IN-VITRO BEVERAGE DISCOLORATION AND STAIN REMOVAL OF PROVISIONAL C&B MATERIALS

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Objectives
To assess the discoloration of conventional and milled provisional crown and bridge (C&B) restorative materials by exposure to various beverages and to evaluate the efficacy of stain removal by simulated tooth-brushing.

Materials selected for this study
- Acrylic Resin Jet Set-4 (Lang)
- Bis-acryl Luxatemp (DMG)
- Bis-acrylic Composite Protemp Plus (JM ESPE)
- Microfiller Reinforced Polycrystalline Vita CAD/Temp (Vita)
- Polymethylmethacrylate Telio CAD (Ivoclar)
- Polymethylmethacrylate artBloc Temp (Merz)

Methods

1. Preparation of specimens.
   - Conventional provisional material specimens were fabricated using silicon molds.
   - Provisional CAD/CAM blocks were sectioned into tiles.
   - Specimens were polished down to 1μ using diamond paste.

2. Baseline Color Measurements.
   - Using a spectrophotometer.
   - Specimens against a gray background.
   - CIE L*a*b* values

3. Immersion in beverages at 37°C.
   - Specimens (n=10/group) were stored (37°C, 8 weeks) in six different “beverages”.

   - At 24 hours, 4 weeks and 8 weeks on specimens immersed in all beverages.

5. Simulated tooth-brushing on specimens immersed in COFFEE and RED WINE for 8 weeks.
   - 3 minutes on an automatic tooth-brushing machine.

   - To specimens that were immersed on COFFEE and RED WINE for 8 weeks.

Results

Graph 1. Color Difference of Specimens Immersed in Cranberry Juice, Tea, Coca-Cola and Water

Graph 2. Color Difference of Specimens Immersed in Red Wine

Graph 3. Color Difference of Specimens Immersed in Coffee

Conclusions
- Coca-Cola and water had no significant discoloration effect on any of the tested materials (p<0.05).
- Coffee and red wine exhibited the highest discoloration effect at 8 weeks immersion.
- CAD/CAM blocks showed significantly lower color change than traditional materials, at all durations, and after brushing (p<0.001).
- Tooth brushing reversed the coffee and red wine discoloration to an acceptable ΔE value for CAD/CAM blocks.
- Coffee and red wine had significant discoloring effect on the tested materials with discoloration level related to immersion duration.