ABSTRACT

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Title of Thesis **Production of phenylpropanoids in the plant explantat culture**

The aim of this Thesis was to monitor the effect on the production of phenylpropanoids after the application of the biosynthesis precursors by the plant culture *in vitro*. It was examined the effect of a 6, 24, 48, 72 and 168-hour exposure of the phenylalanine and cinnamic acid on the production of flavonoids and isoflavonoids in the suspension and calus culture *Trifolium pratense* L. (variety DO-8). The concentration of 10 mmol.l^{-1} of both precursors was chosen on the basis of the previous experiments. This culture was cultivated on the Gamborg medium with an addition of 2 mg.l^{-1} 2,4-dichlorophenoxyacetic acid and 2 mg.l^{-1} 6- benzylaminopurine, at the temperature of 25 ^{o}C and 16 hour light / 8 hour dark period.

The maximal content of the flavonoids detected by the photometric determination according to Pharmacopoeia Bohemica 2009 was demonstrated in the suspension culture *Trifolium pratense* L. (0.262 %) after the 72-hour exposure of the phenylalanine of the 10 mmol.l^{-1} concentration and in the calus culture *Trifolium pratense* L. (0.161 %) after 24-hours exposure of the phenylalanine of the 10 mmol.l^{-1} concentration.

The maximal content of isoflavonoids detected by a HPLC metod was demonstrated in suspension and calus culture *Trifolium pratense* L. of genistin after 72 and 24-hour exposure of the phenylalanin of the 10 mmol.l^{-1} concentration (both 0.11 %).