Name(s)

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Project Number

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Project Title

Effect of pH on Teeth Staining

Abstract

Objectives

The purpose is to assess the effects of various pH levels prior to drinking tea with respect to teeth staining.

Methods

Extracted teeth were collected, sterilized, and bleached. Distilled water was mixed with sulfuric acid and sodium hydroxide to create pH 4, 7, and 9 solutions; pH levels were confirmed using litmus paper. The teeth were placed into each pH solution for 15, 450, and 1350 minutes and then subsequently submerged in Lipton black tea for the respective amount of time. Three volunteers used the VITA Shade Guide to determine the color shades of the teeth, before and after being exposed to tea. The changes in color shades were calculated and compared for each of the different pH levels and durations of submersion.

Results

The acidic solution had the highest degree of discoloration followed by the alkaline solution and neutral solution. The longer the teeth were exposed to pH solutions and tea, the greater the discoloration.

Conclusions

The pH of the mouth prior to consuming dark-colored food or drinks is an important factor in discoloring teeth. The more acidic or alkaline the environment, the greater the risk of tooth discoloration. To minimize tooth staining, the mouth is best kept in a neutral environment.

Summary Statement

We determined that an acidic environment leads to the greatest degree of tooth discolorations when subsequently exposed to tea, followed by an alkaline and then neutral environment.

Help Received

Materials, supervision, and questions were answered and provided by Dr. Thy Nguyen, DDS and Chemistry Lab Technician Dung Khong.