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RESEARCH TITLE

EFFECT OF CONCENTRATES POMEGRANATE JUICE MIXED ON SELECTED COLOREDFRUIT JUICE ON THEIR PHYSICOCHEMICAL AND ORGANOLEPTIC CHARACTERISTICS UNDER STORAGE CONDITIONS

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Abstract

This study was conducted to investigate the effect of storage period on a the processed mixed juice made from guava (white, pink) and guddeim mixed with concentrated pomegranate juices (CPJ) at (65° Brix). (Guava, guddeim and pomegranate) fruit were obtained from local market in Khartoum during 2021. These fruit rich in sugars, antioxidants, minerals, polyphenolic, anthocyanins. Different levels 5%, 10%, and15% of concentrated pomegranate juice (CPJ) were mixed separately with either pink or white guava juice. and also 10%, 15%, 20% of concentrated pomegranate juice were mixed also with guddeim fruit juice. The treatments were pasteurized and divided in to twelve groups, from A_1 to A_{12}, whereas A_1 to A_3 were controls, but A_4 to A_{12} were treatments displayed into Statistical Package for The Statistical package for the Social Sciences (SPSS). All treatments were analyzed for proximate, physical and chemical analysis. Sensory evaluation was carried out for the samples at zero time and at the end of storage period (3 months). Results showed that, with the increase of concentrated pomegranate juice ratio and storage interval, there was a significant decrease in protein, pH value, total acidity non-reducing sugars, ascorbic acid (AA), total phenolic compounds, anthocyanins, antioxidant activity, and colors (L*, b*) values. With the increase of concentrated pomegranate juice ratio was associated with a significant increased level in total sugars, a*color value , ash, fiber, fatty acid , total soluble solids, reducing sugars. The results obtained in the present investigation concluded that better quality juice of mixed ripe (pink , white) guava pulps and guddeim Blending with concentrated pomegranate juice (CPJ) could be prepared. By using A_{12}(80:20) of guddeim pulps : (CPJ), A_8(90:10) pink pulps guava : cpj and A_{10}(90:10) guddeim : CPJ mixed preparations of superior quality over other treatments were obtained. The processed juice selected could be stored safely in good condition beyond 90 days at ambient temperature. The selected treatments maintained the original characteristics of the processed juice for high levels of vitamin C, good color (a*, l*, b*) value, antioxideante activity, medium total phenolics compared with the other treatments and the control samples. (White , pink) guava juice andguddeim when mixed with concentrated pomegranate juices (65°Brix) at a ratio of A_{12}(80:20), A_{10} (90:10), A_8(90:10) were found to be most acceptable, both for organoleptic and physicochemical properties.

Key Words: Grewia tenax (Guddaim), Pomegranate (Punica granatum L.), Sensory Evaluation, Pink guava, guava (Psidium guajava L, juice.

عنوان البحث

تأثير مركز الرمان على بعض العصائر المخلوطة في الصفات الطبيعية والكيميائية والحسية تحت ظروف التخزين

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المستخلص

أجريت هذه الدراسة للتعرف على تأثير فترات التخزين على عصير الجوافة البيضاء والحمراء والقضيم السودانية المخلوطة مع مركز الرمان (65° درجة البوريكس). تم الحصول على الجوافة والرمان والقضيم من السوق المحلي بالخرطوم في العام 2021 . (الرمان ، والقضيم ، الجوافة) فواكه غنية بالسكريات والمضادات الأكسدة ، والمعادن ، والبوليفينولات ، والأنثوسيانين . تم خلط نسب مختلفة من مركز عصير الرمان (5%، 10%، 15%) مع عصير الجوافة (الأحمر – والأبيض) . كما تم خلط معدلات مختلفة من مركز الرمان (10%، 15% ، 20%) مع عصير القضيم. تم بسترة العصئر وتقسيمهم الى إثناعشرة مجموعة، من أ1 الى أ12، حيث اختيرت المعاملات من أ1 الى أ3 كشواهد ، والعينات من أ4 الى أ12 عبارة عن معاملات موزعا حسب التصميم العشوائي الكامل . وتم تحليل جميع النتائج تقريبيا وطبيعيا وكيميائيا .تم إجراء التقييم الحسي للعينات منذ بداية فترة التحضير وحتى نهاية مدة التخزين لمدة ثلاثة أشهر. أظهرت النتائج بأن زيادة نسبة مركز عصير الرمانى في الخليط مع زيادة فترة التحزين، يتبعها انخفاضا معنويا في البروتين، الأس الهيدروجيني، السكريات غير المختزلة وفيتامين ج، والحموضة، والفينوليك اسيد والأنثوسيانين، والمضادات الأكسدة، ودرجة اللون (L*, b*).كما لوحظة زيادة نسبة مركز الرمان في الخليط، صاحبه ارتفاعا معنويا في السكريات الكلية. ودرجة للون (a*) والرماد والألياف الخام ،الجوامد الكلية الذائبة، والسكريات المختزلة والأحماض الدهنية. أظهرت الدراسة أن أجود العينات هي A_8, A_{10}, A_{12}.في الصفات الطبيعي والكيميائي والتحليلي والحسي. وذلك لمحتواها العالي من فيتمين ج وللون الجيد والألياف والبوليفينول والمضادات الأكسدة بالترتيب، وهم الأكثر قبول في التحليل وعليه عند خلط الجوافة الحمراء والقضيم مع مركز الرمان بنسبة 90:10 مركز الرمان :جوافة أحمر وبنسبة 90:10 مركز الرمان : وقضيم و 80:20 مركز الرمان : قضيم . فإن الخليط الناتج يكون الأكثر قبولا من حيث الخصائص الحسية والفيزوكيميائية.

الكلمات المفتاحية: القضيم ، الرمان ، الصفات الحسية ، الجوافة الأحمر، العصير.

INTRODUCTION

In recent years, there has been an increasing interest in utilizing antioxidant properties of red fruit, because they are rich dietary sources of antioxidant phenolic and anthocyanins (Ozgen *et al.,* 2008). Epidemiological studies have suggested that consumption of red fruit juices such as grape berry and pomegranate juices, correlates with reduced risks of coronary heart disease, stroke, certain types of cancers and aging (Malik and Mukhtar, 2006). Pomegranat fruit (*Punica granatum*) has taken great attention for its health benefits in the last years. The fruit is consumed directly as a fresh fruit or as juice, but it can be used in gam production and as a flavoring and coloring agents. The edible part of the fruit is called arils and constitutes about 52% of the total fruit (w/w), comparising 78% juice and 22% seeds. The fresh juice contains 85.5% moisture and considerable amounts of total soluble solids (TSS), total sugars, reducing sugars, anthocyanins, phenolic, ascorbic acid and proteins (El-Nemr *et al;* 1990). Numerous studies reported that pomegranate juice contains high levels of antioxidants, higher than those of most other fruit juices and beverages (Seeram, 2008). Pomegranate juice is one of the important sources of anthocyanins (cyaniding, delphindin, and pelargonidin), and the phenols and tannins (such as; punicalin, pedunculagin, punicalagin and ellagic acid) (Kulkarni and Aradhya, 2005). In addition, malic acid and citric acid have been described as the most abundant organic acids, whilst oxalic, succinct acid and numeric acid are presented in lower amounts (Mirdehghan *et al.,* 2006). Akpinar-Bayzit (2010) ascertained that the recent interest of pomegranate fruit is not only because of its pleasant teste. Pomegranate juice may also provide protection against cardiovascular disease and stroke, by acting as a potent antioxidant against LDL oxidation and inhibition of atherosclerosis development (Aviram *et al.,* 2002). (Aviram *et al.,* 2000) suggested that pomegranate juice changed on the blood parameters such as LDL, HDL, and cholesterol, increase the prostate specific antigen (Pantuck *et al.,* 2006). All these activities may be related to diverse phenolic compounds presented in pomegranate juice, including punicalagin isomers, ellagic acid derivatives and anthocyanins(delphinidin,cyaniding and pelargonidin 3-glucosides and 3,5-diglucocides). These compounds are known for their properties in scavenging free radicals and inhibiting lipid oxidation (Gil *et al.,* 2000 and Noda *et al.,* 2002).

Guddaim is the local Sudanese name of (*Grewia tenax)* is one of the valuable plant species in Sudan. It is largely spread in arid area such as sand and near mountains, especially in the Savanna plantation area of the Northern and Middle of Sudan (FAO, 1988).*Grewia tenax* is a tree spread in Africa and Southeast Asiatic continents. It belongs to the Tileacea family. It is known by utilization as a medicinal plant. In fact, *Grewia tenax* is a plant that has been used in popular medicine in various ways in different countries. Roots are used to treat jaundice, pulmonary infections and asthma. There is commercial potential in using the fruits in beverages, ice cream, yogurt, and baby food. In Sudan, beverages are prepared by soaking the fruits in water for 3–4 h followed by hand pressing, sifting, and sweetening. The juice is regarded as a good thirst- quencher, especially during the hot season. Because of its high iron, the fruits are used by tribal members as an iron supplement for anemic children. In Kordofan, the fruit pulp is often mixed with juices of other local underutilized fruit trees such as baobab (*Adansonia digitata* L.) and tamarind (*Tamarindus indica* L.). Also, a thin porridge called Nesha is prepared by boiling millet flour and fruit pulp of Guddaim and adding custard to the mixture. The sweetened porridge is given to pregnant and lactating women to improve their health and milk production (Gebauer, 2007). Proved that guddaim plant is used in traditional medication and treatment in Sudan; it is used to treat flesh irritation and skin inflammation for both human beings and animals. In Sudan, Kordofan city, a drink was prepared by soaking the fruits overnight, hand-pressing, sieving, and sweetening. Nesha was also prepared from this drink, by the addition of custard and flour; the nesha is given to mothers to improve their health and lactation (Abdualrahman *et al.,* 2011).

Guava (*Psidium guajava* L.) is a member of the large Myrtaceae or Myrtle family andwas believed to be originated in Central America and the southern part of Mexico (Somo-gyi, *et al.*, 1996). Guava is economically important subtropical fruit in many tropical countries for all seasons, with its unique quince-and banana-like odour. It was distributed into other parts of tropical and subtropical areas such as Asia, South Africa, Egypt, and Brazil since the 17^{th} century and is nowcultivated in nearly 60 countries. The guava production in the world is much less than those of othermajor tropical fruits, but it is still economically important in certain countries such as Sudan. It is nutritionally important due to its high levels of vitamin C and pro-vitamin A; its vitamin C content is three to six times higher than that of orange, and its lycopene content is as twice than of tomato. There is evidence that increased intake of vitamin C and lycopene is associated with a reduced risk of chronic diseases such as cancer, cardiovascular disease and cataracts, probably through antioxidant mechanisms (Soares, *et al.*, 2007). Several guava products have been studied with regard to the influence of processing and storage time on their lycopene and vitamin C contents. (Sato *et al.*, 2006) reported that guava pulp losses 92% of its vitamins C content when stored for 154 days at -20°C. Also, other products have been evaluated: guava purée, sliced guava in syrup, and guava that had been dried by various methods (Ordóñez-Santos and Vázquez-Riascos, 2010). In Sudan, Guava fruit is considered asone of the most popular and major fruits of the country coming after dates, citrus, mango and banana. Themost popular guava cultivars are the pear and apple shaped fruit types which may be either with pink or white pulp. Both types are easily grown in any part of the country with high productivity (7.0 tons/feddan) and could be harvested 2-3 times yearly (Ali *et al*., 2014).

Objectives

1. To prepare concentrate pomegranate, guava and guddaim juices (100%), and their blends and to product new rich polyphenol juice by mixing pomegranate concentrate fruit juice (65^0Brix) with (white and Pink guava, *Grewia Tenax*) juice.
2. To determine the physico-chemical characteristics of the processed samples immediately after processing and during storage (for 3months)
3. To study the effect of pasteurization temperatures at 90° C and storage period on the physico-chemical properties of juices products, antioxidant activities, sensory evaluation and changes in color parameters, immediately after processing and after 3 months of storage period at ambient temperature.
4. To study the effect of storage on the physico-chemicale properties of juice blinded with concentrate pomegranate juice.

