3.2. Abstract
Soil contamination by heavy metals represents rather serious environmental problem for both human health and an environment itself. One of the perspective technologies dealing with this threat that only recently has been intensely developed is phytoremediation by means of short rotation coppice plantations. As plants used in this technology (mostly poplars and willows) host two major groups of mycorrhizal fungi substantially influencing plant physiology it is important to study plant-mycobiontheavy
metals interactions rather than just plant-heavy metals interactions. The present thesis aimed to contribute to the growing knowledge of the field by search for suitable mycobionts of poplar or willow tolerant to heavy metals, by evaluating an activity of the key antioxidative enzyme in selected mycobionts and by looking at physiological responses of plant hosts to their mycobionts in a soil polluted by heavy metals. The first experiment in vitro focused on screening of morphometric criteria of fungi growing on solid growth media amended with mixture of heavy metals. Based on the results, several tolerant ectomycorrhizal strains were chosen for the next inoculation of fast growing trees serving phytoextraction and phytostabilisation strategies. The second, re-synthetic experiment was conducted in petri dishes serving as reservoir for plant roots with mycorrhiza with willows and poplars to study their plant –fungal interactions under the effect of heavy metals focused towards plant metal tolerance and uptake. Performed analyses showed that strains differed in the ability do accumulate heavy metals and partly also in their defence against oxidative stress. The present thesis also demonstrates mycobiont-specific physiological and morphometrical responses of the examined plant hosts. Thus, the present thesis underlines neccessity of detailed testing of host-mycobiont combinations in order to achive demanded output.