ABSTRACT

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APPLICATION OF RAMBUTAN (NEPHELIUM LAPPACEUM L.) PEEL AND ITS ETHANOLIC EXTRACT TO COCONUT (COCOS NUCIFERA L.) SAP TO DELAY FERMENTATION FOR ALCOHOL PRODUCTION

Rambutan (Nephelium lappaceum L.) has been found to contain fermentation inhibitor compounds that had been able to inhibit alcoholic fermentation in cider, cassava tapai, and sugar palm sap. This research was aimed to investigate the application of rambutan peel and its ethanolic extract as a potential fermentation inhibitor to delay the alcohol formation in coconut sap. In the research, both rambutan peel and its ethanolic extract were incorporated into coconut sap and were observed and analyzed for seven days. The rambutan peel used in the research was size-reduced peel with concentrations of 35, 40, and 45%, while ethanolic peel extract concentrations of 1.5, 3.0, 4.5, and 6.0%. Physicochemical properties (pH, total dissolved solids, alcohol content, total sugar, total reducing sugar, and total titratable acidity) and microbiological enumeration were observed. Addition of different concentrations of size-reduced rambutan peel successfully delayed the alcohol production by delaying its peak alcohol content reached after five days of storage for 35% peel concentration added, and seven days for 40 and 45% peel concentration added. Rambutan peel ethanolic extract addition had provided better alcohol delaying effect with 1.5% extract addition was able to delay two days of alcohol production and considered as the most suitable treatment in producing alcohol as compared to untreated sap, while addition of greater extract concentration of 3.0 and 4.5% had greatly suppressed the alcohol production after seven days of storage with alcohol content as low as 1.75±0.23% and 1.74±0.48%, respectively. On the other hand, 6.0% ethanolic peel extract addition was able to completely inhibit the fermentation process indicated by no alcohol produced after seven days of fermentation time. Addition of 40% rambutan peel produced best distillate characteristics i.e. provided high alcohol content of 49.47±0.35%, the highest alcohol yield of 54.71±0.07%, and total dissolved solids of 9.18±0.41 °Brix. Altogether, incorporation of rambutan peel or its ethanolic extract into coconut sap might be carried out by alcohol producers to delay alcoholic fermentation of coconut sap, where the sap can be collected, stored, and then distilled at later time.

Keywords: Alcoholic fermentation, coconut sap, distilled alcohol, fermentation inhibitor, rambutan peel.

References: 67 (1979-2015)