MATERIALS AND METHODS

Materials

Plant materials

The three plants Pomegranate fruits (*Punica granatum* L.) and Guddaim (*Grewia tenax*) and Guava (*Psidium guajava*) were purchased from local market in republic of Sudan, during February 2020 and identified in industrial research and consultancy center(IRC), Khartoum, Sudan.

Chemicals

CMC

Carboxyl methyl cellulose (CMC) was obtained from El Goumhouria Co. For Trading Medicines Chemicals and Medical Appliances, Importation, Cairo Egypt, and used as juice stabilizer. A portion of about 0.2g of CMC was added to each one kg fruit juices.

Methods

Juice extraction

Pomegranate juice

The plant(How much Kilos) was extract by Method of (Maskan, 2006) .fruit were washed by cold tap water and drained. They were manually cut-up and the outer leathery skin which encloses hundreds of flashy sacs was removed. The juice that is localized in the sacs was manually pressed and extracted. The obtained juice had a deep-red color, then filtered and concentrated to 65°Brix by using a rotary- low pressure evaporator (BUCHI Rota vapor R-114 model, Fawil, Switzerland) and stored at 4°C for the next step.

Guava juice

About 15kg of white and pink flesh guava fruits were thoroughly washed by tap water to remove adhering dirts. Then they were dried in air and cut into small parts and were blended by using a moulinex blender for 2 minutes (turrnado blender max 900/2). The homogenate was strained by a stainless steel strainer to separate seed and stored at 4°C for the next step.

Guddaim (*Grewia tenax*) juice

The Guddaim fruits juice was extract according the Method of (Zahra *et al.*, 2018). The fruits were put ina large bowl and washed with tap water, followed by distilled water to get rid of any impurities or dust on their surface. The fruits were sorted to isolate broken or scratched ones. Guddaim fruits juice was obtained by soaking the fruits by using water 1 :4 for about four hours, and then the fruits were pressed till exhaustion, and stirred, and the whole mass was filtered through a filter cloth and pressed to remove cell wall, fiber and seeds. A yield of 75% deep orange juice which good taste and fruity was obtained. For pasteurizing the juice, the fruit juice was blanched by sufficient quantity of water, so, it could be kept in the refrigerator for a long time without losing quality. For thenext step.

Mixed Juice Preparation

Mixed Juice Preparation of concentrate pomegranate juice(65Brix°) consisting of (white and pink guava juice and Guddeim) under study was processed as follows. Different fruit juices were mixed with concentrate pomegranate juice (CPJ) (65Brix°) at ratio of 5ml ,10ml and 15ml juices with 95 ml, 90ml, 85ml fruits juices of pink and white guava .Meanwhile 10ml, 15ml, 20ml concentrated pomegranate juices (65Brix°) with 90 ml, 85ml, 80ml fruit juice of Guddeim) according to Mazza and Miniati (1993) and then pasteurized at temperatures (90̊C) for 20 min, thin the juices filled in to sterilized glass bottles (ca 200 ml), then hermetically capped. The fruit juice were stored at room temperature 30±3C° for 3 months and the analyse was carried out monthly.

Concentration of pomegranate juice

The method of producing concentrate pomegranate juice was concentrated to a final 65°Brix from an initial 13.65 °Brix of by the following processes. Then transferred to rotary vacuum evaporator model: A 1-L. pomegranate juice sample was concentrated in a laboratory rotary flash vacuum evaporator. Samples were taken from the bulk of juice periodically to measure TSS and replaced again (Jadhav *et al*., 2015) The juices were treated as shown in the tables bellow the different combination.

s/n	T. J	B R %	T. S
1	White pulp guava juice	100%	A1
2	Pink pulp guava juice	100%	A2
3	Guddaim pulp juice	100%	A3
4	White pulp guava + pomegranate concentration	95:5	A4
5	White pulp guava + pomegranate concentration	90:10	A5
6	White pulp guava + pomegranate concentration	85:15	A6
7	Pink pulp guava + pomegranate concentration	95:5	A7
8	Pink pulp guava + pomegranate concentration	90:10	A8
9	Pink pulp guava + pomegranate concentration	85:15	A9
10	Guddaim pulp fruit + concentration pomegranate juice	90:10	A10
11	Guddaim pulp fruit + concentration pomegranate juice	95:15	A11
12	Guddaim pulp fruit + concentration pomegranate juice	80:20	A12

S/N= Symbol Number. **TJ=** Type of Juice. **B. R% =** Blinding Ratio. **T.S=** Treatments Symbols.

Physicochemical analysis

This included total soluble solids (TSS), Total acidity, ascorbic acid., total sugar and reducing sugar, non-reducing sugar, total phenols, antioxidant and anthocyanin for all the puree and their blends were determined as follows.

Total soluble Solids (TSS): Total soluble solids were determined using a hand-held refractometeraccording to A.O.A.C, (1990).

Titrable Acidity (TA): Titrable acidity was determined according to the A.O.A.C, (2000).

Determination of Ascorbic Acid: This was determined according to Ruck method (1963).

Determination of total sugars

The total sugars were determined according to the method described by (Mohamed ,1999), 10ml of HCl:H2O (1:1) were added to 50ml sugar extract and left for 8hours, the solution was neutralized by NaOH (40%); the volume was completed to 100ml and titrated against Fehling solution as mentioned above, total sugars were calculated according to the following equation:

Total sugars = mg of sugar / 100ml of solution ×dilution factor×100 /1000×weigh of sample

Determination of reducing sugars

Reducing sugars were determined by modified method of Lane and Eynon as described by (Schneider, 1979) where 10 ml of juice were extracted with 200 ml ethanol (70%) for 6 hours in a Soxhelt apparatus, the solution was then evaporated to 100ml, clarified by adding lead acetate (2 ml) and filtered, sodium oxalate (2 g) was added to remove the lead acetate by filtration, 50 ml burette was filled with solution prepared above. 15ml of this solution were run into 10 ml Fehling solution, mixed well and heated to boiling on an electric heater, the solution was kept boiling for 2minutes and then 3 drops of methylene blue indicator (1mg/100 ml distilled water) were added, the titration was completed by addition of sugar solution (drop by drop) until the color of indicator disappeared and red -brick color appeared, the reducing sugars were calculated according to the following equation:

Reducing sugars = mg of sugar /100ml of solution× dilution factor×100 /100× weight of sample

Non-reducing sugars = Total sugars – Reducing Sugar

Determination of total phenol compounds (TPC)

TPC of juice was determined spectrophotometrically by using (spectrophotometer model PU 8625) by using the Folin and Ciocalteu assay as described by Vinson *et al*. (1995). One milliliter of juice sample was mixed with 1 ml of 6 M HCl and 5 ml of 75% methanol/ water solution in screw-capped tube. The tub was vortexed and placed in a 90ºC water bath and shaken for 2h. Then the tube was allowed to cool to room temperature and diluted to a 10 ml volume with distilled water. One milliliter of this solution was mixed with 5ml of the previously tenfold diluted Folin and Ciocalteau reagent. Fifteen milliliters of Na_2CO_2 (7g/100ml) were added to this mixture to produce basic conditions. The mixture was diluted to 100 ml with distilled to 100 ml with distilled water. The absorbance versus prepared blends was measured at 760nm until it reached steady state. The same procedure was applied for six standard solutions of Gallic acid (50-300 mg/100 ml). Final results were expressed as mg Gallic equivalent per 100 ml of juice.

Determination of anthocyanins

The total anthocyanin content was determined as the method reported by Mondello *et al.* (2000) where ten ml of juice were filtered through glass wool, and the pulp and then washed with 90 ml mixture of a Et OH:HCl (prepared by mixing 79.7 ml of anhydrous ethyl alcohol with 20.3 ml of HCl; 37%). The absorbance has been measured at 535 nm, by using spectrophotometer. The quantification was done with respect to standard curve of cyaniding-3-glucoside. Then the results were expressed as cyaniding-3-glocoside equivalent (mg per 100 ml of fruit juice.

Determination of antioxidant activity

Radical-scavenging activity of fruit juices and mixture was measured according to the method described by Brand- Williams *et al* (1995). Twenty milliliters of methanol were added an aliquot of juice (10g) and homogenized at 20,500 rpm for 25 sec. subsequently, this mixture was centrifuged at 20,000 rpm at 4ºC for 25 min. the supernatant was diluted with methanol (1:25). (1.0ml) of the extract was dissolved in 1.0 ml methanol and added to 0.5 ml methanol solution containing 1,1-diphenyl2-picrylhydrazy (DPPH) 0.5 Mm, the control sample was prepared by using 2.0ml methanol and 0.5ml of the same of methanolic solution containing DPPH. The reacting mixture was shken and left to stand for 30 min at room temperature in the dark. The absorbance of the remaining DPPH was measured in a1 cm cuvette at 517 nm and at 25ºC. The radical scavenging activity (S) of each extract was expressed by the following formula: $S= 100-[(A_X /A_0)]*100$

Where: (A_X) is the absorbance of DPPH solution in presence of sample. (A_0) is the absorbance of DPPH solution in the absence of the sample (control).

Determination of colors in juice sample

Color of all juices and their blends was determined according to the method of Commission international de I'E' clairage ,1976 (CIE). Juice samples were analyzed at

Industrial Research andConsultancy Center , for the following traits: Juice color was measured by chromometer (Konica Minolta, model CR 410, Japan) calibrated with a white plate and light trap supplied by the manufacturer, color was expressed using the International Commission Illumination (CIE) L ,a, and b color system (CIE, 1976). A total of three spectral readings were taken for each sample expressed as Lightness (L*) (dark to light), the redness (a*) values (reddish to greenish). The yellowness (b*) values (yellowish to bluish) were estimated curve of cyaniding-3-glucoside. Then the results were expressed as cyaniding-3-glocoside equivalent (mg per 100 ml of fruit juice.

Sensory evaluation

Panel test

Sensory evaluation was determined two times firstly at zero time (1st), and the second sensory evaluation test was done after the end of storage period (three months) .Six parameters including color, texture, homogeneity, flavors, taste, overall acceptability, were evaluated the effect of storage ,pasteurization and fruit with control samples .This test was carried out using Hedonic scale consisting of 5characters (taste, color, texture, flavor and overall acceptance) and 15 panelist .

Result

Moisture content

Moisture content of the produced juice (white, red guava, and gaddaim) colored with concentrated pomegranate juices (CPJ) as antioxidant at zero time and after 3month were determined and the results are showen in the Fig (1). it recorded increased all level prepared juices, where, the moisture content was significantly ($p \leq 0.05$) affected by the processed juice and their blends and storage period at room temperature.

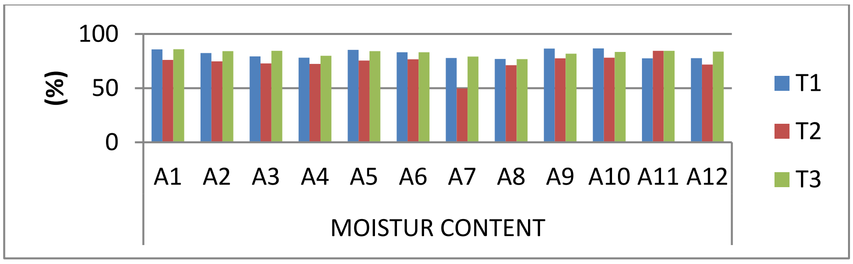

Fig. 1: Effect of pasteurization temperature and storage periods at ambiance temperature on the moisture content of different colored juices after storage for 3month at 30ºC.

