

Physico-Chemical Stability and Microbiological Safety of Novel Wood Apple (*Limonia acidissima* L.) Nectar Beverages

Gundala Manjusha

Ph.D. Student, Department of Home Science, Sri Padmavati Mahila Visvavidyalayam, Tirupati, India

Sadhu Vijaya Jyothi

Professor, Department of Home Science, Sri Padmavati Mahila Visvavidyalayam, Tirupati, India

Abstract:

The present study investigates the physico-chemical characteristics and microbiological safety of novel wood apple (*Limonia acidissima* L.) nectar beverages developed using different formulations. Four variants were prepared, namely N1 (wood apple nectar), N2 (wood apple nectar with pineapple), N3 (wood apple nectar with pomegranate), and N4 (wood apple nectar with spices), and evaluated under baseline and accelerated storage conditions equivalent to 90 days. Physico-chemical parameters including total soluble solids (Brix), total acidity, and pH were analyzed using standard AOAC methods, while microbiological quality was assessed in accordance with FSSR (2011) guidelines.

The results revealed that total soluble solids ranged from 18.5 to 20.25°Brix, with the highest values observed in the pomegranate-based formulation (N3). Total acidity varied between 0.83% and 0.93%, with relatively higher acidity in N2 due to pineapple incorporation. The pH values (3.50–3.64) indicated a stable acidic environment conducive to product preservation. Minimal variations in physico-chemical parameters under accelerated storage conditions confirmed good product stability. Microbiological analysis showed negligible aerobic microbial counts (<1 cfu/ml), absence of yeast and mould, and complete absence of major foodborne pathogens, including *Escherichia coli*, *Salmonella*, *Listeria monocytogenes*, and *Staphylococcus aureus*, throughout the storage period.

Overall, the developed wood apple nectar beverages demonstrated excellent physicochemical stability and microbiological safety, meeting regulatory standards and indicating strong potential for commercial production as functional, value-added fruit beverages.

Keywords:

Wood apple (*Limonia acidissima*), Nectar formulation, Physico-chemical properties, Microbiological quality, Shelf-life stability, Accelerated storage, Food safety, Value-added products, Underutilized fruits.