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Bioactive phytochemicals from Jasminum species

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Abstract : The genus *Jasminum* has been a source of various traditionally useful and pharmacologically active species. The plants are cultivated for their bioactive compounds and for religious purpose. Three species *Jasminum multiflorum, Jasminum sambac* and *Jasminum polyanthum* were selected to study their traditional use, chemical composition and pharmacological effects reported in literature. The leaves and flowers of these species are used traditionally as laxative, cardiotonic, alexipharmic, depurative, digestive disorder, analgesic, antidepressant, anti-inflammatory, antiseptic, aphrodisiac, sedative and expectorant effects. The flowers of J. sambac are used as flavor for tea leaves to provide a characteristic jasmine impact. Various bioactive compounds like iridoids, secoiridoids, essential oils and lactones have been isolated and characterized. The secoiridoid glycosides- multifloroside, mutiroside, jusmultiside, multiflorin, sambacosides, Jaspolyside, jaspolyoleoside, isojaspolyoside, augustifolioside, oleopolyanthoside, jaspofoliamoside, jaspolinaloside, jaspolinaloside etc. isolated from *Jasminum* have been the potent compounds. The pharmacological activities evaluated from *Jasminum* were cardiovascular antioxidant, antimicrobial, antidiabetic, anti-ageing antimicrobial, antidiabetic and anticancer activities. As such these species has emerged as good source of traditional medicines. The chemical compounds isolated from these species have been reported for their pharmacological effects. Although, few experimental studies validated their traditional claim, but uncharacterized crude extracts were employed in most of the activities. Such species need to be explored properly for their bioactive principle and exploited as potential drug. The review will help the researchers to select medicinally potential species of *Jasminum* for future research.

***IndexTerms - Jasminum multiflorum, Jasminum sambac, Jasminum polyanthum,* Secoiridoid, Essential oils.**

I. INTRODUCTION

Herbal plants are pioneer for new drug discovery and development, not only for plant constituents used directly as therapeutic agents, but also as precursor for half of the clinical drugs available in the market. The herbal plants are used for the prevention and treatment of various ailments in the developing countries due to their availability to the native people and heavy cost factor of clinical drugs. The herbs have long history of their use in traditional medicines and latter as clinical candidate. It is estimated that about 25% of drugs prescribed are derived from plants. The WHO essential medicine list contains 252 drugs out of which 11% is exclusively from plant origin. The genus Jasminum (Oleaceae) comprises 200 species are distributed throughout tropical and sub-tropical countries. The species are distributed in Eurasia, India and Mediterranean regions. 16 taxa are endemic to India mainly reported from Deccan Penisula, Eastern and Western Himalayas and Andaman and Nicobar Islands [1]. They are commercially grown for their flowers and essential oil production. The plants of these species are shrub or bush form, vines and trees. Many *Jasminum* plants prominently feature white, yellow or pink flowers with sweet fragrance and others are unscented [2].The phytocmemical screening of these species expressed alkaloids, cardiac glycosides, phenols, sterols, tannins, anthranils, sesquiterpenes (farnesol) [3,4], flavonoids (hesperidin), terpenoids (oleanoic acid, geraniol), quinines, saponins, terpenoids and steroidal saponins (daucosterol) and sterols, monoterpenoids, iridoid glucosides in *jasminum sambac* sambacoside (A-G), geraniol, phenylpropanoid (eugenol), sesquiterpene alcohol (farnesol) [5,6] and characteristically known for their iridoids, secoiridoids and jasmine oil. Flowers of *Jasminum* possess therapeutic value in folk medicine and also cultivated for religious purpose. The flowers of *J. multiflorum* are bitter refrigerant, laxative, cardiotonic, alexipharmic, depurative, digestive and useful in vitiated conditions of pitta, inflammation, rheumatism and cephalalgia. The plant of *J. sambac* has been traditionally used as an analgesic, antidepressant, anti-inflammatory, antiseptic, aphrodisiac, sedative, expectorant effects. Roots are used to treat wounds and snake bites. The leaves and flowers have antipyretic and decongestant properties. The flowers are used as flavor for tea leaves to provide a characteristic jasmine impact. The leaves of *J. polyanthum* were grind into juice and treated for urinary tract infections as sedative, mild anesthetic and astringent. Three species *Jasminum multiflorum, Jasminum sambac* and *Jasminum polyanthum* are selected for study with main focus on their traditional use, chemical compounds isolated and pharmacological activities evaluated. The data was withdrawn from Google Scholar, PubMed, Science Direct, Scopus, Krishikosh and Shodhganga.

