

Study on accumulation and reduction mechanisms of arsenic in *Pteris vittata* L., by using in vivo SR-XRF analysis

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Arsenic-hyperaccumulator fern, *Pteris vittata* L., is known to uptake arsenic as As(V) from the soil and reduce it to As(III) in the plant body. However, details of this reduction mechanism remained to be solved. In this study, roots, midrib of the sporophyte and gametophyte of the fern are subjected to in vivo measurements using the synchrotron radiation X-ray fluorescence analysis and X-ray absorption near-edge structure (XANES) analysis. As a result, we found that arsenic distribution patterns in the plant gradually changed corresponding to the development of the tissue. On the other hand, the reduction of arsenic occurred in the plant in an early stage, which had no specific tissues such as meristem, reproductive tissues, and vascular bundle.