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Effects of Storage Time on the Physico-Chemical Propertiesof Watermelon *(Citrullus lanatus)*and Carrot*(Daucus carota)* Juice

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Abstract:- Watermelon and Carrot juices were prepared and stored for one month, and the effects of storage time on the Physico-chemical characteristics of both juices were monitored. The physicochemical characteristics of the juices determined were pH for watermelon juice which ranged between 5.2 - 3.8, titratable acidity 0.18 - 0.65, specific gravity 1.022 - 1.003, electrical conductivity 3.38 - 3.41µS/cm, vitamin C 40.07 - 20.56 mg/100ml, reducing and total sugar 5.18 - 6.15% and 7.66 - 8.44%, respectively and UV-Vis spectrum absorption peak at 218 nm and 338 nm corresponding to the presence of lycopene and vitamin C respectively. For carrot juice, pH ranged between 6.2 - 3.9, titratable acidity 0.13 - 0.86, specific gravity 1.016 - 1.010, electrical conductivity 5.19 - 5.60 µS/cm, vitamin C 31.40 - 15.72 mg/100ml, reducing sugar and total sugar 4.78 - 5.31% and 7.11 - 7.35%, respectively and UV-Vis spectrum absorption peak at wavelengths 218nm and 305nm corresponding to the presence of lycopene and β-carotene respectively. From the results of this study, it can be concluded that some of these parameters could be used as indicators of quality loss or spoilage of the juices during storage.

Keywords:- *Physico-chemical characteristics, Citrullus lanatus, Daucus carota, UV-Visible, reducing sugars.*

I. INTRODUCTION

Fruits are essential consumables because of their nutritional values and benefits. They are good sources of essential nutrients such as vitamins, fatty acids, amino acids, minerals, phytonutrients, dietary fibers, etc. which are very vital for the proper functioning of the human body (Okwu and Emenike, 2006). Fruits are highly perishable so storage is crucial to making them available for a prolonged time (Gaetano, 2017). Fruits can be preserved as beverages such as fruit juice and the health benefits associated with drinking fruit juice every day are related to the ingestion of essential vitamins and polyphenolic compounds like flavonoids, carotenoids, tannins, etc. These phytochemicals have been found to act as antioxidants effective agents against degenerative diseases and have also shown very promising results in combating various infections (Leja et al., 2013).

With the increase in globalization, the demand for quality juice has markedly expanded. Initially, only a handful of fruit juices such as orange, grape, pineapple, apple, and their blends are well established. Today, minor juices, tropical juices, and juice products are attracting consumers'attention (Bates et al., 2001). Consumers' demand for healthy foods has led to the processing of a different variety of juices. These products are suppliers of antioxidants, vitamins, and other nutritive and effective compounds and, besides the excellent organoleptic and nutritional properties, they also provide useful nutrients for health (Campos et al., 2010; Quek et al., 2007).

Watermelon(Citrullus lanatus) is a common summer fruit in the world that is consumed frequently as a dessert, and fruit salad. (Alim-un-Nisa et al., 2012). Watermelon is rich in immune-supportive vitamins primarily responsible for the production of energy in the body. Watermelon is an unusual fruit source of carotenoid lycopene and a rich source of phenolic antioxidants (Dimitrovski et al., 2010). Additionally, watermelon is a good source of potassium and magnesium; the nutritional profile of watermelon is a full array of nutrients, including carbohydrates, sugar, soluble and insoluble fiber, vitamins, minerals, fatty acids, amino acids, etc. (Adedeji and Oluwalana, 2013). Watermelon is a good source of lycopene and vitamins; these are well-known antioxidants that provide many health benefits to humans such as preventing various cancers and helping against heart diseases. Watermelon juice may be contaminated with microbes from raw materials, juice machines, handling as well as other conditions. In Nigeria, watermelon juice drinks are rare, with commercially available packaged watermelon juice drinks still in their developing state (Alam et al., 2013). The low acidic nature and growing condition of watermelon make it a potentially hazardous food (FDA, 2001). Therefore, proper processing and storageplay a vital role in the preservationand better utilization of fruit juice (Eke- Ejiofor, 2017).

