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Supplementary Material

The Effect of Residual Food Stain on Microbial Colonisation of Denture Acrylics with the Increase of *Candida Albicans*

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ABSTRACT

Objectives: In the UK, 19% of adults wear dentures. Failure to keep a denture clean can lead to staining from foods, along with subsequent colonisation of the denture and associated mucosa by microorganisms, particularly *Candida albicans*. This colonisation can potentially lead to chronic erythematous candidosis and other oral infections. This study investigated the association between staining of denture acrylics by different food types and subsequent *C. albicans* colonisation.

Materials and Methods: Chemically polymerised acrylic specimens were produced and stained for 14 days with six different combinations of food stains. The level of acrylic staining was determined spectrophotometrically. Specimens were then incubated in Sabouraud-dextrose broth (SAB) or SAB inoculated with *Candida albicans*. Confocal laser scanning microscopy coupled with propidium iodide staining of *C. albicans* was used to determine the extent of *C. albicans* colonisation to these acrylics. Results analysed descriptively and by one-way analysis of variance (ANOVA), one sample student t-test, and Dunnett's test.

Results: Acrylics in Group 4 (stained with spices, tomato puree, acai berry juice and sunflower oil) exhibited highest staining but had low *C. albicans* colonisation. Highest *C. albicans* colonisation occurred with Group 5 (sunflower oil) stained acrylics. The unstained control acrylic group had lowest colonisation.

Conclusion: This study demonstrated that staining acrylics with certain foods promoted *C. albicans* colonisation, but this was not associated with level of visual staining. Further research is required to determine the precise mechanism(s) by which residual food stains promote candidal colonisation on denture acrylics. This knowledge may then be used by dental professionals to advise patients on improving denture hygiene to improve not only denture aesthetics but also minimise *Candida* biofilms.

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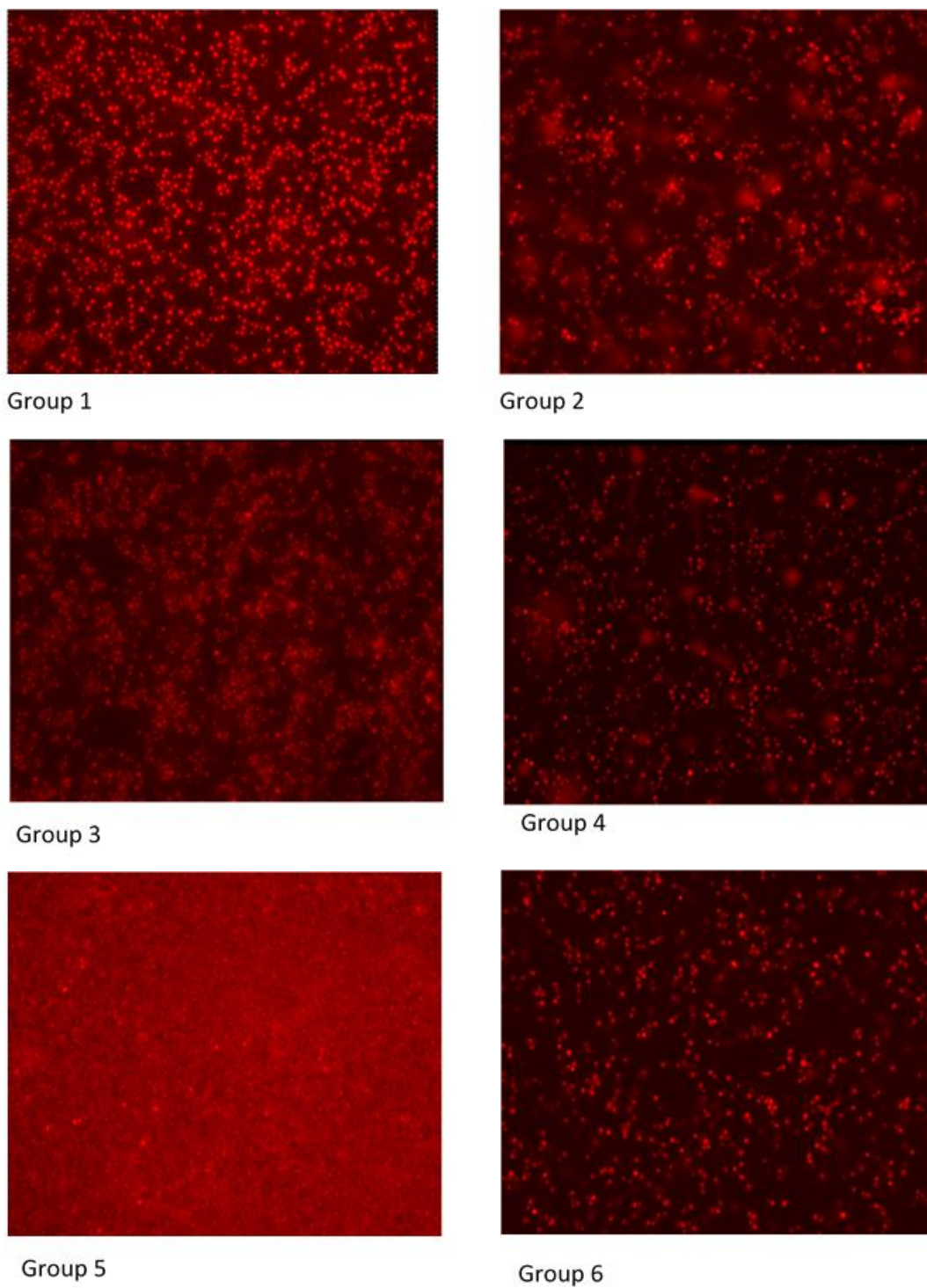


