Title: The Use of Pra Seed (*Elateriospermum tapos* Bl.) in Combination with Maltodextrin as Fat Substitute in Ice Cream

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Abstract

This research was aimed to investigate the chemical composition and functional properties of Pra seeds (*Elateriospermum tapos* Bl.) and its use in combination with maltodextrin as fat substitute in ice cream. The ground seeds contain considerable amounts of protein (16.10%), carbohydrate (25.36%) and fat high in unsaturated fatty acids (36.49%). The water absorption capacity, oil absorption capacity, emulsion capacity, foaming capacity and foaming stability were 185.06 ± 2.45%, 121.15 ± 2.85%, 35.50 ± 2.25%, 30.21 ± 1.36% and 25.02 ± 1.33% respectively. The functional properties of the blends in various ratios of ground seeds and maltodextrin (2:1, 1:1) were also examined. The blend in the ratio of 2:1 has no significant influenced on all functional properties (p>0.05) whereas the ratio of 1:1 lowered emulsion capacity, foaming capacity and foaming stability (p<0.05) compare with the ground seeds.

The effect of the blends on the physico-chemical and sensory properties of ice creams were studied. Reduce fat ice creams were formulated at 50% w/w of cream substitution with various ratios (1:0, 2:1, 1:1) of the blend. Full fat and non-fat ice cream were prepared as controls. Chemical composition was measured, and 9-point hedonic scale test was used to score the ice cream. The fat content of reduced fat samples was significantly lower than the full fat ice cream sample whereas pH, titratable acidity, ash, 

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nitrogen content and overrun were tend to have higher values (p<0.05). Panelists gave significantly higher scores to the full fat and non-fat samples than the reduced fat samples. The sample made with the blend in the ratio of 2:1 had the highest score in all attributes in relation to the rest of reduced fat samples (p<0.05). The addition of the blend in the ratio of 2:1 to the ice cream mix at different levels of cream substitution (60, 80, 100% w/w) significantly affected chemical composition, melting properties and sensory score of ice cream (p<0.05). The reduced fat samples exhibited higher acidity, total solids, ash, nitrogen, viscosity and overrun but lower value in fat content and L* than the full fat sample. The blend significantly retarded the meltdown of the samples (p<0.05). The higher of cream substitution level the longer dripping times of ice cream. Sensory results revealed that all sensory attributes of reduced fat formulations were rated in lower scores compare with those of the full fat and non-fat samples. Storage stability data showed that the reduced fat and standard ice cream samples were considered to be microbiological safe for at least 2 months of storage at -18±2 °C. Results from this study showed that pra seed could be used potentially in combination with maltodextrin (2:1) as fat substitute in ice cream at the maximum levels of 80 % w/w of cream substitution.