

Composition and thermal characteristics of *Madhuca longifolia* seed fat and its solid and liquid fractions

ABSTRACT

This study was to characterize the seed fat from *Madhuca longifolia* known as Mee fat and its solid and liquid fractions with the objective of distinguishing them. A sample of Mee fat was partitioned into solid and liquid fractions using acetone as the solvent medium. The isolated fractions were compared to the native Mee fat sample with respect to various physico-chemical parameters using standard chemical methods as well as instrumental techniques such as, gas liquid chromatography (GLC), reversed-phase high performance liquid chromatography (RP-HPLC), and differential scanning calorimetry (DSC). Basic analyses indicated that there were wide variations between the native sample and its fractions with respect to iodine value (IV), and slip melting point (SMP). The cloud point (CP) of the liquid fraction was found to be 10.5 degrees C. Fatty acid compositional analyses showed that the proportion of saturated fatty acids (SFA) such as palmitic and stearic went up in the high-melting fraction (HMF) while in low-melting fraction (LMF) the proportion of unsaturated fatty acid (USFA) such as oleic and lenoleic increased. According to the HPLC analyses, Mee fat had a tiacyl glycerol (TAG) sequence similar to that of palm oil. After fractionation, the solid and liquid fractions obtained were found to have TAG profiles very much different from the native sample. Thermal analyses by DSC showed that Mee fat had two-widely separated high and low melting thermal transitions, a feature which was beneficial for the effective separation of solid and liquid fractions. The thermal profiles displayed by the fractions were clearly distinguishable from that of the native sample.

Keyword: Cocoa butter substitute; Confectionery fat; DSC; Fractional crystallization; *Madhuca longifolia*; Mee fat; Seed fat