



Stain Resistance of Three Different Manufacturers' Artificial Teeth: In-vitro Study

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INTRODUCTION

Color stability of denture teeth is important in maintaining optimal esthetics. The effects of various denture cleansers on the surface properties and color stability of denture base resins have been well documented.^{1,2,3} It is believed that some denture cleansers could have a bleaching or whitening effect on resin-based materials and that even distilled water could affect the color of resin-based materials after a prolonged immersion period.^{4,5}

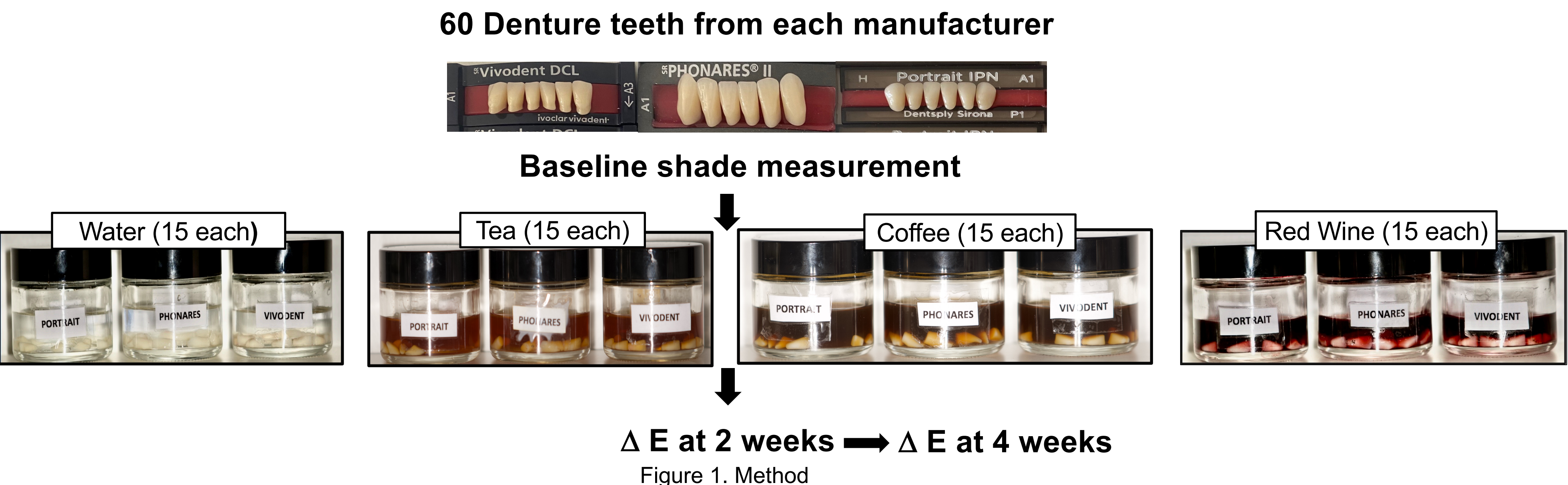
OBJECTIVES

The objective of this project is to evaluate the stain resistance of three different manufacturers' of artificial teeth.

METHODS

Thirty mandibular central and thirty mandibular lateral incisors in A1 shade from each of the following manufacturers: Portrait IPN (Dentsply, York, PA), Vivodent, and SR Phonares (IvoclarVivadent, Schaan, Liechtenstein) were used for this study. Fifteen denture teeth from each mould type were randomly assigned and submerged into four different liquids: distilled water, tea, coffee, or red wine, for four weeks. A total of 12 test groups were set up (Fig.1). The immersion liquids were changed every three days. After the initial immersion period of 2 weeks, all teeth were washed under tap water for 10 seconds and blot dried with tissue paper before measuring shades using a spectrophotometer.

The baseline (E1) shades were measured at the incisal one-third using a spectrophotometer (VITA Easyshade VITA Zahnfabrik H. Rauter GmbH & Co KG) (Fig.6). The Commission International de l'Eclairage (CIE) L*a*b* colour scale was used, where: L* represents lightness, from 0 (black) to 100 (perfect white), a* represents red (positive value) or green chroma (negative value), b* represents yellow (positive value) and blue chroma (negative value). Three measurements were taken for each tooth to obtain the mean L*a*b* value at 2 weeks (E2) and 4 weeks (E3) using the same spectrophotometer.² All measurements were taken by a single examiner under the same room lighting condition.



