

# Changes in the permeability and morphology of dentine surfaces after brushing with a Thai herbal toothpaste: A preliminary study

La-ongthong Vajrabhaya<sup>1</sup>, Suwanna Korsuwannawong<sup>2</sup>, Choltacha Harnirattisai<sup>3</sup>,  
Chayada Teinchai<sup>2</sup>

**Correspondence:** Dr. La-ongthong Vajrabhaya  
Email: [la-ongthong.v@rsu.ac.th](mailto:la-ongthong.v@rsu.ac.th)

<sup>1</sup>Endodontic Section, Faculty of Dental Medicine, Rangsit University, Pathumthani, Thailand,  
<sup>2</sup>Research Office, Faculty of Dentistry, Mahidol University, Bangkok, Thailand,  
<sup>3</sup>Department of Operative Dentistry and Endodontics, Mahidol University, Bangkok, Thailand

## ABSTRACT

**Objectives:** The aim of this study was to evaluate dentine permeability after brushing with Twin Lotus<sup>®</sup>, Thai herbal toothpaste by comparing with Sensodyne Rapid Relief<sup>®</sup>, a commercial desensitizing toothpaste, and also after artificial saliva (AS) immersion or citric acid challenge. **Materials and Methods:** Dentine discs from human mandibular third molars were divided into three groups ( $n = 20$ ) and brushed with either experimental toothpaste or water (control) for 2 min with an automated toothbrush. Then, 10 discs were immersed in AS, and the other 10 discs were immersed in 6% citric acid to simulate the conditions of the oral environment. The dentine permeability of each specimen was measured before brushing and after each treatment using a fluid filtration system. Morphological changes in the dentine were observed using scanning electron microscopy (SEM). **Results:** Both toothpastes significantly reduced dentine permeability, and a crystalline precipitate was observed on the dentine surface under SEM observation. No significant difference was found between the two toothpaste groups with regard to dentine permeability after brushing and AS or acid immersion. **Conclusions:** The dentine permeability reduction caused by the two toothpastes did not differ after brushing or after AS or citric acid immersion.

**Key words:** Dentine permeability, herbal toothpaste, occlusion

## INTRODUCTION

Dentine hypersensitivity is normally caused by exposure of dentine to external stimuli such as temperature changes, air, sour drinks, and sweet drinks.<sup>[1]</sup> Enamel and cementum, which normally cover the exposed dentine, can become damaged due to attrition, abrasion, erosion, abfraction, and gingival recession.<sup>[2,3]</sup> Dentine hypersensitivity occurs more frequently in the cervical region of the tooth because

the cementum in this area is very thin, ranging from 20 to 50  $\mu\text{m}$ .<sup>[4]</sup>

The mechanism of dentine hypersensitivity is explained by the hydrodynamic theory,<sup>[5]</sup> which states that the stimulus evokes a fluid shift in the dentinal tubules affecting the pulpal mechanoreceptors, which results

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