

COMPARATIVE ANALYSIS BETWEEN ARABIDOPSIS THALIANA AND THE METAL HYPERACCUMULATOR ARABIDOPSIS HALLERI IDENTIFIES MICRO-RNA ASSOCIATED WITH NUTRIENT HOMEOSTASIS, DEVELOPMENT AND STRESS RESPONSE

DALCORSO G.*, FASANI E.*, ZORZI G.*, VITULO N.*, FURINI A.*

*) University of Verona - Dept. Biotechnology

metal hyperaccumulation, miRNA, nutrition, Zn homeostasis

miRNAs have been found to be key players in mineral homeostasis, both in the control of nutrient balance and in the response to toxic trace elements. However, the effect of Zn excess on miRNAs has not been elucidated; moreover, no data are present regarding miRNAs in hyperaccumulator species, where metal homeostasis is tightly regulated. Therefore, expression levels of mature miRNAs were measured by RNA-Seq in Zn-sensitive *Arabidopsis thaliana* grown in control conditions and upon high Zn, in soil and in Zn-hyperaccumulator *Arabidopsis halleri* grown in control conditions. Differential expression of notable miRNAs and their targets was confirmed by real-time RT-PCR. The comparison in *A. thaliana* revealed a small subset modulated upon Zn treatment that is associated with stress response and nutrient homeostasis. On the other hand, a more consistent group of miRNAs was differentially expressed in *A. halleri* compared with *A. thaliana*, reflecting inherent differences in nutritional requirements and response to stresses and plant growth and development. Overall, these results confirm the involvement of miRNAs in Zn homeostasis and support the hypothesis of distinct regulatory pathways in hyperaccumulator species.