



Tainted by Cleanser

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Source: *Science News*, Vol. 169, No. 18, (May 6, 2006), pp. 275

Published by: Society for Science & the Public

Stable URL: <http://www.jstor.org/stable/4019324>

Accessed: 08/08/2008 13:03

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SCIENCE NEWS

This Week

Tainted by Cleanser

Antimicrobial agent
persists in sludge

About 76 percent of a commonly used antimicrobial agent exits sewage-treatment plants as a component of the sludge that's often used as a farm fertilizer, according to the first study to track the chemical through a typical plant. The finding raises questions as to the ultimate fate of the antimicrobial in the environment, the study's authors say.

U.S. manufacturers add 500,000 to 1 million pounds of the chemical triclocarban each year to personal-care products, such as antimicrobial soaps. Past toxicological studies have linked the chemical to decreases in birthweight and survival in rats and rabbits, says Rolf U. Halden of Johns Hopkins University in Baltimore.

Halden and his colleagues followed triclocarban through a treatment plant that takes in 680 million liters of wastewater per day produced by 1.3 million residents of a city in the mid-Atlantic region. The plant separates the sewage into liquid and solid streams, and microbes break down much of the organic content of those flows.

According to the National Academies in Washington, D.C., U.S. treatment plants send about 60 percent of the solid sludge that they generate to agricultural fields and other land as fertilizer. Liquids leaving the plants typically flow into streams or other bodies of water.

The group determined the quantity of triclocarban in samples of the incoming sewage and outgoing liquid and sludge. "It's difficult analyzing the sludge," says Halden. "In the past decade, the appropriate instrumentation has become available."

In an upcoming *Environmental Science & Technology*, the team reports that microbes broke down only about 21 percent of the triclocarban entering the treatment plant. About 76 percent accumulated in the sludge, and another 3 percent remained in the liquid stream.

"If a consumer goes to the supermarket

and buys a bar of soap, three-quarters of the active ingredient could end up in agriculture because the sludge is being recycled," says Halden.

The researchers estimate that from sludge released solely by the plant that they studied, more than 1,000 kilograms of triclocarban enter the environment each year. Scientists haven't yet discerned whether the chemical degrades or accumulates in soils or what its effects are on natural soil microbes, says Halden. "We don't know if it's being taken up by plants and migrating into the food supply," he adds.

"This finding suggests potential problems due to the high usage rate of triclocarban in the U.S.," says Craig D. Adams, an environmental engineer at the University of Missouri-Rolla.

With the new insight on what quantities can be expected in the environment, researchers can now turn to assessing the chemical's risk, says chemist Diana Aga of the State University of New York at Buffalo.

Although the Environment Protection Agency hasn't endorsed a method for detecting triclocarban in sludge, Rick Stevens, EPA's national biosolids coordinator, says that the results "are the kind of thing that raises interest." —A. CUNNINGHAM

QUOTE



If a consumer ... buys a bar of soap, three-quarters of the active ingredient could end up in agriculture."

ROLF U. HALDEN,
Johns Hopkins
University

bility that ancient human ancestors spoke to one another.

Excavations in 2005 at Dmanisi, Georgia, yielded five vertebrae from a *Homo erectus* individual, says anthropologist Marc R. Meyer of the University of Pennsylvania in Philadelphia. The finds occurred in previously dated sediment that has yielded several skulls now attributed to *H. erectus* (SN: 5/13/00, p. 308).

The new discoveries represent the oldest known vertebrae for the genus *Homo*, Meyer announced last week at the annual meeting of the Paleoanthropology Society in San Juan, Puerto Rico. The fossils consist of one lumbar, two thoracic, and two cervical vertebrae.

Meyer and his colleagues—David Lordkipanidze and Abesalom Vekua, both of the Georgian State Museum in Tbilisi—compared the size, shape, and volume of the Dmanisi vertebrae with more than 2,200 corresponding bones from people, chimpanzees, and gorillas.

"The Dmanisi spinal column falls within the human range and would have comfortably accommodated a modern human spinal cord," Meyer says.

Moreover, the fossil vertebrae would have provided ample structural support for the respiratory muscles needed to articulate words, he asserts. Although it's impossible to confirm that our prehistoric ancestors talked, Meyer notes, *H. erectus* at Dmanisi faced no respiratory limitations on speech.

In contrast, the 1984 discovery in Kenya of a boy's 1.6-million-year-old skeleton, identified by some researchers as *H. erectus* and by others as *Homo ergaster*, yielded small, chimplike vertebrae. Researchers initially suspected that the ancient youth and his presumably small-spined com-

Evolutionary Back Story

Thoroughly modern spine
supported human ancestor

Bones from a spinal column discovered at a nearly 1.8-million-year-old site in central Asia support the controversial possi-



WIDE OPEN A recently discovered *Homo erectus* vertebra from central Asia (left) displays a larger spinal cord canal than does a corresponding bone (right) from a skeleton that had been found in Kenya.