***KLUYVEROMYCES MARXIANUS* STRAIN FOR THE PRODUCTION OF BIOETHANOL, TEQUILA AND METABOLITES OF INDUSTRIAL INTEREST**	
Offering Organization:	Centro de Investigación y Asistencia en Tecnología y Diseño del Estado de Jalisco, A.C. and the University of Guadalajara
Type of Organization:	Public Research Center
Development Stage:	Laboratory Tests
Desired Relationship:	– Technological research and development financing (technological partner) – Specialized application tests – Creation of a new company (Joint Venture) for the commercialization of the products outlined herein – Licensing of patents
Sector:	Food
Area of knowledge:	Industrial Biotecnology
Key words:	Yeasts, *Kluyveromyces marxianus* , fructans , fermentation, agave

DETAILED DESCRIPTION:

Problem to be solved:

Structurally, fructans are fructose polymers found naturally in dicotyledonous and monocotyledonous plants, grasses, gramineaes and agaves. Owing to their prebiotic properties, these compounds are used as ingredients in the formulation of functional foods as a fat substitute, as a stabilizer, in the preparation of syrups and sweeteners. Moreover, through simultaneous hydrolysis and fermentation processes, microbial or enzymatic, fructans are used for the production of metabolites of industrial interest with respect to tequila, ethanol, aldehydes, higher alcohols, esters and organic acids. However, to-date these simultaneous processes have not seen much development because the complexity of the structure of the fructans requires highly specific enzymes.

Solution:

It has been found that the *Kluyveromyces marxianus* type yeasts, isolated from fermentation processes during the manufacture of agave beverages, act as a natural source of specific enzymes for the hydrolysis of branched fructans.

New and Innovative Aspects:

– Isolation, purification and characterization of a strain of *Kluveromyces marxianus* (NRRL Y- 50882) capable of producing an inoculum compound of extracellular fructanase and cells capable of hydrolyzing branched fructans and converting the hydrolysate sugars in ethanol and other metabolites of industrial interest all while with maintaining high performance.

TECHNICAL CHARACTERISTICS:

– Isolation, purification and characterization of the *Kluyveromyces marcianus* strain with accession number NRRL Y- 50882.
– Use of *Kluyveromyces marcianus* NRRL Y-50882 to produce extracellular enzymes with fructanase activity for the hydrolysis of branched and linear fructans and other

sugars for conversion into metabolites of industrial interest with respect to tequila, ethanol, aldehydes, higher alcohols, esters and organic acids.

- *Kluyveromyces marcianus* NRRL Y-50881 inoculum containing cells and extracellular fructanase enzymes for the simultaneous process of saccharification and fermentation in the production of tequila and other metabolites of industrial interest.

Main advantages derived from its utilization:

The present invention provides an inoculum of a strain of *Kluyveromyces marxianus* (NRRL Y-50882) with highly specific enzymes for the hydrolysis of branched fructans, while simultaneously performing the conversion of the released sugars to ethanol without requiring the use of mixed cultures or genetic engineering to modify the metabolic capacity of the strains.

Applications:

- In the food, bioenergy and pharmaceutical industries for the production of bioethanol, tequila and other metabolites of industrial interest.

INTELLECTUAL PROPERTY

- MX/a/2014/008844

ABOUT THE OFFERING ORGANIZATION

Presentation:	El Centro de Investigación y Asistencia en Tecnología y Diseño del Estado de Jalisco, A.C. (CIATEJ) is a public research center that belongs to the national technology development and innovation network, the National Council for Science and Technology (CONACyT). CIATEJ is focused on the agricultural, food, health, and environmental sectors with an emphasis on the application of innovative biotechnology.
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