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EFFECT OF ENVIRONMENTAL CONDITION ON PHYSICO-CHEMICAL CHARACTER OF DIFFERENT GENOTYPE OF CARAMBOLA (AVERRHOA CARAMBOLA L.) AT GEKU IN UPPER SIANG DISTRICT ARUNACHAL PRADESH, INDIA

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Abstract: Survey was conducted at Geku on 6 carambola plants to study the effect of environment on biochemical and Physical character on selected genotypes. Based on the survey conducted the environment effect significantly on vitamin C content range from 38mg (P3) to 68mg (P1), TSS 5.03(P2)-8.53^0 brix(P1), total sugar content 3.97%(P3)-9.17% (P6) , Fruit weight range from 90.7-130.9g of carambola but on other parameter like yield, shelf life, juice content there is very less noticeable difference.

Index terms - Carambola, Genotype, Biochemical, Yield

Introduction

Carambola (*Averrhoa carambola* L.) also known as five finger fruits, star fruits and locally called Kordoi in upper siang and belong to Oxalidaceae which is native to southeast Asia. Arunachal Pradesh has rich diversity of carambola and they are confined in homestead garden (Chadha, 2013).Carambola is a short and slow growing evergreen plant and the fruits is 2-6 inches in length; is oval in shape. The fruits have five prominent longitudinal ridges resembles a star. The fruit of carambola is rich source of reducing sugar, ascorbic acid and mineral such as K,Ca, Mg and P (Haick,1952).Singh *et all.* Reported that ripe fruit pulp of carambola along with little common salt is eaten against jaundice,bleeding piles and for washing utensils. Also the crushed leaves have also been for curing chicken pox, ring worm and scabies and its root extract is used as an antidote for poisoning.

Materials and methods

The survey was conducted at Geku village,India. The geographical location is situated in 28^0 24'47''N latitude and 95^0 4'17''E longitude with the altitude 341.55 meter above main sea level and the prevailing climatic condition of Geku is sub-tropical humid with an average mean temperature of 22.3^0-24.9^0C .The maximum rainfall occur between june –september with average of 200-500 cm.

The experiment material for the investigation consists of 6 genotype of carambola having a sweet taste. The physio-chemical character of carambola were recorded based on NBPGR carambola descriptor.

Results and discussion

During the survey, it is observed that though the plant grow on same environmental condition there is variation on the fruit weight varied from 90.7 g in P6 to130.9g in P4 and the mean average value was 112 .09 g which is contrast to Narain *et all*., (2001) report on fruit weight range from 20.26g-56.32g. The fruit yield of different genotypes ranged from 95.0kg to 165.0 kg per plant per tree. The highest yield was observed on P1 (165 kg per tree per year). With regard to fruit juice the average mean value recorded was 39.89 ml. The highest fruit juice content was recorded in plant P6.

The biochemical profiling of carambola fruit showed that oxalic acid content of fruit range from 0.01% to0.35%. In this regard , Watson *et all*., (1998) reported that oxalic acid content in carambola ranged from 0.01%-0.07% in 100g.The observed data of fruit showed almost similar TSS value ranged from 5.73^0 brix P5 to 8.53^0 brix. In this regard, Watson *et all.*, (1998) reported that TSS value ranged from 5-13^0 brix. The genotype observed showed significant variation in vitamin C content ranged from 38mg/100g in P3 to 68mg/100g in P1. In this regard Lim and Lee (2013) recorded that vitamin C content of carambola was 1.56g per 100g which is contrast to present finding. Ali and Jaffar (2013) also reported that vitamin C content of carambola was 38-40.2g per 100g. The observed reveal that total sugar content of genotype varied significantly ranged from 4% to 9.17% in 100g. The highest was observed in P6. Watson *et all*., (1998) found out total sugar content of carambola range from 3.5-11% in 100g which is consonance to present finding. The shelf life of observed genotype was range from 11-14 days in room temperature.

