

Phytoremediation with Transgenic Trees

Andreas D. Peuke* and Heinz Rennenberg

Institut für Forstbotanik und Baumphysiologie, Professur für Baumphysiologie, Georges-Köhler-Allee, Geb. 053/054, D-79110 Freiburg im Breisgau, Germany. Fax: 49-761-2038302. E-mail: AD_Peuke@web.de

* Author for correspondence and reprint requests

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In the present paper actual trends in the use of transgenic trees for phytoremediation of contaminated soils are reviewed. In this context a current field trial in which transgenic poplars with enhanced GSH synthesis and hence elevated capacity for phytochelatin production are compared with wildtype plants for the removal of heavy metals at different levels of contamination and under different climatic conditions. The studies are carried out with grey poplar (*Populus tremula* x *P. alba*), wildtype plants and plants overexpressing the gene for γ -glutamylcysteine synthetase (*gshI*) from *E. coli* in the cytosol. The expression of this gene in poplar leads to two- to four-fold enhanced GSH concentrations in the leaves. In greenhouse experiments under controlled conditions these transgenic poplars showed a high potential for uptake and detoxification of heavy metals and pesticides. This capacity is evaluated in field experiments. Further aims of the project are to elucidate (a) the stability of the transgene under field conditions and (b) the possibility of horizontal gene transfer to microorganisms in the rhizosphere. The results will help to assess the biosafety risk of the use of transgenic poplar for phytoremediation of soils.

Key words: Phytoremediation, Transgenic Trees, Poplar