T1.time first month., T2 . second month., T3 . third month., Grand Mean = 78.826. P-Value = 0.5691 . CV = 9.15

Ash Content

The results showed that the ash content of the processed juice and their blends were significantly decreased at zero time, but after 3monthe it observed increased the most ash content of treatment, the interaction between the two fruits was significant ($P \leq 0.05$) affected during storage period at room temperature. There was a slight increase in the ash content after two month as revealed in most treatments.

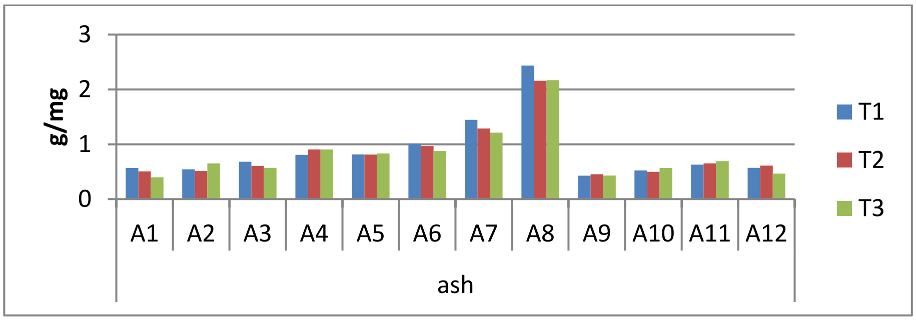

Fig. 2: Effect of pasteurization temperature and storage periods at ambiance temperature on the ash content of different colored juices after storage for 3month at 30ºc.

T1. first month., T2 . second month., T3 . third month., Grand Mean = 0.8373, CV =,29.65 ,P-Value = 0.7384

Crud Fiber content

The Fig. (2) showed that the Crud Fiber content of the processed juice and their blends were significantly ($p \leq 0.05$) affected by the processed juice and their blends and storage period at room temperature. at zero time, the lowest value observed in gaddaim 85:15 CPJ A_9(0.51g/100g) and white guava 85:15CPJ A_{10}(0.64g/100g). But, after 3monthe the increment of crud fiber observed for white guava 95:5CPJ A_4 (2.0237 g/100g), pink guava 90:10 CPJ, A_8 (1.7633g/100g) and gaddaim 80:20 CPJ, A_{12}(1.88g/100g).

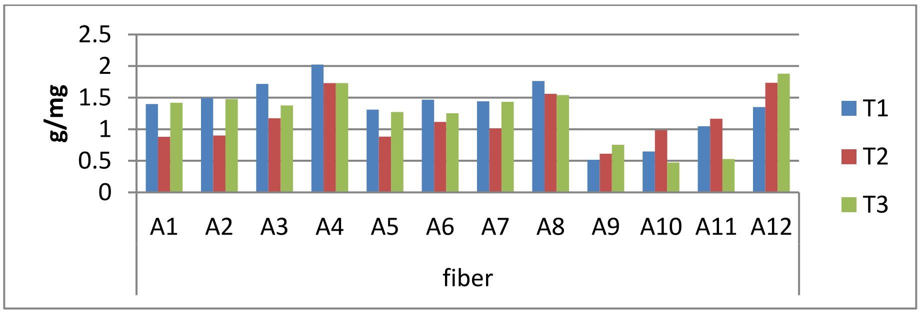

Fig.3: Effect of pasteurization temperature and storage periods at ambiance temperature on the Crud Fiber content of different colored juices after storage for 3month at 30ºC.

T1. first month., T2. second month., T3 . third month., Grand Mean = 1.4294, CV =158.47, P-Value =.0.4558

Protein Content

Figure (4) showed that the protein content was significantly ($P \leq 0.05$) affected by the processed juice and their blends and storage period at room temperature, it was also, observed slightly higher in all treatments of zero time, But after 3monthe was observed decreased the protein content.

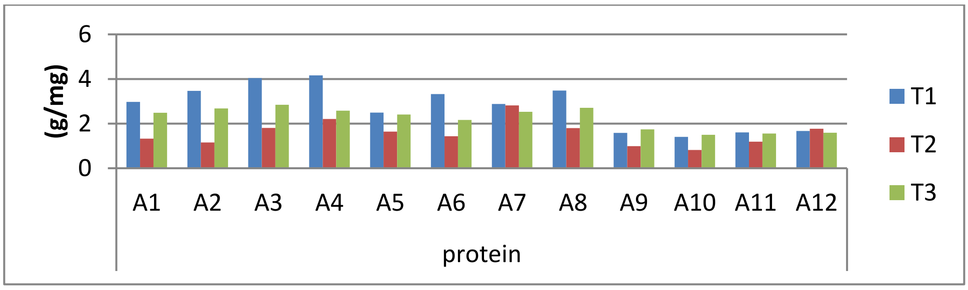

Fig. 4: Effect of pasteurization temperature and storage periods at ambiance temperature on the protein content of different colored juices after storage for 3month at 30ºC.

T1. first month., T2 . second month., T3 . third month., Grand Mean = 2.19 , CV= 15.88 , P-Value = 0.000

Total soluble solids (T.S.S)

Total soluble solid (T.S.S) was significantly (P ≤0.05) affected by the processed juice and their blends and storage period at room temperature. The produced juices (white guava , pink guava, goddaim) colored with concentrated pomegranate juices (CPJ) at zero time and after 3months were determined and the results are shown in Fig (5). Total soluble solid represent good correlation with elevated temperature in all prepared juices. At zero time reveled the highest total soluble solid was recorded by white guava 95:5 CPJ ,pink guava 90:10 CPJ and goddaim 80:20 CPJ A_4(16.27%), A_8(18.33 %) and A_{12}(15.07%) respectively. whereas, after 3 month the results showed in Fig (1) Where, the lowest total soluble solid it was in white gava100% A_1(9%) followed pink guava 100% A_2(9.52%). Therefor the total soluble solid (T.S.S) content was significantly affected by the type of the fruit and processing method of the juices and slightly by storage time.

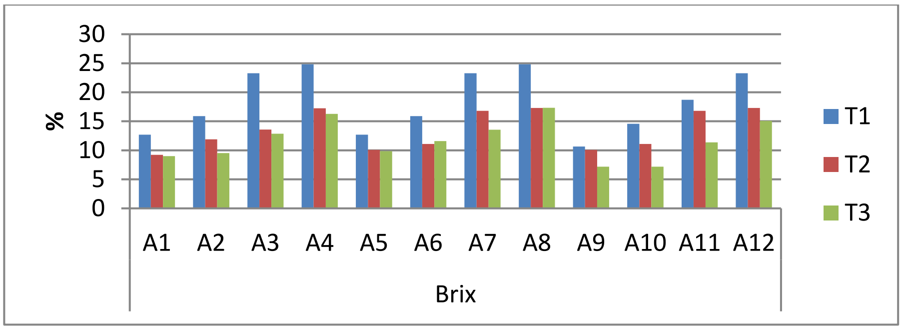

Fig. 5: Effect of storage periods at ambiance temperature on the total soluble solid (TSS) of different colored pasteurized juices after storage for 3month at 30ºC.

T_1. first month., T_2 . second month., T_3. third month., Grand Mean = 14.55, CV = 4.87, P-Value = 0.000.

Total acidity (g/100 g)

Total Acidity is an important parameter in food quality attributes because it inhibits the spoilage and the fermentation of food, and it would be of great importance since the ratio of total soluble solids to acidity will affect flavor. Total acidity (as citric acid) was significantly (P ≤0.05) affected by the processed juice and their blends and storage period at room temperature. The processed juice and their blends during storage for 3 months are shown in Fig (6). The higher Total acidity was revealed at A_{12} (1.92 mg/L) followed by A_8 (1.63 mg/L). Whereas lower acidity was observed at A_9 (0.26 mg/L). The slight decreased in acidity values could be observed in the processed juice and their blends after storage period. Generally, higher total acidity was observed at zero time, whereas lower total acidity was observed after 3month of storage. Throughout Fig. (6) its revealed that by the processed juices and their blends with storage period it's found that the total acidity was decreased with the increased of amount of concentrated pomegranate juices ratio as antioxidant and due to the pasteurization temperatures used.

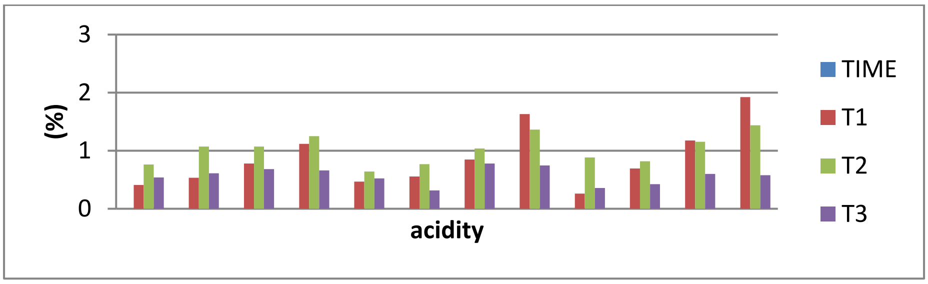

Fig. 6: Effect of storage periods at ambiance temperature on the acidity of different colored pasteurized juices after storage for 3month at 30ºc.

T1. first month., T2. second month., T3. third month., Grand Mean = 0.818, CV = 12.55 , P-Value = 0.000

Total sugar content

Total sugar content is very important in fruit nectar because it affects taste and flavor which are considered the most important features of quality attributes. It was significantly ($P \leq 0.05$) affected by the processed juice and their blends and storage period at room temperature . At zero time, it observed that increasing the total sugars content for all treatment. Where, the Highest total sugars content at zero time , were observed at A_{12} (14.36 g/100g), A_8 (14.2 g/100g) followed by A_4(13.05g/100g). and lowest total sugars at zero time was observed at A_{10} (0.767 g/100g) followed by A_5(6.393 g/100g).whereas after 3 months its observed decreasing for all treatments compared at zero time. The highest total sugars recorded after 3month was observed at A_{12} (27.07g/100g) followed by A_8 (22.13 g/100g) results showed that the total sugars content was significantly affected in the processed juice due to blends.

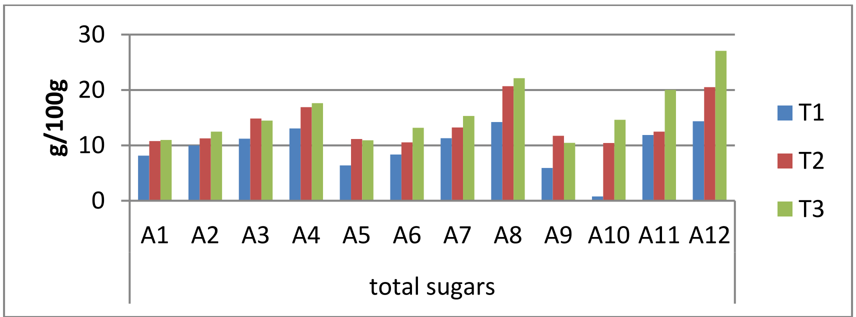

Fig. 7: Effect of storage periods at ambiance temperature on the total sugar of different colored pasteurized juices after storage for 3month at 30ºC.

T1. first month., T2. second month., T3 . third month., Grand Mean = 13.26, CV = 6.38, P-Value = 0.000.

Reducing Sugars (g/100g)

Reducing sugars was significantly ($p \leq 0.05$) affected by the processed juice and their blends and storage period at room temperature. It was gradually increase with the increase of concentration pomegranate juices (CPJ) ratio in the guava and guddaim blended with CPJ. Higher reducing sugars content at zero time were observed at A_{12}(17.31g/100g), followed by A_{11} (7.68 g/100g) and lower reducing sugars was recorded by A_5 (1.38 g/100g) followed by A_6 (2.58 g/100g). but after three month, The results obtained showed that the reducing sugar content was significantly affected by the processed method as well as and the blends type and storage periods (Fig.4). a slight increase in reducing sugars content was observed from zero time and up to 3 month of storage in all treatments . Higher reducing sugars content after 3month were observed at A_{12}(17.31g/100g) followed by A_8(12.06g/100g). Whereas, the lowest reducing sugars content it recorded after 3 months of storage at A_5 (4.58g/100g). Thus it clear that the reducing sugars of processed juice and their blends were decreased with the increase of storage duration. The increase in reducing sugar during storage interval may be due to the conversion of sucrose to reducing sugars (glucose, fructose).

