Partition-Limited Plant Uptake of Pesticides from Water. (S11-sheng162023-Poster)

Authors:

- S.Zhang* University of Arkansas
- G.Sheng University of Arkansas

Abstract:

Phytoremediation is an emerging technology to effectively remediate contaminated soil and groundwaters. Understanding plant uptake processes is important in rationally selecting plants for the uptake of target contaminants. We measured the uptake from water of two pesticides differing significantly in their lipophilicity, lindane and hexachlorobenzene, by wheat seedlings over time. For less lipophilic lindane (log Kow = 3.72), the uptake reached equilibrium in roots within 24 hours and in leaves within 100 hours. For more lipophilic hexachlorobenzene (log Kow = 5.73), the uptake in both roots and leaves continued over a period of 312 hours. For both pesticides, the root uptake is consistently higher than the leaf uptake. Calculations using a recently developed partition-limited plant uptake model indicated that both pesticides accumulated primarily in the lipid phase of roots and leaves. The accumulation capacity is higher for hexachlorobenzene than for lindane, due largely to the higher lipophilicity of the former, as compared to the latter. The results suggest the potential utility of high-lipid plants for the effective uptake of lipophilic contaminants.

Corresponding Author Information:

Guangyao Sheng
University of Arkansas
1366 W. Altheimer Dr
Fayetteville, AR 72704

phone: (479)575-6752 fax: (479) 575-3975 e-mail: gsheng@uark.edu

Presentation Information:

Presentation Date: Wednesday, November 13, 2002 Presentation Time: 2:00-4:00 pm Poster Board Number: 1438

Keywords: plant uptake, pesticide, partition