ABSTRACT

Margaretha Manuella C (03420100055)

FRACTIONATION AND IDENTIFICATION OF POTENTIAL FERMENTATION INHIBITOR(S) FROM RAMBUTAN (NEPHELIUM LAPPACEUM L.) PEEL EXTRACTS APPLIED TO CIDER PRODUCTION
(xiv+117 pages: 21 figures, 19 tables, 4 appendices)

Ethanolic and ethyl acetate rambutan (Nephelium lappaceum L.) peel extracts had been reported to show a fermentation inhibitory activity. This research was aimed to fractionate and identify potential active compound(s) that acts as natural fermentation inhibitor(s) in rambutan peel extract where the fractionated extracts were applied in cider making as a model system. Rambutan peels were extracted by using maceration method with either ethanol (polar) or ethyl acetate (semi polar) as solvent. Rambutan peels macerated with ethanol or ethyl acetate were evaporated using rotary evaporator. Evaporated rambutan peel extracts were then fractionated by using column chromatography with gradient eluents of 75 ethyl acetate : 25 ethanol, 50 ethyl acetate : 50 ethanol and 25 ethyl acetate : 75 ethanol ratios resulting in three fractions (Fractions I, II and III). Fractions collected after column chromatography conducted were applied to apple cider and fermented for 21 days. The physicochemical of cider such as pH, total titratable acid, total dissolved solid, total reducing sugar and alcohol content were observed every three days. The addition of the fraction I of ethanol and ethyl acetate rambutan peel extract produced low-alcohol-cider of 0.98±0.32 and 0.19±0.41% alcohol content, respectively, after 21 days of fermentation. The addition of fraction II of ethanol and ethyl acetate rambutan peel extract produced cider with alcohol content of 7.69±1.27 and 6.60±0.85%, respectively, and the addition of fraction III of ethanol and ethyl acetate rambutan peel extract produced 8.05±0.77 and 7.79±0.36% alcohol content of cider, respectively, comparable to the control apple cider with the alcohol content of 7.30±0.56% after 21 days of fermentation. This indicated that the potential inhibitor(s) was present in the fraction I of the rambutan peel extracts. The fermentation inhibitor compound(s) was identified using Liquid Chromatography-Mass Spectrometry (LC-MS) method. There were four identified chemical formulas (C_{8}H_{12}N_{2}O_{3}S and C_{30}H_{44}O_{2} in fraction I of ethanol extract and C_{15}H_{14}O_{6} and C_{30}H_{26}O_{12} in fraction I of ethyl acetate extract) presumably as the inhibitors.

Keywords : Alcoholic fermentation, apple cider, column chromatography, fermentation inhibitor, fractionation, LC-MS, rambutan peel
References: 74 (1969-2014)