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Following the passing of our president Bob Ryan, his wife Adele has sent a message to the Society members. See attached. We also note the recent passing of other current (Geoff Monteith) and past (David McAlpine) members.

As I have not long returned from overseas together with pressing family issues (GW) this edition of Tarsus will be brief and delayed.

This edition we have another interesting contribution from Graeme Smith on silverfish. Dinah Hales has kindly provided some recent insect photos.

We encourage all members to consider that the society, Tarsus and the journal GAE rely heavily on the contributions of members. We need your input to not only populate the society endeavours but to also encourage others to contribute and become members.

Kind Regards

Garry Webb

Thomas Heddle

Circular editors

Message from Adele Ryan to members of the NSW Entomological Society

I am so deeply touched by those of you who attended Robert's funeral on Tuesday 3 September at Sans Souci. My apologies if I missed acknowledging you on the day.

And to all of you who may not have been there, thank you for your messages.

It is a testament to Robert, the person, that so many from his vast network came to the celebration of his life and my family and I are truly moved.

We are comforted in the fact that he had a wonderful farewell made possible through the spirit of those who made the effort on the day.

Regards

Adele Ryan

Colourful Australian silverfish

Graeme Smith

In 2020, while searching for silverfish on-line, I came across a photo of an amazingly coloured silverfish posted on Flickr. I was able to make contact with the photographers, who were able to collect some specimens for me to describe. Fortunately, Jean and Fred Hort have a reputation for finding all sorts of interesting animals and plants and have been included on the WA Museum collection permit. They are also meticulous in applying for National Parks permits.

Andrew Mitchell, a molecular biologist colleague at the Australian Museum, immediately recognised the possibility that this silverfish might be mimicking velvet ants. The description of this species, as well a second very similar species collected by the Horts was published in 2021 (*Hemitelsella mutilloides* and *Hemitelsella hortorum*).

During my current travels in WA I was finally able to meet up with the Horts, who took Louise and me to their collection sites. I'm afraid I couldn't find any specimen myself but Jean fairly quickly found two. In contrast to most silverfish that hide during the day, this species was running around on bare sand in the middle of the day. It appears that it is similar enough in appearance to a stinging insect that day-active predators do not bother it. It also displays a strange behaviour in that it waves its tail filaments around in a circle in the air. I had only previously seen these insects in photos or preserved in alcohol, where the scale pattern becomes hard to determine, so it was great to see them live.

Recently, Graham Brown sent me photos of a similar mimic, caught in a pitfall trap in Central Australia, and a friend of Jean and Fred photographed another specimen, south of where they took Louise and me. I am also convinced that a specimen I described in 2016 from northern Tasmania (*Hemitelsella clarksonorum*) also shows mutillid mimicry but I was only able to see a single specimen in alcohol, where the dramatic colouring was not visible.



Hemitelsella hortorum Smith & Mitchell, 2021 from Wandoo National Park (photo courtesy of Jean and Fred Hort)

At Drovers Cave National Park in WA, Louise and I found another small but colourful silverfish. Several specimens were collected from dry leaf litter beneath a small-leaved bush. It is possible here that the colours play a different role. When disturbed, these silverfish initially ran a short distance into other leaves. When I scooped up these leaves and sand into a plastic tray (silverfish can't climb smooth plastic surfaces) I had a devil of a job trying to find them. They played dead! They curled their body slightly and lay still, very much resembling the dead leaves in which they were hiding. The curled edges of these dead leaves had a lighter colour similar to the margins of the silverfish. The trick was to collect as few leaves as possible when scooping up the silverfish.

I cannot tell what genus this species belongs to until I can get home and examine it properly, but I suspect it might also belong to *Hemitelsella*.

While Western Australia seems to have more than its share of colourful species, I suspect that similar interesting species will eventually be found in other states.



Undescribed Ctenolepismatinae from Drovers Cave National Park (photo by Louise Smith)

New Entomological Research

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

[Scientists Discover Bacteria That Could Help Us Win the Fight Against Mosquitoes](#)

A new study has found that certain bacteria can accelerate mosquito larvae growth, a discovery that may support global health efforts. The *Aedes aegypti* mosquito, which spreads diseases such as dengue, yellow fever, and Zika, is a target of anti-disease programs. These programs focus on breeding and releasing non-biting male mosquitoes, either sterile or modified to block disease transmission. Compared to widespread insecticide spraying, mass release programs offer a more effective solution, especially since mosquitoes are increasingly resistant to common insecticides. In the study, researchers from the universities of Exeter and Wageningen investigated how *Asaia* bacteria influence mosquito larvae development. They found that exposure to *Asaia* bacteria sped up larvae growth by a day—an advantage that could aid large-scale mosquito breeding programs needing to produce millions of adults quickly.

