

Enzymatic and Mechanical Extraction of Virgin Coconut Oil

Soo Pooi Pooi¹, Phuah Eng Tong¹, Ali Yassoralipour¹ Lai Oi Ming^{2,3} and Kuan Chee Hao¹

¹*Department of Agricultural and Food Science, Faculty of Science, Universiti Tunku Abdul Rahman, Bandar Barat, 31900 Kampar, Perak, Malaysia.*

²*Department of Bioprocess Technology, Faculty of Biotechnology and Biomolecular Sciences, Universiti Putra Malaysia, Selangor, Malaysia.*

³*Institute of Bioscience, Universiti Putra Malaysia, Selangor, Malaysia.*

Corresponding author email: phuahet@utar.edu.my

INTERNATIONAL CONFERENCE ON RECENT TRENDS IN HUMANITIES AND SCIENCE 2018, 'ICRTHS-2018'.

UNIVERSITI TUNKU ABDUL RAHMAN, BANDAR BARAT, 31900 KAMPAR, PERAK, MALAYSIA.

26TH OCTOBER 2018.

American J of Bio-pharm Biochem and Life Sci 2018 December, Vol. 6: OP37

ABSTRACT

Virgin coconut oil (VCO) is gaining popularity due to its therapeutic values. Past studies proposed that pineapple is rich in protease (bromelain) which exhibits demulsification effect. However, no reports on VCO extraction using bromelain from pineapple. Therefore, this study aimed to evaluate the yield recovery and physicochemical properties of VCO extracted using crude protease extract (CPE) from pineapple; meanwhile compared with mechanical extraction techniques (microwave and sonication) without enzyme. VCO was extracted from coconut flesh using CPE from overripe pineapples at different temperatures (40°C-60°C) and reaction times (1h-3h). The highest VCO yield was 77.7% at temperature 50°C for 2h. Meanwhile, CPE showed higher VCO extraction efficacy as compared to microwave (58.6%, at 450W for 10min), sonication (24.1%, for 2h) and control (24.1%, at 50°C for 2h) ($P < 0.05$). Lauric acid (C12:0) was the most abundant medium chain fatty acids detected, followed by myristic acid with no significant difference for different extraction techniques ($P > 0.05$). Other physicochemical properties namely iodine value, saponification matter, moisture content and free fatty acid for the VCOs extracted conform to the APCC standards established. No significant difference was found for the physicochemical properties studied for VCO extracted using both mechanical and enzymatic approaches ($P > 0.05$). The thermal behavior for all VCOs were comparable with 2 distinct peaks detected in the both melting and crystallisation thermograms at 13.5°C and 24°C, and -1.5°C and 4.5°C, respectively. Triacylglycerol (TAG) profile analysis of the extracted VCOs revealed 7 major TAGs which differ in carbon number (CN) with TAG-CN 32, 34 and 36 being the most predominant.