



Genotypic variation in the accumulation of rare earth element (REE) in *Phalaris arundinacea* L. (reed canary grass)

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Rare earth elements (REEs) represent a number of economically valuable elements whose increasing demand is closely associated with rapidly growing high-tech sectors such as high-tech electronics and "green energy technologies". In soils REEs are actually not rare but occur widespread with concentrations comparable to some essential plant nutrients (e.g. Zn). Thus, a promising chance to improve supply of these resources could be phytomining. The aim of the present study is to explore effects of genotype and selected soil properties (organic matter content, pH) on the accumulation of REEs in plants of *Phalaris arundinacea*. In a field experiment 12 different genotypes and 15 populations of *Phalaris arundinacea* were cultivated on four substrates with differing organic matter contents and pH-values in order to distinguish effects of genotype and soil properties. On each of the substrates each genotype was cultivated on plots (4 m² each) with three replications. After harvest REE-concentrations in the shoots were measured by means of ICP-MS. High contents of organic matter and low pH significantly increased the REE-concentrations in all plants showing a strong impact of soil properties on REE-availability. However, considering all substrates we found substantial genotypic variation in the accumulation of REEs in shoots of the plants. REE-concentrations of shoots correlated significantly with those of Fe suggesting relationships between REEs and Fe during nutrient acquisition in the rhizosphere of the genotypes. These studies have been carried out in the framework of the Phalaris II project (Grant number FKZ 220 18913, financed by the Federal Ministry of Food and Agriculture, Germany). The authors are grateful to students and laboratory assistants contributing in the field work and sample preparation.