[New predatory bug species discovered in Aussie wilderness uses 'tool' to assassinate prey](#)

A new species of assassin bug has been discovered in the wilds of Australia that uses a “tool” to capture its prey. It’s one of several species scientists have documented using complex methods to attack. Western Australian Museum insect expert Dr Nikolai Tatarinic told Yahoo News that tool use is traditionally associated with primates, dolphins and birds. But in the case of the newly described *Gorareduvius gajarrangarnang* it doesn’t use sticks, stones or sea sponges, but rather spends its day extracting a resin from plants and then coating itself in the sticky substance. “Assassin bugs, as the name suggests are predators. When they attack other invertebrates the sticky resin helps them grab them more readily,” Tatarinic said. The assassin bug lives in two remote areas of the Kimberley. It’s been documented laboriously cultivating the resin from a soft species of spinifex, but there is some evidence to suggest it could also be stealing it from the nests of resin bees. Along with using resin to kill, the insect also appears to be coating its eggs in the substance for two specific reasons.

[Aussie hiker's timely warning as 'itchy' bites in the bush pose serious health risk](#)

A woman is urging Aussies to remember that ticks don't just pose a health risk to pets after her husband has copped multiple bites in recent months, with each taking him weeks to recover from. Rachelle Patterson told Yahoo News her husband Hamish's most recent bite occurred on Wednesday morning while he was out on a dog walk near Picnic Point in Toowoomba, Queensland. The paralysis tick lodged itself into his neck, with pictures showing the unnerving aftermath. “[It was] very red and inflamed, plus itchy... normally the bites take about two weeks to properly heal and resolve,” she said. The couple were able to remove the paralysis tick using Medi Freeze tick-off — something Rachelle called “a must-have during tick season”. Thankfully Hamish's symptoms weren't severe, however, tick bites can pose serious health risks and can cause collapsing and even difficulty breathing. Another woman told Yahoo News her brother had developed an allergy to ticks after being bitten several times in close succession last year, with his doctor telling him the next tick bite could even cause life-threatening anaphylactic shock.

[The Great Monarch Migration: Can These Butterflies Survive Climate Change?](#)

The monarch butterfly's migration is one of the wonders of the natural world. A new generation of monarch butterflies is born each autumn in the northern United States and southern Canada. Hundreds of millions of these butterflies then fly to Central Mexico's mountains, between 4,000km and 4,800km away, where they overwinter in forests of the sacred fir *Abies religiosa* at high altitudes. Without these sacred firs, the monarchs couldn't survive their grueling migration. However, with the ongoing effects of global warming, these forests are predicted to slowly move up the mountain slopes. By approximately 2090, they will reach the summit, leaving no room for further upward movement. Thus, it will be necessary to create new forests outside their current geographic range, such as mountains further east, which are at higher altitudes. "Here we show the feasibility of planting new sacred fir forests on a nearby volcano, Nevado de Toluca, at altitudes between 3,400 and 4,000 meters," said Dr. Cuauhtémoc Sáenz-Romero, a professor at the Universidad Michoacana de San Nicolás de Hidalgo in Mexico, and the lead author of a new study in a new study in *Frontiers in Forests and Global Change*.

[Tiny creature undergoes massive change after humans arrive on island](#)

European settlement has had a clear impact on a species of native bug, new research has revealed. The dark-coloured long-tailed stonefly (*Zelandoperla*) that once lived in forests in New Zealand has vanished as its habitat has been destroyed, and its light-coloured cousin has moved in. The reason behind the change is a surprising but simple one. The colouring of the darker version evolved to resemble a similar bug — the poisonous stonefly (*Austroperla*) — and this effectively tricked birds into thinking it was dangerous to eat. "But the removal of forests since humans arrived has removed the poisonous species. As a result, in deforested regions the mimicking species has abandoned this strategy — as there is nothing to mimic — instead evolving into a different colour," study co-author University of Otago Professor Jon Waters said.

[Are You Tasty to Mosquitoes? Yale Scientists Reveal What Drives Their Biting Choices](#)

As mosquito-borne illnesses like dengue fever continue to spread worldwide, researchers believe that one way to prevent these diseases is by stopping mosquitoes from biting people in the first place. While scientists have long understood how odor and heat guide mosquitoes to humans, the role of taste once they land has been less clear. In a new study, Yale researchers have uncovered how mosquitoes' neurons encode different tastes and how these tastes affect their biting, feeding, and egg-laying behaviors. The study also identified compounds in human sweat that increase mosquitoes' biting tendencies and bitter compounds that can reduce feeding and egg-laying. This research offers new insights into why some people may be more attractive to mosquitoes than others. These findings could pave the way for new methods to reduce or prevent mosquito bites in the future.

['The bush calls us': the defiant women who demanded a place on the walking track](#)

Many Australians feel drawn to explore the bush on foot. Bushwalking offers a chance to escape the city, forge friendships, explore beautiful scenery and keep our bodies and [minds](#) healthy. But the bushwalking track wasn't always a place where women felt welcome. In the 1920s and '30s, some people scoffed at the idea women could handle rugged encounters with nature. The bush was considered a place for men. Besides, how could women walk rocky paths and steep hills in their long skirts and dainty shoes? But some courageous women walked anyway. The Melbourne Women's Walking Club formed in 1922, and was the first of its kind in Australia.

