



A WORLD WITHOUT THE BUZZ: WHAT IF MOSQUITOES WENT EXTINCT?

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Mosquitoes: Tiny tormentors that buzz in your ear and leave you scratching at itchy red welts. Imagine a world where these pests no longer exist; it may sound like a dream come true, but the ripple effects of their extinction would be more complex than you think.

Mosquitoes are notorious for spreading diseases, such as malaria, dengue, Zika, and yellow fever, claiming millions of lives every year. Mosquitoes are responsible for the death of more people than any other species worldwide. Nearly half of the world's population is at risk of contracting a disease from their bites, and the impact extends to livestock and other animals. Without mosquitoes, the immediate benefits to human health would be monumental, as global health systems would experience unprecedented relief, saving billions in health care costs and lives that might otherwise be lost. Eradication of mosquitoes would provide a long-term solution to the life-threatening diseases they carry, but mosquitoes are not the problem per se. The real issue lies in their role as vectors, unwitting hosts that transmit pathogens from one source to another.

Mosquitoes are integral to many ecosystems. More than 3,500 species of mosquitoes exist, and only 100 of them feed on human blood. Most play a role in pollination, especially in areas where they are among the few insects active during twilight hours. In the Arctic region, mosquitoes serve as a critical food source for migratory birds, whereas in tropical areas, they serve as prey for frogs and other insect-eating animals. However, is the mosquito's ecological role irreplaceable? Many scientists argue that the niche currently occupied by mosquitoes would be taken over by other organisms; for example, pollination might be taken over by bees, butterflies, or other flies, and predators, such as frogs and dragonflies, might adapt by prying on alternate species. While this adaptability is plausible, the process could take decades, if not centuries, and may still leave certain ecosystems destabilized.

From a scientific standpoint, the eradication of mosquitoes has not been entirely theoretical. Researchers at Oxford University have developed a method involving genetic modification of the male mosquito species

(*Aedes aegypti*) responsible for carrying the gene for Zika virus. By introducing a self-limiting gene into male mosquitoes, they ensured that when these modified males mate with wild females, their offspring inherit the gene and die before reaching adulthood. This approach has led to significant reductions in mosquito populations during field trials, with decreases exceeding 90% in areas such as Brazil and the Cayman Islands. Genetically modified mosquitoes and their offspring carry a fluorescent marker, facilitating easy monitoring. As a significant step forward, Brazil's National Biosecurity Technical Commission approved the release of these mosquitoes nationwide.

Although the complete eradication of mosquitoes remains hypothetical, largely due to the infeasibility of deploying these methods on a global scale, millions of mosquitoes would be needed, even for a small area. Alternative technologies have also been developed.

For instance, a newly developed sensor can identify mosquito species, allowing individuals to wear the device and receive alerts regarding disease-carrying mosquitoes. This technology could play a significant role in monitoring and preventing future outbreaks. Additionally, researchers are investigating why mosquitoes are drawn towards specific body odors, a discovery that could lead to the creation of more effective mosquito repellents.

Ultimately, the question is not just about what we can do but what we should do. Mosquitoes, for all their notoriety, are a testament to the interconnectedness of life on Earth. Their extinction could alleviate immense suffering, but it also serves as a reminder of the intricate web relationships that sustain our planet. A world without mosquitoes might be quieter and more comfortable, but it would also be a world forever changed.

