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Editorial

Uses of Fungus in Controlling Malarial Mosquito

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Editorial Note

Malaria is still the most deadly of the insect-borne illnesses. Mosquitoes are growing increasingly resistant to the chemical pesticides presently used to control malaria vectors, piqueing interest in other management options. The use of fungal entomopathogens is one potential technique. Malaria is spread through the bite of a mosquito carrying the Plasmodium single-cell parasite. Entomopathogenic fungi can, in theory, drastically reduce parasite transmission while exerting considerably less selection for resistance by killing mainly older mosquitoes. Mosquitoes that carry malaria are growing increasingly resistant to insecticides.

As a result, malaria is extremely difficult to eradicate. There are few mosquito control methods except current chemical pesticides such as DDT and pyrethroids, which are sprayed inside and on mosquito nets. The use of insect-killing fungus as a biological control approach for malaria mosquitoes is a new biological control method. The fungi's spores can infect mosquitos and kill them within a few days if they come into touch with them. A fungal infection also decreases the insect's appetite and delays the growth of malaria parasites within the mosquito.

A genetically modified fungus might be a powerful tool in the fight against malaria spread. Metarhizium anisopliae, a fungus that destroys mosquitos naturally, is being used as a mosquito-specific "bio insecticide." This approach has been found to be efficient in killing mosquitos in previous research. The mosquitos, on the other hand, must acquire the fungus soon after contracting the malaria parasite. Another issue is that a mosquito-killing fungus might quickly develop to mosquito resistance. Chemical insecticides against adult mosquitos are an important part of most malaria control programmes, but their effectiveness is jeopardised by the emergence of insecticide-resistant mosquitos.

Insect-killing fungus like Beauveria bassiana are being studied as potential active ingredients for use in new biopesticides to combat malaria-carrying mosquitos. Applications of spores to surfaces such as walls, nets, or other resting spots provide plausible ways to infect mosquitoes in and around residential homes since fungal diseases infect by touch. Fungal entomopathogens, unlike other insect diseases, infect by touch, with fungal spores (conidia) being induced to germinate and pierce the insect cuticle when they come into contact with a suitable host.

In order to use fungus in biopesticides, the target insect must take up enough spores either through direct application (e.g., spraying) or by residual exposure to treated surfaces. The findings suggest that fungus have the potential to be an efficient and long-lasting biological control agent for malaria mosquitos. They provide a critical alternative to present management approaches due to the growing problem of pesticide resistance. Infected mosquitoes are still capable of reproducing because they die slowly, over several days.

As a result, their offspring are less likely to develop fungus resistance. Delayed-action insecticides, such as fungal biopesticides, have the potential to achieve transmission reductions equal to those obtained by current instant-kill insecticides, and to maintain this control for much longer after resistance alleles emerge.

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