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## Characterization of crystallization and melting profiles of blends of mango seed fat and palm oil mid-fraction as cocoa butter replacers using differential scanning calorimetry and pulse nuclear magnetic resonance (Article)

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### Abstract

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Mango seed fat (MSF) and palm oil mid-fraction (POMF) blends were stabilized prior to investigate crystallization and melting behavior, solid fat content (SFC) and triglyceride compositions. Ten blends at various ratios of MSF/POMF, 95/5 (blend 1), 90/10 (blend 2), 85/15 (blend 3), 80/20 (blend 4), 75/25 (blend 5), 70/30 (blend 6), 65/35 (blend 7), 60/40 (blend 8), 55/45 (blend 9), 50/50 (blend 10) were used in this study. Results showed that the major triglyceride ranges in all blends were from 11 to 38.8% 1,3-dipalmitoyl-2-oleoyl-glycerol (POP), from 22.1 to 36.9% 1,3-distearoyl-2-oleoyl-glycerol (SOS), and from 15.4 to 16.2% 1-palmitoyl-3-stearoyl-2-oleoyl-glycerol (POS), respectively. The melting behavior indicated a single curve with only one maximum and one small shoulder for the blends of 3 to 6. The blends having 70, 75, 80, and 85% of MSF showed similar crystallization pattern with a single curve having one maximum peak heights at temperatures of 10.17, 10.58, 11.54, and 11.66. °C. The SFC of the blends no. 1 to 5 was found to be close to these SFC of commercial CB at 10 to 20. °C temperatures. A multiple regression equation was developed which showed strong correlations between triglycerides of blends 1 to 10 and their properties. The studies revealed that preparation of green quality cocoa butter replacers (CBRs) is possible using MSF and POMF. © 2013 Elsevier Ltd.

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Cocoa butter replacer Crystallization and melting characterization Mango seed fat Palm oil mid-fraction Solid fat content Triglyceride

### Indexed keywords

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