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New research lays foundation for innovative mosquito control methods in India

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Researchers from IIT Mandi and DBT-inStem unveil the biochemistry behind the resilience of dengue mosquito eggs



Researchers from the Indian Institute of Technology (IIT) Mandi, the Institute for Stem Cell Science and Regenerative Medicine in Bengaluru, have discovered the biochemical processes that enable the eggs of the dengue-causing mosquito to survive harsh conditions and rejuvenate when favourable conditions return.

This research marks a significant stride in our battle against mosquito-borne diseases, offering hope for more effective vector control measures.

Mosquitoes, viral vectors for various diseases, deposit their eggs in water, where they hatch. The eggs of dengue and zika-carrying Aedes mosquitoes can endure extended periods without water, akin to plant seeds patiently waiting for germination in the absence of moisture. Despite the knowledge of this phenomenon, the molecular reasons behind the desiccation tolerance and post-rehydration survival remained a mystery until now.

The collaborative team reared Aedes aegypti mosquitoes, studying their eggs through a series of innovative experiments. By subjecting the eggs to dehydration and subsequent rehydration, they discovered that the developing larvae undergo specific metabolic changes required for survival.

The implications of this research are far-reaching. Understanding these survival mechanisms provides a foundation for innovative mosquito control strategies. By disrupting the desiccation tolerance of mosquito eggs, researchers anticipate a significant reduction in mosquito populations and disease transmission. The understanding gained from this work could potentially prevent the resurgence of mosquitoes following monsoon rains, a period traditionally associated with increased disease transmission risks.