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Investigation of the potential of wood rotting fungi as efficient sawdust decomposers

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Dumping of sawdust of industrial origin has created a major environmental problem in Sri Lanka. Sawdust consists mainly of recalcitrant organic matter. Wood rotting fungi have the capability to decompose recalcitrant organic matter. As such, the potential of using wood rotting fungi as rapid sawdust decomposers was investigated. The fungal fruit bodies from decaying wood were collected. Each fungus was photographed and assigned codes from 1-19. Their mycelia were isolated using tissue culture method and spore drop method. In the first method, the whole fruit body or pieces were detached and surface sterilized with NaOCl and placed on Potato dextrose agar (PDA) and Malt extract agar (MEA) plates. Outgrowing hyphae were plated onto fresh media. In the spore drop method, agarics and polypore fruit bodies were cut into small pieces and suspended on the lid of a water agar plate with the fertile regions of the fruit body facing downwards. Plates were incubated at room temperature and the germinating spores were removed while observing under a dissecting microscope and transferred to fresh MEA or PDA plates for further purification.

Growth performance on PDA and MEA was measured by inoculating the centre of a plate with a 5 mm disk of each fungus. Mean diameter of each fungal colony was measured on the 4th day after inoculation. No significant difference in fungal growth was observed at 5 % significance level, in the media tested. As such MEA was employed as the culture maintenance medium. Fungal Inoculum production for efficiency studies employed a spawn medium described by Atempawala *et al*. (2005). The medium, inoculated with a specific fungal pure culture was incubated at room temperature until fully grown and the whole mass was utilized as the inoculum in subsequent experiments. One fungus species (Code 12) failed to produce spawn in this medium. A comparative study on the efficiency of degrading sawdust was conducted using 125 g of air dried sawdust contained in plastic boxes. Distilled water was added to sawdust to provide adequate moisture and then mixed well with the whole mass of the respective spawn medium and four replicates per fungus were employed. After incubating for 3 months, the reduction of dry weight in each treatment was measured and the means were compared by the one way ANOVA. Of the fourteen fungi used in this analysis, fungus coded as Code 14 showed the highest rate of sawdust decomposition, with a significant 31.61 % reduction of dry weight under normal conditions at 5% level of significance ($p= 0.000$). For the mass production of efficient sawdust decomposing fungi, a paddy and kurakkan containing medium was tested against the medium employed by Atempawala *et al*. (2005). The tested medium was successful in reducing spawn maturation time significantly, ranging between 9 - 12 days compared to 20 - 50 days on Atempawala *et al*. (2005) medium at 5% significance level.

Keywords: sawdust, wood rotting fungi, spawn production