

## **MISWAK (*Salvadora persica*) as a Cleansing Teeth**

### **MISWAK (*Salvadora persica*) sebagai Pembersih Gigi**

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#### **Abstrak**

Miswak adalah batang kayu dari pohon arak (*Salvadora persica*) yang digunakan untuk membersihkan gigi. Menggunakan miswak (bermiswak) sudah sekian lama dianjurkan oleh Nabi Muhammad SAW melalui hadist hadistnya. Hal ini masih banyak dilakukan penduduk di Arab, Timur Tengah, India, Pakistan, dan kaum muslim pada umumnya.

Banyak penelitian telah dilakukan untuk mengetahui kelebihan batang kayu ini sehubungan dengan kebersihan dan kesehatan mulut. *Salvadora persica* mengandung trimethylamine, salvadorine, chloride, fluoride, silica, sulphur, minyak mustard, vitamin C, resins and tannin, saponins, flavonoids dan sterol. Bahan kimia ini ternyata banyak berpengaruh pada kesehatan gigi dan mulut terbukti dapat mengurangi karies gigi, meningkatkan kesehatan gusi dan status periodontal, memutihkan gigi, menghilangkan karang gigi dan mempunyai efek antimikroba. Apalagi bersiwak biasa dilakukan dengan frekuensi minimal 5 kali sehari (sebelum melakukan sholat) dan durasi yang lebih lama. Oleh karena itu orang-orang yang menggunakan Miswak umumnya mempunyai status kesehatan gigi dan mulut yang lebih baik.

Kata kunci : Miswak, *Salvadora persica*, kesehatan gigi dan mulut

#### **Abstract**

*Miswak is a chewing stick that derives from Arak tree (*Salvadora persica*) which is used as cleansing teeth. It is used in different part of Africa, Asia especially in Middle East, South of America,<sup>2</sup> India, Pakistan and mostly of Muslim community. This custom was adopted and Islamized by Prophet Muhammad (Peace and Blessings of Allah be upon Him/PBUH) because there are several hadith mentioning the benefits of siwak in maintaining oral hygiene.*

*Many studies have been done to explore the oral hygiene advantages of this stick. *Salvadora persica* contains trimethylamine, salvadorine, chloride, fluoride, silica, sulphur, mustard oil, vitamin C, resins and traces of tannins, saponins, flavonoids and sterol. Actually this chemical composition influence to the oral hygiene. The unique chemicals component, fibers proved the effect to periodontal status, caries, antimicrobial, cleanness, whitening, calculus removal, and so on. Furthermore miswak is generally used for a longer period of time and frequency (because it is used at least 5 times a day before praying). So normally the miswak users have higher oral hygiene status.*

*Keywords: Miswak, *Salvadora persica*, oral hygiene*

## Introduction

Naturally we are lover cleanness of our body. Since the dawn of time a variety of oral hygiene measures have been performed. This has been verified by various excavations throughout the world where toothpicks, chewing-sticks, twigs, linen strips, birds' feathers, animal bones and porcupine quills were recovered. Those that originated from plants, although primitive, represent a transitional step towards the modern toothbrush. About 17 different plants have been used as natural instruments of oral hygiene.<sup>1</sup>

The most widely used twig since early times is the Siwak or Miswak. Siwak or Miswak was used by Babylonians 7000 years ago. It was later used throughout the Greek and Roman Empire and has also been used by ancient Egyptians and Muslims. It is used in different part of Africa, Asia especially in Middle East, South of America,<sup>2</sup> and India, Pakistan.<sup>3</sup> The use of Miswak in a pre-Islamic custom, which was adhered to by the ancient Arabs to get their teeth white and shiny. This custom was adopted and Islamized by Prophet Muhammad (Peace and Blessings of Allah be upon Him/PBUH) around 543 AD.<sup>2</sup>

