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Herbal Whitening Agents: Traditional Remedies for Reducing Tooth Discoloration

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A B S T R A C T

Objective: Although professional dental whitening procedures like composite bonding, veneers, and bleaching are prevalent, traditional and herbal remedies present viable alternatives. These natural approaches can effectively contribute to tooth whitening and mitigate the formation of yellow and brown stains, frequently with fewer adverse effects.

Methods: This review article utilized keyword searches including medicinal plants, traditional medicine, tooth discoloration, and tooth whiteners across databases such as Web of Science, Medline, PubMed, Scopus, and Google Scholar. Relevant articles were reviewed to compile the information.

Results: In traditional Iranian medicine, several herbal remedies are recognized for their tooth whitening properties. These include lemon juice, turmeric, coconut oil, strawberries, orange peel, apple cider vinegar, banana peel, Persian pomegranate, licorice root, mint, wild thyme, and myrtle.

Conclusion: Herbal tooth whitening agents derive their efficacy from their distinctive chemical and biological characteristics. These botanical substances employ mechanisms including abrasiveness, pigment degradation, antibacterial and anti-inflammatory properties, and direct whitening effects to promote tooth whitening and overall oral health. Consistent and appropriate application of these remedies can contribute to the preservation of dental aesthetics and oral well-being.

Keywords: Tooth, Tooth discoloration, Whitening agents, Beauty, Traditional medicine

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Introduction

Tooth whitening is a widely practiced cosmetic procedure aimed at enhancing personal appearance, as the luminosity of one's teeth is a significant determinant of overall attractiveness and self-confidence [1]. Discoloration of teeth can be a source of discomfort for individuals, leading many to seek professional dental care [2]. Research suggests that for many people, the whiteness of their teeth takes precedence over their overall oral health, resulting in dissatisfaction with the color of their teeth [3]. Tooth whitening is a common procedure in cosmetic dentistry, performed by specialized dentists to improve the appearance of teeth and create aesthetically pleasing smiles [4]. The visual impact of a beautiful smile has motivated researchers in dental sciences to investigate safer and less harmful whitening methods [1-4]. While traditional dental whitening treatments encompass composite bonding, veneers, and bleaching [1-4], traditional and herbal remedies also offer viable alternatives that can effectively whiten teeth and potentially mitigate the formation of yellow and brown stains with fewer adverse effects [5].

The maintenance of oral health is influenced by multiple factors, and certain herbal remedies have traditionally been employed to support dental health and tooth whiteness [6]. The integration of traditional practices with contemporary techniques can be highly effective in maintaining oral health and eliminating dental plaque [6]. Herbal whitening remedies offer a natural approach to brightening and restoring the natural luster of one's smile [7]. One of the

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most rapid at-home whitening methods involves the utilization of herbal oils. Oil pulling, an ancient practice of swishing natural oils in the mouth, is employed to enhance oral hygiene [8].

The objective of this review is to identify efficacious medicinal plants employed in traditional Iranian medicine for tooth whitening purposes, which have historically been utilized to enhance the color and luminosity of teeth. This study endeavors to acquire a scientific and practical comprehension of the effects of these botanical substances on dental health and their whitening capabilities.

Methods

This review article sought to evaluate herbal remedies for their efficacy in mitigating tooth discoloration and whitening. A comprehensive and systematic literature search was conducted across esteemed databases. Initially, relevant keywords such as "medicinal plants," "traditional medicine," "tooth discoloration," and "tooth whiteners" were identified and employed as primary search criteria. These keywords were subsequently searched in databases including Web of Science, Medline, PubMed, Scopus, and Google Scholar to locate articles discussing the effects of medicinal plants in this context. Articles with full-text access were selected using search filters. Each article was meticulously reviewed to identify those directly addressing the impact of herbal remedies on tooth discoloration and whitening. Additionally, traditional medicine textbooks and reputable websites were examined. The findings were ultimately summarized and presented in a tabular format.

Results

In traditional Iranian medicine, a diverse array of herbal remedies was employed for tooth whitening purposes. These included lemon juice, turmeric, coconut oil, strawberries, orange peel, apple cider vinegar, banana peel, Persian pomegranate, licorice root, mint, wild thyme, and myrtle. Each of these botanical substances was utilized for its distinctive properties to enhance oral hygiene and improve tooth whiteness. The outcomes of the herbal tooth whiteners in traditional Iranian medicine are summarized in Table 1.

