

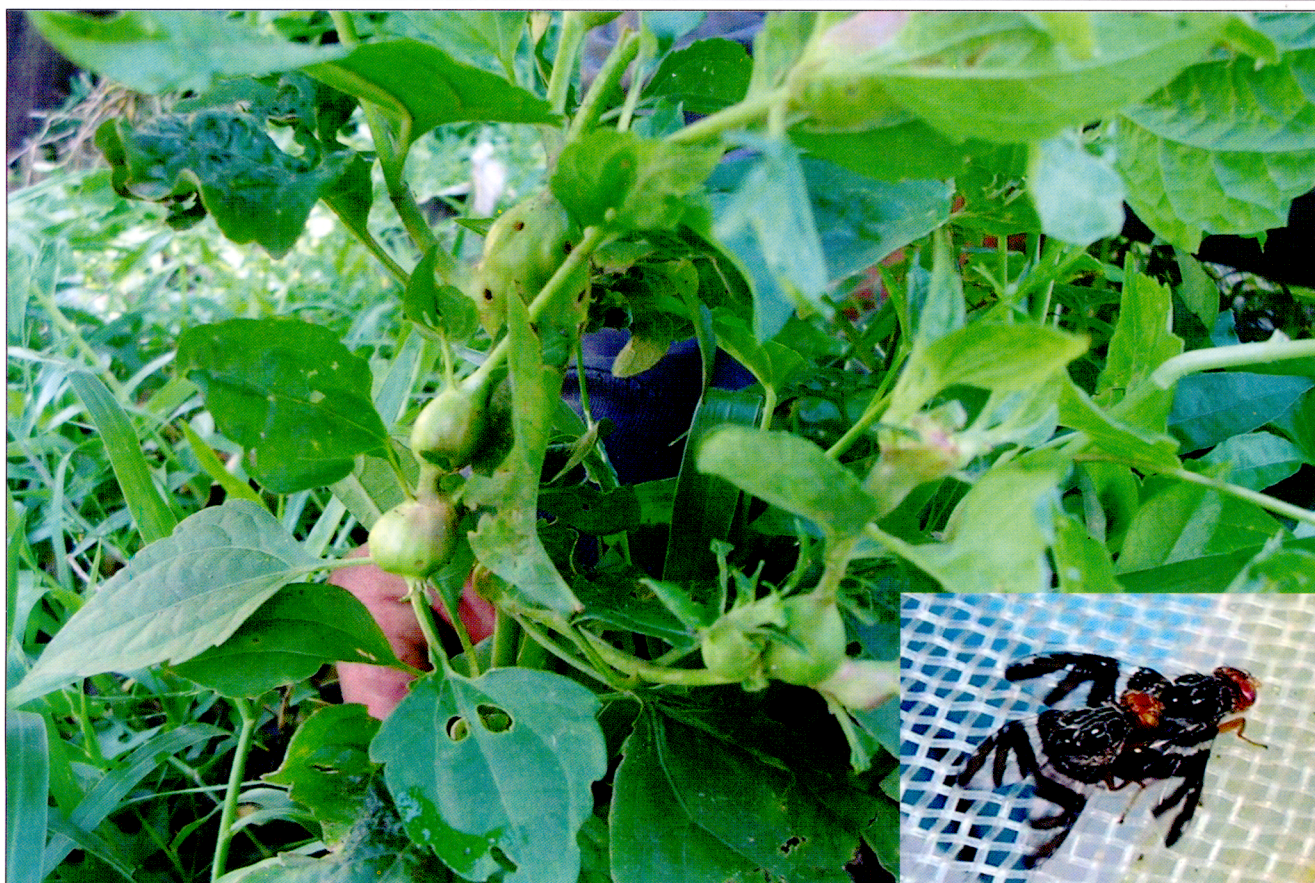


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Validation of a Time and Cost Saving Indirect Method of Oil Estimation from Oil Palm Mesocarp by Using Large-sized Soxhlet Apparatus

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Estimation of oil in the oil palm mesocarp is a very important process for evaluation of individual palms, which determines the actual oil yielding capacity. In the case of oil palm, each palm needs to be evaluated and hence, thousands of mesocarp samples are subjected to oil extraction every year. Usual procedure of oil estimation is by directly weighing the extracted oil. Each mesocarp sample is put in a thimble and oil is extracted in a Soxhlet apparatus by using petroleum ether as a solvent for 14 hours at 60-80°C followed by evaporation of the solvent and estimation of oil. Only one sample is extracted in each Soxhlet and hence, time and solvent requirement are very high. In the present study, a known amount of oil palm mesocarp was put inside a pouch of Whatman No.3 filter paper and several pouches were put in one big-sized Soxhlet apparatus for oil extraction. Subsequently, oil content was measured from the difference in weight of the pouch, before and after extraction of oil. Oil content from each dry mesocarp sample was estimated following both the methods. No significant difference in percentage oil extraction was observed, even at 1 per cent probability level, between the two methods. In the new method, a large-sized extractor of 2-litre capacity could extract a minimum of 50 samples at a time and thereby considerably reduced time taken by the conventional method. Moreover, since the mixture of oil from different samples collected with the solvent at the flask needed no attention, the solvent could be recovered by distillation and be reused.

Keywords: Oil estimation, oil palm, mesocarp oil, indirect method.

Estimation of oil content in the mesocarp of oil palm is an integral part of the evaluation of the yield potential of the palm. Usually, oil content in a bunch is estimated by a stepwise analysis called 'bunch analysis'. During the last phase of this process, dry mesocarp is subjected to oil estimation using the Soxhlet apparatus. Usual process of estimation of oil from dry mesocarp involves weighing of dry mesocarp, putting it into a filter paper thimble which is placed in the extraction unit of the Soxhlet apparatus and the oil is subsequently extracted using a suitable solvent like petroleum ether; hexane or carbon tetrachloride. Solvent and oil mixture is collected

at the bottom flask of the Soxhlet apparatus and oil is estimated after evaporating the solvent. Though this method of estimation is accurate, it is expensive in terms of labour, time and solvent requirement. In large selection programmes, where a large number of samples need to be analysed daily, the total capital outlay for oil estimation can be very high (Wonkyi, 1982). Hence, a speedy and economic method for estimation of oil from mesocarp is required.

As early as in 1947, Venderweyen *et al.* reported that fresh mesocarp had a fairly constant fibre content of about 16 per cent. Oil content in the mesocarp could thus be

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