

Determination of physiochemical parameters.

The standard methods of Jackson (2018) were used to determine the physiochemical parameters during and after fermentation. The parameters investigated were pH, total titratable acidity, specific gravity, alcohol content, temperature.

RESULT AND DISCUSSION

During and after fermentation of Ripe plantain using *Saccharomyces cerevisiae* and *Lactobacillus bulgaricus*, the following values were gotten as shown in the figures below.

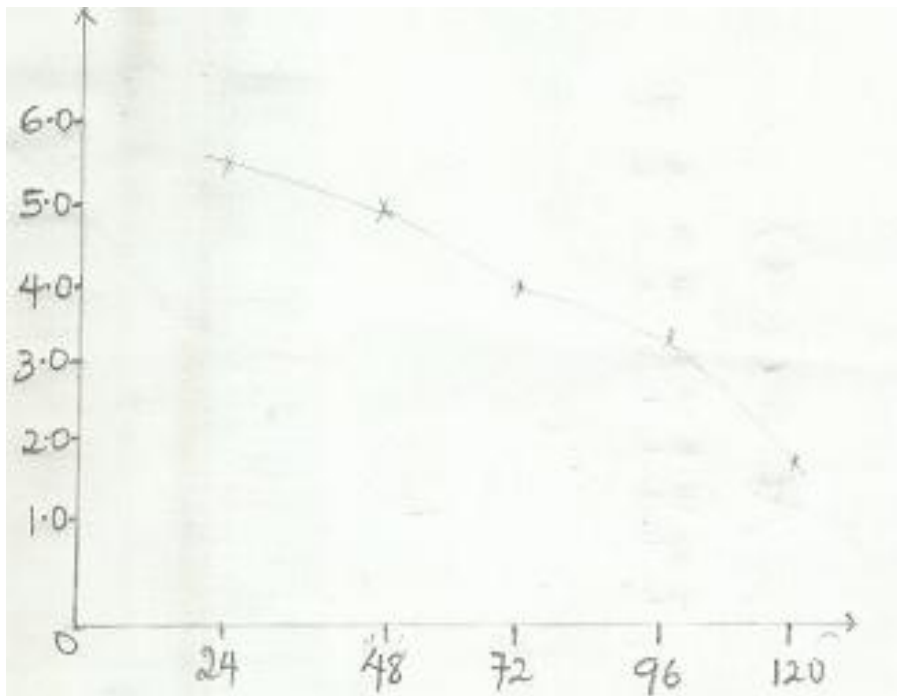


Fig 1. Change in pH value during and after fermentation

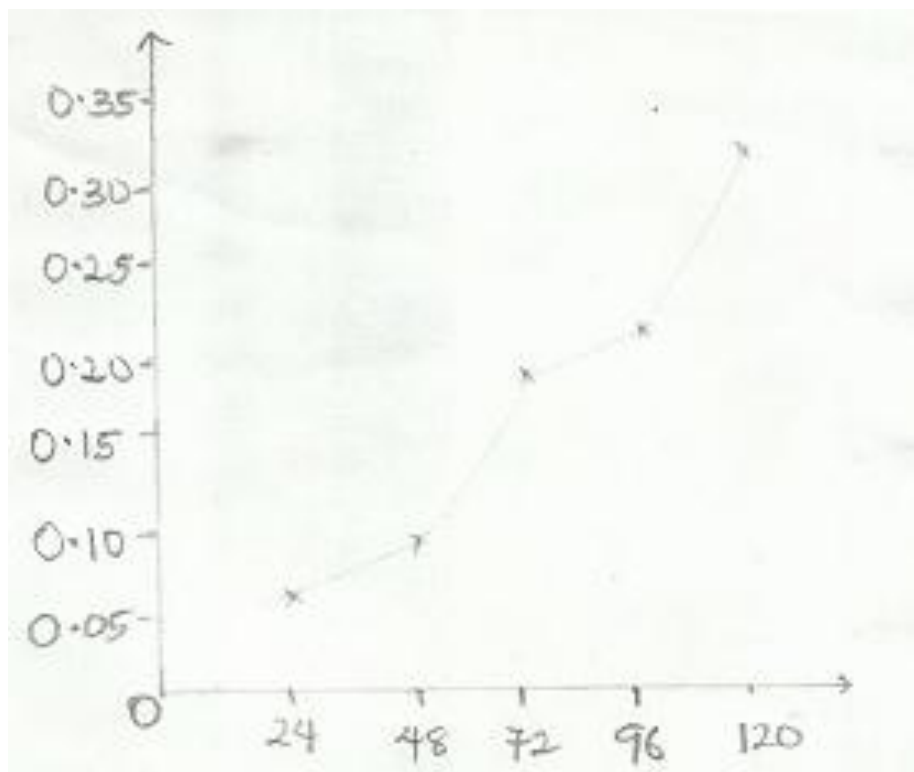


Fig 2. Change in TTA value during and after fermentation

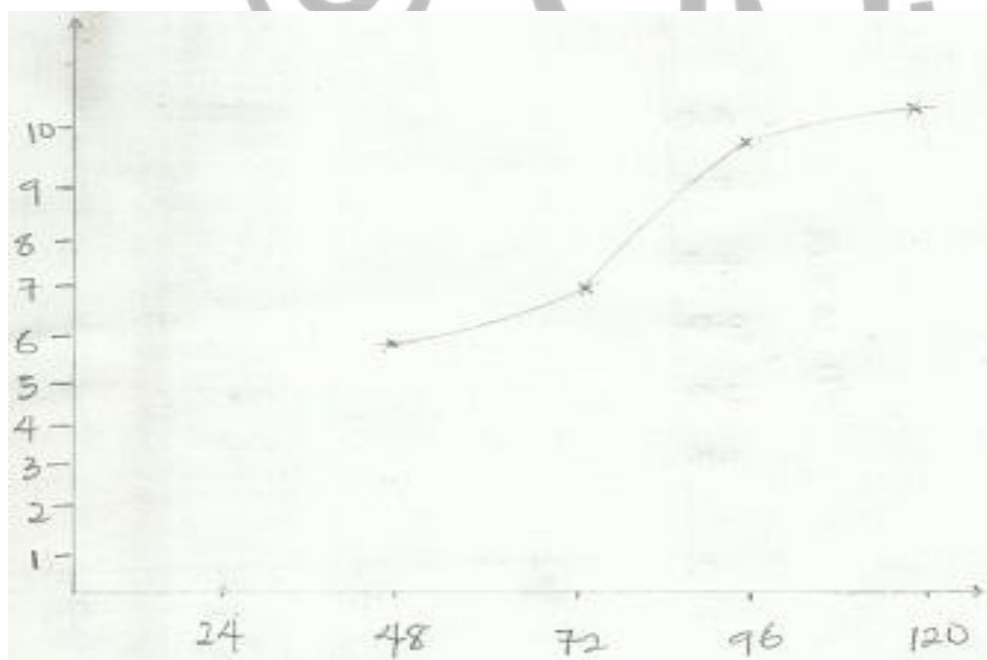


Fig 3. Change in specific Gravity (g/cm^3) value during and after fermentation

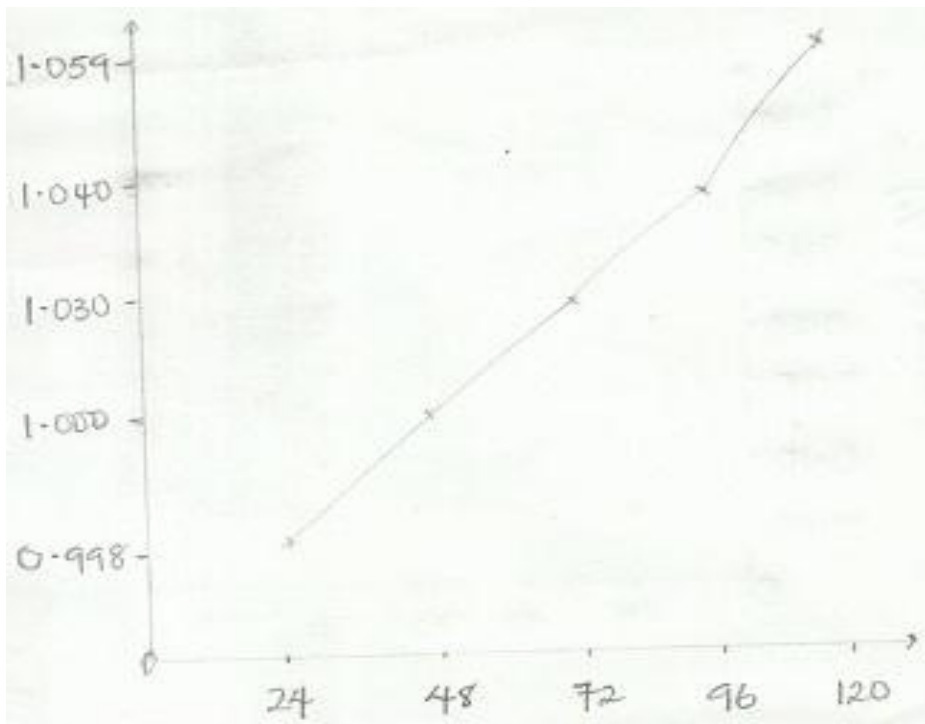


Fig 4. Change in Alcoholic content value during and after fermentation

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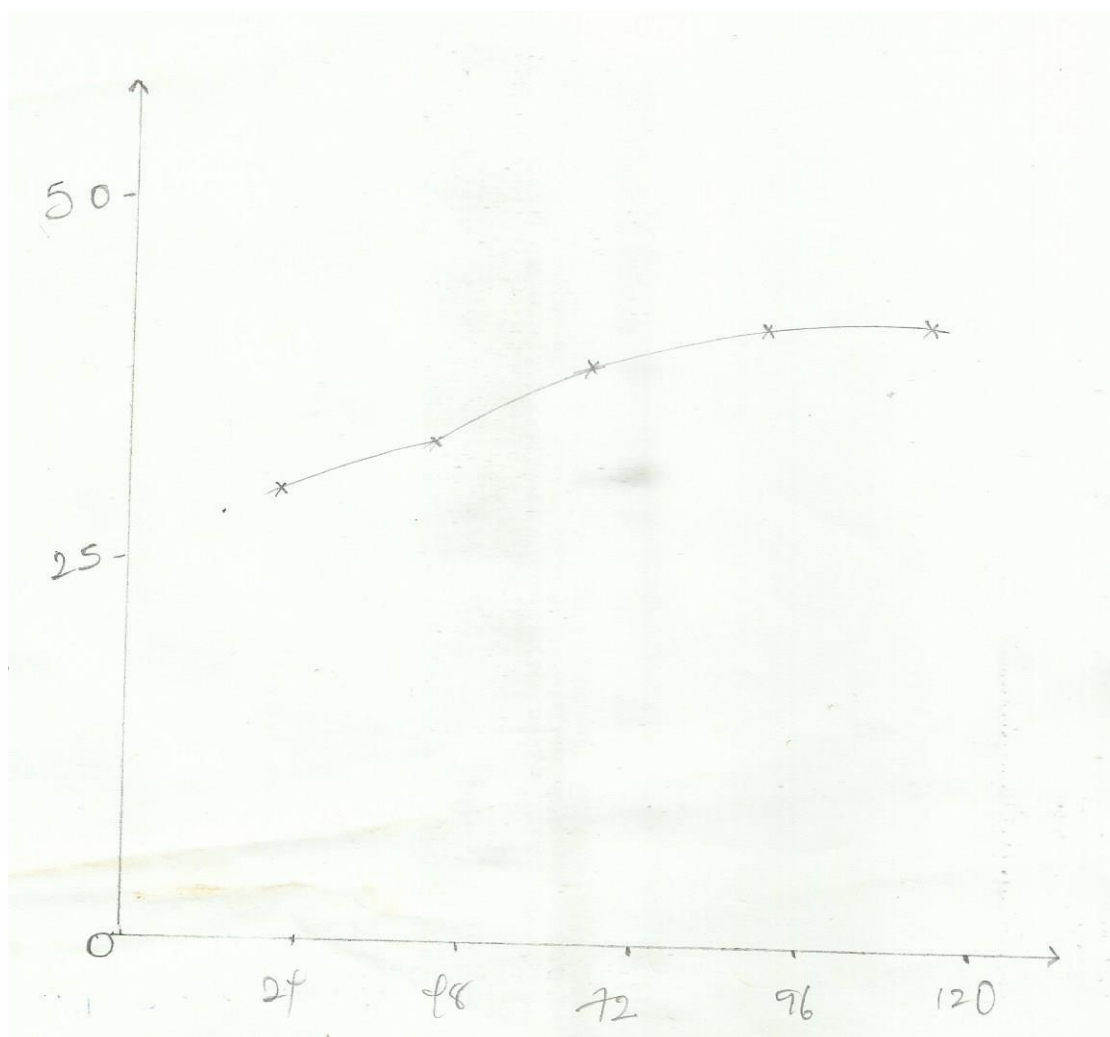


