

# Influence of Gargling Leaf Boiling Water Soursop in Inhibiting Formation Plaque in Grade VII 3 UPTD Students State Junior High School 10 Barru Regency South Sulawesi Province

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**Abstract:** Soursop (*Annonamuricata* L) is one of the plants that contains antibacterial substances, especially flavonoids, so that it can be used as an herbal medicine in overcoming dental health problems. According to the Ministry of Health of the Republic of Indonesia (2019), based on *the global burden of disease study 2016*, oral and dental health problems, especially dental caries, are diseases that occur in almost half of the world's population (3.58 billion people). The main cause of the appearance of various diseases in the human oral cavity is the unmaintained dental hygiene because of the deposits of feces that contain pathogenic microorganisms, one of which is plaque. Purpose of the study: To determine the effect of gargling soursop leaf boiled water in inhibiting plaque formation in grade VII 3 students of UPTD SMP Negeri 10 Barru. Research method: The type of research used is experimental with a *pre-test post test design*. The population in this study is equal to the number of samples, which is 30 people. The data collection technique uses *the total sampling method*. Study results: From the test results using *the paired sample T test*, it was known that the significance value of 2-tailed was  $0.000 < 0.05$ . So it can be stated that soursop leaf boiling water can inhibit the formation of plaque. Conclusion: There is an influence between gargling soursop leaf decoction in inhibiting plaque formation.

**Keywords:** Gargling Soursop Leaf Boiling Water, Dental Plaque, Child.

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## I. INTRODUCTION

Dental and oral health plays an important role in our overall well-being, as the condition of our teeth and mouth can significantly affect the health of our entire body. Unfortunately, many countries in the world are grappling with challenges related to dental and oral health issues.

As reported by Indonesia's Ministry of Health in 2019, the Global Disease Burden Study conducted in 2016 revealed a shocking statistic: about half of the global population, which amounts to about 3.58 billion people, is grappling with dental and oral health problems, and dental caries has become very prevalent. This underscores the significant challenges posed by oral health issues around the world and highlights the need for increased awareness and targeted interventions (Anggita Febriyanti *et al.*, 2022).

Based on the findings of Riskesdas health research in 2018, most dental problems in Indonesia are caused by cavities, damage, and pain, which is 45.3% of reported cases. In addition, the most common oral health problems among the Indonesian population are swollen gums and abscesses, which affect 14% of individuals. The survey showed that 57.6% of Indonesians have dental and oral health problems, but only 10.2% seek treatment, while 47.4% do not receive any treatment.

Based on the health profile of South Sulawesi Province, as many as 55.54% of people reported problems related to damaged, rotten, or unhealthy teeth, while only 4% had had their teeth filled. Especially in Barru Regency, the figure is slightly lower, namely 51.59% of the population has a similar dental problem and only 3.76% have had cavity fillings. School-age children in particular, are particularly susceptible

to dental and oral health problems, as evidenced by the prevalence of cavities at 54% among those aged 10 to 14 years. What is worrying is that only 7% of these children are free from dental and oral health problems, this shows that this is an urgent public health problem (Riskesdas Regency/city, 2018).

The dental and oral health of a person or a community is shaped by four main factors: genetics, the surrounding environment, personal behavior, and access to health services. Of these elements, behavior plays a very important role in shaping dental and oral health standards. A person's commitment to maintaining dental and oral hygiene has a significant effect on their overall health status (Dirman *et al.*, 2022).

The main factor that contributes to the onset of various diseases in the human oral cavity is inadequate oral hygiene. Maintaining good dental and oral hygiene means ensuring that the teeth and mouth are free of dirt and harmful microorganisms, including plaque (Erwin *et al.*, 2021).

Dental plaque is a delicate layer made up of various microorganisms that develop on the enamel of the teeth after exposure to saliva over time. This biofilm is recognized as a significant contributor to the onset of dental and periodontal diseases (Nurasikin *et al.*, 2023).

To effectively prevent plaque buildup, it's important to prioritize dental and oral hygiene. Maintaining regular dental and oral hygiene plays an important role in controlling dental plaque. The cornerstone of plaque management is to brush your teeth consistently, and using mouthwash can further improve the health of your dental environment. Although brushing is the most effective method, mouthwash serves as a valuable addition in reducing and inhibiting plaque formation. For optimal plaque control, consider mouthwashes that contain active ingredients such as chlorhexidine, or look for natural alternatives (M&Soegiharto, n.d.).

