

**TITLE:** MASS GROWTH OF *Pichia membranifaciens* IN DIFFERENT MEDIA FOR PENTOSE FERMENTATION

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## **ABSTRACT**

Biofuels produced by lignocellulosic biomasses are considered ethanol second generation (2G) and can be produced by several promising technologies. In Brazil, the use of bagasse, straw, and sugarcane for biofuels production has been widely studied. In this context, microorganisms that can metabolize and ferment 5-carbon sugars from the hemicellulose fraction have been investigated. Among the yeasts that can ferment xylose, the genus *Pichia* stands out. *P. membranifaciens* is a widely distributed yeast in nature that is part of the microbiota of several spontaneous fermentative processes, but its growth and use for ethanol production have not been explored. This work had the goals to evaluate the best average for mass growth of *P. membranifaciens* for use in the production of 2G ethanol. The experimental design was completely randomized, with 3 replicates. YPX media (10 g.L<sup>-1</sup> of yeast extract, 20 g.L<sup>-1</sup> of peptone, and 20 g.L<sup>-1</sup> xylose), YPX-D (10 g.L<sup>-1</sup> of yeast extract, 20 g.L<sup>-1</sup> of peptone, 6.7 g.L<sup>-1</sup> of yeast nitrogen base, and 10 g.L<sup>-1</sup> of xylose), YNB-XD (6.7 g.L<sup>-1</sup> of yeast nitrogen base, 5 g.L<sup>-1</sup> of xylose, and 5 g.L<sup>-1</sup> of glucose), MEA-X (3 g.L<sup>-1</sup> of malt extract, 5 g.L<sup>-1</sup> of peptone, 3 g.L<sup>-1</sup> of yeast extract, and 10 g.L<sup>-1</sup> of xylose), MEA-X-D (5 g.L<sup>-1</sup> of peptone, 3 g.L<sup>-1</sup> of yeast extract, 5 g.L<sup>-1</sup> of xylose, and 5 g.L<sup>-1</sup> of glucose) and sugarcane molasses diluted at 5° brix. For cell mass growth the microorganism was inoculated into Erlenmeyer with 200 mL of each media. The flasks were incubated for 72 hours at 32°C under agitation, in the end, being centrifuged, recovered and, heavy. The results were submitted to analysis of variance and Tukey's test at 5%. According to the data, the highest masses were obtained in the YPX-D and MEA-X media, with mean values higher than 1 g. There was no substantial growth in the YNB-X-D medium, being significantly lower than the other treatments. The results proof the yeast does not require high amounts of micronutrients for growth since the values found in diluted (ash-rich) molasses medium do not differ significantly from YNB-X and MEA-X-D media. It is concluded that of all the analyzed media, the YPX-D medium showed higher cell mass growth rate for the yeast *Pichia membranifaciens*.

**Keywords:** Media of growth, yeast, alcoholic fermentation, 2G ethanol, biofuel.

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