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Comparative spore germination of filamentous fungi on solid state fermentation under different culture conditions

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ABSTRACT

Environmental factors influencing spore germination of three filamentous fungi (*Aspergillus niger*, *Myceliophthora thermophila*, *Rhizopus microsporus*) were studied. Four substrates, all containing sugar cane bagasse as support, were tested for spore germination. Different temperature, moisture, aeration and humidity conditions were evaluated for each species. Spore germination was assessed by observing emergence of the germ tube. Germination rates in *A. niger*, *M. thermophila*, and *R. microsporus* cultivated in solid state fermentation were affected by the substrate, incubation temperature, and initial moisture. A mixture of sugar cane bagasse and wheat bran (80:20 w/w) resulted in high germination rates for all species tested, and was selected for additional experiments. The optimal temperature for spore germination and initial growth was 30 C for *A. niger* and 45 C for *M. thermophila* and *R. microsporus*. Higher germination rates were recorded in all species at 85% (a_w 0.99) initial moisture after 6 h of incubation at optimal temperature. Forced humid aeration increased germination rates and decreased the time required for complete spore germination in all species studied.

Key words: Germination, temperature, initial moisture, aeration, sugar cane bagasse, *Aspergillus niger*, *Myceliophthora thermophila*, *Rhizopus microsporus*.