



ETHNOBOTANICAL, PHYTOCHEMICAL AND PHARMACOLOGICAL APPROACHES OF *JASMINUM MESNYI* *HANCE: A REVIEW*

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Abstract

Jasminum mesnyi Hance commonly known as “Peeli chameli” belongs to family oleaceae, is an evergreen and widely used plant in traditional medicines. It has been comprehensively used by the ethnic groups all over India to treat various ailments which mostly consist of diabetes, muscular pain, joint disorder, spinal pain, migraine, anorexia, depression, stress, anxiety, peridontitis, GIT disorder, mouth ulcers, nocturnal ejaculation, menstrual disorder and hepatitis. Phytochemical studies accepted the different secondary metabolites namely flavonoids, saponins, terpenoids, glycosides, secoiridoid and iridoid. Pharmacological evaluation revealed its antioxidant, wound healing, antimicrobial, antihyperglycemic, antihelminthic and antiulcer activities. A number of researchers have endeavoured to authenticate the claims of the plant and succeeded in proving some. Still many of the traditional uses of this plant are not substantiated up to now. This article features the review of traditional uses, botany, chemical constituents and pharmacological activities of *J. mesnyi* to date. This will sanguinely support and helps the future research on the plant.

Keywords: *Jasminum mesnyi*, Phytochemistry, Pharmacological activities

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INTRODUCTION

India is considered as herbal goldmine, having 20,000 plant species, out of which 2500 possess medicinal importance, from them nearly 25000 effective formulations are prepared. More than 7800 manufacturer in India, are engaged in the production of herbal formulation, which are used by around 1.5 million practitioners. Due to the rapid proliferation of herbal medicine, the webs of researchers are becoming more attentive to explore the hidden treasure of herbal medicine in both developing and developed countries. *Jasminum mesnyi* is still one from them, which requires its authenticity in the field of medicine. The genus *Jasminum* belongs to Oleaceae family having 200 species throughout the world and out of which

around 40 species are native to India.^[1, 2] *J. mesnyi*, well known as Yellow jasmine, is an perennial shrub. ^[3] Being known for its fragrances, the flowers are used in aromatherapy for uplifting the mood. The leaves are traditionally used to treat anxiety, anorexia, diabetes, depression, gastric disturbance, muscular pain, nocturnal emission, oral sores and stress. Wound healing potential of roots and antioxidant, antihelminthic and antimicrobial efficacy of leaves were substantiated.^[4, 5] The literature survey revealed that the plant is used by alternative and complementary medicine professionals as a folk remedy for a variety of disorders, but very little effort has been made to test its effectiveness through scientific screening on animal models and

clinical studies. This review focuses on various traditional uses, phytochemical and pharmacological studies conducted on *J. mesnyi* by several researchers. The unusual prospectives of this plant are also expatiated.

TAXONOMICAL CLASSIFICATION^[6]

Kingdom: Plantae (Plants)
Subkingdom: Tracheobionta (Vascular plants)
Superdivision: Spermatophyta (Seed plants)
Division: Magnoliophyta (Flowering plants)
Class: Magnoliopsida (Dicotyledons)
Subclass: Asteridae
Order: Scrophulariales
Family: Oleaceae
Genus: *Jasminum*
Species: *mesnyi*
Botanical name: *Jasminum mesnyi* Hance

Synonym :*Jasminum primulinum*Hemsl.

Common names: Peelichameli

Vernacular names: Primerose, Jasmine, Sansonae, Peelimalati, Yellow Jasmine, Japanese Chameli, Japanichameli, primerose jasmine, primrose jasmine, Chinese jasmine

AYURVEDIC PROPERTIES^[7]

Rasa – Tikta, Kashaya
Guna – Laghu, Rooksha
Veerya – Seeta

BOTANICAL DESCRIPTION

It is a tall, slender stemmed evergreen shrub with long arching stem in figure 1. The stems climb like a sprawling vine. It grows in a fountain like mound 5-10 ft in height and spread. Leaves are green in color, opposite and trifoliolate. Flowers are usually solitary, axillary or rarely terminal, yellow in color having 6-10 petals arranged in a semi double whorl.^[8] These are normally seen in the winter and spring. The calyx is short having 6 lobes. The corolla is bright yellow in color with orange throat. The flowering tubes are stout, obovate, rounded and 2.5 cm long. Stems are slender arching, square in cross section and green, becoming woody with age.^[9] Fruits are simple berry, ellipsoid, up to 1 cm long and 6 mm in diameter, each part containing 1 or 2 seeds.^[10]



Figure 1: Plant of *Jasminum mesnyi* Hance.

