

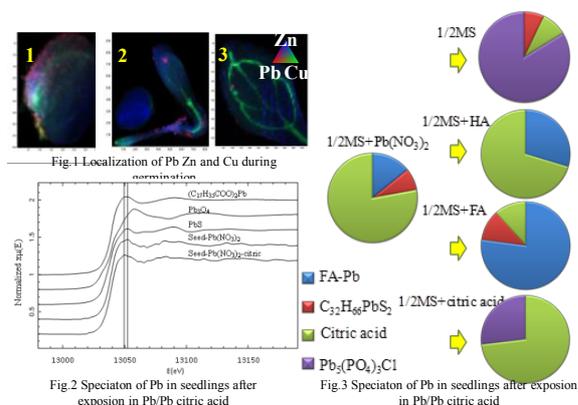
Effects of dissolved organic matter on localization and speciation of heavy metals in *Arabidopsis* during germination by μ -XRF and XANES

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Heavy metals make great effects on seed germination for most of terrestrial and wetland plants. The dissolved organic matter (DOM) in soil and rhizosphere can strongly bind heavy metal ions and change their species. Thus, the investigation aims at evaluating the effects of DOM on location and speciation of heavy metals in *Arabidopsis* germination.

In the first phase, seed was soaked in solution containing Cu, Pb and Zn and measured by μ -XRF. Most of Pb was found at the surface of the seed, as shown in Fig. 1-1, During the germination, then, Cu was located in the stem, but Pb moved upward more quickly and a hot point of Pb was found in the leaf (Fig.1-2). At the last phase, Cu was obviously observed along the leaf (Fig.1-3). The results show the location of Cu, Pb and Zn was different from each other during the germination, which implies that their mechanism of absorption and transport by plants may be different.



It was found that speciation of Pb changed during the germination. Most Pb (>80%) was precipitated as $Pb_2(PO_4)_3Cl$ in seedling. However, some components of Pb binding DOM were found by XANES. The components of CA-Pb (CA, citric acid) and FA like-Pb (fulvic acid, FA) were detectable, as shown Fig.2. The results reveal that exogenous DOM affected Pb species in *Arabidopsis*, and may pass through root surface and affected the Pb detoxication process of *Arabidopsis*.