

PHILIPS

sonicare

3500/3600

Stain removal

In-vitro study

An in-vitro assessment of Philips Sonicare 3500/3600 with Gentle White brush head on induced stain

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Study completed in 2021

Objective

The objective of this study was to evaluate stain removal and tooth shade improvement following use of Philips Sonicare 3500/3600 series with Gentle White brush head, in a two-week 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 3500/3600 plus Gentle White brush head (S3GW) 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 28 (two weeks, twice daily use) brushing sessions. 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 a two-week brushing simulation (expressed as shade change), an average improvement of 2.12 shades, per VBG, was observed for the S3GW plus Colgate Max White Optic toothpaste group, and 1.07 shades for the S3GW plus Sensodyne Fresh Mint group.

For the S3GW plus Colgate Max White Optic toothpaste, the mean change in tooth color lightness, expressed as L^* , was 1.77 units. For S3GW plus Sensodyne Fresh Mint, the outcome was 0.75. These differences were statistically significant from baseline (p -value = 0.00).

Figure 1:
VITA BleachedGuide, Mean Change in Shades following 28-brushing (2-week) simulation

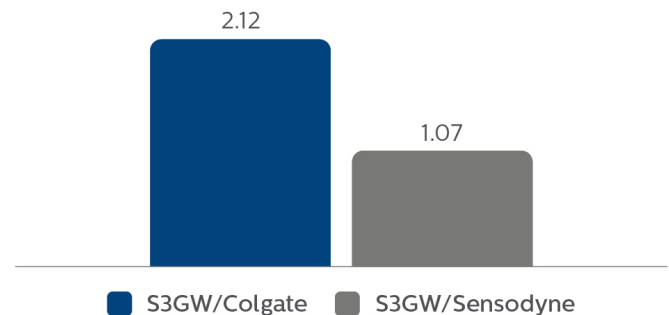
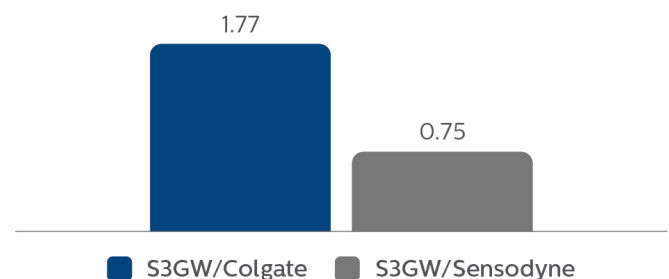


Figure 2:
Mean Change in Lightness (ΔL^*) following 28-brushing (2-week) simulation



Conclusions

Following induced staining, Philips Sonicare 3500/3600 with Gentle White brush head significantly improves tooth color, with concomitant tooth shade improvement of up to two shades (per VBG), following two weeks of use.