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Mineral Acquisition in Land Plants

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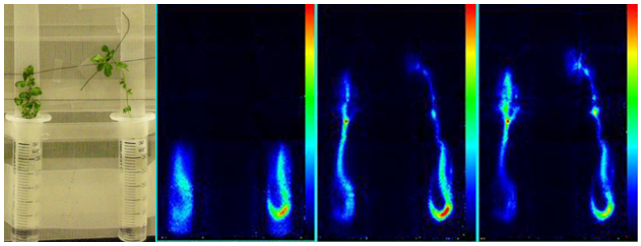
Plants are always affected by a lot of environmental factors, such as high and low temperatures, water and/or nutrition deficiency and etc. However, by using various mechanisms properly and systematically, plants can survive these stressful environments. In these environmental adaptations, we are focusing on the relationship between inorganic ions and plant. Under the nutrient deficient conditions, plants activate the mechanisms for acquiring inorganic nutrient ions. On the other hand, under the conditions existing toxic levels of ions, they will activate the mechanisms for sequestration and/or detoxification of excess amount of ions internally and externally. By using these mechanisms, plants can maintain its homeostasis and adapt to the environments.

Through the research of their environmental adaptation mechanisms, we want to understand their strategies and want to find the way how to utilize their functions in our human activities, such as phytoremediation and phyto-fortification.



Zinc accumulation in *Lotus japonicus*
Real-time imaging of ^{65}Zn distribution in two cultivars of *Lotus japonicus*. The nutrient solution containing ^{65}Zn was applied to the root and its uptake and transport were observed during 48 hours. One cultivar translocated a large amount of ^{65}Zn in their shoot tissue.

Select Publications

1. Furukawa, J., Kanazawa, M., and Satoh, S. (2012). Dormancy-induced temporal up-regulation of root activity in calcium translocation to shoot in *Populus maximowiczii*. Plant Root *6*, 10-18.
2. Furukawa, J., Abe, Y., Mizuno, H., Matsuki, K., Sagawa, K., Mori, H., Iwai, H., and Satoh, S. (2011). Abscisic acid-inducible 25 kDa xylem sap protein abundant in winter poplar. Plant Root *5*, 63-68.
3. Furukawa, J., Abe, Y., Mizuno, H., Matsuki, K., Sagawa, K., Kojima, M., Sakakibara, H., Iwai, H., and Satoh, S. (2011). Seasonal fluctuation of organic and inorganic components in xylem sap of *Populus nigra*. Plant Root *5*, 56-62.
4. Miura, K., Sato, A., Ohta, M., and Furukawa, J. (2011). Increased tolerance to salt stress in the phosphate-accumulating *Arabidopsis* mutants *siz1* and *pho2*. Planta *234*, 1191-1199.
5. Furukawa, J., Yamaji, N., Wang, H., Mitani, N., Murata, Y., Sato, K., Katsuhara, M., Takeda, K., and Ma, J.F. (2007). An aluminum-activated citrate transporter in barley. Plant and Cell Physiology *48*, 1081-1091.