Genetically Modified Mosquitoes

Why in news?

\n\n

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

\n\n

What is the initiative?

\n\n

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

\n\n

What is the new gene?

\n\n

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

- Oxitec has bio-engineered a *transgenic male Aedes aegypti mosquito.*
  \n
- This carries a *new gene fatal only to female mosquitoes*.
  \n

\n\n

What does it do?

\n\n

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

\n\n

\n\n

How is it justified?

\n\n

\n
- The life cycle of a mosquito is only around two-three weeks.
  \n
- So the effects of the trial should be apparent in a few months.
  \n
- Transgenic males do not bite and the modified genes are said to be harmless to humans.
  \n
- The so-called **“Friendly Aedes” project** launched “closed cage” trials at the Oxitec facility in Maharashtra.
  \n
- Trials have been launched in Malaysia, Brazil, and Florida as well.
  \n

- Given these, permission has now been sought for open field trials in India.
\n

\n\n

Why is DBT hesitant to approve?

\n\n

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

\n\n

\n\n

Source: Business Standard

\n

SHANKAR
IAS PARLIAMENT
Information is Empowering