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Research Paper

Preservation of onion (*Allium cepa* L.) by lactic acid fermentation

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ABSTRACT

Preservation of onion by lactic acid fermentation was conducted on three varieties of onion such as Arka niketan, Arka bindu and White onion, to produce sour onion. During the study different vinegar like white vinegar, black vinegar, cider vinegar of concentration 25 per cent, Brine 14 per cent and different vinegar with lactic acid bacterial culture were tried. The highest acidity and lowest pH were observed with the use of cider vinegar 25 per cent with lactic acid bacterial culture in variety Arka bindu. Sensory evaluation showed that the variety Arka bindu was a favourable product with respect to colour, flavour, texture, clarity of liquid and overall acceptability. The sour onion had a tart acidic taste, with onion flavour but without the pungency of raw onion.

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Key words : Onion, Lactic acid, Fermentation, Preservation

Onion (*Allium cepa* L.) belongs to the family *Alliaceae*. A distinctive characteristic of onion is the presence of alliaceous odour which accounts for its use as food, salad, spice, condiment and in medicine. Despite the fact that the world production of onion is steadily increasing due to improved production technology, the post harvest losses due to sprouting, rotting, rooting, post harvest diseases and physiological loss in weight pose great problems. Freshly harvested onions contain about 86 per cent moisture and are subject to heavy post harvest losses of 40-60 per cent of the annual production in India. Estimated post harvest losses are about 25-30 per cent due to microbial spoilage. This can be prevented by the use of various preservation techniques such as canning, freezing, fermentation, dehydration etc. Lactic acid bacteria (LAB) is the extensively studied organisms for biopreservation. Lactic acid bacteria are relatively a diffuse group of bacteria that encompass several genera like *Lactobacillus*, *Leuconostoc*, *Pediococcus*, *Lactococcus*, *Brevibacteria*, *Propionibacteria*, *Streptococcus* and *Bifidobacteria*. These are regular, non-sporing, gram-positive rods and cocci having natural association with different foods. Lactic acid bacteria grow as adventitious microflora on foods are added to food as cultures. They are generally considered to be harmless or known to improve human health. They are designated as GRAS (Generally Regarded as Safe) status in United states (Stiles, 1996).In this context, emphasis is given to the preservation of onions by using different vinegars, brine and lactic acid bacterial cultures.

MATERIALS AND METHODS

Mature and cured bulbs of onion varieties, namely Arka niketan, Arka bindu and White onion were collected from Indian Institute of Horticulture Research, Hessarghatta, Bangalore during the month of January-February. Stainless steel knives were used for peeling and cutting of onion bulbs. Glass bottles of 700 ml capacity were used for preservation. The onion top and roots were removed with the help of sharp stainless steel knives, later onions were peeled for easy removal of outer loosened scales. Brine solution of 14 per cent was prepared by dissolving 14 g of crystallized iodide salt in 100 ml of clean water, 25 per cent vinegar was prepared by diluting 4 per cent commercially available acetic acid, 25 ml of vinegar was diluted in 100 ml of water to get 25 per cent. Lactic acid bacterial suspension was prepared by using Mann Rogosa and Sharpe (MRS) broth. The cultures were incubated at 37^0C for two days. The bulbs were put in to different vinegar, brine, vinegar with lactic acid bacterial culture, brine with lactic acid bacterial culture in glass bottles. To this $CaCl_2$ (0.3%) was added and kept in dark at room temperature for about seven weeks.