Traditional uses:

Jasminum multiflorum

Jasminum multiflorum Andr. synonym J. pubescens (Sanskrit: kunda, Bengali: kundaphul, Hindi: chameli, English: star jasmine) is native to India distributed in forests of Western Ghats and sub-Himalaya range upto 1500 m, southeast Asia [7] and throughout China, Malaysia, Taiwan, Europe and Africa [8]. In comparison to the vine type plants of genus *Jasminum* this plant is more commonly grown as woody shrubs that climb upto 20 or more feet by scrambling over its support. *J. multiflorum* possess almost scentless pure white flowers with 8 lobes of about an inch across with axillary clusters. *J. multiflorum* is an evergreen ornamental plant of velvety appearance of leaves and white flowers blooming profusely during winters and commercially cultivated for its

essential oil of flowers, useful in cosmetic industry [9]. Flowers possess therapeutic value in folk medicine and also cultivated for religious purpose. The flowers of *J. multiflorum* are bitter refrigerant, laxative cardiotonic, alexipharmic, depurative and digestive and useful in vitiated conditions of pitta, inflammation, rheumatism and cephalalgia [10]. The leaves and flowers are reported to possess coronary vasodilating and cardiotropic pharmacological properties [11]. The dried leaves are used to treat indolent ulcer and juice to treat typhoid and stomach ache. Roots of the plant are emetic and used as antidote to snake venom [12].

Jasminum Sambac:

Jasminum sambac (Arabian jasmine, Indian jasmine, Sampaguita, Mogra) is the national flower of Philippines, distributed throughout 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 [13]. The plants are ever green in the form of vine or shrub reaching up to 1-3 m. The leaves are ovate; phyllotaxy is opposite or in whorls of three. The flowers blooms throughout the year and are produced in clusters of 3-12 together. They are strongly scented and open at night, close in morning. The plant traditionally used as an analgesic, antidepressant, anti-inflammatory, antiseptic, aphrodisiac, sedative, expectorant and tonic (uterine) effects [13]. Roots are used to treat wounds and snake bites. The leaves and flowers have antipyretic and decongestant properties. The flowers are used for treatment of diarrhea, abdominal pain, conjuctivitis and dermatitis. The leaves and roots are used for treating diarrhoea, fever, pain and as an anesthetic [14,15]. The flowers of *J. sambac* are used as flavor for tea leaves to provide a characteristic jasmine impact [16]. *J. sambac* absolute and essential oil are extensively used in perfumery industry due to their Wine, 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. On the other hand, the essential oil is prepared using hydro-distillation, simultaneous steam distillation-solvent extraction and super critical carbon dioxide extraction [17]. The volatile composition of *J. sambac* absolute varies depending on the environmental conditions and the agricultural practices [18].

Jasminum polyanthus:

J. polyanthum the many-flowered jasmine or pink jasmine is a species of flowering plant native to China and Myanmar. It grows well in subtropical climate. The plant is a strong evergreen twining climber and it is especially noted for its abundant, highly fragrant pink to white flowers. It produces pinkish white flower buds in early spring, followed by 5 petalled flowers (white and pink mixed) which are 2 cm in diameter [19]. It develops into dense bush and produces fragrance wherever it is present. Since it grows extremely fast, It also acts as invasive species in some countries. The leaves were grind into juice and treated for urinary tract infections as sedative, mild anesthetic and astringent. Jasmine species also finds place in cosmetics and used for making perfumes and scents. Flowers are used for skin conditioner and used in shampoos, soaps, creams etc. Flowers were used as folk remedy for hepatitis, stomatitis, and duodenitis in china, Jasmine flowers are also used for decorative purpose [20].

Chemical Composition of *Jasminum* species.

Jasminum multiflorum:

The major chemical compounds reported from this species are secoiridoids derived from iridoid based bicylclic ring iridane opening at 7-8 position. The aqueous extract of J. multiflorum derived secoiridoid glycosides-multifloroside, mutiroside, 10-hydroxy-oleoside-11-methyl ester, 10-hydroxyoleuropein, 10-hydroxyligustroside, jusmultiside, multiflorin [21,22]. Secoiridoid lactones- jasmolactone A, B, C and D [23].

