



**“TO EVALUATE THE INFLUENCE OF DIFFERENT BEVERAGES
ON COLOUR STABILITY, FLORESCENCE STABILITY AND WEAR
RESISTANCE OF TWO COMMERCIALY AVAILABLE COMPOSITE
RESINS: AN INVITRO STUDY”**

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ABSTRACT

Introduction:

An increasing interest in esthetic dentistry from both patient and dentist stand point, has brought about the development of new materials to meet this demand. Resin based composite materials have evolved over the past decade and are widely used in dentistry due to their excellent esthetics, adequate strength ,bonding to enamel and dentine and moderate cost compared with that of ceramics. However, the shortcomings of these materials include secondary caries, plaque accumulation discoloration, wear, leakage and polymerization shrinkage.

The purpose of this study is to evaluate the color and florescence change of different types of resin-based composite materials upon exposure to staining agents. Also, to compare the wear resistance of the two composite materials before and after immersion in the staining agents, which serve as a chemical stress to hasten the process of wear.

Objectives:

1. To evaluate the color stability, florescence stability and wear resistance of two commercially available brands of composite resin when immersed in different staining agents.
2. To compare and determine which staining agent has the maximum influence and which composite shows more color, florescence and wear change.

Methodology:

120 samples of two composite resins namely Brilliant NG Nano Composite and Filtek™ Z350 XT Nanofilled Composite of the dimension 15x2mm were fabricated using a Teflon mold. The samples were cured as per manufacturer's instructions and then polished using Sof-Lex™ polishing kit. Samples were tested before and after immersion for thirty days in test solutions namely coffee solution, gutka solution and control ie artificial saliva.

Color determination was performed following the CIE (Commission Internationale de l'Eclairage) L^* a^* b^* model by means of Spectra Magic NX software (Konica Minolta) using an illuminant D65 on reflectance mode. The equipment was adjusted such that three consecutive readings were taken to calculate the mean of L^* , a^* and b^* values. Fluorescence readings were directly generated by the machine. For wear resistance, the loading pattern was the positive half of the sine function to simulate the loading pattern on human teeth during mastication. The magnitude of the maximum sine curve load applied was 15 N, with reference to the masticatory stress of 0.8 to 1.75 MPa typically applied to occlusal surfaces in vivo. Three hours of wear was undertaken continuously for every specimen. All samples were subjected group-wise to a profilometer (Surface Roughness Tester, Model- SJ 210, Mitutoyo, Japan) to check the surface roughness of each sample.

Results:

The data was tabulated and subjected to statistical analysis. The mean and standard deviation was calculated for each group and subjected to test for normality. Non

parametric tests of Kruskal Wallis were done followed by Mann Whitney U tests for pair wise comparisons between the groups.

The results of comparison of Filtek™ Z350 Xt Nanofilled Composite and Brilliant Ng Nanocomposite are statistically significant for color stability and wear changes as $p \text{ value} < 0.05$. The results for comparison of Filtek™ Z350 Xt Nanofilled Composite and Brilliant Ng Nanocomposite are statistically not significant for florescence stability as $p \text{ value} > 0.05$.

Conclusion: Thus within the limitations of this study it was concluded that the results of comparison of Filtek™ Z350 Xt Nanofilled composite and Brilliant Ng Nanocomposite for color stability showed that Filtek™ Z350 Xt Nanofilled composite had better color stability. The results of comparison for florescence stability of the two composite resins did not show significant difference. For comparison of wear resistance, Filtek™ Z350 Xt Nanofilled composite was superior to Brilliant Ng Nanocomposite. Gutka or chewable tobacco showed the maximum effect on color, florescence and wear resistance of the two composite resins.

Keywords: Composite resin, color stability, florescence stability, wear resistance.