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Magnesium sulphate and β-alanine enhanced the ability of *Kluyveromyces marxianus* producing bioethanol using oil palm trunk sap

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ABSTRACT

The abundance of oil palm trunk waste generated each year has encouraged research in using its sap for fermentation to produce value-added products. One of these value-added products is bioethanol production using yeast strains. In this study, the ability of *Kluyveromyces marxianus* ATCC 46537 to produce bioethanol using oil palm trunk sap (OPTS) was examined. The nutrients (ammonium sulphate, di-ammonium hydrogen phosphate, magnesium sulphate, β-alanine, calcium chloride and potassium dihydrogen phosphate) required to enhance production were screened and optimised. The concentrations of bioethanol and sugars were monitored with high performance liquid chromatography. The results showed that *K. marxianus* could attain maximum bioethanol concentration at 16 h with a higher productivity as compared to *S. cerevisiae*. Magnesium sulphate and β-alanine were found to increase bioethanol production. When 7.93 g/L of magnesium sulphate and 0.90 g/L of β-alanine were supplemented to OPTS, bioethanol production increased 20% with a bioethanol yield of 0.47 g/g and a productivity of 2.22 g/L.h. Therefore, minimum supplementation of OPTS with inorganic nutrients could enhance the bioethanol production of *Kluyveromyces marxianus*.

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