

Impact of Bamboo Insulation on Patchouli Leaves Steam Distillation: Ecological and Energy Efficiency Aspects

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Abstract. On several Indonesian islands, particularly Sulawesi, patchouli leaves are distilled to produce an essential oil highly valued by many international perfume brands. This research aims to improve the production of patchouli oil in both quantity and quality while maintaining environmental sustainability. Bamboo, a locally available material, was used as thermal insulation to reduce heat losses, primarily through conduction, in the distillation system. The use of insulation also decreases fuel consumption, especially firewood, which remains the main energy source in much of the distillation industry. The experiment consisted of steam distilling 1 kg of patchouli leaves for one hour, starting from the effective evaporation temperature. The results indicate a 30% reduction in thermal losses, with the recovered energy being effectively redirected to enhance patchouli oil extraction.

Keywords: Patchouli oil, thermal insulation, decrease fuel consumption, reduction in thermal losses, increase oil settings