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Hello Members,

This edition contains a few internet snippets of research and everyday entomological new.

Remember, we can ensure that each edition of Tarsus is of maximum interest to members if we have members contributing articles or simple observations and photos.

Kind Regards

Garry Webb

Circular editor

New Entomological Research

(**Right Click** on the titles (or **CTRL Right Click**) to see the full articles)

How Far Do Mosquitoes Travel or Fly and Why Does It Matter?

Mosquitoes are annoying but they can also be dangerous. Australia is lucky to be free of major outbreaks of serious mosquito-borne diseases such as dengue and malaria but this doesn't mean that our local mosquitoes don't pose a health risk. Thousands of people fall ill following a mosquito bite each year across the country. Beyond these serious health risks, swarms of summer mosquitoes can still be disruptive to your time outdoors. Some of the fun of spending time in your backyard can be lost when you're swatting away at mosquitoes all afternoon. But where are they all coming from?

Scientists Spent 7 Years Studying Moth Wings and Discovered Something Unexpected

A search to change the patterns on moth wings uncovered something unexpected: wider tails, suggesting that evolution may reshape insects' defenses by modifying features they already possess. A luna moth's leaf-like wings help it escape the notice of predators that hunt by sight. Other giant silk moths display prominent eyespots that can make them look threatening. A new study suggests that moving between those appearances can require only a small change in the signals that guide wing development. Over seven years, Andrei Sourakov hand-reared more than 700 luna (*Actias luna*) and polyphemus (*Antheraea polyphemus*) moths from egg to adulthood. Sourakov is the collection coordinator of Lepidoptera at the Florida Museum of Natural History and an affiliate associate professor of entomology at the University of Florida. His findings, recently published in *Evolution & Development*, reveal how treatments during development can alter both the patterns and shapes of moth wings.

Australia's native bees have an unusual power that can fight antibiotic resistance

A grazed knee. A cut while gardening. A routine hip replacement. For most of the past century, these were minor worries. But in a world where antibiotics stop working, any of them could turn deadly. Drug-resistant infections are on the rise, and developing new drugs is difficult, expensive and slow. This has researchers looking beyond conventional medicines for new ways to fight harmful microbes. One place worth investigating is surprisingly close to home: the nests of Australia's native stingless bees. In our new study published in PLOS One, we tested honey and propolis (a sticky resin bees build their nests from) from the tiny native bee *Tetragonula carbonaria* against 16 types of bacteria and fungi that can cause disease in people. The honey stopped every bacterium we tested. The propolis was more selective, but it hit certain fungi remarkably hard.

Millions of bogong moths are blanketing our cities and they are still endangered

In recent weeks, people across Australia have found fluttering bogong moths (*Agrotis infusa*) in their homes, cars and even bedrooms. These insects have embarked on their annual migration from breeding grounds across southern Australia to the cool caves of the Australian alps. For entomologists, or insect scientists, like myself who have studied these moths for years, it's been a hopeful sight. But it hasn't changed the fact bogong moths remain endangered on the International Union for Conservation of Nature's Red List of Species. Bogong moths are at risk of extinction due to climate change heating up their mountain boulderfields.

These Giant-Headed Ants Are Breaking a Fundamental Rule of Biology

Bigger animals generally have bigger body parts, but new research reveals that certain ants defy this biological rule. In the insect world, bigger bodies usually come with bigger body parts. But some ants break this rule in an unexpected way. A massive soldier ant, equipped with an oversized head and powerful jaws, can have smaller antennae than a worker that is only a fraction of its size. Researchers at the University of Ottawa have discovered that this unusual pattern is widespread among *Pheidole* ants, a diverse group known for their distinct worker and soldier castes. Although antennae grow in proportion to body size within each caste, their sizes overlap between castes despite major differences in overall body size. The findings suggest that evolution can alter how individual body parts grow, allowing ants to develop specialized features without following the usual rules of biological scaling.

The Incredible, Lovable Silverfish

Did you know silverfish are one of the most primitive insects on Earth, dating back to more than 400 million years ago? Now that's incredible, don't you think? Did you know they can live up to six years (providing the individual lives a charmed life away from predators and the foot of a human)? Did you know they feed on almost anything in our homes? It's true! Silverfish will feed on bookbindings, hair, clothing, carpet, glue, coffee, sugar, paper, leather, cereals and dandruff! They will even feed on their own molted exoskeleton and dead insects. So, if you think you can starve them out, think again! On top of their omnivorous appetite, silverfish can live for 12 months or more without feeding, as long as water is available.

