



A review on *Jasminum sambac*: A potential medicinal plant

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Abstract

Plant medicine system is attracting more attention than the allopathic system nowadays, as this system is pollution free, less toxic and without side effects. The dependency on plants urged human beings to identify and classify the plants into different groups such as food plants, poisonous plants and medicinal plants. *Jasminum sambac* are native of tropical and sub-tropical regions. The Arabian or Tuscan jasmine (*Jasminum sambac*) is considered as native of the East Indies. But contrary opinions are also found to indicate its original home being the region of west India. The distribution of the genus is wide but majority of the species are centered on India, China and Malaysia. Traditionally *Jasminum sambac* has been used to treat dysmenorrhoea, amenorrhoea, ringworm, leprosy, skin diseases and also as an analgesic, antidepressant, anti-inflammatory, antiseptic, aphrodisiac, sedative, expectorant. This study includes its importance in day to day life and review of *Jasminum sambac* plant which has immense medicinal properties.

Keywords: Medicinal Plant, *Jasminum sambac*, Phytochemicals, Pharmacological Properties

Introduction

Over the last decade there has been a growing interest in drugs of plant origin in contrast to the synthetic that are regarded as unsafe to human and environment [1]. It is estimated that about 25% of all modern medicine are directly or indirectly derived from higher plants. Jasmine is a genus of shrubs and vines in the olive family Oleaceae with about 200 species throughout the world, out of which around 40 species are reported to be growing in India. Jasmine is an important traditional flower crop of our country. A number of varieties of a few Jasmine species are grown all over the Karnataka state. The important jasmine cultivars grown in the state are Gundu mallige (*Jasminum sambac* Ait), Jaji Mallige (*Jasminum grandiflorum* Linn), Kakada (*Jasminum multiflorum* Burm. F.) and Sooji Mallige (*Jasminum auriculatum* Vanl.). Jasmine is grown for its highly scented flowers. The flower buds are harvested every day morning and are tied together along a single plane using banana fiber and thread. A group of about two hundred flower buds tied together is called an 'Atte' and one long 'Atte' consists of about eight hundred flower buds folded into four rows and is called as 'Chendu'. The flowers are used for hair adornments as Veni, and also in performing pooja.

Jasminum sambac (Arabian jasmine, Indian jasmine, Sampaguita, Mogra) is a member of Oleaceae family, known as sampaguita in the Philippines, where it is national flower, gunda mallige in India, moli in China, pikake in Hawaii and Arabian jasmine in the mainland USA. It is commercially

grown in India, Thailand, China and Philippines [2]. It is an evergreen vine or shrub reaching up to 1-3 m. The leaves are ovate; phyllotaxy is opposite or in whorls of three. The flowers bloom throughout the year and are produced in clusters of 3-12 together. They are strongly scented and open at night, close in morning [2]. The plant traditionally used as an analgesic, antidepressant, anti-inflammatory, antiseptic, aphrodisiac, sedative, expectorant and tonic (uterine) effects [2]. Roots are used to treat wounds and snake bites. The leaves and flowers have antipyretic and decongestant properties [2]. The flowers are used for treatment of diarrhoea, abdominal pain, conjunctivitis and dermatitis. The leaves and roots are used for treating diarrhoea, fever, pain and as an anaesthetic [3, 4].

The flowers of *Jasminum sambac* are used as flavor for tea leaves to provide a characteristic jasmine impact [4, 5]. *Jasminum sambac* absolute and essential oil are extensively used in perfumery industry due to their Wne, sweet and elegant fragrance impact. The fully bloomed flowers are extracted using organic solvents to get the concrete followed by ethanol extraction to obtain the absolute [6]. On the other hand, the essential oil is prepared using hydrodistillation [7], simultaneous steam distillation-solvent extraction [8] and super critical carbon dioxide extraction [9]. The volatile composition of *Jasminum sambac* absolute varies depending on the environmental conditions and the agricultural practices [10-12]. The major and the minor volatile constituents of *Jasminum sambac* absolute and essential oil were previously

studied [9, 13-16]. The volatile composition of the headspace collected directly from the flowers [17, 18] as well as from the concrete [13] was also reported.

