Science briefs

Scientists look at kids' pesticide exposure

The UC Berkeley School of Public Health will be the site of one of the first federal research centers devoted to studying children's environmental health hazards. The center will investigate pesticide exposure in the children of California farmworkers.

In recent years, researchers have begun to question whether the common practice of setting standards for environmental exposure in children based on what is known about adults is appropriate.

Over the next 5 years, a team of UC scientists will evaluate the impact of pesticide exposure on growth and development and illnesses such as respiratory ailments in children under age three. The scientists will also develop methods to protect children from health risks associated with pesticides. The study is funded by a $1.18 million award from the U.S. Environmental Protection Agency.

Brenda Eskenazi, who will direct the new center, says that recent preliminary studies show that young children can be exposed to pesticides from residues in their food, as well as from their normal exploration of their environment.

"Children are small, and we have no idea how these chemicals are metabolized in small bodies," says Eskenazi, an expert in the developmental and reproductive effects of chemical exposures.

Plants detoxify chromium

Plant biologists at UC Berkeley have documented, for the first time, that many vegetable and wetland plants can remove toxic chromium from the environment and convert it to a nontoxic form.

Hexavalent chromium, Cr(VI), is a toxic element with many industrial uses. It also is a potent carcinogen and is lethal at high doses. However, trivalent chromium, Cr(III), a variant of this metallic element, is not only nontoxic but essential for human and animal health.

UC Berkeley scientists have demonstrated that plants absorb hexavalent chromium and convert it to nontoxic trivalent chromium in just a few hours.

The plants used in the crop study included the Brassica vegetables (e.g., broccoli, cauliflower and cabbage), lettuce, spinach, cucumber, cantaloupe, radish and tomato. The wetland plant species included water hyacinth, cattail and saltmarsh bulrush.

The chemical conversion occurs primarily in the plants' root systems; by the time chromium enters the shoots and leaves (which humans generally eat), it is in the nontoxic form.

"We did not know going into the studies that the plants could do this without producing other toxic forms of chromium, such as Cr(V)," says plant biologist Norman Terry. "Now, we have two separate papers, on different sets of plants, in two separate journals — all showing that plants can detoxify chromium."

Those papers are in the October 1998 issue of *Planta;* and in the Oct. 15, 1998, issue of *Environmental Science and Technology.* The first paper is on *Planta*'s Web site.

UC Berkeley plant biologist Adel Zayed and his colleagues have shown that many plants can remove toxic chromium from the environment. Water hyacinth, *below*, is one species that detoxifies chromium.

Imported fire ant elicits tempered concern

The discovery of Imported fire ants in Kern and Fresno counties should not cause a high level of anxiety, says Mark Freeman, a Fresno County farm advisor.

"These were very isolated finds," says Freeman. "So far, the California Department of Food and Agriculture hasn't found movement outside the target areas."

Local agricultural commissioners have been monitoring the almond orchards where the colonies were found and report that no new mounds have been found.

Imported fire ants closely resemble California fire ants (also called Southern fire ants), which were long ago established in the state and also damage crops. Both ant species are red and black in color, initially construct soil mounds that look similar, and aggressively attack food sources and enemies. However, the imported species attacks en masse, stinging simultaneously and repeatedly. The huge numbers of ants along with this behavior presents a threat to humans and domesticated animals. Long established colonies of Imported fire ant also have much larger mounds. Imported fire ant mounds can be 18 to 24 inches wide and 5 to 6 inches high, according to Freeman.

"Quarantine areas have been established so scientists are focused on eradicating the pest," Freeman said.