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Newly Discovered Virus May be Killing Bees - Study

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US: September 7, 2007

WASHINGTON - A newly discovered virus may be killing bees or may be making some bees vulnerable enough to disappear, US researchers reported on Thursday.

While the virus probably does not alone account for what scientists call colony collapse disorder, or CCD, it could help explain what is happening to bees across the United States, they said.

The virus, called Israeli acute paralysis virus, or IAPV, was discovered in Israel in 2004 and is new to science.

CCD hit an estimated 23 percent of all beekeeping operations in the United States during the winter of 2006-7. "These beekeepers lost an average of 45 percent of their operations," the researchers wrote in their report, published in the journal Science.

Beekeepers do not find bees dead -- they simply find the hives nearly empty, with the queens alone and workers gone.

Honeybees originally imported from Europe are used to pollinate US\$14.6 billion worth of fruits, nuts and other US crops annually. Bees also have disappeared from hives in Brazil and across Europe.

A team led by Dr. Ian Lipkin, an expert in the spread of infectious diseases at Columbia University in New York, ground up bee samples from across the United States and compared them to non-affected bees from Pennsylvania and Hawaii. They also looked at bees imported from Australia and samples of a bee product called royal jelly from China.

They then sequenced the genomes -- the entire collection of DNA -- and looked for genes from bacteria, viruses and parasites. They found five major bacterial groups, four lineages of fungi and seven types of viruses.

LOADED WITH VIRUSES

"We found a remarkably high viral burden in bee

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populations -- both those that have CCD and not," biologist Edward Holmes of Pennsylvania State University told reporters in a telephone briefing.

Only one was always associated with CCD -- IAPV.

"Whether it is a causative agent or a very good marker is the next major question that we need to address," said Diana Cox-Foster, an entomology professor at Penn State. A marker might mean that something else that was making the bees disappear also helped them become infected with the virus.

Jeffery Pettis of the US Department of Agriculture's Bee Research Laboratory in Maryland said IAPV was only one of several leads that must still be followed.

"I hope no one goes away with the idea that we have actually solved the problem," Pettis told the briefing.

"I still believe that multiple factors must be involved in CCD." Perhaps interactions among parasites, viruses and nutrition could be involve, he said.

IAPV can be transmitted by the varroa mite, a parasite known to affect US bees.

Lipkin said in a telephone interview the next step is to infect healthy bees with IAPV and see if their colonies then collapse, as seen in CCD.

Cox-Foster said the team was also looking at other possible causes of CCD, although some leads were being pursued more urgently than others.

"We have very little evidence that the radiation from cellphones could impact bees," she said.

She said tests also have shown that genetically modified crops have no ill effects on bees, although chemical pesticides could be adding stress.

As for why the bees disappear, Cox-Foster said they may deliberately avoid returning to the hive when they begin to feel ill, perhaps to protect their sisters and the queen.

Story by Maggie Fox, Health and Science Editor

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