In recent times, there has been a major shift in people's approach to health, with an increasing preference for traditional medicine over chemical medicines, largely due to the potential side effects of these drugs. Among the various natural remedies that attract attention, soursop leaves (*Annonamuricata L.*) stand out for their therapeutic properties. This leaf is not only effective against various diseases but also has antibacterial properties because it is rich in compound composition that has been shown to inhibit the growth of *Streptococcus mutans* bacteria (Mayestika & Hasmira, 2021).

Research conducted by Jafril *et al.* shows that soursop leaf decoction at a concentration of 10% and 20% does not have definite antibacterial properties; However, they do show the ability to inhibit the growth of bacteria. In contrast, soursop leaves boiled at concentrations of 30% and 40% show a pronounced antibacterial effect (Gountia, 2018).

Based on a preliminary survey conducted on 10 students of UPTD SMP Negeri 10 Barru Regency, 8 of them had a medium average plaque value and 2 people had a low average plaque value. Based on this, the researcher was interested in

conducting a study with the title "The effect of mouthwash with soursop leaf decoction on plaque formation in grade VII 3 students of UPTD SMP Negeri 10 Barru Regency, South Sulawesi".

**II. METHODS**

The type of research used is experimental with a *pre test - post test* design which aims to find out the difference in plaque scores before and after gargling soursop leaf boiled water in Grade VII 3 UPTD SMP Negeri 10 Barru Regency, South Sulawesi Province.

**III. RESULT**

Based on the results of the study, the effect of gargling soursop leaf boiled water in inhibiting plaque formation in grade VII 3 students of UPTD SMP Negeri 10 Barru Regency which will be held in April 2025. This study was a direct observation of 30 samples by observing plaques before and after gargling soursop leaf boiled water.

*A. Respondent Characteristics*

➤ *Characteristics by Age*

Table 1: Characteristics of Respondents based on the Age of Grade VII 3 Students of UPT SMP Negeri 10 Barru Regency

Age	Sum	Percentage
12	22	73%
13	8	27%
Total	30	100%

Source: Primary Data (2025)

In table 1 above, you can see the characteristics of respondents based on the age of grade VII 3 students at UPTD SMP Negeri 10 Barru Regency, the number of students aged 12 years is 22 students (73%) and students who are 13 years old are 8 students (27%).

➤ *Characteristics by Gender*

Table 2: Characteristics of Respondents based on Gender of Grade VII 3 Students of UPTD SMP Negeri 10 Barru Regency

Gender	Sum	Percentage
Man	16	53%
Woman	14	47%
Total	30	100%

Source: Primary Data (2025)

From table 2, it can be seen the gender characteristics of grade VII 3 students of UPTD SMP Negeri 10 Barru Regency which amounted to 30 students, male gender as many as 16 students (53%) while women amounted to 14 students (47%).

**B. Univariate Analysis**

Table 3: Frequency Distribution of Dental Plaque Score before Gargling Soursop Leaf Decoction

Pre – Test			
	Sum	Percentage	Total
Good	4	13.3%	13.3%
Bad	1	3.3%	16.6%
Keep	25	83.3%	100

Source: Primary Data (2025)

Table 3 shows the distribution of the frequency of plaque scores before (pre-test) gargling soursop leaf boiled water with moderate criteria as many as 25 students (83.3%) and 1 person (3.3%) bad.

Table 4: Frequency Distribution after (Post-Test) Gargling Soursop Leaf Decoction

Post - Test			
	Sum	Percentage	Total
Good	26	86.7%	86.7%
Bad	0	0	86.7%
Keep	4	13.3%	100.0%

Source: Primary Data (2025)

Table 6: Paired Test T Test Pre-Test and Post-Test Gargling Soursop Leaf Decoction

	Mean	Std.deviation	Std.error mean	lower	upper	T	df	Sig.
Pre Test-Post Test	.767	.430	.079	.606	.927	9.761	29	.000

Source: Primary Data (2025)

The test results in table 6 above use the paired sample T test. It is known that the significance value of 2-tailed is  $0.000 < 0.05$ . So it can be stated that soursop leaf boiling water can inhibit the formation of plaque.

