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SR induced micro-XRF for studying the spatial distribution of Pb in plants used for soil phytoremediation

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Synchrotron-based X-ray fluorescence techniques enables substantial progress in several disciplines of plant sciences since it allows *in situ* examination of elements within vegetable tissues in order to understand the mechanisms involved in metal(loid) uptake and metabolism in plants [(1-3)].

To study how Pb and others soil elements are uptaked and translocated in the plant, we consider essential to investigate by SR micro XRF the spatial distribution of these elements in selected sections of studied plants.

The experiments were conducted in two kind of vegetable species: hyperaccumulator plant species such as *Brassica napus* and fast-growing non-hyperaccumulator plants such as *Festuca arundinacea* and *Lolium perenne*.The plants were grown in Pb soil contaminated and in crops in hydroponics conditions exposed to lead, in controled environment, cultivated in greenhouses at CEPROCOR.

The measurements were carried out at the D09B XRF Fluorescence beamline of the LNLS and were performed in situ on different parts of the plant (roots and leaves) and in living conditions.

The phytoextracion capacity of the studied plants was evaluated to develop an efficient phytoextraction technology for the remediation of Pb contaminated soils.

SR micro XRF results showed that *Brassica napus* extracted Pb from the ground and translocated it to the leaves more effectively than *Festuca arundinácea* and *Lolium perenne* plants grown in contaminated soil, where lead remained at the root. Furthermore, a co-distribution was observed between Pb and Zn, P, S and Fe. This suggest that *Brassica napus* is a potential plant to be used for phytoextraction of Pb from soil.

The use of SR micro XRF to map the distribution of metals in plant tissue allows significant advances in phytoremediation studies as well as in other topics of environmental sciences.

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