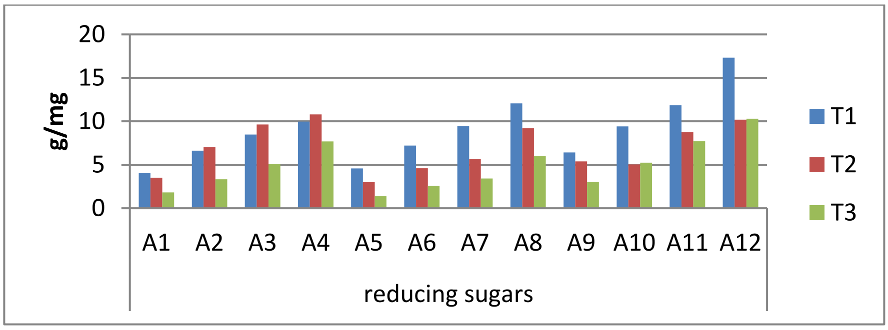

Fig. 8: Effect of storage periods at ambiance temperature on the reducing sugar of different colored pasteurized juices after storage for 3month at 30ºC.

T1. first month., T2 . second month., T3 . third month., Grand Mean = 6.8846, CV = 9.12, P-Value = 0.000.

Non-reducing sugars (g/100g)

Fig. 9 showed the non-reducing sugars content of the colored juices (white and red guava and goddaim) with CPJ at zero time to up to 3month of storage. There was a correlation between the decreasing in pH and increase in reducing sugar content, this may be due to the degradation of complex sugars to reducing sugars as a result of acid medium and high temperature that took place during pasteurization. Higher non- reducing sugars content at zero time were observed at A_4 (10.067 g/mg), followed by A_8 (10.07 g/mg) whereas lower non-sugars content at zero time were observed at A_9 (4.09 g/mg).whereas, after 3 month it observed the highest non reducing sugars at A_8 (8.187g/mg) whereas, the lowest non reducing sugars it recorded at A_9 (2.89 g/mg) followed A_{10} (3.52g/mg). The results showed that the non-reducing sugar content were significantly ($P \leq 0.05$) affected by the processed juices and their blends and storage period (Fig.9). From preparation time to 3 months of storage a slight decrease in the non-reducing sugars content was revealed in all treatments of all stages.

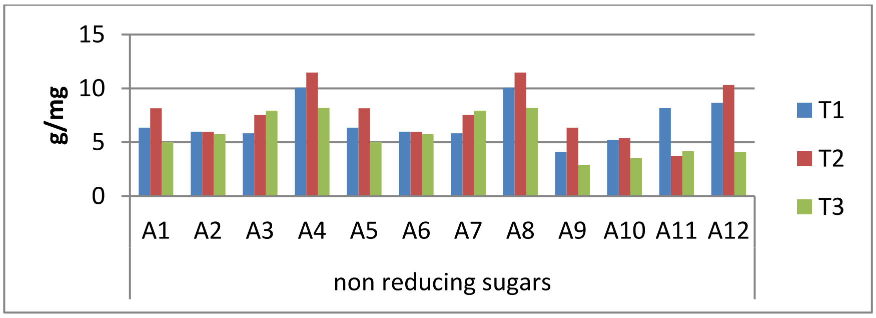

Fig. 9: Effect of storage periods at ambiance temperature on the non-reducing sugar of different colored pasteurized juices after storage for 3month at 30ºc.

T1.time in the first month., T2 . time in the second month., T3 . time in the third month., Grand Mean = 6.749, CV = 17.7, P-Value = 0.000.

Ascorbic acid content (mg/100g)

Ascorbic acid content was significantly (P ≤0.05) affected by the processed juice and their blends and storage period at room temperature. The most important quality characteristic of the processed juice and their blends because it reflects the nutritional and technological characteristics of the processed juice and their blends. Higher ascorbic acid content was observed at (A_8, A_4 and A_{12} as 110.85 mg/100g, 97mg/100g, 84.09mg/100g respectively, meanwhile the lowest ascorbic acid content was observed at A_5 (17.9 mg/100g). Therefore the concentration of ascorbic acid content in processed juice and their blends was determined during the storage intervals (3months). Mixing guava and goddaim with concentrated pomegranate juices significantly elevates the vitamin C levels in the blends. Results of ascorbic acid content were shown in (Fig.10). Higher ascorbic acid content was observed at zero time followed by two months after storage, while the lowest ascorbic acid was observed at three months storage time. Fig.10 revealed that the processed juices and their blends with storage interval the ascorbic acid was decreased with the increase of storage duration . This reduction might be due to oxidation of ascorbic acid into dehydroascorbic acid by oxygens a well as the effect of processing, storage time and exposure to light.

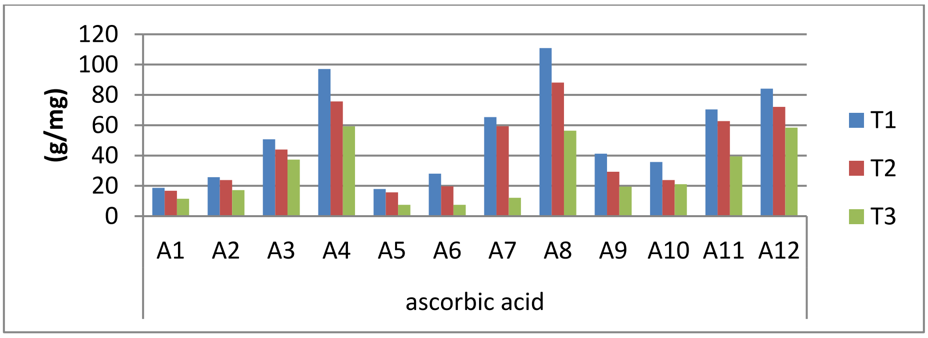

Fig. 10: Effect of storage periods at ambiance temperature on the ascorbic acid of different colored pasteurized juices after storage for 3month at 30ºC.

T1. first month., T2 . second month., T3 . third month., Grand Mean = 42.329,CV = 7.24, P-Value = 0.000.

Total phenolics content

Fig. 11 implies the content of total phenolics compounds in colored juices with concentrated pomegranatejuices (CPJ) at zero time was significantly (P ≤0.05) affected by the processed juice and their blends and storage period at room temperature. Wherefore, the highest phenolics content was observed at zero time by A_8 (310.2 mg/100g) followed by A_4 (291.7mg/100g) and A_7 (289.2mg/100g).where, the lowest value of phenolics content were observed after 3month by A_{12}(176.8mg/100g). During storage the total phenolic content decreased gradually during course of time. In the obtained results it was observed decrease the value of phenolic content and this may be to many factor like pasteurization, time of storage at ambient temperature.

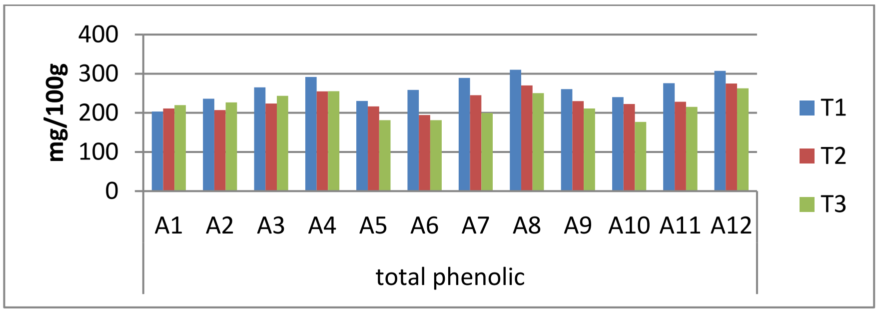

Fig. 11: Effect of storage periods at ambiance temperature on the total phenolic content of different colored pasteurized juices after storage for 3month at 30ºC.

T1.time in the first month., T2 . time in the second month., T3 . time in the third month., Grand Mean = 238.1,CV = 6.16 , P-Value = 0.000.

Anthocyanin content

Fig.12 illustrated the anthocyanin pigment content in juices (goddaim, pink and white guava) colored with concentrated pomegranate juices (CPJ). It is clear that, at zero time, the anthocyanin content decreased gradually after pasteurization, it also indicates the close of anthocyanin pigment in the colored juices with CPJ after 3 month of storage at room temperature. It is well known that many factors affect the stability of anthocyanin including temperature, pH, oxygen, enzymes, ascorbic acid. Total anthocyanin pigment decreased significantly through storage, which strongly dependent on storage temperature. Higher anthocyanins content observed at zero time by A_{12} (29.02 mg/100g) followed A_9 (17.08 mg/100 g) whereas, the lowest value of anthocyanin it recorded after three month by A_5(0.77 mg/100 g) and A_{10}(1.977 mg/100 g).

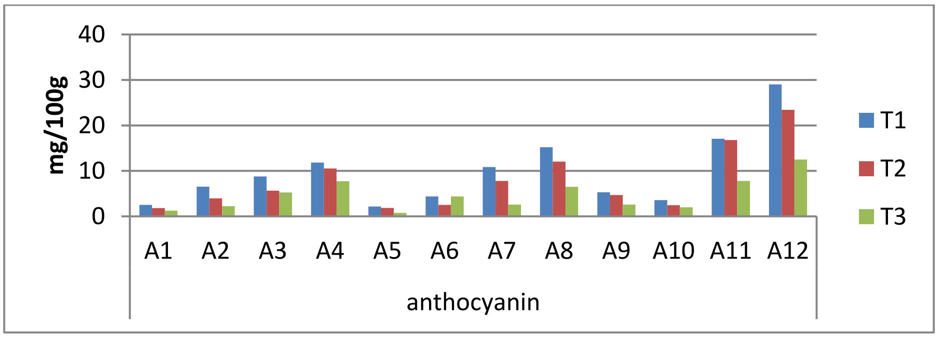

Fig. 12: Effect of storage periods at ambiance temperature on the anthocyanins content of different colored pasteurized juices after storage for 3month at 30ºC.

T1.time in the first month., T2 . time in the second month., T3 . time in the third month., Grand Mean = 7.297, CV = 12.96 , P-Value = 0.000.

Antioxidant Activity (mg/100g)

The Fig. 13 showed the changes in antioxidant activity of different colored juices were determined at zero time. It was observed that the highest antioxidant activity recorded at zero time at A_{12}(180.1 mg/100 g) followed by A_8 (180 mg/100 g) and A_9 (170 mg/100 g), whereas the lowest antioxidant activity at zero time observed at A_5 (69 mg/100 g), whereas after 3month the highest value was obcerved at A_8 (127 mg/100 g) but the lowest were observed at A_5(54 mg/100 g). the change in degradation of antioxidant activity of the different colored juices after 3month of storage at room temperature was recorded at all treatments after 3month where decreased the value of antioxidant activity of all treatment compared at zero time.

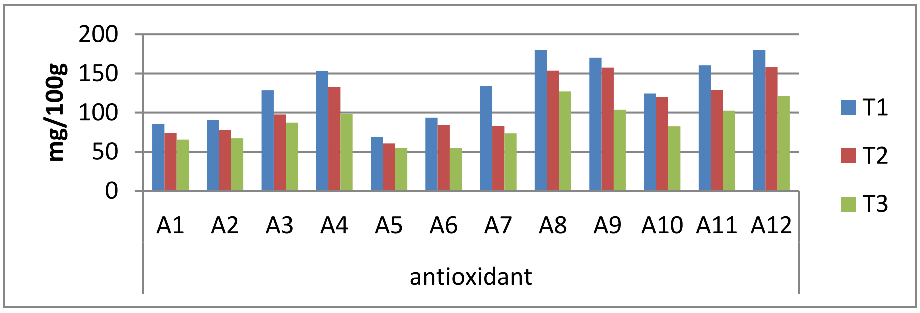

Fig. 13: Effect of storage periods at ambiance temperature on the antioxidant content of different colored pasteurized juices after storage for 3month at 30ºC.