Fig 5. Change in Temperature value during and after fermentation

The pH values as shown in fig 1 dropped from 5.4 at the 24th hour to 2.0 by the 120th hour. Fig 2 should total titratable acidity increasing from the 24th hour at 0.062% to 0.315% by the 120th hour. No alcohol content recorded at the first 24 hours but by the 48th hour, co-culture fermentation showed an increase from 6% to 10% as shown in fig 3. Specific gravity also increased from 0.998 to 1.059g/cm³ as shown in fig 4 and temperature change was relatively constant.

The reduction in pH values was due to the production of lactic acid during the period of fermentation as observed by (Akingbala, *et al.*, 2015) when he produced wine from ripe mango. Production of lactic acid which is an organic acid is also responsible for the increase in total titratable acidity during the fermentation period (Ba and Boyac, 2007).

The increase in specific gravity of the sample however may be due to conversion of sugar to alcohol as described by Okafor, (2007).

Temperature was relatively constant, the slight change in temperature was probably as a result of bio-chemical changes during the metabolism of the substrate by the fermenting microorganisms.

Overtime, wines have been produced by alcoholic fermentation using *Saccharomyces cerevisiae* as the starter culture but this research has shown a wine produced from ripe plantain using a co-culture of *Saccharomyces cerevisiae* and *Lactobacillus bulgaricus*. The wine had a sugar level, alcohol and organic acid tolerable by the body system.

Wineries should employ the use of co-culture in the production of wine from fruits especially from plantain.

Extensive research should also be carried out to ascertain the organoleptic qualities of wine produced from co-culture fermentation against single culture fermentation.

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