



Review Article

Miswak (Salvadora Persica) Oral Mouth Wash: A Review of Literature.

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Abstract: Due to their affordability and accessibility, natural chewing sticks like *S. persica* miswak are still utilized in many underdeveloped nations. The purpose of this review is to compile evidence about Miswak mouthwash's ability to improve oral health. The keywords "Miswak", "Salvadora persica", "plaque", and "oral health" were used in the PubMed and Google Scholar databases to find relevant articles published between 2000 and December 2025. Each study found that miswak has a beneficial anti-plaque effect. The plaque score significantly decreased when *Salvadora persica* extract was used. However, compared to the gold standard chlorhexidine mouthwash, this reduction was less. Because of its effectiveness, safety, accessibility, affordability, and convenience of use, *Salvadora persica*-containing rinse may be a good oral hygiene substitute for people of various ages, socioeconomic backgrounds, and medical problems, particularly as a long-term measure.

Keywords: *Salvadora persica*, Miswak, Mouth wash, Oral Rinse, Oral health.

INTRODUCTION

The most important aspect of general health is oral health. The general quality of life and well-being is significantly affected by poor oral hygiene. Poor oral health has been linked to a number of systemic and

chronic illnesses [1]. One of the most common methods utilized to maintain oral hygiene is to use a toothbrush and dentifrices. Nonetheless, there are numerous ways to maintain and preserve dental and oral hygiene worldwide. Even though toothbrushes

and dentifrices are widely used, chewing sticks are used in many regions of the world for natural tooth cleaning [1]. Due to their accessibility, affordability, and ease of use, chewing sticks made from the twigs, stems, or roots of several plant species are still used in many developing nations as a natural tooth-cleaning method [2].

Salvadora persica, the most widely used plant to make chewing sticks, is the source of these sticks, which are known in Arabic as "miswak." The Arak tree's roots are typically used to make miswak, while some sticks are made as well from the twigs and stem [3]. With its fibers functioning as bristles and releasing antimicrobial agents like silica, fluoride, and essential oils, Miswak, a natural toothbrush made from the *Salvadora persica* tree, offers oral hygiene through mechanical cleaning and advantageous chemical compounds, reducing plaque and bacteria, fighting inflammation, and promoting gum health [4, 5].

Miswak sticks became widely used during the Islamic Golden Age, when Islamic scholars emphasized the need of dental cleanliness. The use of it was highly advised by Prophet Muhammad. The World Health Organization also endorsed miswak in 1987 as an adjunct for patients who lack access to routine oral hygiene products [6, 7].

Using teeth brushes and interdental cleaning tools, the individual is primarily responsible for controlling supragingival plaque. Microbial plaque buildup in and around the dentogingival complex is the main cause of gingivitis; when this plaque is eliminated, the inflammatory lesion completely disappears. Although mechanical plaque management is an essential part of periodontal therapy, the clinical and microbiological response may be limited by factors like accessibility or the existence of plaque-retentive regions. Additionally, a significant percentage of people find that mechanical cleaning is insufficient to preserve gingival health and, in susceptible individuals, to stop the onset, progression, or recurrence of periodontal disease [8].

This lends support to the idea of using agents to manage plaque with the least amount of intervention and skill. Chemical supragingival plaque control is based on this concept. Numerous chemical agents with antibacterial or antiseptic properties have been employed. The most studied and efficient antiseptic for preventing gingivitis and inhibiting plaque is chlorhexidine. However, a variety of adverse effects, such as brown staining, bitter taste, and occasionally sloughing of the oral mucosa, have been documented when using chlorhexidine orally as a mouth rinse, limiting its widespread use [8].

The World Health Organization (WHO) advises researchers to look into the potential usage of natural products like herbs and plant extracts in order to alleviate such negative effects. *Salvadora persica* has several identified antibacterial and prophylactic components, such as fluorides, alkaloids, sulfur compounds, glucosinolates, and volatile oils including benzylisothiocyanate [8].

The aim of this review is to evaluate the most recent findings about *Salvadora persica*'s therapeutic qualities, particularly as mouthwashes.

This could facilitate its usage especially in low-income regions where it is more readily available. In an effort to explain the significance and benefit of this traditional oral hygiene product, the current article reviews the therapeutic effects of *Salvadora persica* as a mouth wash on oral health.

METHODOLOGY:

Between 2000 and 20025, PubMed and Google Scholar were used to conduct an electronic search of the body of existing literature. Only publications published in the English language were included in the search, which was conducted using a range of keywords in various combinations. The miswak of the *Salvadora persica* (Miswaak OR *Salvadora persica*) and oral health (Mouth wash OR Mouth rinse OR plaque OR oral) keywords were combined for the electronic search. Additionally, a manual search for pertinent articles on this subject was also carried out.

