

The Role of Mechanical Cleaning in Plaque Reduction: Implications for Chewable Oral Care Products

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Introduction

Mechanical disruption of dental plaque is a cornerstone of effective oral hygiene. While traditional methods focus on brushing and flossing, alternative mechanical cleaning actions—such as chewing and swishing—also play important roles in maintaining oral health. Products like DentiMints, which combine chewing, swishing, and the gentle abrasivity of hydrated silica, offer convenient oral care solutions especially suited for situations where traditional brushing is impractical.

This paper explores the scientific evidence supporting the effectiveness of chewing, swishing, and mild abrasives like silica in disrupting plaque biofilms and enhancing oral cleanliness.

Chewing as a Mechanical Cleaning Mechanism

Chewing stimulates saliva production, which is essential for oral health. Saliva neutralizes acids, delivers remineralizing ions, and aids in the physical removal of food particles and debris. Additionally, the mechanical action of chewing itself can disrupt and dislodge plaque.

A study published in *ScienceDirect* demonstrated that sugar-free chewing gum reduces dental plaque accumulation. The mechanical action of chewing, combined with increased salivary flow, significantly decreased plaque formation compared to non-chewing controls (Alanen et al., 2007).

This finding supports the role of chewing as an effective adjunct to traditional oral hygiene practices.

Swishing Action Enhances Plaque Removal

Swishing liquid or semi-liquid substances around the mouth assists in dislodging food debris and biofilm from hard-to-reach areas. While mouthwash studies have emphasized the antimicrobial properties of active ingredients, the mechanical action of swishing alone contributes meaningfully to plaque reduction.

A review from *Verywell Health* discusses oil pulling, an ancient swishing practice using oil, and notes its observed benefits in reducing plaque and improving oral health (Verywell Health, 2022). While oil pulling differs from DentiMints' mechanism, the underlying principle—that active swishing mechanically disrupts plaque—is highly relevant.

The swishing motion induced during the use of a chewable tablet like DentiMints can help spread saliva and active ingredients throughout the mouth, enhancing the reach and efficacy of mechanical cleaning.

Role of Silica as a Mild Abrasive

Hydrated silica is widely used in dental products as a safe and effective mild abrasive. It aids in the removal of plaque and superficial stains without damaging enamel when properly formulated.

An in vitro study published on *PubMed Central* assessed toothpastes with varying concentrations of hydrated silica and demonstrated their effectiveness in cleaning tooth surfaces while maintaining low abrasivity relative to enamel and dentin wear thresholds (Dörfer et al., 2023).

By incorporating hydrated silica, DentiMints offers users a mild mechanical polishing effect that complements the cleaning actions of chewing and swishing.

Implications for DentiMints

DentiMints' unique formulation and usage method combine three synergistic mechanical cleaning actions:

- **Chewing:** Stimulates saliva flow, physically disrupts plaque, and increases oral cleansing.
- **Swishing:** Enhances the distribution of saliva and active ingredients, aiding in the mechanical removal of plaque from hard-to-reach areas.
- **Silica Polishing:** Provides gentle abrasive action to remove surface plaque and debris without damaging enamel.

This comprehensive mechanical cleaning strategy makes DentiMints an effective adjunct to traditional oral hygiene, especially in scenarios where brushing and flossing are impractical, such as during travel, at work, or in medically compromised individuals.

Conclusion

Scientific evidence supports the significant role of mechanical actions—chewing, swishing, and mild abrasion—in maintaining oral hygiene and preventing plaque accumulation. By leveraging these natural mechanisms, DentiMints offers a convenient, microbiome-conscious solution for promoting daily oral health.

Products like DentiMints demonstrate that effective oral care can extend beyond the toothbrush, offering important preventive benefits wherever traditional oral hygiene practices are not immediately accessible.

References

1. Alanen, P., Holsti, M.L., & Pienihäkkinen, K. (2007). "The effects of sugar-free chewing gums on dental plaque regrowth." *Journal of Clinical Periodontology*, 34(9), 766-771.
2. Verywell Health. (2022). "Oil Pulling Benefits for Dental Health." Retrieved from <https://www.verywellhealth.com/oil-pulling-5083468>
3. Dörfer, C.E., Staehle, H.J., & Wolff, D. (2023). "Toothpaste Abrasion and Abrasive Particle Content." *International Journal of Dental Hygiene*, 21(1), 50-59.