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TRANSGENIC MOSQUITOES TRANSFER GENES TO NATIVE MOSQUITO SPECIES

Relevant for: Science & Technology | Topic: Biotechnology, Genetics & Health related developments

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Contrary to claims made, genes from genetically-modified *Aedes aegypti* mosquito were found to have been transferred to naturally-occurring *A. aegypti* mosquito population in three areas in Brazil where transgenic mosquitoes were released. It is unclear if the presence of transgenic mosquito genes in the natural population will affect the disease transmission capacity or make mosquito control efforts more difficult. *A.aegypti* mosquitoes are responsible for transmitting dengue, chikungunya and Zika virus.

About 4,50,000 transgenic male mosquitoes were released each week for 27 months (June 2013 to September 2015) in three areas in Brazil. Genetic analysis of naturally occurring mosquitoes were done prior to the release and at six, 12, and 27-30 months after the releases.

Researchers from Yale University studied 347 naturally-occurring *A. aegypti* mosquitoes for transfer of genes from the transgenic insects. The transgenic strains can be distinguished from naturally-occurring mosquitoes by using fluroscent lights and filters. They found that some transgenic genes were found in 10-60% of naturally-occurring mosquitoes. Also, the naturally occurring *A. aegypti* mosquitoes carrying some genes of the transgenic mosquitoes were able to reproduce in nature and spread to neighbouring areas 4 km away. The results were published in the journal *Scientific Reports*.

The genetic strategy employed to control *A. aegypti* population known as RIDL (the Release of Insects carrying Dominant Lethal genes) is supposed to only reduce the population of the naturally occurring A. aegypti mosquitoes and not affect or alter their genetics. Also, offspring are not supposed to grow to adult mosquitoes and reproduce as per claims made by the British company Oxitec Ltd, which had developed the technology and field-tested it in several countries.

“The claim was that genes from the release strain would not get into the general population because offspring would die. That obviously was not what happened,” senior author Prof. Jeffrey Powell from Yale University was quoted as saying on the University website.

The genetic strategy works on the premise that the transgenic male mosquitoes released frequently in large numbers would compete with the naturally occurring male mosquitoes to mate with the females. Offspring from the mating of transgenic male mosquito and naturally occurring female mosquito do not survive to the adult stage. This is because tetracycline drug, which prevents the dominant lethal gene from producing the lethal protein during rearing in labs, is not present in sufficient quantity in nature. In the absence of tetracycline, there is overproduction of the lethal protein causing the larvae to die.

Assam is the most species-rich State in India in terms of turtle diversity.

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