Table 1. Herbal Tooth Whiteners

Persian name	English name	Scientific name	Herbal name	Tooth Whitening Mechanism [9-13]
Limo torsh	Lemon	*Citrus limon*	Rutaceae	Remove surface stains and whiten teeth by breaking down discoloration
Zardchobeh	Turmeric	Curcuma longa	Zingiberaceae	Natural abrasive with anti-inflammatory and antioxidant properties that may help to reduce plaque buildup and surface stains.
Nargil	Coconut	Cocos nucifera	Arecaceae	Reduce harmful bacteria in the mouth, potentially preventing plaque and reducing stains
Toutfarangi	Strawberry	*Fragaria ananassa*	Rosaceae	Remove surface stains and whiten teeth. Also, fibers in strawberries can act as a natural scrub
Porteghal	Orange	*Citrus sinensis*	Rutaceae	Remove surface stains and has mild abrasive properties that contribute to whitening
Sib	Apple	*Malus domestica*	Rosaceae	Remove stains and kill bacteria, potentially improving the appearance of teeth
Mouz	Banana	Musa spp	Musaceae	Contains potassium, magnesium, and manganese, which are believed to help reduce stains and provide a gentle polishing effect on the enamel.

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Golnarfarsi	Pomegranate	Punica granatum	Lythraceae	Reduce plaque and discoloration while maintaining oral health
Shirinbaian	Licorice	Glycyrrhiza glabra	Fabaceae	Reduce plaque and promote a whiter appearance by preventing stains
Naena	Mint	Mentha spp	Lamiaceae	Reducing discoloration and promoting oral health
Pouneh kouhi	Oregano	Origanum vulgare	Lamiaceae	Contains thymol, which has antibacterial properties that may help prevent plaque buildup and maintain the natural color of teeth.
Sedr	Christ's Thorn Jujube	Ziziphus spina-christi	Rhamnaceae	Can help to maintain oral health and prevent stains, contributing to a whitening effect over time

The analysis of the available data indicates that various plants with distinct whitening properties can contribute to improving dental health. Specifically: Lemon and Orange are categorized as plants that help remove surface stains and whiten teeth. Turmeric acts as a natural abrasive with anti-inflammatory and antioxidant properties, which can aid in reducing plaque and surface stains. Coconut and Strawberry contribute to stain removal with their natural abrasive properties, enhancing the appearance of teeth. Apple and Banana help reduce stains and provide a gentle polishing effect on the enamel. Mint and Oregano are noted for their antibacterial properties, which help prevent plaque formation and maintain the natural color of teeth.

The data analysis shows that the Lamiaceae and Rutaceae families have the highest number of samples, with two plants each. These families are particularly significant in dental whitening applications and therapeutic uses in herbal medicine.

Rutaceae Family: Includes Lemon and Orange, known for their whitening properties and ability to remove surface stains from teeth.

Lamiaceae Family: Includes Mint and Oregano, recognized for their antibacterial properties and positive effects on oral health.

Other families, such as Rosaceae, Zingiberaceae, and Arecaceae, each include one or more plants in this analysis. These families are associated with specific benefits such as plaque reduction, teeth whitening, and stain removal.

Discussion

Tooth whiteness is a substantial determinant of personal appearance and self-esteem, serving as a pivotal factor in overall attractiveness. White teeth not only contribute to a vibrant aesthetic but also promote better oral health and the prevention of dental complications. Consequently, the investigation of effective and natural approaches for preserving tooth whiteness is essential [14].

The mechanisms underlying tooth whitening with herbal remedies are rooted in their distinctive chemical and biological characteristics. These botanical substances employ several key mechanisms to facilitate tooth whitening. For example, strawberries and banana peels contain fine abrasive particles that gently cleanse the tooth surface, removing surface stains and plaque [15]. Lemon and orange, with their natural acids, assist in breaking down pigments on teeth and reducing discoloration caused by food and beverages [16]. Herbs such as mint and wild thyme possess antibacterial properties that diminish oral bacteria and prevent plaque formation, thereby supporting oral health and tooth whiteness [17]. Turmeric and licorice root contribute by reducing gum inflammation and improving oral health, which indirectly benefits tooth whiteness [18]. Antioxidant-rich herbs, such as strawberries and apples, help preserve tooth whiteness by mitigating oxidative damage [19]. Moreover, coconut oil directly whitens teeth and reduces plaque and tartar through the oil-pulling process [20].

Conclusion

The mechanisms underlying tooth whitening with herbal remedies elucidate that these botanical substances, owing to their distinct chemical and biological characteristics, can effectively promote tooth whiteness. By capitalizing on key mechanisms such as abrasiveness, pigment degradation, antibacterial, anti-inflammatory, and antioxidant properties, as well as direct whitening effects, herbal remedies contribute to both the health and aesthetics of teeth. Consistent and appropriate application of these herbs

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can substantially enhance tooth appearance and support overall oral well-being.

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Competing interests

The authors have no competing interests to declare that are relevant to the content of this article.

Ethics approval

This study was performed in line with the principles of the Declaration of Helsinki.

Consent to participate

Informed consent was obtained from all individual participants included in the study.

Author contributions

AA: Conceptualization, the original draft writing, investigation, writing including reviewing and editing and investigation and formal analysis; FA: Conceptualization, supervision, and project administration; AA: Conceptualization, the original draft writing, investigation, writing including reviewing and editing

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