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Chemical Composition and Organoleptic Evaluation of Blended Cashew Apple Juice

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Abstract **– The experiment was conducted in the Post Harvest Department of College of Agriculture, OUAT, Bhubaneswar, Odisha in 2011-12. The raw materials i.e. the cashew apples were collected from AICRP on Cashew, Ranasinghapur, OUAT, Bhubaneswar. As cashew apple juice due to some sort of astringency is not liked by the costumer, it was planned to blend cashew apple juice with pineapple juice or with orange juice to have better acceptability for which after juice extraction the cashew apple juices were blended with pine apple or orange juice in different proportions such as 90:10, 85:15, 80:20, 75:25, 70:30, 65:35, 60:40, 55:45 and 50:50 and it was found that when cashew apple juice was blended with pine apple juice at 60:40 proportion, it was liked by the judges the most as compared to other blended combinations of pineapple and sweet orange juice.**

Keywords **– Blending, Cashew Apple, Chemical Composition, Organoleptic Evaluation.**

I. INTRODUCTION

Cashew (*Anacardium occidentale* L.) belongs to family Anacardiaceae is considered to be native of tropical America(South-East Brazil) and was originally introduced into India by Portuguese during 16 th century. It is considered as gold mine in waste land. Cashew is commercially grown for its kernel, although CNSL, cashew apple and testa are also having their own importance. Now, India has largest area under cashew and stand as the second largest producer of cashew in the world. India's share of world cashewarea is 22.5 percent(9.23 lakh hectare) and share in production is 20.74 percent(6.53 lakh tonnes).

The cashew apple is the pseudo fruit developed from the pedicel. Production of cashew apple in India is estimated to be 45 lakh tones [7]. The juice of cashew apple has innumerable medicinal property and is used to cure Scurvy, Diarrhoea, Uterine Complaints, Dropsy, Cholera and Rheumatism [9]. But the juice extracted from cashew apple cannot be consumed due to its characteristic astringent taste, which causes biting sensation of the tongue and throat. In order to decrease astringency and to prevent spoilage, it is essential to investigate a suitable method for preservation of cashew apple juice and also to blend the cheap juices with other fruit juices to increase vitamin-C content and also to increase the consumer acceptability.

II. MATERIALS AND METHODS

The experiment was conducted in the Post Harvest Department of College of Agriculture, OUAT, Bhubaneswar,Odisha in 2011-12. The raw materials i.e. the cashew apples were collected from AICRP on Cashew, Ranasinghapur, OUAT, Bhubaneswar. Bhubaneswar is situated at 20 ^{0}.15' N latitude and 85^{0}52'E longitude and an altitude of 25.5m above MSL. Here cashew plants enjoy a warm and moist climate with mild winter and hot summer. As cashew apple juice due to some sort of astringency is not liked by the costumer, it was planned to blend cashew apple juice with pineapple juice or with orange juice to have better acceptability for which after juice extraction the cashew apple juices were blended with pine apple or orange juice in different proportions such as 90:10, 85:15, 80:20, 75:25, 70:30, 65:35, 60:40, 55:45 and 50:50 and evaluated by a panel of judges to decide the best proportion for blending of juice for consumer acceptability. The determination of sensory quality on 9 point hedonic scale, i.e 9- like extremely, 8- like very much, 7- like moderately, 6- like slightly, 5- neither like nor dislike, 4- dislike slightly, 3- dislike moderately, 2- dislike very much and 1- dislike extremely and qualitative characters like TSS, total sugar percentage, reducing sugar percentage, vitamin-C (mg per 100 g), titrable acidity and pH were also estimated for both of the blended juice.

III. RESULTS AND DISCUSSION

TSS of pine apple juice is 10.45 % but when it is blended with cashew apple juice the TSS was increased and found to be highest(12.37%) under T4 (75:25). The total sugar in blended juice varied differently, which ranged from 10.28 % (55:45) to 10.60 % (90:10), which found to more than that of only pine apple juice (9.85%).