[Meet the Trickster Wasps: 22 New Species Discovered, Named After Legendary Thieves Like Han Solo](#)

A team led by Penn State researchers identified 22 new species of gall wasps, naming them after famous thieves. This discovery opens new opportunities for future research on the biology and ecology of these understudied wasps. A Penn State College of Agricultural Sciences graduate student has led research that has resulted in the discovery and naming of 22 new species of gall wasps for the first time. The study, which includes the new names and descriptions of each species along with an identification guide, recently was published in the journal *Zootaxa* and nearly doubles the number of known species in this genus of wasps. The tiny wasps — which live in small structures called galls that they steal from other wasps — were named after famous thieves and tricksters in history, mythology, and pop culture, such as Catwoman and Han Solo.

[Colourful critters 'falling out of trees' in garden stuns Aussie](#)

An Aussie man was baffled after noticing an influx of colourful critters "falling out of trees" with the unusual behaviour even stumping an expert who warned of their painful sting if touched. And he's not the only one who noticed one of late. A Tasmanian woman also spotted the brightly-coloured creature on the sand at a beach before moving it back to the bush. Although people are generally warned not to touch them because of their poisonous hairs. The local man, who didn't reveal his location, was quick to identify the unique caterpillar as a *Doratifera oxleyi*, which grows to be a Painted Cup Moth. Dr Chris Burwell, Senior Scientist and Curator of Entomology from Queensland Museum confirmed to Yahoo News it is indeed the case.

[WA Health issues urgent warning over mosquito-borne disease](#)

An urgent warning has been issued by WA Health to prevent mosquito bites in Western Australia's north-west after a potentially deadly disease was found. The department has advised people to take caution when travelling through the Kimberley, after mosquito-borne virus activity was identified in sentinel chickens. More testing is needed to identify the specific virus, but it is known that illness from the same family of viruses can be severe, and even lead to death. Symptoms are fever, drowsiness, stiff neck, headache, nausea and dizziness. In children the only sign of infection may be a fever.

[How the Asteroid That Killed Dinosaurs Turned Ants Into Farmers](#)

Research highlights how the meteor impact that ended the dinosaurs helped spawn the mutualistic relationship between ants and fungi, marking an early form of agriculture long before humans farmed. The meteor strike that killed the dinosaurs 66 million years ago may have led to a remarkable mutually beneficial relationship between fungi and ants. The low-light environment caused by the impact created conditions favorable to the spread of fungi that feed on organic matter, which was abundant at the time as plants and animals were dying in droves. According to a new study published in *Science*, this was the perfect opportunity for the ancestor of a group of ants to start cultivating these microorganisms. "The origin of fungus-farming ants was relatively well understood, but a more precise timeline for these microorganisms was lacking. The work provides the smallest margin of error to date for the emergence of these fungal strains, which were previously thought to be more recent," explains André Rodrigues, professor at the Institute of Biosciences of São Paulo State University (IB-UNESP) in Rio Claro, Brazil, and one of the authors of the paper.

[Have Humans Accidentally Created the Coptotermes Hybrid Termite?](#)

The vast majority of invasive pests have been introduced through human activity, mainly through accidental introduction along shipping routes. As bad as an individual incursion can be on the endemic ecosystem, there is always the potential that the invasive pest could interbreed with a closely related native species, with unknown consequences. But what about the possibility of interbreeding between two invasive species? Although the probability of such an event occurring is small, researchers have now established that hybrid populations exist in the wild, created through interbreeding of two of the most significant invasive termite species, *Coptotermes formosanus* and *Coptotermes gestroi*. Work is underway to understand the nature of these hybrid populations and their potential impact on termite management in the affected areas. This is the story so far...

[Invasive ants selectively abandon toxic baits, evading our most effective eradication method](#)

Invasive ants are economically costly and ecologically devastating, and most of our eradication attempts have failed. Now, researchers at the University of Buenos Aires and the University of Regensburg have discovered that these ants can evade the most ecological friendly and effective control method we have—toxic baits—by rapidly abandoning them before the ants can be killed. The paper is published in the journal *Communications Biology*. The costs of invasive ants are staggering: A recent study estimated it at 52 billion U.S. dollars. However, the ecological cost of ant invasions is perhaps worse. Invasive ants drive out native ants, destabilizing ecosystems and threatening vertebrates such as sea birds with extinction. Many countries have spent millions on control efforts, but two thirds of eradication attempts have failed. No one really knows why.

[Bird nests made with a toxic fungus seem to fend off attacking ants](#)

When building a bird nest in ant territory, the best defense could be an offensive fungus. Swollen-thorn acacia trees are aggressively defended by multiple species of ants. And yet, several species of birds across Central America and Africa choose to nest in these trees. It seems that fungal fibers in the nests deter the ants who encounter them and alter their behavior, making them apparently alarmed and intoxicated, researchers report in the October *Animal Behaviour*. “It seemed very strange to me that the ants did not harm the chicks,” says Rhayza Cortés-Romay, an ecologist at the Universidad Mayor de San Andrés in La Paz, Bolivia. “So I started to think from the bird’s perspective: How does it achieve this?”

