

## Ethnobotany and Pharmacognostical studies of *Jasminum sambac* Linn.

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### ABSTRACT

In the present study of *Jasminum sambac* ethnobotanical and pharmacognostical activity of *Jasminum sambac* leaf. These species of highly medicinal purpose flowers, leaves act as lactifuge, arrest the secretion of milk in the puerperal state in case of threatened abscess pharmacognostical study of leaf parts of *Jasminum sambac* has been undertaken, hence it is establish. Pharmacognostical and quality control parameters of leaf, of *Jasminum sambac* was carried out. Various microscopic characters viz., transverse section of leaf, quantitative parameters (stomatal number, stomatal index, and vein-islet and termination number) were determined for the identification of plant material. Powder microscopic studies, were also performed. Physicochemical parameters such as total Ash(13.5%), water soluble ash (6.7%) and acid-insoluble ash (8.2 %)Alcohol soluble extractive(30%) Water soluble extractive(11.8%)Moisture content(6.19%)Crude fibre content(15.1%)Swelling index (1)and Foaming index (Lessthan 100).

### 1. INTRODUCTION

*Jasminum sambac* Linn. (Family-Oleaceae) commonly known as Motia or lily Jasmine is a scandent or sub-erect shrub with young pubescent branches, broadly ovate or elliptic, opposite leaves, white, very fragrant flowers cultivated nearly throughout the tropical and sub-tropical parts of the world. The plant is much valued for its exquisitely fragrant flowers and it is estimated that nearly 400md of flowers are annually used for the extraction of perfumed oils and 250md for the preparation of attar .The plant is considered cool and sweet used as a remedy in case of insanity, in weakness of sight and affections of the mouth. The flowers are bitter, pungent, cooling, tonic to brain, purgative, cure tridosha, biliousness, itching sensation, allays fever, stop vomiting, useful in the diseases of eye, ear, mouth, good for skin diseases, leprosy and ulcers Kiritikar KR *et al.*, (2003). Traditionally leaves are used in fever, cough, indolent ulcer, abdominal distention, diarrhoea, lowering the blood glucose level, regulating menstrual flow, to clean kidney waste, inflamed and blood shot eyes. Root, flowers, leaves are galactogogues therefore act as lactifuge, Kiritikar KR *et al.*, (2003) and Nadkarni KM (2007). The plant is reported to have to have antidiabetic Upaganlawar AB *et al.*, (2003), antitumor Radu *et al.*,(2009) antimicrobial Hussaini RA *et al* .,(2009) antioxidant Latif FA *et al.*,(2010) anti-acne Harisaranraj RS *et al.*,(2010) suppression of puerperal lactation Shrivastav p *et al.*,(1988) A.N.S stimulating effect Hongratanaworakit T (2010).The plant contains friedelin, lupeol, betulin,  $\alpha$ -amyrin, ursolic acid Rastogi RP *et al.*,(2002) sambacin, jasminin, sambacoside A, sambacolignoside, quercitin, isoquercitin, rutin, kaempferol, luteolin4, phenylmethanol, linalool,  $\alpha$ -terpineol Rastogi RP *et al.*, (2006) and Secoirridoid glucoside- sambacoside A-G along with oleoside 11- methylesterTanahashi T *et al.*, (1988). In spite of the numerous medicinal uses attributed to this plant, pharmacognosy information about this plant has not been published. Till date, no ethno botany and pharmacognostical studies have been reported for *Jasminum sambac*. In the present investigations, ethnobotany and pharmacognostical studies viz., macroscopic, microscopic, physicochemical parameters was determined.

