IN VIVO MICRO-XRF TO STUDY RUBIDIUM UPTAKE IN PLANTS

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Laboratory-based Micro-X-ray fluorescence instruments have focal spots in the mesoscopic range 10-30 µm focal diameter size. The resolution of Micro-X-ray fluorescence is sufficient to make it a powerful tool in quantitatively visualizing changes in elemental distribution on the microscale caused by plant development effects of by loss or gain-of-function mutations in the plant genome. We have shown previously using TXRF that micro-analysis (7.1 mm2, 300 µg) presents a powerful tool to understand complex physiological processes in context such as the link between the plant ion homeostasis and photosynthetic efficiency [1].
Recently, we finished the design and assembly of our first laboratory-based X-ray microscope at WSU and optimized it for plant *in vivo* analyses [2]. A major advantage of being able to probe the plant in vivo are uptake studies like Rb (K analog) uptake over time, which is usually done using radioisotopes. The micro-XRF approach will enable to probe a larger set of ions then the radio approach. Here, we will present our first results obtained on Rb uptake in A*rabidopsis thaliana.* Our preliminary data provide insights regarding the spatial distribution of Rb in plants

[1] Hoehner et al. Spectrochim. Acta B 125: 159-167 (2016)
[2] Fittschen et al. XRS in revision