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Investigation of the Potential for *Eucalyptus* Leaf Oil Extraction Industry in Sri Lanka

S.A.Y. Medhavi^{1*}, S.M.C.U.P. Subasinghe¹, D.S. Hettiarachchi²

¹Department of Forestry and Environmental Science, University of Sri Jayewardenepura, Sri Lanka

²Wescorp Group of Companies, 26, Coulson Way, Canning Vale, WA, Australia

*yasika0117@gmail.com

Abstract

Eucalyptus oil is a product of secondary metabolism of trees which is extracted mostly by its leaves. It holds a long history of use against respiratory infections due to its antibacterial, antifungal and antiviral properties and also acts as a fragrance in perfumes and as a flavouring agent in certain food items.

A survey was conducted in the first phase of this study with the Customs Department to identify the existing market potential for *Eucalyptus* oil in Sri Lanka. Results revealed that the export is far below in compared with the imports. Although a few local oil extractors are present, their production is highly insufficient to meet even the local market demand, hence most of the *Eucalyptus* oil demand is fulfilled by importing large quantities from Australia, China, India and United Kingdom. Therefore if the optimum conditions are identified, commercial level extraction of *Eucalyptus* oil will be an ideal opportunity of earning a significant income for both government and private sectors because they manage nearly 32,000 ha of *Eucalyptus* plantations in Sri Lanka. This will create much benefit, especially for the owners of *Eucalyptus* plantations grown above 1,500 m from mean sea level, because harvesting of those plantations have been banned.

Hydro and steam distillation are the only two methods used in *Eucalyptus* leaf oil extraction in commercial scale. Therefore the second phase of the study was designed to identify the best distillation method and required optimum physical conditions in *Eucalyptus* leaf oil extraction. Fresh leaves were collected from the middle of the canopy of a young *E. microcorys* plantation at Demodara and those were air dried under shade. Both steam and hydro distillation methods were conducted parallelly for 250 g of leaves, using a small-scale distillation apparatus for 3 hours. The effect of the particle size of the leaves (full leaf and 4.0, 2.0, 0.2 cm) and leaf to water ratio (1:4, 1:6 and 1:8 (w/v)) were examined. Altogether 24 different treatments were used with three replicates. According to one-way ANOVA, 16 different combinations of the tested variables had significantly higher oil yields. Among them there were 11 steam distillation methods and five hydro distillation methods. However, the best average oil content was yielded by the hydro distillation, used with leaves cut into 4.0 cm and with 1:4 leaf water ratio.

Keywords: *Eucalyptus* leaf oil, Distillation, *Eucalyptus microcorys*, Oil yield