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Review Article

Oil Pulling *(Gandusha)* and Oral Microbiome: An Evidence-Based Review

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ABSTRACT

The oral microbiome plays a crucial role in maintaining oral and systemic health. Dysbiosis of oral microbial flora has been implicated in dental caries, gingivitis, periodontitis, halitosis, and several systemic disorders. Oil pulling, an ancient Ayurvedic oral hygiene practice known as *Gandusha* or *Kavala*, has gained increasing scientific interest as a complementary preventive strategy for maintaining oral microbial balance. *Gandusha* involves retaining medicated or non-medicated oils in the oral cavity for a specific duration to promote oral detoxification and tissue strengthening. This review critically evaluates the role of oil pulling in modulating the oral microbiome and improving oral health outcomes through analysis of classical Ayurvedic literature and contemporary scientific evidence. A structured literature review was conducted using classical Ayurvedic texts and modern databases including PubMed, Scopus, Web of Science, and Google Scholar. Evidence suggests that oil pulling with sesame oil, coconut oil, and medicated formulations may reduce oral bacterial load, plaque formation, gingival inflammation, and halitosis. Proposed mechanisms include mechanical cleansing, inhibition of bacterial adhesion, anti-inflammatory activity, and modulation of microbial ecology. Coconut oil demonstrates additional antimicrobial effects due to lauric acid content. Although several clinical studies report beneficial outcomes comparable to chlorhexidine mouthwash, methodological limitations such as small sample sizes and short study duration restrict definitive conclusions. Integrating *Gandusha* into preventive oral healthcare may provide a safe, economical, and holistic adjunctive approach. Further microbiome-based longitudinal

studies are required to establish standardized protocols and mechanistic evidence.

Keywords: *Gandusha*, oil pulling, oral microbiome, Ayurveda, oral hygiene, periodontal disease, oral health

1. Introduction

The oral cavity hosts one of the most diverse microbial ecosystems in the human body, comprising bacteria, fungi, viruses, and protozoa collectively termed the oral microbiome [1]. Maintenance of microbial balance is essential for oral and systemic health.

Disruption of oral microbial ecology contributes to:

- Dental caries
- Gingivitis
- Periodontitis
- Halitosis
- Cardiovascular and metabolic disorders [2]

Modern oral hygiene practices rely primarily on mechanical plaque removal and antimicrobial mouthwashes. However, prolonged use of chemical agents such as chlorhexidine may cause tooth staining, altered taste sensation, and mucosal irritation [3].

Ayurveda describes several preventive oral hygiene procedures under *Dinacharya* (daily regimen), including *Gandusha* and *Kavala* [4]. Oil pulling involves retaining or gargling oil in the mouth for a prescribed duration to improve oral hygiene and strengthen oral tissues.

In recent years, oil pulling has attracted global attention due to its potential antimicrobial and anti-inflammatory effects.

Aim and Objectives

- To critically review the concept of *Gandusha*
- To analyze its effects on the oral microbiome
- To compare oil pulling with conventional oral hygiene methods
- To identify research gaps and future directions

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2. Methodology of Literature Review

Databases Searched

- PubMed
- Scopus
- Web of Science
- Google Scholar

Ayurvedic Sources

- *Charaka Samhita*
- *Sushruta Samhita*
- *Ashtanga Hridaya*

3. Historical Perspective

Gandusha and *Kavala* are described in classical Ayurvedic texts as therapeutic and preventive oral procedures [4].