In spite of the numerous medicinal uses attributed to this plant traditional, pharmacognosy, phytochemical and pharmacological information about this plant has not been published. The present review is an attempt to highlight the various ethno botanical and traditional uses as well as phytochemical and pharmacological activities reported so far from *Jasminum sambac*.

Botanical description

Jasminum sambac, is popular in different countries and known by its various names, like, in Philippines it known as Sampaguit and it is national flower of the country as well. In India, it is popular as Gunda mallige, in China called as Moli, in Hawaii as Pikake and in the mainland USA, it is known as Arabian jasmine. This plant is commercially grown in Thailand, Philippines and India. Arabian jasmine probably native to India or Southeast Asia it is an evergreen shrub. On a support, it grows as a twining shrubby vine. Unsupported, it grows as a sprawling shrub. It is an evergreen broadleaf vine or shrub and its height reaching up to 1-3 m. The phyllotaxy of the leaves is opposite or in three whorls, ovate and dark green in colour. In green house, flowers can bloom through the entire year and are present in the form of clusters ranging from 3 -12. These flowers have strong aroma and open at night. Jasmine plants can easily grow in hot and humid environment during day time and it require low temperature at night. These plants easily grow as indoor plants as in this way as they can escape damage from frost. This plant can be grown when sun is at its extreme and form bushy shrubs whereas it can also be grown in shady areas and form a vine with darker and bigger leaves. These plants are splendid container plants. During planting, well- drained soil and even moisture is required with high organic matter, like, humus, peat moss, compost and leaf molds. Soggy conditions always act as a constraint for jasmines.

Ethnobotanical uses

Traditionally, this plant used as an antidepressant, analgesic, sedative, antiinflammatory, antiseptic, expectorant and aphrodisiac. Wounds and snake bites can be cured by the roots. The flowers and leaves have decongestant and antipyretic properties. Various diseases like conjunctivitis, diarrhoea, abdominal pain and dermatitis are treated with its flowers along with roots and leaves are also utilized for curing pain, diarrhoea and fever. It is also used for anaesthetic purposes [3].

Their flowers and leaves have been well recognized for multipurpose uses. For instance, the flowers have been utilized as traditional medicines in Asia to treat many diseases including diarrhea, fever, conjunctivitis, abdominal pain, dermatitis, asthma, abscess, breast cancer, uterine

bleeding, and toothache. In China, the leaf parts are used for the treatment of quadriplegia gall, dysentery, and bellyache. According to its high medicinal value, *Jasminum sambac* is one of the most cultivated species in many countries in Asia including Thailand.

Phytochemical studies

Jasminum sambac phytoconstituents contain iridoidal glycosides [19], linalyl 6-O-malonyl- β -D-glucopyranoside, benzyl 6-O- β -D-xylopyranosyl- β -D-glucopyranoside (β -primeveroside), 2-phenylethyl β -primeveroside, 2-phenylethyl 6-O- α -L-rhamnopyranosyl- β -D-glucopyranoside (β -rutinoside) [20], dotriacontanoic acid, dotriacontanol, oleanolic acid, daucosterol, and hesperidin [21]. The volatile constituents consist of benzyl acetate, indole, E-E- α -farnesene, Z-3-hexenyl benzoate, benzyl alcohol, linalool, and methyl anthranilate [22]. . Phytochemical studies showed that the roots contain dotriacontanoic acid, dotriacontanol, oleanolic acid, daucosterol, and hesperidin [23].

The potency and incredible fragrance power of jasmine essential oil make it a great investment even though it is one of the most expensive oils. There are well over 100 constituents found in jasmine oil, but the main chemical components are benzyl acetate, linalool, benzyl alcohol, indole, benzyl benzoate, cis-jasmone.