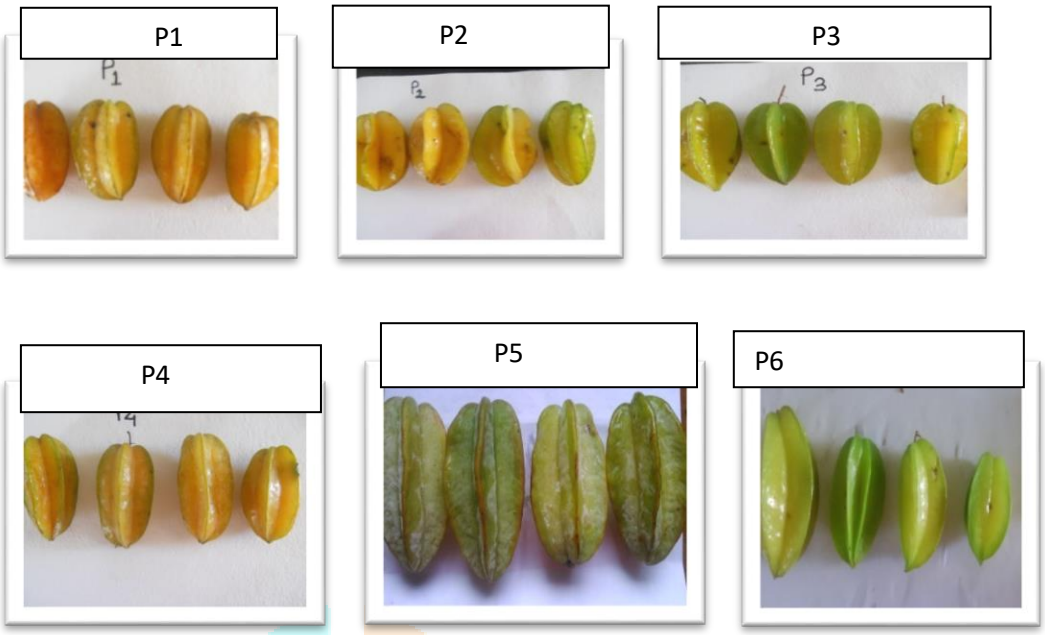
Conclusion

Base on the finding from present study, it is found that there is no noticeable effect of climatic condition on yield, fruit juice content, oxalic acid shelf life as the all selected genotype are almost in similar range result. Though all selected plant are growing on same climatic condition there is significant variation on biochemical parameter such vitamin C (68mg/100g in P1 where else P3 content 38mg/100gm), TSS (5.03% in P2 and 8.53% in P1), Fruit weight ranged from 90.7-130.9g. Hence the biochemical character of fruit is effected by environment though climatic condition was same for all selected genotypes.

Table 1. Mean value of parameter of different genotype

genotype	Fruit weight (g)	Fruit juice content per fruit (ml)	TSS (^{0}Brix)	Oxalic acid (%)	Total sugar content (%)	Vitamin C(mg/100g)	Yield in kg (per plant per year)	Shelf life in days
P1	99.7	34.67	8.53	0.35	5.97	68	165	13.6
P2	121.0	37.62	5.03	0.03	6.9	42	111.3	14
P3	118.13	34.3	6.07	0.03	3.97	38	111.0	12
P4	130.9	41.6	6.13	0.02	8.2	45	112	13.3
P5	112.9	41.6	5.73	0.03	4.0	51	112.6	13
P6	90.7	49.4	8.03	0.01	9.17	50	95.0	11
mean	112.09	39.87	6.59	0.08	6.37	49	117.82	12.82

Figure:1- Fruits of different genotypes



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Reference

1. Ali, S.H. and Jafaar, M.Y. 1992. Effect of harvest maturity on physical and chemical characteristics of carambola (Averrhoa carambola L.). New Zealand Journal of Crop and Horticultural Science. 20(2): 133-136.
2. Chadha,K.L., 2013. Carambola .In: Handbook of horticulture. Directorate of knowledge management in Agriculture ICAR publishing house, KrishiAnusandhanBhavan, Pusa New Delhi,pp.159.
3. Haick, I.1952. An Fac. FarmeOdontol Univ. Sao Paulo, 10 : 125-133.
4. Lim, Y.S. and Lee, S.T. 2013. In vitro Antioxidant Capacities of Star Fruit (Averrhoa carambola), an Underutilised Tropical Fruit. Journal of Biology. 1(1): 21-24.
5. Narain, N., Bora, P.S., Holschuh, H.J. and Vasconcelos, M.A.D. 2001. Physical and chemical composition of carambola fruit (Averrhoa carambola L.) at three different stages of maturity. Journal of Food. 3(3): 144-148.
6. Singh, S.R., Phurailatpam, A.K., Wangchu, L., Ngangbam, P. and Chanu, T.M. (2014). Traditional medicinal knowledge of underutilized minor fruits as medicine in Manipur. Int. J. Agric. Sci., 4 (8): 241-247.
7. Watson, B.J., George, A. P., Nissen, R.J. and Brown, B.I. 1988. Carambola : a star on horizon. Queensland Agricultural Journal, 114: 45-54.