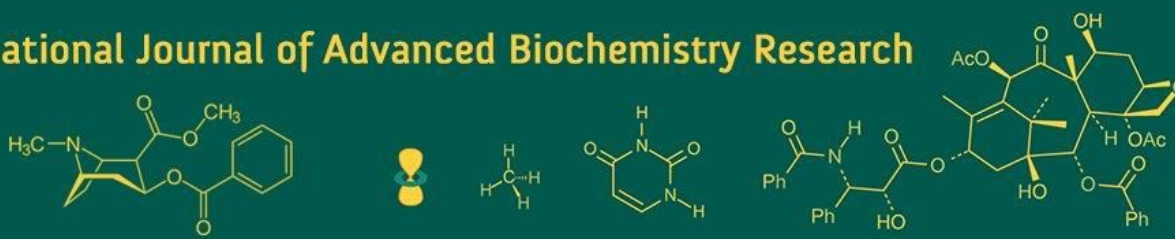


International Journal of Advanced Biochemistry Research



ISSN Print: 2617-4693
 ISSN Online: 2617-4707
 IJABR 2024; 8(7): 312-314
www.biochemjournal.com
 Received: 06-05-2024
 Accepted: 18-06-2024

Rathore Shilpa
 M.Sc. Fruit Science,
 Department of Horticulture,
 Sam Higginbottom University
 of Agriculture, Technology &
 Sciences, Prayagraj,
 Uttar Pradesh, India

Bahadur Vijay
 Associate Professor,
 Department of Horticulture,
 Sam Higginbottom University
 of Agriculture, Technology &
 Sciences, Prayagraj,
 Uttar Pradesh, India

Corresponding Author:
Rathore Shilpa
 M.Sc. Fruit Science,
 Department of Horticulture,
 Sam Higginbottom University
 of Agriculture, Technology &
 Sciences, Prayagraj,
 Uttar Pradesh, India

Study the physico-chemical properties of value added product of banana chips

Rathore Shilpa and Bahadur Vijay

DOI: <https://doi.org/10.33545/26174693.2024.v8.i7d.1491>

Abstract

The present investigation entitled “The Physico-chemical properties of value added product of banana chips” was conducted at the experimental Laboratory of Horticulture department and also at Post harvest technology Laboratory the Department of Horticulture, Naini Agricultural. Institute, Sam Higginbottom university of Agriculture, Technology and Sciences, Prayagraj (U.P.) during 2023-2024. The Physico-chemical properties of value added product of banana chips done with two different cultivar Nendran and cv. Dwarf Cavendish. There was significant differences between the treatments. The experiment was laid out in Completely randomized design with 12 treatments which were replicated thrice. The treatments were T₁ Nendran banana chips (Refined oil without spices & salt), T₂ Nendran banana chips (Refined oil with black pepper and salt), T₃ Nendran banana chips (Refined oil with red chilli powder and salt), T₄ Nendran banana chips (Coconut oil without spices & salt), T₅ Nendran banana chips (Coconut oil with black pepper and salt), T₆ Nendran banana chips (Coconut oil with red chilli powder and salt), T₇ cv. Dwarf Cavendish chips (Refined oil without spices & salt), T₈ cv. Dwarf Cavendish chips (Refined oil with black pepper and salt), T₉ cv. Dwarf Cavendish chips (Refined oil with red chilli powder and salt), T₁₀ cv. Dwarf Cavendish chips (Coconut oil without spices & salt), T₁₁ cv. Dwarf Cavendish chips (Coconut oil with black pepper and salt), T₁₂ cv. Dwarf Cavendish chips (Coconut oil with red chilli powder and salt). On the basis experimental finding it was concluded that the best treatment is T₂ in refined oil fried Nendran banana chips with black paper and salt was found to be based in terms of pH is 4.7 and TSS content is 2.8 °Brix. Overall acceptability is 8.36 score out of 9 during in 3 month storage.

Keywords: Nendran, dwarf cavendish, banana chips, refined oil, coconut oil

Introduction

Banana (*Musa Paradisiaca*) belongs to the family Musaceae. It is one of the oldest fruits known to mankind. Banana plants are the largest plants on earth without a woody stem. Banana is the most delicious fruit used as subsidiary food. It is consumed as table purpose as well as culinary fruit, its leaves are universally used for serving meals in South India and chopped banana stems are used as cattle feed. Some species of banana yield fibre, which is used for making ropes. The tip of inflorescence is cooked as a vegetable in some places. The plant is also used for decoration purpose in wedding, festivals and fairs. It is used as raw material in industries for preparation of banana powder, chips, juices and beer. The juice of banana stem is used in making paper bond, tissue paper etc.

India is the major exporter of banana. However tremendous quantities of bananas are lost either through overproduction or in sorting and grading to meet quality standards for the fresh fruit export market, which could otherwise be used for processing.

Fried products are popular as snack foods. These are prepared from a variety of raw materials and vary in size, shape and composition, but all are prepared by deep fat frying in vegetable oils and have relatively large proportions of fat/oil.

