



Far left: Entomologist Ang Yuchen says fewer than 10 specimens of the *Eosmallota singularis* (left) have been found worldwide. The *Eosmallota singularis* was rediscovered in 2017 during a survey at the Bukit Timah Nature Reserve. ST PHOTOS: TIMOTHY DAVID



Above: The wasp-mimic *Milesia vespoides* (second from left), with other wasps. Below: The *Milesia vespoides* was sighted on Pulau Ubin this year.

BICENTENNIAL BUZZ



Sightings of 2 species of flower flies last seen in S'pore 200 years ago give cause for hope

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One is tiny and plain, the other strikes fear in the hearts of many with its hornet-like appearance.

Scientists are abuzz at recent sightings of the two species of flower flies, last seen in Singapore almost 200 years ago by British naturalist Alfred Russel Wallace.

Flower flies are so called because the adults visit flowers, just like bees and wasps, often mimicking them in appearance.

As pollinators that transfer pollen from flower to flower, they play an important role in helping plants flourish.

"It is a nice surprise for Singapore's bicentennial year," said National University of Singapore (NUS) entomologist, Professor Rudolf Meier, who heads the Evolutionary Biology Laboratory.

The wasp-mimic (*Milesia vespoides*) was rediscovered on Pulau Ubin this year by Mr Joseph Lin, senior officer for conservation at the National Parks Board (NParks).

The mimic has no sting, although it wears the hallmark yellow-and-black jacket of a hornet, a type of wasp.

This fear by association helps it avoid predators, scientists say.

The second flower fly (*Eosmallota singularis*) was rediscovered in 2017 by researchers from Prof Meier's laboratory during a survey at the Bukit Timah Nature Reserve.

This flower fly is small – no bigger than the length of a human fingernail – dull-coloured and is easily overlooked.

But it is probably even rarer than the wasp-mimic, as fewer than 10 specimens of this species have been found worldwide, in the forests of Borneo and Malaysia, said Dr Ang Yuchen, museum officer at NUS' Lee Kong Chian Natural History Museum.

This is only the second time that both species have been seen in Singapore since the 1850s.

Wallace had collected their holotypes – the first and most important specimens of their kind, which scientists studying the species refer back to – when he was in Singapore between 1854 and 1856, before taking them back to Britain.

The holotypes are at the Natural History Museum in London. But the precious specimens can be seen online, via the freely-accessible Biodiversity of Singapore database compiled by Prof Meier's lab.

A grant from the Ministry of Education (MOE) had enabled this "virtual repatriation" of insect species collected by Wallace.

For the project, researchers travelled to British museums housing specimens collected from Singapore during the colonial era and documented them in high-resolution photographs for the database.

It was this database that helped to unravel the significance of the two fly rediscoveries.

After the specimens were collected in Bukit Timah and Pulau Ubin, researchers compared them with the database and discovered that they were last seen here almost 200 years ago.

An MOE spokesman said the research was supported by the ministry's Academic Research Fund.

She added: "The research outcomes should advance knowledge in the sciences and humanities."

More than 1,000 species have been "virtually repatriated" under the MOE grant, although the researchers hope to expand the library to include specimens collected by other naturalists that are no longer in Singapore.

Said Prof Meier: "With a fuller database of the species we had 150 years ago, we can compare them with the specimens found today. This way, we can track how factors such as climate change are impacting diversity."

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FRAGILITY OF KEY HABITATS

Although we have recorded a large number of new species, rediscovered species and new records of flora and fauna in our biodiversity surveys, many of them were not found in large numbers. (The rediscovery of the *Milesia vespoides* and *Eosmallota singularis*) reflects the fragility of our key habitats... and the need to strengthen the conservation and resilience of these areas.



MR LIM LIANG JIM, group director for NParks' National Biodiversity Centre.

the forest. They play important roles as pollinators and decomposers, breaking down organic matter and releasing nutrients for plants and other animals to use.

"The forests will die without insects, and we need a whole assemblage of them to keep them alive," said Prof Meier.

Singapore is home to a rich variety of insects, with 334 species of butterflies, 124 species of dragonflies and damselflies, and 130 species of bees, NParks data shows.

But Prof Meier thinks there could be as many as 50,000 to 100,000 species of animals here.

This is comparable to what is known for European countries like Belgium.

Mr Lim Liang Jim, group director for NParks' National Biodiversity

Centre, said monitoring of Singapore's butterfly, dragonfly and bird species is carried out in parks, gardens and nature reserves by citizen scientists biannually.

Comprehensive surveys of areas have also been carried out, he said, pointing to one done in the 163-ha Bukit Timah Nature Reserve from 2014 to 2018.

In May, NParks announced that around 200 species new to Bukit Timah Nature Reserve were listed during the survey, and of these, 10 species of beetles are potentially new to Singapore.

The Comprehensive Ubin Biodiversity Survey is also under way, he added.

NParks' Mr Lim said the rediscoveries of the *Milesia vespoides* and *Eosmallota singularis* contributes to the increasing scientific value of Singapore's nature reserves and nature areas, and show that they should continue to be safeguarded.

"Although we have recorded a large number of new species, rediscovered species and new records of flora and fauna in our biodiversity surveys, many of them were not found in large numbers.

"This finding reflects the fragility of our key habitats, such as the Bukit Timah Nature Reserve, and the need to strengthen the conservation and resilience of these areas," he added.

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