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Screening for Proteolytic Lactic Acid Bacteria With Potential for Application in the Production of Fermented Hypoallergenic Dairy Products

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Resumo

Cow milk allergy (CMA) is a serious problem that affects 2.5% of children under 3 years of age, representing 9% of food allergy cases. This immunological reaction is triggered by the binding of Immunoglobulin E to specific epitopes present in milk proteins. An alternative to reduce this problem could be the hydrolysis of milk principal allergens by microbial fermentation. However, the bacterial strains used in the process may influence the success of this application. Therefore, investigation of new proteolytic lactic acid bacteria (pLAB) strains, able to hydrolyze the milk proteins responsible for CMA, is interesting for the development of new hypoallergenic dairy products. This study aimed to isolate new pLAB active against the main milk allergens. The pLAB isolates were obtained from seven samples of Brazilian ripened artisanal cheeses and preliminary tests were performed in MRS agar, supplemented with 20% of UHT skim milk. Confirmation of proteolytic activity was carried out by fermentation in UHT skim milk, followed by the observation of the protein hydrolysis profiles, obtained in polyacrylamide gels after SDS-PAGE electrophoresis. All proteolytic strains were submitted to catalase tests and Gram staining, to be confirmed as lactic acid bacteria. From the 187 isolates, obtained in the preliminary tests, 36 confirmed the proteolytic activity in UHT skim milk and 20 were considered as pLAB (with Gram-positive and catalase-negative results). The hydrolysis profiles revealed that, even though the

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proteolytic activity varied among the isolates, all pLAB presented strong activity against casein milk fractions. All isolates were able to completely hydrolyze β- e α_{S2}-caseins, and to partially hydrolyze α_{S1} fraction. Besides, a partial hydrolysis of whey protein fractions (represented by β-lactoglobulin and α-lactalbumin) was also observed for five isolates. The results obtained up to now suggest that these isolates present a good potential to be applied in the production of fermented hypoallergenic dairy products. Further studies will be carried out in order to enable the application of the obtained pLAB isolates in the reduction of CMA.
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Palavras-Chave: Lactic acid bacteria, Milk allergy, Proteolytic activity

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