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Evaluation of ultrafiltration combined with UV sterilization for the preservation of King coconut (*Cocos nucifera* var. *aurantiaca*) water

M.R.F. Amani¹ and P. Ranasinghe^{2*}

¹*School of Applied Sciences, Edinburgh Napier University (ENU), Edinburgh, Scotland, UK & Spectrum Institute of Science & Technology (SIST), Colombo 05, Sri Lanka*

²*Herbal Technology Section, Industrial Technological Institute (ITI), Sri Lanka*

Worldwide, king coconut water (KCW) is well known for its unique, refreshing and authentic taste. However, the enzymatic activity of peroxidases and phenol-oxidases limits the shelf life of KCW, altering sensory properties such as taste and aroma upon extraction of KCW from the fruit. The shelf-life of KCW can be improved by eliminating the enzymes which degrade quality of the nut water. Thermal treatment is the commonly applied method in extending the shelf life of KCW. However, undesirable changes in the physicochemical properties, nutritional quality, taste and other sensory attributes are major drawbacks which are encountered in the use of thermal processing methods. Hence, the objective of this study was to extend the shelf life of KCW using a combination of non-thermal technologies; ultrafiltration and ultraviolet (UV) sterilization retaining sensory and physicochemical properties. A pilot scale unit comprising of an ultrafiltration unit combined with a UV sterilizer was designed for this study. Fresh KCW was used as the control. Physicochemical properties; pH, acidity, percentage of reducing sugars, non-reducing sugars and total sugars were measured in the control and in ultrafiltered and UV sterilized KCW. On the 3rd, 7th and 14th day of storage, physicochemical parameters were evaluated and the total plate count was observed. Sensory evaluation was conducted and the most preferred sample for KCW was selected. Findings from the study revealed that, panelists mostly preferred fresh KCW. However, ultrafiltered and UV sterilized KCW was successful in retaining the unique taste of KCW which was almost similar to that of fresh KCW. In ultrafiltered and UV sterilized KCW, except for acidity, there was a change in the other tested parameters from the 3rd to the 14th day of storage. Non-thermally treated KCW was found to be microbiologically safe for consumption. It is concluded that ultrafiltered and UV sterilized KCW was successful in retaining the taste almost similar to that of KCW. Even though other tested parameters were altered, ultrafiltration and UV sterilization have been effective in extending the shelf life of KCW. However, an extension of shelf-life for two months is required for further validation.

Keywords: King coconut water, ultrafiltration, UV sterilization, shelf-life

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E-mail: pathmasiriranasinghe@yahoo.com