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Efficacy of various farm wastes on cultivation of *Pleurotus ostreatus* (Jacquin ex. Fr.) Kummer

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ABSTRACT

Various farm wastes were investigated as substrates for *Pleurotus ostreatus*. The highest mushroom harvest (fresh weight) was obtained from oil palm fruit fibre substrate and the lowest yield was from yam (*Dioscorea* sp.) peelings. Casing enhanced yield from all substrates. Oil palm fruit fibre spawn is an alternative to the sclerotium in propagating the fungus. Some fungi and pests were associated with the mushroom on these substrates but only *Sclerotium rolfsii* caused stipe rot.

Key words : *Pleurotus ostreatus*, Mushroom, Substrates, Spawn

INTRODUCTION

Pleurotus ostreatus (Jacquin ex.Fr.) Kummer, an edible Basidiomycetous fungus, occurs in both tropical and subtropical regions of the world (Gray, 1970; Hayes and Nair, 1975).

It is a common mushroom in the southern part of Nigeria and forms large spherical to ovoid, subterranean sclerotia which sometimes measure up to 30 cm in diameter (Okhuoya and Harvey, 1984). The fungus infects dry wood, where it produces the sclerotium, usually buried within the wood tissues but also found between the wood and the bark. Both the sclerotium and the mushrooms are eaten. Sclerotia are used in various soup and medicinal preparations both for human consumption and in traditional medical practice (Gray, 1970; Hayes and Nair, 1975; Zoberi, 1972). The fungus grows with relative ease in the laboratory and is noted for rapid growth and for causing extensive wood decay (Okhuoya and Harvey, 1984). Mushroom cultivation is still in its infancy in Nigeria, and many species that might be cultivated for food are known only in the wild state. The objective of this study was to evaluate the use of different farm wastes as possible substrates for the growth of *P. ostreatus*.

MATERIALS AND METHODS

Sclerotia used for this study were obtained from Tamil Nadu Agricultural University, Coimbatore. They were taken to the laboratory and stored for 4-5 days at room temperature before use. The wastes products used were : cassava (*Manihot* sp.) peelings collected fresh from a cassava mill, corn (*Zea* sp.) straw collected from the University farm, oil palm fruit fibre from the private oil mill of Coimbatore City, rice (*Oryza* sp.) straw from a private farm, wild grass (*Pennisetum* sp.) collected after land preparation from the University farm and yam (*Dioscorea* sp.) from local field. The cassava and yam peelings were sun-dried for 10 days and crushed to coarse sizes (ca. 3 cm) with amortar and pestle. Corn, rice, and wild grass straws were separately cut into small pieces (ca. 3 cm) and the large cylinders of straw were split into 3-4 slices. Oil palm fruit fibres were also sun-dried for 10 days before use.

The substrates were separately bulked and treated with 5% bleach (v/v) with a moisture content maintained at 70%, read with a Sargent Welch (U.S.A.) moisture meter. Two hundred grams of each of these substrates were loaded into plastic trays (30 trays), 60x60x15 cm. Controls trays were filled with 200 g of white river sand. Each tray was seeded with 50 g of fresh sclerotia, at three different equidistant points on the tray. Trays (uncovered) were then placed in a greenhouse (25 ± 3 °C) for observation of fungal growth.

Spawn trial:

Oil palm fruit fibre supported extensive growth and was tested as a spawning material. The spawn was prepared by stuffing three polyethylene bags (75 x 60 cm) with oil palm fruit fibre treated with 5% bleach (v/v) and inoculated with sclerotial pieces (25 g each), 10 to each bag, and incubated at room temperature. After 20 days, extensive and compact mycelium (mushroom "seed") had developed on the oil palm fruit fibre. The bags were opened, and the mushroom seed divided into 15-g portions and used to inoculate the different substrates. Fifteen days after "seeding," 10 trays were cased with garden top soil. Fresh mushroom yield per tray was recorded 20 days after casing. Each tray was watered once per day with 40 ml of sterile distilled water.All fungal contaminants and other pests associated with the different substrates and mushrooms were recorded. Fungal contaminants growing directly on the