

Structural analysis by ^{13}C - nuclear magnetic resonance spectroscopy of glucan extracted from natural palm wine

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Abstract

The linkages of the glucan produced in palm wine during fermentation were determined by ^{13}C NMR spectroscopy. The glucan was found to be linked $\alpha(1-6)$ in the main chain, showing it to be a dextran. The dextran appeared to be a mixture of the dextran types elaborated individually in pure culture by dextran-producing bacteria isolated from palm wine in a previous study. All branch linkages [$\alpha(1-3)$, $\alpha(1-2)$, $\alpha(1-4)$] found in the spectra of the dextrans of the respective palm wine bacteria, were present in the spectrum of the palm wine glucan. There was also evidence of the presence of a dextran branching mainly through $\alpha(1-4)$ linkages, thus differing from all the dextran-producing bacteria so far isolated from palm wine. It is concluded that at least 4 types of dextrans are produced concomitantly in palm wine by different bacteria and that the bacteria producing the dextran branching mainly by $\alpha(1-4)$ linkages in palm wine are yet to be isolated. Formulations of analogues of palm wine may therefore need to use a mixture of dextrans in order to simulate, more exactly, the consistency and colour of natural palm wine.

Keywords: Natural palm wine; Glucan; dextrans