

# Swedish lab eyes poisoned chalice in malaria fight

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Researchers believe they have found an environmentally friendly way of killing off mosquitoes that transmit malaria.

Cages meshed over with women's tights and crawling with mosquitoes are stashed in a Swedish laboratory. Every day, researchers feed them

beetroot juice laced with deadly toxins, part of a grand plan designed to fight malaria.

With hopes of field trials delayed repeatedly by the Covid-19 pandemic, researchers in Sweden still believe they have found the secret to a new environmentally friendly way of killing off the *Anopheles* species of mosquitoes that transmit malaria.

So hopeful are they, they have founded a company with a view to turning their discovery into a commercially viable alternative to the pesticides currently used to kill mosquitoes, but which can also harm humans and the environment.

Researcher Noushin Emami, 44, jokes that it's like having a pet, but that unlike a pet these mosquitoes are tricked into drinking a poisoned chalice.

They are tricked because the liquid is spiked with the very molecule that makes humans infected with malaria so appetising to them.

"If we add this molecule to any other solution, we make that solution very tasty for mosquitoes," says Emami, a molecular infection biologist at Stockholm University.

"Like the taste of a fresh baguette or a pizza for a hungry creature... just out of the oven," she told AFP.



Beetroot juice laced with toxins and a deadly molecule lure the mosquitoes in.

In December, the WHO reported 241 million cases of malaria in 2020, up from 219 million in 2019, with an estimated 627,000 deaths—96 percent of which were in Africa. Children under five accounted for about 80 percent of those deaths.

Malaria not only sickens people, those who become infected become more attractive to mosquitoes which then transmit the parasite to more and more people.

In 2017, Emami and her fellow researchers discovered this was due to a specific molecule, dubbed HMBPP, released as the parasite that causes

malaria, attacks the body's red blood cells.

## **'Eat it and die'**

Opening what looks like a giant refrigerator kept to a temperature of 27 degrees Celsius (80 Fahrenheit), Emami shows off shelves of water-filled containers full of wriggling larvae, and the improvised mosquito cages, which she and her team feed daily.

By adding to the beetroot juice—in place of human blood—"a trace amount of toxins combined with the molecule, mosquitoes eat it and die," explained Emami, who is an associate professor at the University of Greenwich in London.

The goal is also to use "harmless, environmentally friendly and easy to get killing-compounds".





Researcher Noushin Emami and her fellow researchers discovered the deadly molecule, dubbed HMBPP.

Lech Ignatowicz, who together with Emami co-founded the company Molecular Attraction to commercialise the discovery, said the new method has the potential to drastically change the fight against mosquitoes spreading diseases.

"The most effective way of killing mosquitoes is still using pesticides, but we know that pesticides are not only killing mosquitoes, but also other insects and other forms of life," Ignatowicz told AFP.

There is also evidence that pesticides are becoming less effective. Nearly 80 countries reported to the World Health Organization that mosquitos

exhibited resistance to at least one of the four commonly used insecticides between 2010 and 2019.

## **'Problem scaling up'**

Not only is the molecule relatively cheap, Ignatowicz said another benefit is how precisely it can target mosquitoes.

"Even in very dense environments, the jungle or tropical environments with a lot of insects, we can pick the ones we want to get rid of... and leave the rest of the ecosystem alone," Ignatowicz said.

While the team is focusing on malaria, the method has the potential to be adapted in the fight to curb the spread of other diseases transmitted by insects or even rodents.



The blood of people infected with malaria is more attractive to mosquitoes.

The next step is to start testing the method in the field.

Anders Lindstrom, a mosquito researcher at Sweden's National Veterinary Institute who is not connected to the project, told AFP he was "cautiously optimistic" about the method, but said much work remains to be done.

"The problem is always scaling up. The areas that need to be covered with these types of traps to get an effect are huge," Lindstrom explained.

Any method also needs to be applied consistently over time, which can be difficult in poor or conflict-hit areas where malaria is common.

"You can have a rather fast effect in reducing populations, but the moment you stop, they come back," Lindstrom said.

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