HEALTHY LIVING

Here's What You Need To Know About 'GMO Mosquitos' And Zika Virus

They could save many lives.

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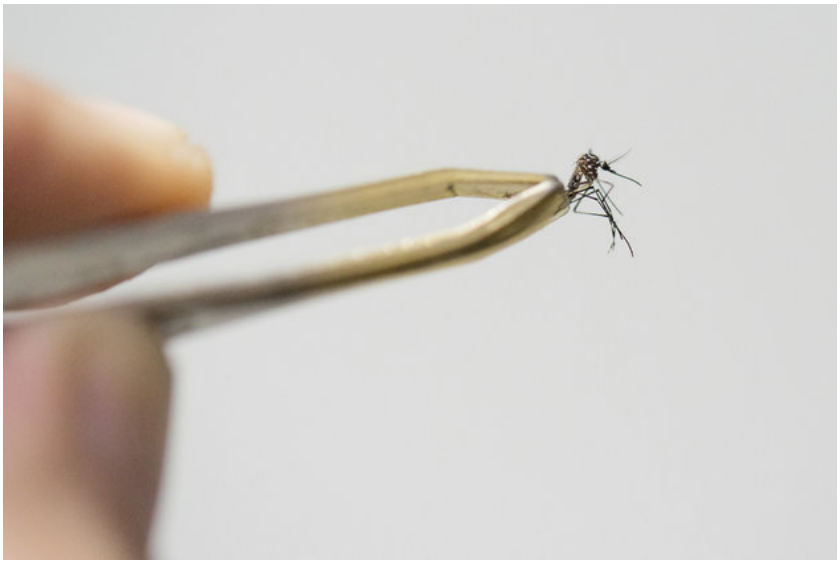

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Aedes aegypti mosquito, the species which transmits the dengue virus, chikungunya fever and zika is photographed on March 04, 2016 in Sao Paulo, Brazil.

Scientists think a type of genetically modified mosquito could help stop the march of Zika virus, a disease that's spreading in 37 countries and territories around the world.

The *Aedes aegypti* mosquito is the primary vector for Zika virus, and making genetic tweaks to the population could one day either stop the mosquitoes from reproducing or prevent them from carrying diseases that threaten human beings.

Preliminary findings from the U.S. Food and Drug Administration indicate that using genetically modified mosquitos to fight Zika virus shouldn't have a significant impact on the environment, Reuters reports. Those findings are in line with the environmental assessment submitted by Oxitec, the British biotechnology company that developed the modified mosquito.

Before the threat of Zika, Oxitec was having trouble getting FDA approval to

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"The data seems to be promising in terms of reducing the mosquito populations in those small field trials, but we need to go through our process, and we are greatly expediting the process," said FDA assistant commissioner Dr. Luciana Borio at a House Energy and Commerce subcommittee hearing on Zika preparedness earlier this month.

1. How do GMO mosquitos work?

So far, genetically modified mosquitos have been tested in several forms. Oxitec reported exciting success in the field with its "self-limiting strain" — a male mosquito that reproduces baby mosquitoes that never make it past the pupae stage. Releasing this male, non-biting mosquito in the Cayman Islands in 2010 led to an 80 percent suppression of the *Aedes aegypti* in the test region, and releasing it again in the suburb of Juazeiro, Bahia, Brazil in 2011 resulted in an 81 to 95 percent suppression.

Scientists are also working on breeding mosquitos that are genetically resistant to diseases like dengue, malaria and — in the future — Zika virus.

2. Would eliminating an entire species of mosquito upset the environment's delicate balance?

"*Aedes* is generally an invasive species, so removing an invasive species shouldn't have any negative ecological implications in terms of the environment," Omar Akbari, an assistant professor at the University of California's Center for Disease Vector Research, told The Huffington Post.

The *Aedes aegypti* most likely originated in Africa and spread throughout the world via trade and shipping activities, according to the CDC.

"I don't think removing the species would be harmful in any way, and [the species] doesn't serve any positive benefit in these areas where it's invasive to," Akbari said, noting that climate change has increased the *Aedes'* habitable territory.

"This places many more countries now at risk of diseases transmitted by this vector, including Zika and dengue fever, than ever before," he said.

3. Why don't we use natural methods or insecticides to stop Zika-carrying mosquitos?

Many such methods are in use already. To combat its ongoing Zika outbreak, Brazil deployed national army troops to go door-to-door to hunt down mosquito breeding sites and raise awareness about mosquito bite prevention. Public health experts are advising Brazilians to make sure they're dumping excess water from their flower pots. Other traditional mosquito control measures include repellant fogging, breeding mosquito-eating fish in stagnant water, and many kinds of poisons that address every stage of the insect's life cycle.

Unfortunately, that's not enough. **In order to stop the spread of Zika virus, as well as make sure a widespread outbreak like it never happens again, Brazil is going to have to think bigger: total mosquito eradication.**

The South American country achieved mosquito eradication once before. In

really good at killing insects, but, unfortunately, also good at killing birds and fish. The eradication campaign became less urgent with its apparent success, coupled with increasing concern over the environmental effects of DDT and the advent of the yellow fever vaccine. Pockets of the mosquitos became resistant to DDT, and the population roared back in the absence of this scorched earth approach, explained Akbari.

Because of DDT's affect on the environment, as well as emerging evidence that the chemical and its byproducts are linked to cancer, decreased fertility, miscarriage and other health complications, DDT is no longer a realistic option for Brazil's new war against mosquitos and Zika virus, Akbari said. Instead, the future of mosquito eradication means pitting mosquitoes against themselves.

4. Have insects ever been genetically modified in the past?

Yes. Oxitec has previously tested genetically modified pink bollworms, designed to reduce cotton pests in Arizona, the Associated Press reports. The company also has plans in the works for field trials of diamondback moths in upstate New York.

Despite the fact that genetically modified insects haven't been *proven* safe, Akbari is on board with experimentation in the field.

"I think the future is leaning toward genetic control," he said.

Zika Virus In Brazil

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