T1. first month., T2 . second month., T3 . third month., Grand Mean = 109, CV = 7.14 , P-Value = 0.000.

Color Value

Figures (14, 15 and 16) showed CIE values of whiteness (L*), redness (a*) and yellowness (b*) measured for product colors from the processed juice and their blends. The results showed that the L* value was significantly affected by the processed juices and their blends and storage intervals. The highest color L* value at zero time were observed at A_8 (7.03) followed by A_7 (6.33) whereas lowest color L *value at zero time was recorded at A_9(0.75) .but after three month it recorded the highest L*value it recorded at A_8 (36.86) followed at A_9 (36.73). whereas, the color (a*) value was significantly affected by the processed juice and their blends and storage period. The highest color (a*) score at zero time were observed at A_8 (36.6) followed by A_9 (36.1) whereas lower color (a*) at zero time was observed at A_4 (18.233). compared with control a*value A1, A2, A3, (10.467), (11.333), (15.267) respectively. Mixing pink flesh guava with CPJ intensifies the red color values especially at a ratio of pink guava 90:10 CPJ A_8(36.6), The red color intensity increases with storage up to 2 months and started to decline gradually with the increase of CPJ ratio and storage period. Whereas The Fig (16) showed that the color (b*) value was significantly affected by the processed juices and their blends and storage intervals. The highest color (b*) score at zero time were observed at A_8 (0.700) followed by A_{12} (0.667) and A_4(0.633), whereas lower color (b*) was observed at A_5 (0.200). but , higher Color (b*) value content was observed after 3month at A_5 (0.733) followed at A_8(0.700), the lowest b* value after 3month was observed at A_{10}(0.100). Pink flesh guava is the limiting factor for yellow color appearance when mixed with CPJ at any combination. It seems that this color is quiet stable during storage for a period of 3 months (Fig.15). Generally, the highest color (L*) was observed at after three month followed by the two months of storage, whereas lower color (L*) score recorded were observed at zero time .Throughout (Fig.14) its revealed that the processed juices and their blends with storage interval the Color L* content was increased with the increase of storage period . Whereas the highest color (a*) score were observed at zero time followed by 2 months of storage whereas lower color (a*) score recorded, were observed after 3month of storage .but The highest color (b*) score were observed at zero time storage compared to control, whereas only slight decrease in color (b*) score recorded were observed at 3 months of storage. Therefore, The results revealed that the processed juice and their blends with storage period the color (L*) content was increased with the increase of short storage duration. whereas the a*value was decreased with the increased of storage duration. wherever, the slight decrease was revealed at b*value after three month.

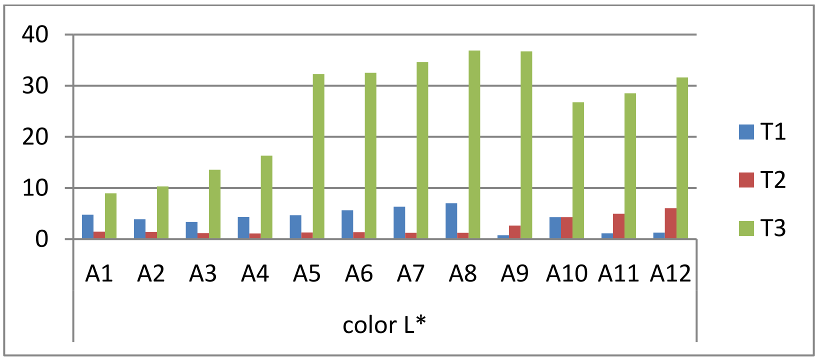

Fig. 14: Effect of storage periods at ambiance temperature on the color L* value content of different colored pasteurized juices after storage for 3 month at 30ºC.

T1. first month., T2 . second month., T3 . third month., Grand Mean = 10.6, CV = 4.96 , P-Value = 0.000.

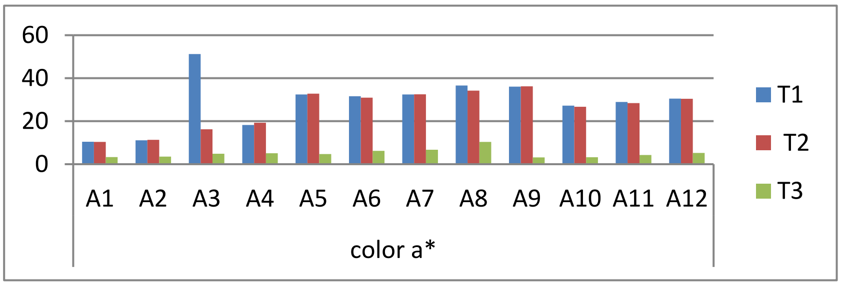

Fig. 15: Effect of storage periods at ambiance temperature on the color b* Value content of different colored pasteurized juices after storage for 3 month at 30ºC.

T1. first month., **T2** . second month., **T3** . third month., Grand Mean = 18.843 , CV = 1.56 , P-Value = 0.000.

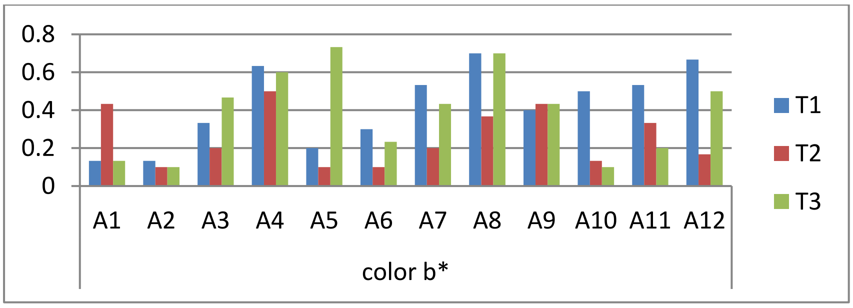

Fig. 16: Effect of storage periods at ambiance temperature on the color b* Value value of different colored pasteurized juices after storage for 3month at 30ºC.

T1. the first month., T2 . the second month., T3 . the third month., Grand Mean = 0.382 , CV = 21.5 , P-Value = 0.000.

Sensory evaluation

Changes in sensory properties of processed juice and their blend during storage period at room temperature.

Sensory evaluation was determined twice during storage period, first evaluation time was immediately after preparation at zero time (1st), and the last sensory evaluation test was after the end of storage period after three months (3rd).Color, texture, homogeneity, flavors, taste, overall accepts, were the six parameters which were evaluated to compare treatments with others, was carried out by hedonic scale consisting of 15 points.(where is the results).

Table 1. Panel test values of color scores organoleptic tests of processed juice and their blends during storage period at room temperature.

N	Tr	At zero time						After 3 month					
		N.A	**AC**	**G**	**V.G**	**EX**	**T**	**N.A**	**AC**	**G**	**V.G**	**EX**	**T**
1	A1	0	0	9	2	4	15	0	5	7	2		15
2	A2	0	3	5	4	3	15	3	5	3	3		15
3	A3	0	6	3	6	0	15	0	4	3	5		15
4	A4	0	4	2	3	6	15	0	6	0	2		15
5	A5	0	0	2	3	10	15	0	0	2	2		15
6	A6	0	0	1	1	13	15	0	5	0	0		15
7	A7	0	3	3	4	6	15	0	5	3	4		15
8	A8	0	1	2	3	9	15	0	5	1	3		15
9	A9	0	1	4	5	5	15	0	0	5	3		15
10	A10	0	4	1	5	5	15	0	4	2	4		15
11	A11	0	1	1	5	8	15	0	2	2	3		15
12	A12	0	0	0	2	13	15	0	0	0	3		15
Overall Mean		3.79											
SE		0.29											
LS		***											

Where:

A_1.white guava 100%, **A_2**.red guava 100%, **A_3**.guddeim 100%, **A_4**.white guava 95% +5% concentrated pomegranate juices (CPJ), **A_5**. White guava 90% +10% CPJ, **A_6**.white guava 85% +15% CPJ, **A_7.**pink guava 95% +5% (CPJ), **A_8**. Pink guava 90%+10% CPJ, **A_9.**pink 85% +15% CPJ, **A_{10}**.guddeim 90% +10% (CPJ), **A_{11}**. guddeim 85% +15% CPJ, **A_{12}**. Gaddaim 80%+20%CPJ.

Means superscript by the same letter in a column are not significant; **SE**: Standard error; **LS:** Level of significant ,*** significant at level ($P \leq 0.001$). **TR** .Treatment

Table 2. Panel test values of texture scores organoleptic tests of processed juice and their blends during storage period at room temperature**.**

N	Tr	At zero time						After 3 month				
		N.A	**AC**	**G**	**V.G**	**EX**	**T**	**N.A**	**AC**	**G**	**V.G**	**EX**
1	A1	0	2	8	2	3	15	0	2	6	4	3
2	A2	0	5	4	3	3	15	1	5	7	0	2
3	A3	1	6	3	4	1	15	0	4	4	4	3
4	A4	0	5	2	5	3	15	0	6	2	5	2
5	A5	0	2	0	5	8	15	0	2	2	3	7
6	A6	0	1	1	4	9	15	1	3	0	2	9
7	A7	0	6	0	5	4	15	0	4	5	5	1
8	A8	0	1	1	2	11	15	1	2	0	5	7
9	A9	0	2	5	4	4	15	0	5	1	2	7
10	A10	0	4	1	7	3	15	0	2	1	9	3
11	A11	0	0	2	4	9	15	0	1	2	4	8
12	A12	0	0	0	3	12	15	0	0	1	1	13
Overall Mean		3.79										
SE		0.28										
LS		***										

Where:

A_1.white guava 100%, **A_2**.red guava 100%, **A_3**.guddeim 100%, **A_4**.white guava 95% +5% concentrated pomegranate juices (CPJ), **A_5**. White guava 90% +10% CPJ, **A_6**.white guava 85% +15% CPJ, **A_7.**pink guava 95% +5% (CPJ), **A_8**. Pink guava 90%+10% CPJ, **A_9.**pink 85% +15% CPJ, **A_{10}**.guddeim 90% +10% (CPJ), **A_{11}**. guddeim 85% +15% CPJ, **A_{12}**. Gaddaim 80%+20%CPJ.

Means superscript by the same letter in a column are not significant; **SE**: Standard error; **LS:** Level of significant ,*** significant at level ($P \leq 0.001$). **TR** .Treatment

Table 3. Panel test values of homogeneity scores organoleptic tests of processed juice and heir blends during storage period at room temperature**.**

N	Tr	At zero time						After 3 month					
		N.A	**AC**	**G**	**V.G**	**EX**	**T**	**N.A**	**AC**	**G**	**V.G**	**EX**	**T**
1	A1	0	2	12	0	1	15	1	4	6	4	0	15
2	A2	0	6	5	3	1	15	3	5	2	3	2	15
3	A3	3	3	4	5	0	15	2	3	4	5	1	15
4	A4	0	4	7	1	3	15	1	4	5	3	2	15
5	A5	0	0	4	9	2	15	0	0	2	6	7	15
6	A6	0	0	0	2	13	15	0	1	2	6	6	15
7	A7	0	5	1	8	1	15	0	1	4	7	3	15
8	A8	0	1	1	3	10	15	0	1	1	6	7	15
9	A9	0	2	5	4	4	15	0	5	3	2	5	15
10	A10	0	1	2	9	3	15	0	1	5	5	4	15
11	A11	0	1	5	4	5	15	0	0	5	5	5	15
12	A12	0	0	0	3	12	15	0	0	0	2	13	15
	T												
Overall Mean		3.692											
SE		0.25											
LS		***											

Where:

A1.white guava 100%, **A2**.red guava 100%, **A3**.guddeim 100%, **A4**.white guava 95% +5% concentrated pomegranate juices (CPJ), **A5**. White guava 90% +10% CPJ, **A6**.white guava 85% +15% CPJ, **A7.**pink guava 95% +5% (CPJ), **A8**. Pink guava 90%+10% CPJ, **A9.**pink 85% +15% CPJ, **A10**.guddeim 90% +10% (CPJ), **A11**. guddeim 85% +15% CPJ, **A12**. Gaddaim 80%+20%CPJ

Means superscript by the same letter in a column are not significant; **SE**: Standard error; **LS:** Level of significant ,*** significant at level ($P \leq 0.001$). **TR** .Treatment

Table 4. Panel test values of flavor scores organoleptic tests of processed juice and their blends during storage period at room temperature.