[10 deadliest insects: Discover the world's most dangerous insects to humans](#)

There are plenty of contenders for the top 10 deadliest insects in the world. Forget great white sharks and grizzly bears, insects are actually the most dangerous group of animals in the world to humans. This is in a large part due to their proficiency at carrying and spreading deadly diseases, from malaria to the black death. Many species of insect feed on vertebrate blood, putting them in a prime position to carry nasty bacteria, viruses, and parasites from victim to victim, and often from animal to human. This list of deadly insects will cover such disease carriers, as well as those that can kill through toxic stings and bites, and even by destroying our crops. Insects have been implicated in major history-defining events, from devastating plagues to colonial expansions, and their effects have shaped our own human evolution. Size really can be deceptive. Read on to find out more about the world’s deadliest insects.

[Rentokil encourages vigilance as wasp activity increases ahead of the early autumn nesting period](#)

Rentokil Pest Control has advised that common species of wasps found in the UK such as the Common and German Wasp, which are generally most active over the summer months, still present a threat of infestation over the late summer and early autumn. Typically, at this time, wasps will be in search of carbohydrates for energy, as the sugary secretions provided by wasp larvae in the nest will no longer be available to them as these larvae will have matured. This change, alongside the breaking down of the social order of the nest will force adult wasps to venture further afield in search of alternative carbohydrate sources, often bringing them into direct contact with humans. During this time mating also takes place, creating fertile queens who will restart the life cycle of the colony for next year, following winter hibernation. As we enter the winter months male and worker wasps typically die out, leaving only the fertile queens who will survive the winter period as the rest of the colony dies from lack of food and lower temperatures.

[Move over Olympians, Australia's wildlife are incredible athletes](#)

Now that the Paris Olympics and Paralympics have disappeared from our screens, let's get back to watching animal videos. But seriously, have you ever paused to think about the athletic abilities of Australian wildlife? In my research as an ecologist, I'm constantly amazed by the strength, speed and resilience of our native animals. Their prowess is testament to the wonders of evolution, and the necessity of species having to adapt to challenging and changing environments in order to survive. Let's take a closer look at some of our best competitors and how might they fare, against humans and overseas entrants. On your marks, get set... swim, hop, dig, dance, glide!

["Masters of Shape-Shifting": How This Peculiar Insect Conquered the World](#)

Darkling beetles have undergone rapid evolutionary changes over 150 million years, allowing them to adapt to diverse environments and become ecologically dominant. A large-scale genomic study of darkling beetles, a hyper-diverse group of over 30,000 species worldwide, has revealed a 150-million-year evolutionary history of one of Earth's most ecologically significant yet overlooked creatures, according to new research from The Australian National University (ANU) and CSIRO. Scientists have long been captivated by the "extraordinary" diversity of darkling beetles – tiny critters that have lived since the age of the dinosaurs – and their ability to successfully adapt to and thrive in a range of diverse and harsh environments over hundreds of millions of years. But until now, it was not fully understood how beetles were able to evolve certain traits and abilities that allowed them to "conquer the world." According to lead author Dr. Yun (Living) Li, from ANU and CSIRO, darkling beetles underwent multiple "big bang" evolutionary events right from the start, allowing them to expand and colonize a vast range of terrestrial environments across Earth and rapidly evolve into a "spectacular array" of different body forms that we see today.

[Where did all these dragonflies come from?](#)

If you've spent much time outdoors along the east coast of Australia in the past week, particularly near waterways, you've probably seen something quite interesting emerging: dragonflies, whether in ones and twos or what feel like clouds and swarms. Where did they come from? What are they up to? And why are there so many dragonflies all of a sudden?

The short answer is the weather. A warm start to spring has meant a lot of dragonfly nymphs have decided it's a good time to take the leap into adulthood. Adult dragonflies are the highly visible winged predators we see buzzing around everywhere at the moment. In cities, where bodies of water may be relatively small – think ponds and creeks rather than lakes and rivers – water temperatures rise more quickly as winter ends. When the weather is warmer, dragonflies may emerge earlier in the year.

[Invasive pest threatening to devastate Aussie communities as weather warms: 'Economical disaster'](#)

As Australia's weather gradually heats up, agriculture experts are sounding the alarm over an invasive pest due to reemerge that has the potential to wreak "economic and ecological disaster". With spring officially underway, pest control authorities are warning Aussies conditions are ripe for yellow crazy ants (YCA) — a highly invasive and dangerous species that puts our tourism sector at risk and threatens to devastate the agriculture industry, leaving lasting impacts on local communities. Speaking to Yahoo News Australia, Reece Pianta from the Invasive Species Council said these ants prefer warming weather and therefore are now becoming more active. "This period is extended with the warm late weather, [which] generally means there are more food sources to forage so ants become more active," he told Yahoo. YCA are established across Australia and have been branded one of the most damaging invasive species on the planet. First found in the country in 1934, yellow crazy ants have since been recorded in Queensland, the Northern Territory and NSW.

[Perth-wide quarantine on plants and trees as government tackles tiny borer beetles](#)

A quarantine area around the whole of Perth has been extended to stop the spread of a tree-killing beetle. Effective from Friday, the WA Department of Primary Industries has broadened a quarantine area, restricting the movement of plants. Authorities are trying to get a handle on the destructive polyphagous shot-hole borer, which burrows into tree making tiny holes. The beetles have a symbiotic relationship with fungus; the fungus kills trees and the beetles also cause structural damage. "Across the Perth metropolitan area, [department] officers have inspected more than 1.9 million trees on over 62,000 properties since the response started in 2021," chief plant biosecurity officer Vincent Lanoiselet said. Despite the three-year fight against the beetle, five new council areas have now been added to the quarantine blanket, which now encompasses 30 councils; Armadale, Kwinana, Mundaring, Rockingham and Serpentine Jarrahdale have now been included.