**Vernacular Names**

<b>Bengali</b>	- Bel/Beli;
<b>Hindi &amp; Marathi</b>	- Mogra, Chamba, Bel, Motia, Mugra;
<b>Sanskrit</b>	- Mallika, Ananga, Ashtapadi, Devalata, Gauri, Mudgara, Janeshta,
<b>Telugu</b>	- Mallepuvvu, Boddumalle, Bondmalle, Gundemalle, Malle, Virajadi,
<b>Tamil</b>	- Mallikaipu, Anangam, Iruvachi, Iruvadi, Karmugai, Malli, Maladi,
<b>Kannada</b>	- Dundu Mallige;
<b>Urdu</b>	- Kaliyan, Azad, Raibel, Sosan;
<b>Punjabi</b>	- Chamba, Chambeli, Mugra;
<b>Marathi</b>	- Mogara, Mogra, Java- Melati;
<b>Malayalam</b>	- Cherupichakam, Chirakamulla;
<b>Spanish</b>	- Chamela, Gamela, Jazmine de Arsbia;
<b>Tulu</b>	- Ma lligedai;
<b>Uriya</b>	- Belophulo, Bondumalle, Moli , Mollika.

**Botanical / Scientific Classification (Kiritikar KR et al., (2003) and Anonymous )**

<b>Taxon</b>	: <i>Jasminum sambac</i> (L.)
<b>Family</b>	: <i>Oleaceae</i>
<b>Tribe</b>	: <i>Jasmineae</i>
<b>Group</b>	: <i>Dicot</i>
<b>Class</b>	: <i>Magnoliopsida – Dicotyledons</i>
<b>Subclass</b>	: <i>Asteridae</i>
<b>Order</b>	: <i>Scrophulariales</i>
<b>Genus</b>	: <i>Jasminum</i>
<b>Species</b>	: <i>Jasminum sambac</i> (L.)

**World Wide Distribution**

*Jasminum sambac* (Linn.) Probably originated in India and was brought to Malaysia and Java around the 3rd century; since then widely cultivated throughout the Malaysian region for its heavily scented flowers and tropics of both Hemispheres. In Tamilnadu, Andhra Pradesh, Kannad, Chazipur, Sikanderpur and Karnataka, the Jasmine particularly *Jasminum sambac* (L.) Are commercially cultivated for flowers (Kiritikar KR et al., (2003) and ethnobotany *Jasminum sambac* 2010) .

**2. ETHNOBOTANY**

Ethno botanical survey of plant has been conducted in Solan, Una, Kangra, Sirmour and Mandi district of Himachal Pradesh, India. Ethno botanical Information about the *Jasminum sambac* has been collected through interview and discussion with the people having the age 30- 85 years. *Jasminum sambac* are used in various diseases like as spinal cord injury, menstrual disorder, migraine and others, mentioned in **Table 1**.

**3. MATERIAL AND METHODS****Plant material**

Fresh leaves and stem were collected from Villupuram District Alagramam (TamilNadu) in the month of March and were authenticated by Dr. N.Rajasulochana Madras University (Presidency College Autonomous) Chennai.

**Instrument, Chemicals and reagents**

Chloral hydrate, iodine and sodium hydroxide were procured from RFCL, Mumbai, India. Compound microscope, Camera Lucida, Stage and eyepiece micrometer, glass slides, cover slips,

watch glass and other common glassware were the basic apparatus and instruments used for the study. Microphotographs were taken using Labomed ATC-200 microscope attached with Sony digital camera.

### **Macroscopy of leaf**

Morphological studies were done by using simple microscope to determine the shape, apex, base, margins, taste and odor of the leaves .

### **Microscopic studies**

Microscopy was done by taking the thin hand sections of the midrib and lamina region of the leaves. The thin sections were cleared with chloral hydrate solution and stained with phloroglucinol and hydrochloric acid, then mounted in glycerin for the identification of various regions. Powder of the dried leaves was separately treated with phloroglucinol, hydrochloric acid and glycerin to study various characteristics. Similarly, the powder was

also stained in iodine solution, ruthenium red solution for the identification of starch grains, calcium oxalate crystals etc. As a part of quantitative microscopy stomata number, stomata index, veinislets number and vein termination number were determined by using fresh leaves of the plant Evans WC (2005) ,Khandelwal KR (2006)and Kokate CK et al., (2008).

### **Physicochemical parameters**

The moisture content, total ash, water soluble ash, acid insoluble ash, alcohol and water soluble extractive values were determined as a part of its physicochemical parameters Who Quality control methods for medicinal plant materials ABTS publisher and distributor (1998).

