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Screening for Antibacterial Compounds from Spent Mushroom Substrate

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Agaricus bisporus (J. Lge) Imbach mushroom production in Australia results in the production of thousands of tonnes per week of mushroom compost, containing a large amount of viable mycelia. This waste product is known as spent mushroom substrate (SMS). Crude aqueous extracts obtained from SMS were found to be a complex mixture containing bacterial and fungal metabolites, extracellularly secreted lignocellulolytic enzymes, and a wide range of soluble humic compounds. Plate diffusion assays indicate that the crude SMS extract exhibits antibacterial activity. The specific compound or compounds responsible for these properties have not yet been rigourously identified. The principal purpose of this study was to examine the antibacterial activities of the various components present in the SMS.

Antibacterial screening studies were performed using a range of extracts and purified enzyme systems. Extracts included crude SMS extract, the crude extract obtained from mycelia-free mushroom compost, and the crude liquid culture fluid of *A. bisporus*. Enzyme systems studies were made using purified laccase and cellulase. These studies have allowed an insight into the species responsible for the antibacterial properties exhibited by SMS extracts.

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