**IV. CONCLUSION AND RECOMMENDATIONS**

**A. Conclusion**

- The average score of plaque before gargling soursop leaf boiled water in grade VII 3 students of UPTD SMP Negeri 10 Barru Regency was 2,303. This means that the average dental and oral hygiene in children is moderate and still needs to be improved.
- The average plaque score after gargling soursop leaf boiled water in grade VII 3 students of UPTD SMP Negeri 10 Barru Regency was 0.897.
- There is an effect between gargling soursop leaf decoction in inhibiting plaque formation, this is evidenced by a significant value (2-tailed)  $0.000 < 0.05$ .

**B. Suggestions**

- This study provides scientific evidence that soursop leaf decoction is effective in inhibiting plaque formation on

**C. Bivariate Analysis**

Table 5: Effect of Gargling Soursop Leaf Decoction in Inhibiting Plaque Formation

	Mean	Sum	Sig.
Pre-test	2.303	30	
Post-test	.897	30	.000

Source: Data Primer (2025)

After gargling soursop leaf boiled water, the good category plaque score was obtained for 26 students (86.7%) and the medium criterion was only 4 students (13.3%).

Based on the table above, the average score before gargling is 2.303 and after gargling is 0.897. This shows that there is an influence between gargling soursop leaf boiled water and a decrease in dental plaque scores in grade VII 3 students of UPTD SMP Negeri 10 Barru Regency.

teeth, it is recommended that researchers further conduct further research to identify and isolate the active compounds in soursop leaves that are responsible for these antibacterial effects. In addition, it is also necessary to conduct research with broader methods and parameters to confirm the results that have been obtained and deepen understanding of the working mechanism of these compounds.

- In the community, especially parents and educators, they are more proactive in utilizing natural ingredients such as soursop leaves as an alternative treatment to maintain healthy teeth and mouth, education on the benefits and how to use soursop leaf boiled water as a natural mouthwash can be socialized through health programs in schools and the community environment.
- Institutions such as schools and health centers can take advantage of the results of this research by integrating the use of soursop leaf boiled water in the UKGS (School Dental Health Business) program as a preventive step in maintaining dental and oral health. In addition, cooperation between schools and health institutions can be increased to hold training or workshops for students and parents on the importance of maintaining dental and oral hygiene and the use of natural ingredients in daily life.