### **Powder analysis**

The shade dried aerial parts of the plant were powdered and powder was passed through 100 # sieve. A small amount of powder was taken on to a microscopic slide, cleared from chlorophyll by heating with chloral hydrate solution and was mounted in 50% v/v glycerol in water. This was then observed under microscope to study the characteristic featuresWallice TE (2005) and Betty PJ et al., (2000).

## **4. RESULTS AND DISCUSSION**

### **Macroscopical characteristics**

The leaf has prominent midrib, uniformly smooth and even lamina. Morphologically the leaf appeared simple in composition, opposite in arrangement, variable in shape usually ovate or elliptic, glabrous or nearly so, with acute apex, entire margin, petiolated (3-6mm), 4- 12cm (length) by 2.4-6.5cm (breadth). The fresh leaf was green in colour with characteristic odour and slightly bitter taste (**Figure.1**)

### **Microscopical characteristics**

#### **The Transvers section ( T.S.) of leaf**

In transverse section the leaf appeared dorsiventral in nature showing three layers (**Fig .2**). It showed the presence of single layered epidermis composed of flat rectangular cells covered by thin cuticle while lower epidermis covered by thick cuticle . The uniseriate, unicellular and multicellular covering trichomes were present in the upper and lower epidermis. The glandular trichomes were multicellular with single stalk . Stomata were present only on the lower epidermis . Below the epidermis layer in the lamina the next region was mesophyll which consisted of single layered long elongated palisade cells followed by spongy parenchymatous cells. The midrib region consisted of closely packed multilayered collenchymatous cells present below the upper epidermis and above the lower epidermis. Below and above the collenchymatous cells loosely packed with intracellular spaces parenchymatous cells were present. In the centre (midrib region) 'C' shaped or half moon shaped vascular bundles were present composed of xylem and phloem cells

### Powder microscopy

The powder microscopy of plant (leaves) was light green in colour and showed the anomocytic stomata, spiral vessel, starch grain and calcium oxalate crystal.

### Quantitative microscopy

Various quantitative microscopic parameters viz., stomatal number and index, vein islet and termination number and were determined as per the WHO guidelines for quality control methods for medicinal plant material. The results are given in **Table 3**.

### Physicochemical parameter

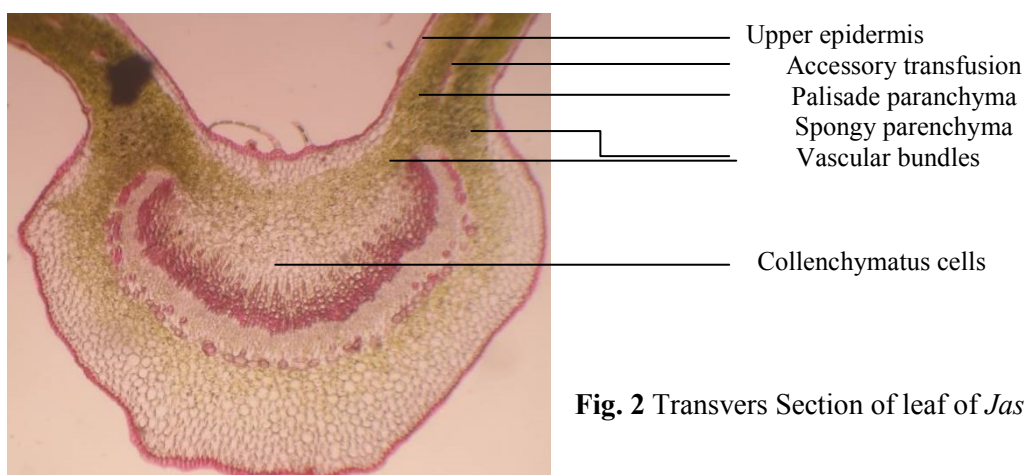
Physicochemical parameter- Various parameters such as ash and extractive values, moisture content and foreign matter were established and the results are summarized in **Table**

