

Antimicrobial, Anti-inflammatory, Analgesic Potential and Cytotoxic Activity of *Salvadora persica* : A Review

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ABSTRACT

Salvadora persica is a popular teeth cleaning stick throughout the Arabian Peninsula, as well as the wider Muslim world. Also commonly referred to as miswak. *S. persica* exhibited significant antimicrobial activity against both aerobic as well as anaerobic bacteria collected from teeth by different researchers in the various parts of world. Dental plaque is a general term used for the diverse microbial community (predominantly bacteria) found on the tooth surface, embedded in a matrix of polymers of bacterial and salivary origin. Plaque develops naturally on teeth, and forms part of the defense systems of the host by helping to prevent colonization of enamel by exogenous (and often pathogenic) microorganisms (colonization resistance). *S. persica* is found to be a multipurpose plant and possesses several agro-pharmaceutical applications. Toothbrushes prepared from the roots and small branches of *S. persica*, to be highly useful as maintainer of teeth. Plant possess anti-microbial, anti-plaque, aphrodisiac, alexiteric, analgesic, anti-inflammatory, anti-pyretic, astringent, diuretic and bitter stomachic activities. It has great medicinal use in the treatment of nose troubles, piles, scabies, leucoderma, scurvy, gonorrhoea, boils and toothache, to treat hook worm, venereal diseases, for teeth cleaning, in rheumatism, cough and asthma, to lower cholesterol plasma levels, reestablishment of the components of gastric mucosa, and as a laxative.

Keyword: *Salvadora persica*, A review, Antimicrobial, Anti-inflammatory, analgesic, Cytotoxic.

INTRODUCTION

Meswak (*Salvadora persica*) is one of the most commonly used medicinal plants for oral hygiene among global Muslim community. *Salvadora persica* has antiurolithiatic properties. Used for centuries as a natural toothbrush, its fibrous branches have been promoted by the World Health Organization for oral hygiene use. Research suggests that it contains a number of medically beneficial properties including abrasives, antiseptics, astringent, detergents, enzyme inhibitors, and fluoride¹⁻¹⁷. Previous studies have reported that *S. persica* extracts were effective against *Streptococcus*

mutans and *Streptococcus faecalis*, even using low extract concentrations. Plaque is found preferentially at protected and stagnant surfaces, and these are at the greatest risk of disease. Moreover, the attachment, growth, removal and reattachment of bacteria to the tooth surface¹⁸⁻²³ are a continuous and dynamic process. Dental plaque, biofilms of microorganisms on tooth surface, plays an important role in the development of caries and periodontal disease.

Antimicrobial activities

According to both antimicrobial assays, the aqueous extract inhibited all isolated microorganisms, especially the *Streptococcus* spp., and was more efficient than the methanol extract, which was resisted by *L. acidophilus* and *P. aeruginosa*. In vitro antibacterial effect of miswak pieces without extraction has been¹⁹⁻²⁹ found most pronounced on *P. gingivalis*, *A. actinomycetemcomitans*, and *H. influenzae*, less on *Strep. mutans*, and least on

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L. acidophilus. The antibacterial effect of suspended miswak pieces suggested the presence of volatile active antibacterial compounds.

Cytotoxic activity

Both *persica* and CHX mouthwashes were toxic to macrophage, epithelial, fibroblast, and osteoblast cells in a concentration-dependent manner.

Tick-repellent properties

The *S. persica*, *Pistacia*, and *Juniperus phoenicea* were evaluated using host-seeking nymphs of *Ixodes ricinus* in the laboratory for tick-repellent effects of the essential oils³⁰⁻⁴⁵. Significant tick-repellent effects were observed for the oils of all three species, but the duration of action was short.

Anti-inflammatory and analgesic potential

The extract of stem of *S. persica* was reported to possess anti-inflammatory activity.

ACE-inhibiting ability

In vitro screening has reported that *S. persica* possesses high ACE-inhibiting ability.

Anticonvulsant and sedative potential

The extracts of *S. persica* extended sleeping time and decreased induction time induced by sodium pentobarbital; in addition it showed protection against pentylenetetrazol-induced convulsion by increasing the latency period and diminishing the death rate⁴⁶⁻⁵¹.

Removal of smear layer and occlusion

S. persica contains potential antimicrobial anionic components, and the capillary electrophoresis is a convenient method for their identification and quantification⁵²⁻⁶⁹.

CONCLUSION

S. persica, is widely used in the antimicrobial, cytotoxic activity, anti-inflammatory and analgesic potential. Medicinal plant property of *S. persica* is due to presence of natural bioactive compounds.

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Conflict of Interest: None to declare.

Ethical Clearance: In our review, all these major pharmacological activity were complete analysis under the biological department of College of Science for Women in Hillah city.

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