## OFV-23

# Silver Zeolite: A Microbial Sieve – A Study to Evaluate the Mechanical and Chemical Properties Oo Heat Cure Denture Base Resins After Incorporation of Different Percentages of Silver Zeolite

Silpa Madhuri Chikkala[1], Aashi Chawla[2], Ranganath Jingade[3†]

[1]Manipal University College Malaysia, Melaka, Malaysia.
[2]Clove Dental Bangalore, India.
[3]Krishnadevaraya College of Dental Sciences.

Denture-related infections are frequently linked to microbial colonization by *Candida albicans*, *Streptococcus mutans*, *Staphylococcus aureus*, and *Pseudomonas aeruginosa*. Incorporation of antimicrobial agents into denture base resins may help reduce microbial growth and improve patient outcomes. This study aimed to evaluate the antibacterial and antifungal properties of Silver-Zeolite (Ag-Z) incorporated into heat-cure denture base resin. Heat-cure acrylic resin specimens were fabricated and divided into five groups based on Ag-Z concentrations: 0% (control), 2.5%, 5%, 7.5%, and 10% by weight. Antimicrobial activity was assessed using the agar well diffusion method against *C. albicans*, *S. mutans*, *S. aureus*, and *P. aeruginosa*. The diameter of inhibition zones was measured after 24 hours, and data were analysed with one-way ANOVA and Tukey's *post-hoc* test. Control specimens exhibited no antimicrobial activity. In contrast, incorporation of Ag-Z produced statistically significant inhibition zones ($p < 0.001$) for all tested microorganisms. The size of inhibition zones increased proportionally with Ag- Z concentration, with the highest values observed in the 10% group (*C. albicans*: 14.65 ± 0.29 mm; *S. mutans*: 17.35 ± 0.31 mm; *S. aureus*: 15.36 ± 0.30 mm; *P. aeruginosa*: 17.32 ± 0.72 mm). The findings indicate that incorporation of Silver-Zeolite into denture base resins significantly enhances antimicrobial efficacy in a concentration-dependent manner. This suggests its potential application in reducing denture-associated infections and improving the overall biocompatibility and performance of heat-cure acrylic resins in clinical use.

**Keywords:** Silver-Zeolite, denture base resin, Antimicrobial activity, Agar well diffusion, *Candida albicans*, *Streptococcus mutans*

†**Correspondence:** Ranganath Jingade
drjkr.rao07@gmail.com