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SHORT COMMUNICATION

Studies on maturity indices of karonda (Carissa carandas L.) fruits

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Karonda (Carissa carandas L.) a member of family Apocynaceae is an indigenous fruit of Indian subcontinent. It is an underutilized evergreen thorny bush which thrives well through out Tropical and Subtropical climate (Singh and Singh, 1992) and is also found in Africa, Australia, Srilanka, Thailand, Indonesia and Malaysia mainly in wild form. In India its cultivation was initiated by the European in Kitchen garden to get fruit for jelly preparation. Karonda is known by several vernacular names such as karaunda, Karunda, garinga, krrona, timukhia and gotho in Hindi; Kurumia, Karamcha, Bainchi, Karenja and tair in Bingali; Karauanda and baronda in Marathi; Karamarda and Timbarran in Gujrati; Karamarda, Karamardaka, avinga and vrishnapakphula in Sanskrit; Kendakeri and Kerendokuli in Uriya; waaka and kalivikaya in Telgu and Kalaka and Kalapa in Tamil. It can flourish well on saline, alkaline and other waste lands on which other fruit crops do not thrives well. Karonda is best plant for live fencing that also produces fruits.

The fruit of karonda is good source of iron, calcium and pectin. Its vitamin 'C' and anthocyanin content enhances the antioxidant properties of the fruit. The fruit is used for preparation of jelly, pickle, beverages and preserve. The karonda candy is used in place of cherry in baking industries. The ripe fruit having antiascorbutic properties is reported to be cooling, acid and useful in bilious (Watt, 1972), cough, diabetes, Leprosy, anaemia and intestinal worming (Vasu, 1986). The fruit is not popular as desert because of its latex content and special astringent taste. Maturity is a stage of fruit development when fruits get its full growth (Singh *et. al.*, 1993). The stage of harvesting has significant effect on quality, shelf life and marketability of fruits. it is, therefore, need to decide maturity indices for harvesting of fruits at its right stage of maturity for different uses. Specific gravity, colour and T.S.S./ acid ratio are the criteria to determine the maturity of jamun (Ashraf, 1987) and aonla (Singh *et. al.*, 1993) fruits. Karonda is a non-climacteric underutilized fruits regarding that systematic information on harvest indices are not available so far. The present study therefore was done to formulate the maturity indices of karonda fruits.

The experiment was conducted at Department of Horticulture, N.D.University of Agriculture & Technology, Kumarganj, Faizabad, U.P. and the fruits were collected from experimental farm of the university. The study was done on Maroon and Pink with White Blush (PWB) genotypes of karonda. Four Plants of each genotype were selected randomly and one branch in each direction on each selected plants was tagged for taking the sample of the fruits. Samples were taken at 15 days intervals after fruit set. Fruit weight was recorded on physical balance and average fruit weight was calculated and expressed in g. Water displacement method was used in determination of volume and specific gravity was calculated dividing the weight of fruit by its volume.

Total Soluble Solids (T.S.S.) was estimated using Japan made ERMA hand refractometer of 0-32% range and calibrated at 20 °C. The acidity was determined by titrating a known volume of sample against 0.1 N NaOH solution using phenolphthalein as an indicator (Ranganna, 1978). The per cent T.S.S. was divided by per cent acidity to get T.S.S./Acidity ratio. The fruit colour was determined with the help of Horticultural Colour Chart (Wilson, 1938). The recorded data were statistically analysed using Complete Randomised Design.

The data recorded on the changes in fruit weight and volume during growth and development of both Maroon and PWB genotypes are presented in Table-1 which shows significant gradual increase in weight and volume of fruits up to 105 days after fruit set (DAFS) whereas changes were not significant between 105-120 DAFS. It indicates that fruit got maximum growth at 105 DAFS. Similarly significant increase in specific gravity was recorded up to 90 DAFS thereafter changes were not significant it was due to more qualitative changes in fruits after 90 DAFS. Continuous increase in T.S.S. / acid ratio was recorded in fruits of both genotypes that might be the conversion of organic acids into their salts which contribute to increase in T.S.S. and a simultaneous decrease in titrable acidity (Hawker, 1968). The colour of the fruits also changes from green to dark purple or red indicating degradation of chlorophyll and synthesis of anthocyanins when fruit proceeded to maturity and ripening. Maturity

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indices of various fruits such as mango (Singh *et al.*, 1976), jamun(Ashraf, 1987), ber (Pandey *et al.*, 1990), sapota (Paralkar *et al.*, 1987), papaya(Akamine and Goo,1971),grape (Daulta and Gupta, 1973), and Litchi (Singh and Abidi, 1986) were also determined by using the parameters of specific gravity, colour and T.S.S./ acid ratio.

The findings of present investigation indicate that maturity of karonda fruits can be considered after 105 DAFS which coincided with their natural maroon and pink with white blush colour, specific gravity of 1.02 and 1.02 and T.S.S./acidity ratio of 1.43 and 1.18 with maximum growth in Maroon and PWB genotypes, respectively. This was most appropriate stage to harvest Karonda for candy, jelly and pickles. The fruit ripened and become soft after 120 DAFS with dark purple and dark red colour having T.S.S. acid ratio of 1.74 and 1.42 in Maroon and PWB genotypes, respectively.This was the correct stage for harvesting of the fruits for squash, syrup and other beverages.

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