





# Toxicology: Detection of heavy metals in Plants

 **Sample**  
Cannabis sativa

 **Spatial resolution**  
100  $\mu\text{m}$

 **Elements of interest**  
Cd, Pb

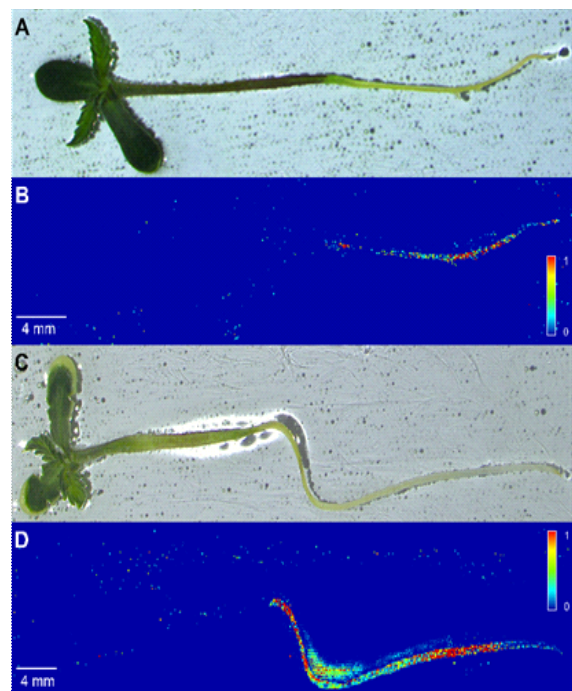
 **Measurement rate**  
20 Hz

 **Limits of Detection**  
7  $\mu\text{g/ml}$

Due to growing industrial production over last decades the degree of pollution by heavy metals and recently for example nano particles has grown to. The presence of these contaminants in soil pose great danger to plants grown in these conditions. In case of industrial crops this contamination can significantly affect the yield, more over in case of food crops it can have a great impact on human health.

With LIBS we analyse various plant samples to see the spatial distribution of selected contaminant in the plants. Whether it is only accumulated in the roots or it is translocated to higher parts of the plant..

Toxicity of cadmium was tested on cannabis satvia. Plants were grown in 2ml microtubes type Eppendorf, in 5 and 20  $\mu\text{mol}\cdot\text{dm}^{-3}$  solution of  $\text{CdCl}_2 \cdot 2.5 \text{H}_2\text{O}$ . LIBS measurements showed, that Cd is only accumulated in the roots and no translocation to the stem or leaves is visible.



**Fig. 1.** Pictures A and B show photo and corresponding LIBS map of sample grown in 5  $\mu\text{mol}\cdot\text{dm}^{-3}$  solution of  $\text{CdCl}_2 \cdot 2.5 \text{H}_2\text{O}$ . Pictures C and D show photo and corresponding LIBS map of samples grown in 20  $\mu\text{mol}\cdot\text{dm}^{-3}$  solution of  $\text{CdCl}_2 \cdot 2.5 \text{H}_2\text{O}$ .