

A Guide to Non-Biting Midges

Introduction to Non-biting Midges

Non-biting midges, also known as chironomids, are small insects commonly mistaken for mosquitoes. They exist in and near water bodies.

Midges occur naturally in aquatic ecosystems, such as fast-flowing shallow streams and deep lakes, where they are food for a variety of animals such as fish, birds and spiders.

They are highly adaptable insects, with over 5,000 species recorded worldwide for centuries. In Singapore, there are approximately 57 species of non-biting midges in our reservoirs.

Are midges the same as mosquitos?



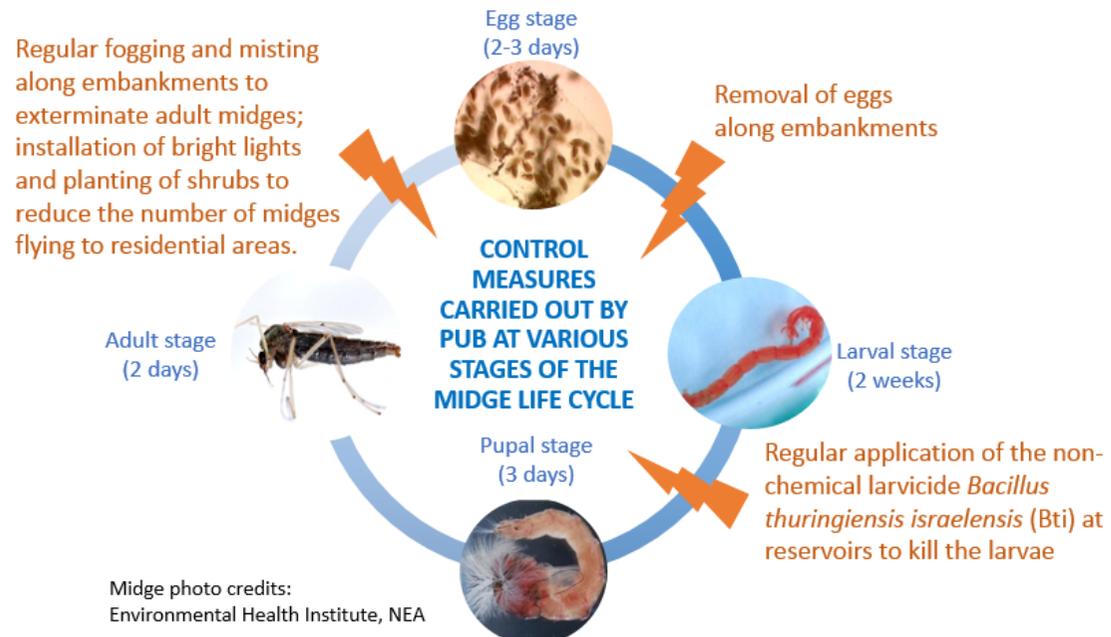
Unlike mosquitos, midges do not bite as they do not have probosces (piercing mouth parts). Midges do not spread diseases, but may cause discomfort and irritation to people who cross their flight paths.

Life Cycle and Control Measures

Adult midges lay their eggs in water in water bodies such as reservoirs. After the eggs hatch, the larvae burrow and grow in the sediments of the reservoir bed. Eventually, the pupae swim to the water surface and emerge as flying adults. At times, these adults may emerge in large numbers, causing a nuisance to those residing around the reservoirs.

To reduce such occurrences, PUB regularly monitors the egg, larvae and adult numbers and implements control measures at affected reservoirs:

PUB, NEA and the relevant Town Councils also work together to regularly monitor adult midge numbers at residential and commercial areas around the reservoirs.



Tips for the Public

You can adopt these measures to minimise the nuisance caused by midges:

1. Install insect screens across windows and doors to prevent the midges from entering your home.
2. Close the blinds and curtains during dusk and dawn when the midges are most active.
3. Midges are attracted to light. Switch off the lights in rooms that are not in use, or dim the light if possible.

Frequently Asked Questions (FAQs)

What is the life-cycle of midges?

There are four stages in the life-cycle of midges — egg, larva, pupa and adult. In the tropics, depending on species and environmental conditions, the entire life-cycle takes around 3 weeks to complete. The longest stage is the larval stage, when the larvae burrow in the sediment and organic matter in the water body. The mature larvae are also known as ‘bloodworms’ due to their bright red appearance. During the pupal stage, they swim to the water surface and emerge as flying adults. Adults can survive for up to a few days.

What times of the day do they tend to swarm?

The midges in Singapore have been observed to be more active during the cooler parts of the day, including early mornings and late evenings. Pest control measures undertaken by PUB are targeted at these timings (e.g. pre-dawn) to more effectively control the midge population.

Why do they appear at large numbers at certain times of the year?

Midge adults can emerge simultaneously from the water to form swarms. It is believed that this behaviour is a mechanism to ensure the survival of the species and to overwhelm their predators during the mating season. This could be triggered by various environmental factors, including light, rainfall, temperature and changes in water quality. Midges are also very light and are easily blown in the direction of the wind. For example, the northeast monsoon (Dec-Mar) may cause an accumulation of midges south-east of the reservoir.

Based on observations and monitoring over the years, a smaller peak appears during the middle of the year at Bedok Reservoir while a larger peak occurs at the start of the northeast monsoon in November, stretching all the way to the following February. For Pandan Reservoir, there is no well-defined peak period as it tends to vary each year.

Are midges new to Singapore?

Mass emergences of non-biting midges are not new to Singapore. For example, emergences were recorded at Seletar Reservoir in 1971 and Lower Peirce Reservoir in the 1990s.

Are the control measures effective?

Bti is a biological larvicide that stunts the growth of the larvae and prevents them from growing into adults. Fogging and misting target the adult midges. These strategies help to reduce the number of midges.

Is it possible to eradicate the non-biting midges?

As non-biting midges occur naturally in aquatic ecosystems, it is not possible to completely remove them. Nevertheless, to better control their numbers, PUB had commissioned a study with NUS to identify what triggers non-biting midges to emerge in large numbers in Bedok and Pandan Reservoir. The study identified, with greater resolution, locations where midge larvae survived. For example, *Tanytarsus oscillans*, a minuscule green species, was found to survive in the deep waters of Bedok Reservoir. In contrary, at Pandan Reservoir, another nuisance species *Polypedilum nubifer* was identified and it inhabits sediments some distance away from reservoir edge. Based on this, PUB refined the larvicide treatment area accordingly and modified the applicator of the larvicide so that the larvicide could reach reservoir bed more effectively. Prior to this, the larvicide was applied mainly along shallow banks. The study also found that a combination of factors may trigger mass emergences, and that this differs between species.

Together with local researchers, PUB continues to study the ecology of the reservoir with the aim of finding better and more sustainable midge control methods.