

Antimicrobial Efficacy of Denture Adhesives

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3065

ABSTRACT

Objective: The objective of this research was to quantitatively evaluate the antimicrobial efficacy of commercial denture adhesives. **Methods:** A kill-kinetic assay was used to evaluate the antimicrobial efficacies of two commercial denture adhesives. A 24-hour-old culture of *Streptococcus mutans* (plaque-bacteria) was exposed to the denture adhesives, and an aliquot of the streptococcal culture was diluted into a neutralizing broth. The dilutions were subsequently plated onto Tryptic Soy Agar and incubated in a CO₂ atmosphere. The viable organisms on the agar plates were enumerated, and the log of Colony-Forming Units per ml were calculated. Exact Wilcoxon Rank Sum test was used for treatment comparison. **Results:** Fixodent® denture adhesive showed the strong antimicrobial efficacy with significantly ($p < 0.05$) less *Streptococcus mutans* detected relative to negative control. The mean difference of the *Streptococcus mutans* between Fixodent® denture adhesive and the negative control were greater than 2 log CFU. **Conclusions:** This research found that Fixodent® denture adhesive provided significant antimicrobial efficacy and may help improve the oral hygiene of denture patients by reducing plaque-bacteria.

INTRODUCTION

Denture adhesives have historically been used as a means of improving denture retention and stability. Recently however, it has been shown that denture adhesives may also provide an antimicrobial benefit. He et.al., reported that Fixodent denture adhesive showed an *in-vivo* reduction of denture plaque microorganisms even after 8 hours¹. Alexander et.al., reported an *in-vitro* reduction in bacteria that cause oral malodor². The reduction in plaque-bacteria is particularly relevant to the increasing number of denture-wearers with remaining natural teeth. Furthermore, two new 'antimicrobial' denture adhesives (UK Fixodent® Hygiene and UK Poligrip® Total Care) are now being marketed – both claim to provide antimicrobial hygiene/protection. The current study was designed to evaluate the antimicrobial efficacy of these two denture adhesives.

PURPOSE

This study was designed to determine the antimicrobial efficacy of two commercial denture adhesives. *Streptococcus mutans* was chosen as the appropriate test organism because it is widely associated with plaque; and it is also a pioneer species that facilitates the progression of biofilm colonization by bacteria implicated as causative agents of malodor. Inhibiting *Streptococcus mutans* can also help interrupt the biofilm maturation even prior to colonization by species such as *Fusobacterium nucleatum*.

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MATERIALS AND METHODS

Test Products:

1. UK Fixodent® Hygiene
2. UK Poligrip® Total Care

Test Organism: *Streptococcus mutans* ATCC 35668.

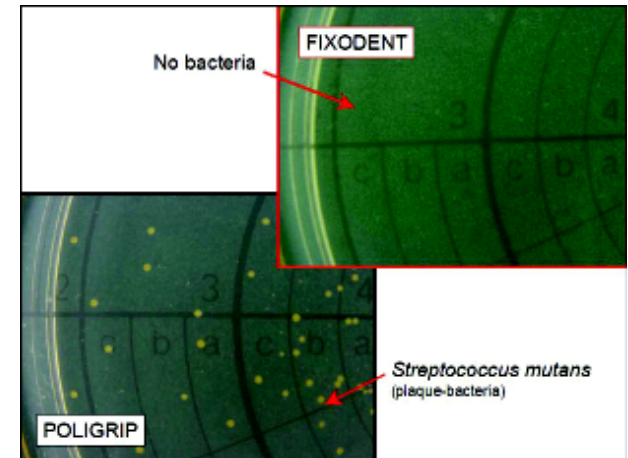
Method: The denture adhesives were weighed directly into sterile flasks and nine milliliters of peptone water were added to each flask. One milliliter of the *Streptococcus mutans* broth culture was transferred into each flask. All the flasks were incubated at 35°C; a 1 ml sample was taken from each flask, diluted in neutralizing broth, plated, incubated, and enumerated.

Statistics: p -values obtained from 2-sided Exact Wilcoxon Rank Sum test.

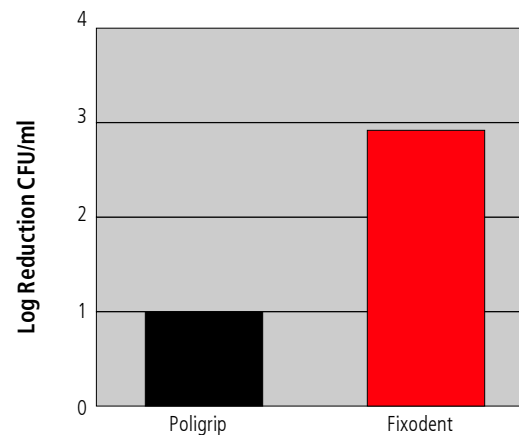
RESULTS

Fixodent® Hygiene is significantly superior to Poligrip® Total Care in antimicrobial efficacy toward *Streptococcus mutans*.

RESULTS (Cont.)



DATA



CONCLUSION

- ❖ Fixodent® denture adhesive provided strong antimicrobial protection against plaque-bacteria such as *Streptococcus mutans*.
- ❖ Comparing two leading 'antimicrobial' denture adhesives, Fixodent® was found to be significantly superior to Poligrip® in antimicrobial efficacy toward *Streptococcus mutans*.

1. Plaque inhibition with denture adhesive use, T. He et.al., AADR Poster 459, 2001
2. Denture adhesive inhibits oral malodor causing bacteria, D. C. Alexander et.al., FDI PP39, 2003.

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