

A REVIEW ON BOTANICAL REMEDIES FOR ORAL HEALTH AND THE EFFICACY OF A JASMINUM OFFICINALE

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ABSTRACT

With an emphasis on the plant's pharmacological traits and traditional applications, this study investigates the medicinal potential of *Jasminum officinale*. The classification of *Jasminum officinale* within the plant kingdom is elucidated, emphasizing its botanical relevance. The causes and bacteriology of mouth ulcers, a frequent oral ailment with a variety of etiologies, are covered in detail. The *Jasminum officinale* extract can be used against streptococcus mutans. Overall, this study contributes to the understanding of traditional medicine, and oral health care, providing insights into the potential use of *Jasminum officinale* in treating mouth ulcer.

INDEX TERMS

Jasminum officinale, Traditional medicine, Herbal Formulation, Oral health care.

I. INTRODUCTION

Herbal crude drugs having different activities are used for the medicinal therapy, since longer due to their diversity in Pharmacological and therapeutic applications of medicinal herbal plants. In India, reports of medicinal plants number about 20,000. Merely 7,000 to 7,500 plants are employed in the treatment of various illnesses.

Indian system of medicines comprises of Ayurveda, Unani, Siddha, Homeopathy, Naturopathy and Yoga. Each of which employs some type of herbal element, crude drugs are less effective because their potency hasn't been rigorously verified in accordance with Pharmacological guidelines. Because the components extracted from the medicinal plants were found to be effective in treating human ailments, they were employed for their Pharmacological function.

ORAL HEALTH

Oral health is a vital indicator overall well-being, quality of life and general health with historical roots in Unani medicine. Herbal drug *Jasminum officinale* showed a sustainable effect when compared with 0.2% chlorhexidine mouthwash with the efficacy and safety of the prepared herbal mouthwash in maintaining oral health which was assessed through scientific parameter.

BACTERIOLOGY

Dental plaque is the main factor in initiating and progressing oral diseases. Inflammatory periodontal diseases are significant public health related problem. Dentifrices and mouthwashes are supplements to toothbrushing and dental flossing, aid in reducing plaque and calculus and control gingivitis. Numerous beneficial and harmful bacteria and microorganisms can now enter the mouth through the wound surface. These microorganisms release toxins that promote more cell death and enlarge the ulcer. Additionally, the ulcer's lining microorganisms at this point. This process keeps happening until the harmful agent is eliminated, the body's immune system finds a remedy, and the harmful bacteria are reduced in size. A lot of variables affect how long this takes. Proteus, Bacillus, Enterococcus, E. Coli, Staphylococcus, and Candida species are essential members of the normal oropharyngeal flora.

MOUTH ULCERS

Sores on the inside of the mouth lining are called mouth ulcers. Usually, they appear on the inside of the lips, cheeks, underside, and border of the tongue. Pharmacies sell medications that can ease discomfort and promote the healing of mouth ulcers. Sores, lesions, abrasions, laceration, or any open break in the lips, mouth, or tongue mucosa are examples of mouth ulcers. Also known as stomatitis, mouth ulcers can be a sign of a number of minor to major illnesses, ailments, and diseases. Infections, vitamin shortages, trauma, inflammation, cancer, and other illnesses and aberrant processes can all lead to mouth ulcers.

CAUSES

It is still unclear why mouth ulcers originated in the first place. About forty percent of individuals who get oral ulcers have a family history of the condition. Ulcers can sometimes be associated with medical conditions. These include damage from improperly fitting dentures, vigorous tooth brushing, etc. variations in hormone concentrations. For some women, mouth ulcers seem to happen right before their menstruation. In certain instances, deficiency in iron or specific vitamins (such folic acid and vitamin B12) could be a contributing factor. Very seldom, a food allergy could be the reason. Some people are thought to get mouth ulcers as a result of stress. Certain medications may result in oral ulcers.

Examples of medicines that can cause mouth ulcers are: nicorandil, ibuprofen etc. Mouth ulcers are more common in people with Crohn's disease, coeliac disease, HIV infection etc.

BACTERIA OCCURRED IN MOUTH ULCER

1. Escherichia coli.
2. Pseudomonas aeruginosa.
3. Staphylococcus aureus.
4. Bacillus subtilis.
5. Enterococcus faecalis.

Jasmine is botanically known as *Jasminum officinale* or *Jasminie*, belongs to the olive family of *Oleaceae*. Jasmine is analgesic, antidepressant, antiseptic, expectorant, aphrodisiac, sedative, stomachic, diuretic, depurative, astringent, stimulating, anti-oxidizing, anthelmintic and anti-inflammatory in nature. Furthermore, there are other numerous advantages this amazing plant offers to humanity. These benefits have been attributed to its phytochemical, medicinal and Pharmacological properties.