N	Tr	At zero time						After 3 month					
		N.A	**AC**	**G**	**V.G**	**EX**	**T**	**N.A**	**AC**	**G**	**V.G**	**EX**	**T**
1	A1	0	1	7	3	4	15	5	5	4	1	0	15
2	A2	1	5	5	2	2	15	5	3	3	3	1	15
3	A3	1	4	5	2	3	15	3	3	5	4	0	15
4	A4	1	4	7	3	0	15	2	2	4	5	2	15
5	A5	0	0	4	5	6	15	0	2	2	9	2	15
6	A6	0	0	2	7	6	15	0	0	3	3	9	15
7	A7	0	6	1	7	1	15	0	1	6	3	5	15
8	A8	0	0	1	2	12	15	0	2	3	4	6	15
9	A9	0	2	5	3	5	15	0	3	5	2	5	15
10	A10	1	0	6	5	3	15	0	6	4	2	3	15
11	A11	0	0	3	6	6	15	0	1	4	4	6	15
12	A12	0	0	1	2	12	15	0	0	0	2	13	15
	T												
Overall Mean		3.64											
SE		0.26											
LS		***											

Where:

A_1.white guava 100%, **A_2**.red guava 100%, **A_3**.guddeim 100%, **A_4**.white guava 95% +5% concentrated pomegranate juices (CPJ), **A_5**. White guava 90% +10% CPJ, **A_6**.white guava 85% +15% CPJ, **A_7.**pink guava 95% +5% (CPJ), **A_8**. Pink guava 90%+10% CPJ, **A_9.**pink 85% +15% CPJ, **A_{10}**.guddeim 90% +10% (CPJ), **A_{11}**. guddeim 85% +15% CPJ, **A_{12}**. Gaddaim 80%+20%CPJ

Means superscript by the same letter in a column are not significant; **SE**: Standard error; **LS:** Level of significant ,*** significant at level ($P \leq 0.001$). **TR** .Treatment

Table 5. Panel test values of Taste scores Organoleptic Tests of processed juice and their blends during storage period at room temperature

N	Tr	At zero time						After 3 month					
		N.A	AC	G	V.G	EX	T	N.A	AC	G	V.G	EX	T
1	A1	1	3	4	4	3	15	4	6	2	3	0	15
2	A2	0	5	7	3	0	15	5	2	5	3	0	15
3	A3	0	3	8	2	2	15	2	3	4	4	2	15
4	A4	2	2	4	3	4	15	1	1	9	2	2	15
5	A5	0	2	5	3	5	15	1	2	4	4	4	15
6	A6	0	0	2	5	8	15	0	0	1	7	7	15
7	A7	1	2	3	6	3	15	0	1	5	3	6	15
8	A8	0	0	1	5	9	15	0	5	1	3	6	15
9	A9	0	4	4	4	3	15	0	5	4	3	3	15
10	A10	0	0	10	3	2	15	0	7	3	2	3	15
11	A11	1	2	1	5	6	15	0	0	3	5	7	15
12	A12	0	0	2	8	5	15	0	1	1	5	8	15
Overall Mean		3.92											
SE		0.27											
LS		***											

where

A_1.white guava 100%, A_2.red guava 100%, A_3.guddeim 100%, A_4.white guava 95% +5% concentrated pomegranate juices (CPJ), A_5. White guava 90% +10% CPJ, A_6.white guava 85% +15% CPJ, A_7.pink guava 95% +5% (CPJ), A_8. Pink guava 90%+10% CPJ, A_9.pink 85% +15% CPJ, A_{10}.guddeim 90% +10% (CPJ), A_{11}. guddeim 85% +15% CPJ, A_{12}. Gaddaim 80%+20%CPJ

Means superscript by the same letter in a column are not significant; SE: Standard error; LS: Level of significant ,*** significant at level ($P \leq 0.001$). TR .Treatment

Table 6. Panel test values of Overall accept scores Organoleptic Tests of processed juice and their blends during storage period at room temperature**.**

N	Tr	At zero time						~~After 3 month~~					
		N.A	**AC**	**G**	**V.G**	**EX**	**T**	**N.A**	**AC**	**G**	**V.G**	**EX**	**T**
1	A1	0	1	7	6	1	15	8	4	2	1	0	15
2	A2	3	4	3	2	3	15	5	5	3	0	2	15
3	A3	1	1	3	9	1	15	4	6	4	1	0	15
4	A4	1	1	3	3	7	15	2	6	1	5	1	15
5	A5	0	2	2	5	7	15	3	1	1	3	7	15
6	A6	0	1	1	3	10	15	0	2	0	1	12	15
7	A7	1	0	0	6	8	15	1	3	1	5	5	15
8	A8	0	0	0	0	15	15	0	1	0	1	13	15
9	A9	1	0	1	3	10	15	0	2	1	4	8	15
10	A10	0	0	1	4	10	15	0	3	1	3	8	15
11	A11	0	0	3	3	9	15	0	0	0	4	11	15
12	A12	0	0	0	3	12	15	0	0	0	2	13	15
Overall Mean		3.93											
SE		0.26											
LS		***											

where

A1.white guava 100%, **A2**.red guava 100%, **A3**.guddeim 100%, **A4**.white guava 95% +5% concentrated pomegranate juices (CPJ), **A5**. White guava 90% +10% CPJ, **A6**.white guava 85% +15% CPJ, **A7.**pink guava 95% +5% (CPJ), **A8**. Pink guava 90%+10% CPJ, **A9.**pink 85% +15% CPJ, **A10**.guddeim 90% +10% (CPJ), **A11**. guddeim 85% +15% CPJ, **A12**. Gaddaim 80%+20%CPJ.

Means superscript by the same letter in a column are not significant; **SE**: Standard error; **LS:** Level of significant ,*** significant at level (P≤0.001). **TR** .Treatment

Discussion

The results in this study showed that, there were differences between the blends when different levels of (pink , white) guava juice and guaddaim mixed with concentrated pomegranate juices (CPJ) stored for a period of 3 months at room temperature. Moisture content was slightly decreased in most treatments with the increase of concentrated pomegranate juices (CPJ) ratio in the blend and storage intervals. correlation in the concentration pomegranate juices (65 Brix). It recorded decreased most level prepared juices, where, the moisture content was significantly affected by the processed juice and their blends and storage period at room temperature. The pasetization plye a major role in decreasing of moisture value in most treatments. Higher moisture content after 3 month was observed to be related to mixed of white guava with CPJ at 90% white guava with 10% CPJ, and other losses noticed may be due to pasteurization and interval of storage. The minimum changes in interaction of mixed (white ,pink) guava pulp and gaddaim with CPJ was in treatment A_{10} (86.61% to 83.36%), A_9 (86.46% to 81.86%) followed A_5 (85.39 to 84.18) by during storage periods. The moisture content of the processed juice and their blends was observed to the highest moisture were in the sample $A_{10,}$ followed by A_9.Therefore the samples A_{10} was obtained the highest value .Our result was in agreement to that obtained by USDA (2012), who evaluated the national nutrient database for standard reference release. Wills *et al*. (1986) studied the composition of Australian foods and Ashaye *et al*. (2005) studied the chemical and organoleptic characterization of pawpaw and guava leathers, both observed variations in moisture content when guava was mixed with other fruits.

The ash content was significantly ($P \leq 0.05$) increased of most treatments. The increase might be due to various factors which affect the stability of ash content, these factors include storage interval, pasteurization and interaction of the sample mixtures, these factors led to affect the textures and overall appearance of blending treatments as compared to the control samples after 3 month A_1, A_2 and A_3, (0.3967 g/100 g), (0.6533 g/100 g) and (0.57 g/100 g) respectively. Between the mixtures The higher ash content was observed for the blend pink guava at ration 90% pink guava : 10% (CPJ), A_8 (2.433 g/100g to 2.17g/100g) followed by the blend 95:5 pink guava: cpj A_7(1.446 g/100g to 1.2133g/100g), whereas lower ash content after 3month were observed at pink guava juice A_9 (0.43 g/100g) . Therefore the mixed samples $A_{8,}$ A_7 gained the highest ash values. High mineral contents are sometimes used to retard the growth of certain microorganisms and can have beneficial effects on the physicochemical properties of foods (Effah-Manu *et al*., 2013). Ash content in guava was reported by (USDA, 2012) national nutrient database for standard reference, release. (Aberoumand, 2011) studied the evaluation of some phytochemical and nutrients constituents of Iranian *Cordia myxa* fruits and (mohamed *et al.*, 2014) stated that ash content of mixed guava juice affects the physicochemical, sensorial, antioxidant and volatile of juice from prickly pear with guava.

The crude fiber content was no significantly ($P \leq 0.05$) affected in all treatments. the increased for fiber content in the ration of blinding white guava 95:5 (CPJ), A_4 (1.7633g/100 g), pink guava 90:10 CPJ, A_8 (1.7633 g/100 g) and gaddaim 100% A_3 (1.25g/100 g) at zero time was observed. whereas, the lowest value at zero time observed in pink guava 85:15 CPJ A_9(0.51 g/100 g) and white guava 85:15cpj A10(0.64 g/100 g). But, after 3monthe the increment of crud fiber observed for white guava, pink guava and gaddaim A_4, A_8 and A_{12} (1.73 g/100 g to 2.0237 g/ 100 g),(1.54 g/100 g to1.7633 g/100g) and (1.35 g/100 g to 1.88 g/100 g) respectively. the interaction between the two fruits was significant affected during storage period at room temperature. The change of these blending samples might be due to the interaction of mixed both species guava pulp and gaddaim fruits with concentrated pomegranate juices. Generally crude fiber contents in the study were not changed with storage intervals. Therefore the samples A_4, A_8,A_{12} obtained the highest fiber values of the mixed treatments. These results were similar to those reported by (USDA, 2012) national nutrient database for standard reference, release and (Wills *et al.,* 1986) who evaluated the composition of Australian foods in tropical and sub-tropical fruits.

The results showed that the protein content was higher in the gaddaim fruit juice A_3 (4.04 g/100 g) and the pink guava juice A_2 (3.47 g/100 g), but protein content was significantly ($p \leq 0.05$) decreased in all blending containing high gaddaim fruit juice ratio, which might affect also the stability of the protein content. Storage intervals might contributed to conversion of crude protein to some soluble compounds which affect the average of protein content in these treatments. During the pasteurization of samples, the decrease of crude protein might be due to the low amount of protein in the gaddaim juice and how affected in all stages of manufacturing treatments. The interaction between the gaddaim juice and the decrease in protein content decreased in the processed juice and their blends as during heat treatment proteins undergo denaturation degradation and the reduction in the crude protein content. Therewith, higher protein content at zero time were observed at A_3 (4.04 g/100 g) followed by A_4 (4.1633 g /100 g), whereas after three month it observed decreased the protein content in all treatment, the highest value was recorded in the blending pink guava 90%: 10% CPJ A_8 (2.7067 g/100 g) followed by white guava 95:5 CPJ, A_4 (2.576 g/100 g). Therefore the samples A_8 and A_4 obtained the highest protein values giving a juice mixture of high nutritive value. The result of protein content of mixed guava juice was comparable with that obtained by (Chaterjee *et al.,* 1992; Sandhu and Bhatia, 1985).

