

Characterisation of musk lime (*Citrus microcarpa*) seed oil

ABSTRACT

The seeds of musk lime (*Citrus microcarpa*) represent a substantial waste product of small-scale citrus-processing factories, as they constitute about 100.0 ± 3.2 g kg⁻¹ of the whole fruit and contain a considerable amount of crude fat (338.0 ± 11.3 g kg⁻¹). Thus the aim of the present study was to determine the physicochemical properties of this fat with a view to potential applications. **RESULTS:** The iodine and saponification values and unsaponifiable matter and free fatty acid contents of the freshly extracted oil were 118.0 g I₂ per 100 g oil, 192.6 mg KOH g⁻¹ oil, 22 mg g⁻¹ oil and 18 mg oleic acid g⁻¹ oil respectively. The oil had a Lovibond colour index of 33.1Y + 1.1B. Its fatty acid profile indicated that 73.6% of the fatty acids present were unsaturated. Linoleic (L, 31.8%), oleic (O, 29.6%) and palmitic (P, 21.4%) acids were the predominant fatty acids, existing mainly as the triacylglycerols POL (18.9%), PLL (13.7%) and OLL (11.9%). The melting and cooling points of the oil were 10.7 and -45.2 °C respectively. Electronic nose qualitative analysis of the oil showed the presence of volatile (aroma) compounds, although the concentrations of the more volatile compounds were lower than those present in the seeds. **CONCLUSION:** Musk lime seeds are a rich source of oil, which is unusual in having linoleic, oleic and palmitic acids dominating the fatty acid composition. This property should make the oil both relatively stable to thermal oxidation owing to the combined presence of oleic and palmitic acids (61.0%) and highly nutritive owing to its high concentration of unsaturated fatty acids (73.6%).

Keyword: musk lime, *Citrus microcarpa*, seed oil, physicochemical properties, characterisation