

Analisis Protein Saliva Early Childhood Caries terhadap Pembentukan Biofilm Streptococcus mutans serta Kombinasi Streptococcus mutans dan Candida albicans di Rongga Mulut = Analysis of Saliva Protein Early Childhood Caries on Biofilm Formation of Streptococcus mutans and Combination of Streptococcus mutans and Candida albicans in the Oral Cavity

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Abstrak

Latar belakang: ECC menjadi masalah serius di Indonesia dan Dunia. Terdapat 3 komponen ECC, yaitu gigi, mikroba, serta lingkungan rongga mulut yang dalam hal ini yaitu protein saliva. Penyebab dari ECC sendiri yaitu bakteri Streptococcus mutans. Tidak hanya itu, Candida albicans sering dihubungkan dengan Streptococcus mutans pada plak ECC. Namun, adanya riset di mana Candida albicans cenderung mengurangi sifat kariogenik Streptococcus mutans menarik untuk diteliti. Tujuan: menganalisis peran protein saliva ECC terhadap pertumbuhan biofilm Streptococcus mutans dan Streptococcus mutans dan Candida albicans (atau dual-spesies) di rongga mulut. Metode: Setiap sampel dilakukan uji SDS-Page untuk melihat apakah terdapat perbedaan profil protein antar setiap sampel. Lalu, sampel dilakukan pengenceran menjadi 3 konsentrasi, kemudian diinkubasi bersama dengan Streptococcus mutans serta dual-spesies di dalam 96-well plate selama 24 jam dan 48 jam secara anaerob. Lalu, masing-masing biofilm dilakukan uji Crystal Violet Staining (untuk mendapatkan nilai Optical density) serta Total Plate Count. Hasil: Tidak terdapat perbedaan profil protein antara saliva ECC dengan laju alir saliva <30 detik, 30-60 detik, 30-60 detik bebas ECC. Pada variabel konsentrasi protein, terdapat perbedaan dan kenaikan nilai rerata pada nilai Optical density biofilm pada Streptococcus mutans dan dual-spesies. Tidak terdapat perbedaan secara statistik antara konsentrasi protein saliva dengan viabilitas mikroba pada biofilm Streptococcus mutans dan dual-spesies meski nilai rerata menunjukkan penurunan viabilitas mikroba. Pada biofilm Streptococcus mutans dan dual-spesies, tidak terdapat perbedaan bermakna pada hasil uji Optical density dan viabilitas mikroba berdasarkan variabel waktu inkubasi biofilm. Meski nilai rerata menunjukkan adanya penurunan pada Optical density Streptococcus mutans, kenaikan pada viabilitas mikroba Streptococcus mutans, dan kenaikan pada Optical density sekaligus viabilitas mikroba dual-spesies, namun tidak memengaruhi nilai komparasinya. Kesimpulan: Protein saliva dapat memengaruhi pembentukan biofilm baik Streptococcus mutans maupun kombinasi dual-spesies Streptococcus mutans dengan Candida albicans. Waktu inkubasi biofilm tidak dapat memengaruhi pembentukan biofilm Streptococcus mutans maupun kombinasi dual-spesies Streptococcus mutans dengan Candida albicans

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Background: ECC is a serious problem in Indonesia and the world. There are 3 components of ECC, namely teeth, microbes, and the oral environment, in this case salivary protein. The cause of ECC itself is *Streptococcus mutans*. Not only that, *Candida albicans* is often associated with *Streptococcus mutans* in ECC plaques. However, the research in which *Candida albicans* tends to reduce the cariogenic properties of *Streptococcus mutans* is interesting. Purpose: to analyze the role of the ECC salivary protein on the growth of *Streptococcus mutans* and combination of *Streptococcus mutans* and *Candida albicans* (or dual-species) biofilms in the oral cavity. Methods: Each sample was subjected to an SDS-Page test to see if there were differences in protein profiles between each sample. Then, the sample was diluted into 3 concentrations, then incubated together with *Streptococcus mutans* and dual-species in 96-well plates for 24 hours and 48 hours anaerobically. Then, each biofilm was subjected to a Crystal Violet Staining test (to obtain Optical density value) and Total Plate Count. Results: There was no difference in protein profile between salivary ECC with salivary flow rates <30 seconds, 30-60 seconds, ECC-free 30-60 seconds. In the protein concentration variable, there were differences and an increase in trend lines in the Optical density value of biofilms in *Streptococcus mutans* and dual-species. There was no statistical difference between salivary protein concentrations and microbial viability in *Streptococcus mutans* and dual-species biofilms, although the trend line showed a decrease in microbial viability. In *Streptococcus mutans* and dual-species biofilms, there were no significant differences in the Optical density test results and microbial viability based on the biofilm incubation time variables. Although the trend line showed a decrease in Optical density *Streptococcus mutans*, an increase in microbial viability of *Streptococcus mutans*, and an increase in Optical density as well as dual-species microbial viability, it did not affect the comparative value. Conclusion: Salivary protein can influence biofilm formation for both *Streptococcus mutans* and the dual-species combination of *Streptococcus mutans* and *Candida albicans*. Biofilm incubation time could not affect the biofilm formation of both *Streptococcus mutans* and the dual-species combination of *Streptococcus mutans* and *Candida albicans*