Total soluble solids (T.S.S) content was significantly increased in all treatments with the increaseof concentrated pomegranate juices (CPJ) ratio in the blend. The interaction of mixed white or pink guava juice and gaddaim with CPJ had no effect at the beginning of processing, but showed variations with storage. The increase of TSS in the processed juices and their blends may be due to conversion of some polysaccharides into soluble sugars and the formation of water soluble pectin to prospecting. So at zero time reveled the higher total soluble solid at pink guava 90:10 CPJ ,white guava 95:5 CPJ and goddaim 80:20 CPJ A_8 (18.33%), A_4(16.27%) and A_{12} (15.07%) respectively. whereas, after 3 month the results was illustrated in Fig. (1) the normally total soluble solid after 3month was observed in treatment A_6 (11.6% to 15.9 %) and A_{10} (7.19% to 14.57%), there after A_6, A_{10} and A_5 was the highest value. Such types of studies were taken by (Tiwari and Deen, 2015a) who observed increased in TSS during preparation and storage of blended ready-to-serve beverage from bale and aloevera. (Bal *et al.,* 2014a) studied the evaluation of quality attributes during storage of guava nectar from different pulp and TSS ratio were increased. (Sarkar and Bulo, 2017a) observed changes in TSS while studying the standardization of blending of guava pulp with pineapple juice for preparation of Ready-To-Serve. (Kumar *et al.*, 2009) also noticed the effect of different pulp concentration and their treatment on storage of nectar.

Total acidity values as citric acid content was determined in the processed juice and their blends during storage . Generally pink ,white guava and gaddaim fruits with CPJ have closer values regarding acidity and hence at any combination between them, acidity remained unchanged even at different storage intervals. Despite of the numerical variations in acidity values between blends, still there was a slight decrease in all treatments, indicating that mixing (pink , white) guava and gaddaim with CPJ is compatible. The minimum changes in interaction when mixing white, pink guava pulp and gaddaim with CPJ was found in the treatment A_{12} (1.92 to 0.577) and A_8 (1. 63 to 0.747), The increase in acidity by zero time might be due to the accelerated degradation of sugar substances in the processed juice and their blends. the decrease of acidity after 3month might be dut to many factors. The result in this study indicated that pomegranate juices fruit contains about two times of total higher than guava and gaddaim . Therefore sugar content of blends tends to increase significantly when pomegranate juice amount increased in the blend . Similar results of total acidity increament was obtained by (Babbar *et al*., 2015) who reported, the effect of addition of hydrocolloids on the colloidal stability of *litchi* juice and its association with acidity. (Kumar *et al.*, 2008) how was called, The increase in acidity might be due to the accelerated degradation of pectin substances in nectar and the acidity content in guava nectar showed the minimum change during storage . (Sousa *et al*. 2010) also studied the storage stability of a tropical fruit including acidity. (Bal *et al*. 2014) reported that acidity was stable when studied the evaluation of quality attributes during storage of guava nectar from different pulp and TSS Ratio.

Total sugar content is very important in fruit nectar because it affects taste and flavor which are considered the most important features of quality attributes. Concentration pomegranate juices significantly increases sugar content in gaddaim blends at any combination ratio. From preparation time up to 3 months of storage, only slightl increase in the total sugars content was observed in most treatments. Generally, higher total sugars content increased with the increase of concentration pomegranate juices ration. Also, the increased in total sugars during storage interval may be due to solubilization of pulp constituents and hydrolysis of polysaccharides including pectin and starch materials. The normally total sugar content after 3month was observed in treatment A_7(11.29 mg/100g to 15.31 mg/100 g) and A_6(8.33 mg/100 g to 13.18 mg/100 g), therefor, A_7, A_6 was the highest value . Similar types of observation for total sugar of various products have been reported by (Chaudhary *et al.*, 2008) in guava nectar, (Pandey , 2004) stability of guava beverages, (Murari and Verma,1989) pulp extraction methods and quality of guava nectar, Total sugar increase in fruit blends was reported by (Elbandy *et al.*, 2010) when preparing a product of guava nectar supplemented with *Aloe Vera* gel.

Reducing sugars gradually increase with the increase of concentration pomegranate juices (CPJ) ratio in the guava and goddaim blended with (CPJ) Higher reducing sugars content recoded at zero time at A_{12} (17.31 mg/100g), followed by A_{11} (7.68 mg/100g) and lower reducing sugars were observed at A_5 (1.38 mg/100g) following by A_6 (2.58 mg/100g). but after three month, The results showed that the reducing sugar content was significantly affected by the processed juice and their blends and storage intervals. At preparation time up to 3 month of storage a slight increase in the reducing sugars content was observed in all treatments of all stage. Higher reducing sugars content after 3month were observed at A_{12} (17.31 mg/100g) followed by A_8(12.06 mg/100g). Whereas, the lowest reducing sugars content it recorded after 3 months of storage interval at A_5 (4.58 mg/100g). Thus it seems that the processed juice and their blends the reducing sugars were decreased with the increase of storage duration. The increase in reducing sugar during storage interval may be due to the conversion of sucrose to reducing sugars (glucose, fructose). The normally reducing sugar content after 3month was observed in treatment A_{12}(10.29 mg/100g to 17.31mg/100g) and A_8 (6.01mg/100g to 12.06 mg/100g), therefor, A_{12}, A_8 was the highest value. These results were agreed with the investigation reported by (Tiwari and Deen, 2015) noticed an increase in reducing sugars during the preparation and storage of blended ready-to-serve beverage from bale and *Aloe Vera*. Sarkar and Bula, (2017) have shown similar pattern when studying the standardization of blending of guava pulp with pineapple juice for preparation of Ready-To-Serve. These results were agreed with the investigation reported earlier for canned mango necta (Chakraborthy *et al*, 1991), guava nectar (Choudhary *et al*.2008), guava beverages (Harsimart and Dhawan, 2009), and guava-aonla blended beverage (Mall and Tondon, 2007)

The non-reducing sugars content of the colored juices (white and red guava and goddaim) with CPJ at zero time to 3month. There was a good correlation between the reducing sugar and pH of the juices an increment in these values lead to decrease of reducing sugar content , this may be due to hydrolysis of complex sugars to reducing sugars as a result of acid medium and or high temperature that happens during pasteurization. Higher non-reducing sugars content at zero time were observed at A_4 (10.067 mg/100 g), followed by A_8 (10.07 mg/100 g) whereas lower non-sugars content at zero time were observed at A_9 (4.09 mg/100 g).whereas, after 3 month of storage it was observed that the highest nonreducing sugars at A_8 (8.187mg/100g) whereas, the lowest non reducing sugars it recorded at A_9 (2.89 mg/100 g) followed A_{10} (3.52mg/100 g). The results showing that the non-reducing sugar content were significantly affected by the processed juices and their blends and storage period (Fig 9) From preparation time up to 3 months of storage there was a slight decrease in the non-reducing sugars content in all treatments of all samples. Throughout storage period, it revealed that the non-reducing sugar of processed juice and their blends were decreased with the increase of storage duration and this may be due to the conversion of some total sugars to reducing sugars this may be to the action of pH, temperature. However, the pattern of decrease of non-reducing sugars percent varied according to the type of treatments. The accordance of reducing sugar content after 3month was observed in treatment A_4 as (10.06 mg/100 g to 8.187 mg/100 g) and A_8(10.07 mg/100 g to 8.187 mg/100 g), therefor, A_4 and A_8 showed the highest value of reducing sugar. Similar results were reported by (Kumar *et al*., 2009) who studied the effect of different pulp concentration and their treatment on storage of guava nectar. (Tiwari and Deen, 2015) noticed the same pattern during the preparation and storage of blended ready-to-serve beverage from bale and *Aloe Vera*. (Sarkar and Bula, 2017) reported such observations when studying the standardization of blending of guava pulp with pineapple juice for preparation of Ready-To-Serve. These types of observations were also reported by (Choudhary *et al.,* 2008) in guava nectar, (Pandey 2004) in guava beverages, (Adina *et al.,* 2006) in mango nectar, (Kalra *et al.,* 1991) in mango: papaya beverage.

Ascorbic acid content is the most important quality characteristic of the processed juice and their blends because it reflects the nutritional and technological characteristics of the processed juice and their blends. Higher ascorbic acid content was observed at ($A_{8,}$ A_4 and A_{12}, as 110.85 mg/100 g, 97 mg/100 g, 84.09 mg/100 g respectively), whereas lowest ascorbic acid content was observed at A_5 (17.9 mg/100 g). Therefore the concentration of ascorbic acid content in processed juice and their blends was determined during the storage period. Mixing guava and goddaim with concentrated pomegranate juices significantly elevates the vitamin C levels in the blends. Results of ascorbic acid content were shown in (Fig.10). Higher ascorbic acid content was observed at zero time and decreases with course of. Throughout (Fig10) it revealed that the processed juices and their blends with storage period the ascorbic acid was decreased with the increase of storage duration. This reduction might be due to oxidation of ascorbic acid into dehydroascorbic acid. These losses of ascorbic acid may be attributed to the effect of processing, storage time and exposure to light. The accordance of ascorbic acid content after 3month was observed in treatment $A_{8,}$ A_4 and A_{12} (110.85 mg/100 g to 56.38 mg/100 g) , (97.07 mg/100 g to 59.22 mg/100 g) and (84.1 mg/100 g to 58.45mg/100 g), therefore, A_4 , A_8 and was the highest remaining ascorbic acid than A_{12}. Losses in vitamin C have been reported during the production of guava nectar supplemented with *Aloe Vera* gel (Elbandy *et al*., 2010). (Mohamed *et al*. 2014) observed ascorbic acid reduction when studied the physicochemical, sensorial, antioxidants and volatile substances of juice from prickly pear with guava or mandarin. (Sousa *et al*., 2010) indicated that degradation of vitamin C is eminent during the storage and stability of a tropical fruit juice. (Sarkar and Bula, 2017), showed a similar pattern upon the standardization of blending of guava pulp with pineapple juice for preparation of ready To serve. These findings also were accordance with (Choudhary *et al*.2008) and Ahmed *et al,* 1996) for guava nectar, (Pandey,2004) for guava beverages, (Das,2009) for nectar products.

Total phenolic content was increase in of the colored juices (white ,pink guava and guddeim) with increase of concentrated pomegranate juices at zero time to 3 month of storage at ambience temperature. During storage the total phenolic content decrease gradually by course of time . The highest phenolic content was observed at zero time in the treatments A_8, A_{12}, A_4 and A_7, (310.2 mg/100 mg), (307 mg/100 mg), (291.7 mg/100 mg) and (289.2 mg/100 gm) respectively. Whereas the lowest value of total phenolic content observed at 3 month by A_{12} and A_6 (176.8 mg/100g) and (181.5 mg/100mg). It also, pomegranate juice alone recorded higher content of total phenolic. The accordance of total phenolics content after 3 month was observed in treatment $A_{8,}$ A_{12} and A_4, (A_8(310.2 mg/100 g to 250 mg/100 g), (307.4 mg/100 g to 262.7 mg/100 g) and (291.7 mg/100 g to 255.2 mg/100 g), therefore, the samples A_8 , A_{12} and A_4 was the highest value of total phenolics content .The trend of our finding was similar to those found by Wrolstad *et al,* (1980), who found that the total phenolic in pasteurized strawberry juice decreased during storage at 20^{o}c for 55 days. Ibrahim (2006) stated that the total phenolic content of pasteurized and modified pH strawberry juices decreased during storage.