On the other hand, Carrot (Daucus carota) is one of the popular root vegetables grown throughout the world and is the most important source of dietary carotenoids in Western countries(Berger et al., 2008; Alasalvar et al., 2005). Recently, the consumption of carrots and their products has increased steadily due to their recognition as an important source of natural antioxidants besides, the anticancer activity of β-carotene being a precursor of vitamin A (Dreosti, 1993; Speizer et al., 1999). Carrots are major vegetables in diets worldwide mainly due to their pleasant flavor (Vervoort et al., 2013) and perceived health benefits (good for eye disorders, skincare nervous disorders, and indigestion). In addition to providing a good content of vitamins and minerals, it is also rich in flavonoids and polyacetylenes which are essential for good health

(Aderinola and Abaire, 2019). Among common fruits and vegetables, carrots are high in fibers, carotenoids, vitamins C and E, and phenolic compounds (Alasalvar et al., 2001).

Processing of fruits and vegetables to juices and other value-added products are the alternative ways in which excess fruits and vegetables can be utilized to reduce wastage and bring economic returns to farmers (FAO, 2011). Several studies have already been conducted to extend the shelf life of minimally processed fruit juice, with a lot of them focusing majorly on physiological aspects of fruits. In this study, the physicochemicalproperties assessment of watermelon and carrot juices during storage was carried out to assess storage time changes that give nutritive implications.

II. EXPERIMENTAL

A. Sample preparation

Carrot and watermelon fruits were obtained from Uselu Market, Benin City, Edo State, Nigeria. Both fruits were peeled, washed, and cut into pieces before the juices were extracted with an electric blender, followed by filtration using a muslin cloth. The physicochemical parameters of the juices obtained were immediately determined and the juices were bottled in white plastic gallons and stored at 4-5°C.

B. Physico-chemical analyses of the refrigerated juices

The stored juices were analyzed at a 2-days interval for pH, titratable acidity (TA), specific gravity (SG), electrical conductivity (EC), vitamin C, sugar content, UV-Vis spectrum, and mineral elements were determined once a month.

C. Determination of pH

The pH of the samples was determined using a standard pH meter (Expandable Ion Analyzer EA 920). The pH meter was calibrated using buffer solutions of pH 4 and 7. 10 ml of the sample was measured into a beaker and the pH meter was dipped into the beaker with continuous stirring to measure the pH of the sample. The pH values were obtained and recorded (AOAC, 1990).

D. Determination of titratable acidity (as citric acid)

The acidity was measured by titrating 10 ml of the juice sample mixed with 100ml distilled water against 0.1M NaOH using 1% phenolphthalein as an indicator up to pH 8.2. The endpoint showed a pale pink color, which persisted for 15 seconds. Three consecutive readings were taken and acidity was calculated based on citric acid.

% Acidity (Citric acid per 100ml of juice) =

$$\frac{Vol\ of\ NaoH\ X\ 0.1M\ NaoH\ X\ 0.064\ X\ 100}{Vol\ of\ juice\ sample}$$

E. Determination of specific gravity

Specific gravity (SG) was determined by using a 50ml specific gravity bottle which was thoroughly cleaned with distilled water, dried in an oven at 50°C, and allowed to cool. The weight of the dry bottle was recorded as W_1. The bottle was then filled with distilled water and the weight was recorded as W_2. The bottle was emptied and filled with the juice sample and the weight was recorded as W_3. The specific gravity of the sample was calculated thus (Hough *et al*., 1991):

$$\text{Specific gravity} = \frac{W3-W1}{W2-W1}$$

Weight of volume of juice sample = $(W_3 – W_1)$

Weight of volume of water = $(W_2 – W_1)$

F. Determination of electrical conductivity

The conductivity of the juice was measured using a conductivity meter (MP526 Conductivity & DO Meter). 20 ml of juice sample was measured into a beaker and the conductivity meter electrode was dipped into the beaker to measure the electrical conductivity of the sample. The conductivity values were then recorded.

G. Determination of Ascorbic acid

The Ascorbic acid content was determined by the titrimetric method of Helmenstine (2013) as described by Ismail (2014), with a slight modification.

- **Preparation of 0.005 mol L^{-1} iodine solution:** 2 g of potassium iodide was weighed into a 100 ml beaker and 1.3 g of iodine I_2 was added into the same beaker. Then, distilled water was added and the beaker was shaken for 15 minutes until the iodine dissolved. Thereafter, the iodine solution was transferred into a 1L volumetric flask, while making sure to rinse all traces of the solution into the volumetric flask using distilled water. The solution was then made up to the 1L mark with distilled water.
- **Preparation of 0.5% starch indicator solution:**0.25 g of soluble starch was weighed and added into 50 ml of near-boiling water contained in a 100 ml conical flask and stirred continuously until the starch dissolved.
- **Titration:** 20 ml aliquot of the juice sample was transferred into a 250 ml conical flask, 2 ml of oxalic acid, 100 ml of distilled water, and 1 ml of starch indicator solution were all added. The juice sample was titrated with 0.005 molL^{-1} iodine solution. The endpoint of the titration was identified as the first distinct trace of a dark blue-black color due to the formation of the starch-iodine complex. The titration was repeated with further aliquots of the sample solution until concordant results (titres agreeing within 0.1 mL) were obtained.
  mg of vitamin C in the juice = 5 X Titre Vol. X Conc. iodine x M_{wt} Ascorbic acid
  Where 5 is the dilution factor.

