



Growth and physiological alterations related to root specific gene function of LrERF061-OE in *Glycyrrhiza uralensis* Fisch. hairy root clones under cadmium stress

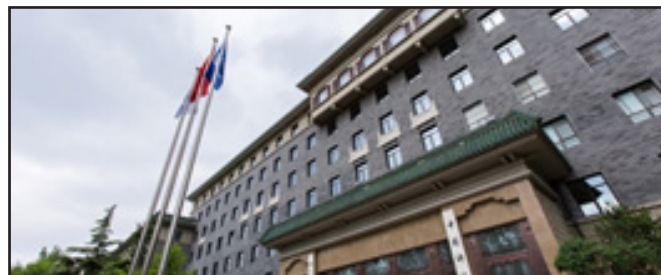
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Abstract:

Abiotic stresses particularly heavy metals are a threat to living organisms including plants. It activates ethylene biosynthesis and finally stimulation of reactive oxygen species (ROS) gene expression that enhances stress tolerance. Identification and functional analysis of such stress related genes is very important to increase the stress tolerance of valuable plants against heavy metals. Ethylene responsive factor ERF061 belongs to transcription factors family ERF, controls plant growth and ontogenesis as well as regulate abiotic stress in model plant species. Therefore, in this study, we examined tolerant function of LrERF061 over-expression vector on growth and physiology of *Glycyrrhiza uralensis* hairy roots under cadmium (Cd) stress. Effect of different Cd concentrations (0, 25, 50, 75, 100 mg/L) on growth and physiology of LrERF061-OE hairy roots (LrE-HR) and control hairy roots (LrC-HR) of *G. uralensis* was measured. Initially at low cadmium concentration there was stimulating effect of Cd on LrE-HR and LrC-HR of *G. uralensis*. While at high cadmium doses growth of LrC-HR were retarded as compared to LrE-HR. Intriguingly, significant increase was observed in relative expression level of LrERF061-OE in LrE-HR at 100 mg/L Cd concentration. According to results LrE-HR showed maximum Cd uptake (81 mg/g) at high Cd concentrations compared to LrC-HR (11 mg/g). The antioxidant enzyme activities (SOD, CAT and POD) were also enhanced at high Cd concentrations in LrE-HR compared



to LrC-HR. This work highlighted for the first-time tolerant effect of LrERF061-OE which is upregulated under Cd stress in *G. uralensis* hairy root clones.

Biography:

Aysha Arif Chahel is a “Doctor of Philosophy in Plant Sciences” and works as a Post-doctorate in South China Botanical Garden (SCBG) under University of Chinese Academy of Sciences Guangzhou, China. He holds a BS, MS and Ph.D. degree in Plant Sciences and Molecular Genetics of Medicinal Plants. I have 2 years of research experience in SCBG as a senior visiting scholar. I have also been involved in outbreak investigations of hairy roots in *Lycium* species with LrTCP4 over-expression vector. I have presented an abstract on Plant-specific transcription factor LrTCP4 enhances secondary metabolite biosynthesis in *Lycium ruthenicum* hairy roots in an international conference held in Government College University, Lahore Pakistan. I am passionate about my field studies and want to improve quality of Goji berry (*Lycium* species) which is well known traditional Chinese medicinal plant.

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