Derivatives - jasmultiside was acetylated to derive jasmultiside octacetate. Methylation and acetylation of mulifloroside was performed to prepare 10-hydroxyoleoside 7, 11-dimethyl ester pentaacetate identical derivative of 10-hydroxyligustroside. Multiroside was derived to prepare 10-hydroxyoleoside 11-methyl ester pentaacetate. 10-hydroxy-oleoside-11-methyl ester have been directly acetylated to pentaacetate acid. An acetylated phenolic derivative 2-p-acetoxy phenyl ethanol along with long chain saturated compounds n-tritetracontane and heptacosane were reported from the flowers of J. multiflorum [24].

Through GCMS[25] the compounds identified from jasmine oil of flowers were indole (0.11 %), cis-jasmone (0.01 %), benzyl alcohol (13.85 %), linalool (4.92 %), benzyl acetate (1.24 %), eugenol (0.15 %), benzyl benzoate (0.69 %), farnesol (7.01 %), methyl palmitate (0.21 %) and methyl salicylate (0.42 %) Another GC-MS analysis was carried out on flowers of *J.multiflorum* extracts prepared by different extraction techniques like solvent extraction/ maceration (methanol), hydrodistillation and headspace solid phase microextraction (HS-SPME). The GC-MS profile of methanol extract yielded nerolidol (42.44 %), benzyl benzoate (39.00 %) and jasmolactone (12.02 %). Hydrodistillation of *J. multiflorum* flowers yielded hexenyl benzoate (35.89 %), β-farnesene (24.62 %) and cadinol (14.30 %) as main constituents. HS-SPME analysis yielded nerolidol (76.56 %), jasmine (15.31 %) and hexyl benzoate (4.40 %). The GC-MS analysis concluded that flowers of J. multiflorum are rich in nerolidol, benzyl benzoate, jasmolactone, jasmine, hexenyl benzoate and β-farnesene.

***Jasminum sambac*:**

The phytochemicals from *Jasminum sambac* contain iridoidal glycosides, linalyl 6-O-malonyl-β-D-glucopyranoside, benzyl6-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) [26], dotriacontanoic acid, dotriacontanol, oleanolic acid, daucosterol, and hesperidin [27]. The compounds isolated from leaves contain sambacosides A, E and F [28], and flowers contain molihuaside A-E, sambaeoside A [29].The volatile constituents consist of benzyl acetate, indole, E-E-α-farnesene, Z-3-hexenyl benzoate, benzyl alcohol, linalool, and methyl anthranilate [30]. The volatile organic compounds from flowers of *J. sambac* were cis-3-hexenyl acetate, linalool, (E)-β-ocimene, benzyl acetate, and (E, E)-α-farnesene were determined using using solid phase microextraction fibers and Gas chromatography with Mass spectroscopy detection [31]. Major constituents identified in essential oil were, eugenol, phenyl ethyl alcohol, geranial, citronellol, farnesol, geranyl acetate, 2-phenyl ethyl acetate, citrinyl acetate, citral (mixture of cis and trans) and benzyldehyde [32].

***Jasminum polyanthum*:**

From leaves and flowers of *Jasminum polyanthum* alkaloids, phenols, quinines, saponins, and terpenoids are phytochemically screened. The major isolated compounds are from secoiridoids class of compounds. The secoiridoids from leaves- jaspolyside, oleoside-11-methyl ester, 7,11oleoside dimethyl ester methylglucooleoside, augustifolioside, oleuropein, isonuezhenide [33].

Table-1Chemical constituents from *Jasminum* species.

