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## Improvement of heavy metal phytoextraction by application of metal chelators and plant growth regulators

Tomoki Chatani, Takeshi Suzuki and Nobuhide Fujitake  
Kobe University, Japan

The bio-availability of metals in the rhizosphere soils is considered to be an important requirement for successful phytoremediation. Although several synthetic chelators have recently been suggested to enhance the metal bio-availability in soils and facilitate metal accumulation by plants, chelators application may have potentially toxic effects on plant growth and development. The specific objective of this study is to evaluate the effects of plant growth regulator (PGR) and metal chelator (MC) on heavy metal phytoextraction by hybrid marigold (*Tagetes erecta* × *Tagetes patula*) and leaf mustard (*Brassica juncea* 'hakarashina'). A metal-spiked soil (As-15, Cd-15, Cu-125 Zn-125 ppm) was extracted by different rates (10, 20, 50 and 100 mmol/kg soil) of the solution of four MCs (EDTA, HEDTA, NTA, Citric acid). The amount of extracted HM significantly increased in all MC and rates compared to control (e.g. As:10-710%). A pot experiment was conducted with foliar application of four different rates of four PGRs (IAA, GA3, 6-BAP and salicylic acid) to plants. The 6-BAP (100 μM) was found to generate a 39% increase in leaf mustard biomass and the GA3 (3000 μM) was found to generate 27 and 36% increase in marigold and leaf mustard biomass compared to control. Another pot experiment was conducted in a metal-spiked soil with application of MCs (EDTA, NTA, citric acid) and with foliar application of PGRs (6-BAP-100, GA3-3000 μM) to reveal their synergistic effect on heavy metal phytoextraction. Various results were found in the amount of removed HM by the combination of MCs and PGRs.

### Biography

Tomoki Chatani is 2nd year of a master's degree of Kobe university in Japan and his major is soil science. He belongs to the Soil Science lab. His research interests are waste management, phytoremediation, soil chemistry and fertilizer.

171a512a@stu.kobe-u.ac.jp

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