Table 1: Chemical composition of pineapple and orange juice

Characters	Kew Pineapple Juice	Orange Juice
Total Soluble solid (%)	10.45	9.2
Total sugar (%)	9.85	4.45
Reducing sugar (%)	3.28	2.30
Ascorbic acid (mg/100g)	15.6	60.7
Acidity (%)	0.89	0.5
pH	3.26	3.7

The lowest value of reducing sugar 6.23% was obtained under 50:50 blending and highest of 8.80% in 90:10 blending followed by 8.50% (85:15). The vitamin –C content of cashew apple and pine apple blended juice was better than the vitamin-C of pine apple alone. The minimum (132.01mg per 100g) vitamin-C was observed with 50:50 blending and the highest value was with 90:10

proportion (211.67 mg per 100 g). The acidity was found minimum(0.53%) under 90:10 proportion and highest(0.75%) under 50:50 proportion. The pH value as observed from the table-2 ranged from 4.06 to 4.52 in 50:50 and 90:10 proportion of blending of cashew apple and pine apple juice which was higher than that of pH of pineapple juice alone.

The TSS of orange juice alone is 9.2% but when it is blended with cashew apple juice in different proportion the range is varied between11.46% (50:50) to 11.97 (90:10). The total sugar content of blended juice was ranged from 7.60 to 10.13 percent.

Table 2: Chemical composition of cashew apple juice after blended with pine apple juice

Treatments	Proportion of cashew apple: orange	TSS (%)	Total Sugar (%)	Reducing Sugar (%)	Vitamin-C (mg/100g)	Titrable acidity(%)	pH
T_1	90:10	12.19	10.60	8.80	211.67	0.53	4.52
T_2	85:15	12.30	10.57	8.50	206.38	0.54	4.46
T_3	80:20	12.86	10.47	8.16	201.36	0.60	4.42
T_4	75:25	12.37	10.48	7.83	191.38	0.62	4.31
T_5	70:30	12.11	10.38	7.58	183.69	0.65	4.23
T_6	65:35	11.96	10.40	7.26	181.43	0.67	4.19
T_7	60:40	11.93	10.31	6.98	178.26	0.70	4.12
T_8	55:45	11.86	10.28	6.61	144.62	0.73	4.10
T_9	50:50	11.73	10.29	6.23	132.01	0.75	4.06
SEM		0.11	0.12	0.08	2.53	0.004	0.05
CD (5%)		0.34	0.35	0.22	7.53	0.013	0.15

Table 3: Chemical composition of cashew apple juice after blended with orange juice

Treatments	Proportion of cashew apple: orange	TSS (%)	Total Sugar (%)	Reducing Sugar (%)	Vitamin-C (mg/100g)	Titrable acidity(%)	pH
T_1	90:10	11.97	10.13	8.70	234.52	0.40	4.53
T_2	85:15	12.8	9.81	8.30	226.37	0.51	4.52
T_3	80:20	12.21	9.42	8.01	210.48	0.51	4.48
T_4	75:25	11.67	9.18	7.62	211.78	0.51	4.43
T_5	70:30	11.73	8.87	7.27	192.04	0.51	4.36
T_6	65:35	11.69	8.55	6.87	193.23	0.51	4.32
T_7	60:40	11.47	8.17	6.58	192.70	0.50	4.28
T_8	55:45	11.57	7.83	6.14	167.09	0.52	4.24
T_9	50:50	11.46	7.60	5.82	153.32	0.54	4.20
SEM		0.12	0.07	0.07	3.20	0.004	0.02
CD (5%)		0.34	0.22	0.21	9.51	0.011	0.06

As observed from the table-3 the highest reducing sugar of 8.70 was obtained when cashew apple juice were blended in 90:10 proportions and the minimum value of 5.28% was recorded when the blending was in the proportion of 50 : 50 and the minimum value of vitamin-C (153.32)was recorded in 50:50 proportions of blending. The minimum titrable acidity of 0.40 and the maximum value of 0.54 were obtained when the juices were blended in 90:10 and 50:50 proportions. The minimum pH value of 4.20 was recorded when cashew apple juice and orange juice were blended in 50:50 proportion and the height value of 4.53 was recorded in 90:10 proportion of blending [1], [8].

