

TITLE: USE OF SWEET SORGHUM AS SUBSTRATE TO PRODUCE A NOVEL DISTILLED BEVERAGE

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ABSTRACT:

Sweet sorghum (*Sorghum bicolor* (L.) Moench) presents a short planting period, high biomass productivity, and accumulates soluble sugars in its stalk. In many countries, this crop has gained attention as an alternative substrate for alcoholic fermentation. Consequently, this study aimed to evaluate the possibility to produce a distilled beverage from sweet sorghum using *Saccharomyces cerevisiae* and *Meyerozyma caribbica* as starter cultures. The final beverages were submitted to chemical and sensorial characterization. Two beverages were produced: one inoculated with *S. cerevisiae* and another with *S. cerevisiae* co-inoculated with *M. caribbica*. Fermentations were carried out in duplicate at 28 °C until °Brix stabilization. After cell separation by gravity, the fermented juice was distilled using a glass distillation apparatus. The sweet sorghum spirit ("heart") was collected until 42% (v/v) ethanol content. The final distillate was submitted to chemical characterization by HS SPME GC-MS, being extraction conducted at 60 °C for 25 min and injections in splitless mode using a system operated at 35 °C and increment of 4 °C/min until 240 °C. Compounds were identified by the NIST library 2011 and expressed as equivalents of 4-nonanol. Fifty-five volatile compounds were identified, being esters and higher alcohols the majority, which are desirable due to their fruity aromatic descriptors in distilled beverages. The sweet sorghum spirit fermented by *S. cerevisiae* showed higher concentrations of volatile acids (9431.86 µg/L), aldehydes (331.93 µg/L) and terpenes (4881 µg/L). On the other hand, the spirit produced with mixed inoculum showed 58021.27 µg/L of esters and 9717.07 µg/L of higher alcohols. The spirit produced with both yeasts showed a slightly greater acceptance when submitted to sensorial analysis, and a higher index of purchase intention. The sweet sorghum showed to be a suitable substrate to the production of a spirit with good fermentation efficiency, a desirable profile of aromatic compounds, and good acceptance among the tasters in the sensorial analysis.

Keywords: *Sorghum bicolor*; volatile compounds; distilled beverage; *Meyerozyma caribbica*; non-*Saccharomyces*.

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