



Potential use of plant extracts with antibacterial properties in cosmetic preparations for oral hygiene



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INTRODUCTION

A cosmetic product by its definition is also any substance or mixture intended to come into contact with teeth and oral mucous membranes, whose sole or main purpose is to keep them clean, protect and keep them in good condition. The search for new, safe ingredients in cosmetic products is increasingly prompting us to reach for vegetable sources of active compounds. Plant extracts rich in polyphenolic compounds, exhibiting antibacterial properties may also be indicated in the prevention and control of the problem of halitosis. Its occurrence is most often associated with the symptom of a bad smell from the mouth, which arises, among others, as a result of bacterial action. One of the effects of halitosis is an unpleasant smell from the mouth, which can reduce the patient's quality of life. Bacteria such as *Porphyromonas gingivalis*, *Clostridium perfringens* and *Fusobacterium nucleatum* are believed to cause bad breath due to the degradation of substances present on the tongue and the release of volatile sulfur compounds (VSC) [1]. Scientific reports from recent years indicate the high potential of *Aloe vera* gel, Indian mango seeds, *Curcuma zedoaria* and *Camellia sinensis*, quinoa saponin, honokiol and magnolol - components of the polyphenol fraction of *Magnolia* extract and *Sasa senanensis* leaves.

METHODOLOGY

In a study by Mishra et al. (2016), the effect of cleaning the tongue with oral *Aloe vera* gel in combination with the use of ordinary fluoride toothpaste on combating oral malodor in patients with halitosis was assessed. Group A performed standard toothpaste cleaning of teeth and tongue. Group B performed tooth brushing and tongue cleaning with *Aloe vera* gel twice a day for 7 days. The organoleptic evaluation, the VSC measurement and the tongue coating index after 5, 60 minutes in 1 and after 7 days of use showed a significant reduction in all three parameters. Intergroup analysis indicated a difference in the mean reduction in the organoleptic measurement and the halimeter reading [2].

Sorna Kumar et al. (2016) tested the mouthwash containing the aqueous extract of *Mangifera indica* L. seeds for antioxidant, antibacterial and haemolytic activity. Using the free radical scavenging test, well diffusion and blood lysis method, its beneficial antimicrobial activity and effectiveness in combating halitosis were determined. In the study of activity against halitosis, swab and plating on agar medium were performed [3].

A study by Farina et al. (2012) investigated the activity of aqueous solutions obtained from *Curcuma zedoaria* and *Camellia sinensis*, which were used as mouthwash, in relation to a standard mouthwash containing 0.12% chlorhexidine gluconate and water as placebo. The experiment was carried out with 30 volunteers who tested four mouthwashes. A breath assessment was performed following an acetylcysteine mouth rinse [4].

Saponin obtained from quinoa (QS) and alkali-transformed saponin (ATS) were subjected to plate tests against bacteria related to the etiology of halitosis: *P. gingivalis*, *C. perfringens* and *F. nucleatum*, and to assess the change of membrane integrity using a microplate reader, and to determine the membrane potential with using the spectrofluorimetric method [5].

Magnolia bark extract (*Magnolia officinalis* Rehder & Wilson) was used to evaluate the alleviation of oral malodor in the plate test and in the MIC determination. The extract and its polyphenolic components showed a strong antibacterial effect against microorganisms causing halitosis and *Streptococcus* responsible for the formation of caries [6].

Sakagami et al. (2016) tested *Sasa senanensis* Rehder alkaline leaf extract (SETP) as toothpaste *in vivo* to assess efficacy against oral malodor and reduce oral bacteria. 12 volunteers who were brushing their teeth 3 times a day with a paste with SETP or a paste without extract (placebo) had their unpleasant breath (VSC) measured with the Breathron measuring device and the number of bacteria on the back of the tongue was counted with a bacteria counter [7].

RESUME

The cited scientific studies indicate a high cosmetic and protective potential of the above-mentioned plant extracts in the prevention of halitosis. This research could be used to develop new and effective cosmetic products for oral hygiene and refreshing products for people prone to halitosis.

Potencjalne wykorzystanie ekstraktów roślinnych o właściwościach przeciwbakteryjnych w preparatach kosmetycznych do higieny jamy ustnej

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Produkt kosmetyczny według swojej definicji to również każda substancja lub mieszanina przeznaczona do kontaktu z zębami oraz błonami śluzowymi jamy ustnej, którego wyłącznym lub głównym celem jest utrzymywanie ich w czystości, ochrona, utrzymywanie w dobrej kondycji. Poszukiwanie nowych, bezpiecznych składników produktów kosmetycznych skłania coraz częściej do sięgnięcia po roślinne źródła związków aktywnych. Ekstrakty roślinne bogate w związki polifenolowe, wykazujące właściwości przeciwbakteryjne mogą okazać się także wskazane w profilaktyce i zwalczaniu problemu halitozy. Jej występowanie łączy się najczęściej z objawem przykrego zapachu z ust, który powstaje m.in. w wyniku działań bakterii. Jednym ze skutków występowania halitozy jest nieprzyjemny zapach z ust, który może obniżać komfort życia pacjenta. Bakterie takie jak: *Porphyromonas gingivalis*, *Clostridium perfringens* i *Fusobacterium nucleatum* uważane są za przyczynę nieprzyjemnego oddechu ze względu na degradację przez nie substancji obecnych na języku i uwalnianie lotnych związków siarki (VSC) [1]. Doniesienia naukowe z ostatnich lat wskazują na wysoki potencjał żelu aloesu zwyczajnego, nasion mango indyjskiego, *Curcuma zedoaria* i *Camellia sinensis*, saponiny komosy ryżowej, honokiolu i magnololu – składników frakcji polifenolowej ekstraktu z magnolii oraz liści *Sasa senanensis*.

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