

# SELECTION OF NON-CONVENTIONAL NATIVE YEASTS FOR CRAFT BEER PRODUCTION WITH LOW CARBOHIDRATE CONTENT AND GLUTEN FREE

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## ABSTRACT:

Non-*Saccharomyces* yeasts represent a valuable group of microorganisms useful for their application in the brewing industry. According to recent research, non-*Saccharomyces* yeasts present a great potential in the formation of desirable aromatic compounds to produce quality craft beers.

In this work, we evaluated the following yeasts' desirable properties for craft beers from 250 native yeasts: fermentation capacity, aroma profile, amylase activity screening and capacity to ferment alternative barley's grains (gluten free grains).

The non-*Saccharomyces* yeasts used, were isolated from raw materials of the Uruguayan brewing and wine industries, native fruits and native trees. The material was enriched in a maltose culture liquid media, incubated and plated in selective and differential solid culture mediums. The isolated strains were finally genetically identified by divergences in the variable domain D1/D2 of the 26S subunit of the ribosomal DNA. Pure culture fermentations were conducted at laboratory scale, in a similar brewing liquid medium, designed specifically for this purpose.

According with the capacity to ferment maltose we selected native strains of *Pichia*, *Zygoascus*, *Starmerella*, *Candida*, and *Lachancea*.

Fifty-two strains were selected for their amylase activity, belonging to the genera *Aureobasidium*, *Cryptococcus*, *Debaryomyces* and *Meyerozyma*. None of these yeasts were maltose positive, so the strategy was to co-inoculate these strains with native strains that ferment maltose.

Finally, according to fermentation capacity using a gluten free medium we selected two strains of *Saccharomyces cerevisiae*. GC-MS analyses showed an increased formation of acetate esters and the monoterpenes myrcene and limonene (fruit / floral notes).

These results highlighted strains diversity and demonstrated a promising selection to produce craft beers reduced in carbohydrates and gluten free.

The next steps of this work include the scale up of two of these strains at real craft brewing level to confirm the obtention of desired characteristics.

**Keywords:** amylase activity, craft beer, fermentation, gluten free, non-*Saccharomyces* yeast

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