-inflammatory, immunomodulatory, analgesic, antimicrobial, antiplatelet, antihyperlipidemic, adulticidal, melanin inhibitory, antidepressant, antiobesity, antiamebic, radioprotective, larvicidal, cardioprotective, antifungal, coronary vasodilation, antifertility, brain protective,

cytoprotective, gastroprotective, laxative, estrogenic, diuretic and many others. Moreover advances in clinical research and quality control showed a greater value of herbal medicine in the treatment and overcome from many diseases [3]. Out of many research articles and from other folk documents we have found and reviewed about the traditional plant such as *Justicia tranquebariensis*, which is well-known traditional herb and it is native plant into India and Srilanka, widely distributed in the South Indian states of Tamilnadu, Andhra Pradesh and Kerala and globally distributed into India and Srilanka. Conservation status of *Justicia tranquebariensis* is under Not Evaluated [4]. Various proved therapeutic value of *Justicia Tranque bariensis* followed by Anti-inflammatory activity, Cardioprotective activity, Antiarthritic activity, Antiulcerogenic activity, Hepatoprotective activity, Bronchial Asthma, Antihelmenthic activity, Antioxidant activity and Antibacterial activity [5].



## 2. TAXONOMIC CLASSIFICATION [6]

Kingdom: plantae

Division: magnoliophyta

Class: magnoliopsida

Order: scrophulariales

Family: acanthaceae

Subfamily: acanthoideae

Genus: Justicia

Species: tranquebariensis

## 3. LOCAL NAMES OF THE PLANT

*Justicia tranquebariensis* known as sivanarvembu, tavashoomoorunghie, punnakupudi, tavacumurunkai, tavicimurunkai, kakanacam, niyakkiyamaram, pilavumurunkai, pinnakkuceti, punakuppuntu, punnakkuppuntu, putanayakiceti, taciver, tavacimurunkaiceti, tavamurunkai, tavattumurunkai, mutaliyar, narimurunkai, Vankanattam in Tamil. In Sanskrit and oriya it is pindi. In Telugu it is pindikonda, chikerachettu, kondapindi, redamandalam. In Kannada it is known as shivanaaruballi, kaddiyarakina, kaddiyarakinagida.

## 4. BOTANICAL DESCRIPTION

Scientific Name: *Justicia tranquebariensis*

Synonyms: *Adhatodantranquebariensis*, *Justicia glauca* Heyne ex Wall. *Justicia parvifolia* [7]

Family: acanthaceae

Sub family: acanthoideae

Genus: justicia

Species: tranquebariensis

## 5. MORPHOLOGICAL DESCRIPTION [5]

Subshrubs, leaves 2.5-3×2cm, obovate –orbicular , apex obtuse, base cuneate, membranous , 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 srilanka

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

## 6. TRADITIONAL USES

In Ayurveda, *Justicia transquebariensis* has been used to treat poisonous bites. Leaf juices act as a cooling agent and aperients and also given to children during small box. Crushed leaves are applied to contusions. Leaf paste is applied externally on the swelling to reduce the pain. Root paste is applied for tooth ache. About 20 ml of leaf juice is administrated orally or keeping the leaf paste externally on the sight of snake bite works as an antidote for cobra bites. The plant extract is used in the management of inflammation and arthritis confirming the use of medicinal plants. The leaves are traditionally used to treat chest disease, rheumatism, fever, asthma, pneumonia, tuberculosis, expectorant, diuretic, antispasmodia, antiseptic and to reduce swelling. It is used in the treatment of leprosy, cancer, edema, abscess and skin disorder [6].

## 7. PHARMACOLOGICAL ACTIVITIES OF JUSTICIA TRANQUEBARIENSIS

### 7.1. Antibacterial and Antifungal activity

The antibacterial activity of leaves of *Justicia tranquebariensis* against 10 pathogenic bacteria strains. 25mg/ml showed more level of 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 antibacterial activity. But chloroform extract showed better 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 [8-9].

Both the extracts Chloroform extract of *Justicia tranquebariensis* and Ethanolic extract of *Justicia tranquebariensis* exhibited antibacterial and antifungal activities against the tested microorganisms. In an overall purview Chloroform extract of *Justicia tranquebariensis* was found to be more active against *S. aureus*, *E. coli*, *A. niger* and *C. albicans* at 50 and 100 µg concentrations. Similarly EEJT was active against *B. subtilis*, *K. pneumoniae* and *C. albicans* at 100 µg concentration. There were no resistant organisms as all the tested microorganisms were sensitive towards the extracts at different concentrations (Table 1).

**Table - 1: Zone of Inhibition of *Justicia tranquebariensis***

Organism	Extract	Std (mm)	25 µg	50 µg	µg
<i>B. subtilis</i>	CEJT	28	16	18	20
ATCC 6633	EEJT	32	18	20	22
<i>S. aureus</i>	CEJT	32	16	21	28
ATCC 9144	EEJT	32	16	20	23
<i>E. coli</i>	CEJT	38	16	18	21
ATCC 25922	EEJT	38	15	18	20
<i>K. pneumoniae</i>	CEJT	36	16	18	23
ATCC 29665	EEJT	36	17	19	23
<i>A. niger</i>	CEJT	30	16	20	22
ATCC 2091	EEJT	28	15	19	21
<i>C. albicans</i>	CEJT	32	18	21	28
ATCC 9029	EEJT	32	19	20	30

CEJT: Chloroform Extract of *Justicia tranquebariensis*; EEJT: Ethanolic Extract of *Justicia tranquebariensis*.

