# Abstract

Arsenic in its various forms is one of the most toxic environmental contaminants, which is also taken up by plants and can affect their vitality. The risk category is crops where As contamination reduces the overall yield and through which As enters the food chain. Its inorganic (arsenite and arsenate) and organic (methylated) forms are taken up by roots and rhizomes, where they can either accumulate or be translocated and subsequently stored in shoots. Arsenate reductase is an enzyme that catalyses the reduction of arsenate to arsenite, thereby affecting not only the overall toxicity of As in the plant, but also its transport between underground and aboveground organs. However, the interplay of the different mechanisms of As uptake, translocation and detoxification has not been investigated in detail. The aim of this bachelor thesis was to analyze and compare the importance of arsenate reductase in these processes in the model organism *Arabidopsis thaliana*, in a rice crop and in the arsenic hyperaccumulator *Pteris vittata*. The different tolerance of these organisms to As and their differences in the preferential site of As deposition in leaves or seeds could be used for different purposes, such as in the phytoremediation of As-contaminated soils, or in limiting the uptake or translocation of As to edible parts of plants.
This is why a more detailed identification and interconnection of the different players involved in uptake, translocation and detoxification has the potential to provide more possibilities in breeding crops resistant to elevated As concentrations in the environment.



# Key words

Arsenic, Arsenate reductase, Uptake, Translocation, Detoxification, Arabidopsis, Rice, Pteris