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CIRCULAR OF THE ENTOMOLOGICAL SOCIETY OF NEW SOUTH WALES Inc

This month's member spotlight is Dr Graham Brown. Graham has had a varied career in entomological roles in both NSW and the NT. His interests are varied but his passion is Thynnid wasps, on which he has published many papers.

During March we lost a stalwart of forest and timber entomology in Phil Hadlington aged 97. Vale Phil Hadlington OAM (1924-2021). You can read more here.

This month, in the Photo Corner section, there are some photos of some common insects on rice flower (*Ozothamnus diosmofolius*) when in flower and also emerging from plant stems.

We continue providing hyperlinks to entomological stories and research that may be of interest to members.

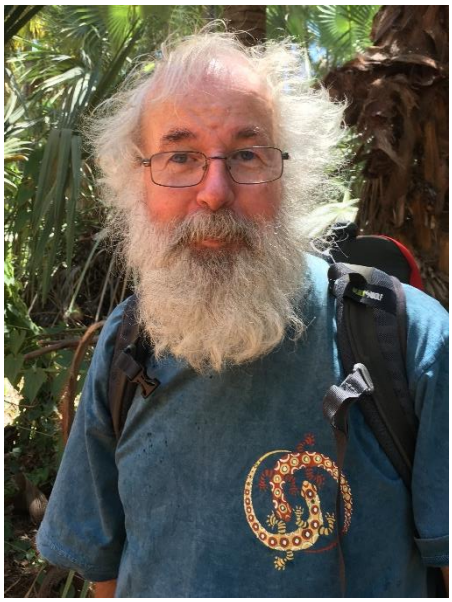
Kind Regards

Garry Webb

Circular editor

Member Spotlight

Dr Graham Brown



I grew up in Panania, a Sydney suburb. We lived in the second last house in the street and separated by some distance from the Georges River. The intervening area was casuarina forest that later became land fill and then an extention of the suburb. The forest was boring but there was a good dragonfly swamp a bit to the north at Deepwater and the bush on the other side of the river was accessible via a long, narrow footbridge at East Hills - apparently now mostly houses in suburbs called Voyager Point and Pleasure Point.

I knew I wanted be a scientist by the age of 10 but I didn't know what field. My father was a keen backyard gardener but in those days it was not easy to identify insects let alone the immature stages. So I ended up rearing a lot of things to adulthood with grapevines and citrus being particularly interesting. But I looked every where I went and this seed, now planted, germinated when I did a naturalist badge towards a Queen Scout Award.

University at UNSW was followed with a job with the NSW Dept Agriculture at Rydalmere as an offsider to Graeme Goodyer. The work was on the pests of pastures and field crops. A wonderful place to work and so much knowledge readily shared with among colleagues. Lots of field trips to see new crops and insects. And Graeme was the best boss I ever had.

After three years, I replaced Steve Nikitin working with the insect collection, which is where I wanted to work. I curated the collection and managed the Department's identification service. During spare moments I re-identified the whole insect collection except the Hemiptera and Diptera. It also included the immature stages - which was a challenge. It also included field trips to investigate specific problems, to simply collect or to provide curatorial expertise to regional Departmental collections.

Between 1989 and 1993 and while still in this position, I was regularly seconded in AQIS to be the regional Quarantine Entomologist for the Commonwealth. A lot of power, not much training and a real eye-opener. Climbing into the holds of ships and aircraft, fumigating big buildings, watching the loading of grain ships etc.

In 1993 I replaced Alice Wells at the Museum and Art Gallery of the Northern Territory to be Curator of Entomology and Arachnology. Unfortunately, the NT has a "policy" of regularly reorganising the Public Service and I was moved to Primary Industry in 1998. It was largely a waste of my time and expertise but I did become AQIS Quarantine Entomologist again but for the NT. I lasted until 2008, shortly after the Commonwealth took back the control of quarantine functions from the Territory.

I have had lots of collecting trips in and from the NT including one for AQIS to New Guinea and a couple to Ashmore Reef for Parks Australia. I still do a lot of travelling and collecting and hold collecting permits for most NT Parks. It is so under-collected, so many remote places and knowledge and expertise is so hard to find.

