The influence of the medium composition on the biosurfactants produced by *Lactobacillus paracasei*

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Lactic acid bacteria is an interesting group of microorganisms for the production of biosurfactants. In addition, these bacteria are generally recognized as safe by the American Food and Drug Administration. An example is the *Lactobacillus paracasei* that was isolated from a Portuguese dairy industry and has been previously reported by Gudiña and collaborators [1] for the production of biosurfactants. The biosurfactants produced by LAB are cell-bound biosurfactants contrarily to the most well-known extracellular biosurfactants produced by *Pseudomonas* or *Bacillus* species. The main bottleneck of their industrial production and application is related with the production and recovery costs. Therefore, many studies are focusing on the use of renewable agro-industrial wastes as carbon sources in the fermentative processes [2]. The aim of this work was the production and characterization of biosurfactants by *L. paracasei* using a lignocellulosic residue (vineyard pruning waste) as carbon source. The vineyard pruning waste was subjected to a fractionation process to obtain cellulose, which was next submitted to a saccharification step with enzymes in order to convert cellulose in a glucose-based fermentation media. Once this glucose solution was obtained, it was further supplemented with 10 g/L of yeast extract and 10 g/L of corn steep liquor. The fermentation process was carried out in a 2-L Applikon bioreactor during 24 h, at 37ºC, pH=5.85 and 150 rpm. Finally, the cells were recovered and washed, and the biosurfactant was extracted (with phosphate buffer saline solution). Next, the biosurfactant content in sugars, proteins and fatty acids was determined and compared to the same contents obtained while using a synthetic lactose-based medium (control). The chemical analysis revealed that the biosurfactant obtained from the culture grown on glucose from vineyard pruning waste was a mixture of carbohydrate, protein and lipid in the combination 1:4:4.5, respectively. This composition is in good agreement with data reported by other authors using cellulosic sugars to produce biosurfactants by lactobacilli strains. Vecino and collaborators [3] found that the biosurfactant produced by *L. pentosus*, grown on hemicellulosic sugars from vineyard pruning waste, is a glycolipopeptide. However, Pinto et al. [4] reported that the biosurfactant from *L. paracasei* (the strain herein used) produces a glycoprotein biosurfactant when grown in MRS-Lac medium (lactose-based media). Based on the results gathered in this work, it can be speculated that the composition of biosurfactants can change according to the type of carbon source used in their production. This finding opens the door to the production of different types of biosurfactants from the same strain using different carbon sources.

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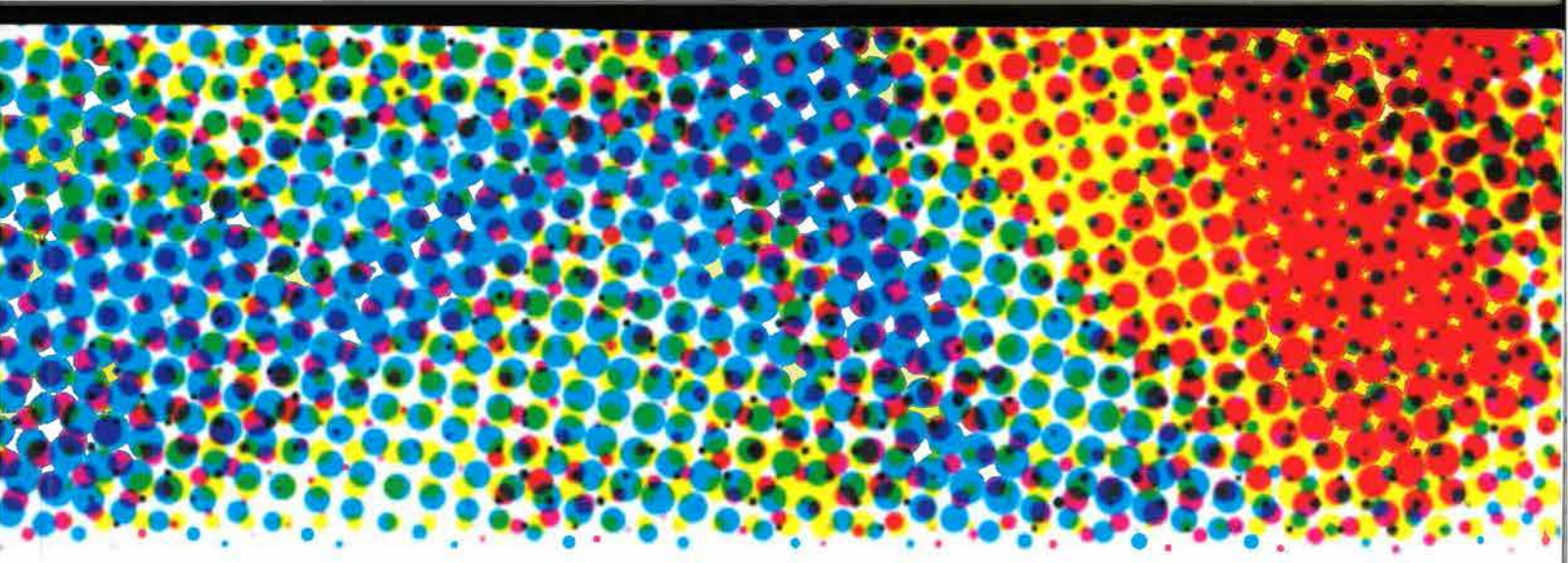

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