[Landowners go cold on mandatory fire ant poisoning](#)

Hostility is on the rise among landowners who object to a mandatory baiting program to defeat fire ants. Australia has ramped up its decades-long effort to eradicate the South American super pest, which could cost the country billions each year if they escape from south east Queensland. But there's growing opposition among residents whose properties are being targeted under a mass baiting program, including on properties where there's no evidence of fire ants present.

[Astonishing Aerials: This Tiny Backyard Bug Performs the Fastest Backflips on Earth](#)

Move over, Sonic. There's a new spin-jumping champion in town – the globular springtail (*Dicyrtomina minuta*). This diminutive hexapod backflips into the air, spinning to over 60 times its body height in the blink of an eye, and a new study features the first in-depth look at its jumping prowess. Globular springtails are tiny, usually only a couple of millimeters in

body length. They don't fly, bite, or sting. But they can jump. In fact, jumping is their go-to (and only) plan for avoiding predators. And they excel at it – to the naked eye, it seems as though they vanish entirely when they take off.

[Silent Spring Revisited: Revamping Pest Control to Save Our Bees](#)

New research adds solid evidence to the suspicion that steep declines in America's wild bee populations stem in large part from the use of pesticides. USC Dornsife scientists say saving the crucial pollinators requires new approaches to managing pesky insects. Whether you're strolling through a garden, wandering a park, or simply enjoying an open space in the United States, you're likely to notice bees buzzing about the flowers. While honeybees, imported from Europe in the 17th century to produce honey, are the most recognizable, they aren't the only bees at work. If you're a keen observer, you might spot some of the thousands of less familiar, native bee species that call these spaces home. Native wild bees play a crucial ecological role, ensuring the survival and reproduction of countless plant species — including many agricultural crops — by spreading pollen as they forage for food. Unfortunately, their numbers seem to be declining, and despite experts suggesting multiple causes, the exact reason remains a mystery.

[Wasps can be pests in NZ – but they have potential to be pest controllers too](#)

What good are wasps? It's a question we hear all the time. And, let's face it, wasps are routinely demonised. They interrupt picnics (they love beer and fruit as much as we do). Their sting can be painful or even cause an allergic reaction requiring medical treatment. And a swarm of them flying at you is genuinely terrifying. The beech forests in the northern South Island of New Zealand are home to the world's highest populations of ground-nesting *Vespula* wasps, also known as the German or common wasp. So it's not surprising they get a lot of press, and hardly any of it is positive. But this reputation is not entirely deserved. In fact, some types of wasp have been shown to be useful in crop pest control – something New Zealand's horticultural industries may benefit from.

[How long can a cockroach live without its head?](#)

Did you know insects can live without their heads? We take a look at how long a cockroach could survive without its head. The insect nervous system is based on nerve nodules (ganglia) repeated in each body segment. While the 'brain' ganglion in the head is important, it is not the vital, all-controlling organ we see in vertebrates. They also have an open circulatory system, rather than a network of blood vessels, and breathe through spiracles, or little holes in each body segment. So in theory it is possible for insects to live without their heads. So how long can a cockroach live without its head?

[Cultural Isolation: A Story of One Entomology Student's Difficult Journey](#)

I grew up in the middle of Chongqing, China, the largest city in the world by population. I lived in a high-rise building on a floor so high that, when I looked down from my window, the busy people on the streets below appeared smaller than ants. In this bustling city I was always surrounded by thousands of people who spoke my language and shared my culture. But, in 2014, I moved to the United States. It was a huge life event that required me to learn a new language and a new culture, to make all new friends, and to leave behind the big-city life I had grown up with. I was 14 years old when I immigrated to the U.S. with my father. I spent my high-school years in Portland, Oregon. The language barrier, combined with the cultural shock and the stress of my parents' divorce, initially drove me to lose myself in the

world of video games. Then one day my aunt asked me to take care of her garden, and I found myself lost in a new amazing world of plants and the tiny creatures living in the garden that sparked my curiosity. After that initial spark I became obsessed with watching agricultural education videos on YouTube, learning everything I could about this fascinating world. That is when I started to dream of one day becoming a scientist like the agronomists and entomologists I saw in those videos.