Nature may have a preferred tempo

From flashing fireflies to human music, many biological rhythms appear to converge on the same rhythmic range. While in Thailand's mangrove forests filming *Pteroptyx malaccae* fireflies, known for synchronized flashing, researchers noticed a coincidence: nearby crickets appeared to chirp in time with the flashing insects. "I thought, whoa, could the two be interacting?" says Northwestern University biophysicist Guy Amichay, lead author of a new study on the phenomenon. "It also blew my mind because it's light versus sound."
A closer analysis showed that both produced signals at nearly the same tempo—about 2.4 hertz, or roughly 145 beats per minute. While the tempos' extreme closeness may indeed be coincidental, a survey of animal communication studies revealed that a broader range—around 0.5 to 4 hertz, or 30 to 240 beats per minute—appeared repeatedly across animals varying enormously in size, from fireflies and fiddler crabs to fish, birds, apes and humans.

Hordes of yabbies are trashing rivers in Africa. How did this happen?

Every year, the upper Zambesi River breaks its banks and spreads across the wide Barotse floodplains in Zambia. These seasonal wetlands are famed for their exceptional richness of species, from birds to unique cichlid fish. But there are signs of profound upheaval. Native fish and invertebrate populations have fallen, river plants are being devoured and river banks hollowed out from within. The culprit will be familiar. As the flood eases and the dry season begins, the shallow muddy pools left behind teem with redclaw crayfish (*Cherax quadricarinatus*), a freshwater crayfish native to the tropics in northern Australia and Papua New Guinea. Many Australians call these "yabbies", as they do other medium-sized *Cherax* crayfish. It might seem bizarre that an Australian species has become an invasive pest overseas. The flow of introduced species usually goes the other way. But these yabbies were forged in the intense crucible of the Australian climate. Unfortunately, they may be all but unstoppable in the Zambesi – and many other water bodies around the world.

Grim new details in Qantas bed bug saga

Shocking new details have emerged after it was revealed that a recent Qantas flight was infested with bed bugs. The unbelievable ordeal all unfolded when passengers on board flight QF5 from Perth to Rome complained about being bitten by bed bugs during the flight on October 9. The airline was then forced to cancel Saturday's return flight, QF6, from Rome to Perth, with the Boeing 787 Dreamliner being taken out of service for a deep clean. Affected passengers were provided with accommodation and rebooked on alternative flights.

Insane map insectophobe's worst nightmare

It's moth season, baby. Zoos Victoria's Moth Tracker map has charted the monstrous amount of new sightings across eastern Australia as millions of bogong moths head for the Alps. The citizen-science project has recorded 12,000 verified sightings, according to Zoos Victoria senior conservation biologist Dr Marissa Parrott, who says the fluttering visitors are cause for celebration. It's not great if you're an insectophobe, but wildlife experts are saying the sightings are great news. "We're seeing wonderful healthy numbers again after lower years," she told Sunrise. "That's about six times higher than our previous best seasons. It's just wonderful to see the numbers coming back to where they should be and everyone enjoying a visit from an endangered species." Swarms have already descended on NSW South Coast homes, with strong winds pushing migrating moths towards the coast and artificial lights drawing them into built-up areas.

From bogong moths to Christmas beetles – how to slow down and spot more insects

Millions of people worldwide watched on as the Sydney Olympics came to a close in 2000. Meanwhile, thousands of bogong moths (*Agrotis infusa*) were airborne, making their annual migration to the Australian Alps. These bogong moths swarmed in such large numbers that the rain radars showed a storm approaching Sydney. The bright lights of Stadium Australia, where the closing ceremony was unfolding, had lured them in. As an entomologist, I'm fascinated by insects. This year, the bogong moth population has exploded along Australia's east coast, with people discovering these insects in every nook and cranny of their homes. The current resurgence offers scientists valuable information about the health and abundance of the bogong moth population. But they aren't the only insects worth watching.

A Giant Insect on the Brink of Extinction Is Making an Extraordinary Comeback

Captive breeding has helped New Zealand's largest giant wētā establish new wild populations, with at least four generations now born on two islands. As early European settlers cleared land for farms and introduced rats, stoats, and other pests, wētāpunga disappeared from every wild refuge except Te Hauturu-o-Toi/Little Barrier Island. Moving these giant insects elsewhere offered a way to rebuild their populations, but surveys between 2005 and 2009 found that too few remained to supply those transfers directly. Conservationists collected a small founding group and began breeding them at Butterfly Creek, creating a source of insects for release without relying on large collections from the wild. Over 15 years, that effort, later expanded by Auckland Zoo, produced tens of thousands of wētāpunga and supplied more than 11,000 for release at 10 new sites.

