

STUDY OF OIL FROM WILD PLANTS OF KIVU, DR CONGO

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ABSTRACT

Many important plant species in Kahuzi-Biega National Park and surrounding areas in Kivu Region, Democratic Republic of Congo are threatened with extinction. Some of these plants are harvested and their oil extracted and used as medicines or as food. Many of these plants have not been evaluated to determine their oil content and its characteristics. This study was undertaken to determine the oil content and its characteristics for selected 11 wild plants species in Kivu Region, D.R. Congo. These were *Carapa grandiflora*, *Carapa procera*, *Cardiospermum halicacabum*, *Maesopsis eminii*, *Millettia dura*, *Myrianthus arboreus*, *Myrianthus holstii*, *Pentaclethra macrophylla*, *Podocarpus usambarensis*, *Tephrosia vogelii* and *Treculia africana*. The oils were extracted using ethyl ether in Soxhlet extractor. To determine the oil physicochemical characteristics the methods of the American Oil Chemists Society were used. The identification and quantification of the fatty acids were undertaken using Gas Chromatography.

The seed oil content of these 11 species ranged from 17.2 to 64.4%. The highest oil content was obtained from *P. usambarensis* and the lowest from *T. vogelii*. The oil specific gravity varied from 0.8050 to 0.9854; melting point from -12 to 32⁰C; saponification values from 182.5 to 260.9 mg KOH/g; acidity index from 1.74 to 5.31 mg KOH/g and the unsaponifiable matter from 0.54 to 2.25%. Twenty four fatty acids were found and 18 of these were identified including α -linolenic acid, linoleic acid, oleic acid, stearic acid and palmitic acid. There were also remarkable occurrences of long chain fatty acids particularly lignoceric acid (9.8% in *P. macrophylla* oil) and behenic acid (7.3% in *M. dura* oil, 6.3% in *P. macrophylla* oil and 5.8% in *T. vogelii* oil).

The plant seed oil contents reported in this study are high compared to some food crops such as soybean and olive seed. The oils of the plants studied here have potential for use in food especially *M. eminii*, *P. usambarensis* and *T. vogelii* oils because of their essential fatty acids content; *M. arboreus* and *M. holstii* oils due to their high linoleic acid content; *M. eminii* oil because it has fatty acid with similarities with to that of groundnut oil and *C. procera* oil which was found to be more stable as deep frying oil. Some of the oils from the studied wild plants showed good promise in use in the cosmetic industry and particularly most promising are *C. grandiflora*, *C. procera*, *M. arboreus*, *M. holstii* and *P. usambarensis* seed oil due to their fatty acids profile and high unsaponifiable matter content.

These plant oils may also have good application as biofuels and the most promising are those of high density and relative low melting point as *T. vogelii*, *T. africana*, *M. arboreus*, *M. holstii*, *C. grandiflora*, *M. dura* and *C. procera*. *P. macrophylla*, *P. usambarensis*, *M. dura* and *T. vogelii* seed oils may be sources for long chain fatty acids which have important chemotaxonomic significance.

Key words: oil content, oilseed plants, fatty acids, nutritional potential, Kahuzi-Biega National Park.

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