HYPERACCUMULATORS – THEIR CHARACTERISTICS, RESEARCH AND PRACTICAL IMPORTANCE

Environmental contamination with trace elements (both metals and non-metals), mainly of anthropogenic origin, is one of the most challenging contemporary global problems. Toxic amounts of elements in different environmental compartments may pose a threat for many years. On the other hand, there is an increasing demand for metals, particularly those used in new technologies. A sustainable use of non-renewable resources is one of the priorities of the global economy. Modern biotechnological methods could help to ameliorate these problems through application of metallophytes in the process of phytoremediation and phytoextraction. Hyperaccumulating plants are species showing the highest potential for taking up and storage of abnormal concentrations of trace elements in their green parts. Hyperaccumulators are mostly endemic plants, occurring both in tropical and temperate climate zones. Their efficiency for accumulation of trace elements is affected by many factors such as the rate of biomass production. However, most of the known hyperaccumulators do not meet the criteria of an ideal hyperaccumulator, some of the species are able to show accumulative properties only under specific conditions. There is a need to find new accumulating plant species. Aside from their application in phytoremediation, hyperaccumulators are also used in phytomining (as a source of metals of economic value) and in nanotechnology (in synthesis of nanomaterials). These features make hyperaccumulators very interesting subject of basic and applied research.