

Vegetable oil production potential from *Jatropha curcas*, *Croton megalocarpus*, *Aleurites moluccana*, *Moringa oleifera* and *Pachira glabra*: Assessment of renewable energy resources for bio-energy production in Africa

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Abstract

Research on vegetable oil for biofuels in Africa and Asia has focused mainly on *Jatropha curcas* while other potential oil bearing plants have received little attention. Vegetable oil production potential for five oil bearing plant species namely: *Aleurites moluccana*, *Croton megalocarpus*, *Jatropha curcas*, *Moringa oleifera* and *Pachira glabra* were investigated. Nuts and seeds of the plants were collected from the wild and their potential for vegetable oil production assessed in terms of seed/nut acreage yield, seed/nut oil content, harvesting requirement, and upstream processing before vegetable oil recovery. All five varieties were found to contain acceptable but different oil content ranging from 20 to 33% w/w, and seed/nut acreage yield of 3 t ha⁻¹ y⁻¹ to 12.5 t ha⁻¹ y⁻¹. Upstream processing was needed for *A. moluccana* to break open nuts to release the kernel, and dehulling for both *C. megalocarpus* and *J. curcas* to release the seeds, before extracting the vegetable oil, while the seeds of both *M. oleifera* and *P. glabra* did not need upstream processing. The Multi-criteria Decision Analysis ranked *C. megalocarpus* as the plant with the highest vegetable oil production potential of 1.8 t ha⁻¹ y⁻¹ followed by *M. oleifera*, *J. curcas* (1 t ha⁻¹ y⁻¹), *A. moluccana*, and *P. glabra*. The analysis underlines the need for more studies on *C. megalocarpus* and *M. oleifera* for biofuel production in Africa and other regions.

Keywords

Aleurites moluccana; *Croton megalocarpus*; *Jatropha curcas*; *Moringa oleifera*; *Pachira glabra*