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Poster Abstract – I.03

EXPRESSION OF *BRASSICA JUNCEA* BZIP TRANSCRIPTION FACTOR IN ARABIDOPSIS AND TOBACCO ENHANCES RESISTANCE TO AND DECREASES UPTAKE OF CADMIUM

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Brassica juncea, cadmium, bZIP, transcrition factor

Cadmium, a non-essential heavy metal, is considered one of the major pollutants and disturbance in the uptake and distribution of macro and micronutrients in plants is also shown to be correlated with its toxicity. In view of the risk posed by Cd as an environmental pollutant, there has been interest to study in plants the mechanisms responsible for the ability either to take up toxic metals along with nutrients or to resist toxic metals and maintain homeostasis. By the AFLP-TP approach we have identified genes that exhibit modulated expression following Cd-treatment in *Brassica juncea* and several of them are under investigation. The characterization of the bZIP transcription factor *Bj*CdR15 showing 89 % similarity to Arabidopsis TGA3 revealed that it is induced 2 hours after Cd addition to colture medium and similar expression was observed after Ni and Pb treatments. When tobacco protoplasts were transfected with the BjCdR15-dsRED fusion protein, red fluorescence was readily detected in the nucleous. Tobacco and Arabidopsis plants transformed with this gene under the constitutive 35S promoter showed improved resistance to Cd measured as chlorophyll content, fresh weight and Cd uptake whereas wild-type plants grown on the same conditions were severely affected by Cd treatment. Furthermore, when wild-type plants were maintained in cadmium supplied medium they showed the formation of numerous root hairs and the inhibition of lateral root growth while plants overexpressing BjCdR15 and grown on Cd-supplied medium showed normal root morphology. Therefore this study opens the possibility of using genes isolated from *B. juncea* to develop plants with improved resistance to and reduced uptake of Cd.