

Catechin Inhibition toward the *S. mutans* Growth

ABSTRACT

Streptococcus mutans (*S. mutans*) is one of the components of microorganisms that cause dental plaque. Plaque was the main cause of oral disease. Tea was known has catechin which useful to prevent dental plaque's formation that was caused by *S. mutans*. Catechin is tea polyphenol which helps the formation of leukocyte. The function of leukocyte was to against infection and bacteria growth. The aim of this study was to compare the inhibition of catechin from two type of tea which are green tea and black tea toward *S. mutans* growth. The method of this study was bacteria test with Kirby Bauer's method, and is used culture media Mueller Hinton Blood (MHB). Each extract was diluted to 1%, 2.5% and 5%. The result of this study show that there was significant difference between green tea extract and black tea extract in inhibiting *S. mutans* growth ($\alpha < 0.05$). It can be concluded that resistivity of the green tea extract with a concentration 2.5% is more effective in inhibiting *S. mutans*'s growth than black tea.

Key Words: catechin, *Streptococcus mutans*, green tea, black tea

INTRODUCTION

Dental plaque is the main cause of oral disease. Plaque is a group of bacteria which tied in an organic matrix and stick on the tooth surface. One of the cariogenic-mikroorganisme component in dental plaque is *Streptococcus mutans* (*S. mutans*). *S. mutans* predominate in dental plaque formation.¹ *S. Mutans* is a gram positive bacteria, nonmotil, asidogenic and have an enzyme called glukosiltransferase that is able to synthesize glucose molecule become dextran- $\alpha(1 \rightarrow 6)$ and $\alpha(1 \rightarrow 3)$. Dextran- $\alpha(1 \rightarrow 3)$ is very sticky, insoluble in water and can support other bacteria stick in tooth enamel. The acidogenic character of plaque is able to produce acid to dissolve tooth enamel. That caused colonization of *S. mutans* and plaque formation on the tooth surface.²

Tea is made from young tea leaf that called *Camellia sinensis* L. Kuntze. Based on the way to processing, traditionally tea consist of 3 type, that is green tea, oolong tea, and black tea.³ Some literatures mention that green tea can reduce acid and dental plaque formation of *S. mutans*. Polifenol of green tea so-called katekin, can pursue growth all bacterial type include *S. mutans* standard strain, and has ability as antibacterial and antioxidant. Green tea also contain fluoride to inhibit growth of plaque bacteria.^{4,5} Chemical component in black tea so-called teaflavin, has ability as antibacterial that is preventing bacterial colonization, inhibit plaque formation and reduce acid production. Consuming black tea can assist to prevent dental plaque formation, dental caries and periodontal disease.^{6,7} The aim of this study was to compare resistivity of two type of tea which are green tea and black tea toward *S. mutans*'s growth.

DENTAL PLAQUE

Dental plaque is a semi-transparent coat, stick on tooth surface and consist of a large amount of mikroorganism. Combination of plaque, bacteria and pelicle known as oral-biofilm.^{8,9} According to Besford (1996), plaque consist of *S. mutans*, other type of bacteria and also protein-saliva which forming a microscopic picture at tooth surface. Dental plaque consist of three functional component : (a) cariogenic mikroorganism, especially *S. mutans*, *L. acidophilus*, and *A. viscous*; (b) Periodontopathy mikroorganism, especially *Bacteroides asaccharolyticus* (gingivalis), *Actinobacillus*; (c) adjuvant and supresive materials, the most potential is lipopolysaccharide, dextran, levan, and lipoteichoic acid.⁸ Dental plaque formation started after *S. mutans* c serotype



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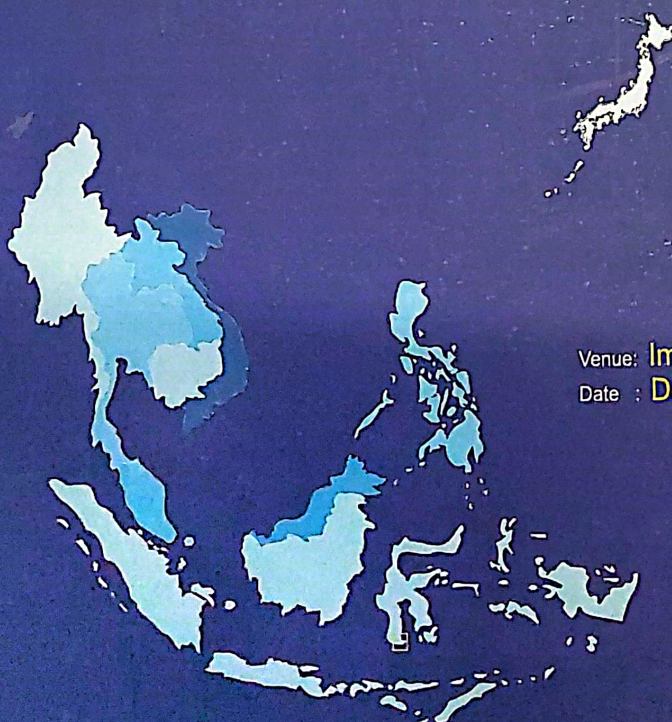
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Faculty of Dentistry Hasanuddin University
Makassar, South Sulawesi, Indonesia

Jl. Perintis Kemerdekaan KM.10 Makassar 90245
Telp : +62 411 586012, +62 411 587444 Fax. 584641



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