During Organoleptic evaluation it was found that 60:40 proportion of blending of cashew apple juice with pineapple juice scored 8 in Hedonic scale (like very much) followed by 8 (like very much) in 55:45 and 50:50 proportions and blended juice of cashew apple and orange in 55:45 and 50:50 proportion of blending Scored a value of 8(like very much) followed by a value of 7(like moderately) in 60:40.The blending of cashew apple juice with pine apple and sweet orange juice was tried to increase the acceptability of cashew apple juice in various proportion by taking into consideration the taste, flavor, colour, acceptability and was found that 60:40 proportion of blending with pine apple juice and 55:45 blending of orange juice scored better organoleptic test value in Hedonic scale.Even though blending at 55:45 and 50:50 proportions with pine apple juice and orange juice gave better taste but it did not produce much of difference in taste and with these proportion of blending the cost will also increasing because of high price of pineapple and orange juice.So it was found that in 60:40 blending the cost of blending was more economical in pine apple than other proportions. This type of findings of blending of cashew apple juice with other fruit juices for better acceptability had been also reported by many authors [3], [4], [5], [6]

Table 4: Sensory quality (Organoleptic) evaluation on 9 point Hedonic Scale for blended Cashew apple juice

Treatments	Prop0rtion of cashew apple: orange/ pineapple juice	Blended with pineapple juice		Blended with Orange juice	
		Scale (point)	Taste (liking)	Scale (point)	Taste (liking)
T_1	90:10	2	Dislike very much	4	Dislike slightly
T_2	85:15	3	Dislike moderately	4	Dislike slightly
T_3	80:20	4	Dislike slightly	4	Dislike slightly
T_4	75:25	4	Dislike slightly	6	Like slightly
T_5	70:30	5	Neither like nor dislike	6	Like slightly
T_6	65:35	7	Like moderately	6	Like slightly
T_7	60:40	8	Like very much	7	Like moderately
T_8	55:45	8	Like very much	8	Like very much
T_9	50:50	8	Like very much	8	Like very much

IV. CONCLUSION

From the above experiment it is concluded that blended cashew apple juice with orange and pine apple juice, increase the acceptability of cashew apple juice and nutritional quality of the blended juice was also increased along with taste and flavor [2]. The cost of production was also decreasing by using cheaper fruits like cashew apple in blends and also leads to new product development[3].

REFERENCES

[1] Ali M.,Ayub M., Alam Z., Yasser D., Javid U and Shams-UR-Rehman A., (2011). Physico chemical analysis of apple pulp from Mashaday variety during storage, Agric. And Bio. J. of North America, ISSN 2151-7517.

[2] Akinwale T.U., (2000). Cashew apple juice:its use in fortifying the nutritional quality of some tropical fruits. European food and research technology, 211 : 205-207

[3] Bharadwaj R. and Pandey S. (2011). Juice blends- A way of utilization of underutilized fruits, vegetables and spices- A review. Critical review in food science and nutrition. 51 : 563-570.

[4] Inyang U.E. and Abah U.J. (1997). Plant foods for human nutrition, The Netherland 50: 295-300.

[5] Jain S.K., Khurdioya D.S., Gaur Y.D. and Ladha, M (2003). Thermal processing of anola (*Emblica officinalis*). Juice Indian Food Packers 32 : 46-49.

[6] Khurdiya D.S. (1993) Nature and retention of anthocyanin pigment in phalsa (*Grewia subinaequalis* L.) juice. Ph.D. dissertation, IARI, New delhi.

[7] Salam M.A. and Joseph P.M. (2003) Apple and juice potential of cashew varieties. J. plantation crops, 31 : 18-22.

[8] Talasila U., Vechalapu R. and Shaik K.B. (2011). Preservation and shelf life extension of cashew apple juice. Internet J. of Food safety. 13 : 275-280.

[9] Vijayakumar P. (1991). Cashew apple utilization- a novel method to enhance the profit. The cashew. 5 : 17-21.