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More Evidence Linking Pesticides and Malformations

Additional studies suggest that common pesticides may be endocrine disruptors, bad news that nonetheless warms the heart of one citizen scientist.

By Joan Melcher

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Concern about toxic chemicals in the environment has erupted into the mainstream media again, with new reports tying pesticides to disruption of male hormones, birth defects and cancer.

Andres Carrasco, head of the molecular Embryology Lab at the University of Buenos Aires and chief scientist at the National Council for Science and Technology, linked glyphosate, the active ingredient in the popular herbicide Roundup, to escalating rates of animal birth defects — including cyclopia, where a single eye is present in the center of the forehead), infertility, stillbirths, miscarriages and cancers — in agricultural areas of the country. The result “opens concerns about the clinical findings from human offspring” exposed to the chemical in the same areas, he wrote.

Following up on Carrasco’s work, *The Ecologist*, a British environmental magazine, published a grisly account of the effects of glyphosate liberally sprayed on genetically modified soy crops in Argentina. The story told how Carrasco was assaulted by a mob when he arrived at a rural town where he was to present his findings.

Carrasco was quoted in an interview on GMWatch.org: “I didn’t discover anything new. I just confirmed what other scientists discovered. In spite of the evidence, they still tried to run down 30 years of my reputation as a scientist. They know they can’t cover up the sun with one hand. There is scientific proof and, above all, there are hundreds of affected towns [that] are a living evidence of this public health emergency.”

In February, *Scientific American* covered a study by scientists from University of London’s Centre for Toxicology that found 30 of 37 widely used pesticides tested blocked or mimicked male hormones. Most of the newly discovered hormone disruptors are fungicides that are applied to fruit and vegetable crops.

A recent study by researchers at the University of Granada showed exposure to the pesticides known as organochlorides significantly altered semen quality in young men in southeast Spain.

These findings resonate with citizen scientist Judy Hoy, a Montana wildlife rehabilitator who, after years of collecting roadkill, noticed a pronounced uptick in malformations like underbite or deformed testicles, deformities that make it harder for the animals to eat and to reproduce, reducing their numbers.

Pointing to abnormalities in white-tailed deer, she believes endocrine disrupting chemicals, or EDCs, possibly blowing over from potato farms in neighboring Idaho, are affecting wildlife populations. As Miller-McCune reported in the fall of 2009, her observations and theories on ungulates in the Bitterroot Valley and about the fungicide chlorothalonil (an organochloride) and its effects were met with skepticism from the state’s Fish, Wildlife & Parks biologists.

There has been little scientific study of the fungicide until recently, although a study released ahead of print by Environmental Health Perspectives shows exposure to chlorothalonil at levels common to which humans are exposed resulted in mortality for several species of frogs in Florida.

As far as the migration of chemicals, Hoy points to a recent Miller-McCune story on a series of reports by the National Park Service that documented airborne pollutants tending to accumulate in alpine and polar areas.

The roadkill story (and others) reported on several scientific studies tying EDCs to birth defects in males of several species. A second story drew on the emerging field of epigenetics as a possible explanation of how deformities related to chemical exposure could be passed through



New evidence is lending credence to the hypothesis that common pesticides may be linked to endocrine disruptors. One new study suggested exposure to chlorothalonil at levels common to which humans are exposed resulted in mortality for several species of frogs in Florida. (Guido Muermann / stockxchange.com)

generations.

Under the Food Quality Protection Act, passed in 1996, the U.S. Environmental Protection Agency has been tasked with screening and testing pesticide chemicals for possible endocrine disruption; the EPA has identified 200 chemicals for screening, but the process is still in the early stages.

Legislators in several U.S. states are drafting bills to ban various purported EDCs and are calling for reform of the federal Toxic Substances Control Act. The states, according to the advocacy coalition Safer Chemicals, Healthy Families, are particularly focused on banning bisphenol A from baby bottles, infant formula packaging and receipt paper.

Recent declines in both white-tailed deer and elk lent some credence to Hoy's suppositions, although another possible culprit has been identified: resurgent gray wolves.

Hunters and sportsmen throughout the American West are increasingly agitated about growing populations of the wolf, protected under the Endangered Species Act, and the number of deer and elk the wolves eat.

Precipitous drops in elk numbers in the West Fork of the Bitterroot Valley (more than 50 percent since 2005) has drawn the attention of the FWP, which recently started a three-year study of 44 cow elk fitted with radio collars.

The study, supported by several sportsmen's groups, will monitor the health of the elk, possible diseases, their movement patterns, pregnancy and body condition, and attacks by black bears, mountain lions and wolves. It won't, however, consider underbite.

Kelly Proffitt, FWP biologist and project leader, said she couldn't comment on Hoy's suggestion to consider hormone- or thyroid-related causes. "It's not been an objective that we've defined at this point."

Meanwhile, Hoy is preparing a paper for publication and has found a collaborator of sorts in a 14-year-old whose involvement grew out of a school project.

Samantha Crofts read Rachel Carson's *Silent Spring* before enrolling in Brett Taylor's freshman science class at Missoula's Sentinel High School. Taylor requires all students develop a research project suitable for presentation at a science fair. He knew something of Hoy's research and suggested Crofts visit Hoy at her rehabilitation center.

After talking with Hoy, Crofts decided to research the incidence of underbite on domestic goats — in the Bitterroot Valley. She has visually observed 43 goats and has found 60 to 70 percent of them have the condition known as brachygynathia, similar to Hoy's recent findings when observing Bitterroot fawns. ("Goats aren't my favorite animal," Crofts admitted. "I'm scared of them, to tell you the truth.")

Crofts plans to continue the study by determining the probability that genetics is behind the malformations; her control will be drawn from two baseline studies with a population of 39,000 animals.

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