Keratinolytic and Xylanolytic Screening and Optimization of Xylanase Production by *Trichosporon* Preserved in Culture Collection URM

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Abstract:

Trichosporon are yeasts belonging to the phylum Basidiomycota, with some species highlighted proteolytic and xylanolytic activities among other enzymes. The objectives of this study was to determine viability, to endorse the taxonomy, to characterize the keratinolytic and keratinophilic activities in solid medium and submerged cultivation, to select strains in solid medium and submerged culture for the production of xylanase and optimize the production of xylanases in cultures of *Trichosporon* strains preserved in mineral oil at the URM Culture Collection. Were performed reactivation and authentication of strians through the morphophysiological features. The characterization keratinolytic, keratinophilic and xylanolytic activities were used as substrates feathers and xylan in solid medium and submerged cultivation were used as carbon sources feathers and xylose respectively. To determine the best conditions of xylanase production was carried out a complete factorial design (24). Of the 22 samples stored in the URM Culture Collection, 91% remained viable and were authenticated confirming the species deposited. Twenty isolates viable were able to colonize the feathers, showing keratinophilic activity. In solid medium, all cultures showed growth, without the presence of halo of degradation, but in submerged cultivation, all cultures showed keratinolytic activity, being *T. aquatile* URM4440 the best producer presenting 2.65 U / mL in pH 8.6 at 40°C. In the detection of xylanolytic activity, 12 strains showed halo of degradation, being selected to test in submerged culture. In liquid medium, the isolated *T. cutaneum* URM4789 with 24.25 U / mL was the best producer at pH 6.0 and 60°C being selected to optimize the conditions for production of xylanases. The best result of the conditions of production of xylanase activity was determined in the test 13, the following conditions: time 96 hours, the concentration of xylose 1.5%, absence of yeast extract, pH 7.0 and temperature of 27°C. In these conditions 65.15 U / mL of enzyme activity was obtained. The variables, xylose concentration, temperature and pH showed significant effect on the production of xylanases. Among the species evaluated, *T. aquatile* URM4440 and *T. cutaneum* URM4789 showed the best results regarding keratinolytic and xylanolytic activities.

Key words: *Trichosporon*, Culture Collection URM, Enzymatic activity, keratinases, Xylanases