VITA Shade	A2	A3	B1	B2	C1	C2	D2	D3
Δ E	3.2	6.6	1.6	3.5	4.8	7.8	5.7	6.7

Table 1. Δ E Values used

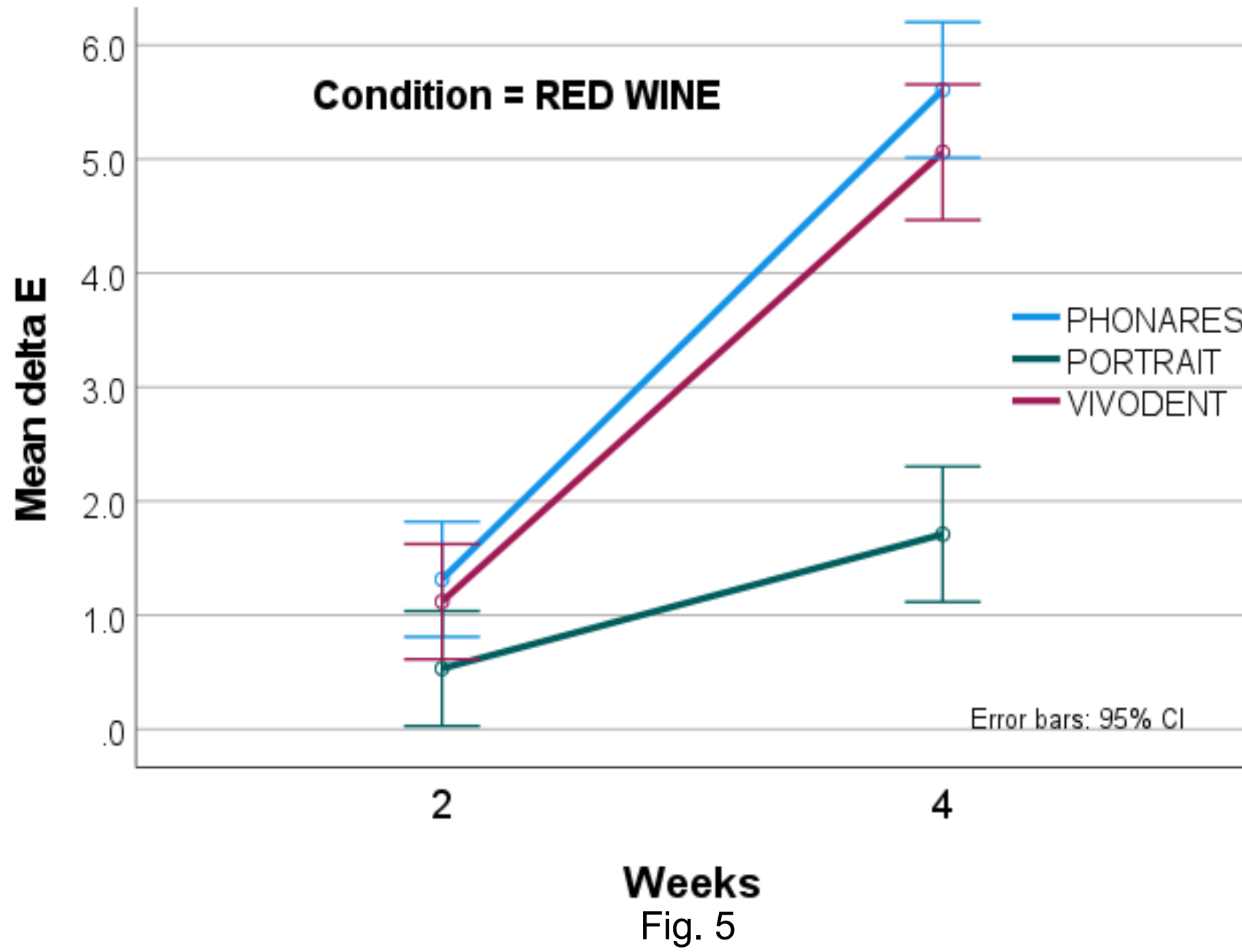
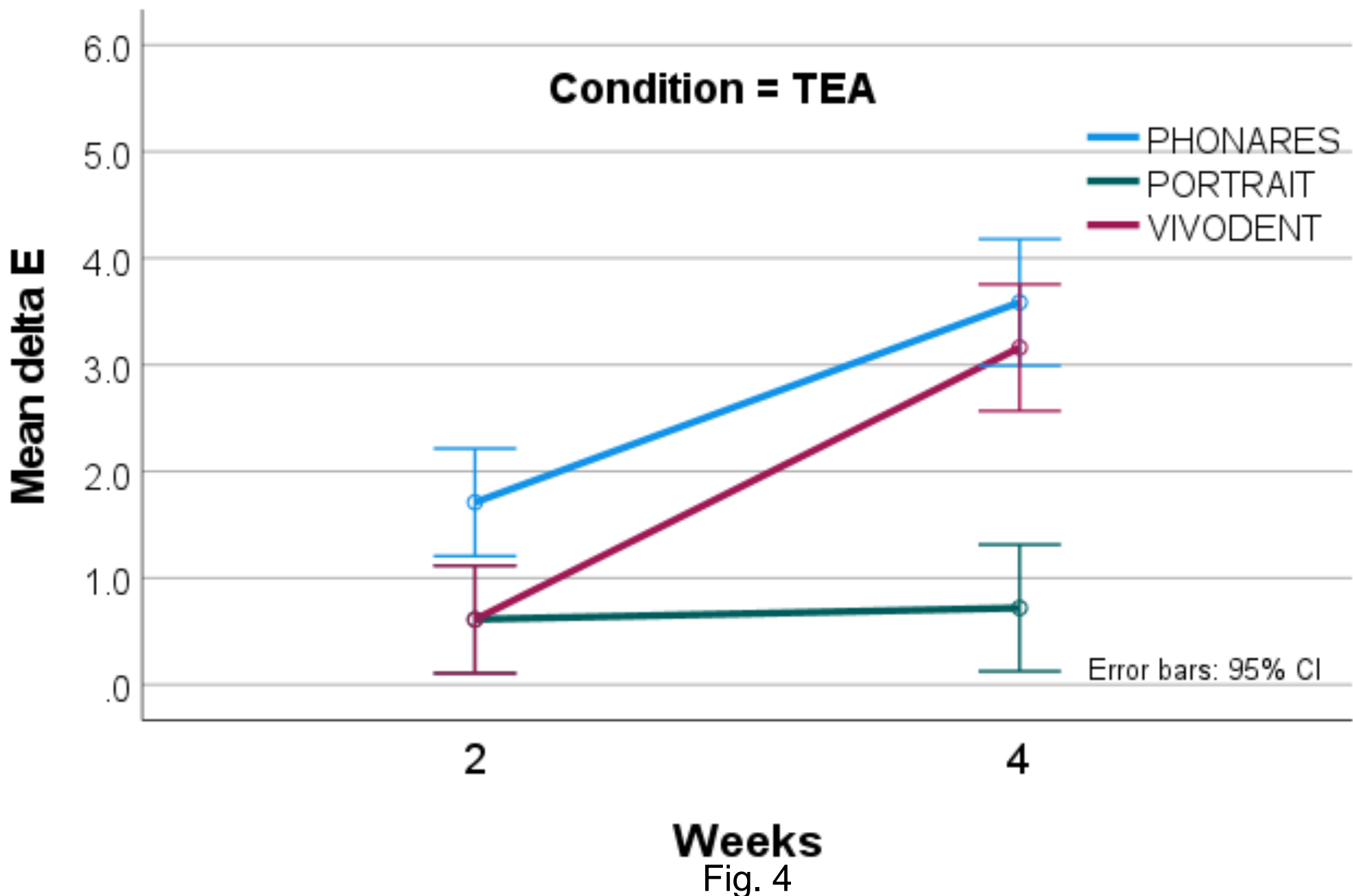
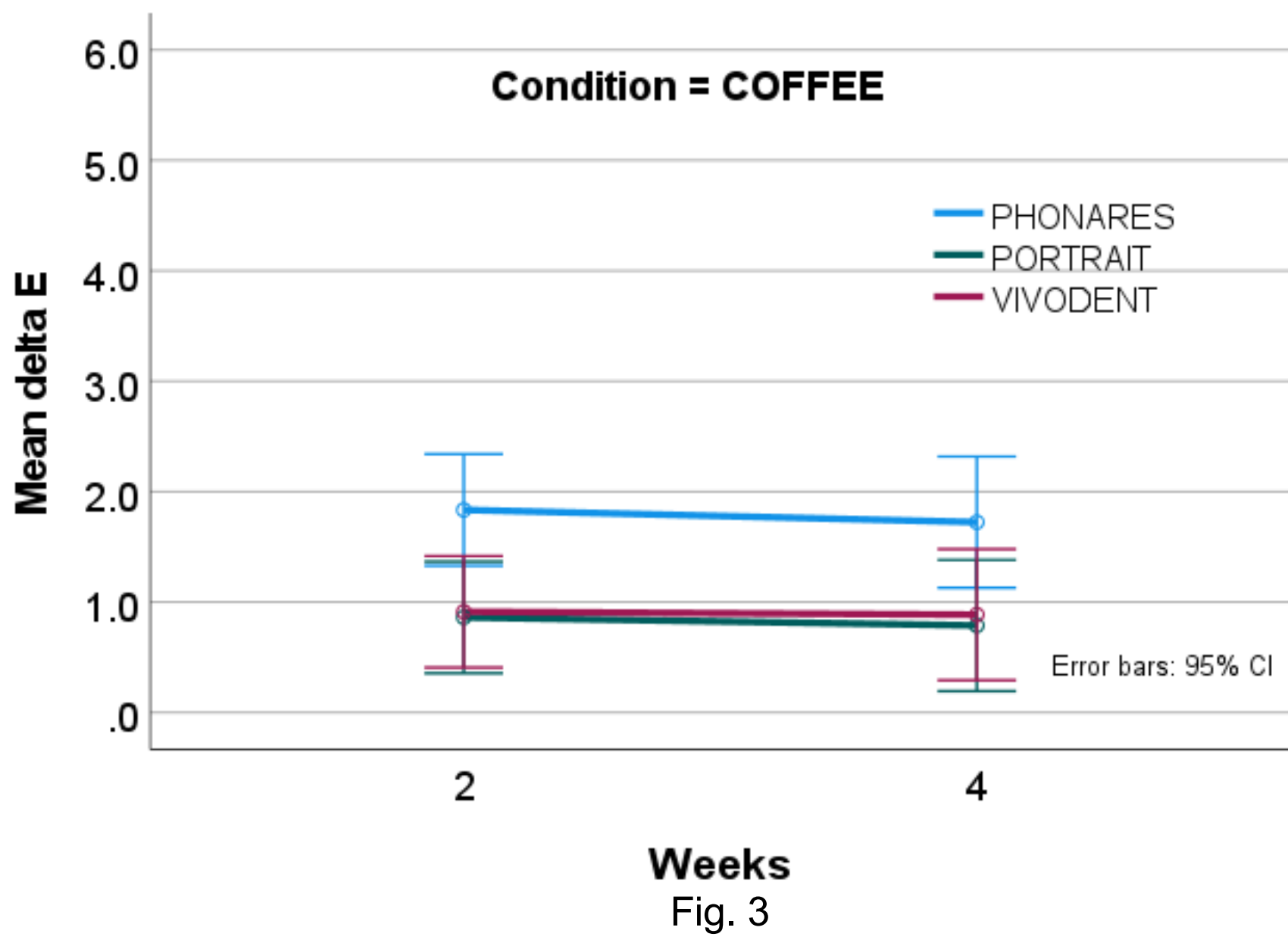
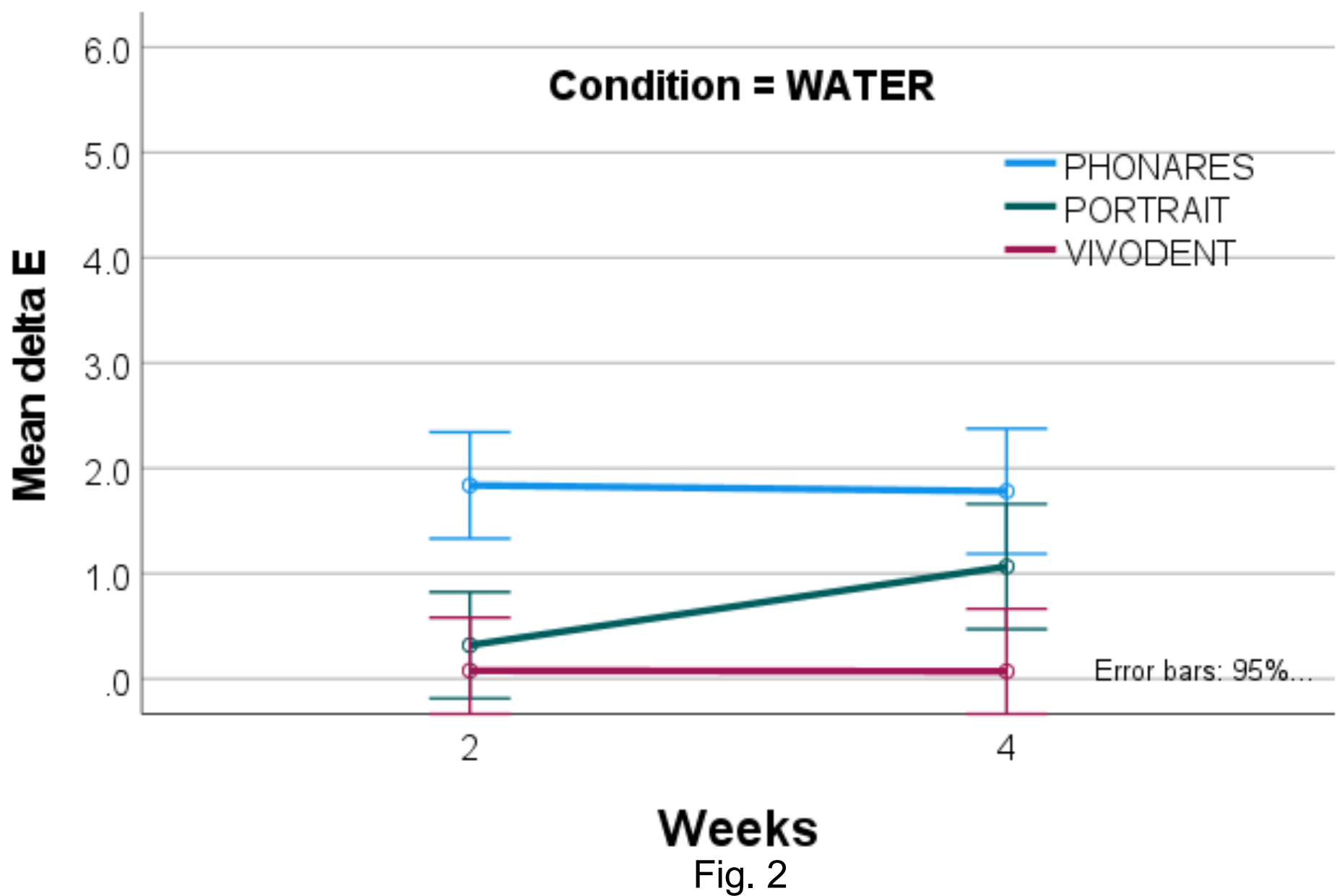


Fig. 6 (A and B). VITA Easyshade

RESULTS

For statistical analysis, the shades measured using spectrophotometer were converted to delta E (color difference measurement unit by the CIELAB),⁶ Figures 2 and 3 shows that no material showed appreciable staining to either coffee or distilled water, changing less than one level over the 4 week period. Portrait teeth resisted tea stain and were statistically more resistant to tea staining than Phonares or Vivodent teeth (Figure 4, p<0.05), which were 2 shade level changes darker at the end of 4 weeks. The darkest shades (D2) were observed in Phonares and Vivodent teeth at the end of 4 weeks. For red wine (Figure 5), Portrait teeth showed some staining (p<0.05), but less than that shown by Phonares or Vivodent teeth (p<0.05). Finally, both the Phonares and Vivodent teeth showed more staining when exposed to red wine than when exposed to tea (Figures 4 and 5, p<0.05). All denture teeth in distilled water showed a change in shade from the baseline. However, the result was not statistically significant.

CONCLUSION

Within the limitations of this study, Portrait teeth had the highest resistance to tea and red wine stain. Therefore, Portrait teeth may be more suitable teeth if patients are frequent tea or red wine drinkers.

REFERENCES