Common Termite Management Tool Creates “Death Zone” That Limits Effect on Colonies

Termites are voracious critters that can cause extensive damage to structures. This is particularly true with some invasive subterranean termite species within the *Coptotermes* genus in the southeast United States, such as the Formosan subterranean termite (*Coptotermes formosanus*) and the Asian subterranean termite (*Coptotermes gestroi*). Both species can form large colonies of millions of individuals and have a high destructive potential, costing several billions of dollars in damage, treatment, and repair in the U.S. Historically, the use of liquid termiticides has been a standard practice in protecting houses across the country against various species of subterranean termites, including native and invasive ones. In the early 1980s, traditionally used chemicals for termite control were phased out owing to environmental concerns and were replaced with less persistent products. However, the treatment protocol has remained similar: drench the soil around the structure with a pesticide treatment to keep termites away. For more than 20 years, it was assumed that newer generations of non-repellent liquid termiticide chemicals had the ability to spread among all termites within a subterranean colony and could lead to termite population control through transfer among nestmates. However, in a new study published in July in the *Journal of Economic Entomology*, I confirmed that such treatments actually have limited impact on subterranean termite colonies' long-term functioning and survival.

[A Guide to the Nesting Habits of Australian Termite Genera](#)

Termites are social and build nests in which they live – sometimes for decades. This is unusual for insects. Most insects are solitary and do not build anything, let alone a complex nest that serves as a functional, multi-generational city. So termites are different, and understanding nests will help to understand termites. Nests come in a variety of numbers, shapes and sizes, and may be located in different positions, all dependent on species. Some species have just one nest in their colony, whereas others may have more than one. Multiple nests may be similar in size, or one may dominate. They may be housed within a food source or separated from all food. Species with separate nests may have short or far foraging distances, with nests from a few to dozens of meters away from food. Understanding the nesting pattern of a species may help in managing that species. Consider the difference between a species with one nest that is always close to food, compared with another species with multiple nests that can be far from food. The best choices for management will differ between these species. Once a management system is installed, continued observation of the termites in the property may give more information about the termite species and potential location of the nest/locations of the nests. This should help control the termite infestation faster and more completely.

[Air pollution makes it harder for bees to smell flowers](#)

In the summers of 2018 and 2019, ecologist James Ryalls and his colleagues would go out to a field near Reading in southern England to stare at the insects buzzing around black mustard plants. Each time a bee, hoverfly, moth, butterfly or other insect tried to get at the

pollen or nectar in the small yellow flowers, they'd make a note. It was part of an unusual experiment. Some patches of mustard plants were surrounded by pipes that released ozone and nitrogen oxides — polluting gases produced around power plants and conventional cars. Other plots had pipes releasing normal air. The results startled the scientists. Plants smothered by pollutants were visited by up to 70 percent fewer insects overall, and their flowers received 90 percent fewer visits compared with those in unpolluted plots. The concentrations of pollutants were well below what US regulators consider safe. “We didn’t expect it to be quite as dramatic as that,” says study coauthor Robbie Girling, an entomologist at the University of Southern Queensland in Australia and a visiting professor at the University of Reading.

[Urgent Countermeasures Are Needed: Researchers Find Blowflies Carrying Bird Flu in Japan](#)

A recent study conducted in a wild bird colony in southern Japan indicates that blowflies could be a possible vector for the transmission of bird flu. Researchers at Kyushu University have found that blowflies, which are highly attracted to decaying flesh and feces, are carriers of the bird flu virus in southern Japan. Their study, published in *Scientific Reports*, suggests a potential new transmission route for bird flu and underscores the importance of developing new strategies to prevent and control the disease in poultry farms. Since 2020, bird flu has been spreading rapidly around the globe, leading to the death of millions of wild birds and the culling of more than half a billion farmed birds worldwide. In Japan, where a single case of infection on a poultry farm mandates the culling of the entire stock, the 2022-2023 winter season saw a record-high of 326 outbreaks of bird flu, resulting in the sacrifice of 17.7 million birds. Some strains of bird flu have also jumped to mammals, including cows, goats, dogs, and cats, and since March, an uptick of cases in poultry and dairy workers, with a high fatality rate, has raised significant concern.

[The Future of Entomology: New Technology Revolutionizes Insect Research](#)

Emerging technologies are transforming insect research and environmental surveillance. Utilizing AI to analyze DNA, images, sounds, and flight patterns, we can unlock novel insights into the insect world. Recent concerns about significant declines in insect populations have prompted researchers to urgently gather data on their current status. “So far, such data are only available for a few insect groups and for selected regions. To improve on the status quo, we need urgent assessments of all types of insects in all parts of the world,” says Roel van Klink, senior researcher at the German Centre for Integrative Biodiversity Research (iDiv) and the lead editor of the special issue. Given how numerous insects are, and how hard it is to tell them apart, obtaining complete information on insect trends has remained a tall order. Now technological breakthroughs are paving the way for global insect surveys.

['Electric butterflies' create a charge so strong they can pull pollen through the air like telekinetic superheroes](#)

A new study has revealed that the electrostatic field created by butterflies and moths in flight allows them to attract pollen grains from flowers across air gaps up to several centimetres wide. Researchers from the University of Bristol also observed that the amount of static electricity carried by butterflies and moths varies from species to species depending on variations in their ecology, such as the type of flowers they visit, whether the insects fly at day or night, and the habitat in which they live. The new findings, published in the *Journal of the Royal Society Interface*, suggest that this electric field increases their efficiency and effectiveness as pollinators.

[How Ants Do Battle: Toxic Sprays, Thick Armor, Overwhelming Numbers, and More](#)

If you have ever watched a battle between two ant colonies, have you wondered who's in charge? Unfortunately, you won't find some great general ordering troops to watch their flanks or a queen directing when the big soldier ants need to come forward.

