

**PENGARUH KONSENTRASI PAPAN GEL THEOBROMINE TERHADAP
KEKASARAN DAN KEKERASAN PERMUKAAN EMAIL
GIGI DESIDUI SETELAH DEMINERALISASI
(Kajian in vitro pada gigi incisivus desidui)**

INTISARI

Tahap awal pembentukan karies dapat dicegah dengan terjadinya proses remineralisasi. Theobromine merupakan alkaloid golongan metylxantine yang berperan meningkatkan kekerasan permukaan email dengan pertukaran mineral pada permukaan email. Penelitian ini bertujuan mengetahui pengaruh konsentrasi gel theobromine terhadap kekasaran dan kekerasan permukaan email gigi desidui setelah demineralisasi.

Dua puluh gigi incisivus desidui dibagi menjadi 5 kelompok perlakuan. Objek dilakukan demineralisasi menggunakan asam fosfat 37% selama 60 detik kemudian dilakukan aplikasi topikal gel theobromine konsentrasi 1%, 2%, 3%, 4% dan 5% selama 4 menit. Objek direndam dalam saliva buatan selama 60 menit. Pengukuran kekasaran permukaan email menggunakan *Surface Roughness Tester* dan kekerasan permukaan email menggunakan *Vickers Microhardness Tester*. Hasil dianalisis menggunakan uji *Kruskal Wallis* dilanjutkan dengan uji *Mann Whitney*.

Hasil penelitian menunjukkan semakin besar konsentrasi gel theobromine semakin menurunkan kekasaran dan meningkatkan kekerasan permukaan email. Hasil uji *Kruskal Wallis* menunjukkan terdapat pengaruh yang bermakna paparan gel theobromine terhadap perubahan penurunan kekasaran dan peningkatan kekerasan permukaan email gigi ($p < 0,05$). Uji *Mann Whitney* menunjukkan kelompok gel theobromine konsentrasi 5% berbeda secara signifikan dengan kelompok lainnya baik terhadap penurunan kekasaran maupun peningkatan kekerasan permukaan email. Kesimpulan penelitian ini adalah konsentrasi gel theobromine 5% paling efektif menurunkan kekasaran dan meningkatkan kekerasan permukaan email gigi desidui setelah demineralisasi.

Kata kunci: theobromine, kekasaran, kekerasan, email gigi desidui, demineralisasi

**EFFECT OF CONCENTRATION OF THEOBROMINE GEL EXPOSURE
ON ENAMEL SURFACE ROUGHNESS AND HARDNESS OF
DECIDUOUS TEETH AFTER DEMINERALIZATION
(An in vitro study of deciduous incisors)**

ABSTRACT

The initial stage of the formation of caries still can be prevented by remineralization. Theobromine is a methylxanthine alkaloid to increase the hardness of enamel surface by means of mineral exchange on it. This research aims to shed a light on the effect of concentrations of theobromine gel on enamel surface roughness and hardness of deciduous teeth after demineralization.

Twenty deciduous incisors were divided into 5 treatment groups. Every object was demineralized using 37% phosphoric acid for 60 seconds and exposed to theobromine gel with the concentration of 1%, 2%, 3%, 4% and 5% for 4 minutes. The object was immersed in artificial saliva in 60 minutes. The roughness of the enamel surface was tested using *Surface Roughness Tester* and its hardness was tested using *Vickers Microhardness Tester*. Result was analyzed with *Kruskal Wallis* test and *Mann Whitney* test.

The research findings showed that the concentration of theobromine gel was inversely proportional to the roughness of enamel surface and directly proportional to its hardness. *Kruskal Wallis* test showed that there was an effect of the exposure of theobromine gel on the decrease of the roughness of enamel surface and the increase of its hardness ($p < 0,05$). *Mann Whitney* test showed that the theobromine gel with concentration of 5% was significantly different from other groups in terms of the decrease of the roughness of enamel surface and the increase of its hardness. It was concluded that the concentration of theobromine gel 5% was the most effective in decreasing the roughness of enamel surface and increasing its hardness after demineralization.

Key words: theobromine, roughness, hardness, deciduous teeth enamel, demineralization