DISCUSSION:

Miswaak comes from a *Salvadora persica* plant species that is a member of the Salvadoraceae family. The most widely used plant in the Middle East, *Salvadora persica*, has several identified antibacterial and other prophylactic components. Numerous organic and inorganic substances have been reported to be present in the extract of *Salvadora persica*. Glycosides, saponins, flavonoids, alkaloids, tannins, phenol compounds, benzyl derivatives, and organic acids were among the organic compounds. Anionic inorganic compounds, such as nitrate, fluoride, chloride, sulphate, and thiocyanate, have been identified. Commercial oral hygiene products have contained *S. persica* extracts as ingredients [9]. An alcoholic extract of *S. persica* is used as the main antibacterial ingredient in *S. persica* mouthwash. Sofrata et al. discovered benzyl isothiocyanate in *Salvadora persica* extracts and showed its quick and strong bactericidal action against Gram-negative bacteria [10].

Ingredient of Miswak	Function
Silica	Abrasive: to remove plaque and stains

Tannin	Reduce plaque and gingivitis
Resins	Protective action against Dental caries
alkaloids (salvadorine)	Bactericidal; Antifungal; cytotoxic activity
volatile oils (simgrins)	Carminative & Antibacterial action
Sulphur	Antibacterial action
Vitamin C	Healing & tissue repair
Sodium Bicarbonate	Mild abrasive
Calcium	Inhibits demineralization and induce remineralization of enamel
Fluoride	Anticariogenic activity & tooth remineralization
Chloride	Inhibit formation of calculus
N-benzyl-2-phenylacetamide	Antibacterial activity against E.coli
benzylisothiocyanate	Chemo-preventive agents; Bactericidal activity, virucidal function
Trimethylamine	Antibacterial
Flavonoids	Has cytotoxic activity

Table 1: Miswak's (Salvadora persica) bioactive components and their function on oral health. (Haque MM & Alsareii SA; 2015) ^[22]

Miswak (*Salvadora persica*) exhibits strong antibacterial action against both aerobic and anaerobic bacteria, according to several investigations. Al-Bayati and Sulaiman examined the antibacterial properties of *Salvadora persica* aqueous and methanol extracts using disc diffusion and micro-well dilution tests. Both antimicrobial tests revealed that *Salvadora persica*'s aqueous extract was effective against every pathogens examined and exhibited greater inhibitory activity than the methanol extract. *Streptococcus* species were the most susceptible to aqueous extract of all the pathogens studied ^[11].

The whole miswak pieces (without extraction) embedded in agar or suspended above the agar plate demonstrated potent antibacterial effects against bacteria that contribute to the development of caries and periodontitis according to an in vitro study by Sofrata^[12].

Almas (1999) demonstrated the antibacterial activity of *S. persica* miswak extracts on *E. faecalis* and *Streptococcus mutans*. The alcoholic extract of *S. persica* miswak exhibited stronger antibacterial activity than the aqueous extract, according to a comparison of the two extracts ^[13].

Poureslami et al. (2007) suggested using *S. persica* miswak extract in mouth rinses and toothpastes because of its exceptional antibacterial properties based on the findings of their experimental study ^[14].

It has been proven that mouthwash works well to reduce plaque. Due to its strong anti-plaque properties, chlorhexidine, a cationic chemical agent frequently found in conventional mouthwash, has been linked to a number of adverse effects, including teeth discolouration, irritation of the oral mucosa, and an unpleasant taste. Therefore, it was necessary to look for a natural substitute ^[1].

In a double-blind RCT, Niazi et al. (2018) compared the effects of neem mouthwash, cetylpyridinium, miswak, and chlorhexidine on plaque reduction in 80 orthodontic patients. When compared to the two chemical ingredients, mouthwash made with miswak showed a noticeably larger plaque reduction impact ^[15].

Al-Bayaty et al. (2010) compared the effectiveness of miswak ethanolic extract to chlorhexidine in a cross-over double-blind RCT with ten 22-year-old dental students. The mouthwash used as a negative control was distilled water. However, compared to the chlorhexidine group, the miswak therapy showed a greater plaque index ^[16].

Another study that examined the plaque status after orthodontic treatments with miswak and chlorhexidine mouthwash found no differences between the groups. 54 individuals who received fixed orthodontic treatment for four months participated in the single-blind RCT study. When compared to the placebo mouthwash, the plaque reduction impact of both miswak and chlorhexidine was considerable, indicating that miswak may be used in orthodontic patients in place of the synthetic chemical agent chlorhexidine ^[17].

