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Characterization of *Nephelium lappaceum* and *Schleichera oleosa* Seed Oils for the Potential Applications in Cosmetics and Dietary Supplements**Thathsara, K.A.H., Chinthaka, S.D.M.****Department of Chemistry, University of Sri Jayewardenepura, Nugegoda, Sri Lanka***sdmchin@sjp.ac.lk***Abstract**

Sri Lanka has a rich diversity of oil-bearing seeds that go to waste without proper utilization. *Nephelium lappaceum* and *Schleichera oleosa* are such two species that belong to Family Sapindaceae. Plant seed oils offer an exciting avenue for use in cosmetic and dietary supplements due to their chemical constituents, mainly due to their fatty acid (FA) composition and constituents in unsaponifiable matter. This study aims to characterize these seed oils by FA composition, constituents in unsaponifiable matter, and other physical properties. The oil was extracted using soxhlet extraction. Acid value, iodine value, and smoke point of oils were determined. Gas chromatography-mass spectrometry was employed to identify fatty acid methyl esters and constituents in the unsaponifiable matter. Thermogravimetric analysis was performed to assess the thermal behavior of seed oils. The following values were obtained for *N. lappaceum* and *S. oleosa* respectively: crude oil yields $50.31 \pm 0.01\%$ and $69.52 \pm 0.01\%$, ash contents $2.28 \pm 0.09\%$ and $1.87 \pm 0.24\%$, acid values 9.25 ± 0.94 and 2.47 ± 0.35 mg KOH/g, iodine values 7.61 ± 1.12 and 8.43 ± 0.11 g I₂/100 g and yields of unsaponifiable matter $3.48 \pm 0.01\%$ and $0.47 \pm 0.01\%$. The saturated fatty acids (SFA) presented in *N. lappaceum* were Palmitic(C16:0) 5.14%, Stearic(C18:0) 6.75%, Arachidic(C20:0) 36.32% and Behenic (C22:0) 2.44% acids and unsaturated fatty acids (UFA) were Oleic(C18:1) 36.39%, Linoleic (C18:2) 1.72%, Gondoic (C20:1) 6.56% and Erucic (C22:1) 0.26% acids. *S. oleosa* oil contained Palmitic 1.80%, Stearic 3.29%, Arachidic 59.37% and Behenic 3.56% acids as SFAs and Oleic 15.77%, Linoleic 0.93%, Gondoic 10.32% and Erucic 1.78% acids as UFAs. This study found that both *N. lappaceum* and *S. oleosa* oils contained unusually high levels of very long chain ($\geq C20$) fatty acids (45.58% and 75.03% respectively). Triglycerides with very-long-chain fatty acids are proven to provide excellent emollient and moisturizing properties. Therefore, both oils offer very high potential in cosmetic applications. The presence of significant levels of various phytosterols, squalene and phytol in the unsaponifiable fraction of both oils also offers enhanced cosmetic and health benefits such as moisturizing, anti-inflammatory, and antioxidant properties etc. Therefore, findings of this study also highlight the very high potential of both seed oils in dietary supplement applications as well.

Keywords: *Nephelium lappaceum*, *Schleichera oleosa*, Unsaponifiable matter, Very long chain fatty acids, Cosmetics and dietary supplements