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BIOCHEMICAL AND FUNCTIONAL RESPONSES OF ARABIDOPSIS THALIANA SEEDLINGS EXPOSED TO CADMIUM, COPPER AND ZINC

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Arabidopsis thaliana L. is considered a model plant for many studies as its genomic sequence was completely identified and its mechanisms in genomic, transcriptomic and proteomic regulation are often similar to other plant species. Seedlings of *A. thaliana* were exposed to cadmium, copper and zinc at two different concentrations, chosen on the basis of the levels of heavy metals realistically found in contaminated soils. After 7 and 12 days of exposure to metals, applied separately or in different combinations, plant shoots and roots were sampled and analyzed. Microscopic analysis revealed that root morphology was strongly affected by metal exposure, both alone or in combination, if compared to control plants. The different growth patterns observed for shoots and roots were likely due to a different production and proportion of auxins and cytokinins, the two most important classes of phyto-hormones affecting cell expansion and proliferation, respectively. The levels of trans-zeatin, dehydrozeatin and indolacetic acid, as well as the ratio auxins/cytokinins, were different among the plants treated with the metals above, and the perturbation given by cadmium appeared to be significant. Preliminary data on phytochelatins, thiol peptide compounds mainly produced by plants and algae, indicate that they can play an important role in metal homeostasis and detoxification of *A. thaliana*.