

Fatty Acid Evaluation and Antimicrobial Activity of Virgin Coconut Oil and Activated Virgin Coconut Oil on Streptococcus mutans

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Abstract

For decades, coconut oil was reported to possess a broad spectrum of antimicrobial activity due to its abundant fatty acid's contents. Streptococcus mutans (*S. mutans*) has been strongly implicated as the main etiological factor in dental caries. Regardless of the ongoing medical advances, the therapeutic resources for dental caries remain ineffectual, and this has led to renewed interest in using virgin coconut oil (VCO) as a possible choice for dental caries control. In this study, the ability of VCO and activated virgin coconut oil (AVCO) combatting cariogenic *S. mutans* ATCC 25175 has been evaluated. Fatty acids contents were compared through gas chromatography-mass spectrum (GC-MS) analysis, and their antimicrobial activity was determined using disc diffusion and minimum inhibitory concentration (MIC) test. From the GC-MS analysis, AVCO (59%) was found to have a slightly higher medium-chain fatty acids (MCFA) as compared to VCO (54.1%), and the long-chain fatty acids (LCFA) contents in VCO (45.9%) was found to be higher than AVCO (41%). Interestingly, *S. mutans* ATCC 25175 was found to be susceptible towards AVCO (MIC: 6.24 mg/ml) and resistance towards VCO in vitro. The excellent antimicrobial activity of AVCO as a result from (i) the release of individuals fatty acids after activation of VCO by lipase digestion and (ii) the present of MCFA and LCFA that are significant in antimicrobial activity. Further study can be designed to specifically examine the activity of individuals fatty acids present in oils against *S. mutans* virulence genes/protein using molecular dynamic assessment.

Keywords

Author Keywords: Activated virgin coconut oil; antimicrobial activity; fatty acids; GC-MS analysis; virgin coconut oil
KeyWords Plus: ANTICANCER DRUG METHOTREXATE; LAURIC ACID; PROPIONIBACTERIUM-ACNES; ANTIBACTERIAL ACTIVITY; ANTIOXIDANT; SURVIVAL; EFFICACY; DISEASE

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