ABSTRACT

An Investigation Into The Laboratory-Scale Production Of Ginger (*Zingiber officinale* Roscoe) Beer By Natural And Controlled Fermentations.

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The sensory characteristics, optical and chemical properties, and the microbial content of fermented ginger beer were evaluated. A traditional processing method, using the indigenous microflora present in the ingredients (natural fermentation), was compared to a controlled fermentation using an inoculum of the yeast *Saccharomyces cerevisiae,* in producing ginger beer.

Sensory evaluation showed that the general appearance, colour, odour, mouthfeel and taste of the ginger beer prepared by natural fermentation and that prepared by controlled fermentation, were consumer-acceptable and similar ($P \leq 0.05$). Fermentation led to reductions in the specific gravity of the fermenting mixtures (from 1.0721 to 1.0695 during natural fermentation and from 1.0721 to 1.0671 during controlled fermentation), and in the total soluble solids (from 18.0°B to 17.4°B during natural fermentation and from 18.0°B to 17.0°B during controlled fermentation), with simultaneous increases in organic acids and alcohols during processing. The titratable acidity increased by 67.5% during natural fermentation, and by 112.5% during controlled fermentation. The concentration of methanol,

ethanol, 1-butanol, and ethyl acetate, determined by gas chromatography, increased from 0% to 2.85%, 0.44%, 2.41% and 0.72% respectively, during natural fermentation, and from 0% to 0.09%, 0.80%, 0.94% and 0.32% respectively, during controlled fermentation. Pasteurisation of the fermented ginger beers reduced the concentrations of methanol, 1-butanol and ethyl acetate to barely perceptible amounts, thereby projecting the concentration of ethanol above that of the other alcohols. Only yeasts and lactic acid bacteria were present in the controlled fermentation mixture, whereas moulds and aerobic bacteria were present in the natural fermentation mixture, in addition to the yeasts and lactic acid bacteria.

Keywords: Ginger beer, natural fermentation, controlled fermentation, yeasts, lactic acid bacteria.