

Pengaruh permen karet CPP-ACP propolis terhadap kadar kalsium dan fosfat saliva subjek bebas karies serta pembentukan biofilm streptococcus mutans = The effect of CPP=ACP propolis chewing gum towards calcium and phosphate level in caries free subjects saliva and the formation of streptococcus mutans biofilm

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Abstrak

Latar Belakang : Karies gigi merupakan penyakit gigi dan mulut yang sering ditemukan di Indonesia. Diperlukan upaya alternatif pencegahan, yang dalam penelitian ini dilakukan dengan menggabungkan dua bahan aktif CPP-ACP dan lilin propolis dalam satu sediaan permen karet bebas gula dengan lima konsentrasi yang berbeda (0% Prop, 0% CPP-ACP ; 0% Prop + CPP-ACP ; 2% Prop + CPPACP ; 4% Prop + CPP-ACP ; dan 6% Prop + CPP-ACP).

Tujuan : Menganalisis kadar pelepasan ion kalsium dan fosfat oleh CPP-ACP untuk mendukung remineralisasi dan keefektifan lilin propolis dalam menekan pembentukan massa biofilm S.mutans pada subjek bebas karies serta melihat apakah kedua bahan aktif ini efektif jika digabungkan dalam satu sediaan permen karet bebas gula.

Metode : 25 sampel saliva bebas karies sebelum dan sesudah simulasi pengunyahan lima konsentrasi permen karet in vitro dilakukan uji pelepasan ion kalsium dan fosfat serta uji biofilm. Pelepasan ion kalsium dideteksi menggunakan AAS, ion fosfat menggunakan Spektrofotometri UV-VIS, dan uji biofilm menggunakan uji crystal violet 96-well plate ELISA dan dibaca menggunakan microplate reader.

Hasil : Permen karet CPP-ACP-Propolis dengan konsentrasi 0% Prop + CPP-ACP menunjukkan kadar pelepasan ion kalsium ($p < 0,05$) dan fosfat ($p > 0,05$) tertinggi dan signifikan dalam menekan pembentukan massa biofilm S.mutans ($p < 0,05$).

Simpulan : Terjadi peningkatan kadar ion kalsium dan fosfat pada saliva bebas karies, serta, penurunan massa biofilm S.mutans setelah pengunyahan permen karet CPP-ACP-Propolis.

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Background: Dental caries is an oral disease commonly found in Indonesia. Alternative prevention are needed, which in this research is going to be combining two active components which are CPP-ACP and propolis wax into one substance of sugar-free chewing gum with five different concentrations (0% Prop, 0% CPPACP ; 0% Prop + CPP-ACP ; 2% Prop + CPP-ACP ; 4% Prop + CPP-ACP ; and 6% Prop + CPP-ACP).

Objectives: To analyze the amount of calcium and phosphate ion released by CPP-ACP to support the remineralization and to analyze the effectiveness of propolis wax in suppressing the mass formation of Streptococcus mutans biofilm in caries-free subjects and also observing if these two active components are effective when combined into one substance of sugarfrees chewing gum.

Methods: 25 samples of caries-free saliva before and after the mastication simulation (five concentrations of chewing gum) in vitro, observed the release of calcium and phosphate ion along with a biofilm assay. The release of calcium ion is detected using AAS, while phosphate ion using the Spectrophotometry UV-VIS, and the biofilm assay using the crystal violet 96-well plate ELISA and evaluated with a microplate reader.

Result: Chewing gum with a concentration of 0% Prop + CPP-ACP has shown the highest release level of calcium ($p < 0,05$) and phosphate ion ($p > 0,05$) and is significant in suppressing the mass formation of *S.mutans* biofilm ($p < 0,05$).

Conclusion: Increased calcium and phosphate ion level in caries-free saliva and decreased of *S.mutans* biofilm mass after mastication simulation of CPP-ACP-Propolis chewing gum are detected.