

Bay Leaf Extract (*Eugenia polyantha wight*) to Reduce Plaque Index

Muhammad Saleh¹(corresponding author), Sainuddin², Bahtiar³

¹Department of Dental Health, Poltekkes Kemenkes Makassar, Indonesia

²Department of Dental Health, Poltekkes Kemenkes Makassar, Indonesia

³Department of Nursing, Poltekkes Kemenkes Makassar, Indonesia; bahtiar.poltekkes@gmail.com

Submitted: August 9, 2021 -Revised: August 29, 2021 -Accepted: September 4, 2021 -Published: September 30, 2021

ABSTRACT

Mouthwash from natural ingredients is more efficient, environmentally friendly, easy to obtain, and has minimal side effects, one of which is bay leaf. This study aims to analyze the effect of gargling using bay leaf extract (*Eugenia polyantha wight*) on the reduction of plaque index. This study was a literature review. Information obtained from text books, journals, books and other literature ⁽⁸⁾. The information is collected and processed by the steps of editing, organizing and interpreting. Based on the results of the study, it can be concluded that gargling using bay leaf extract can reduce plaque index because bay leaves contain flavonoids, essential oils, eugenol and tannins which have anti-inflammatory and anti-microbial effects.

Keywords: bay leaf (*Eugenia polyantha wight*); gargling; plaque index

INTRODUCTION

Dental and oral health is a very important part of overall health. Dental and oral health in Indonesia needs to be considered, because caries and periodontal disease are dental and oral health problems that are experienced by many people. About 60-90% of school-age children suffer from tooth decay and for adults it is almost 100% ⁽¹⁾. Public awareness in maintaining dental health is still very lacking. This is in line with the 2013 Basic Health Research data which shows that the prevalence of dental and oral health problems in Indonesia is 25.9%, and only 8.1% receiving treatment or medication ⁽²⁾.

In developing countries, dental and oral disease in adults is worse, due to the accumulation of untreated dental and oral diseases ⁽³⁾. One of the efforts to improve dental and oral health is to remove plaque regularly so that plaque does not accumulate, so that tissue damage in the oral cavity can be prevented.

Dental plaque is a soft layer consisting of a collection of microorganisms and proliferates in a matrix. Dental plaque adheres tightly to the surface of the teeth that are not cleaned. Shah (2007) stated that the composition of dental plaque is very complex. The bacteria in plaque can damage the tooth surface and the supporting tissues. Sweet and sticky foodstuffs, especially sucrose, can produce acid which can lead to demineralization of calcium and phosphate from tooth enamel ⁽²⁾.

Prevention of acid imbalance in the oral cavity, can be done mechanically and chemically. Mechanical prevention can be done using a toothbrush, while chemical prevention can be done using mouthwash ⁽⁴⁾. The use of mouthwash has been shown to inhibit the formation of dental plaque. Commonly used chemical substances have antiseptic or anti-bacterial properties that are useful for inhibiting plaque formation ⁽⁵⁾.

Mouthwash from natural ingredients is more efficient, environmentally friendly, easy to obtain, and has minimal side effects, one of which is bay leaf ⁽⁶⁾. According to Chrisnaningsih (2006), bay leaves contain chemical compounds, namely essential oils (citral and eugenol), tannins, flavonoids, and methachaficol ⁽⁷⁾. Essential oil functions as an antiseptic that can inhibit the growth of bacteria. This study aims to analyze the effect of gargling using bay leaf extract (*Eugenia polyantha wight*) on the reduction of plaque index.

METHODS

This study was a literature review. Information obtained from text books, journals, books and other literature ^(8,9). The information is collected and processed by the steps of editing, organizing and interpreting.

RESULTS

Some research results show that gargling with bay leaves can reduce plaque index on teeth. In 2015, Wiradona et al. examined the effect of gargling using bay leaf extract on the formation of dental plaque in fifth

grade students, SDN Meteseh Semarang, which involved 30 people, who were divided into 2 groups: group 1 (control) who rinsed using distilled water and group 2 (treatment) who gargled using bay leaf extract. The results showed that the plaque score in the treatment group was 0.1306 which was greater than the control group with a plaque score of 0.0566. The results of statistical tests showed that there was a significant difference in plaque between the two groups ⁽²⁾.

Meanwhile, in 2013, Merrystia et al reported that bay leaf decoction inhibited plaque growth in fixed denture restorations. This research was conducted at the Prosthodontic Clinic, Faculty of Dentistry, Airlangga University and also at the patient's residence. In this case, the subject was asked to rinse his mouth using distilled water (treatment I) and 50% bay leaf decoction (treatment II). Subjects were also asked not to consume food for 4 hours after gargling. From the results of the study, it is known that there are differences in plaque formation between treatment groups I and II. Less plaque growth in respondents who rinsed with 50% bay leaf decoction than respondents who gargled with distilled water ⁽¹⁰⁾.

DISCUSSION

The results of the two studies above show that bay leaves are very useful for inhibiting the formation of dental plaque. This can happen because bay leaves contain chemical compounds, namely tannins, flavonoids, and 0.05% essential oil consisting of eugenol and citral. Plaque is a soft deposit that is firmly attached to the tooth surface consisting of microorganisms that multiply in an intercellular matrix when a person neglects dental and oral hygiene. Therefore, prevention and control of dental plaque formation must be based on active oral hygiene maintenance efforts. The efforts that can be done to prevent and control the formation of dental plaque include regulating food patterns, chemical actions and mechanical actions in the form of cleaning the oral cavity from food residue.

