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Isolation and molecular characterization of *Saccharomyces cerevisiae* from palm wine residue as a potential biofertilizer

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Palm wine is a naturally fermented beverage derived from the sap of palm trees. It is traditionally consumed in many tropical regions and represents more than just cultural heritage. However, beyond its role as a beverage, microbiota of palm wine holds untapped agricultural potential, particularly as a biofertilizer. In light of rising costs and environmental impacts of synthetic fertilizers, finding low-cost, eco-friendly alternatives has become imperative. The aim of this study was first to isolate microorganism, characterize microbial isolate using ITS region and evaluate growth promoting properties of palm wine. The mineral composition of palm wine was determined using atomic absorption spectrometry. Also, the microbial isolates gotten from harvested palm wine were subjected to molecular identification using Internal Transcribed Spacer (ITS) sequencing while the effect of palm wine on cowpea seed germination (0, 3, 5 and 10%) was laid out in complete randomized design. The results of the mineral composition revealed the presence of high potassium in the palm wine. Furthermore, cowpea seeds treated with 3–5% dilutions of palm wine exhibited significantly higher germination rates and greater early seedling vigor compared to untreated controls indicating the prospect of palm wine as a biofertilizer. Hence, molecular analyses confirmed the presence of *Saccharomyces cerevisiae* in the palm wine samples. Also, the presence of nifH gene in *S. cerevisiae* was confirmed. The study provides insight on the potential of palm wine as a suitable bio-fertilizer and contains healthy microorganisms – *S. cerevisiae* that may spur plant growth.

Keywords: Palm wine, biofertilizer, *Saccharomyces cerevisiae*, microorganisms, fertilizers