

## Abstract

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Title of diploma thesis: Sulfates as phase II metabolites of natural phenolic compounds

Natural monophenolic compounds, which both occur in plants and are formed during gut microbiota metabolism of polyphenols, are absorbed and pass through phase II metabolism. This results in the formation of various conjugated metabolites, such as sulfates, whose biological activity was not studied as yet. This work focused on the preparation and isolation of pure sulfated metabolites of phenolic compounds, namely 4-methylcatechol, protocatechuic, homoprotocatechuic, and 2,3,4-trihydroxybenzoic acid, and phloroglucinol, using the aryl sulphotransferase from *Desulfitobacterium hafniense*. As a result, two sulfated products of sufficient purity were prepared, namely 4-methylcatechol-*O*-sulfate (an inseparable mixture of 4-methylcatechol-2-*O*-sulfate and 4-methylcatechol-1-*O*-sulfate) and phloroglucinol-*O*-sulfate. Their antioxidant activity was evaluated and compared with the activity of the parent compounds using the following six *in vitro* tests: DPPH (1-diphenyl-2-picrylhydrazyl) and ABTS (2,2'-azinobis-(3-ethylbenzothiazoline-6-sulfonic acid)) radical scavenging, ability to reduce Folin-Ciocalteu reagent, ferric and copper ions, and the ability to inhibit the lipoperoxidation of rat liver microsomes damaged by *tert*-butylhydroperoxide. Sulfation of phenolic compounds led mostly to the loss of their antioxidant activity. The sulfated products were characterized by HPLC, MS and NMR analyses.