The stick is obtained from a plant called *Salvadora persica*. The most common type of chewing stick, miswak, is derived from Arak tree (*Salvadora persica*) that grows mainly in Saudi Arabia but also in other parts of the Middle East. *Salvadora persica* is a small tree or shrub with a crooked trunk that is seldom more than one foot in diameter and reaching maximum height of three meters.<sup>2</sup> It has scabrous and cracked bark, and is whitish with pendulous branches. The root bark is light brown and the inner surfaces are white. It has an odor like cress, and its taste is warm and pungent.<sup>1</sup> The leaves are small, oval, thick and succulent with a strong smell of cress or mustard. The fresh leaves are eaten as salad or are used in traditional medicine for cough, asthma, scurvy, reumathism, piles, and so on.<sup>2</sup> The flower are small and fragrant and are used as astimulant and are mildly purgative.

Miswak is a pencilsized stick 15-20 cm long and diameter 1-1.5 cm that is prepared from the root, stem, twigs or bark. The stick is chewed or tapered at one end until it becomes frayed into abrush.<sup>3</sup>

Miswak is traditional equipment for teeth cleansing, that it still is used of muslim community. Actually that chewing stick has advantages as cleansing teeth because it contains several of chemical components. This article is written to help the researchers to explore the ability of *Salvadora persica* in oral hygiene and to proven that the ordered from Prophet Muhammad (PBUH) consider with modern scientific.

## Discussion

In religious background, Islam teaches the importance of cleanliness of body as well as our mind. Including a basic oral hygiene was introduced by Islam. There are several hadith mentioning the benefits of siwak in maintaining oral hygiene; hence, it has been used widely among Muslims since the Prophet Muhammad (PBUH).<sup>1</sup> For example Prophet Muhammad said: "Siwak purifies the mouth and pleases Allah' and said: Were it not to be a hardship on my community, I would have ordered them to use Siwak for every ablution."<sup>2</sup> In this respect, our Prophet (PBUH) can be considered among the first dental instructors of proper oral hygiene.<sup>1</sup>

A variety of chemical components have been identified in *Salvadora persica*. Some of recheacher have reported that it contains trimethylamine, salvadorine, chloride, fluoride, silica, sulphur, mustard oil, vitamin C, resins and traces of tannins, saponins, flavonids and sterol.<sup>456</sup> In the present study, the sticks from *Salvadora persica* were analyzed for their soluble and total content of fluoride, calcium, phosphorus and silica. Results showed that the fluoride released from miswak soaked in water was negligible (0.07 microgram/ml). The leached phosphorus averaged 582 micrograms/ml and 34g/ml, respectively, representing 19.6% and 26.4% of their total content in the sticks. There was a substantial amount of silica in the ashes of miswak. It appears that miswak

is probably not particularly active against caries through its fluoride content, but it does act as a brush for removing dental plaque and polishing the teeth.<sup>7</sup> Besides that, aqueous extract of miswak at concentration of 15% and above has fungi static effect for up to 24 hours. This mycotic effect was probably due to one or more of the root contents which included chlorine, trimethylamine, and alkaloid resin, and sulphur compounds.<sup>8</sup>

There is evidence that *Salvadora persica* contains antibacterial properties. Some other components are astringents, detergents and abrasives. These properties encourage some toothpaste laboratories to incorporate powdered stems and/or root material of *Salvadora persica* in their products. Although commercial powders may be highly efficient in plaque removal, their use has been shown in a survey to cause a high incidence of gingivitis. Plaque eradication is essential, but it should not be in a manner that creates negative side effects for other tissues.<sup>1</sup>

Antimicrobial effect and plaque reduction of Miswak have been proven that it can be effective in removing soft oral deposits. Repeated use of siwak during the day produces an unusually high level of oral cleanliness. It has been proven that plaque is formed immediately after eating. After 24 hours, it starts to act on the teeth. However, it can be eliminated through meticulous tooth-brushing.<sup>1</sup>

