

Total Antioxidant Capacity of Fruit and Seeds from Normal and Enhanced Lycopene Tomato (*Lycopersicon esculentum* Mill.) Genotypes

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ABSTRACT

Elevated antioxidant content of tomato fruits is desirable for human health and nutrition. In seeds, antioxidant capacity may be also a desirable trait for increased seed storability and slower deterioration rates. This study was conducted to test whether tomato fruits from a genotype with elevated levels of natural antioxidants produce seeds with a functionally greater total antioxidant capacity. The tomato genotype 'T4099', which produces elevated levels of lycopene and ascorbic acid, and the recurrent parent 'Flora-Dade' were grown in the field and greenhouse under standard agronomic practices. Fruits and seeds were evaluated for antioxidant capacity and lycopene content. Total antioxidant capacity of the water- and lipid-soluble fractions of seeds were evaluated using the Trolox Equivalent Antioxidant Capacity (TEAC) and Photo-induced Chemiluminescence (PCL) methods. The high pigment line 'T4099' resulted in a higher fruit tissue lycopene content and total antioxidant capacity than 'Flora-Dade'. However, both TEAC and PCL methods indicated that seeds of 'T4099' had lower antioxidant capacity and that the difference was greater for water-soluble antioxidants. Based on these results it is hypothesized that tomato fruits and seeds may compete for antioxidants. Fruits with enhanced lycopene content are desirable for human consumption, yet this may produce seeds with lower antioxidant levels and influence seed dormancy or longevity in storage.

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