Research in vivo and in vitro shows that flavonoids have biological and pharmacological activities, such as antibacterial. Several studies have shown that flavonoids cause damage to the permeability of bacterial cell walls, microsomes and lysosomes as a result of the interaction between flavonoids and microbial DNA. Several studies have shown that flavonoids have antimicrobial, anti-inflammatory effects, stimulate collagen formation, protect blood vessels, are antioxidant and anticarcinogenic. Tannins which are also phenolic compounds work by inhibiting bacterial growth by denaturing proteins and reducing surface tension, so that bacterial permeability increases. Damage and increased permeability of bacterial cells cause cell growth to be inhibited and eventually lead to cell death. The function of tannins in preventing tooth decay is by inhibiting the activity of glycolysis and glucosyltransferase (GTF) so that plaque formation is inhibited. Tannins cause protein denaturation by forming protein complexes. The formation of protein complexes through nonspecific forces such as hydrogen bonding and hydrophobic effects as well as the formation of covalent bonds, inactivates bacterial adhesion (molecules to adhere to host cells), stimulates phagocytic cells that play a role in cellular immune responses.

It is known that the content contained in bay leaves is able to inhibit the growth of *Streptococcus mutans* because it has antibacterial power. The antibacterial power of bay leaves is due to the presence of flavonoids, essential oils, eugenol and tannins. Tannins and flavonoids are active ingredients that have anti-inflammatory and antimicrobial effects, while essential oils have analgesic effects.

Bay leaves contain several vitamins, including vitamin C, vitamin A, vitamin E, vitamin B6, vitamin B12, thiamin, riboflavin, niacin and folic acid. Some of the minerals contained in bay leaves are iron, phosphorus, calcium, magnesium, selenium, zinc, sodium and potassium. Besides being able to be used to inhibit the formation of dental plaque, bay leaves can also be used as a stomach ache medicine. Bay leaves can also be used to stop excessive bowel movements. Bay tree can also be used to treat gout, stroke, high cholesterol, blood circulation, stomach ulcers, itching and diabetes.

Based on the explanation above, gargling using bay leaf extract is useful in reducing plaque index so that it can reduce the risk of oral disease, especially periodontal disease.

CONCLUSION

Based on the results of the study, it can be concluded that gargling using bay leaf extract can reduce plaque index because bay leaves contain flavonoids, essential oils, eugenol and tannins which have anti-inflammatory and anti-microbial effects.

REFERENCES

1. Wiradona I, Prasko. Efektifitas Konsumsi Buah Belimbing dan Nanas dalam Menurunkan Indeks Plak. *Jurnal Kesehatan Gigi*. 2018;5(1):17.
2. Wiradona I, Mardiaty E, Sariyem. Pengaruh Berkumur Ekstrak Daun Salam (*Eugenia polyantha Wight*) terhadap Pembentukan Plak Gigi. *Jurnal Riset Kesehatan*. 2015;4(2):769.
3. Sutha DW, Susilarti, Ta'adi. Pengaruh Mengunyah Buah Nanas dan Belimbing Terhadap Skor Plak pada Pasien Perawatan Orthodonti Cekat di Klinik Gigi Alamanda Yogyakarta. *Jurnal Gigi dan Mulut*. 2015;2(1):11.
4. Embisa YA. Pengaruh Konsumsi Nanas (*Ananas comosus L. Merr*) terhadap Penurunan Indeks Plak pada Anak Usia 10-12 tahun di SD Inpres 4/82 Pandu. *Jurnal e-GiGi*. 2016;4(2):171-172.
5. Ladytama RS, Nurhapsari A, Baehaqi M. Efektifitas Larutan Ekstrak Jeruk Nipis (*Citrus aurantifolia*) Sebagai Obat Kumur Terhadap Penurunan Indeks Plak Pada Remaja Usia 12-15 Tahun. *ODONTO Dental Journal*. 2014;1(1):40.
6. Santoso B, Wiradona I, Afifah N. Pengaruh Berkumur Air Rebusan Daun Salam Kering (*Eugenia polyantha*) Terhadap pH Saliva. *Jurnal Kesehatan Gigi*. 2015;02(2):80.
7. Angraini M, Nazip K, Meilinda. Efektifitas daya Anti Jamur Daun Salam (*Syzygium polyanthum W.*) Terhadap Pertumbuhan Jamur *Candida albicans* dan Sumbangannya pada Pelajaran Biologi di SMA. Palembang: Program Studi Pendidikan Biologi FKIP Universitas Sriwijaya; 2015.
8. Acob JRU, Nugroho HSW. Writing The Literature Review. *Aloha International Journal of Multidisciplinary Advancement (AIJMU)*. 2019;1(1):8-11.
9. Acob JRU, Nugroho HSW, Auta TT. Publication Opportunities of Non-research Articles in Health. *Health Notions*. 2021;5(1):38-40.
10. Merrystia N, Subianto A, Salim S. Rebusan Daun Salam (*Eugenia polyantha*) dalam Menghambat Pertumbuhan Plak pada Restorasi Gigi Tiruan Tetap (Boiling of Bay Leaf (*Eugenia polyantha*) in Inhibiting Plaque Growth on Fixed Bridge Restoration). *J Prosthodontics*. 2013;4(1):27-31.