New Entomological Research

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

A PERFECT STORM FOR FLEAS THIS YEAR

Summer in Australia is often associated with an increase in fleas, but this year in particular the weather has created a perfect storm for severe outbreaks. This is due to the combination of three factors: heat, humidity, and pets living under Covid lockdown conditions. Understanding the flea life cycle is critical for gaining control, especially when infestation levels are high. The most common species pest managers will encounter is the cat flea *(Ctenocephalides felis)* which despite its name mostly affects dogs, and in the process impacts humans. It is one of the 88 identified species of flea in Australia (of which 78 are native to the continent and the remaining 10 are introduced species). In an infestation environment, more than 95% of the fleas will be in the immature stages. Adults (the other <5%) are present feeding off hosts, reproducing by laying and dropping their eggs into the environment. The adult stage is the most active stage, with humans and pets alike often suffering from irritating bites.

The Cicadas Are Coming

Brood X, perhaps the largest in the country, will emerge this spring after 17 subterranean years. Here's why it takes so long for them to emerge and how they will spend their fleeting time above ground. For nearly two decades, billions of cicadas have lain beneath the ground of eastern North America, feeding and fattening, waiting for the signal to rise and restart one of the most extraordinary life cycles in the animal kingdom. They are Brood X, an insect swarm of mind-boggling proportions that will soon make its first appearance since 2004. The bugs belong to a group called "periodical cicadas," named as such because they emerge only once every 13 or 17 years, depending on the brood. A brood, by the way, is simply a class of cicadas that happen to pop out of the ground at the same time — there are 15 in the U.S. They often consist of multiple species, all coincidentally synchronized. Brood X, or the Great Eastern Brood, spans more than a dozen states, and may be the largest among the 17-year cicadas.

Tiny Game of Thrones: the workers of yellow crazy ants can act like lazy wannabe queens.

The invasive ant world is a competitive one, rife with territorial battles and colony raids. And yellow crazy ants (*Anoplolepis gracilipes*), one of the world's worst invasive species, have an especially interesting trait: they're the only invasive ant known to have workers who can reproduce. Worker reproduction has big implications for a colony's social dynamic. So we observed and experimented with more than 200 captive colonies of yellow crazy ants to understand what triggers worker reproduction and the potential costs

and benefits for the colony. We used a range of techniques, including removing queens and observing worker behaviour, and setting up ant gladiator rings to test how well reproductive workers fought other ants. It wasn't just for fun — learning about ants' basic biology, including reproduction, may allow us to better understand their success and tailor management programs to help save the ecosystems they threaten.

Attack of the alien invaders: pest plants and animals leave a frightening $1.7 trillion bill

They're one of the most damaging environmental forces on Earth. They've colonised pretty much every place humans have set foot on the planet. Yet you might not even know they exist. We're talking about alien species. Not little green extra-terrestrials, but invasive plants and animals not native to an ecosystem and which become pests. They might be plants from South America, starfish from Africa, insects from Europe or birds from Asia. These species can threaten the health of plants and animals, including humans. And they cause huge economic harm. Our research, recently published in the journal Nature, puts a figure on that damage. We found that globally, invasive species cost US$1.3 trillion (A$1.7 trillion) in money lost or spent between 1970 and 2017. The cost is increasing exponentially over time. And troublingly, most of the cost relates to the damage and losses invasive species cause. Meanwhile, far cheaper control and prevention measures are often ignored.

Genetically Modifying Mosquitoes to Eliminate Malaria

Genetically modifying mosquitoes to express antimalarial genes and pass them on to their offspring is being tested as a new strategy to eliminate malaria. Altering a mosquito's gut genes to make them spread antimalarial genes to the next generation of their species shows promise as an approach to curb malaria, suggests a preliminary study published today (April 13, 2021) in *eLife*. The study is the latest in a series of steps toward using CRISPR-Cas9 gene-editing technology to make changes in mosquito genes that could reduce their ability to spread malaria. If further studies support this approach, it could provide a new way to reduce illnesses and deaths caused by malaria. Growing mosquito resistance to pesticides, as well as malaria parasite resistance to antimalarial drugs, has created an urgent need for new ways to fight the disease. Gene drives are being tested as a new approach. They work by creating genetically modified mosquitoes that, when released into the environment, would spread genes that either reduce mosquito populations or make the insects less likely to spread the malaria parasite. But scientists must prove that this approach is safe and effective before releasing genetically modified mosquitoes into the wild.