Pharmacological studies

Although the whole parts of the plant are employed and prescribed in folk medicines, only two pharmacological studies of *Jasminum sambac* have been reported. The flower displayed the efficacy to suppress puerperal lactation [24] and the essential oil was determined to possess antibacterial activity [25]. The *Jasminum sambac* flowers and leaves are largely used in folk medicine to prevent and treat breast cancer. Flowers of *Jasminum sambac* are useful to women when brewed as a tonic as it aids in preventing breast cancer and stopping uterine bleeding [26]. Previous studies done on *Jasminum sambac* reveal that the plant antifungal [27] and anti-cancer [28] works. Essential oil and methanol extract from *Jasminum sambac* have in vitro antimicrobial and antioxidant activities which could support the use of the plant by traditional healers to treat various infective diseases [29]. Ethyl acetate and water extract of leaves of *Jasminum sambac* showed reduction in plasma glucose level, lipid profile, and serum urea in diabetic rats [30].

The therapeutic properties of jasmine essential oil are antidepressant, anxiolytic, antiseptic, aphrodisiac, anti-spasmodic, cicatrisant, expectorant, galactagogue, parturient, sedative and tonic (uterine).

Research and Development

Natural products chemistry is the branch of chemistry which deals with the study of isolation, identification, structure elucidation, and the study of the chemical characteristics of chemical substances produced by living organisms. The word

natural refers to something that is present in or produced by nature and not artificial or man-made. The term natural products today is quite commonly understood to refer to herbs, herbal concoctions, dietary supplements, traditional Chinese medicine, or alternative medicine. Natural products are not just accidents or products of convenience of nature. More than likely they are a natural expression of the increase in complexity of organisms. Interest in natural sources to provide treatments as primary health care reaches back to the earliest points of history.

Recent years have witnessed a renewed interest in plants as pharmaceuticals in the western world. In the global context, herbal medicines flourish as the method of therapy of choice in many parts of the globe. Recently there is an increase in demand for herbal medicines that is fuelled by a growing consumer interest in natural products.

The World Health Organization (WHO) has defined traditional medicine as "the sum total of all the knowledge and practices, whether explicable or not, used in diagnosis, prevention and elimination of physical, mental or social imbalance and relying exclusively on practical experience and observation handed down from generation to generation, whether verbally or in writing. The World Health Organization estimates that approximately 80 % of the world's population relies primarily on traditional medicines as sources for their primary health care.

Natural products are indeed viable sources and resources for drug discovery and development. Without natural products, medicine would be lacking in therapeutic tools in several important clinical areas such as cardiovascular disease, solid tumors treatment, and immuno-inflammatory disease. Recently there has been continual emergence of new natural product along with their chemical structure skeletons, with interesting biological activities along with the potential for chemical modification and synthesis of natural products.

Conclusion

In recent years, ethnobotanical and traditional uses of natural compounds, especially of plant origin received much attention as they are well tested for their efficacy and generally believed to be safe for human use. They obviously deserve scrutiny on modern scientific lines such as phytochemical investigation, biological evaluation on experimental animal models, toxicity studies and investigation of molecular mechanism of actions of isolated phytoconstituents. Thorough screening of literature available on *Jasminum sambac* depicted the fact that it is a popular remedy among the various ethnic groups, Vaidyas, Hakims and Ayurvedic practitioners for cure of variety of ailments. Following the traditional and folk claims, very little efforts have been made by the researchers to explore the therapeutic potential of this plant. From the literature, *Jasminum sambac* have been screened for some pharmacological activities and found to

possess spasmolytic, anti-inflammatory, antimicrobial, antiulcer, antioxidant, cytoprotective, chemopreventive, breast cancer, wound healing and anti-acne activities but number of other pharmacological activities are yet to be explored. In future study, the isolated principles from *Jasminum sambac* needs to be evaluated in scientific manner using specific experimental animal models and clinical trials to understand the molecular mechanism of action, in search of lead molecule from natural resources.

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