EFFECT OF THE SUBSTRATE COMPOSITION ON THE SOLID STATE FERMENTATION TO OBTAIN ENZYMES WITH POTENTIAL FOR EXTRACTION OF BIOACTIVE COMPOUNDS FROM GRAPE POMACE

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The enzymatic hydrolysis of grape pomace has been suggested as an efficient technology for the recovery of its bioactive compounds. However, synthesis of enzymes can be costly when the medium used requires a very complex supplementation. Therefore, the objective of this work was to evaluate the effect of wheat bran, grape pomace and tannic acid concentrations in the solid-state fermentation (SSF) of grape pomace in order to produce tannase and others hydrolytic enzymes. Additionally, the effect of these enzymes on the hydrolysis of grape pomace to recovery bioactive compounds and their α-amylase inhibition potential were studied and compared with a commercial enzyme (Viscozyme L) and a standard ethanol extraction methodology. The activities of tannase, polygalacturonase, carboxymethylcellulase and β-glucosidase were determined in the complex produced by SSF, and the extract obtained after the hydrolysis of grape pomace was evaluated in relation to total phenolic content, phenolic compounds profile by HPLC and α-amylase inhibitory activity. The best medium for SSF was a mixed medium (MM) containing grape pomace and wheat bran (1:1). The enzymatic hydrolysis (using 12 $U.g^{-1}$, based on the polygalacturonase activity) showed to be more efficient in the recovery of most of the phenolic compounds evaluated when compared to conventional extraction with ethanol (50%). However, ethanolic extraction had higher release of ellagic acid and anthocyanins. Despite the low tanase activity, the complex produced in the MM substrate resulted in a greater galic acid (43.89 ± 0.26 $mg.100g^{-1}$) release, 2.7 times greater than ethanolic extraction (16.30 ± 1.14 $mg.100g^{-1}$). In addition, the extract obtained with the MM complex was responsible for the greater inhibition of α-amylase (97%). These results demonstrate the possibility of obtaining extracts rich in phenolic compounds with high biological potential from extraction assisted by enzymes produced by SSF without needing very complex supplements.

Keywords: Supplementation; Fermentative process.