The anthocyanin pigment content in juices (goddaim, pink and white guava) colored with concentrated pomegranate juices it was studied as illustrated in Fig. (12) It is clear that, at zero time, the anthocyanin content decreased gradually after pasteurization, It is well known that many factors affect the stability of anthocyanin including temperature, pH, oxygen, enzymes, ascorbic acid. Total anthocyanin pigment decreased significantly through storage, which strongly dependent on storage temperature. Higher anthocyanins content observed at zero time by A_{12} (29.02 mg/100 g) followed A_9 (17.08 mg/100 g). whereas, the lowest value of anthocyanin it recorded after 3 month by A_5(0.77 mg). The maximum retain in anthocyanin of mixed (white ,pink) guava pulp and gaddaim with CPJ was observed in treatment A_{12} as (29.02 mg/100 g to 12.51 mg/100 g), followed by A_{11} (17.08 mg/100 g to 7.797 mg/100 g) during storage periods The highest values anthocyanins of the processed juice and their blends was observed in the sample A_{12} and A_{11}. Therefore the samples A_{12} was obtained the highest percentage of CPJ. throughout, Higher temperatures may be responsible for a degradation of anthocyanins as reported by (Cacace and Mazza, 2003). Wherefore, pomegranate juice alone recorded the higher anthocyanin retain, it is also clear that all juices mixed with concentrated pomegranate juice. Whereat, (Torskangerpoll and Andersen, 2005) reported that the color stability of anthocyanins depends highly on pH of the medium and anthocyanins structure. The transformation of anthocyanin pigment to other forms by enzymes (poly phenol oxidase, peroxidase, and glycosidase enzymes), oxidation light, temperature, during storage , cause color change which has a negative impact on appearance of the product (Wrolstad *et al*.,1994 and Laleh *et al*., 2006). temperature had not enough effect to preserve anthocyanin pigment during long periods. The effect may be due to the lower ability to inhibit all biological activity such as enzymes and microorganisms. The result were in accordance with the previous results reported by Perez-vicente *et al*. (2004) who found that degradation percentage of bioactive compounds (anthociyanins, ellagic acid, and other non-colored phenols) increased in pasteurized pomegranate juices during the storage. On this occasion, the color resulting of sugar degradation products have been found to be effective on accelerating anthocyanin (pomegranate pigment breakdown and enhance non-enzymatic browning during thermal processing (Cemeroglu *et al*., 1994 and Suh *et al*., 2003).

The changes in antioxidant activity of different colored juices at zero time were Determined and it was observed that the higher antioxidant activity recorded at zero time by A_{12} (180.1 mg/100 g) followed A_8 (180 mg/100 g) and A_9 (170 mg/100 g) whereas the lowest antioxidant activity recorded after three month by A_5(69 mg/100 g). Degradation of antioxidant activity of the different processed juices and their blends after 3month of storage at room temperature was recorded in all treatments. the best antioxidant activity was found in treatments A_{12}, A_8 and $A_{9.}$

Depression of the value of antioxidant activity of all treatment compared at zero time may be due to many factors such as the anthocyanin content, which well-known by their ability to form complexes due to the hydroxyl functional groups linked to the (β) ring as mentioned by (Sarma *et al* , 1997) and (Noda *et al* ; 2002) as well as the hydrolysable tannins group, mainly punicalagin , isomers , by the presence of 16 dissociable A OH groups in their structure acting not only as scavenger but also by forming metal cheaters which induced peroxidation (Gil *et al.*, ; 2000; Kulkarni *et al* ., 2007; Smyk *et al* ., 2008). Also, it was observed that, pomegranate juice and its mixtures exhibited higher antioxidants activity after 3 month of storage at ambient temperature.

Attractive color is one of the most important sensory characteristic of fruit and their products especially, juices. It also the major parameters that affect the quality of the final product. The juice prepared from concentrated pomegranate juices with the goddaim and (white, pink) guava showed a difference in color values. A_8 recorded the highest color (L^*) score at zero time were as (36.9) followed by A_1 (36.7) whereas lower color (L^*) was observed at A_9 (0.75). The L^* Value content was significantly ($p \leq 0.05$) decreased of all treatments. The decrease might be due to Storage interval, the change in color can occur due to browning of the juice, the rate of browning is affected by the storage conditions, the presence of metal ions and oxygen can also lead to browning. Fruit juices can be discolored also due to the activity of oxidative enzymes like POD. The L* value was observed to decrease with increase of storage duration. Carboxy methyl sillulose (C.M.C) acts as an emulsifying agent where the elements are metabolized, which leads to the coloration of the juice in brown Blending (white , pink) guava pulp and gaddaim with concentrated pomegranate juicse (CPJ). The minimum changes in interaction of mixed (white ,pink) guava pulp and gaddaim with CPJ was in treatment A_8 (36.9 to 7.03), followed by A_9 (36.7 to 0.75) during storage periods The L-value of the processed juice and their blends was observed to the highest color (L^*) score were in the sample $A_{8,}$ followed by A_9.Therefore the samples A_8 was obtained the highest value. Similar results have been reported by (Darvishi *et al*., 2013), (Icier *et al*., 2008; Sarkis *et al*., 2013) and (Leizerson and Eyal, 2005). The highest color (a^*) score at zero time were observed at A_8 (36.6) followed by A_9 (36.2) whereas lower color(a^*) was observed at A_4 (18.233). The a^* Value content was significantly ($P \leq 0.05$) increased of all treatments. The a* values depicts represents the extent of redness or greenness; a significant change in color a* was observed during storage interval. The maximum color a* score of the processed juice and their blends was observed in all treatments. During storage the color a* score showed increasing trend during storage, which might be due to the action of acidity which enhances the hydrolytic reaction causes browning and acid also enhances the Millard reaction and caramelization which causes more browning in product. Polyphenolic compound present in fruit pulp also reacts with enzymes to get discoloration. Mixing pink flesh guava with CPJ intensifies the red color values especially at a ratio of pink guava 90:10 CPJ A8(36.6), The red color intensity increases with storage up to 2months and started to decline gradually with the increase of CPJ ratio and storage period. Generally, the highest color (a^*) score were observed at zero time followed by 2 months of stage storage whereas lower color (a*) score recorded were observed after 3month of storage. The results revealed that the processed juice and their blendswith storage interval the color (a*) content was increased temporarily and decreased with theincrease of storage periods. The a* value of the processed juice and their blends was observed tothe highest color a* score were in the sample A_8(36.6 to 10.333) followed by A_9(36.1 to 3.167).Whereas lower color a* score after 3month recorded were observed at A_9 (3.16). Therefore the samples A_8 and A_9, obtained the highest value. Similar results have been reported by (Kalra and Tandon, 1984) for guava nectar, (Pandey, 2004) for guava beverages, (Mall and Tondon, 2007) for guava-aonla blended beverage, (Kumar *et al.*, 2008) for musambi RTS beverage.

The color b* was observed during storage interval significantly ($P \leq 0.05$) decreased in all treatments. The b* represents the extent of blueness or yellowness. The highest color (b*) score at zero time were observed at A_8 (0.700) followed by A_{12} (0.667) and A_4 (0.633), whereas lower color (b*) was observed at A_5 (0.200). but after 3month, the higher Color (b*) value contentwas observed at A_5(0.733) followed at A_8(0.700), the lowest b* value after 3month wasobserved at A_{10}(0.100). Pink flesh guava is the limiting factor for yellow color appearance whenmixed with CPJ at any combination. It seems that this color is quiet stable during storage for aperiod of 3 months. The highest color (b*) score were observed at zero time storage compared tocontrol, whereas only slight decrease in color (b*) score recorded were observed at 3 months ofstorage. The maximum color b* score of the processed juice and their blends was observed inthe treatments A_8 (0.700 to 0.700) followed by A_4 (0.633 to 0.60), the decreasing which might be due to the action of acidity which enhances the hydrolytic reaction causing browning and acid also enhances the Millard reaction and caramelization which causes more browning in product.Polyphenolic compound present in fruit pulp also reacts with enzymes to get discoloration.Therefore the samples a_8 and a_4, was obtained the highest value. similar results have beenreported by (kalra and tandon, 1984) for guava nectar, (pandey, 2004) for guava beverages,(mall and tondon, 2007) for guava-aonla blended beverage, (kumar *et al.*, 2008) for musambirts beverage.

the results showed that the color scores on organoleptic qualities were significantly ($P \leq 0.001$) affected in the processed juice and their blends during storage period at room temperature . at zero time the maximum colors scores content was observed and excellent one in the treatments ,A_6, A_{12}, 13, 13, respectively as shown in the (Table 1) below. The results showed that. The texture scores were significantly ($P \leq 0.001$) affected in the processed juice and their blends during storage intervals at room temperature , the maximum texture scores content was observed at excellent one in the treatments, A_8, A_{12},11 ,12 respectively, as shown in the (table 2) below. The results showed that .The homogeneity scores were significantly ($P \leq 0.001$) affected in the processed juice and their blends during storage intervals at room temperature. the maximum homogeneity scores content it was observed at excellent, very good and good, whereas the excellent one recorded in the treatments A_6, A_{12}, 13, 12 respectively, while at three month of storage the maximum homogeneity scores content were observed at excellent A_8, A_{12} ,7 ,13 respectively as shown in the (Table 3) below. The results showed that The flavors scores were significantly ($P \leq 0.001$) affected in the processed juice and their blends during storage intervals at room temperature., the maximum flavors scores content was observed excellent A_8 ,A_{12}, 12, 12 respectively and very good one in the treatments A_6, A_7, 7, 7 respectively, while at three month of storage the maximum flavors scores content were observed at excellent and very good one A_{12}, 13 and A_5, 9 respectively as shown in the (Table 4) below.

The results showed that the taste scores were significantly ($P \leq 0.001$) affected in the processed juice and their blends during storage intervals at room temperature . the maximum taste scores content it was observed at excellent A_6, A_8, A_{12}, 8, 9, 8 and good one observed in the treatments A_{10} , 10, respectively, while at three month of storage was observed at A12, 8 of taste scores content as shown in the (Table 5) below. The results showed that the overall accept scores was significantly ($P \leq 0.001$) affected in the processed juice and their blends during storage intervals at room temperature. The maximum overall accept scores content it was observed at excellent one in the treatments, A_8, A_{12}, 15, 12 respectively, while at three month of storage overall accept scores content was observed at excellent one also, in the treatments A_8, A_{12}, 13, 13 respectively as shown in the (Table 6) below.

CONCLUSIONS

This study was conducted to detect the effect of pasteurization temperatures and storage duration on the quality criteria of the processed juice of mixed guava and guddeim fruits juices with concentrated pomegranate juices (CPJ) . The results obtained in the present investigation concluded that better quality juice of mixed ripe (pink , white) guava pulps and guddeim with concentrated pomegranate juice (CPJ) could be prepared by using (80:20) of guddeim pulps : (CPJ) and (90:10) pink guava pulps: CPJ, mixed preparations of superior quality over other treatments were obtained. The processed juice selected could be stored sound in room condition up to 90 days without changing the physical, chemical and sensory attribute. The blend showed attractive characteristics of natural fruit juice, by its enrichment component of total soluble solids, total acidity, total sugars, high levels of ascorbic acid content, total phenolics compounds, anthocyanins, and antioxidants.

RECOMMENDATIONS

The study recommended to use the samples that have been well accepted, both organoloptically and phisico-chemically analysis in the commercial production range for what distinguishes both the pomegranate and (guddeim, pink and white guava) from the mineral and vitamins. It may also be mention that by exporting the best quality product of International Standard may earn foreign exchange that may have positives contributes in the national economy of republic of Sudan . However, further increasing the agricultural production of pomegranate fruit how that we can increase the industrial production of pomegranate juices and their blends in the Republic of Sudan due to its nutritional and economic value.

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