

## Effects of Banana Leaves and Paddy Straw on the Growth, Nutrition Composition, Bioactive Compound Levels, and Antioxidant Activity of *Pleurotus ostreatus* (American Oyster Mushroom)

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### Abstract

*Pleurotus ostreatus* (American oyster mushroom) is one of the most commonly cultivated mushroom species in the world and is known to grow faster than other edible mushrooms. They are cultivated on various agricultural waste substrates which are rich in lignin and cellulose. In this study, *Pleurotus ostreatus* was grown on Paddy Straw (PS) and Banana Leaves (BL) in different ratios (100%, 75:25, 50:50) to find out the most efficient Substrate Combination (SC). Lowry assay and phenol-sulfuric assays were done to measure the total protein and carbohydrate contents. Total Antioxidant Capacity (TAC), DPPH (IC<sub>50</sub>) and Total Phenolic Content (TPC) assays were done to evaluate the antioxidant capacity. Moreover, qualitative tests for bioactive compounds, and a comparison of morphological parameters were conducted. Based on the results, a significantly high total protein concentration, total carbohydrate concentration, and a significantly high TAC were reported in 75% PS 25% BL SC compared to both 100% SCs. Moreover, a significantly high TPC was recorded in 75% PS 25% BL SC compared to 100% PS. The lowest IC<sub>50</sub> values were observed in both 100% SCs. Based on the parameters of the mushrooms, 100% PS displayed the highest values for weight, cap diameter, and stipe thickness. Bioactive compounds such as saponins, polyphenols, and terpenoids were present in all SCs. In conclusion, it can be suggested that 100% PS can be used to gain high yields of *Pleurotus ostreatus*. However, to enhance the nutritional value and antioxidant capacity, PS can be mixed with BL at a ratio of 75:25.

**Keywords:** *Agricultural waste, Oyster mushrooms, Polyphenols, Proteins, Carbohydrates*