So, is it every ant for herself in a chaotic battle for survival? Ant colonies are in a constant struggle for territory and resource control. They end up in conflicts with their neighbors all the time, no matter if they're cousins, distant relatives, or species from the opposite sides of the world. However, despite their lack of leadership on the battlefield, ant species have independently developed tactics, strategies, and adaptations to improve their odds of victory. Recently, a pair of researchers teamed up to review 50 years' worth of research about ant combat, which they published in June in the open-access *Journal of Insect Science*.

[Australian amber has revealed 'living fossils' traced back to Gondwana 42 million years ago](#)

Amber is fossilised tree resin. Unlike traditional fossils found on land or in the sea, amber can preserve ancient life forms in incredible detail. It's often considered the "holy grail" of palaeontology worldwide. Amber acts like a time capsule, capturing tiny animals, plants and even microorganisms from millions of years ago. These fossils – also known as inclusions – can appear astonishingly fresh, preserved just as they were when they died trapped in sticky tree resin. Australian amber is now helping to understand the biological diversity of ancient [Gondwanan environments](#) from 42 million years ago and their connections to today's Australian forests. From it, we can learn yet more reasons for why we must protect today's forests.

[10 most poisonous animals, from frogs and toads to sharks and even butterflies. Yes you heard that right...](#)

From frogs and toads to butterflies and beetles, there is no shortage of toxicity in the animal kingdom. Read on to discover our list of poisonous animals - some you may know well, others may surprise you. It's a tough world out there and many animals have had to arm themselves. One capacity that has evolved time and time again is toxic weaponry – venoms and poisons. Although oft confused, there is a clear distinction between these two forms of toxins. Whereas venoms are produced in specialised tissues and are delivered to predators or prey through specialised body parts such as fangs and stingers, poisons are not directly delivered. They are instead accumulated within an animal's tissues and exert their effects when the animal is touched or consumed. Poisoning is often passive, whereas envenomation is an active process.

[Millions of crabs scuttle across this island every year](#)

With the onset of the rainy season, Christmas Island transforms. Roads shut down, the forest floor comes alive, and tens of millions of red crabs take over. The remote Australian territory, located about 190 nautical miles south of Indonesia, is host to one of the world's most singular natural occurrences. There, like clockwork each year, red crabs emerge from their burrows en masse and move to the Indian Ocean, guided by rainfall and lunar cycles. Thick-legged, hard-shelled bodies, about five or fewer inches across, cover the 52 square mile island as they embark from land to sea. "It's a spectacular event that few people get to see," says [Brendan Tiernan](#), Christmas Island National Park's senior field program coordinator for threatened species. Tiernan has lived and worked on the island for 17 years, as one of its approximately 1,500 residents. Still, each year, he bears an eager witness to "one of the great animal migrations." The spread of invasive yellow crazy ants in the 1990's

led to “invasional meltdown.” Yellow crazy ants killed crabs by the millions, spraying formic acid in their eyes and joints in a bid to defend their “supercolony” territories, which can span hundreds of acres. Red crab numbers plummeted through the 2000’s and into the 2010’s, as the ants took over the island.

[The world's 20 most astonishing insect photos of 2024](#)

Delve into the alien-like world of insects with this incredible selection of winning images from the Royal Entomological Society’s Photography Competition. The winning images from the Royal Entomological Society’s Photography Competition have been revealed.

The annual competition showcases the very best amateur insect photography.

This year's overall winner is Yorkshire-based Luke Chambers for his image ‘Sleeping Cuckoos’, which shows two cuckoo bees taking a break on a blade of grass.

[Fire ants: Global 'super-pest' threatens Aussie cities](#)

No other country has managed to eradicate fire ants, but Australia thinks it can. Australia’s largest cities could soon be waving goodbye to beloved traditions like picnics and barbecues if feral hoards of biting invasive insects continue to march across the country. Thousands of red fire ant nests have been detected over the past 12 months across Queensland, with four found to have breached a biosecurity zone set up to stop them. The ants use pheromones to communicate and work together to attack humans, domestic pets and wildlife. While one bite produces a relatively mild needle-like sting, swarms can inflict hundreds or even thousands of bites that can result in anaphylactic shock.

[Red imported fire ants posing major threat to Australia](#)

An invasive species first discovered in 2001 has dodged eradication and now it could strip \$22bn from Australia by the 2040s. Red imported fire ants could cost Australia up to \$22bn in losses by the 2040s, a major research institute has warned, arguing the federal government may be low-balling the biosecurity threat from the invasive species. The Australia Institute says eradicating the ants has not been properly resourced and the government’s own economic modelling on the ants underestimates their danger. “Government commissioned modelling assesses only a 15-year time frame and ignores the \$2.5bn per year in damages that fire ants will cause beyond 2035,” the institute said in a research paper released on Wednesday. “Extending the government commissioned analysis to a 20-year time frame shows every dollar invested in eradication will bring between \$3 and \$9 in benefits. “This analysis shows that RIFA will cost Australia more than \$22bn by the 2040s. “This means that it is less costly to spend \$200m or even \$300m per year every year for the next 10 years, which would be a total of between \$2bn and \$3bn, to eradicate RIFA now.”

