



EFFECTIVENESS OF ARTIFICIAL AGARWOOD RESIN FORMATION IN *Gyrinops walla* USING TRADITIONAL METHODS

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ABSTRACT

Certain members of Genera *Aquilaria*, *Gyrinops*, *Gonystylus* and *Aetoxylon* of Thymelaeaceae family produce a highly valuable resin inside the stem called agarwood. It is used for perfume manufacturing, burning aroma for cultural and religious activities in many countries of the world. *Gyrinops walla* is the only agarwood producing member present in Sri Lanka belongs to this family. Formation of agarwood in the tree stem is believed to be due to a defense mechanism against the causal agents, either environmental stress or disease. Natural formation of agarwood is rare and low in content. Therefore, the present study was aimed at identifying the best artificial inoculation methods that can induce agarwood formation in *G. walla*. The selected methods are practiced for *Aquilaria* species in Northeast Asian region covering all types of inoculations. This study tested, chemical, mechanical and biological methods; inserting iron nails, galvanized tubes, polyvinyl chloride tubes and polypropylene tubes were used as mechanical method and sodium chloride and sodium bi-carbonate were used as chemicals. Forest mushroom mycelia was used as the biological method to induce agarwood formation. Medium size *G. walla* trees grown in Kalawana and Mathugama in the wet zone of Sri Lanka were selected to test these methods. Five replicates were used for each treatment which were applied in spiral manner on the tree stem. Agarwood formed tissues were extracted 12 months after the inoculation and resins of these tissues were collected by solvent extraction. Colours of both resinous tissues and extracted resins were determined using Munsell colour chart. Aroma produced when burning the resinous tissues was detected by a sensory panel. Significance of resin contents among different inoculation treatments were tested using One-way ANOVA. According to the results, the highest mean resin content (4.38%) was recorded from the trees inoculated with sodium chloride and the lowest mean was recorded from the trees inoculated with forest mushroom mycelia (2.16%). One-way ANOVA showed a significant difference of resin content between different artificial methods. Colours of both resinous tissues and extracted resins varied from brown to very dark brown. All treatments produced an aromatic agarwood scent which is unique to *G. walla* when burning wood samples. Finally, out of the selected methods, it was revealed that addition of sodium chloride is the best method that can be used to induce agarwood resin formation in *G. walla*.

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Keywords: Agarwood, *Gyrinops walla*, Artificial inoculation, Thymelaeaceae