

# Brazil mutant mosquitoes to breed out diseases

October 29 2016, by Natalia Ramos

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Larvae of mosquito *Aedes aegypti* OX513A, infected with the *Wolbachia* bacteria which alters the reproductive capability of its host, seen at Oxitec facility in Piracicaba, Brazil, on October 26, 2016

Scientists in Brazil are preparing to release millions of factory-bred mosquitoes in an attempt to wipe out their distant cousins that carry tropical diseases. The insects' method: have sex and then die.

British firm Oxitec says its genetically modified mosquitoes will swarm in among ordinary species such as *Aedes aegypti*, the insect that carries

feared diseases such as Zika, dengue, yellow fever and chikungunya.

They will mate with the females of the ordinary mosquitoes, spawning babies with a genetically inbuilt flaw that causes them to die quickly.

With their work done, the modified father mosquitoes will then give up the ghost themselves—as they are genetically programmed to do.

Oxitec says its factory in the town of Piracicaba, northwest of Sao Paulo, can produce 60 million mutant mosquitoes a week.

Piracicaba is the world's "first and biggest factory" of genetically modified mosquitos, said Oxitec president Hadyn Parry.

"This is the only place where we have a factory like this. We can use this as a hub for Brazil," said Parry, who traveled to Piracicaba for the plant opening.

Currently their only Brazilian customer is the city of Piracicaba, "but we are having conversations with several municipalities and states," Parry said.



Oxitec CEO, Hadyn Parry

## **Mosquitoes by the millions**

According to the firm, five field tests that they conducted between 2011 and 2014—in Panama and the Cayman Islands, as well as the northeastern Brazilian state of Bahia—showed the population of wild *Aedes aegypti* insects dropped by 90 percent after the mutant mosquitoes were released.

Oxitec does not yet have a sales permit from Brazil's Anvisa health authorities, and there are no epidemiological studies showing whether mosquito-carried diseases drop after the factory-bred insects are released.

Parry is not concerned. "We are still waiting for Anvisa approval—we have no date for it, but we expect it for 2017," he said.

And none of this has stopped the mayor of Piracicaba from signing a four-year, \$1.1 million deal with Oxitec.

In its first wave, the company will release 10 million factory-bred mosquitos each week into this city of 360,000 people.

The need for insect control is pressing, as the summer in the southern hemisphere approaches and the mosquito population—and cases of the diseases that they carry—is likely to boom.



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As of July nearly 1.4 million cases of dengue were recorded in Brazil, following the record 1.6 million cases in 2015, according to health ministry figures.

In the same period 174,000 cases of Zika were reported.

The Zika virus outbreak began in late 2015 in Brazil and has since spread across the Americas.

Zika is particularly dangerous to pregnant women because it can cause birth defects such as microcephaly, in which babies are born with unusually small heads and brain deformities.

Zika infection has also been linked to a nerve and immune disorder called Guillain-Barre syndrome.

## Sex and death

Scientists keep the spacious rooms at the Piracicaba factory at temperature and humidity levels ideal for mosquito breeding.



An *Aedes aegypti* OX513A mosquito, created by Oxitec, seen at the British firm's facility in Piracicaba, north-west of Sao Paulo

While [female mosquitoes](#) are kept for breeding, [male mosquitoes](#) of the OX513A breed—especially developed by Oxitec in 2002—are released to mate with females in the wild, produce short-lived offspring, then die.

Oxitec biologist Karla Tepedino dismisses environmentalists' concerns about the lack of long-term impact studies.

"There are three essential factors for the transmission of these diseases: the mosquitoes, the virus and humans. What we do here is eliminate the mosquitoes, which transmit the virus," Tepedino told AFP.

"Eliminating the vector, we eliminate the disease," she said.

The *Aedes aegypti* mosquito is well-adapted to city life as it can breed in even tiny amounts of water, such as a puddle of rainwater or water pooled in flowerpots.

Experts have pointed to poor sanitation and the practice of storing open water containers in poor neighborhoods as contributing factors in the explosive growth of the mosquito population.

Separately, Rio de Janeiro authorities are attempting to control their mosquito population by releasing insects inoculated with the *Wolbachia* bacteria, which makes them resistant to Zika, dengue and other viruses.

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