

Chemistry in the Service of Dengue Protection

Marcos Aurélio Gomes da Silva*

Federal University of Juiz de Fora ,Brazil

Corresponding Author: Marcos Aurélio Gomes da Silva, Federal University of Juiz de Fora, Brazil.

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Abstract

Dengue fever, a mosquito-borne disease caused by the dengue virus, is a major public health concern worldwide. With no specific treatment or widely available vaccine, prevention is key. This is where chemistry steps in, offering solutions to protect against dengue.

Mosquito Repellents

Chemical compounds like DEET (N,N-Diethyl-metoluamide) and picaridin are commonly used in mosquito repellents. These compounds work by interfering with the mosquito's olfactory receptors, making it harder for them to detect human presence.

Insecticides

Chemistry also plays a role in the development of insecticides. Organophosphates, pyrethroids, and carbamates are classes of chemicals used to control mosquito populations. They work by disrupting the nervous system of the mosquito, leading to their death.

Larvicides

Larvicides target mosquitoes in their aquatic larval stage. Chemicals like temephos are used to prevent

larvae from maturing into adults. Another approach is the use of insect growth regulators, which disrupt the normal growth process of mosquito larvae.

Future Directions

While these chemical methods have proven effective, there is a growing need for more environmentally friendly and sustainable solutions. Research is being conducted into the use of natural compounds from plants as potential mosquito repellents and larvicides. In conclusion, chemistry plays a crucial role in the fight against dengue. Through the development of repellents, insecticides, and larvicides, chemistry provides us with the tools to protect ourselves and our communities from this disease. As we move forward, the challenge will be to balance efficacy with environmental sustainability.