

RESEARCH EXPERIMENT NO. - 2

Title: Standardization of process technology for preservation of tender coconut water (20.5.3.7)

Name of the Department: Department of Post Harvest Technology, ASPEE College of Horticulture, Navsari Agricultural University, Navsari – 396 450 Gujarat.

Investigators:

PI : Dr. Dev Raj, Professor and Head (PHT)

Co-PI(s) : Dr. Nilam V. Patel, Assistant Professor (PHT)

Dr. A. K. Senapati, Assistant Professor (PHT)

Dr. HG Suthar, Assistant Professor (Food Micro-biology)

Background and justification:

Fresh coconut water is mostly used as a refreshing drink throughout the year, but the preserved coconut water is lacking in the market. Coconut water deteriorate in quality due to a wide range of reactions in food which may be chemical or microbiological. Thermal processes such as blanching, pasteurization or heat sterilization are being employed for food preservation. However, in most cases thermal energy induces various chemical reactions, leading to quality deterioration in certain foods causing undesirable changes in sensory and nutritional qualities. In addition, the food preservatives which are being used for preservation of the processed foods possess several health ill effects and even some time deteriorates nutritional and sensory qualities of foods. So, now a day, peoples are becoming more health conscious and demanding food products having better nutritional quality with low or even no food preservative. Therefore, some alternative methods need to be evaluated for the preservation of the foods to develop the consumer's confidence towards safety. Application of UV light can become a non-thermal non-chemical (NTNC) preservation method by killing microbes present in the food. At present, very little literature is available on UV light assisted preservation method. Hence, the present investigation was taken for preservation of coconut water using UV light in combination with other methods. Thus, the present investigation entitles "Standardization of process technology for preservation of tender coconut water" was planned with the following objectives:

Objectives:

1. To standardize processing methods for preservation of coconut water for quality retention.
2. To study quality of preserved coconut water during storage

Year of Commencement: 2024-25

Specification of Juice: Coconut Water= 100 %

TSS = 10° Brix will be maintained in all treatments.

Acidity = Natural

Technical Programme:

Ex. 1. Preservation of tender coconut water

Treatment details:

Treatments (T)	Treatment detail	Code for Treatments (T)
T ₁	Heat processing at 95±1°C for 30 min	T ₁ - H ₃₀
T ₂	Heat processing at 95±1°C for 5 min along with Potassium sorbate @150 ppm	T ₂ - P ₁₅₀
T ₃	Heat processing at 95±1°C for 5 min and UV light exposure for 30 min	T ₃ – U ₃₀
T ₄	Heat processing at 95±1°C for 5 min and UV light exposure for 60 min	T ₄ – U ₆₀

T ₅	Heat processing at 95±1°C for 5 min and UV light exposure for 90 min	T ₅ – U ₉₀
T ₆	Heat processing at 95±1°C for 15 min and UV light exposure for 30 min	T ₆ - H ₁₅ U ₃₀
T ₇	Heat processing at 95±1°C for 15 min and UV light exposure for 60 min	T ₇ - H ₁₅ U ₆₀
T ₈	Heat processing at 95±1°C for 15 min and UV light exposure for 90 min	T ₈ - H ₁₅ U ₉₀
T ₉	Heat processing at 95±1°C for 5 min along with 50 % Preservative and UV light exposure for 30 min	T ₉ – P ₇₅ U ₃₀
T ₁₀	Heat processing at 95±1°C for 5 min along with 75 ppm Potassium sorbate and UV light exposure for 60 min	T ₁₀ -P ₇₅ U ₆₀
T ₁₁	Heat processing at 95±1°C for 5 min along with 75 ppm Potassium sorbate and UV light exposure for 90 min	T ₁₁ -P ₇₅ U ₉₀

Number of Treatments =11

Number of Repetitions =3

Design: CRD

Sample size = 200 ml

Sample Number/treatment/repetition = 20

Packaging material: PET bottle

Storage: at ambient temperature

Observations: Initial, 15, 30, 45 and 60 days of storage

A. Physico-chemical Parameters	B. Sensory Parameters
1. Total Soluble Solids (°Brix) 2. Acidity (%) 3. Total sugars (%) 4. Ascorbic acid (mg/100 ml) 5. Potassium (mg/100 ml) 6. Phenols (µg/100 ml) 7. Calcium (mg/100 ml) 8. Sodium (mg/100 ml) 9. Non-enzymatic browning (OD 440 nm) 10. Anti-oxidant activity by DPPH method	1. Colour and Turbidity 2. Consistency 3. Flavour 4. Taste 5. Overall acceptability
C. Microbial Parameters	D. Economics
1. Total Plate Count, Coliform count, Yeast and Mold count	

Selection of tender Coconut (Tender Green)



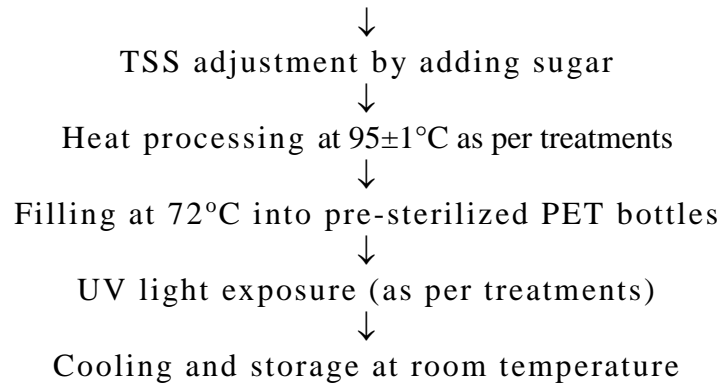
Washing with chlorine water



Coring for coconut water



Filtration of coconut water



Main steps used for preparation of coconut water