H. Determination of sugar

The sugar content was determined by Lane and Eynon Method (1923), which is based on determining the volume of the unknown sugar solution required to completely reduce a measured volume of Fehling's solution as described by IGNOU (2017).

- Fehling's solution Preparation;

Fehling's solution A:69.28 g copper sulphate ($CuSO_4.5H_2O$) was dissolved in distilled water and the volume was made up to 1000 ml, filtered, and stored in an amber-colored bottle.

Fehling's solution B:346 g Rochelle salt (Potassium sodium tartrate: KNa $C_4H_4O_6$. $4H_2O$) and 100 g NaOH were dissolved in distilled water and the volume was made up to 1000 ml, filtered, and stored in an amber-colored bottle.
20 % Neutral lead acetate solution: 100 g of neutral lead acetate was dissolved in water and the volume was made up to 500 ml.
22 % Potassium oxalate solution:110 g potassium oxalate was dissolved in water and the volume was made up to 500 ml.
Indicator: 1 g of methylene blue was dissolved in 100 ml of distilled water.

- Standardization of Fehling's solution for invert sugar

4.75 g of AR grade sucrose was weighed and transferred to a 500 ml volumetric flask with 50 ml distilled water. Then, 5 ml of conc. HCl was added and the solution was allowed to stand for 24 hours. Thereafter, it was neutralized with 20% NaOH solution using phenolphthalein as endpoint indicator and made up to volume. Furthermore, it was properly mixed and 50 ml was transferred into a 100 ml volumetric flask and made up to volume (1 ml = 2.5 mg of invert sugar). Finally, it was transferred to a burette and titrated against Fehling's solution as described below;

The factor for Fehling's solution (g of invert sugar) = $\frac{Titre \times 2.5}{1000}$

$= V_1 \text{ x } 0.0025$

a) Determination of reducing sugars

25 g of the juice sample was weighed and transferred to a 500 ml volumetric flask, about 100 ml of distilled water was added and the solution was neutralized with 20% NaOH solution to the phenolphthalein endpoint. Then, Neutral acetate (10 ml) was added to the solution, shaken, and left to stand for 10 minutes. Thereafter, potassium oxalate solution in small drops was added until there was no further precipitation. Finally, the solution was made up of the volume, mixed properly, filtered, and transferred to a 50 ml burette.

Weight of the sample = W

Dilution volume for the sample = V_2

The volume of clarified sample solution required for Fehling's reaction

(titre) = V_3

Based on the factor for Fehling's solution, the V_3 sample solution contains:

2.5 V_1 mg reducing sugar (as invert sugar)

Therefore;

% reducing sugars in the sample = $\frac{2.5 \times V1 \times V2 \times 100}{V3 \times W \times 100}$

$= \frac{2.5 \times V1 \times V2}{V3 \times W} \qquad = X\%$

b) Total reducing sugars

50 ml of the clarified solution was pipetted into a 250 mlconical flask. Then, 5 g of citric acid and 50 ml of water were added. The solution was gently boiled for 10 min to complete the inversion of sucrose and then cooled. Thereafter, transferred to a 250 ml volumetric flask and neutralized with 1% NaOH solution using phenolphthalein as an indicator. The solution was made up to volume.

For inversion at room temperature, 50 ml aliquot of the clarified, de-leaded solution was transferred to a 250 ml volumetric flask and added about 10 ml of conc. HCl and was allowed to stand at room temperature for 24 hours. It was then neutralized with conc. NaOH solution using phenolphthalein as endpoint indicator and made up to volume. 50 ml aliquot was then transferred to a burette having an offset tip and was titrated against Fehling's solution similar to the procedure described for reducing sugars, and the total sugars were determined as invert sugars.

