

Abstract (EN)

This work is dealing with study of fungal strain RJ0258 (*Geosmithia* sp.9) which was previously found to be the producer of secondary metabolites with antimicrobial activity. Production of secondary metabolites is significantly dependent on the conditions of cultivation and the subsequent gaining of these metabolites depends on the extraction method as well. This thesis involves the optimization of the cultivation conditions for fungal culture to ensure maximum production of substances with antimicrobial activity, the subsequent treatment of the fermentation medium, the extraction procedure focused on biologically active substances and finally the chromatographic separation.

The most suitable design of the fermentation broth was chosen based on the tests - Malt extract agar medium (MEA – 100 ml, malt extract – 2 g, glucose – 2 g, pepton 0,1 g, pH adjusted to 5-6). Moreover, it was found out, that the optimal time of cultivation is 11 days, because, according to the test of biological activity, there is the highest production of secondary metabolites with antimicrobial activity. Following cultivation, the fermentation medium was extracted liquid-liquid extraction employing solution of 5% acetic acid in ethyl acetate. After evaporation and dissolution of the extract the obtained extract was analyzed by UPLC-DAD-TOF-MS. Separation was carried out on Acquity UPLC BEH C18 column under linear gradient elution program with mobile phase (A) 0.1 % aqueous formic acid and (B) acetonitrile. UPLC enables due to its high efficiency the separation of high amount of secondary metabolites in difficult matrix, the employment of both DAD and mass spectrometric detection provide, moreover, a lot of important spectral characteristic of the present substances. The antimicrobial activity of the extracts was tested using Kirby-Bauer disc diffusion test with *Kocuria rhizophila* as indicating organism.

Key words: fungi of the genus *Geosmithia*, SPE, LLE, UPLC-DAD-TOF-MS

Subject heading: study of bioactive secondary metabolites produced by fungi, searching for new antibiotics, new antibiotics from natural resources, bioassay tests