Identification and Biotechnologycal Aplication of *Kluyveromyces marxianus* secretome Proteins

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The yeast *Kluyveromyces marxianus* has versatile biotechnological applications. This yeast group gathers physiological characteristics such as the wide utilization of the substrates, fermentation capacity at temperatures above 40°C, production and secretion of endogenous high molecular weight proteins, such as the inulinase and proteins with potential biotechnological applications, for example β-glucosidases and endopoligalacturonases. Some strains of this genus, described as “killer yeasts” also display the ability to secrete enzymes that control other microorganisms growth. The “killer” activity of these enzymes is mostly involved in the control of the microorganisms growth, once their cell walls are the “killer’s” main target. Our purpose is to identify proteins secreted by *Kluyveromyces marxianus* in optimal conditions to produce β-glucanases and evaluate its biotechnological potential in controlling phytopathogenic fungi. In this study the following strains were used: *K. marxianus* CCT 7735, *K. marxianus* ATCC 8554. The secretome activity on substrates azocasein, chitin azure and ρ-nitrophenyl-β-D-glucopyranoside have been determined. The enzymatic extract of *K. marxianus* CCT 7735 and *K. marxianus* ATCC 8554 were choosen to evaluate the hydrolysis potential of the cell wall of *S. cerevisiae* W303 and the damage was evaluated by electron scanning microscopy. The *K. marxianus* CCT 7735 secretome was sequenced by mass spectrometry. The group of proteins that compose the *K. marxianus* CCT 7735 secretome has been identified by sequencing. The enzymatic secretome profile indicates effective action in the yeast cell wall hydrolysis, implying a potential biotechnological application in the production of glucans, protoplasts and as an antifungal agent.

Keywords: *Kluyveromyces marxianus*, killer yeast, secretome.

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