Difference Between *Gandusha* and *Kavala*

Procedure	Description
Gandusha	Filling oral cavity completely with liquid
Kavala	Gargling smaller quantity of liquid

Ayurvedic texts recommend oil-based *Gandusha* for:

- Strengthening teeth and gums
- Prevention of oral diseases
- Improving taste perception
- Preventing dryness and cracking [5]

Commonly used oils include:

- Sesame oil (*Tila Taila*)
- Coconut oil
- Medicated oils

4. Review of Literature

4.1 Oral Microbiome and Disease

The oral microbiome consists of over 700 microbial species [6]. Key pathogenic organisms include:

- *Streptococcus mutans*
- *Porphyromonas gingivalis*
- *Candida albicans*

Microbial dysbiosis leads to:

- Plaque formation
- Gingival inflammation
- Periodontal destruction

4.2 Ayurvedic Understanding

Ayurveda attributes oral diseases to:

- *Kapha Dosha* accumulation
- Poor oral hygiene
- Impaired digestion (*Agni Dushti*)

Oil pulling is believed to:

- Remove toxins (*Ama*)
- Lubricate oral tissues
- Strengthen oral structures

4.3 Mechanism of Oil Pulling

Ayurvedic Perspective

- *Kapha Shamana*
- Cleansing of oral cavity
- Tissue nourishment (*Brimhana*)

Modern Scientific Interpretation

A. Mechanical Cleansing

Swishing oil creates shear forces that reduce bacterial adhesion.

B. Emulsification

Oil emulsifies during gargling, increasing surface area for microbial interaction.

C. Antimicrobial Effects

Lauric acid in coconut oil exhibits antimicrobial activity against *S. mutans* [7].

D. Anti-inflammatory Action

Reduction in gingival inflammation through decreased bacterial load.

5. Types of Oils Used and Clinical Protocols

5.1 Sesame Oil (*Tila Taila*)

Dose

- 10–15 ml

Method

- Hold/swish in mouth for 10–20 minutes

Frequency

- Once daily, preferably morning

Duration

- 2–6 weeks in clinical studies

Actions

- Antibacterial
- Strengthens gums
- Reduces dryness

5.2 Coconut Oil

Dose

- 10–15 ml

Duration of pulling

- 10–15 minutes daily

Clinical Duration

- 14–30 days

Mechanism

- Lauric acid-mediated antimicrobial effect

5.3 Medicated Oils

Irimedadi Taila

Dose

- 5–10 ml

Indications

- Gingivitis
- Bleeding gums
- Halitosis

Triphala Taila

Dose

- 10 ml once daily

Action

- Anti-inflammatory
- Antioxidant

6. Clinical Evidence

Several studies have reported:

Outcome	Observation
Plaque reduction	Significant
Gingival index	Improved
Halitosis	Reduced
S. mutans count	Decreased

Oil pulling has shown comparable effects to chlorhexidine in some studies [8].

However:

- Most studies are short-term
- Small sample sizes
- Lack of microbiome sequencing data

7. Comparison with Chlorhexidine Mouthwash

Parameter	Oil Pulling	Chlorhexidine
Antimicrobial effect	Moderate	Strong
Side effects	Minimal	Staining, taste alteration
Cost	Low	Moderate
Long-term safety	Good	Limited

8. Practical Integrative Oral Hygiene Protocol

Morning Routine

1. Tongue cleaning
2. Oil pulling with sesame/coconut oil (10–15 min)
3. Warm water rinse
4. Tooth brushing

For Gingivitis

- *Irimedadi Taila Gandusha* for 14–21 days

9. Research Gaps and Limitations

- Lack of standardized protocols
- Limited microbiome studies
- Inadequate long-term clinical trials
- Variability in oil types and duration

10. Future Perspectives

- Microbiome sequencing studies
- Comparative trials with probiotics
- Development of standardized medicated oils
- Integration into preventive dentistry

11. Conclusion

Gandusha or oil pulling represents a promising Ayurvedic oral hygiene practice with potential benefits in maintaining oral microbial balance and preventing oral diseases. Scientific evidence suggests beneficial antimicrobial and anti-inflammatory effects, particularly with sesame and

coconut oils. Although preliminary findings are encouraging, further high-quality microbiome-based research is necessary to establish definitive clinical recommendations. Integrating oil pulling into routine oral healthcare may provide a safe, economical, and holistic adjunctive strategy for oral health promotion.

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