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ABSTRACTS

17. Exploring watermelon genotypes for lycopene and antioxidant activity

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Watermelon [*Citrullus lanatus* (Thunb.) Mansf.] is a popular dessert crop throughout the tropics and the Mediterranean regions of the world. Now, it is no longer just a summer season fruit and is becoming an everyday fruit like apples, bananas and oranges because of its antioxidant properties. Fruits contain diverse carotenoids that are responsible for the different flesh colour. Watermelon exhibits a number of flesh colour and therefore, it has different carotenoid patterns associated with different cultivars and cultivated environments. The red fleshed fruits are rich in lycopene and with a total antioxidant capacity similar to tomato. The fruits are also rich source of β -carotene, amino acid (citrulline) and phenolics. Among carotenoids, β -carotene is a precursor of vitamin A, which is needed for eye sight. Lycopene imparts red colour in watermelon and has been classified as useful antioxidant in the human diet which prevents the cardiovascular diseases as well as certain types of cancer and may protect the skin from ultraviolet light damage. The red-fleshed watermelon varieties contain high lycopene and varying amount of β -carotene. The main source of lycopene in human diet is tomato and its products in several countries. However, the red-fleshed watermelon contains more lycopene per unit fresh fruit weight than tomato and is equally bioavailable to human body.

In recent years, consumers are aware about their health due to heavy burden of noncommunicable diseases like hypertension, diabetes, cancer, cardiovascular diseases, etc. and there has been a surge demand for high quality fruits. Therefore, the investigation for antioxidant composition and content in watermelon becomes an important field of watermelon breeding for quality estimation and nutrition breeding because of its strong antioxidant properties. The information on antioxidants is very limited in watermelon cultivars grown in India. Keeping in view, this study was undertaken at CIAH, Bikaner during summer season of 2013 with the objective to identify promising genotypes of watermelon rich in antioxidants. The fruits of 10 diverse genotypes of red fleshed watermelon comprising 8 released varieties from different research institutes, one advance breeding line (AHW/BR-16) and one Indigenous Collection were analyzed for total carotenoids, lycopene and antioxidant activity. The significant difference has been recorded among the evaluated genotypes of watermelon for total carotenoids, lycopene and antioxidant activity. Total carotenoids ranged from 4.90 to 8.06mg/100g fresh weight (FW) being maximum in Asahi Yamato (8.06mg/100g FW) followed by AHW/BR-16 and Sugar Baby (6.90 and 6.65mg/100g FW, respectively). The lycopene content varied from 3.74 to 6.80mg/100g FW showing twofold variation. The cultivar Asahi Yamato had the highest lycopene (6.80mg/100g FW) closely followed by AHW/BR-16 (6.01mg/100g FW). The average antioxidant activity of different watermelon genotypes were 40.13 to 84.05 μ mol Trolox (TE)/100g FW as determined by the CUPRAC assay. Likewise, according to the results obtained, the cultivar Asahi Yamato had the strongest antioxidant activity (84.05 μ mol TE/100g FW), closely followed by AHW/BR-16 and Sugar Baby (72.98 and 66.79 μ mol TE/100g FW, respectively). The findings indicated that red fleshed genotypes of watermelon showed wide variation for total carotenoids and lycopene, which could be exploited to develop new cultivars/ hybrids rich in lycopene for nutritional security.