

## DISTRIBUTION OF TRACE ELEMENTS AND MINERALS IN PULP AND PEEL OF APPLES AND OF PERSIMMONS

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The nutritional importance of elements is under increasing interest due to their influence on several biochemical reactions e.g. antioxidant processes. For this preliminary study two popular kinds of fruit from Israel (persimmons) and Poland (apples) were selected and 10 trace elements and minerals were analyzed.

Fruits were purchased at fruit market: persimmons (*Diospyros Kaki Thunb*) in Jerusalem (1997), apples (*Malus sylvestris* Mill. var *Lobo*) in Kraków (Poland, 1998).

Fruits were washed in distilled water, then peeled. Samples (separately, pulp and peel) were lyophilized. The samples ca. 0.8 g of lyophilized fruits were mineralized in a microwave oven MDS 2000 (CEM) with addition of 5 ml of conc. nitric acid (suprapure, Merck).

The concentration of elements were estimated with atomic absorption spectrometer (Perkin Elmer 5100 ZL), using the flame method for Cu, Zn, Fe, Na, K, Mg, Ca and a flameless one for Mn, Pb, Cd.

The mean concentrations of elements in whole fresh fruits and the ratio of their content in peel to pulp (given in parentheses) were as follows:

- persimmons:

Mn 107(2.7), Zn 13.9(4.1), Cu 9.76(4.6), Fe 101(3.7), Pb 0.32(12), Cd 0.13(3.1) in ug/100g

Na 4.91(0.9), K 254(1.1), Mg 8.22(1.7), Ca 9.35(4.6) in mg/100 g

- apples:

Mn 30.7(2.9), Zn 18.1(2.3), Cu 24.0(2.3), Fe 94.3(4.5), Pb 0.72(9.0), Cd 0.20(2.9) in ug/100 g

Na 0.59(0.8), K 81.9(1.4), Mg 5.02(3.3), Ca 4.28(2.6) in mg/100 g

The values of the elements content obtained for the whole fruit were in agreement with tabulated data (Scherz and Senser, 1994). There were no significant differences between element contents in persimmons and apples except for Mn, K and Na, for which higher contents were found in persimmons. The peel to pulp element ratios were generally similar in both kinds of fruit investigated and were ca. 1 for mono-valent metals (Na and K) and 2-4 for bivalent metals. For toxic metals this ratio was 3.0-3.1 for Cd; that is, the same as for bivalent metals, whereas it was significantly higher (9.0-12) for Pb. This suggests that in both kind of fruits from two different countries an additional contamination with lead (e.g. from traffic) occurred during the final stages of growing, picking, transportation and/or trade.