Abstract
Production of hypericine in explantate cultures of Hypericum perforatum
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Key words: St. John’s Wort, precursors, hypericine, flavonoids, acetate, cinnamic acid, cinnamate, tyrosine, shikimic acid
The goal of this work was to affect the production of hypericin (naphto-dianthrone), hyperoside and quercitrin (flavonoids) in the suspensional Hypericum perforatum explantate cell cultures. The method of precursor feeding was used. The precursors of naphtodianthrones and flavonoids were added into the medium in final concentrations 10 mg.l-1, 50 mg.l-1 and 100 mg.l-1. Samples were taken after 72 and 168 hours after adding the precursor. Potassium acetate, cinnamic acid, sodium cinnamate, tyrosine and shikimic acid were used as precursors. Cultures were cultivated on the Murashige and Skoog medium with the addition of the growth stimulator α-NAA. Concentration of hypericin, hyperosid and quercitrin was measured by HPLC analysis.
The highest influence on the production of hypericin in cultures was detected after adding of tyrosine. The concetration of hypericin in cells raised in this experiment from 0,003% (control culture) to 0,03% (culture with tyrosine concentration of 100 mg.l-1). This concentration of hypericin was detected in the culture after 72 hours. The highest influence on the production of hyperoside in cultures was found after adding of cinnamate. The concentration of hyperoside in cells raised in this experiment from 0,002% (control culture) to 0,048% (culture with tyrosine concentration 100 mg.l-1) after 168 hours of cultivation. Positive influence on the hyperoside concentration was also detected in cultures with shikimic acid. Adding of acetate and cinnamic acid had not positive influence on concentrations of hypericin and hyperoside.