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IMPACT OF GEOGRAPHICAL LOCALIZATION ON SEED MORPHOLOGY, OIL CONTENT AND FATTY ACID COMPOSITION OF *MADHUCA LONGIFOLIA* GROWN IN SRI LANKA

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M. longifolia (Sapotaceae) is a locally available plant in Sri Lanka which is valued for its seeds as a source of edible oil. Past studies revealed that the quantity of oil in seed is over 50% of its weight, yet this remains as an under-utilized source of oil. The aim of this study was to identify the variation in morphology of seeds, variation in fatty acid profile and in oil content of *M. longifolia* seeds from different agro-ecological zones in Sri Lanka. Simultaneously, to determine the relationship of oil content and fatty acid profile with some geographical factors. Dried, fallen seeds were collected from randomly selected 16 plants (4 from each zone) representing four agro-ecological zones in Sri Lanka based on the availability of plant. They were low country dry zone (LD), low country wet zone (LW), low country intermediate zone (LI) and mid country intermediate zone (MI). The length, width and the weight of seeds were determined as morphological characteristics. Oil from seed kernel was extracted using Soxhlet method (AOAC, 1990) using *n*-Hexane (bp. 65-70° C). Fatty acid methyl esters were prepared and identified using GC-MS. Significant differences ($P<0.05$) were observed within agro-ecological zones on seed morphology (in terms of all 3 tested characteristics). Results ranged from 2.73-3.43 cm for length, 1.06-1.30 cm for width and 0.93-1.40 g for weight. Significant differences were resulted ($P<0.05$) in oil content also (50.07-53.85%) among agro-ecological zones. As the major fatty acids, Oleic, Stearic, Palmitic and Linoleic were resulted in all four agro-climatic zones. The total saturated fatty acid content (C18:0, C16:0, C14:0, C17:0, C19:0, C22:0, C24:0, C26:0, C20:0 and C8:0) varied from 40.87-47.20%. However the total unsaturated fatty acid content (C16:1, C18:1, C18:2, C20:1) was observed in the range of 49.6-53.86% (TMUFA+TPUFA). The highest total fatty acid content was recorded in low country intermediate zone and the lowest in mid country intermediate zone. A considerable variation was shown among the individual fatty acid contents obtained from different agro-climatic zones. Oil content and the fatty acid composition were not correlated with the studied geographical parameters (altitude, longitude and latitude).

Keywords: *M. longifolia*, Fatty acids, oil extraction, agro-climatic zones