The volume of the acid hydrolysed sample solution required for Fehling solution
(titre) = V_4

Based on the factor for Fehling's solution, total reducing sugars in

$V_4 = 0.0025 \times V_1$ g

Therefore;

% Total reducing sugars (as invert sugars) = $\frac{2.5 \times V1 \times V2 \times 100}{V4 \times W \times 100}$

$= \frac{2.5 \times V1 \times V2}{V4 \times W} \qquad = Y\ \%$

Total reducing sugars comprise of reducing sugars and non-reducing sugars, which can be hydrolysed into reducing sugars under experimental conditions. This non-reducing sugar is usually expressed in terms of sucrose.

As 0.95 g sucrose on hydrolysis yields 1 g invert sugar (glucose + fructose):

% Sucrose in the sample = (%Total reducing sugars − % Reducing sugars originally present) × 0.95

= (Y – X) × 0.95

% Total sugars = (% Reducing sugars + % Sucrose)

I. UV-Vis spectroscopy

The UV-Vis spectroscopy of the juice was done using a JENWAY 6715 UV-VIS Spectrophotometer as described by Hashimoto *et al*. (2001). 3 ml of the juice samples were introduced into the sample cuvette to obtain the UV-Vis spectra of the juice samples at a wavelength of 200-650nm.

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III. RESULTS AND DISCUSSION

A. Effect of storage time on the pH of watermelon and carrot juices

Days	Watermelon	Carrot
0	5.2	6.2
2	5.1	6.1
4	4.8	5.3
6	4.6	4.8
8	4.5	4.6
10	4.4	4.6
12	4.2	4.5
14	4.2	4.5
16	4.1	4.4
18	4.1	4.3
20	4.1	4.2
22	4.0	4.2
24	3.9	4.1
26	3.9	4.1
28	3.9	4.0
30	3.8	3.9

Table 1: Effect of storage time on the pH of watermelon and carrot juice

In terms of pH, watermelon juice was observed to be more acidic 5.2 - 3.8 than carrot juice 6.2 - 3.9, this characterizes carrot juice as a low-acid food.

The pH of the juices decreased progressively during the storage period ranging from 5.2 - 3.8 and 6.2 - 3.9 for the watermelon and carrot juices, respectively. This indicates an increase in the acidity of the juices with an increase in storage time and may be due to biochemical reactions taking place within the juices, particularly the fermentation process. This may be expected since the juices were only stored at refrigerated temperature and no chemical preservative was used. This trend is in agreement with a report by Bhardwaj and Mukherjee (2010) who stated that this might be due to an increase in titratable acidity, as acidity and pH are inversely proportional to each other.

B. Effect of storage time on the titratable acidity (as citric acid) of watermelon and carrot juice

Days	Watermelon	Carrot
0	0.18	0.13
2	0.26	0.22
4	0.32	0.31
6	0.39	0.39
8	0.39	0.46
10	0.40	0.46
12	0.41	0.48
14	0.42	0.48
16	0.42	0.51
18	0.43	0.51
20	0.43	0.54
22	0.44	0.55
24	0.46	0.62
26	0.48	0.65
28	0.51	0.75
30	0.65	0.86

Table 2: Effect of storage time on the titratable acidity (as citric acid) of watermelon and carrot juices

Titratable acidity of the juices analysed in this study increased during storage time from 0.18 - 0.65% and 0.13 - 0.86% for the watermelon and carrot juices, respectively. The increase in acidity was obviously due to the formation of acids and acidic compounds like carbonic acid in the juices. Similar studies have observed a decrease in pH and an increase in titratable acidity (TA) along with increased storage time (Garcia *et al*., 1998; Bron and Jacomino, 2006; Falah *et al*., 2015).

The acidity of foods is important in foods because they offset flavor, shelf-life, color, and effectiveness of other stabilizers used in foods. A drawback to high acidity in foods (low pH) is the problem of acidosis, especially in ulcer patients and the necrotic effects in human cell organs which can lead to cancer, accelerated aging, etc.

High acid-producing foods, such as proteins or sugars, have been found to cause acidity in the human urine as well as other negative health effects. This has caused a type of kidney stone called uric acid stone to form.

C. Effect of storage time on the specific gravity (SG) of watermelon and carrot juice

Days	Watermelon	Carrot
0	1.022	1.016
2	1.024	1.016
4	1.026	1.017
6	1.028	1.017
8	1.022	1.014
10	1.021	1.016
12	1.019	1.017
14	1.018	1.019
16	1.022	1.021
18	1.024	1.023
20	1.016	1.015
22	1.005	1.016
24	1.008	1.014
26	1.011	1.012
28	1.005	1.013
30	1.003	1.010

Table 3: Effect of storage time on the specific gravity (SG) of watermelon and carrot juice

The specific gravity of the watermelon and carrot juices decreased on storage. This could have been due to fermentation during which there was a microbial attack on the fermentable sugars, resulting in the production of ethanol and carbon dioxide. These results are in agreement with the report by Querol *et al.* (2003) and Yusufu *et al.* (2018).

