SYNTHESIS OF GALACTOOLIGOSACCHARIDES FROM LACTOSE BY Pseudozyma tsukubaensis AND Pichia kluyveri

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Besides being important in the fermentation of foods and beverages, yeasts have shown numerous beneficial effects on human health and potential uses in biotechnology. Thus, there seems to be a need to understand the positive effects of yeasts, their mechanisms and employment of them. This work was thus aimed at the screening of available microorganisms for the production of galactooligosaccharides (GOS) from lactose. In vitro assessment of probiotic potential was also carried out. Pichia kluyveri and Pseudozyma tsukubaensis were isolated from peach (Prunus persica) and nectarine (Prunus persica var. nucipersica), respectively and identified by using molecular approach (D1/D2 28S rDNA) and phylogenetic analysis. The isolated yeasts were tested for their ability to produce GOS from lactose using living whole cells. An in vitro analysis of probiotic properties of both yeasts was also carried out. A maximum yield of 14.01 and 15.71% (w/w) GOS was obtained from the reaction from lactose solution (40% w/v) by P. kluyveri and P. tsukubaensis, respectively at 30°C, pH 7.0 for 24 h. For the best of our knowledge this is the first study reporting the potential of P. kluyveri and P. tsukubaensis to produce GOS from lactose. Evaluation of their probiotic attributes revealed that only P. kluyveri strain has desirable probiotic potential with reference to its thermotolerance, antibacterial activity against some pathogenic bacterial species and tolerance to acid and bile.