## 5. CONCLUSION

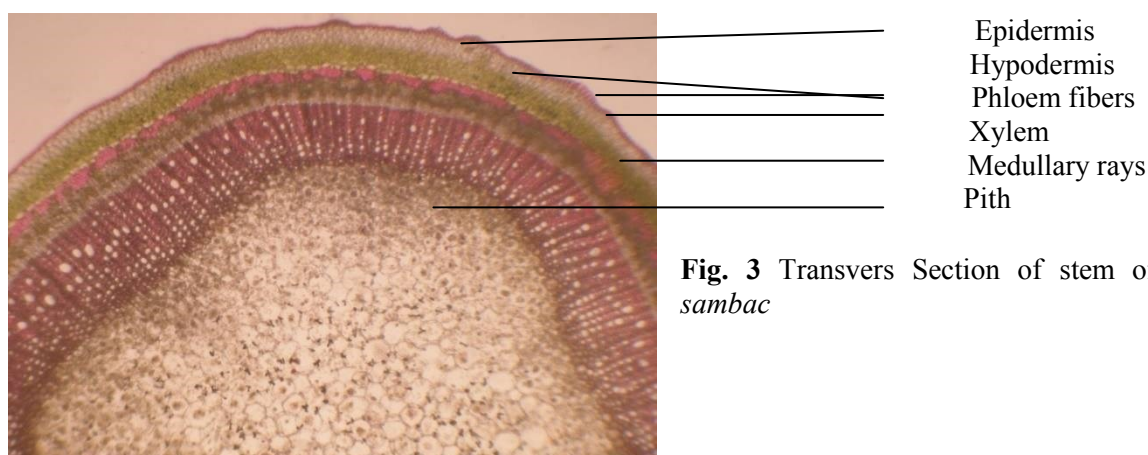
The methods carried out in the present research work namely .The pharmacognostical and physicochemical characteristics of *Jasminum sambac* Linn , which could be used in identification and to distinguish the plant material, were determined and established. The ethnobotanical study of plant material reveals about its potential to cure various ailments. The present study may be useful information with regards to its, ethno- pharmacological potential, screening and isolation of phyto-constituent to carrying out further research.



**Fig. 1** Morphology of *Jasminum sambac* Linn. (Whole Plant) and Leaf



**Fig. 2** Transvers Section of leaf of *Jasminum sambac*



**Fig. 3** Transvers Section of stem of *Jasminum sambac*

**Table 1:** Ethnobotany of *Jasminum sambac* Linn

S.No	Parts	Preparation and administration	Uses
1	Root	Root is boiled and the extract is used to Root of this plant is mixed with rice and used as facial powder	Treat diabetes mellitus Treat pimples and to get a smooth skin
2	Leaves	Young jasmine leaves boiled and the infusion is taken The dried leaves soaked in water and made in to poultice Fresh leaves are chewed. Decoction of leaves taken in empty stomach .	Treat gallstones Indolent ulcers, ophthalmopathy skin disease, wounds healing
3	Flowers	Dried flower powder mixed with honey and taken after meal.	cooling, tonic to brain, purgative, cure tridosha, biliousness, itching sensation, fever, stop vomiting, skin diseases, leprosy and ulcers

**Table 2** Physicochemical parameters of *Jasminum sambac* Linn (Leaves)

S.No	Type of Ash	Values
1	Total ash	13.5%
2	Water soluble ash	6.7%
3	Acid insoluble ash	8.2%
4	Alcohol soluble extractive	30%
5	Water soluble extractive	11.8%
6	Moisture content	6.19%
7	Crude fibre content	15.1%
8	Swelling index	1
9	Foaming index	Less than 100

**Table 3** Quantitative microscopic parameters of *Jasminum sambac* Linn(leaves)

S.No	Quantitative microscopic parameters	Values
1	<b>Stomatal number</b>	
	Upper surface	Nil
	Lower surface	150-170
2	<b>Stomatal index</b>	
	Upper surface	Nil
	Lower surface	14.26
3	<b>Vein islet number</b>	
	Upper surface	9.5-10.5
	Lower surface	12.5-13.5
4	<b>Vein termination</b>	
	Upper surface	25.5-26.5
	Lower surface	16.5-17.5