Farhadian et al. (2015) examined the impact of plaque reduction after using an electric toothbrush in addition to Miswak mouthwash. The use of miswak mouthwash in conjunction with an electronic toothbrush significantly reduced plaque compared to using an electronic toothbrush alone ^[18].

Rezaei et al. (2016) examined how miswak mouthwash and chlorhexidine mouthwash reduced the gingival index in

patients who were intubated. 76 critical care unit patients who were intubated participated in the double-blind RCT study. The patient received mouthwash every two to three hours for four days. When compared to chlorhexidine mouthwash, miswak mouthwash was found to significantly reduce Gingival Index [19].

Author/ Year	Experiment	Intervention	Conclusion
Khalessi et al ^[4] (2004)	double-blind, cross-over trial	- Mouthwash (containing an extract of <i>Salvadora persica</i>) - placebo	Use of mouthwash (extract of <i>Salvadora persica</i>) resulted in improved gingival health
Al-Bayaty ^[16] (2010)	Double-blind, randomized Controlled trial	10% miswak ethanol extract 0.2% Chlorhexidine gluconate solution - Distilled water	Miswak mouth rinse was less effective as compared to chlorhexidine
Farhadian et al ^[18] (2015)	Single-blind, randomized controlled trial	- Manual toothbrush - Electric toothbrush - Manual toothbrush with miswak mouthwash - Manual toothbrush with 0.2% chlorhexidine.	Miswak and chlorhexidine mouthwash are equally effective in treating hyperplastic gingiva in orthodontic patients.
Rezaei et al ^[19] (2016)	Double-blind randomized controlled trial	- Herbal mouth wash containing <i>Salvadora persica</i> and <i>Aloe vera</i> 0.2% chlorhexidine mouthwash	Combination of <i>Salvadora persica</i> and <i>Aloe vera</i> mouthwash reduces gingivitis among intubated patients in ICUs.
Shetti NA ^[8] , (2016)	Randomized controlled trial	- Test group: <i>S. persica</i> alcoholic extract at 10% concentration - Control Group: distilled water	Mouthwash made from <i>Salvadora persica</i> (MiswaK) is effective chemical plaque control agent.
Al-Dabbagh SA et al ^[20] 2016	Randomized controlled clinical trial	- MiswaK toothpaste group - MiswaK mouthwash and ordinary tooth paste group - Ordinary toothpaste group - Normal saline and ordinary tooth paste group	MiswaK products were more effective in reducing the growth of cariogenic bacteria than ordinary toothpaste.
Sobouti et al ^[17] (2018)	Single-blind, parallel arm, randomized controlled trial	- MiswaK mouthwash. - Chlorhexidine mouthwash. - Placebo mouthwash.	MiswaK can improve the deteriorating gingival health resulted from orthodontic treatment.
Niazi et al ^[15] (2018)	Double-blind, parallel arm, randomized controlled trial	- Chlorhexidine mouthwash. - Cetylpyridinium mouthwash. - MiswaK extract. - Neem extract.	MiswaK can be a useful alternative to synthetic mouthwash.
Irani H et al ^[21] (2019)	single-blind randomized clinical trial	- miswak mouth wash - chlorhexidine mouthwash	miswak can substantially decrease the incidence of ventilator-associated pneumonia in patients with endotracheal tube

Table 2: Summary of studies on miswak used as a mouth rinse.

In summary, the numerous advantages of *Salvadora persica* (Miswak) mouthwash for preventing oral diseases and promoting health are amply demonstrated by this review. The belief that *Salvadora persica* (Miswak) rinse can be a powerful oral hygiene tool due to its wide spectrum of biological features is well supported by the descriptive and experimental investigations that are currently available. Miswak mouthwash can be an affordable substitute for traditional mouthwashes in developing countries. For maintaining good oral and dental health, the miswak rinse can be recommended as an effective and useful tool. Due to various medicinal properties miswak rinse has a very wide potential for use for maintaining oral health. However, more investigation is required to examine the use of Miswak mouthwash on a wide population over long-term follow-up.

CONCLUSION:

The present review has collected empirical data demonstrating the therapeutic benefits of *Salvadora persica*, often known as miswak mouthwash, for promoting oral and dental health.

Based on the previous studies we conclude that, the plaque score and cariogenic bacterial count were much lower when *Salvadora persica* extract was used. *Salvadora persica*-containing rinse could be regarded as a suitable oral hygiene alternative for use in individuals of all ages, socioeconomic backgrounds, and health conditions, especially as a long-term measure due to its efficacy, safety, availability, cost-effectiveness, and ease of use, even though this reduction was less than that attained with the gold standard chlorhexidine mouthwash.

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