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RESEARCH ARTICLE

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Studies on effect of preservatives on keeping quality of Khoa

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ABSTRACT

The khoa was preserved by addition of various plant essential oils as rosemary (1.0, 0.1%), garlic oil (0.25, 0.1%) and sage oil (1.0, 0.1%) and by potassium sorbate (0.02%) and shelf-life was studied at ambient and refrigerated temperatures. These samples were observed periodically for physico-chemical and microbial quality characteristics. The study revealed that khoa prepared by using sage oil was found distinctly superior ($p<0.05$) in physico-chemical and microbial characteristics than rosemary and garlic oil.

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Key words : Khoa, Essential oil, Shelf-life, Refrigerated temperature, Microbial characteristics

INTRODUCTION

It has been estimated that about 50-55% of milk produced in India is being converted into variety of traditional Indian dairy products of which 6.5% of milk is used for manufacture of khoa, mostly in private and unorganized sector. Khoa is partially dehydrated product prepared by continuous heating in a pan over direct fire while constant stirring-cum-scrapping by using stirrer till it reaches semi-solid consistency (Bhadania *et al*., 2004). Khoa obtained by traditional method as well as using khoa making machine has a limited shelf-life of less than a week under ambient conditions. The loss of moisture due to desiccation, development of rancidity and surface mould growth are the main forms of quality deterioration that can occur.

Attempts to increase the shelf-life of khoa based on wrapping in butter paper, storage under refrigeration, addition of sugar and incorporation of preservatives have been reported by Goyal and Srinivasan (1988). The incorporation of plant essential oil in foods is found effective for inhibiting the growth of *Staphylococcus aureus* (Burt and Reinders, 2002; Hili *et al.*, 1996). Being plant natural foodstuffs, spices appeal to consumers who tend to question the safety of synthetic additives. Antimicrobial activity of spices depends on several factors which include kind of spice, composition, concentration, and microbial species and their occurrence level, substrate composition, processing and storage conditions (Smith-palmer *et al*., 1997).

Therefore, the attempts were made in the present investigation to study the effect of plant essential oils on keeping quality of khoa at ambient and refrigerated storage conditions.

MATERIALS AND METHODS

Fresh, clean and pure buffalo milk was purchased from the local market and stored at 4^0C temperature until use. Plant essential oils extracted by using solvent extraction method, were also obtained from local Ayurvedalaya and stored at 4^0C temperature until use. Baird Parker agar and Plate count agar were used for the development of *Staphylococcus aureus*. The supplements such as 1% potassium tellurite and egg yolk emulsion were used with Baird Parker agar (Jha *et al.*, 1977).

Preparation of khoa:

The khoa was prepared as per the standard methods. Then 0.02% potassium sorbate, 0.1 and 1.0% sage oil, 0.1 and 1.0% rosemary oil, 0.25 and 0.1 % garlic oil were added separately in hot khoa. It was then shaped into large circular pats and allowed to cool on the floor at room temperature. The prepared buffalo milk khoa was then