

Competitive Exams: Current Affairs 2011: Dengue

Dengue

Nearly 50 million people get infected with dengue fever every year in more than 100 countries, India included. And the severity of the outbreaks is showing an upward trend. All conventional methods have so far failed to prevent people from getting infected. Humans get infected with dengue when *Aedes aegypti* mosquitoes carrying the dengue virus bite them.

It is against this backdrop that two groups of scientists have taken a totally different route to fight the battle. They have made the *Aedes aegypti* mosquitoes completely resistant to dengue virus infection.

As a result the manipulated *A. Aegypti* mosquitoes are no longer the carriers of the dengue virus. Thus the transmission of the virus to humans is blocked. Their work is reported in two papers published today (August 25) in *Nature*.

The mechanism:

They introduced *Wolbachia* bacterium, a common bacterium which even in nature infects insects and mosquitoes, into *A. Aegypti*. Since the bacterium lives inside the host's cells, it makes the mosquitoes resistant to dengue virus.

Incidentally, studies done already have shown that mosquitoes become resistant to West Nile virus when an avirulent strain of *Wolbachia* bacterium is introduced into them. These papers come at a time when earlier studies had shown that the ability of the *Wolbachia* infected mosquitoes to block dengue transmission came at the cost of fitness of the mosquitoes.

The highlight is that the bacterium is maternally inherited and hence the offspring carry the bacterium. That is, the embryos die when *Wolbachia* infected males mate with uninfected females. On the other hand, the embryos are not destroyed when *Wolbachia* infected females mate with either infected or uninfected males. Thus in principle, the bacterium can spread through the *A. Aegypti* population in the field.

While the first team led by T. Walker of The University of Queensland, Brisbane, restricted itself to laboratory and caged studies, the second team led by A. A. Hoffmann of The University of Melbourne, Victoria, went a step further. They released the genetically modified mosquitoes in the field in two locations near Cairns in north eastern Australia in January this year.

The field studies showed that wild mosquito populations' ability to act as carriers of the dengue virus can be reduced by releasing *Wolbachia* infected mosquitoes.

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The advantage of such population replacement approach is, once established, they are self propagating. And since the mosquito population is simply changed rather than eliminated, effects on the ecosystem should be minimal.

Courtesy: The Hindu and Times of India

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