Species	Chemical compounds	Ref.
Jasminum multiflorum	Secoiridoid glycosides-multifloroside, mutiroside, 10-hydroxy-oleoside-11-methyl ester, 10-hydroxyoleuropein, 10-hydroxyligustroside, jusmultiside, multiflorin. Secoiridoid lactones- jasmolactone A, B, C and D. The GCMS-nerolidol, benzyl benzoate, jasmolactone, jasmine, hexenyl benzoate and β-farnesene.	21,22,23
Jasminum sambac	linalyl 6-O-malonyl-β-D-glucopyranoside, benzyl6-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. The compounds isolated from leaves contain sambacosides A, E and F , and flowers contain molihuaside A-E, sambaeoside A.The volatile constituents consist of benzyl acetate, indole, E-E-α-farnesene, Z-3-hexenyl benzoate, benzyl alcohol, linalool, and methyl anthranilate.	26,27,28,29,30
Jasminum polyanthum	Secoiridoids-jaspolyside, oleoside-11-methyl ester, 7,11oleoside dimethyl ester methylglucooleoside, augustifolioside, oleuropein, isonuezhenide, jaspolyoside, jaspolyanthoside, GI5, augustifolioside, isojaspolyoside A, isojaspolyoside B, isojaspolyoside C, polyanoside, jaspolyoleoside A, jaspolyoleoside B, jaspolyoleoside C, oleopolyanthoside A, oleopolyanthoside B, jaspofoliamoside C, jaspofoliamoside D, jaspogeranoside A, jaspogeranoside B, jaspofoliamoside G, jaspofoliamoside E, jaspofoliamoside F, jaspolinaloside B, jaspofoliamoside B, jaspofoliamoside A, jaspolinaloside, neopolyanthoside.	33,34,35,36,37,38

From flowers- jaspolyoside, jaspolyanthoside, GI5[34], augustifolioside, isojaspolyoside A, isojaspolyoside B, isojaspolyoside C, polyanoside [35], jaspolyoleoside A , jaspolyoleoside B, jaspolyoleoside C, oleopolyanthoside A, oleopolyanthoside B [36], jaspofoliamoside C, jaspofoliamoside D, jaspogeranoside A, jaspogeranoside B, jaspofoliamoside G, jaspofoliamoside E, jaspofoliamoside F, jaspolinaloside B [37], jaspofoliamoside B, jaspofoliamoside A, jaspolinaloside, neopolyanthoside [38].

Pharmacological activities from *Jasminum* Species.

***Jasminum multiflorum*:**

Cardiovascular activity: In Ayurvedic system of medicine flowers of *J. multiflorum* is reported as cardiotonic. The evaluated water, acetone and ethanol extracts of leaves and flowers of *J. multiflorum* for inhibitory activity of angiotensin converting enzyme (ACE) to investigate its cardiotonic potential and water extract was found to inhibit 92 % of angiotensin converting enzyme[39]. The secoiridoids glycoside, 10-hydroxyoleuropein and multifloroside isolated from aerial parts of *J. multiflorum* exhibited strong coronary dilating and cardioprotective (negative inotropy) activities on isolated guinea pig preparations. The minimum effective concentration (MEC) of 10-hydroxyoleuropein for coronary dilating and cardioprotective activities was 9.0×10^{-6} M (both activities) whereas multifloroside exhibited 3.7×10^{-6} M and 1.5×10^{-6} M, respectively [23]. Secoirridoid lactones, jasmolactone B and D reported to induces dilation (MEC 1.3×10^{-5} M and 4.8×10^{-6} M) and chronotropic and inotropic effects (MEC 2.5×10^{-5} M and 9.7×10^{-6} M) in isolated guinea pig heart coronary, using isoproterenol as standard (MEC 4.7×10^{-7} M and 4.7×10^{-8} M) [21].

Antioxidant activity: The methanolic extract of flowers of *J. multiflorum* has been reported to scavenge DPPH radicals with IC50 value 81 µg/mL using BHT (IC_{50} 12.5 µg/mL) as positive control and the GC-MS analysis of methanolic extract showed the presence of nerolidol, benzyl benzoate and jasmolactone as main chemical constituents [40]. The DPPH scavenging activity of *J. mutiflorum* shows that it can use as a natural reducing agent and free radical scavenger.

***Jasminum sambac*:**

Antimicrobial activity: The therapeutic properties of jasmine essential oil are antidepressant, anxiolytic, antiseptic, aphrodisiac, antispasmodic, cicatrisant, expectorant, galactagogue, parturient, sedative and tonic (uterine). The essential oil and methanol extract of flowers of *J. sambac* were evaluated for its antimicrobial activity against *E. faecalis*, *E. coli*, *S. enteric* and *S. pyogenes*., *B. Cereus* by using disc diffusion and micro dilution methods and also subjected for their antioxidant activity by DPPH free radical scavenging and β-carotene-linoleic acid assays. In the DPPH test system, the IC_{50} value of essential oil and methanol extract were respectively 7.43 and 2.30µg/ml. In the β-carotenelinoleic acid system, oxidation was effectively inhibited by *J. Sambac* and the RAA (Relative antioxidant activity) value of essential oil and methanol extract were respectively 96.6% and 93.9% [41]. The methanol extract of flowers of *J.sambac* showed DPPH scavenging ability with IC_{50}= 208 and leaves collected from the sites Arabian night and Grand Duke of Tuskeny in 80% of methanol extract have DPPH scavenging ability with IC_{50}= 103.7 and IC_{50}= 155.5 respectively[42].