Changes in SG are used as indicators of fermentation in the brewery industry to indirectly monitor the production of ethanol, because of the relationship between sugar content and changes in SG.

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D. Effect of storage time on the electrical conductivity (EC) of watermelon and carrot juices

Days	Watermelon (µS/cm)	Carrot (µS/cm)
0	3.38	5.19
2	3.36	5.25
4	3.33	5.34
6	3.30	5.43
8	3.27	5.52
10	3.24	5.62
12	3.21	5.72
14	3.15	5.61
16	3.10	5.59
18	3.14	5.63
20	3.21	5.65
22	3.24	5.62
24	3.39	5.72
26	3.34	5.57
28	3.37	5.59
30	3.41	5.60

Table 4: Effect of storage time on the electrical conductivity (EC) of watermelon and carrot juices

The electrical conductivity increased from 3.38 - 3.41µS/cm and 5.19 - 5.60 µS/cm for the watermelon and carrot juices, respectively on storage. This might be attributed to the systematic release of mineral elements or other ionic species into the juice via degradative reactions involving carbohydrates, vitamins, and proteins (Abid *et al*., 2014).

E. Effect of storage time on the Ascorbic acid content of watermelon and carrot juices

Days	Watermelon Ascorbic acid(mg/100ml)	Carrot Ascorbic acid (mg/100ml)
0	40.07	31.40
2	39.63	31.13
4	38.00	29.64
6	37.74	29.37
8	36.68	27.61
10	35.23	26.73
12	33.13	25.23
14	31.71	24.97
16	31.13	24.08
18	29.64	22.77
20	26.99	21.58
22	25.67	19.24
24	24.97	18.80
26	23.67	18.36
28	23.21	17.04
30	20.56	15.72

Table 5: Effect of storage time on the vitamin C content of watermelon and carrot juices

The ascorbic acid content of the juices ranged between 40.07 - 20.56 and 31.40 - 15.72 mg/100ml of the watermelon and carrot juices. In terms of ascorbic acidcontent, watermelon juice was observed to possess a higher ascorbic acidcontent than carrot juice this characterizes watermelon juice as a higher ascorbic acidfood than carrot juice.

The ascorbic acidcontent of the watermelon and carrot juices also decreased on storage. This was probably becauseascorbic acid, being sensitive to oxygen, light, and heat, was oxidized in presence of oxygen by both enzymatic and non-enzymatic reactions. Because of the nutritional importance of ascorbic acidin human nutrition by way of being an anti-scurvy and antioxidant and therefore as an anti-aging and anti-carcinogen, the storage losses of ascorbic acidas reported in this study is undesirable. This calls for the need to adopt methods to mitigate ascorbic acidlosses in the commercial production of these juices. Such methods could involve low oxygen atmosphere packaging techniques, pasteurization to inactivate ascorbic acid oxidases, low-temperature storage, or the addition of other chemicals that reduce oxidative tendencies in juices.

F. Effect of storage time on the sugar content of watermelon and carrot juices

Days	Watermelon				Carrot			
	Reducing Sugar (X%)	Total Reducing Sugar (Y%)	Sucrose 0.95(Y% - X%)	Total Sugar (%)	Reducing Sugar (X%)	Total Reducing Sugar (Y%)	Sucrose 0.95(Y% - X%)	Total Sugar (%)
0	5.18	7.79	2.48	7.66	4.78	7.23	2.33	7.11
2	5.19	7.79	2.47	7.66	4.81	7.24	2.31	7.12
4	5.21	7.80	2.46	7.67	4.84	7.24	2.28	7.12
6	5.22	7.80	2.45	7.67	4.86	7.25	2.27	7.13
8	5.24	7.80	2.43	7.67	4.96	7.31	2.23	7.19
10	5.25	7.80	2.42	7.67	4.98	7.31	2.21	7.19
12	5.27	7.81	2.41	7.68	5.02	7.31	2.18	7.20
14	5.30	7.83	2.40	7.70	5.04	7.31	2.16	7.20
16	5.40	7.91	2.38	7.78	5.11	7.33	2.11	7.22
18	5.49	7.98	2.37	7.86	5.14	7.34	2.09	7.23
20	5.70	8.17	2.35	8.05	5.17	7.37	2.09	7.26
22	5.81	8.27	2.34	8.15	5.22	7.41	2.08	7.30

