Genetically Modified Mosquitoes

Why in news?

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The Department of Biotechnology (DBT) is hesitant to permit field trials to release GM mosquitoes to tackle certain diseases.

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What is the initiative?

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- Aedes aegypti mosquito is the carrier of diseases such as Zika, dengue and chikungunya.
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- A new initiative thus aims at reducing the population of Aedes aegypti mosquito.
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- It comes from the Mumbai-based company, Gangabishan Bhikulal Investment and Trading Limited (GBIT).
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What is the new gene?

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- Diseases such as Zika, dengue and chikungunya are transmitted when an infected, pregnant female mosquito bites somebody.
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- Males do not bite and are, therefore, harmless.
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- So GBIT wants to introduce a new Genetically Modified (GM) male Aedes aegypti mosquito.
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- This GM insect has been bred by Oxitec, an R&D biotech company with roots in the University of Oxford.
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- Oxitec has bio-engineered a *transgenic male Aedes aegypti mosquito.*
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- This carries a *new gene fatal only to female mosquitoes*.
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What does it do?

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- The idea is to release a large number of such GM male mosquitoes into the trial zone.
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- These will then breed with normal females in the wild.
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- In the next generation, only the males would survive and these would breed again, with normal females.
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- After a few generations, the female population will be drastically reduced.
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- Eventually this cycle will result in a reduction of the entire mosquito population.
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How is it justified?

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- The life cycle of a mosquito is only around two-three weeks.
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- So the effects of the trial should be apparent in a few months.
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- Transgenic males do not bite and the modified genes are said to be harmless to humans.
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- The so-called **“Friendly Aedes” project** launched “closed cage” trials at the Oxitec facility in Maharashtra.
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- Trials have been launched in Malaysia, Brazil, and Florida as well.
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- Given these, permission has now been sought for open field trials in India.
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Why is DBT hesitant to approve?

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- Indian policy has been very cautious about allowing the genetically modified technologies.
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- DBT scientists fear that there may be unknown hazards associated with large scale trials.
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- It is thus feared that it could result in harmful consequences to the environment or ecology.
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- Notably, the Aedes aegypti is part of the food chain.
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- During its life cycle, it is consumed by fishes.
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- Also, during its early aquatic phase, it is consumed by frogs and then by birds, lizards and spiders.
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- A drastic reduction in the mosquito population could thus impact prey species.
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- This could also potentially result in ecological collapse.
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- There is also a possibility that the engineered genes could directly harm the species that consume mosquitoes.
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- More research may be required to ensure that there are no unforeseen consequences.
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Source: Business Standard

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