## References

- [1] Kiritikar KR, Basu BD. Indian medicinal plants with Illustrations. 2nd Edition, Vol 7: 2003. p. 2093-2096.
- [2] Nadkarni KM. Indian Matreria Medica, Indian plants and drugs with their medicinal properties and uses. 2nd Edition, vol 1: Asiatic Publishing House: 2007.p. 704.
- [3] Upaganlawar AB, Bhagat A, Tenpe CR and Yeole PG. Effect of *Jasminum sambac* leaves extracts on serum glucose and lipid profile rats treated with alloxan. Pharmacologyonline 2003; 1: 1-6.
- [4] Radu S , Kqueen CY. Preliminary screening of endophytic fungi from medicinal plants in Malaysia for antimicrobial and antitumour activity. Malaysian Journal of Medical Sciences 2002; 9(2): 23-33.
- [5] Hussaini RA, Mahasneh AM. Microbial growth and quorum sensing antagonist activities of herbal plants extracts. Molecules 2009; 14: 3425-3435.
- [6] Latif FA, Edou P, Eba F, Mohamed N, Ali A, Djama S, Obame LC, Bassolé I, Dicko M. Antimicrobial and antioxidant activities of essential oil and methanol extract of *Jasminum sambac* from Djibouti. African Journal of Plant Science 2010; 4 (3): 038-043.
- [7] Harisaranraj RS, Babu S, Suresh K. Antimicrobial properties of selected Indian medicinal plants against acne-inducing bacteria. Ethnobotanical Leaflets 2010; 14: 84- 94.
- [8] Shrivastav P, George K, Balasubramaniam N, Padmini Jasper M, Thomas A, Kanagasabhpathy A S. Suppression of puerperal lactation using jasmine flowers (*Jasminum Sambac*). Australian and New Zeland Journal of Obstetrics and Gynaecology 1988; 28(1): 68–71.
- [9] Hongratanaworakit T. Stimulating effect of aromatherapy massage with jasmine Oil. Natural Product Communications 2010; 5(1): 157-162.
- [10] Rastogi RP, Mehrotra BN. Compendium of Indian Medicinal Plants.; Ist ed. vol 4; 2002: p. 407-408.
- [11] Rastogi RP, Mehrotra BN. Compendium of Indian Medicinal Plants. 2006; Ist ed,vol 2: p. 395-396.
- [12] Tanahashi T, Nagakura N, Nishi T. Sambacosides A, E and F novel tetrameric iridoid glycosides from *Jasminum sambac*. Tetrahedron Letters 1988; 29(15): 1793-1796.
- [13] Kiritikar K R and Basu B D: Indian Medicinal Plants with Illustrations. 2<sup>nd</sup> edition. Vol 7. Oriental Enterprises 2003; 2093-2096.

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- [14] Ethnobotany: *Jasminum sambac*. [online]. 2009 [Cited 2010 Aug 24]; Available from: URL:ethnobotanyukmhoney.blogspot.com/ 2009\_02\_01\_archive.html.
- [15] Anonymous. The wealth of India, A Dictionary of Raw Materials and Industrial Products, Raw Materials. Vol 5th: H-K. Publications and Information Directorate, New Delhi; 289-290.
- [16] Evans WC: Trease and Evans .Pharmacognosy.International ed., WB saunders, 2005;456.
- [17] Khandelwal KR practical pharmacognosy .16<sup>th</sup> ed. Nirali prakashan , pune ., 2006: p.146-153
- [18] Kokate CK and Gokhale SB.Practical pharmacognosy12<sup>th</sup> ed. Nirali prakashan, 2008;p.129
- [19] Wallice TE Text book of pharmacognosy (5<sup>th</sup> edition )CBS publishers & distributors: New-Delhi,2005:104-120
- [20] Betty PJ and Derek WS ,Atlas of microscopy of medicinal plants ,culinary Herbs and species, (1<sup>st</sup> edition )CBS publisher New Delhi; 2000: 17-42.

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