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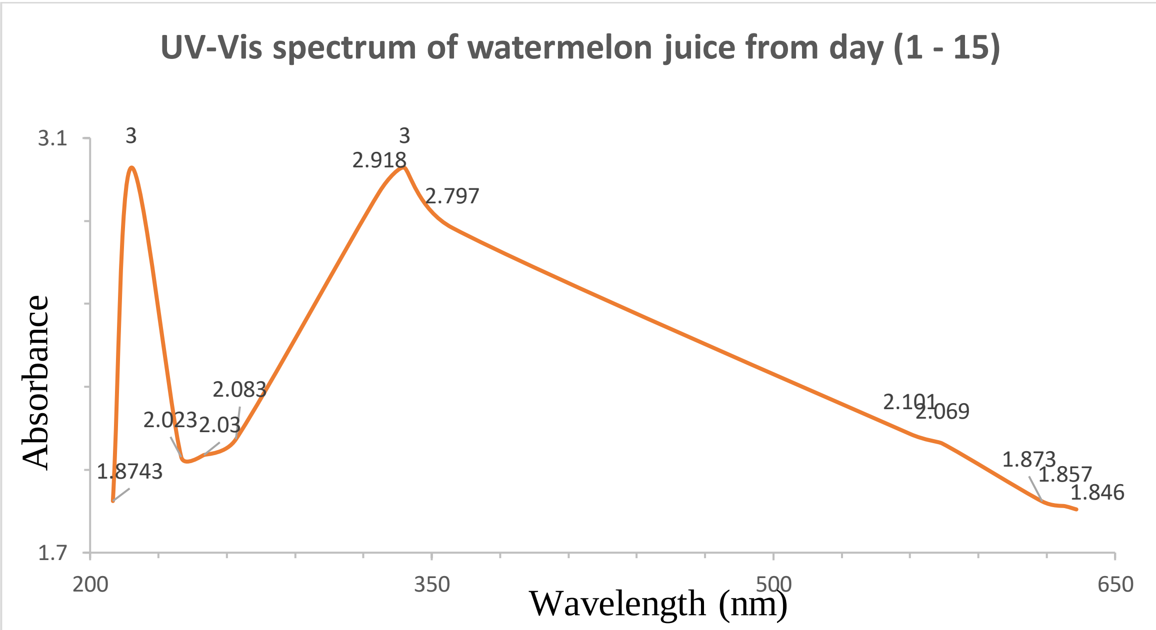
24	5.93	8.38	2.33	8.26	5.25	7.42	2.06	7.31
26	6.05	8.49	2.32	8.37	5.26	7.42	2.05	7.31
28	6.08	8.51	2.31	8.39	5.30	7.45	2.04	7.34
30	6.15	8.56	2.29	8.44	5.31	7.46	2.04	7.35

Table 6: Effect of storage time on the sugar content of watermelon and carrot juices

In terms of sugar content, watermelon juice was observed to possess a higher sugar content than carrot juice. The reducing sugar and total sugar of the juices are observed to increase while the non-reducing sugar (sucrose) was decreasing probably due to conversion of sucrose to glucose and fructose sugars during the storage (Deka, 2000).

The increase in total sugar content as presented in this table would seem to contradict the earlier observation that specific gravity values decreased during storage because of the fermentation of sugars to alcohols. Therefore, the changes in sugar content of these juices may be accounted for by the interplay between fermentation, sucrose inversion, glycolysis, the citric acid (TCA) cycles, mitochondrial chain reactions, etc.

