Selenium speciation and translocation in a Se hyperaccumulator from high-Se area, Enshi, China

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Selenium (Se) is of great concern because of its special biological function for organisms, narrow range between deficiency and toxicity for human beings. Se speciation is important to understanding Se transformation in plant tissues and human Se nutrient intake, while Se translocation from soil to vegetation is a key aspect to clarify Se enrichment mechanism for Se hyperaccumulator. In this study, the *Thlaspi arvense* L. plant with Se concentration of 2816 mg/kg was found in high-Se area of Enshi, China, and this Se hyperaccumulator was selected to study Se speciation and transformation in its tissues by XRF and XAFS technique. The Se K-edge XANES results showed that Se-methylselenocysteine (SeMeSeCys) is predominant in the aerial part, accounting for 68-93.5% in different tissues, and the proportion of SeMeSeCys species is decreased from stem to leaf in *Thlaspi arvense* L.. These results are very similar to the Se speciation in other Se hyperaccumulator [1]. However, selenocysteine (SeCys) is the dominant species in root and the rhizosphere soil, which are different from our previous studies that Se(IV) is the main form in common Se-rich soils [2, 3]. The transformation of Se speciation may be explained by the metabolism of Se in Se hyperaccumulator and/or microbial activities in rhizosphere. These still need to be further studied.

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[1] Freeman *et al* (2006) *Plant. Physiol* **142**, 124-134 [2] Qin *et al* (2012) *Chemosphere* **86**, 626-633 [3] Qin *et al* (2013) *Environ. Int* **52**, 66-73