Antidiabetic activity: Ethyl acetate (EAE) and water extract (WTE) of leaves of *J. sambac* showed reduction in plasma glucose level, lipid profile and serum urea in diabetic rats [43]. The efficacy of jasmine flowers applied to the breasts to suppress puerperal lactation was compared that of Bromocriptine by reduction in serum prolactin level.

Anti-inflammatory activity: The anti-inflammatory potential of the ethanol root extract (EJS; 100, 200, and 400 mg/kg, p.o.) of J. sambac was investigated using acute (carrageenan-induced paw edema), and sub-chronic (cotton pellet-induced granuloma) inflammation model of Charles Foster albino rats using diclofenac (10 mg/kg p.o) as a reference standard. It was found that, EJS

(400 mg/kg) and standard significantly ($p < 0.001$) inhibited rat paw edema after 3, 4, and 6 h of treatment as compared to the untreated control. Moreover, EJS inhibited granuloma formation by 3.7%, 5.93%, and 33.58% at 100, 200, and 400 mg/kg, while diclofenac showed 43.40% inhibition in granuloma formation. In addition, EJS extract decreased AST ($p < 0.05$ and $p < 0.05$), ALT ($p < 0.05$ and $p < 0.05$), and lipid peroxidation ($p < 0.05$ and $p < 0.01$) levels, whereas it increased SOD ($p < 0.05$ and $p < 0.01$) and catalase ($p < 0.001$) in rats edematous tissue after acute and sub-chronic inflammation exposure, respectively in comparison to respective model groups. Also, EJS extract decreased lipid peroxidation ($p < 0.001$) levels whereas enhanced SOD ($p < 0.05$ and $p < 0.05$) and catalase ($p < 0.01$) in the serum of acute and sub-chronic inflammation model, respectively, with respect to their model group. Likewise, the standard, diclofenac, markedly ($p < 0.05$) reversed the altered parameters in serum and edematous tissue by both the models [44].

Anti-aging activity: In another study, the anti-aging effect of J. sambac flower extract fermented with Lacto-bacillus rhamnosus (F-FEJS, 0.1%, 0.25%, 0.5%, 1.0%, 2.5%) was assessed in UVB (40 mJ/cm2) or H2O2 (200 µM) -induced aging in HS68 dermal fibroblast cells. It was observed that the extract (2.5%) significantly ($p < 0.001$) reduced intracellular reactive oxygen species production (ROS) stimulated by UVB or H2O2 as revealed by fluorescence microscopy and flow cytometry analysis. Moreover, the extract (2.5%) markedly decreased p53, p21 and p16 levels in H2O2 ($p < 0.001$, $p < 0.001$ & $p < 0.001$, respectively) and UVB treated HS68 cells when compared to H2O2 and UVB treated cells. In addition, the extract led to MMP-1 inhibition, SA-β-Gal positive cells, p-JNK, p-P38, p-ERK, and p-c-jun protein levels whereas efficiently upregulated collagen synthesis-related pathway components (p-smad2/3, TGF-β, COL3A1, and COL1A1), p-Nrf2 and antioxidant gene expression (HO-1) levels with respect to H2O2/UVB treated cells. Likewise, the extract enhanced p-Nrf2 nuclear translocation while down-regulated p-c-jun in the nuclear fractions. Further, it was confirmed that J. sambac flower extract attenuated H2O2/UVB-induced aging, ROS production, and degradation of collagen in HS68 cells through smad2/3, Nrf2, and c-jun pathways [45].