Chips are the most popular snack item in many fast food outlets. Fried banana chips may be one of the important potential banana products in India. Banana chips may be also easily salable snack food in the markets. For longer shelf life, crispiness and chips quality moisture content is the most important factor as far as storage stability is concerned. Bacteria and other microorganism cannot grow easily in lower percentage of moisture content in chips.

Visual colour is the major quality criterion for determining the commercial quality with respect to consumers' preferences and cost of the chips (Anand *et al.*, 1982). Dwarf Cavendish is a popular commercial cultivar grown extensively for table and processing purpose in the states Maharashtra, Gujarat, Bihar and West Bengal. It is also popular in Tamil Nadu, Karnataka and Andhra Pradesh. 'Basrai' is the leading commercial variety of Cavendish group and is a leading commercial variety of Maharashtra. Nendran is a popular variety in Kerala where it is relished as a fruit as well as used for processing. Commercial cultivation of Nendran has picked up rapidly in Tamil Nadu in the recent past. Nendran is known to display considerable diversity in plant stature, pseudostem colour, presence or absence of male axis, bunch size, etc.

Materials and Methods

The present investigation entitled "The Physico-chemical properties of value added product of banana chips" was conducted at the experimental Laboratory of Horticulture department and also at Post harvest technology Laboratory the Department of Horticulture, Naini Agricultural Institute, Sam Higginbottom university of Agriculture, Technology and Sciences, Prayagraj (U.P.) during 2023-2024. The Physico-chemical properties of value added product of banana chips done with two different cultivar Nendran and cv. Dwarf Cavendish. There was significant differences between the treatments. The experiment was laid out in Completely randomized design with 12 treatments which were replicated thrice. The treatments were T₁ Nendran banana chips (Refined oil without spices & salt), T₂ Nendran banana chips (Refined oil with black pepper and salt), T₃ Nendran banana chips (Refined oil with red chilli powder and salt), T₄ Nendran banana chips (Coconut oil without spices & salt), T₅ Nendran banana chips (Coconut oil with black pepper and salt), T₆ Nendran banana chips (Coconut oil with red chilli powder and salt). T₇ cv. Dwarf Cavendish chips (Refined oil without spices & salt), T₈ cv. Dwarf Cavendish chips (Refined oil with black pepper and salt), T₉ cv. Dwarf Cavendish chips (Refined oil with red chilli powder and salt), T₁₀ cv. Dwarf Cavendish chips (Coconut oil without spices & salt), T₁₁ cv. Dwarf Cavendish chips (Coconut oil with black pepper and salt), T₁₂ cv. Dwarf Cavendish chips (Coconut oil with red chilli powder and salt). The present investigation was carried out with the objective to study the physico-chemical properties of banana chips.

Results and Discussion

The maximum pH of banana chips during storage was recorded in T₂ (Refined oil with black pepper and salt) in cv. Nendran with (4.7) followed by T₈ (Refined oil with black pepper and salt) in cv. Dwarf Cavendish with (4.6) and the minimum was recorded in T₁ (Refined oil without spices & salt) in Nendran cultivars with (4.3). Variations in pH during storage may be due to change in chemical properties which are affected by storage conditions. This finding agreed with the finding of Vikram and Prasad (2014)^[6] also reported similar trend in banana chips.

The maximum T.S.S of banana chips during storage was recorded in T₂ (Refined oil with black pepper and salt) in cv. Nendran with (2.8) followed by T₈ (Refined oil with black pepper and salt) in cv. Dwarf Cavendish with (2.7) and the minimum was recorded in T₁ (Refined oil without spices & salt) in Nendran cultivars with (2.1). As the

duration of storage increased, the TSS of banana chips in different cultivars (T₁ to T₉). Increased polysaccharide hydrolysis and concentration from dehydration may be the cause of the rise in total soluble solids with longer storage times. In some cultivars, the maximum TSS was noted at the conclusion of storage. It might be because these chips lose the most water. Jawandha *et al.* (2012)^[5], Mahajan and Singh (2014)^[7] reported similar outcomes in "Nendran and dwarf cavendish and Grand naine (G-9)" banana chips during storage. Mahajan and Singh (2014)^[7] reported that shrink film wrapped Banana chips recorded higher TSS (2.45obrix) after 5 days of storage which reached to its peak value (3.30obrix) after 20 days of storage.

The maximum total sugar of banana chips during storage was recorded in T₂ (Refined oil with black pepper and salt) in cv. Nendran with (34.21%) have highest total sugar followed by T₅ (Refined oil with black pepper and salt) in cv. Dwarf Cavendish with (33.58) which were significantly superior then T₁₁ (Refined oil without spices & salt) in Nendran cultivars with (33.58). This finding agreed with the finding of Kumar and Siddharth (2015)^[4]. The total sugar in banana varieties Grande G-9 and Dwarf Cavendish was compared through rigorous analysis. Statistical data revealed that G-9 exhibited a slightly higher oil content of 22.1% compared to Dwarf Cavendish at 11.8%. This discrepancy underscores the genetic variability within banana species, influencing their nutritional profiles.

