EVALUATION OF PHYSICO-CHEMICAL CHARACTERISTICS FOR SOME PINEAPPLE AND MANGO FRUITE COMPOTE

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Abstract
Fruits are vegetable foods that can be consumed both fresh or processed into juices, syrups, jams, fruit compotes, etc.A popular form often used for preserving fruit in cold periods, are fruit compotes. Pineapples and mango fruit are consumed fresh, cooked, juiced and also can be preserved. The aimof the study was to evaluate physicochemical characteristics (pH, total soluble solids (TSS), conductivity and viscosity) in case of some exotic fruit compotes. In the experimental part were analyzed different samples of pineapple and mango fruit compote prepared by us, simply just from fruit, with sweetener and with the addition of brown sugar. The pH was measured using a pH meter mark OP-211/2 connected with combined electrode OP-0808P according to the AOAC methods, the total soluble solids using a refractometer Abbe. Electrical conductance was determined by conductometer OK 112 and viscosity using Ubbelohde-type viscometer.

Introduction
Increasing tendency for fruits consumption worldwide and also inour country showsthe weight thatthey haveheldor holdthem inour diet. In case of fruits, not onlygood looks, nicecolororta steand aromasareconsidered to be important, but especiallytheir nutritional value,richin sugars,vitaminsand mineralsneededin the diet ofthe human body.The fruit represents the group of foods with vegetable origin, very precious from nutritional point of view, rich in carbohydrates, cellulose, minerals and organic acids, needed daily for the human body. Being sources of vitamins: A, B1, B5, C, enzymes and fiber, they should not be missing from a rational nutrition. [6].Fresh fruit represents the products of great importance in the rational diet, and for the fact that in certain periods are missing, they should be consuming preserved in various forms.The fruits are foods that can be consumed both fresh or processed (preserved) into different types of sorts like juices, syrups, jams, fruit compotes, etc. [3].A popular form often used for preserving fruit are fruit compotes. Fruit compotes are canned food prepared from whole fruit divided into a sugar syrup through thermal treatment packed and hermetically closed. Have been developed methods that do not reduce the qualities and value of fruit and the addition of sugar, pectin, or some food acids, improves taste and increases their energy value. [5].
Also the addition of sugar syrup determines a significantly improved alkalinity of the product and also allows the consumption of the product. The fruit compote is considered one of the most healthiest, very popular food in autumn and winter being found in the cuisine of many nations. Pineapple [*Ananas comosus* (L.) Merr. Family:Bromeliaceae] and Mango [*Mangifera indica*(L.) Merr. Family:Anacardiaceae] are the third most important tropical fruit in the world after Banana and Citrus. They have exceptional juiciness, vibrant tropical flavor and immense health benefits. Pineapple and mango fruit is a rich source of natural antioxidant, vitamins and minerals having good nutraceutical and medicinal value**.** [4]. Mature fruit contains 14% of sugar, a digesting protein enzyme, bromelain, and also citric and malic acid, vitamin A and B,

copper, manganese and dietary fibre. Fresh pineapple contains minerals as Calcium, Chlorine, Potassium, Phosphorus and Sodium [6].Pineapple contains considerable amount of calcium, potassium, vitamin C, carbohydrates, crude fibre, water and different minerals that is good for the digestive system and helps in maintaining ideal weight and balanced nutrition.The fruit compote is not only tasty but also very healthy because can add missing vitamins diet during the cold season and may well have other curative properties.

Experimental

The aimof the study was to assess the physicochemical characteristics pH, total soluble solids content (TSS), electrical conductivity (G) and viscosity (η) in case of some exoticpineapple and mango fruit compotes.

In the experimental part were analyzed different samples of pineapple and mango fruit compote prepared by us, simply just from fruit, with sweetener and with the addition of brown sugar. Pinneaple and mango fruit were purchased from a hypermarket in March 2016 in the city of Timisoara (Romania). pH represents a measure of the acidity or basicity of a solution. It was defined as the cologarithm of the activity of dissolved hydrogen ions (H+).The pH of the juices was measured using a pH meter mark OP-211/2 connected with combined electrode OP-0808P according to the AOAC methods.The total soluble solids (TSS)and the refractive index were obtained using the refractometry method with the Abbe refractometer corrected to the equivalent reading at 20°C (AOAC, 1995).Electrical conductance (G) was determined by conductometer OK 112 and viscosity using the Ubbelohde-type viscometer.