Unusual Fossil Discovered That Reveals Last Meal of a Prehistoric Pollinator

An amber fossil of a Cretaceous beetle has shed some light on the diet of one of the earliest pollinators of flowering plants. The animal's remains were unearthed by researchers at the University of Bristol and the Nanjing Institute of Geology and Palaeontology of the Chinese Academy of Sciences (NIGPAS) who were able to study its fossil fecal matter, which was composed solely of pollen. Besides being a visitor of angiosperms — flowering plants — researchers now have conclusive evidence that the new fossil named *Pelretes vivificus* also fed on their pollen. Details of this discovery have been published today in *Nature Plants*. "The beetle is associated with clusters of pollen grains, suggesting that short-winged flower beetles visited angiosperms in the Cretaceous. Some aspects of the beetle's anatomy, such as its hairy abdomen, are also adaptations associated with pollination," said Professor Chenyang Cai, paleontologist from the School of Earth Sciences and NIGPAS.

Bees bounce back after Australia's black summer: 'Any life is good life'

Australia's bushfires were devastating for bee populations. But steady rain and community efforts are seeing the return of the pollinators. **Y**ou could say that Adrian Iodice is something of a stickybeak neighbour. On Iodice's once-lush bushland property, nestled within the Bega Valley of New South Wales, there stands a majestic rough-barked apple tree that the beekeeper used to, every now and then, jam his head into. In the hollow of the trunk lived a flourishing wild colony of European honeybees that Iodice had been keeping an eye on for years. "I'd have a chat with them," he laughs. "Stick my head in and see how they're getting on in life. They were very gentle bees; they never had a go at me." In the wake of the black summer bushfires of 2019-20 that torched his land and home, Iodice's thoughts turned to the abode of his insect neighbours. "So I went over and stuck my head in the hollow as usual, but they weren't there," he says. "A lot of the wax had melted out, with just the residue left. I got quite emotional."

Aphid-Like Insects Stole DNA From Plants – Gene Shields Them From Leaf Toxins

Millions of years ago, aphid-like insects called whiteflies incorporated a portion of DNA from plants into their genome. A Chinese research team, publishing today (March 25, 2021) in the journal *Cell*, reveals that whiteflies use this stolen gene to degrade common toxins plants use to defend themselves against insects, allowing the whitefly to feed on the plants safely. "This seems to be the first recorded example of the horizontal gene transfer of a functional gene from a plant into an insect," says co-author Ted Turlings, a chemical ecologist and entomologist at the University of Neuchâtel, in Switzerland. "You cannot find this gene, BtPMaT1, which neutralizes toxic compounds produced by the plant, in any other insect species." Scientists believe that

plants probably use BtPMaT1 within their own cells to store their noxious compounds in a harmless form, so the plant doesn't poison itself. The team, led by Youjun Zhang from the Institute of Vegetables and Flowers at the Chinese Academy of Agricultural Sciences, used a combination of genetic and phylogenetic analyses, to reveal that roughly 35 million years ago, whiteflies stole this defense gene, granting the insect the ability to detoxify these compounds for themselves.

After the floods, stand by for spiders, slugs and millipedes – but think twice before reaching for the bug spray

Record-breaking rain has destroyed properties across New South Wales, forcing thousands of people to evacuate and leaving hundreds homeless. Humans aren't the only ones in trouble. Many of the animals that live with and around us are also heading for higher ground as the floodwaters rise. Often small creatures — especially invertebrates like spiders, cockroaches and millipedes — will seek refuge in the relatively dry and safe environments of people's houses. While this can be a problem for the human inhabitants of the house, it's important to make sure we don't add to the ecological impact of the flood with an overzealous response to these uninvited guests.

