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Pesticides Reduce Resistance To Disease, Scientists Say

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Scientists at the University of Wisconsin have reported for the first time that so-called "hard pesticide" materials apparently reduce resistance to and raise death rates from viral disease.

Dr. Milton Friend of the Department of Veterinary Science said in a telephone interview:

"This is the first time that some of the things that people have been saying about these materials have been demonstrated in the laboratory."

He and Dr. Daniel O. Trainer made their report in the current issue of Science magazine.

They said that 10-day-old mallard ducklings fed "sub-lethal doses" of a chlorinated hydrocarbon called "PCB" suffered four times the death rate of ducks who ate no PCBs before being infected with duck hepatitis virus.

Close Chemical Kin

PCBs, technically, polychlorinated bi-phenyls, are such close chemical relatives of DDT and its breakdown product, DDE, that they are virtually indistinguishable.

Though PCBs had been around in the form of industrial products since the 1930s, they did not come to light as a major—and totally unexpected—environmental pollutant until 1966 when they blocked chemists' attempts to find and identify DDT.

Both are now considered to be ubiquitous throughout the environment and one is considered to be as bad as the other. In humans PCBs cause a special form of acne, a skin eruption.

In birds, both PCBs and DDT interfere with the production of estradiol, a hormone that controls egg formation. Their effect is thought to be ultra-thin eggshells which break, thus endangering the perpetuation of whole species of birds.

Reason For Selection

Dr. Friend said mallards were chosen because they are "well understood, ubiquitous and confronted with similar ecological insult . . ."

The researchers are continuing their experments with other disease-causing organisms "to determine whether any interaction, antagonistic or synergistic, occurs . . ."

Dr. Friend and his co-workers used five groups of ducks, 25 ducklings to a group. Three groups were fed diets containing 25, 50 and 100 parts of PCB per million for 10 days.

Two groups of ducklings got no PCBs.

No birds got sick or died during the experiment though those on the 100 ppm diet "were noticeably hyperexcitable" after three days.

All the birds eating PCBs had significantly higher body weights, the researchers reported, the heaviest being those getting the most PCB.

The researchers had no immediate theory as to why.

Birds Isolated

The diets were halted after 10 days and on the 12th day all the birds were moved to isolation units where all three groups of PCB-fed fowl and one of the control groups were injected with duck hepatitis virus. The remaining "control" group got no virus.

Death began among the PCB-treated ducks 8 to 16 hours ahead of the untreated group.

How much PCB the birds had consumed appeared to make no difference in their ability to fight off the infection or when they succumbed to it, the report said.

"The suggestions that PCB may render a host more susceptible to certain types of infectious agents is the significant finding of this study," the researchers concluded.

Influenced Mortality

"None of the concentrations of PCB fed resulted in detectable forms chemical intoxication even with the physical stresses of weighing, handling, confinement and crowding . . .

"However, when the stress of an infectious agent was added, these sublothal concentrations (of PCBs) appeared to influence the resulting mortality rates causing two to four-fold increases . . . and reduced incubation time."

The same sort of effects were observed in similar experiments inviving DDT and dieldrin, Dr. Friend said.

These results have not yet been published but the increased death rates ranged from three to nine-fold when 30-day-old mallards were fed sublethal doses of DDT and dieldrin.

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