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Above: Dr Anuj Jain (left), an ecologist and conservation biologist, and Mr Simon Chan, a landscape officer and member of the Nature Society's Butterfly and Insect Group, with the nets they use to catch butterflies, at Fuyong Interim Park last month. Below: Dr Jain with a Eurema sari (chocolate grass yellow) butterfly they tagged along a trail leading to Singapore Quarry last month. ST PHOTOS: LIM YAOHUI

Seeking social butterflies

Experts find urban butterflies are not mixing enough, and this can affect long-term survival

Shabana Begum

With large insect nets in hand, two local butterfly experts ventured into Bukit Timah forest and urban green spaces to chase butterflies for four hours a day.

Dr Anuj Jain, 36, and Mr Simon Chan, 58, sprinted after their winged targets for nine months between 2013 and 2014.

Their goal – to find out if butterflies flew farther in forests compared with in patchy vegetation in urban areas divided by roads and buildings.

With every successful catch, the researchers gingerly held the insects by their thorax, labelled their wings using a fine-tip marker, measured their wingspan, and recorded the location before releasing them.

With the help of four graduate students, they managed to label about 980 butterflies across six plots – three in the forest and the rest near low-rise houses in Nee Soon, Bukit Timah and the MacRitchie area. The plots were between 12ha and 38ha.

The next step was to record how far the butterflies travelled, and that was done using binoculars or by recapturing them. As that depended entirely on luck, only 130 butterflies reunited with the researchers after a few hours or a couple of days.

Among those, nearly 6 per cent of the butterflies in urban areas flew more than 100m, while 20 per cent in the forest flew the same distance, said Dr Jain, an ecologist and conservation biologist at the National University of Singapore.

"We had hoped that initially, the butterflies would be crossing grass patches a lot more. And that they would be using the roadside greenery," he added.

But only three marked butterflies were seen outside grass patches in the urban areas.

This butterfly dispersal study by NUS and Nature Society (Singapore) – or NSS – was published in journal Biotropica last year.

Butterflies are reluctant to cross over houses, pavements and roads because the urbanised areas are too hot and hostile for them.

And predators can spot them better in less dense roadside greenery, said Mr Chan, a member and former lead of NSS' Butterfly and Insect Group.

Hence, urban butterflies here tend to form sub-populations within their fragmented grass patches, relying on the host and nectar plants there – and this can be dangerous to the population's long-term survival.

"If we want a healthy population, they have got to be exchanging and intermingling," said Dr Jain.

If the butterflies inbreed within their own small patch, genetic diversity will be lost, and if a genetic disease strikes, the population may be wiped out.

Mr Chan, who works as a landscape officer at Khoo Teck Puat Hospital, witnessed the menace of inbreeding in 2019 when he introduced the Common Rose butterfly to the hospital grounds as part of his butterfly conservation efforts there.

"The population survived up to the fourth generation before dying. Nothing came out of the fourth batch of pupae," he lamented.

Mr Chan plans to repeat the experiment soon, but this time, introduce a second batch of Common Rose butterflies from another area midway through the experiment to strengthen the population's genetics and boost survival.

But instead of manually mixing fragmented populations, the best way to increase connectivity is to have more green corridors to link the green spaces, the study suggested.

NUS associate professor and plant ecologist Edward Webb, the paper's senior author, said: "Corridors designed for forest species should be wider, have more tree cover, and have sufficient resources such as nectar-providing plants. For species that are more tolerant of urban habitats, the requirements would be lower."

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980

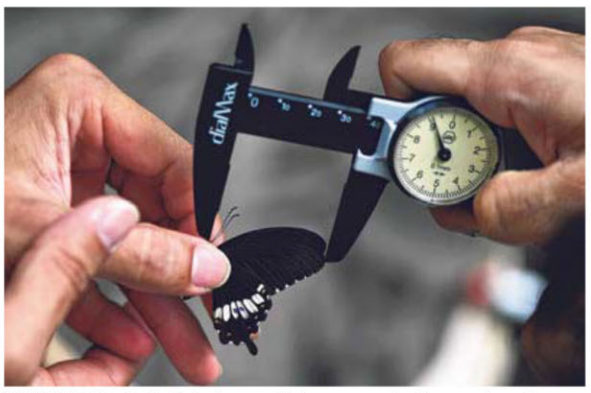
Number of butterflies the team managed to label.

130

Number that were reunited with the researchers after a few hours or a couple of days.

CATCH: Mr Chan chasing butterflies at Dairy Farm Nature Park. He and Dr Jain were involved in a butterfly dispersal study that was published in a journal.

MARK: A Papilio polytes romulus (common mormon) butterfly being tagged on the wing with a fine-tip marker pen.



MEASURE: The butterfly's wingspan being measured with a vernier caliper before it is released.