Figure. 2: Coloured confocal images of acrylic staining Groups 1 to 6.

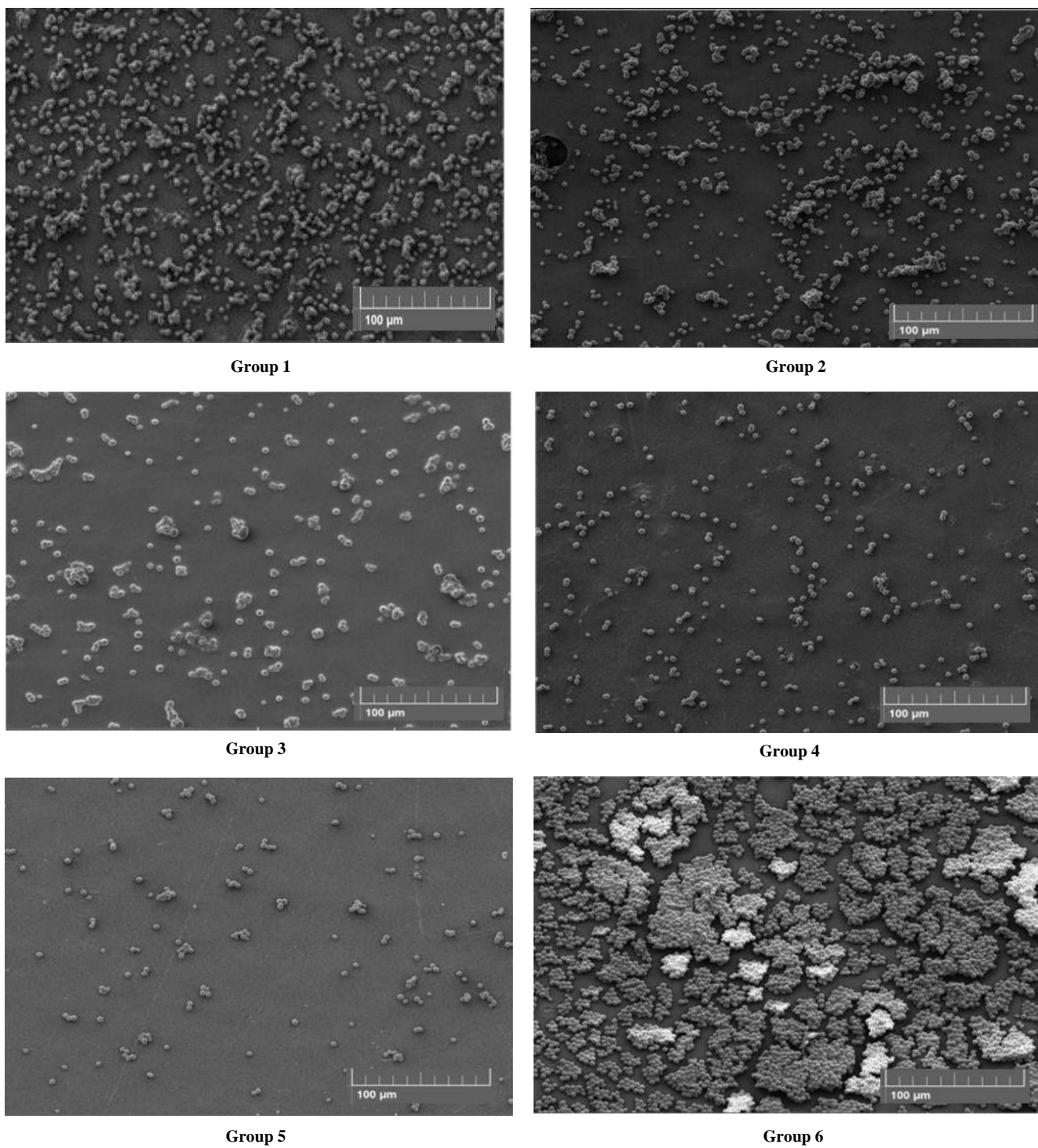


Figure 3: The amount of growth of *Candida albicans* on the SEM images was counted for all groups (1 to 6) using Image J.