Plant Production, Irrigated Agriculture

CULTIVATION OF *Pleurotus ostreatus* AND *Lentinus edodes* ON LIGNOCELLULOSIC SUBSTRATES FOR HUMAN FOOD AND ANIMAL FEED PRODUCTION

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Abstract

Ligninolytic microorganisms, mainly white root fungi are able to colonize different plant residues and increase the digestibility. Lignocellulosic wastes can also be used for the cultivation of edible mushrooms. Therefore, this study was set up to assess the suitability of wheat straw and sugarcane bagasse supplemented with various levels of wheat bran, as substrates for 2 fungi species. Milled wheat straw and sugarcane bagasse were placed in jars and supplemented with 0%, 5%, 10% and 15% of wheat bran. Deionized water (75%) was added to the jars, which were then sterilized (121°C; 30 min). The substrates were inoculated with mycelium of Pleurotus ostreatus and Lentinus edodes, and then incubated (25°C; 45 days). During the colonization period, the pH, water soluble substances, organic matter (OM) loss, lignin content and in vitro digestibility (IVD) of the substrates were measured. After the colonization period, the jars were placed in an incubator (18°C; RH 80-90%) for fructification. The fruiting bodies were collected until 150 days. The IVD of spent substrate after mushroom cultivation was measured. Generally, the fungi colonized better wheat straw than sugarcane bagasse. P. ostreatus degraded OM of substrate and lignin faster than L. edodes. The highest loss of organic matter of wheat straw after incubation with P. ostreatus and L. edodes for 60 days were 28.9% and 23.7% respectively. The substrate pH was lower on substrate incubated by L. edodes than by P.ostreatus (3.8 vs 4.3). It was corresponding with the water soluble substances of substrates. The digestibility of both substrates was 3.8% - 24.2% higher than the control. The supplementation of wheat bran on the substrates increased the fruiting bodies yield. The yield of P. ostreatus growing on wheat straw with supplementation of 15% wheat bran was highest (8.3% in DM). The in vitro digestibility of spent substrate after cultivation of L. edodes was 68%. The upgrading of lignocellulosic wastes into food and animal feed is possible. However, the appropriate technology for this bioconversion is needed.

Key words: *lignocellulose, lignin, digestibility, animal feed, white rot fungi*

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