Image techniques: New approaches in metal homeostasis

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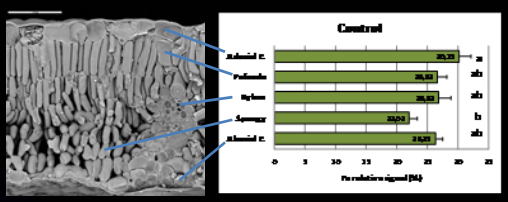
INTRODUCTION

Plant physiological processes take place in a complex cellular environment. Organs are complex structures made up of different tissues with distinct cell types. Traditional biochemistry involves the analysis of bulk samples containing a mixture of heterogeneous tissues, leading to a non correct interpretation of the results. This averaging effect can only be overcome by increasing the spatial resolution of analysis to a tissue- or even cell-specific level, in other words, by using image techniques.

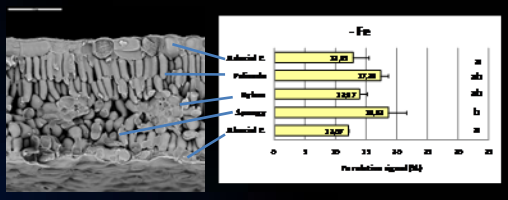
ELECTRON MICROSCOPY

LT-SEM (peach leaves)

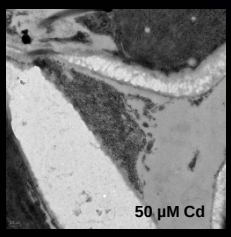
Control SPAD = 39.7 [Fe] = 95 mg Kg^{-1}



-Fe SPAD = 11.5 [Fe] = 70 mg Kg^{-1}

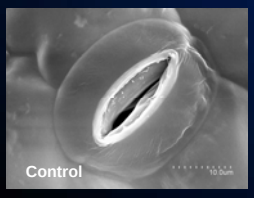


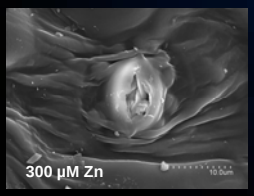
TEM (sugar beet leaves)



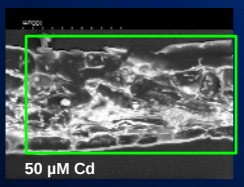
SEM (sugar beet leaves)

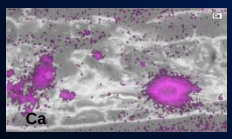
Surface imaging

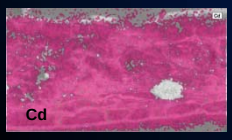




Elemental mapping

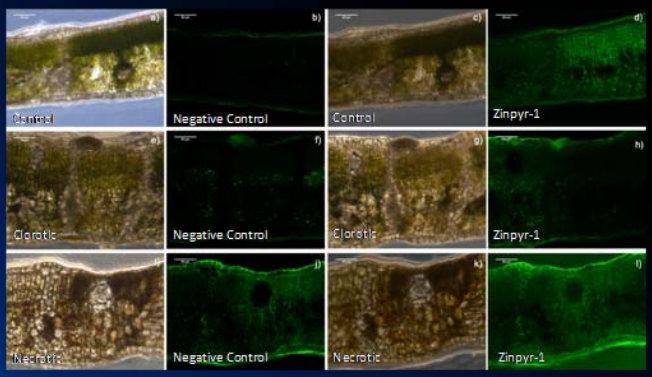




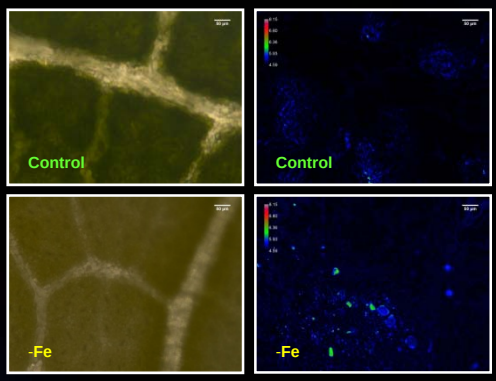


FLUORESCENT MICROSCOPY

Zn localization (pecan leaves)

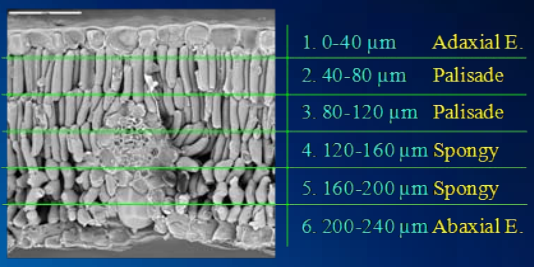


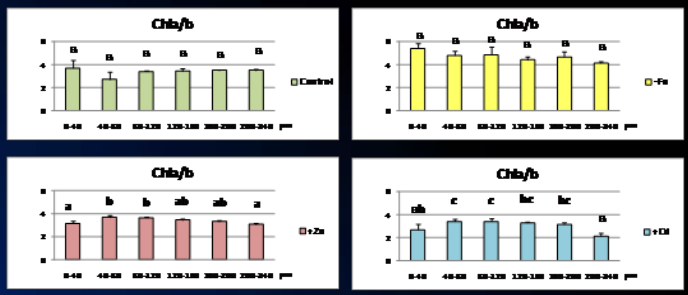
Apoplastic pH image analysis (peach leaves)



PARADERMAL CRYOSECTIONING

Pigments (sugar beet leaves)





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