FORMULATION AND EVALUATION OF A LOW-COST BANANA-BASED CULTURE MEDIUM FOR OYSTER MUSHROOM (*Pleurotus spp*.) CULTURING

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Mushroom cultivation depends on culture media for the growth and maintenance of fungal cultures. As conventional media are relatively expensive, the development of low-cost alternatives using agricultural waste materials can support sustainable mushroom production while promoting waste recycling. Present study aimed to formulate and evaluate a low-cost culture medium using overripe banana waste for oyster mushroom (*Pleurotus* spp.) culturing. Banana-based media were prepared using both banana infusion and banana powder. Dextrose and Sucrose were incorporated as supplementary carbon sources and Augmentin was added to reduce bacterial contaminations. Preliminary trials indicated that incorporation of banana powder altered the physical characteristics of the medium. Therefore, higher agar concentrations are added than the conventional fungal media (1.5–2.0%) to improve gel stability and facilitate mycelial growth. Six banana-based media: Banana Agar (BA – 10.0% banana infusion + 1.5% agar), Banana Dextrose Agar (BDA- 10.0% banana infusion + 1.5% agar + 1.0% dextrose), Banana Sucrose Agar (BSA- 10.0% banana infusion + 2.0% agar + 1.0% sucrose), Banana Powder Agar (BPA- 4.0% banana powder + 7.5% agar), Banana powder Dextrose Agar (BPDA- 3.0% banana powder + 4.0% agar + 3.0% dextrose), Banana Powder Sucrose Agar (BPSA- 3.0% banana powder + 4.0% agar + 3.0% sucrose) along with Potato Dextrose Agar (PDA) as control were tested. BPDA and BPSA failed to solidify properly and were excluded from culturing experiments. Oyster mushroom tissues were inoculated into two culture vessel types (petri plates and glass bottles), and mean colony diameter was measured daily for 14-day. One-way ANOVA was used to compare the mycelial growth among media, while an independent sample t-test was performed to compare mycelial growth between Petri plates and glass bottles. No significant effect ($p > 0.05$) of culture vessels on mycelial growth was observed. BPA and BSA showed comparatively higher mean colony diameter with no significant difference ($p > 0.05$) compared to PDA. The findings indicate that, particularly Banana Powder Agar (BPA) and Banana Sucrose Agar (BSA), have potential as sustainable and low-cost alternatives to conventional culture media for oyster mushroom culturing and laboratory applications.

Keywords: agricultural waste utilization, Augmentin, low-cost medium, mycelial growth, overripe banana, sustainable biotechnology