PLANT GEOGRAPHICAL DISTRIBUTION

The plant grows at an altitude of 1300-1500 meter. It is native to tropical, subtropical and warm temperate region of America, Australia, Bangladesh, China, Pakistan and India mainly in Uttrakhand, Haryana, Uttarpradesh and Maharashtra.^[11]

CULTIVATION AND COLLECTION

The cultivation of *J. mesnyi* is done in well drained loamy soil having pH 6.0 to 7.5, but it can also be grown in black, laterite and clay soil. A good drainage system is required, as the plant is highly susceptible to water logging during cultivation. It can be propagated by layering, cuttings or root suckers method. The first flowering starts with in the year and harvesting is done in the months of March to May.^[12, 8]

PHYTOCONSTITUENTS

From the literary aspects, the phytoconstituents commonly present in *J. mesnyi* are glycosides, saponins, flavonoids, terpenoids, secoiridoid and iridoids and major phytoconstituents include secoiridoids glycosides such as jasminin, isojasminin, jasmesoside, jasmisnyroside, jasmoside, 2-hydroxyjasminin 9-hydroxyjasmesoside, jasminin 10-O-β-d-glucoside, 9hydroxyjasmesosidic acid, 4-hydroxyisojasminin, jasmosidic acid, verbascoside, syringin, rutin, caffeic glycoside esters, polyu- moside, forsythoside B, Echinacoside, Ceryl alcohol, α-amyrin, β-sitosterol, ursolic acid, mannitol, quercetin, secoiridois. It also contains essential oil like benzopyrone coumarin (48.9%), linalool (14.8%) are present in large quantity, αterpineol (5.2%), (Z)-asarone (3.5%), (E)-phytol (3.4%), and geraniol (3.3%), they are present in less

quantity.^[11,13-18]The structures of major constituents are shown in Figure 2.