## REFERENCES

- [1]. Anggita Febriyanti, R., Hadi, S., Fitria Ulfah, S., Kesehatan Gigi, J., & Kesehatan Kemenkes Surabaya, P. (2022). Systematic Literature Review : Penurunan Skor Plak Ditinjau Dari Penggunaan Teh Hitam Dan Teh Hijau Sebagai Obat Kumur. *E-Indonesian Journal of Health and Medical Google Scholar*, 2(3), 296–303.
- [2]. Ansori. (2015). Siswa. *Paper Knowledge . Toward a Media History of Documents*, 3(April), 49–58. <https://www.bps.go.id/publication.html?Publikasi%5BtahunJudul%5D=&Publikasi%5BkataKunci%5D=telu+k+mutiara&Publikasi%5BcekJudul%5D=0&yt0=Tam+pilkan>
- [3]. Arbiyanto, M. R. (2021). "Pengaruh Motif Mengonsumsi Situs corona. jakarta. go. id Terhadap Pemenuhan Kebutuhan Informasi Mahasiswa Institut Bisnis dan Informatika Kwik Kian Gie Angkatan 2016. *Paper Knowledge . Toward a Media History of Documents*, 107–115.
- [4]. Badan Penelitian dan Pengembangan Kesehatan RI. (2018). Laporan Riskesdas 2018 Nasional.pdf. In *Lembaga Penerbit Balitbangkes* (p. 156).
- [5]. Bloom, N., & Reenen, J. Van. (2019). tinjauan pustaka ekstrak daun sirsak. *NBER Working Papers*, 89.
- [6]. Dirman, R., Fatmasari, D., & Wiyatini, T. (2022). *Educational Model Utilization of Family Medicine Plants as a Behavior Improvement about the Importance of Keeping Health Teeth and Mouth of Cadres*. 7(3), 1162–1165.
- [7]. Erwin, E., Asmawati, A., & Sofyan, S. (2021). Perbedaan Indeks Plak pada Pemeriksaan dengan Bahan Disclosing Solution dan Biji Kesumba (Bixa orellana). *Jurnal Surya Medika*, 6(2), 5–9. <https://doi.org/10.33084/jsm.v6i2.1535>.
- [8]. M, , E., & Soegiharto. (n.d.). *Efek Berkumur Sari Buah Tomat ( Solanum lycopersicum*. 3(2), 70–84.
- [9]. Mardiana, Ugi, N., & Budi, S. I. (2022). Motivasi Siswa Mengikuti Mata Pelajaran Pendidikan Jasmani di SMP 13 Tanjung Jabung Timur. *Jurnal Score*, 2(1), 32-37.
- [10]. Mayestika, P., & Hasmira, M. H. (2021). Artikel Penelitian. *Jurnal Perspektif*, 4(4), 519. <https://doi.org/10.24036/perspektif.v4i4.466>
- [11]. Mutiani, N., Wirawan, P. W., Adhy, S., Andi, S., Mukhlisin, H., Muhaemin, M., Nurhayati, S., Untuk, D., Salah, M., Syarat, S., Gelar, M., Teknik, S., Studi, P., Elektro, T., גרינבלט, Martinench, A., Network, N., Php, W., Algoritma, M., ... Adhitya Putra, D. K. T. (2019). Gambaran Efek Berkumur Larutan Teh Putih Terhadap Akumulasi Plak Pada Mahasiswa Jurusan Keperawatan Gigi Poltekkes Kemenkes Ri Medan. *Rabit : Jurnal Teknologi Dan Sistem Informasi Univrab*, 1(1), 2019.
- [12]. Nurasikin, C. A., Salfiyadi, T., & Rahayu, E. S. (2023). Penyuluhan Kesehatan Gigi dan Mulut dalam rangka Menurunkan Indeks Plak pada murid SDN 1 Ajun Jeumpet Darul Imarah Kabupaten Aceh Besar Dental and Oral Health Counseling in the context of Reducing Plaque Index in students of SDN 1 Ajun Jeumpet Darul Masyarakat, 2(2), 1–6.
- [13]. Rahmadina, D. (2020b). Efektivitas Berkumur dengan Larutan Garam 10% Terhadap Penurunan Skor Plak. *Jurnal Kesehatan Gigi*, 2(1), 53–63.
- [14]. Rahmawati, A. Y. (2020). Morfologi Daun Sirsak <https://dspace.umkt.ac.id/bitstream/handle/463.2017/2537/BAB%20II.Pdf?Sequence=3&isAllowed=y>, July, 1–23.
- [15]. Riskesdas Kab/kota.(2018). Laporan Provinsi Sulawesi Selatan Riskesdas. In *Badan Penelitian Dan Pengembangan Kesehatan* (Vol. 110, Issue 9). <http://ejournal2.litbang.kemkes.go.id/index.php/lpb/article/view/3658>
- [16]. Rosyidah. (2019). Pengaruh Pemberian Ekstrak Etanol Daun Sirsak (Annona muricata L.) Terhadap Kadar Superoksida Dismutase (SOD) dan Malondialdehyde (MDA) Mammae Mencit (Mus musculus) Betina Yang Diinduksi 7,12-Dimetilbenz (α) Antrasen (DMBA) Secara In Vivo. *Universitas Islam Negeri (UIN) Maulana Malik Ibrahim Malang*, 12–56.
- [17]. Surkini, N. (2016). *Pengertian Kalkulus*. 1–23. <https://ijohm.rcipublisher.org/index.php/ijohm/article/view/22/17>.
- [18]. Viera Valencia, L. F., & Garcia Giraldo, D. (2019). tinjauan pustaka plak gigi. *Angewandte Chemie International Edition*, 6(11), 951–952., 2, 8–25.
- [19]. Yanti, N. A., Ambardini, S., Ardiansyah, A., Marlina, W. O. L., & Cahyanti, K. D. (2020). Aktivitas Antibakteri Kombucha Daun Sirsak (Annona muricata L.) Dengan Konsentrasi Gula Berbeda. *Berkala Sainstek*, 8(2), 35. <https://doi.org/10.19184/bst.v8i2.15968>.