HPLC-MS/MS Investigation and Extraction Optimization of Beech (Fagus Sylvatica L.) Bark Polyphenols

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INTRODUCTION
Beech is a widely used material in wood industry with several application fields [1]. During the processing of beech logs, considerable amount of bark waste is produced which is difficult to utilize. However, the bark tissues of trees can be a rich source of extracts, mainly of extra-cellular solubles. Using appropriate clean-up methods these compounds could be extracted and utilized for industrial applications (e.g. food antioxidants, wood preservatives, nutrition supplements, etc.). The aim of the present research was the HPLC-MS/MS assessment of beech bark polyphenols, as high-performance separation and multivariate MS characterization of these compounds was carried out yet. Using –ESI ionization with a triple quadrupole/linear ion trap hybrid MS detector (-) catechin, (-) epicatechin, quercetin-O-hexoside, kaempferol-O-hexoside [3], kaempferol-O-gentiocides [4], B-type (B) and C-type (C) proanthocyanidines, as well as other compounds with defined m/z values and MS/MS spectra, yet up to now unresolved structures have been identified. The comparison of different extraction methods (stirring, sonication, microwave assisted extraction) using different solvents (water, 4:1 methanol/water, 4:1 ethanol/water) and time/temperature schedules was also carried out in order to investigate optimum extraction efficiency. Methods were compared basing on total phenol contents (Folin-Ciocalteau) and MRR peak areas of the identified compounds.

FUTURE INVESTIGATIONS will focus on the assessment of antioxidant capacity (DPPH, ABTS, FRAP) of the extracts and finding connections between AO values and the relative concentrations of individual compounds.

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REFERENCES