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Quantitative and qualitative differences of phenolic compounds in apples grown in different geographical regions

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The objective of this study was to evaluate phenolic compounds quantitative composition in apple fruits grown in different geographical region. In the study were investigated biological replicates of apples (cv. 'Ligol') grown in Lithuania, Latvia, Poland and Estonia. There were performed 3 biological replicates, one of each contained 10 apples. Samples of lyophilised apple fruits were extracted with 70% ethanol (v/v) for 20 min at 40°C temperature using ultrasonic bath. The ethanol extracts of apple fruits were analyzed by the HPLC method [1].

The study found that the geographical location of apple-trees had an impact on the composition of phenolic compounds in apples. The amount of quercetin glycosides varied from 314.78±9.47 µg/g (Poland) to 648.17±5.61 µg/g (Estonia). The same trend was also observed with flavan-3-ols (from 829.56±47.17 µg/g to 2300.85±35.49 µg/g), phloridzin (from 55.29±1.7 µg/g to 208.78±0.35 µg/g), and chlorogenic acid (from 501.39±28.84 µg/g to 1704.35±22.65 µg/g). It was observed that the amount of investigated phenolic compounds tended to increase from apples grown in the southern location (Poland) (1701.02±75.38 µg/g) to apples grown northern location (Estonia) (4862.15±56.37 µg/g). Apples (cv. 'Ligol') grown in Estonia accumulated approx. 2.86 times higher amount of phenolic compounds than apples grown in Poland.

In conclusion, the geographic region has meaningful influence on variance of quantitative composition of phenolic compounds.

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References

[1] Liaudanskas M et al. *J Chem.* 2014; 2014.