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ALCOHOL PRODUCTION IN SYNTHETIC MEDIUM ADDED WITH DIFERENT SUGARS

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Introduction. The lignocellulosic biomass is very profuse in nature and it has a great potential to produce a new generation of liquid fuels by fermenting the sugars contained in the cellulose and hemicellulose fractions (1). Moreover, the establishment of a cost effective process requires that the microorganisms have the ability to ferment both hexoses and pentoses present in the substrates (2).

The aim of this research was to obtain a preliminary sugar assimilation profile and to determine the alcohol production of two wild yeasts on different sugars.

Methods. Two wild yeasts identified as *C. glabrata* N1 and *W. anomalus* API-1, were isolated from fermented orange juice and fistulated bovine rumen, respectively, (both from Yucatan, Mexico). A preliminary test of sugars assimilation in YNB minimal medium, based on optical density measurement, was conducted. Alcohol production on different carbon source was also determined. Growth and production kinetic parameters were estimated by mathematical equations available elsewhere. Statistical analysis was performed using the Statgraphics Centurion XV software.

Results. Carbohydrate assimilation profile indicated that both strains assimilate, preferentially, fructose, glucose and mannose (Fig 1A and 1B).

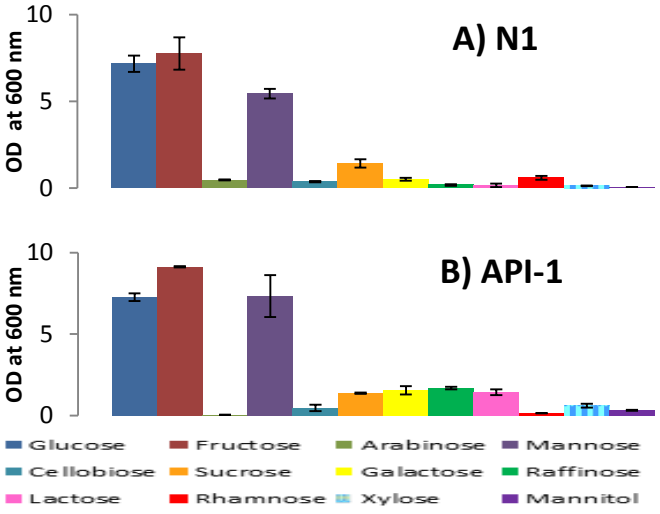

Fig. 1. Carbohydrate assimilation preliminary profile of yeasts *C. glabrata* N1 (A) and *P. anomala* API-1 (B).

Fig. 2 shows the alcohol production of strains *C. glabrata* N1 and *W. anomalus* API-1. The strain N1 has a better growth and alcohol production performance than strain API-1. None of this wild yeast could produce alcohol from galactose or xylose.

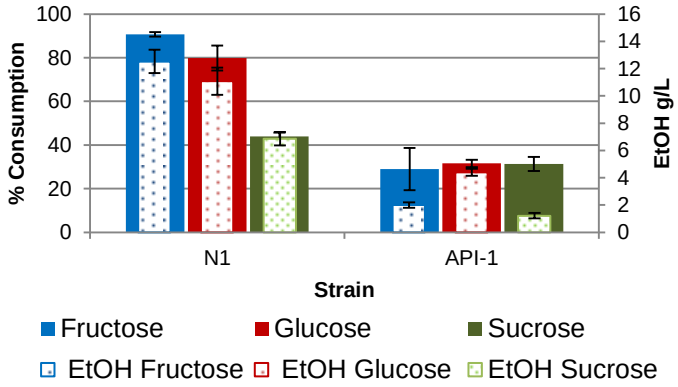

Fig. 2. Ethanol production of *C. glabrata* N1 and *P. anomala* API-1 on different sugars (culture conditions: 40°C, 0 .rp.m.).

The higher kinetic parameters obtained for both wild yeasts are presented in table 1. The best substrate for N1 strain growth and alcohol production was fructose, while for API-1 strain it was glucose.

Table 1. Kinetic parameters calculated for the two wild yeasts studied.

Strain	U_{max} (h^{-1})	ΔP (g/L)	P_{max} (g/L.h)
N1	0.245 ± 0.05	12.53 ± 0.85	0.104 ± 0.01
API-1	0.253 ± 0.05	4.41 ± 0.25	0.037 ± 0.002

Conclusions. The strain and the carbon source have a statistical effect over the alcohol production, being the more suitable for bioethanol production *C. glabrata* N1 strain.

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