

# Abstract

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Title of Diploma Thesis: Monitoring the profile of phenolic substances in different parts of apple trees by HPLC

This diploma thesis covers the performance of a quantitative analysis of phenolic compounds in ten different cultivars in *Malus*. Specifically, the presence of phloridzin, phloretin, rutin, quercitrin and chlorogenic acid was monitored. Extracts of buds, flowers, leaves and bark in each species were analyzed during the four different vegetation periods. Further, the presence of phenolic compounds in samples of wood chips and fruits was monitored. The determined analytes displayed a different content profile depending on the plant material, apple cultivar and the period in which they were collected. Except for fruits, phloridzin was the dominant component in all varieties and in all materials. The highest total concentration of phenolic compounds was found in the leaves in the spring March-April 2020 in species 'Rubinstep'.

This diploma thesis used a developed and validated HPLC-DAD method for a large number of extracts. A YMC-Triart C18 ExRS column (150 × 4.6 mm × 5 μm, 8 nm) was chosen to separate the individual analytes. The gradient elution was used. The mobile phase consisted of the organic part of acetonitrile and the water part consisted of the phosphoric acid. The detection was performed using a DAD detector at wavelengths 280 nm, 327 nm and 354 nm. The temperature of the column oven was 30 °C, injection volume was 1 μl and flow rate of mobile phase was 1 ml/min.

The theoretical part includes studies of the pharmacological effect of phlorizin on various chronic diseases. Dietary supplements with a beneficial effect based on phloridzin and other compounds are mentioned.