**Table - 2: Free Radical Scavenging activities of *Justicia tranquebariensis* against DPPH molecules**

Concentration (µg/ml)	% Inhibition
25	27.5
50	39.52
100	43.22
200	50.10
400	73.55
<b>Ascorbic acid (Standard)</b>	<b>100</b>
	<b>99.20</b>

The author discussed and concluded that the ethanolic extract of *Justicia tranquebariensis* was capable of scavenging free DPPH radical, thus proving to have antioxidant activity. The degree of discoloration indicated the scavenging potential of the extract. The results shown in Table 2.

### 7.2. Antiulcerogenic activity

The leaf extract of *Justicia tranquebariensis* reported the efficacy in hcl-ethanol induced gastric ulceration in albino mice. Investigated that *Justicia tranquebariensis* leaf extract in restraining oxidation process produced in gastric tissue. The animals of the experimental group were pretreated with the aqueous leaf extract of *Justicia tranquebariensis* for 15 days. The result suggested that *Justicia tranquebariensis* leaf extract possesses antioxidant properties and provides protection against ethanol induced gastric injury [10].

### 7.3. Cardio protective activity

The cardio protective role of *Justicia tranquebariensis* leaf extract on isoproterenol induced myocardial infarction in Wistar albino rats was studied. The groups were pretreated with the leaf extract for a period of 28 days and received a subcutaneous injection of isoproterenol. After the experimental period, serum was estimated for content of proteins, cholesterol, triglycerides, phospholipids and lipoproteins and the assay of marker enzymes. An increased level of LDL, VLDL with significant decrease in the level of HDL and rise in the level of myocardial marker enzymes (Creatinine Kinase, Lactate Dehydrogenase, Alanine amino transferase and Aspartate amino transferase) in serum was noted. Oral administration of aqueous leaf extract and isoproterenol-induced rats proved the cardio protective role of the plant [11].

### 7.4. Anthelmintic activity

Author discussed and reported that ethanolic extract of *Justicia tranquebariensis* exhibited

anthelmintic activity against indian earthworm (pheretimaposthuma), roundworm (ascaridiagalli) and tapeworms (raillietinaspiralis). 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 [12].

### 7.5. Bronchial Asthma

The Author was assessed and reported the therapeutic efficacy of *Justicia tranquebariensis* in bronchial asthma using *Justicia tranquebariensis* leaf, for this study there is 40 asthmatic patients were enrolled for the clinical trial. All the patients were administered with 30 ml leaf juice of *Justicia tranquebariensis* for the period of 3 months. The study exhibited improvement on subjective and objective parameters of bronchial asthma. The result showed that during the trial period, no side effects were observed. The herbal juice had proved to lower symptom scores and improve the lung function [13].

### 7.6. Antiarthritic activity

The anti-arthritis activity (in vitro) of *Justicia tranquebariensis* in the treatment of rheumatism reported as positive in the method of protein denaturation with the standard drug Diclofenac sodium. The author discussed that production of auto-antigen in certain arthritic disease may be due to denaturation of protein [6].

Author found from the result of the invitro anti-arthritis activity of *Justicia tranquebariensis* by protein denaturation, it can be stated that all the extracts of *Justicia tranquebariensis* leaves is capable of controlling the production of auto antigen and thereby it inhibit the denaturation of proteins and its effectiveness was compared with the standard drug diclofenac sodium. The percentage protection was found to be 59.7% (water), 55.3 % ( methanol), 45.4% (ethanol) and 76.83% (Diclofenac sodium). This effect may be results from the presence of steroids, alkaloids and flavonoid present in various fractions [14].

### 7.7. Anti-inflammatory activity

The Human Red Blood Cell (HRBC) Membrane stabilization method was used for the in-vitro anti-inflammatory activity of the methanol, ethanol and water extracts of *Justicia tranquebariensis*. The HRBC Membrane stabilization activity of *Justicia tranquebariensis* showed stabilization and hemolysis in hypotonic solution while compared with standard Diclofenac. The HRBC Membrane stabilization activity/protection increased while the membrane

hemolysis was decreased. Hence, the leaves of *Justicia tranquebariensis* had potential anti-inflammatory activity [6].

### 7.8. Anti-oxidant activity

The DPPH scavenging assay was done for the ethanol, methanol, water, Ascorbic acid extract of the plant *Justicia tranquebariensis* with four different concentrations (10, 50, 100,500 µg/well) and compared with control (ascorbic acid). All the three extracts exhibited potential antioxidant activity. The scavenging activity of ethanol extract reached high % compared with methanol and water extract [14].

## 8. CONCLUSION

The traditional medicinal plant of *Justicia tranquebariensis* have reported that it exhibits variety of pharmacological actions like antioxidant, anti-inflammatory, anti-arthritis, hepatoprotective, anthelmintic, cardioprotective, antiulcerogenic, bronchial asthma, anti-bacterial and antimicrobial. Many research findings are required with the *Justicia tranquebariensis* to investigate the mechanism of actions with other therapeutic activities to explore its commercial values in future.

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