***Jasminum polyanthum*:**

Antimicrobial activity: The aqueous extract of flowers and leaves of *J. polyanthum* 2mg/ml expressed potential antibacterial activity against bacterial strains in comparison to the positive control gentamycin (zone of inhibition =10, MIC=µg/ml). The zone of inhibition in Petri Disc Diffusion Experiment recorded against *Escherichia coli, klebsiella pneumonia, Staphylococcus aureus, Pseudomonas aeruginosa, Aspergillus flavus* for flower extract = 89,13,13,8 and leaves extract = 7,7,8,11,12,10 respectively[46] .

Antidiabetic activity : α-Amylase activity: from the water extract of flowers of *J. polyanthus* Amylase activity was recorded to be 34.07% and the inhibitory effects of starch by flower extract was 37.6% proved as glucosidase inhibitory properties [47]: Therefore, flower has higher anti diabetic effects.

Anticancer activity: In vitro cytotoxic activity was evaluated for leaf and flower extracts of different concentration (10µl, 20µl, 30µl) for HeLa cell lines using DMEM media. DMSO was taken as blank and cell lines were used as a control. After washing 20µl MTT dye was added to all the wells and incubated for 24 hours. OD values were measured using ELISA reader. DMSO and trypsin was used to lysis the cells and also for the washing [48].

Antioxidant activity: The antioxidant potential of ethanol extract of *J. polyanthus* have been investigated. In DPPH Assay flower powder of different concentrations (10-30 mg) were taken in different test tube and 0.1ml of 0.1M DPPH solution was added and mixed well. After 5 minutes of incubation 0.4ml of 50 mM Tris HCl was added and made up to 2ml with distilled water and incubated in dark room for 30 minutes. OD reading was taken at 517 nm using spectrophotometer. Ascorbic acid was used as a standard to calculate the mg/g of DPPH [49].

Conclusion:

The genus *Jasminum* is native to Eurasia India and Mediterranean regions. 16 taxa are endemic to India and the genus is represented by 47 species 3 subspecies and 4 varieties.They are mainly reported from Deccan Penisula, Eastern and Western Himalayas and Andaman and Nicobar Islands. 20 species are reported from flora of Presidency Madras. Flowers of *Jasminum* possess therapeutic value in folk medicine and also cultivated for religious purpose. The flowers of J. multiflorum are bitter refrigerant, laxative cardiotonic, alexipharmic, depurative and digestive and useful in vitiated conditions of pitta, inflammation, rheumatism and cephalalgia. The plant of *Jasminum sambac* has been traditionally used as an analgesic, antidepressant, anti-inflammatory, antiseptic, aphrodisiac, sedative, expectorant effects. Roots are used to treat wounds and snake bites. The leaves and flowers have antipyretic and decongestant properties. The flowers are used as flavor for tea leaves to provide a characteristic jasmine impact. The leaves of *Jasminum polyanthum* were grind into juice and treated for urinary tract infections as sedative, mild anesthetic and astringent. The major chemical compounds reported from *Jasminum multiflorum* are secoiridoids derived from iridoid based bicylclic ring iridane opening at 7-8 position. The aqueous extract of *J. multiflorum* derived secoiridoid glycosides-multifloroside, mutiroside, jusmultiside, multiflorin, jasmolactone and their derivatives. The GC-MS analysis concluded that flowers of J. multiflorum are rich in nerolidol, benzyl benzoate, jasmolactone, jasmine, hexenyl benzoate and β-farnesene. *Jasminum sambac*: The phytochemicals from *Jasminum sambac* contain iridoidal glycosides.The compounds isolated from leaves contain sambacosides A, E and F, and flowers contain molihuaside A-E, sambaeoside A.The volatile constituents consist of benzyl acetate, indole, E-E-α-farnesene, Z-3-hexenyl benzoate, benzyl alcohol, linalool, and methyl anthranilate. Jasminum polyanthum: Jaspolyside, jaspolyoleoside, isojaspolyoside, augustifolioside, oleopolyanthoside, jaspofoliamoside, jaspolinaloside, jaspolinaloside etc. The pharmacological activities evaluated from *Jasminum multiflorum* were Cardiovascular activity and antioxidant. The extract of leaves and flower of *Jasminum sambac* have been evaluated for antimicrobial, antidiabetic, anti-ageing and *Jasminum polyanthum* for antimicrobial, antidiabetic, anticancer and antioxidant activities. The crude extract was used in evaluation of most of the activities. More isolation and characterization of pure compounds are needed to examine their biological effects to prove these species as potent drugs potential to their traditional use.

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