

STUDY THE ANTIOXIDANT ACTIVITY OF DIETARY SUPPLEMENTS WITH POMEGRANATE

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Introduction: Nowadays, dietary supplements are a perspective area for pharmaceutical and food industries as a lot of consumers are interested in their health. A pomegranate (*Punica granatum* L.) is a rich source of polyphenols that have a high potential of antioxidant medicine. The arils of pomegranate contain anthocyanins, catechins, flavonoids and derivatives of ellagic and organic acids. Comparing with arils, the peel contains hydrolyzed ellagotannins, significant higher amount of catechins, phenolic acids, but unlike arils the peel is not contain any anthocyanins.

Aim: Determine antioxidant activity of dietary supplements with pomegranate.

Methods: Three dietary supplements with pomegranate of different United States America (USA) manufactures in the dosage form of tablets were purchased for analysis: "Extract of pomegranate" manufactured by "Source Naturals", "Puritan Pride", "Vitacost". Antioxidant activity of analyzed extracts were performed by potentiometric method. A 2 mmol/L solution of $K_3[Fe(CN)_6]$ was prepared by weighing 0.8232 g into a 25.0 mL volumetric flask, dissolving a compound in a distilled water and filling the flask to volume with the same solvent. A 0.02 mmol/L of $K_4[Fe(CN)_6]$ was prepared by weighing 0.0921 g into a 250.0 mL volumetric flask, dissolving a compound in a distilled water and filling the flask to volume with the same solvent. Than a 5.00 mL aliquot of both prepared solutions was taken and transferred into a 250.0 mL volumetric flask and made up to the mark by 0.067 mol/L phosphate buffer solution. A 50.00 mL of prepared mediator solution was transferred in an electrochemical cell. The initial potential of mediator solution was measured after initial one was established, a 1.00 mL of aliquot of the prepared solutions was added and a final potential was measured. The difference (ΔE) between the initial (E_0) and final (E_1) potentials was found. Antioxidant activity was calculated according to the following equation and expressed as mmol-eqv./ m_{extr} :

$$AOA = \frac{C_{ox} - \alpha \cdot C_{red}}{1 + \alpha} \cdot K_{dil} \cdot 10^3 \cdot m_{extract},$$

where, ΔE – change of potential; $F = 96485.33$ C/mol; $R = 8.314$ J/molK; $T = 298$ K; $n = 1$ (number of electrons); K_{dil} – dilution coefficient, mL; $m_{extract}$ – extract mass in tablet, g; $\alpha = C_{ox}/C_{red} \times 10^{(\Delta E - E_{ethanol})nF/2.3RT}$; $E_{ethanol} = 0.0546 \cdot C_{\%} - 0.0091$; $C_{\%}$ – ethanol concentration; C_{ox} – $K_3[Fe(CN)_6]$ concentration, mol/L; C_{red} – $K_4[Fe(CN)_6]$ concentration, mol/L.

Results: According to obtain results, dietary supplement manufactured by Source Naturals demonstrated the highest level of antioxidant activity (266.11 ± 5.32 mmol-eqv./ m_{extr}), followed by dietary supplement manufactured by Puritans Pride (212.12 ± 4.24 mmol-eqv./ m_{extr}), and the lowest level of antioxidant activity had dietary supplement manufactured by Vitacost (150.81 ± 3.02 mmol-eqv./ m_{extr}).

Conclusions: Dietary supplements with pomegranate possess sufficiently high level of antioxidant activity and can be used as an antioxidant dietary supplements.