

PHILIPS

sonicare

9900 Prestige

Stain removal

In-vitro study

An in-vitro assessment of the Philips Sonicare DiamondClean Prestige 9900 power toothbrush and A3 Premium All-in-One brush head on induced staining

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Objective

The objective of this study was to evaluate stain removal and tooth shade improvement when using Philips Sonicare DiamondClean Prestige 9900 with an A3 Premium All-in-One brush head, in a seven-day brushing simulation on stain-induced tooth enamel samples.

Methodology

In this in vitro study, 5x5mm enamel blocks were prepared from extracted human teeth and placed in an acrylic fixture. The enamel samples were polished and etched to facilitate stain uptake. The samples were exposed to cycles of staining in a solution containing tea, coffee, tobacco extract and red wine. Following staining, tooth color (L^* , a^* , b^*) was assessed using a calibrated Konica Minolta CM-700d Spectrophotometer. Forty-eight samples with L^* values in the lower range of the VITA BleachedGuide 3D-Master shade guide (VBG) were then selected.

Enamel samples were placed in a fixed mount, to which toothbrushing with Philips Sonicare DiamondClean Prestige 9900 and an A3 Premium All-in-One brush head (PSP) was applied with a brushing machine set at a standard 100g force, including the use of a standardized toothpaste slurry (including either Colgate Max White Optic whitening toothpaste, or Sensodyne Fresh Mint toothpaste). Repeat color and shade assessments were performed following a simulation of six and 14 brushings (three and seven days, twice daily use). Following brushing, the samples were analyzed for L^* , the attribute of color space where a positive change indicates a lightening effect, with the corresponding effect on VBG shade change computed.

Results

Following the brushing simulation, and expressed as shade change, an average improvement of 1.35 and 1.75 shades for Days 3 and 7 respectively, per VITA BleachedGuide, was observed for the PSP plus Colgate Max White toothpaste group. For the PSP plus Sensodyne Fresh Mint group, the outcomes for Days 3 and 7 were 0.81 and 1.11 shades.

Expressed as mean change in lightness (ΔL^*), the outcomes for PSP plus Colgate Max White toothpaste at Days 3 and 7, respectively, were 1.02 and 1.5 units (p -value = 0.08). For PSP plus Sensodyne Fresh Mint, the outcomes at Days 3 and 7 were 0.57 and 0.88 (p -value = 0.00), respectively.

Figure 1:
Mean Change in Shades, per VITA BleachedGuide following 6-brushing (3 days) and 14-brushing (7 days) simulation

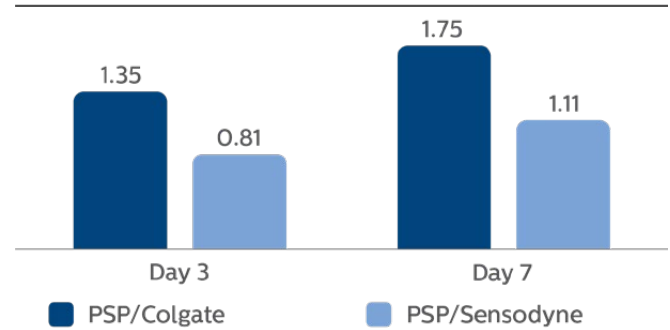
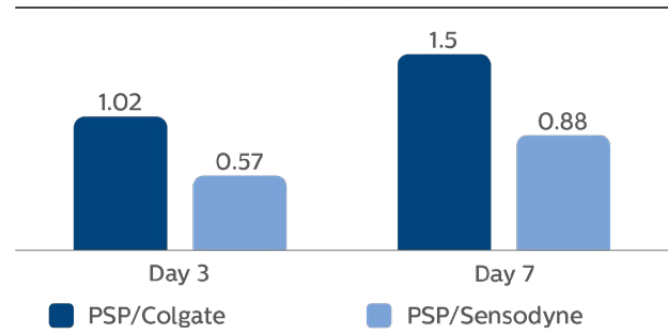


Figure 2:
Mean Change in Lightness (ΔL^*) following 6-brushing (3 days) and 14-brushing (7 days) simulation



Conclusions

Following induced staining on extracted enamel surfaces, Philips Sonicare DiamondClean Prestige 9900 with an A3 Premium All-in-One brush head significantly improves tooth color, with concomitant tooth shade improvement of up to 1.75 shades (per VITA BleachedGuide), following one week of simulated use.