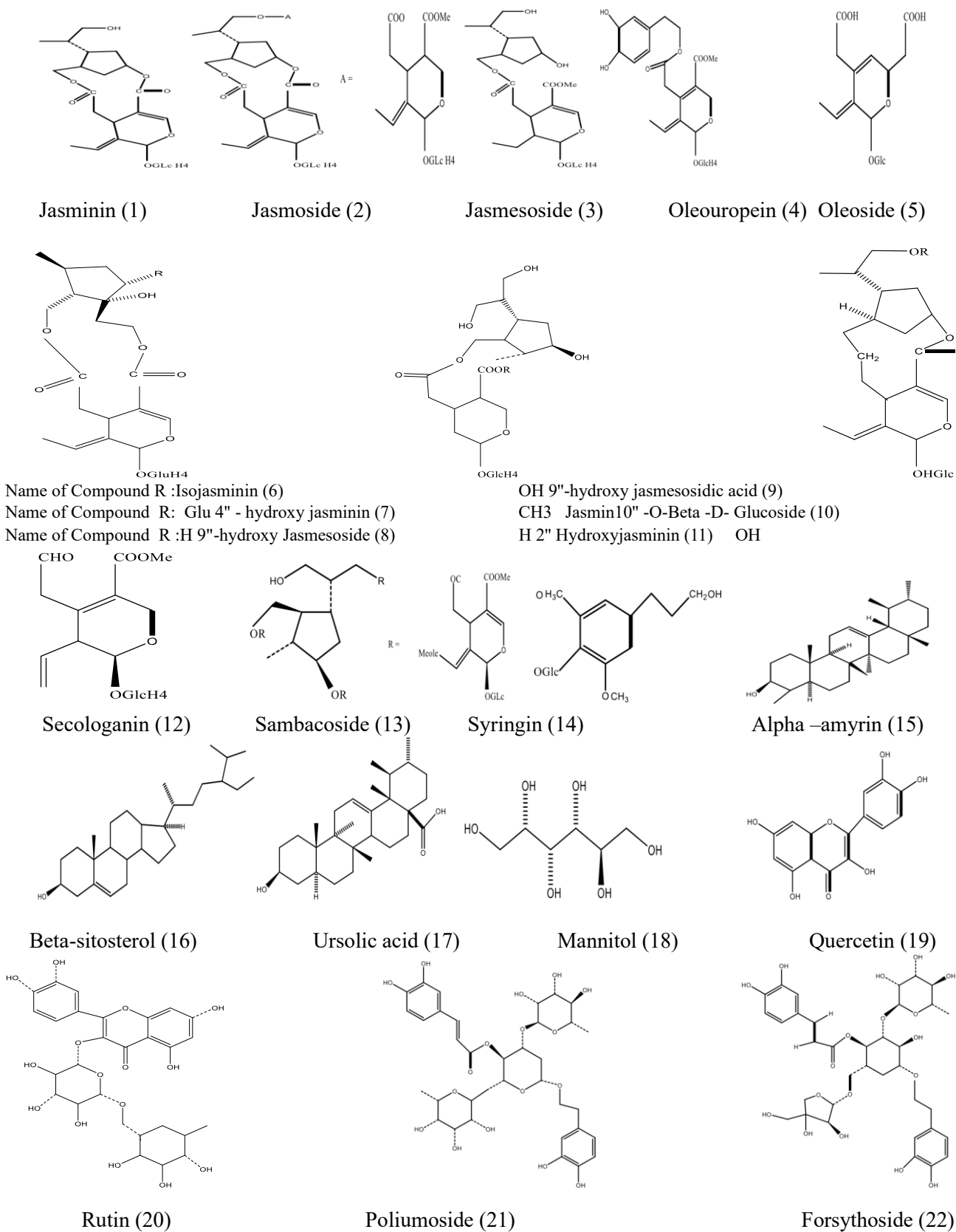


Figure 2: Major chemical constituents reported from *Jasminum mesnyi*

TRADITIONAL USES

In ancient times, the plants are mostly used in diabetes, stress, anxiety, depression, gastric disturbance, periodontitis (Rigg's diseases), mouth ulcers, nocturnal ejaculation and muscular pain in traditional healers.^[19] Leaves are favorable in menstrual disorder, vertebrae (backbone) pain, migraine and joint disorder while the decoctions of flowers are used in hepatitis. In some villages of India, the leaves are also employed as galactagogue, antihelminthic and in treatment of ruminant abdomen problem by veterinarian.^[5] Paste of its flowers has been used for treating sunburns, rashes and healing of wounds. The roots are used in skin infections. The oil of *J. mesnyi* are used in aromatherapy and to relieve stress.

Miscellaneous Uses

It is an ornamental plant and used to trail over fences or walls. It is spectacular in masses and adds interests to mixed shrub hedges and screens. Used for erosion control on banks or slopes where its long trailing cane like stems will take root upon touching the ground.^[8]

Market Availability

It is available in the market under the name "PAHARI BUTTI" which is antidiabetic formulation and it contains *J. mesnyi* as its one of the ingredient.^[4]

Economic Importance

It is used for ornamental purpose and perfumery industries.^[8]

BIOLOGICAL ACTIVITIES

Antioxidant activity n-butanolic and ethyl acetate fractions of methanolic extract of *J. mesnyi* leaves using DPPH method, nitric oxide scavenging activity and reducing power assay. The reference standards used were rutin and ascorbic acid. The dose dependent free radical scavenging effect was observed in both fractions in all the g/ml and $\mu\text{g/ml}$, 5.43 \pm 0.25 $\mu\text{g/ml}$ 6.22 \pm 6.65 $\mu\text{g/ml}$ models. The IC₅₀ values 153.45 g/ml were obtained in ethyl acetate fraction, n-butanol fraction, rutin and ascorbic \pm 0.24 \pm 6.54 acid respectively. g/ml, \pm 1.58 $\mu\text{g/ml}$, 35.12 \pm 9.95 $\mu\text{g/ml}$ In nitric oxide scavenging activity, the IC₅₀ values 141.54 g/ml were obtained in ethyl acetate, n-butanol fractions, \pm 0.32 $\mu\text{g/ml}$ and 29.93 \pm 0.95 $\mu\text{g/ml}$ 21.06 Lascorbic acid and rutin, respectively. The results obtained from the experimentation showed that the n-butanolic

fraction has good reducing potential and better free radical scavenging activity as compared to ethyl acetate fraction.^[20] The aqueous and methanolic extracts (90%) of leaves of *J. mesnyi* by DPPH scavenging method. The total phenolic and flavonoids content were also determined. The IC₅₀ values represents that 90% methanolic extract (IC₅₀ 25.27 \pm 0.6 $\mu\text{g/ml}$) was more effective than aqueous extract

(71.84 \pm 0.06 $\mu\text{g/ml}$) but significantly less effective than ascorbic acid (8.84 \pm 0.05 $\mu\text{g/ml}$) and rutin (3.78 \pm 0.153 $\mu\text{g/ml}$). Even the IC₅₀ values of lipid peroxidation test showed that methanolic extract (IC₅₀ 84.69 \pm 0.008 $\mu\text{g/ml}$) have more antioxidant potential as compared to aqueous extract (IC₅₀ 145.62 \pm 0.007 $\mu\text{g/ml}$) but lesser than BHT (IC₅₀ 48.89 \pm 0.01 $\mu\text{g/ml}$).^[21]

