ZYGOSACCHAROMYCES BAILII STRAIN TALF1 INULINASES: A VERSATILE TOOL FOR BIOPROCESSES

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Background: Fructans are one of the most abundant non-structural polysaccharides found in a wide range of plants. Inulin is a polydisperse fructan polymer composed by linear chains of b-2, 1-linked D-fructofuranose molecules terminated by a glucose residue through a sucrose-type linkage at the reducing end. Inulin or inulin-rich materials can be actively hydrolyzed into fermentable sugars (glucose and fructose) using inulinases and then further used within bioprocesses.

Objectives: The main goals of this work were the characterization of the novel inulinases produced by Z. bailii strain Talf1 and their further application in bioprocesses that use inulin or inulin-rich materials as carbon source.

Methods: *Z. bailii* strain Talf1 enzyme crude extract was applied for bioethanol production and fossil fuels biodesulfurization (BDS). For the bioethanol production two different approaches were used: a consolidated bioprocessing (CBP) with strain Talf1 and a simultaneous saccharification and fermentation (SSF) with the ethanologenic yeast *Saccharomyces cerevisiae* CCMI 885. For the BDS studies it was used the fructophilic bacterium *Gordonia alkanivorans* strain 1B in a SSF approach.

Conclusions: In this study were obtained promising results highlighting the potential of the yeast *Z. bailii* strain Talf1 or its inulinases to be used for further optimization and scale-up viewing their future industrial applications for bioethanol production or fossil fuels BDS from inulin or inulin-rich materials, either in a CBP or SSF process.

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