

In this issue

Origins of SARS-CoV-2

Confronting conspiracy theories

Social media is rife with informed and uninformed guesses about the origins of the virus that led to the COVID-19 pandemic. Initial guesses about a zoonotic starting point led to rigorous screening of viruses from bats, civets, camels, pangolins... But, when attention shifted to the possible location, a wet market in Wuhan, the origins of the virus became a point of political contention. Conspiracy theories soon started emerging. Was the virus engineered by scientists and did it somehow accidentally escape from a lab to start the pandemic?

Anirban Mitra from the Institute of Genetic Engineering, Badu summarises the findings of several research groups in a Review Article on **page 77** in this issue.

Metals in Sewage Sludge

Recycle and reuse?

Sewage in urban centres contains large amounts of heavy metals – arsenic, lead, mercury, cadmium, chromium, cobalt, iron, molybdenum, manganese, zinc... Initially the aerobic digestion of organic material depletes oxygen in sewage. Then anaerobic digestion takes over, where, instead of consuming oxygen and releasing carbon dioxide, microbes consume sulphates and nitrates to release hydrogen, methane, hydrogen sulphide, etc.... The hydrogen sulphide released reacts with the heavy metals and forms metal sulphides which are insoluble. And the metal sulphides are deposited in sewage sludge, or at the bottoms of lakes and rivers into which sewage drains.

This makes the metal sulphides amenable to recovery, recycling and reuse, argue researchers from the Indian Institute of Science, Bengaluru in a Research Article in this issue. Turn to **page 109** for details.

Ficus and Wasps

Focus on parasitoids

The inflorescence of the *Ficus* species, a syconium, looks like a fruit to untrained eyes. Definitely not attractive

to most floral pollinators. For each species of *Ficus*, there is a specific species of wasp that acts as pollinator. Such wasps lay eggs inside the syconium and pollinate the hidden flowers. The reproduction of the *Ficus* species and the wasp species is tightly coupled.

But there are other wasps which do not pollinate. They merely use the syconium as a nursery to raise their young. They use the resources in the syconium, but do not pollinate the flowers.

And there are yet other wasps that are parasites on the wasps which do not pollinate. How do these parasitic wasps recognise the syconium which contains the larvae of their host wasps? Since the parasite wasps and the non-pollinating wasps have males and females with distinct differences in size, do the parasitic wasps preferentially deposit eggs that develop into male or female into syconia depending on the sex of the host species within?

Renee M. Borges and team at IISc Bengaluru investigate the case of *Ficus racemosa*, and of three wasps that do not pollinate and a wasp that parasitises on them.

Read the Research Article on **page 141** in this issue to imbibe insights into the interconnectedness of a tree, three wasps that form galls in the inflorescence and a parasitic wasp.

Artificial Nest for Bees

To cash in on cashew

The production of the Indian cashew crop during 2020–21 will fall short by approximately 50,000 tonnes, according to the International Nut and Dried Fruit Council. One of the primary reasons is lack of adequate pollination. Though there are more than a dozen bees known to pollinate cashew, two that are most common on the west coast region of Karnataka are *Braunsapis picitarsis* and *Braunsapis mixta*. Researchers from the ICAR-Directorate of Cashew Research have now found a way to convince these bee species to stay in cashew plantations by providing free housing in the form of artificial nests.

By studying the habitat preferences and nest building habits of the two species, K. Vanitha and T. N. Raviprasad determined the right kind of sticks and wood with right diameter holes to invite the pollinators to use the human-designed nests. Within 15 days of installation of the artificial nests, the two bee species started moving in. Several wasp species also moved into the neighbourhood. But, when the wasps abandoned their free accommodation, the bees occupied those also.

The three years of work is only a beginning for the researchers. They found that the artificial nests are useful to study the life history and ecological aspects of these bee species. Meanwhile, cashew farmers on the west coast can use the trick to invite bee pollinators to stay in crop fields.

Read the details in a Research Article on **page 127**, in this issue.

Synchronised Spawning

Corals of Kavaratti

To the west of the Kavaratti atoll in Lakshadweep is a coral reef, covering an area of more than three square kilometres. The reef is dominated by various *Acropora* species of corals. The polyps breed either by brooding, fertilising the egg internally, or by broadcast, where bundles of sperm and eggs are released into the water column above and the eggs are fertilised further away from the colony. Broadcast spawning is synchronised by the members of the same species within the reef.

Researchers from the Zoological Survey of India investigated this annual phenomenon in 500 square metres of the reef, containing four *Acropora* species. From January to March, they documented the timing of spawning of each species. They captured spawn to understand fertilisation and larval survival rates.

Now, they reveal the results in a Research Article in this issue. Flip to **page 133**.

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