Batwa et al<sup>8</sup> investigate the effect of chewing stick miswak in comparison with toothbrush on plaque removal during experimental conditions and real life use conditions. Actually the miswak was as effective as a toothbrush for reducing plaque on buccal teeth surfaces both experimentally and clinically. Al-Lafi<sup>9</sup> reported reduction in plaque in miswak users as well. And regularly show decreased gingival bleeding on probing they were compared with non users miswak. Gazi et al reported that plaque and gingivitis were significantly reduced when miswak was used 5 times a day in praying time compare with conventional toothbrush.<sup>12</sup> It has also been shown that

the chewing stick remove plaque from interproximal sites to virtually the same extent as from other more accessible sites.<sup>4</sup>

Darout et al<sup>12</sup> investigate to assess the salivary levels of 25 oral bacteria in relation to periodontal status and experience of caries and to compare the levels of these bacteria between habitual miswak and toothbrush users in adult Sudanese subjects. The findings suggest that miswak may have a selective inhibitory effect on the level of certain bacteria in saliva, particularly several oral streptococci species. It has been demonstrated *in vitro* that the aqueous extracts of miswak have growth inhibitory effects on several oral microorganisms.<sup>10</sup> In Almas et al research; they tested fresh vs. one-month-old Miswak extract for antibacterial activity. And the result is found no different.<sup>10</sup>

The periodontal status of habitual miswak users had lower gingival bleeding and interproximal bone height than the toothbrush users. And there were no significant differences in plaque score pocket depth between them. The researcher also reported that advanced periodontal disease was very rare among persons over the age of 50 years who used miswak for toothbrush.<sup>13</sup> Darout *et al.* reported that the periodontal status of miswak users in a Sudanese population was better than that of toothbrush users, suggesting that the efficiency of miswak use for oral hygiene is comparable or slightly better than toothbrush.<sup>14</sup>

Miswak extract contain of chloride and silica, which indicated the miswak chemical component contribute to its mechanical action in dental calculus removal.<sup>15</sup>

In the *Salvadora persica*, tannin present as well. It also inhibit the action of glucosyl transferase thus reducing plaque and gingivitis.<sup>16</sup>

Freeze-dried extract of miswak was analyzed for antimicrobial components. And it is proven with the results showed a lower caries experience in the miswak users than in the subjects who used a modern toothbrush.<sup>10</sup> Emslei<sup>cit4</sup> reported for the first

time less caries in people using chewing sticks than in those using modern toothbrush in Sudan., Furthermore Baghdady and Ghose<sup>17</sup> compared the caries prevalence between Iraqi and Sudanese schoolchildren (using WHO DMFT). The result reported that Sudanese schoolchildren showed lower caries prevalence due to the use of miswak and their diet. Dental caries relatively rare among Kenyan primary school children who were using only miswak.<sup>18</sup> Another research it was found that Streptococcus mutans were eliminated in Miswak group and were less in chlorhexidine.<sup>2</sup>

The finding lower caries experience of miswak users can be explained by the cleansing effect of miswak. Because when the cleaning procedure is completed, miswak is often left in the mouth for some additional time. It will stimulate saliva secretion and promoting a better cleansing and anti-cariogenic effect.<sup>3</sup>

Miswak has an ability in whitening teeth. Study to compare the effectiveness at removing tea and chlorhexidine stain between toothpaste with *Salvadora persica* extract and commercial whitening toothpaste has been done. And the results showed that the whitening toothpaste containing *Salvadora persica* is more effective than the commercially available whitening toothpaste.<sup>19</sup> High concentration of Chloride in *Salvadora persica* can inhibit calculus formation and help in removing stain from the teeth. Furthermore miswak contain silica and sodium bicarbonate (baking soda). Silica and sodium bicarbonate act as an abrasive material to remove the stains and giving the teeth whiteness. And thus, it is used as a commercial dentifrice.<sup>2</sup>

## Conclusion

Actually there are many advantage of miswak in oral hygiene. The unique chemicals component, fibers proved the effect to periodontal status, caries, antimicrobial, cleanness, whitening, calculus removal, and so on. Furthermore miswak is generally used for a longer period of time and frequency (because it is used at least 5 times a day before praying).

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