

An underground mozzie that postpones its blood feast

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Our researchers have found the *Culex molestus* mosquito has adapted to life underneath cities.

(Phys.org) -- A secretive and exotic species of mosquito, found across much of Australia, has revealed a new twist on the insect's famous 'blood-sucking' reputation to researchers at the University of Sydney.

Researchers discovered that rather than breeding in ponds, pools or wetlands, the *Culex molestus* mosquito has adapted to life underground, particularly in septic tanks and disused stormwater pipes.

Unlike other mosquitoes, the *Culex molestus* can also develop their eggs without first requiring a blood meal.

"The curious biological trait of this underground-dwelling mosquito shows that people in cities need to take mosquitoes' amazing adaptability into account when designing water storage systems," said Dr. Cameron Webb, from Sydney Medical School and the Department of Medical Entomology at Westmead Hospital.

Dr. Webb is the team leader of a study on the mosquitoes which has been published in this month's edition of the [Journal of Vector Ecology](#).

"We have spent the last two years chasing the species, which has adapted superbly to life beneath our cities," Dr. Webb said.

"Finding this mosquito isn't easy. Instead of wandering through pristine wetlands, we were snooping around stormwater drains and other polluted structures," said Dr. Webb.

"However, the toilet blocks in urban parklands were where we really struck gold. The disused septic tanks associated with these structures are where this mosquito is commonly found."

While the majority of pest mosquitoes require blood to develop their eggs, the female of this species can develop and lay a batch of eggs using nutrients stored earlier in its life cycle.

This phenomenon is known as autogeny and has been documented in a number of mosquitoes.

"The breakthrough with our study is that if this mosquito is offered a blood meal, it won't bite until its first batch of eggs has been laid. We believe this is the only Australian species to exhibit this behavior," Dr. Webb said.

"Once that first batch of eggs has been laid, they are on the hunt for

blood and can be severe nuisance-biting pests."

It is difficult to know why the mosquito ignores the offer of blood but given the absence of suitable animals to feed on in underground tanks and pipes, this biological adaptation ensures the mosquito can exclusively exploit these habitats not just during the summer but throughout the year.

"One of the major implications of this work is that we must be mindful of the mosquito risks when designing subterranean water storage systems in our cities so we do not create new opportunities for mosquitoes."

"Ensuring [water storage](#) structures are screened or designed to limit the opportunities for mosquito access is crucial. Perhaps more importantly, when assessing the risks of mosquito-borne disease, these underground habitats shouldn't be ignored," said Dr. Webb.

Culex molestus is thought to have been introduced into southern Australia in the 1940s, hitching a ride into the country with travelling American military personnel. Since then, the mosquito has been found in all states except Queensland and the Northern Territory.

Where exactly the mosquito came from before arriving in Australia is still a mystery but it is well known from cities in the US and Europe. The mosquito infamously made a meal of Londoners sleeping in the Underground during the Blitz and is often commonly referred to as the London Underground Mosquito.

"Mosquitoes have adapted to a wide range of ecological niches, from coastal rock pools to alpine snowmelt pools. Advancing our understanding of how [mosquitoes](#) adapt to their habitats will improve the ways we manage their pest and public health impacts," Dr. Webb said.

The contributing authors on the paper are Nur Faeza Abu Kassim and Professor Richard Russell from the Department of Medical Entomology at Westmead Hospital.

Provided by University of Sydney

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