The maximum protein content of banana chips during storage was recorded in T₂ (Refined oil with black pepper and salt) in cv. Nendran with (2.56) followed by T₈ (Refined oil with black pepper and salt) in cv. Dwarf Cavendish with (2.50) and the minimum was recorded in T₁ (Refined oil without spices & salt) in Nendran cultivars with (2.21). Thakur *et.al* (2002)^[2] reported comparable outcomes in banana chips. Ali *et al* (2015)^[1] reported that the protein content comparison among banana varieties Grande G-9, Dwarf Cavendish, and Nendran revealed distinct nutritional profiles. Statistical analysis showed G-9 with 1.2% protein, Dwarf Cavendish at 2.30/100 g, and Nendran leading at 2.5/100 g.

The maximum Starch percentage of banana chips during storage was recorded in T₂ (Refined oil with black pepper and salt) in cv. Nendran with (21.37) followed by T₈ (Refined oil with black pepper and salt) in cv. Dwarf Cavendish with (21.14) and the minimum was recorded in T₁ (Refined oil without spices & salt) in Nendran cultivars with (19.89). Kumar *et.al* (2006)^[3] noted the same outcome while examining the starch content comparison among banana varieties Plantain, Dwarf Cavendish, and Nendran revealed distinct variations. Statistical analysis indicated Plantain with 25% starch, Nendran at 20%, and Dwarf Cavendish with 15%.

The maximum fiber content of banana chips during storage was recorded in T₂ (Refined oil with black pepper and salt) in cv. Nendran with (8.6) followed by T₈ (Refined oil with black pepper and salt) in cv. Dwarf Cavendish with (8.4) and the minimum was recorded in T₁ (Refined oil without spices & salt) in Nendran cultivars with (7.3). This finding agreed with the finding of Vikram and Prasad (2014)^[6] compositional changes in value-added product banana and potato chips. The fiber content in banana cultivar Nendran is notably higher than in Dwarf Cavendish. Research shows Nendran bananas contain approximately 4.3 grams of fiber per 100 grams, whereas Dwarf Cavendish typically contains around 2.6 grams per 100 grams.

Table 1: Effect on physico-chemical properties pH, TSS, Total sugar, Protein, Starch, fiber and B: C ratio of banana chips during storage.

Treatment	pH	TSS (^o Brix)	Total sugar (%)	Protein (mg/100 g)	Starch (%)	Fiber (mg/100 g)	B:C Ratio
T1	4.3	2.1	31.21	2.21	19.89	7.3	1.01
T2	4.7	2.8	34.21	2.56	21.37	8.6	1.35
T3	4.4	2.2	33.41	2.49	20.78	7.6	1.30
T4	4.5	2.3	32.19	2.45	20.84	7.5	1.00
T5	4.4	2.3	33.58	2.39	20.43	7.4	1.33
T6	4.5	2.7	33.66	2.46	20.41	7.5	1.29
T7	4.5	2.6	25.34	2.32	20.1	7.8	1.18
T8	4.6	2.7	25.13	2.50	21.14	8.4	1.57
T9	4.5	2.2	24.19	2.43	21.08	8.2	1.52
T ₁₀	4.5	2.6	24.95	2.38	21	8.1	1.16
T ₁₁	4.5	2.5	24.17	2.47	20.89	8.3	1.55
T ₁₂	4.4	2.5	24.35	2.34	20.78	8.2	1.50
F Test	S	S	S	S	S	S	
S.Ed(±)	0.06	0.08	0.57	0.21	1.35	0.15	
CD5%	0.17	0.20	1.14	0.43	2.70	0.30	
CV	0.25	0.28	2.28	0.84	4.50	0.45	

Conclusion

On the basis experimental finding it was concluded that the best treatment is T₂ in refined oil fried Nendran banana chips with black paper and salt was found to be based in terms of pH, Total soluble solids, starch, protein and fiber content in banana chips.

References

1. Ali, *et al.* The physical, chemical and nutritional characteristics of Africa yam bean (*Sphenostylis stenocarpa*) harms [PhD thesis]. Ibadan: University of Ibadan, Nigeria; c2015. p. 132-133.
2. Thakur *et al.* Mass transfer analysis in osmo foam-mat drying and storage of mango fruit slabs [PhD thesis]. Makurdi: University of Agriculture; c2002. p. 61-66.
3. Kumar, Maini SB, Diwan B. A simple way to preserve potato for chips making. J Food Sci Technol. 2006;19:267-271.
4. Kumar, Siddharth. Investigation of physical and chemical properties of banana starches. J Food Sci Technol. 2015;47:1493-1497.
5. Jawandha. Effects of vacuum frying on structural changes of bananas. J Food Eng. 2012;106:298-305.
6. Vikram, Prasad. Using hydrocolloids to decrease oil absorption in banana chips. LWT Food Sci Technol. 2014;42:1199-1203.
7. Mahajan, Singh. Modified atmosphere packaging and temperature effect on potato crisps oxidation during storage. Anal Chem Acta. 2014;524:185-189.