[Ants as hosts of honeybee viruses](#)

The COVID-19 pandemic has starkly reminded us that viruses can sometimes jump across species boundaries, leading to significant impact on their new hosts. Monitoring these pathogenic spillover events is crucial, not only for human health but also for the well-being of all living organisms to mitigate the detrimental effects pathogens may have on new hosts that have not yet evolved immunity against them. This is what Rossella Tiritelli, Giovanni Cilia and Donato A. Grasso did in their review article “Occurrence of honey bee (*Apis mellifera*) pathogens in ants (Hymenoptera: Formicidae): a systematic review” by

meticulously examining scientific literature for known honeybee pathogens that have also been detected in ants.

[Neonicotinoid Exposure Worsens Varroa Mite Infestations in Honey Bees, Study Shows](#)

Neonicotinoids are among the most-used insecticides in the world, largely because they are safer for people to use than other pesticide types. However, their impact on bees has been the subject of debate (and some regulatory action) over the past several years. Some researchers and organizations have pointed to neonics as directly harming bees. Others have pointed to other issues, like *Varroa* mite infestation, as more hazardous to honey bee populations. But what if neonicotinoids have an impact on *Varroa* mite infestations? Researchers from the University of Georgia, University of Delaware, and Auburn University inadvertently found that two of these pesticides (there are about a dozen types on the market) may enhance *Varroa destructor* parasitic behavior in honey bee (*Apis mellifera*) colonies. Published in May in the open-access *Journal of Insect Science*, their study is believed to be the first to show—in the field—how neonics can increase *Varroa* mite infestations among honey bees. (The study is included in a new special collection in the *Journal of Insect Science*: “Current Honey Bee Research: Investigating Micro and Macro Aspects of Health and Sociobiology.”)

[Caffeine experiment poses new strategies for ant control](#)

Recent research reveals that doses of caffeine can influence and enhance ants’ behavior, leading to faster foraging efficiency. Like humans, caffeine influences behavior and physiology in animals and even helps to improve cognitive functions, like memory and learning, in bees. Inspired by caffeine-related findings, Dr. Henrique Galante, a computational biologist at the University of Regensburg, investigated the effects of caffeine on the notoriously invasive and meddlesome Argentine ant (*Linepithema humile*). Galante hoped his findings could potentially uncover new methods for managing the species. In his experiment, Dr. Galante used a LEGO drawbridge and tasked the ants to navigate a testing platform in order to reach a sugary reward, conveniently laced with varying levels of caffeine.

[“Astonishing” Discovery – 34,000-Year-Old Inhabited Termite Mounds Discovered in South Africa](#)

Researchers in Namaqualand have found the world’s oldest termite mounds, dating 34,000 years, revealing key insights into ancient climates and carbon storage. In a remarkable breakthrough, scientists have uncovered the world’s oldest inhabited termite mounds along the Buffels River in Namaqualand. These mounds, which date back an astonishing 34,000 years, are transforming our understanding of prehistoric life, climate, and carbon storage. These termite mounds, called “heuweltjies” in Afrikaans, meaning “little hills,” are inhabited by the southern harvester termite, *Microhodotermes viator*, explains lead author on the study, Dr. Michele Francis, a Senior Lecturer (Extraordinary), in the Department of Soil Science in the Faculty of AgriSciences at Stellenbosch University (SU). “Recent radiocarbon dating has revealed that these mounds are far older than any previously known, with some dating as far back as 34,000 years – that’s older than the iconic cave paintings in Europe and even older than the Last Glacial Maximum, when vast ice sheets covered much of the northern hemisphere.”

95% Success Rate: Scientists Develop New, More Effective, and Non-Toxic Way To Kill

Termites

UC Riverside scientists have introduced an effective and sustainable termite control strategy using pinene to lure termites into insecticide-treated areas, achieving over 95% effectiveness and reducing the reliance on harmful fumigation methods. UC Riverside scientists have discovered a highly effective, nontoxic, and less expensive way to lure hungry termites to their doom. The method, detailed in the *Journal of Economic Entomology*, uses a pleasant-smelling chemical released by forest trees called pinene that reminds western drywood termites of their food. They follow the scent to a spot of insecticide injected into wood. “We saw significant differences in the death rates using insecticide alone versus the insecticide plus pinene,” said UCR entomologist Dong-Hwan Choe, who led the discovery. “Without pinene, we got about 70% mortality. When we added it in, it was over 95%. Native to North America, western drywood termites are environmentally important. They are drawn to dead wood above ground, and consume it with the help of microorganisms in their guts. “They are recyclers,” Choe said. “And they’re very common.”

PHOTO CORNER

Young Mantid acting very much like an ant mimic. Found on passion fruit leaves, Beecroft. (photo Dinah Hales)



**Adult Dobson fly (or fish fly) (*Archichauliodes* sp.), in the subway at Beecroft station
(photo Dinah Hales).**



Wattle goat moth (*Endoxyla encalypti*) (*Cossidae*) in the subway at Beecroft station
(photo Dinah Hales).



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