Impacts of P on plant growth and arsenic accumulation by Chinese Brake fern from contaminated soil. (S11-tu163106-Oral)

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Abstract:

Arsenic and P are both Group VA elements and have similar chemical properties. Therefore, it is important to understand the impacts of P on the growth of and arsenic accumulation by arsenic-hyperaccumulating Chinese brake (Pteris vittata L.). In the greenhouse, Chinese brake was grown for 20 weeks in a soil receiving 0.67, 2.67, or 5.34 mmol As kg-1, and 0.80, 1.6, or 3.2 mmol P kg-1. At both low and medium As levels, addition of P slightly increased plant biomass and As uptake of Chinese brake. At high As (5.34 mmol kg-1), however, moderate amount of P (1.6 mmol kg-1) resulted in substantial stimulation of plant growth and As accumulation by alleviating As toxicity, although As concentrations in the fern decreased due to dilution effect. The minimum P/As molar ratios of 1.2 in soil solution or 0.6 in the old fronds are necessary for better growth of Chinese brake in As-contaminated soils. These findings have great implications on developing phytoremediation strategies.

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