

Title Antioxidant activity in different fractions of commercially grown New Zealand tomatoes
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Abstract

Tomatoes have been identified as a rich source of antioxidants like lycopene and phenolics in human diet. During processing of tomatoes, and in home cooking, the skin and seeds of tomato are removed, and this may lead to a loss of antioxidants in the final product. The objective of this study was to measure the hydrophilic and lipophilic antioxidant activities and major antioxidant components in different parts of three commercially grown tomato cultivars of New Zealand. Three tomato varieties (Excell, Tradiro and Flavouring) were each separated into 3 different fractions, outer pericarp (skin), pulp and seeds (with jelly). The hydrophilic and lipophilic and antioxidant activities were determined by the ABTS.- radical decolorization assay. Lycopene content was measured using a specific extinction coefficient ($E_{1\%}^{1\text{ cm}}$) of 3450 in hexane. Total phenolics were measured using Folin-Ciocalteu method. The hydrophilic antioxidant activities in the skin, pulp, and seed fractions ranged from 3371-4280, 1543-2031, and 1465-2049 $\mu\text{M TEAC} / 100\text{g DM}$, respectively. The lipophilic antioxidant activities in the skin, pulp and seed fractions range from 311-340, 154-163, and 136-157 $\mu\text{M TEAC} / 100\text{g DM}$, respectively. Phenolic content in the skin, pulp and seed fractions ranged from 730-780, 375-464, and 415-552 mg gallic acid equivalents /100 g DM, respectively. The ascorbic acid content (mg/100 g DM) ranged from 283-328 in the outer pericarp, 169-213 in pulp and 107-156 in the seed region. The lycopene content (mg/100 g DM) was 114-178 in the outer pericarp, 58-67 in pulp, and 20-35.8 in the seed region. The available results of the study show that the outer pericarp (skin) of tomatoes contains significantly higher amount of antioxidant as compared to the pulp of tomatoes ($p < 0.01$). Both, tomato skin and seeds are potential source of antioxidants, and could be used as a value-added food ingredient in a variety of products.