A Mite on a Bee on a Ship on the Sea Spells Trouble

Pollinator pathogens are spreading through international trade, threatening both agriculture and wild ecosystems. In July 2025, a crewmember on board a cargo ship heading from India to New Jersey noticed a swarm of bees. The ship's master captain notified Customs and Border Protection in the United States, and federal apiarists guided the crewmembers—who were 6,667 kilometers (4,143 miles) from their final destination—on how to capture the hundreds of bees inside a plastic bag and store them in the ship's freezers. The quick action prevented an exotic species and its pathogens from alighting on North American shores. But it was a warning bell for the continent.

Endangered bogong moths swarming into homes across NSW

Reina Hill is playing the reluctant host to some unexpected visitors in her Batemans Bay home. Since Friday, her house has been swarmed by bogong moths. "I walked out my door and was hit in the face by thousands of them," she said. "I swear there was millions of them layered on various areas under my deck, under my eaves and all around the windows." Ms Hill was not alone in noticing the sudden influx of the endangered insects. About 800 moth sightings have been logged on the citizen science platform iNaturalist since Friday, with more than 200 logged in the past 24 hours. Every year, the peanut-sized moths migrate to the NSW Alps to escape the summer heat before returning to their inland breeding grounds in autumn. But the insect's population has fallen steadily since the 1980s due to drought and warming temperatures. In 2017, numbers crashed by as much as 99.5 per cent, and in 2021 they were listed as endangered.

Are Australia's native bees thriving or declining? We don't know but can find out

It's a sight to behold. Each spring, thousands of solitary bees (*Amegilla dawsoni*), also known as Dawson's burrowing bees, emerge from burrows scattered across Western Australia's arid plains. These bees, distinguished by their fluffy appearance and either white and maroon (females) or coffee (males) colouring, are on a quest to find flowers and a mate. They are just one of more than 1,700 native bee species that call Australia home – a figure steadily rising each year. Tragically, Australia's native bees face a conservation crisis. Wild bees are declining worldwide, under pressure from habitat destruction, invasive species, pesticide use and climate change. Due to a lack of funding and attention, few people recognise how much native bees are struggling. Even native bee researchers don't have all the answers. Our new study took a closer look at the major threats to Australia's native bees and, by drawing on research from here and abroad, created a plan to conserve them.

66 million years ago, the dinosaurs died – but ants thrived. Scientists just figured out why

Ants are the most species-rich family among social insects, with more than 15,000 species worldwide. They originated around 140 to 168 million years ago but didn't rise to ecological dominance until 66 million years ago, when an asteroid ended the age of dinosaurs. Scientists now know exactly what allowed ants to triumph after this mass extinction. The research was conducted by an international team of scientists led by Lukas Schrader from the Institute for Evolution and Biodiversity at the University of Munster, Germany. The findings are published in the journal Science Advances. By analysing and comparing the genomes of 163 ant species from 12 of the 16 ant subfamilies living today, the researchers were able to reconstruct the evolutionary history of these animals over the past 100 million years.

Scientists Solve a Decades-Old Stick Insect Mystery

Australia's coastal landscapes are home to large stick insects belonging to the genus *Anchiale*, a group of closely related species. For decades, scientists and nature enthusiasts have documented them, uploading more than a thousand observations to databases like iNaturalist and the Atlas of Living Australia. But despite all that attention, several distinct insects have been hiding in plain sight under the wrong names. A University of Sydney study now recognizes five Australian *Anchiale* species where scientists previously recognized two. The researchers described two new species and restored recognition of a third that had gone unrecognized for decades. These insects range from northern New South Wales through coastal Queensland and into Australia's tropical north.

Two New Large Stick Insect Species Found in Australia, Including One Misidentified For 50 Years

Stick insects are notoriously difficult to spot, and it's not just because they're camouflaged. Scientists in Australia have just discovered two entirely new species of stick insect in areas of the country's tropical state of Queensland that are already very well-researched. One of those species, *Anchiale mabiensis*, has evaded the scientific record until now by hiding out in Queensland's critically endangered Mabi rainforest, on the Atherton Tablelands. As of 2021, there were only 1,050 hectares of Mabi rainforest remaining. Those remnants are heavily fragmented, too, occurring in patches throughout an otherwise agricultural landscape. This adds to their vulnerability, since grazing and feral animals, as well as invasive plants, can get in from all sides. *A. mabiensis* seems to be endemic to this threatened ecosystem.

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