Antihelminthic activity

The anthelmintic potential of ethanolic extract of *J. mesnyi* leaves against adult earth worm *Eisenia fetida* was at a dose level of 20 and 40 mg/mL. The albendazole 10 mg/ml was taken as reference drug. Time taken to paralysis and death of the worm was observed and result showed that, drug extract having dose of 40 mg/ml took 24 min and dose of 20mg/ml took 92 min to paralyze the worms.^[22]

Antiulcer activity

Ethanolic extracts of *J. mesnyi* and *Triticum aestivum* leaves were for their antiulcer activity in albino wistar rats at the dose of 200 and 400 mg/kg body weight using aspirin induced ulceration and Pylorus ligation ulceration method. Omeprazole (30mg/kg body weight) was used as standard drug. Both the plants were estimated for ulcer index and percentage protection whereas volume of gastric secretion, free acidity, total acidity and pH were also determined in both the model using combination (1:1) of extracts of both plants. The ethanolic extract individually and in combination showed significant ($p < 0.001$) ulcer protective action in dose dependent manner in both the models. A decrease in gastric juice volume, free acid, total acid and increase in pH were also favour the protective effect of both the plants.^[23]

Antihyperglycemic activity

The n-butanol fraction of methanolic extract of leaves of *J. mesnyi*, was screened for its antihyperglycemic activity by oral glucose tolerance test and compared with metformin (0.5g/kg) which is used as a standard drug in same

experiment. The rats treated with n-butanolic fraction (300mg/kg body wt.) of *J. mesnyi* showed lesser increase in serum glucose levels (16.97%) in pretreated rats in comparison to metformin (18.59%) pretreated rats. [20]

The ethyl acetate, chloroform, ethanolic and aqueous extract of leaves of *Clerodendrum inerme*, *J. mesnyi* and *Caliistemon citrinus* for their antidiabetic effect at a dose level of 400 and 600mg/kg p.o. in rats by nicotinamidestreptozotocin induced type II diabetic model. The metformin was used as standard drug. The results showed *J. mesnyi* Hance extracts capable of lowering the blood glucose levels after 21 days. [24]

Wound healing activity

The wound healing potential of ethanolic and ethyl acetate extract of root of *J. mesnyi* on the diabetic rats, for 21 days, at a dose of 200 mg/kg and 400 mg/kg body weight using excision wound model. The increased rate of wound contraction and lesser period of epithelialization in rats support the usage of ethanolic extracts of roots *J. mesnyi* in diabetes wound. [4]

Antimicrobial activity

The antimicrobial potential of partitioning fractions (hexane, diethyl ether, ethyl acetate and methanol) of ethanolic extracts of leaves of *J. mesnyi* against gram positive (*B. anthracis*, *B. subtilis* and *S. aureus*) and gram negative (*V. parahaemolyticus*, *A. hydrophila* and *E. coli*) bacteria by broth dilution and agar disc diffusion assay using the concentration of 25, 50, 100, 250 and 500 µg/ml. At a concentration of 250 µg/ml diethylether fraction showed remarkable inhibition of growth of *Aeromonas hydrophila* and *Vibrio parahaemolyticus* with zone of inhibition of 17 and 19mm, respectively. On the other hand, the hexane fraction was found to be more effective against gram-positive test bacterial pathogens (*Bacillus anthracis* and *Bacillus subtilis*) with inhibition zones of 19.6 mm and 17.5 mm, respectively. [25]

CONCLUSION

Herbal medicines are the boon of godas they have immense potential to treat the diseases with least side effect and with high safety and efficacy. Scrupulous screening of literature disclosed that *J. mesnyi* is one of most trendy remedy for curing variety of ailments among the various ethnic groups, Hakims, Vaidyas, and homeopathic practitioners. The plant has been screened for its antimicrobial, antiulcer, antioxidant, wound

healing, antihyperglycemic and antihelmintic activities, but many other biological studies are yet to be explored.

Therefore scrupulous work is required, because the literature shows limited research in several areas to understand and reveal the mode of its pharmacological activities. In addition, isolation, purification and identification of new entities from *J. mesnyi* are required as it may help further to establish the application of isolated compound in treatment of various acute and chronic diseases and provide more assurance in application of isolated compounds.

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