G. Effect of storage time on the UV-Vis spectrum of watermelon and carrot juices



Figure

Fig. 1: Effect of storage time on the UV-Vis spectrum of watermelon juice

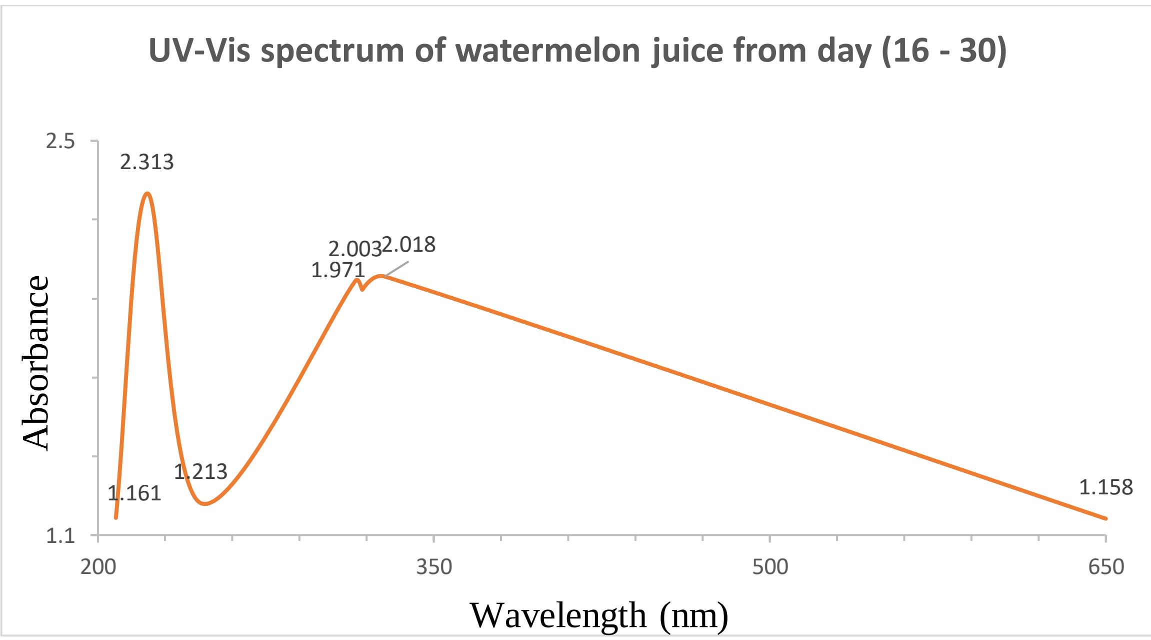


Fig. 2: Effect of storage time on the UV-Vis spectrum of watermelon juice

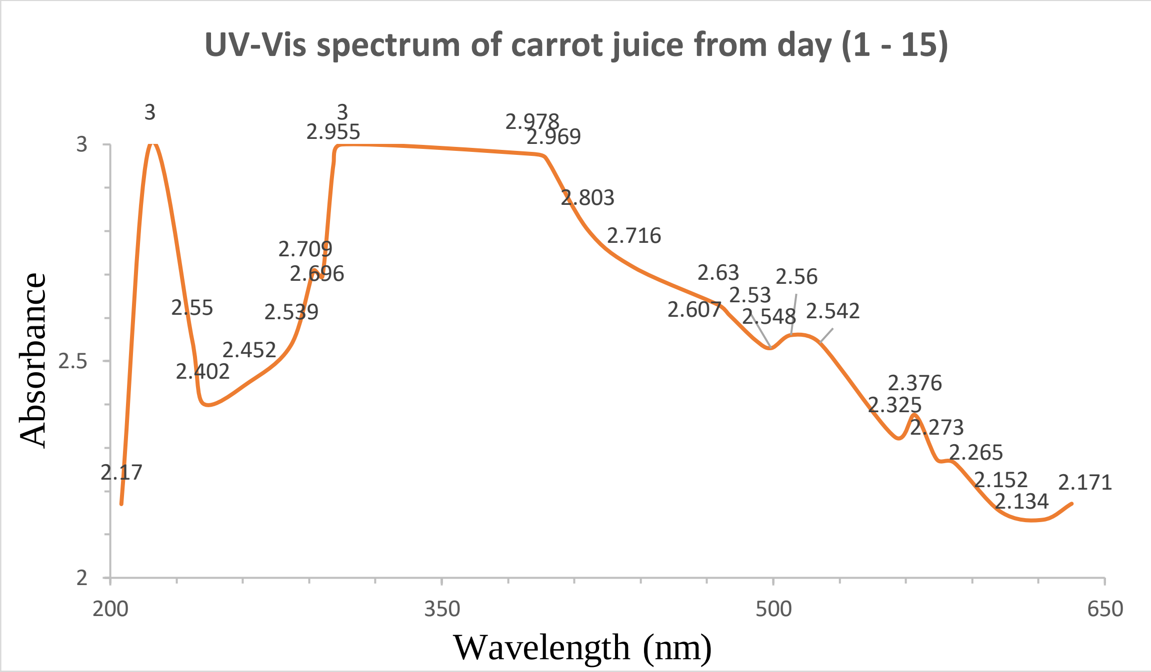


Fig. 3: Effect of storage time on the UV-Vis spectrum of carrot juice

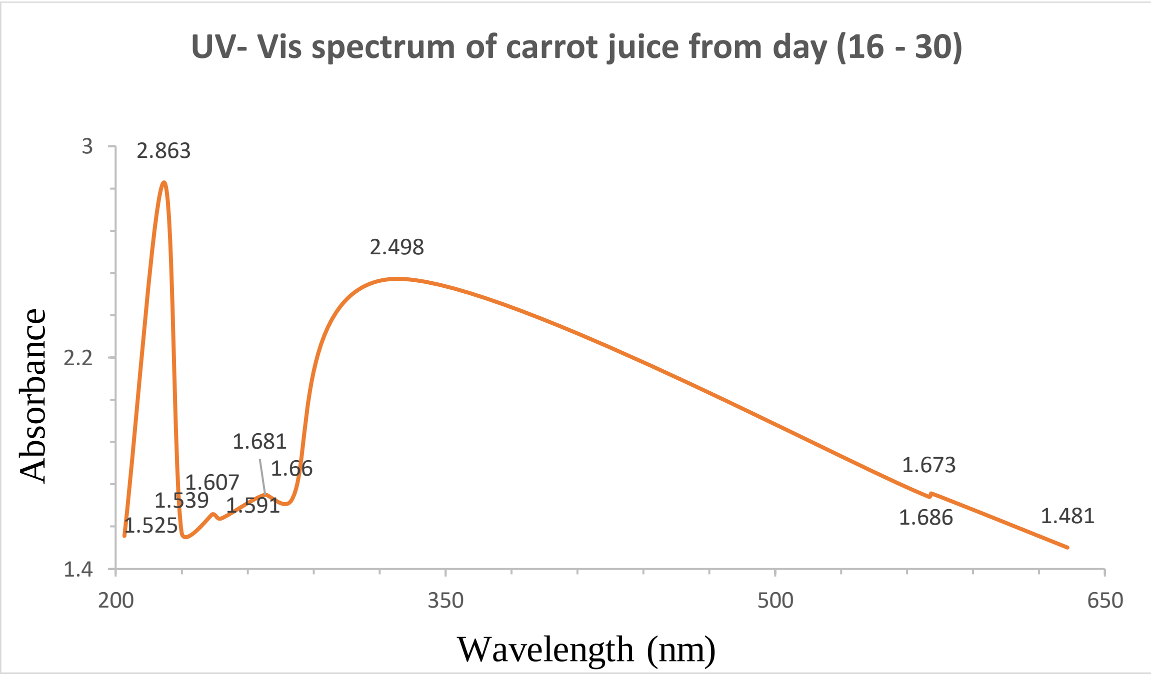


Fig. 4: Effect of storage time on the UV-Vis spectrum of carrot juice

The UV spectrum absorption at a wavelength between 200 - 250nm indicates the presence of lycopene in the juices, while the absorption spectrum between 300 - 400nm indicates the presence of vitamin C in the watermelon juice and β-carotene in the carrot juice which is a precursor to vitamin A.

The UV-Vis spectra of the watermelon and carrot juices also show that during storage there is a loss of nutrients such as vitamin C, lycopene, β-carotene, sugar, etc., even at low temperatures. Studies carried out by Grewal and Jain (1982), Chen *et al.* (1995), and Tarazona-Díaz *et al.* (2017) reported similar findings for carrot and watermelon juices during storage.

Absorption in the UV region of the spectra presented in this study generally means, among other things, the presence of conjugated double bond compounds, which are known to exist insome natural products such as lycopene and vitamin A. Conjugated organic compounds show strong absorption in the UV region. Additionally, absorption in the visible region (above 400nm) could indicate the presence of colored species (chromophores) which are reported to be present in many- colored natural products such as the carrot and watermelon juices used in the present studies.

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IV. CONCLUSION

The effects of storage time on the physicochemical properties of watermelon and carrot juices were carried out. The physicochemical characteristics of the juices determined were pH for watermelon juice which ranged between 5.2 - 3.8, titratable acidity 0.18 - 0.65, specific gravity 1.022 - 1.003, electrical conductivity 3.38 - 3.41µS/cm, vitamin C 40.07 - 20.56 mg/100ml, reducing and total sugar 5.18 - 6.15% and 7.66 - 8.44%, respectively. UV-Vis spectrum absorption peak at 218 nm and 338 nm corresponding to the presence of lycopene and Ascorbic acid respectively. Based on the results of this study,UV-Vis spectra of the watermelon and carrot juices showa significant loss of nutrients such as vitamin C, lycopene, β-carotene, sugar, etc., even at low temperature during storage. This translates to mean that watermelon and carrot juices contain important nutrients; some of which might be lost during storage.Therefore, minimizing these storage time losses is vital to the commercial productionand utilization of watermelon and carrot juices.

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