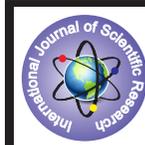


Changes in Ascorbic Acid content during development and maturity in Ber fruits (Ziziphus Mauritiana Lamk) Cvs. Mehrun Khedi, Mehrun and MPKV.



Chemistry

KEYWORDS : Ascorbic Acid , Fruit Pulp, Total Sugar, Enzyme, Maturity

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ABSTRACT

The changes in ascorbic acid content of fruit pulp were studied in ber cultivars Mehrun-Khedi, Mehrun and M.P.K.V., during growth and maturity of ber fruits at 20 days interval from 20 days after fruit set up to 120 days. The ascorbic acid content of ber fruits in all the three cultivars at different developmental stages of fruit development indicated an increasing trend up to the maturity stage. The rate of increase in ascorbic acid content was gradual up to 60 days, but after that the increase in it was rapid in Mehrun-Khedi and M.P.K.V. while in Mehrun it was slightly slowed down up to 100 days then it picked up and continued to increase till the maturity stage. This rapid increase in ascorbic acid content in the later stage of fruits growth might be associated with rapid increase in total sugars in the fruit pulp of all the three cultivars as the fruits synthesize ascorbic acid from hexose sugar precursors. This increase in ascorbic acid content of the fruit pulp in all the three cultivars may be due to decrease in enzyme ascorbic acid oxidase activity in the later stage of the development of fruits.

INTRODUCTION :

Ber (Zizyplus Mauritiana Lamk) Is one of the most ancient fruit indigenous to India. Its scattered cultivation all over India is ascribed to its hardy nature, ability to grow on poor soils and low cost of production.

There are about 125 varieties of ber grown in different parts of India. Mehrun khedi and Mehrun are the famous varieties of Maharashtra, popularity grown in Jalgaon, Dhule and Nashik districts as these varieties are, resistant to rotting by nymphs, better in taste and suitable for processing in to other products. M.P.K.V. is a wild cultivar, locally cultivated in MPAU, Rahuri. During growth and maturity of fruit, it may undergo some characteristics Physico- Chemical changes. The studies on changes in ascorbic acid content during growth and maturity in ber fruits have been made by various workers (Bal and Mann 1978; Bal and Singh 1978.C; Jawanda and Bal 1980; Bal and Chauhan 1981; Bhatia and Gupta 1985; Abbas (1997), Mahapatra et al 2012; Meena et al 2014; Ermosele et al 1991; Kalt et al 1999; LijW et al 2007; Pareek & Dhaka 2008; Bekir San et al 2009; Sunil Pareek 2013; Kadar et al 1984; Bal et al 1995; Abbas 1997; Lu et al 2012) The harvesting of fruits at right stage is of paramount importance to receive the higher premium from the produce. From available literature it has been observed that the work changes in ascorbic acid content during growth and maturity has not reported in ber cultivars Mehrun Khedi, Mehrun and M.P.K.V. As the ber fruits are quite nutritious and rich in Vit C. It is second only to guava and much higher than citrus and apple (Meena et al. 2014). Therefore in the present investigation attempts have been made to study the changes in ascorbic acid content during growth and maturity at different developmental stages right from fruit setting to maturity in ber cultivars, Mehrun-Khedi, Mehrun and M.P.K.V.

MATERIAL AND METHODS :

The present investigation on ber (Ziziphus mauritiana Lamk) var Mehrun-Khedi, Mehrun and M.P.K.V. was carried on during 2010-2011. Material used and Methods followed during the investigation are described in the succeeding paragraph.