Jasminum officinale indicated the presence of alkaloids, flavonoids, tannins, terpenoids, glycosides, steroids, essential oil and saponins. Studies revealed that the plant exerted antimicrobial, insecticidal, antioxidant, antifertility and dermatological effects.

CLASSIFICATION OF JASMINUM OFFICINALE

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|--------------------|----------------------------|
| Kingdom: | Plantae |
| Subkingdom: | Viridiplantae |
| Division: | Tracheophyta |
| Class: | Magnoliopsida |
| Order: | Lamiales |
| Family: | Oleaceae |
| Genus: | <i>Jasminum</i> |
| Species: | <i>Jasminum officinale</i> |
| Synonyms: | white jasmine, jessamine |



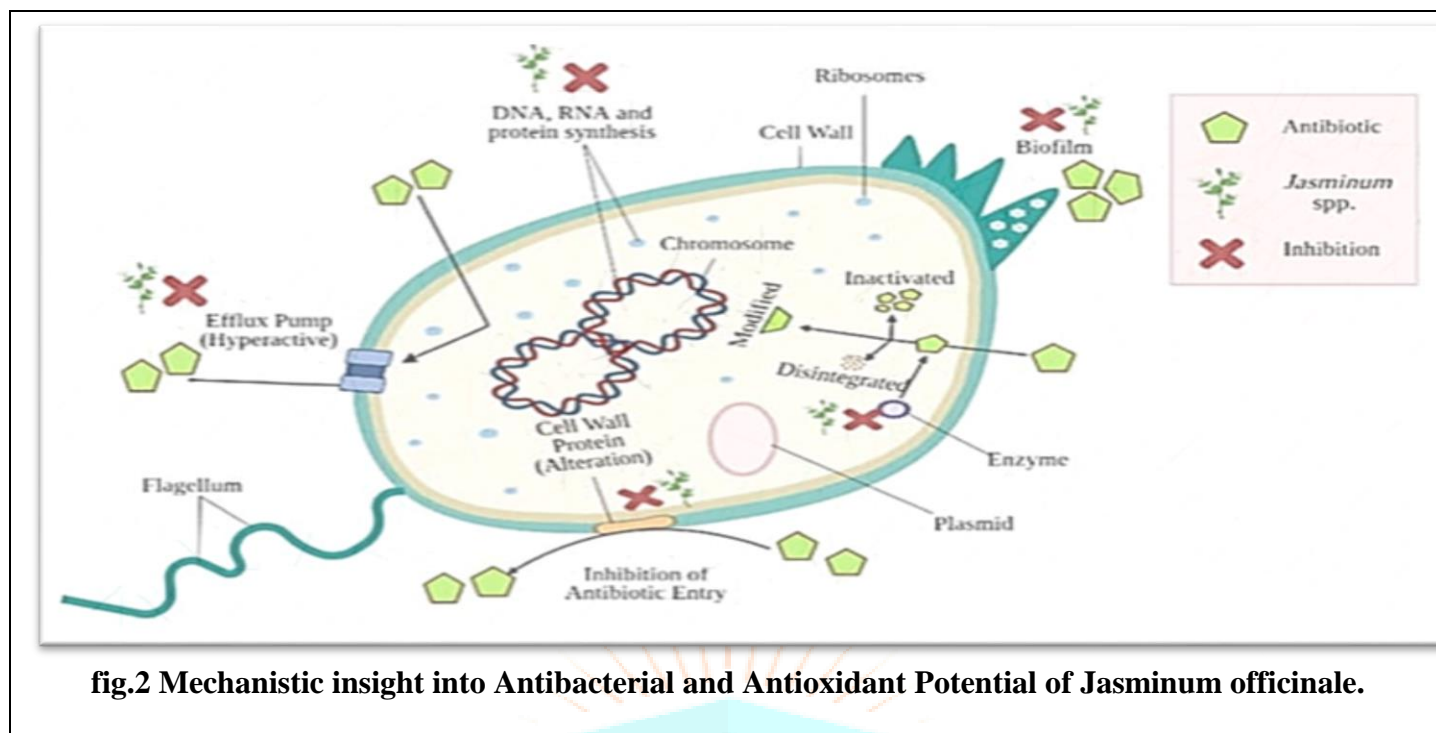
fig.1 *Jasminum Officinale* plant

PHYTOCHEMISTRY

The preliminary phytochemical analysis of the aqueous extract of *Jasminum officinale* leaves indicated the presence of alkaloids, coumarins, flavonoids, tannins, terpenoids, glycosides, emodine, leucoanthocyanins, steroids, anthocyanins, phlobatinins, essential oil and saponins.