Results and discussion

Figures1 to 4 show the effect of the different type of fruit compote on theanalyzedphysicochemical characteristics. The fruite compote was prepared in March.

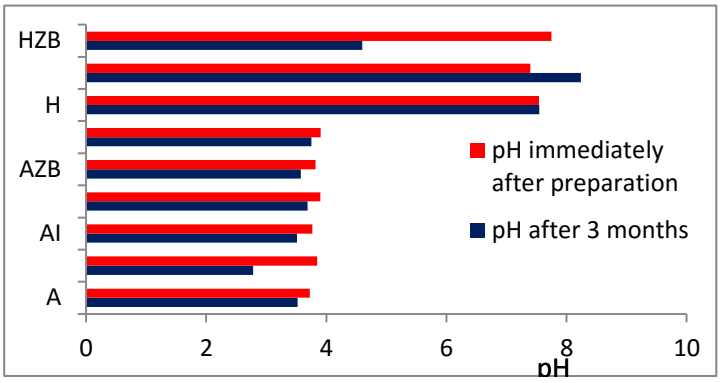

Figure 1. Determination of pH in case of different type of compote samples

From figure 1 we can see thatthevalue of pH decreases from March to June. In March the obtained data provide similar pH values,the lowest pH value was obtained forpineapple fruit compote with sweetener (3.77) and the highest value formango with brown sugar (3.91).

The lowest values of ph were obtained for the mango compote in June(2,783)and the highest value of pH is on mango with brown sugar (3,75). The pHvalue decrease from March to June and the explanation is due to the fermentationprocess. The addition of other compounds (sweetener or brown sugar) in the fruit processing help to conserve the compote caracteristics (pH) for a longer time.

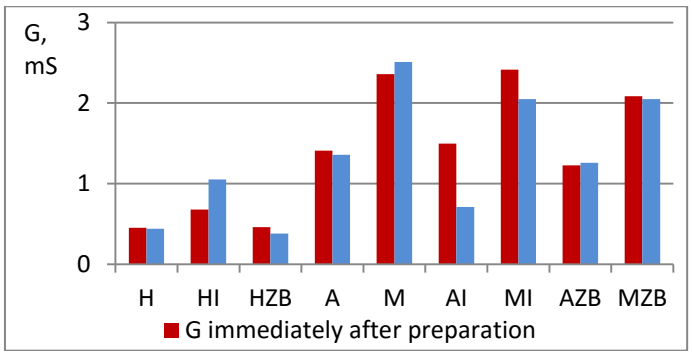

Figure 2. Determination of conductivity for different type of compote samples

In March the lowest value of the conductivity was obtained for the pinneaple fruit compote (1,41mS) and the highest value for mango with sweetener (2,41mS) while in June the lowest value was determined for the pinneaple fruit with sweetener (0,71mS) and the highest electric conductivity was obtained for mango with sweetener (2,05 mS). After 3 month the values shows that the conductivity decrease for the sweetener and brown sugar fruit compotes.

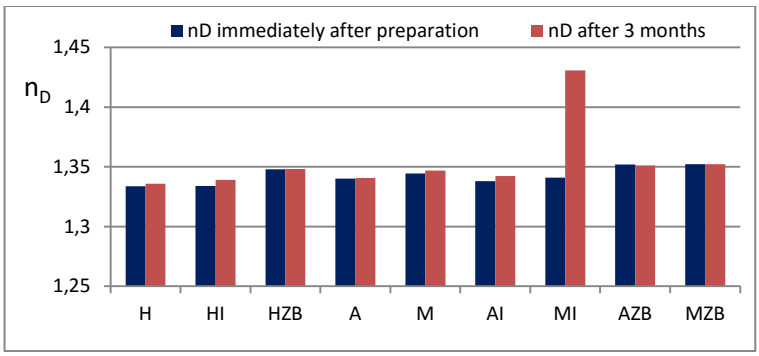

Figure 3. Determination of the refractive index for the different type of compote samples