A) Materials:

five year old plant of ber cultivars Mehrun-Khedi, Mehrun and MPKV growing in the orchards of Mahatma Phule Agricultural

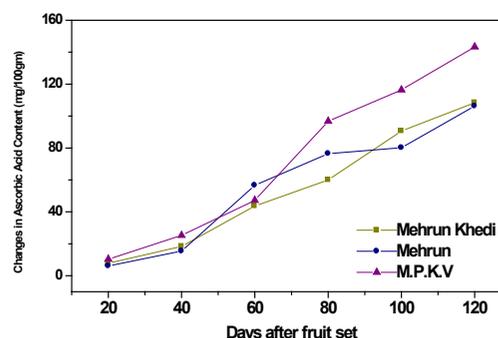
University, Rahuri (M.S) were selected for the present investigation. The fruit samples of these cultivars were collected at an interval of 20 days after fruitset and continued till the complete ripening stage was reached.

B) Methods :

The fruit samples were washed with distilled water and blotted dry before analysis. The ascorbic acid content of the fruit pulp estimated by the method of Johnson (1948)

Table 1- CHANGES IN ASCORBIC ACID CONTENT OF BER FRUITS DURING DEVELOPMENT AND MATURITY CVS MEHRUN KHEDI, MEHRUN AND M.P.K.V.

Days After Fruitset	Ascorbic Acid (mg/100gm)		
	Mehrun Khedi	Mehrun	M.P.K.V.
20	7.80	6.18	10.42
40	18.40	15.50	25.30
60	43.60	56.64	47.25
80	60.0	76.48	96.72
100	90.64	80.20	116.35
120	108.35	106.25	143.33



RESULT AND DISCUSSION:

The data in respect of Ascorbic acid content from the fruit pulp

during development and of fruits in all these three cultivars is depicted in Table -1 and Fig.1. The changes in ascorbic acid content of ber fruits in all the three cultivars at different developmental stage of fruit development indicated an increasing trend up to maturity stage. The rate of increase in it was rapid in Mehrun Khedi and M.P.K.V., While in Mehrun it was slightly slowed down up to 100 days then picked up and continued to increase till the maturity stage (120 days)

This rapid increase in ascorbic acid content in the later stage of fruit development might be associated with rapid increase in total sugars in the fruit pulp of all the three cultivars as the fruit synthesise ascorbic acid from hexose sugar precursors. The ascorbic acid content of ber fruits was initially low, and continued to increase till the fruit increase in ascorbic acid with the advancement of ripening was noticed in ber fruit and reached peak value i.e. 559 mg/100 gm on 15th day of storage (Kader et al., 1984). Bal et al. (1995) also noted the increase in vitamin C content as the maturity advanced in 'Umaran' ber fruits. Highest content of ascorbic acid was observed at 56 days after petal fall and after this period it continuously decreased up to maturity (Lu et al. 2012). A significant difference in ascorbic acid was reported by various workers. Comparatively lesser amount (250-600 mg/g fresh weight) was reported by Wu et al. (2010) whereas it was as high as 721 mg/g fresh weight at 88 days after petal fall (Lu et al., 2012). This increase in ascorbic acid content of the fruit pulp in all the three cultivars may be due to de-

crease in ascorbic acid-oxidase activity in the later stage of the growth of fruit. A similar trends of increase in ascorbic acid of the pulp during growth and maturity of ber fruit was reported by Bal and Mann(1978) in Kaithali, Bal et al. (1979) in Umran, Bal and Chauhan (1981) in Umran, Bhatia and Gupta (1985) in Gola: Kaithali and Umran, Kadam et al. (1993), Bakir San(2012) in four promising varieties. Sunil Pareek (2013), in Indian and Chinese ber, Meena et al. (2014) In Indian Ber.

CONCLUSION:

The studies of activity of enzyme ascorbic acid oxidase and proximate composition, Fraction of sugars, vitamins, carotenoids, minerals, aminoacids, volatiles etc.. of fruit is essential for better understanding the problem. Among three cultivars studied, the ascorbic acid contents at maturity was more in fruit pulp of M.P.K.V., followed by mehrun khedi and mehrun. M.P.K.V. with highest amount of ascorbic acid contents seems to be better suited for preservation purpose like ber juice, ber squash, ber syrup, ber powder, ber wine, ber truti-fruity, ber candy as well as sun drying with greater retention of vitamin C in the preserved fruits.

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