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PHENOLIC DEGRADATION DURING THE RIPENING OF BITTER GOURD FRUIT (*Momordica charantia* .L)

C. Tamilmani

Department of Botany, Annamalai University, Annamalainagar - 608 002 (India)

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ABSTRACT

The bitter gourd fruits took about 8 days for their complete ripening (over ripening). The entire ripening period was divided into three periods, namely the pre-climacteric period of 3 days, the climacteric period of 1 day and the post climacteric period of 4 days. The total phenol gradually decreased while the enzyme peroxidase, polyphenoloxidase and catalase enzyme activity increased during the ripening.

Key words: Phenols, peroxidase, polyphenoloxidase, catalase.

INTRODUCTION

Phenols are the by-product of the metabolism of aromatic aminoacids (Neish, 1964) Phenolic complounds enjoy a wide distribution in the plant kingdom, and they are particularly prominent in fruits where they are important in determining colour and flavour. Naturally phenolic content decreases as the fruits mature (Williams, 1956). The level of phenolics in fruits vary widely from species to species, variety to variety, season to season and location to location. The great majority of the phenolic components found in fruits have no particular taste characteristics when tasted in low concentration in the pure form. The exception to this general rule is the sourness associated with phenolic acid, the astringency of condensed flavons and the bitterness associated with some of the citrus flavonoids (van Buren, 1970). The research presented in this communication pertains phenolic degradation in relation to oxidative enzyme activity during the ripening process of bitter gourd fruits.

MATERIALS AND METHODS

Momordica charantia was grown in the green house of the Botany Department of Annamalai University. The mature green fruits were harvested whenever required for experimental study. The unripe mature green fruits were stored in the laboratory at room temperature of 28+2°C. The fruits took 8 days for their complete ripening (over ripening). Total phenols were extracted and estimated following the method of Chandramohan et al (1973) and quantitative estimation was done based on the method of Bray and Thorpe (1954) Peroxidase and poly phenoloxidase activities were assayed by the method of kumar and Khan (1982). Catalase activity was assayed by the method of Vir and Grewal (1975).

RESULTS AND DISCUSSION

The total phenolic content gradually decreased from the pre-climacteric period to the post climacteric period of ripening both in the epicarp and endocarp. Similarly Az1z et al (1976) observed a general decline in the total phenolic content in the pulp of banana fruit during ripening the activity of peroxidase and catalase increased gradually both in the epicarp and endocarp from the pre-climacteric period to the post-climacteric period of fruit ripening. Similar increase in the activity of the enzyme catalase and perioxidase

Table - 1: Changes in the total Phenolics (T.PH) Peroxidase (PER) Poly phenoloxidase (PPO) Catalase (CA) during the Fruit ripening of *M. charantia* (epicarp and endocarp)

Age (Days)	Epcarp				Endocarp			
	(T.P)	(PER)	(PPO)	(CA)	(T.P)	(PER)	(PPO)	(CA)
1.	0.844 ± 0.05	0.522 ± 0.032	0.108 ± 0.05	0.011 ± 0.0009	0.382 ± 0.003	0.409 ± 0.028	0.093 ± 0.05	0.009 ± 0.0004
2.	0.812 ± 0.06	0.558 ± 0.033	0.203 ± 0.08	0.021 ± 0.0016	0.325 ± 0.040	0.532 ± 0.031	0.142 ± 0.07	0.014 ± 0.0001
3.	0.782 ± 0.02	0.613 ± 0.030	0.229 ± 0.03	0.063 ± 0.0044	0.294 ± 0.020	0.526 ± 0.026	0.180 ± 0.05	0.055 ± 0.0044
4.	0.694 ± 0.02	0.677 ± 0.047	0.380 ± 0.03	0.089 ± 0.0058	0.210 ± 0.010	0.598 ± 0.035	0.375 ± 0.07	0.087 ± 0.0007
5.	0.480 ± 0.02	0.763 ± 0.045	0.397 ± 0.03	0.137 ± 0.0090	0.184 ± 0.010	0.625 ± 0.030	0.381 ± 0.019	0.110 ± 0.0066
6.	0.338 ± 0.063	0.898 ± 0.044	0.404 ± 0.02	0.230 ± 0.0200	0.134 ± 0.090	0.709 ± 0.035	0.391 ± 0.011	0.166 ± 0.0083
7.	0.180 ± 0.01	0.907 ± 0.054	0.431 ± 0.01	0.251 ± 0.0175	0.084 ± 0.050	0.731 ± 0.036	0.403 ± 0.04	0.199 ± 0.0079
8.	0.096 ± 0.06	0.900 ± 0.045	0.431 ± 0.01	0.252 ± 0.0126	0.050 ± 0.030	0.732 ± 0.043	0.404 ± 0.01	0.199 ± 0.0079

have also been reported by (Rothan and Nicolas 1989). Polyphenoloxidase activity increased during the course of ripening period both in the epicarp and in the endocarp. In both the increase occurred in three phase. In the pre-climacteric and the post-climacteric periods the increase was very little, but in the climacteric period the increase was very high. The epicarp had more polyphenoloxidase activity than that of endocarp throuhout the ripening period Galeazzi et al (1981) and cano et al (1995) observed an increase in activity of the enzyme pholyphenoloxidase during ripening. In this study as the enzyme catalase peroxidase and polyphenoloxidase increased during ripening the amount of total phenol decreased (Table -1). This gives an indication that the decreased phenolic content may be due to the oxidation of phenols by the enzyme, catalase, peroxidase and polyphenoloxidase. Of the three enzyme peroxidase activity was high while catalase activity was the lowest. This shows that the peroxidase is the primary enzyme involved in the oxidation of phenol.

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