Pineapple contains 81.2 to 86.2% moisture, and 13-19% total solids, of which sucrose, glucose and fructose are the main components [4]. Sugar (sucrose) is a carbohydrate which naturally occurs in fruits and vegetables.[2].Carbohydrates represent up to 85% of total solids where as fibre makes up for 2-3%. The refractive index of a carbohydrate solution increases with the concentration increasing. High concentration of sugar in fruit samples gives high value of refractive index and brix. TSS varies from 10% to 14% brix depending upon the stage of maturity and season [1]

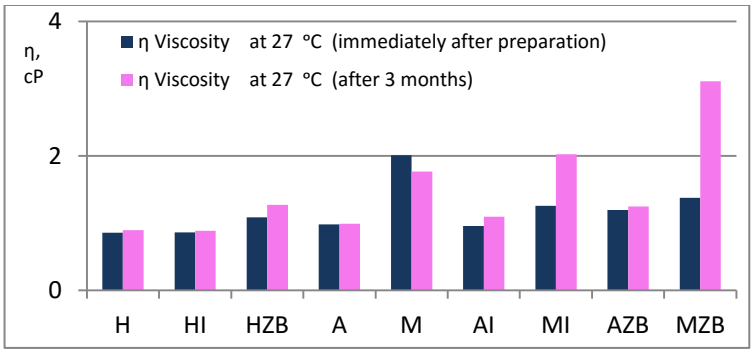

Figure 4. Determination of viscosity for different type of compote samples

The results obtained in March and June shows that the viscosity of the compote in case of sweetener and brown sugar adittion increase in this period (3 month) because of a higher level of glucides.The increasing is more visible for the mango fruit compote.

Conclusion

The addition of sweetener and brown sugar in fruit samples preserved better the fruite compote, **pH** is more stabile while electric conductivity **(G)** and refractive index **(n)**values presents small differences between samples.The viscosity increase in the samples with the sweetener and brown sugar addition, after 3 month. The effect on the viscosity is more visible on the mango compote with brown sugar followed by sweetener.

The effect of different type of fruit compote on theanalyzedphysicochemical characteristics is more significant for the pH and viscosity values.

References

[1] Cretescu Iuliana, Caprita Rodica, Munteanu Oana, Velicevici Giancarla, Duma-Copcea Anisoara, Cozma Antoanela, 2014,Determination of total soluble solid (TSS) in concentrated and diluted fruit juices by refractometric method, PROCEEDINGS of the international conference — „Horticulture in quality and culture of life „

[2] Cozma Antoanela,Petcu Mihaela, Velicevici Giancarla, Cretescu Iuliana, Evaluation of physicochemical characteristics on commercially available carrot juice and carrot juice mixed with other fruit, Journal of Horticulture, Forestry and Biotechnology, Volume 19(1), pag.158-161, 2015.

[3] Cretescu Iuliana, Petcu Mihaela, Cozma Antoanela, Velicevici Giancarla - Evaluation of physicochemical characteristics of some commercially available fruit compote, Research peopleand actual tasks on multidisciplinary sciences 24-28 June 2015, Lozenec, Bulgaria

[4]Md. Farid Hossain, Shaheen Akhtar, Mustafa Anwar - Nutritional Value and Medicinal benefits of Pineapple, International Journal of Nutrition and Food Sciences, 2015; 4(1): 84-88, Science Publishing Group

[5]Joy, P.P. 2010. Benefits and uses of pineapple. Pineapple Research Station, Kerala Agricultural University, Kerala, India[http://www.kau.edu/prsvkm/Html/BenefitsofPA.htm]

[6]Dull, G. G. 1971.The pineapple: general. In: A. C. Hulme (Ed.). The biochemistry of fruits and their products, Academic Press, New York. vol. 2: p. 303-324.