Improvement of melting and crystallisation properties of rambutan seed fat as cocoa butter improver by two-stage fractionation technique

ABSTRACT

The search for hard fats is increasing by the day due to their demand for industrial purposes. Rambutan seed fat (RSF) was fractionated prior to investigate the melting and crystallisation behaviours, triacylglycerols (TAGs), and morphology using different chromatographic and thermal techniques. The increasing trends were observed for high-melting symmetrical monounsaturated TAGs such as 1,3-distearoyl-2-oleoyl-glycerol and 1-palmitoyl-3-stearoyl-2-oleoyl-glycerol in both solid fractions upon fractionation. The solid fractions (F_1-S) and (F_2-S) exhibited small peaks towards low melting area and big peaks towards high melting area with the offset temperatures of 35.29–48.75 °C and 43.58–52.70 °C with significantly higher enthalpies (93.49 and 105.13 J g^{-1}) upon fractionation. F_2-S showed the densely packed microstructure compared to that of crude RSF and F_1-S. Based on the thermal behaviours as well as morphology of RSF fractions, cocoa butter improver could be prepared that has the potential to be utilised in chocolate manufacturing in tropical countries.