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Poster Abstract – C.18

TRANSCRIPTIONAL ANALYSIS OF GENES PUTATIVELY INVOLVED IN CADMIUM ACCUMULATION IN RICE

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Heavy metals, including cadmium, are important soil and water pollutants, deriving from the use of ammendants, poor quality irrigation water and, in particular, mineral fertilizers. Besides being toxic to the plants themselves, cadmium may be adsorbed through the roots, translocated to the seedling and finally accumulated into edible parts such as kernels, with negative consequences on human health. In this regard rice is particularly at risk, due to the peculiar agricultural practices, the frequent proximity of pollution sources and its elevated translocation ability. In order to characterize the genetic basis of cadmium accumulation in rice and, in the long term, to reduce Cd uptake and storage in the grain, we have undertaken the transcription profiling of rice genes putatively involved in the transport of the metal into edible parts. So far, we focused our attention on a family of metal transporters coding genes, the ZIP family, involved in the transport of a variety of cations including cadmium, zinc, iron and manganese. In rice 10 *ZIP* genes have been reported. Here we present the first expression analysis, performed by Real Time RT PCR, of three of them, *OsZIP1*, Os*ZIP3* and Os*ZIP4*, in roots and leaves of control and Cd treated plants of five cultivars; three high- (Loto, Nembo and Gladio) ant two low- (Roma and Volano) cadmium accumulators. In all cultivars, in control plants, *ZIP1* was expressed in roots but barely or not at all in leaves. Viceversa for *ZIP3* and *ZIP4*. In the competent tissue, the response to Cd was gene-cultivar specific: in Gladio, Nembo and Volano *ZIP1* was induced while *ZIP3* and *ZIP4* were downregulated. On the contrary, in Roma and Loto *ZIP1* was downregulated whereas *ZIP3* and *ZIP4* were induced. No correlation between the expression of the three genes, both in control and Cd treated plants, and the metal accumulation characteristics of the different cultivars was observed. Thus, at present, no conclusions can be drawn about a possible role of these *ZIP* genes in the transport/accumulation of cadmium into rice grains. To better understand the mechanisms subtending cadmium adsorption, transport and accumulation in the grain, additional genes of the *ZIP* family as well as genes from other metal transporter families are being investigated.