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Solid-state fermentation of xylanase from *Penicillium canescens* 10-10c in a multi-packed-bed reactor

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Xylanase was produced by *Penicillium canescens* 10-10c from soya oil cake (SOC) in solid-state fermentation (SSF). The investigations were carried out respectively in 250 ml erlenmeyer flasks (EF) containing 5 g of SOC, in enamel metallic trays (EMT: 17*11*5 cm³) containing 50g of SOC and in a multi-packed bed reactor (MPBR) containing 50g to 250 g of SOC/layer. The MPBR contained four cylindrical layers.

In all experiments, the initial moisture content and temperature were kept at 80% and 30°C. The static substrate was sterilised before inoculation by spores suspension or by one day old solid-state preculture of spores. Two substrate aeration types: passive and forced (ambient air and moist air) at flow rates of 0,1 to 2 l/min were compared in the MPBR. Enzyme activity, ergosterol and the solid moisture contents were measured respectively after three, seven and twelve days of fermentations.

Maximum xylanase activities obtained after seven days of fermentation were about 12000, 6000 and 4000 U/g of SOC respectively in EF, EMT and MPBR. The one day old spores preculture allow obtaining better activity than spores suspension. Highest enzyme activity (6000 and 3800 U/g of SOC) was obtained at a moist air flow rate of 0,5 l/min in the MPBR loading respectively of 50 g and 150 g of SOC per layer. These activities levels are higher than those related in the literature in the similar conditions.