

## **Analysis of the Catalytic Behavior of *Osyris Alba* Bark and *Indigofera Amabelacensis* Leaves Extract in Ethanoic and Lactic Fermentation**

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### **Abstract**

Fermentation process naturally occur spontaneously though the process is quite slow. To optimize on fermentation process, high temperature systems and enzymes are used. However, these processes are quite expensive and lead to increased production costs. This is notwithstanding the importance attached to fermentation process in food, diary, baking, brewery, pharmaceutical, chemicals and biofuels synthesis. *Osyris alba* bark and *Indigofera amabelacensis* leave extracts were traditionally used to hasten saccharification and fermentation of biomass during preparation of communal alcohol. This study aimed at exploiting the potentials of these two extracts in catalyzing ethanoic and lactic fermentation at ambient temperature conditions. The extracts were fused into maize and sorghum flour (ethanoic) and milk (lactic fermentation) in 1.5-liter batch reactors. The reactors were monitored for 30 days while closely assessing the amount of CO<sub>2</sub> gas produced. The products were qualitatively screened by Iodoform and Benedicts methods as well as infra-red spectroscopy. The products were quantitatively analyzed by ultraviolet-visible (UV-VIS) spectroscopy and gas chromatography (GC) techniques. The results indicated that the catalyzed samples generated 3-to-5-folds more CO<sub>2</sub> gas compared to the control samples. These findings were supported by the qualitative tests done which showed the catalyzed samples began producing ethanol and lactic acid before the control samples. The catalyzed lactic fermentation setup produced more lactic acid (2.79µg/L) compared to the control one (1.48µg/L). Catalyzed ethanoic fermentation setups yielded 11.55% (sorghum) and 2.16% total ethanol while the control samples had negligible ethanol concentrations at similar conditions.

**Keywords:** Fermentation; bio-catalysts; *Osyris alba*; *Indigofera amabelacensis*; ethanol; lactic acid