

# Surface layer effectively kills malaria mosquitoes in rice paddies

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A thin, liquid layer applied on the surface of inundated rice paddies effectively kills malaria mosquito larvae without having an impact on other aquatic life. Rice yield remains the same and water was saved because of the anti-evaporative properties of the layer.

These conclusions were reached by scientists from Wageningen University and the Kenya Medical Research Institute who tested a silicone-based [surface layer](#) known as polydimethylsiloxane or [PDMS](#), and commercially available as Aquatain. The results were published in this week's edition of *PLoS ONE* and suggest that the surface layer is a suitable tool for controlling malaria [mosquitoes](#) in rice-agro ecosystems.

Malaria is still a major threat to public health in many areas with an estimated 225 million cases of malaria and 781,000 deaths each year. Most of these occur in sub-Saharan Africa and South East Asia, where many people rely on agriculture as their main source of income. Agricultural activities, such as irrigation, have been associated with increased numbers of malaria cases. Especially rice paddies provide ideal breeding sites for [malaria mosquitoes](#). Control of these mosquitoes is challenging due to the large size and vegetation in these paddies, but simple tools such as evaluated by the Dutch and Kenyan researchers could be an important step forward.

Aquatain was originally designed as an anti-evaporation liquid to reduce water loss. It has the ability to self-spread, even around vegetation and debris, and cover the entire water surface. Aquatain does not negatively

affect water quality and is certified for use on drinking water. The active agent, PDMS, is commonly used in shampoo conditioners, contact lenses etc. Therefore, the use of Aquatain as a mosquito control tool poses a minimal risk to the environment.

Based on initial laboratory results and the spreading properties of Aquatain, the researchers carried out a study at the Ahero rice irrigation scheme in western Kenya. Here, Tullu Bukhari and colleagues showed that application of the surface layer reduced the emergence of adult malaria mosquitoes from rice paddies up to 93%. This study also showed that there were minimal effects on non-target organisms and that the growth and development of rice plants in treated rice paddies was not affected.

Future research will focus on the operational feasibility of Aquatain application and determining its impact on reducing [malaria](#) cases in various epidemiological settings.

**More information:** Bukhari T, Takken W, Githeko AK, Koenraadt CJM (2011) Efficacy of Aquatain, a monomolecular film, for the control of malaria vectors in rice paddies. *PLoS ONE* 6(6): e21713. [doi:10.1371/journal.pone.0021713](https://doi.org/10.1371/journal.pone.0021713)

Provided by Wageningen University

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