Abstract
Arsenic is an element which belongs to metaloids. Contamination with arsenic is a problem all over the world. Basically it is a part of Earth's crust, but with anthropogenic activities it could overspread into soil, water and air in large scale a thus it could mean health hazard. Fytoremediation is kind of environment decontamination, which is quite effective and cheap as well. Publications about arsenic and its influence on plant metabolism are mostly focused on important crop plants like rice. Rice is mostly used for experiments and questions on anatomical and morphological changes are widely being solved by these experiments, but it has only insignificant relevance for fytoremediation. There are only few publications about arsenic influence on carbohydrate metabolism, thus little is known about this problem. That is why I have decided to study this topic more deeply and get more information about carbohydrate metabolic changes under influence of arsenic and partly also under influence of mercury, because information about influence of mercury are completely lacking. My experimental material includes tobacco plant, tobacco tissue cultures and horseradish hairy roots cultures. Accumulation of starch and soluble carbohydrate spectrum and content was determined by HPLC. Furthermore arsenic influence on culture growth and cell viability has been followed up I have also carried out greenhouse experiments where carbohydrate contents in tobacco plants grown in substrate treated with arsenic or mercury solutions, or plants grown in substrates from two different locations with heavy metals contamination, have been analysed . When exposed to arsenic or mercury, most plants and plant cultures in my experiments exhibited growth changes as well as changes in carbohydrate content and particular carbohydrate proportion in a spectrum with characteristic features for individual culture types.
Key words: arsenic, carbohydrate, tissue cultures, tobaco, hairy roots