

IN VITRO EVALUATION OF PROBIOTIC POTENTIAL OF YEASTS ISOLATED FROM ANTARCTICA

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ABSTRACT:

The Antarctic environment is one of the most primitive ecosystems in the world, being characterized by a diversity of little known microorganisms able to survive in extreme environmental conditions. Therefore, they can possess unusual biochemical pathways allowing them to generate new bioactive molecules, representing a great source for the development of medicines and the demand for probiotics. Probiotics are defined as living microorganisms which when administered in adequate amounts confer benefits to the host health. Many species of bacteria are used and marketed for this purpose, and the only yeast applied as a probiotic in humans is *Saccharomyces boulardii*. Since 2004, our group has been searching new sources for probiotic yeasts, and previous results have shown that *Saccharomyces cerevisiae* UFMG A-905, isolated from production of an alcoholic beverage (*cachaça*), was able to protect against pathological consequences due to enteric infection, intestinal obstruction, inflammatory bowel disease, chemotherapy-induced mucositis and asthma. The objective of this work was to isolate and identify yeasts from the Antarctic environment and to select, through *in vitro* tests, the best candidates for the development of new probiotics. First, yeasts were tested for their ability to resist to gastrointestinal environment (growth at 37°C, resistance to the gastric and intestinal simulated environment). Second, safety of the yeasts was evaluated by the degradation of mucin and β -hemolysis. Finally, antagonism and co-aggregation tests were performed using *Salmonella* Typhimurium, *Escherichia. coli*, *Listeria monocytogenes* *Salmonella* Typhi and *Shigella sonnei* as indicator strains. Among 254 yeasts tested, only two were satisfactory for most of the tests carried out: *Rhodotorula mucilaginosa* UFMG 11 and *Saccharomyces cerevisiae* UFMG 120. These strains did not antagonize the pathogens tested but showed high co-aggregation, particularly with *S. Typhimurium*. Concluding, Antarctica environment seems to be an interesting source of yeast for probiotic development, UFMG 11 and UFMG 120 strains presenting a good potential for such use. Additional *in vivo* tests are currently carried out in our laboratory to confirm their probiotic effects.

Keywords: probiotic, yeasts, Antarctica, screening, gastrointestinal tract.

This work was supported by grants from CAPES and PRONEM/FAPEMIG