Cell-free extracts from callus of *Jasminum officinale* contained epoxidase activities with isopentyl pyrophosphate, isopentenol, geraniol and nerol as substrates and also hydratase activities towards the resulting terpene oxides [25].

Six iridoid glycosides were identified from the buds of *Jasminum officinale* var. *grandiflorum*: jasgranoside B, 6-O-methy-catalpol, deacetyl asperulosidic acid, aucubin, 8-dehydroxy shanzhiside and loganin[26].



PHARMACOLOGY

ANTIMICROBIAL:

The in-vitro anti-bacterial activity of ethanolic extracts of different parts (flowers, stems plus leaves and roots) of *Jasminum officinale* was evaluated against four reference bacteria (*Staphylococcus aureus* ATCC 29213, *Enterococcus faecalis* ATCC 29212, *Escherichia coli* ATCC 25922 and *Pseudomonas aeruginosa* ATCC 27853). The ethanolic extracts of all parts of the plant showed considerable activity against all the tested bacteria. The MIC of the ethanolic extracts of flowers and stems plus leaves against all the tested bacteria was 2 mg/ml and the MIC of roots against *S. aureus*, *E. faecalis* and *E. coli* was 4 mg/ml, while the MIC of root extract against *P. aeruginosa* was 2 mg/ml [20]. The *Jasminum officinale* flowers extracts were evaluated for antifungal activity against *Candida albicans* and *Aspergillus niger*, and antibacterial activity against *Pseudomonas aeruginosa*, *Staphylococcus aureus*, *Klebsiella pneumoniae*, *Bacillus pumilis*, *P. vulgaris* and *E. coli*.

ANTIOXIDANT:

The antioxidant potential of the aqueous extract of *Jasminum officinale* leaves was evaluated in vitro using free radical scavenging assays for DPPH, NO, superoxide and ABTS radicals in addition to reducing power assessment. The extract possessed significant antioxidant potential. The IC₅₀ values for DPPH, NO, superoxide and ABTS radicals were 41.16, 30.29, 20.19, and 29.48 µg/ml respectively as compared to the standard, ascorbic acid, which showed 42.79, 36.74, 38.22, and 45.57 µg/ml, for the same radicals [16].

The antioxidant property of *Jasminum officinale* methanol and ethanol extracts was determined by hydrogen peroxide method. Both extracts possessed antioxidant activity, but the ethanolic extract showed the more potent activity [19].

ANTIFERTILITY:

The antifertility effect of an aqueous extract of fresh floral buds of *Jasminum officinale* var. *grandiflorum* was studied in female rats. The extract at oral doses of 250 and 500 mg/kg produced a dose dependent significant anti-implantation effect, but didn't produce complete infertility. Treatment of animals during day 8 to day 12 to day 20 of pregnancy did not produce any significant abortifacient activity. There was no significant change in the weight and length of the fetuses delivered by rats treated with extract and no abnormalities were seen in the organs of the offspring. The extract produced a significant decrease in serum progesterone levels on day 5 of pregnancy which may be responsible for the anti-implantation effect [21].

DERMATOLOGICAL:

Ampucare was a topical oil-based preparation containing *Azadirachta indica*, *Berberis aristata*, *Curcuma longa*, *Glycyrrhiza glabra*, *Jasminum officinale*, *Pongamia pinnata*, *Rubia cordifolia*, *Terminalia chebula*, *Trichosanthes dioica*, *Symplocos racemosa*, *Ichnocarpus frutescens*, *Capsicum abbreviata*, *Nymphaea lotus* etc. Application of ampucare in second-degree burn showed burn healing effect with enhancement of antioxidant function. It increased wound contraction, decreased NO, decreased xanthine oxidase activity, increased protein level, increased vitamin C, reduced glutathione and decreased MDA in blood samples [22-24].

CONCLUSION

Jasminum officinale, commonly known as jasmine, exhibits a plethora of medicinal properties, including antimicrobial, antioxidant, antifertility, and dermatological effects. Its antimicrobial activity against bacteria and fungi such as *Staphylococcus aureus*, *Escherichia coli*, *Pseudomonas aeruginosa*, and *Candida albicans* suggests its potential in preventing and treating oral infections, including gingivitis and mouth ulcers. Additionally, its antioxidant properties can help combat oxidative stress in the oral cavity, contributing to overall oral health. Furthermore, *Jasminum officinale* dermatological effects, particularly in wound healing and inflammation reduction, could aid in the treatment of oral ulcers, promoting faster healing and alleviating discomfort.

Incorporating *Jasminum officinale* into oral care products could provide a natural and effective alternative to conventional treatments, with the potential for fewer side effects. Further research and clinical studies are warranted to validate its efficacy and safety for oral health applications.

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