

## ABSTRACT

Microbial fermentation process is economically and environmentally friendly process for the manufacturing of natural vinegar from apples, grapes, oranges and mangoes fruit syrups. On industrial scale, acetic acid was produced by catalytic Cativa and Monsanto processes. Alcoholic and acetous fermentation in the presence of *Saccharomyces cerevisiae* yeast were used for the synthesis of natural vinegar from fruit syrups. Conditions optimization like pH, temperature, time, smell and taste were applied in fermentation process to get optimize yield of acetic acid in natural vinegar. Natural vinegar has a daily routine application of preservatives in pickling. Natural vinegar has also a role in anti-bacterial, anti-infectious, lowering of blood glucose concentrations, regulations of lipid metabolism and weight loss. Characterization of natural vinegar was done by Gas chromatography mass spectrometry, high-performance liquid chromatography and atomic absorption spectroscopy. Acetic acid was identified in natural vinegar. Strength of acetic acid was noted by acid base titration in natural vinegars. Strength of acetic acid was analyzed between 6-7% in all natural vinegars. Range of pH existed between 2.5-3.5. Temperature was optimized at 37 °C. Quality evaluation of natural vinegar was observed by using Iodoform test. All the samples showed negative results for iodoform test. Contamination of natural vinegar was checked by the evaluation of heavy metals by atomic absorption spectroscopy. Iron and zinc were present in natural vinegars but the concentration of these heavy metals was under the prescribed limits of world health organization.