Evolution of One of the Fastest Jaws in the Natural World: Function Before Form in Trap-Jaw Ants

The trap-jaw ants are famous for having one of the natural world's fastest movements, but how did the latch-spring mechanism that drives their jaws evolve? According to a study published on March 2nd, 2021 in the open-access journal *PLOS Biology* by Douglas Booher of UCLA, Evan Economo of the Okinawa Institute of Science and Technology Graduate University, and colleagues, the core mechanism itself arose multiple times before going on to a spectacular diversification of mandible shape. The ants need their fast jaws to catch their similarly fast prey, springtails, which themselves have a spring-loaded escape mechanism. The new findings may explain why the mechanism has evolved so many times independently around the world, eventually developing into the animal kingdom's fastest-accelerating resettable part.

Animals Fake Death for Long Periods of Time to Escape Predators

Many animals feign death to try to escape their predators, with some individuals in prey species remaining motionless, if in danger, for extended lengths of time. Charles Darwin recorded a beetle that remained stationary for 23 minutes – however the University of Bristol has documented an individual antlion larvae pretending to be dead for an astonishing 61 minutes. Of equal importance, the amount of time that an individual remains motionless is not only long but unpredictable. This means that a predator will be unable to predict when a potential prey item will move again, attract attention, and become a meal. Predators are hungry and

cannot wait indefinitely. Similarly, prey may be losing opportunities to get on with their lives if they remain motionless for too long. Thus, death-feigning might best be thought of as part of a deadly game of hide and seek in which prey might gain most by feigning death if alternative victims are readily available.

Phantom of the forest: how I rediscovered the rare cloaked bee in Australia, hidden for a century

It's not often you get to cast your eyes on a creature feared to be long-gone. Perhaps that's why my recent rediscovery of the native bee species *Pharohylaeus lactiferus* is so exciting — especially after it spent a century eluding researchers. But how did it stay out of sight for so long? Australia is home to 1654 named species of native bee. Unfortunately, these are often overshadowed in the eyes of public by the widespread and invasive European honeybee. Scientific research on Australian native bees is lagging, compared to many other nations. With this in mind, it may not be surprising to learn some native species can go unnoticed for many years. Although, when it's the only representative of a whole genus, one might start to worry about losing something special. In this case the genus is *Pharohylaeus*, where "pharo" means "cloaked", as these bees' first three abdominal segments overlay the others to resemble a cloak.

The Lepidopteran Life Aquatic

A new-found wasp that hunts for caterpillars underwater, reported in November 2020 by scientists with an obvious eye for newsy names like *Microgaster godzilla*, amazed people worldwide, but news reports omitted an obvious question: What's a caterpillar doing underwater in the first place? In addition to the wasp, the caterpillar should have provoked a few "oohs" and "aahs," at the least. Outside of entomologists, assorted moth and butterfly buffs, and fanatic fly-fishing purists, it's a good bet that most people who read about the wasp had not known that several types of caterpillars—about 800 species in all—are aquatic. Maybe, however, the apparent indifference by the public and news media to the fact that some moths swim with the fishes is not all that surprising. Even entomologists have paid little attention to the curious band of moths that as caterpillars live in water.

Genetically-modified mosquitoes key to stopping Zika virus spread

In 2016, the World Health Organization called the Zika virus epidemic a "public health emergency of international concern" due to the virus causing birth defects for pregnant women in addition to neurological problems. Since then, researchers have wrestled with different strategies for controlling the spread of Zika virus, which gets transmitted to humans from female mosquito bites. One approach, which was approved by the Environmental Protection Agency in May, will release more than 750 million genetically modified mosquitos into the Florida Keys in 2021 and 2022. These "suicide mosquitoes" are genetically-altered to produce offspring that die before emerging into adults and therefore cannot bite humans and spread disease.

The mystery of the blue flower: nature's rare colour owes its existence to bee vision

At a dinner party, or in the schoolyard, the question of favourite colour frequently results in an answer of "blue". Why is it that humans are so fond of blue? And why does it seem to be so rare in the world of plants and animals? We studied these questions and concluded blue pigment is rare at least in part because it's often difficult for plants to produce. They may only have evolved to do so when it brings them a real benefit: specifically, attracting bees or other pollinating insects. We also discovered that the scarcity of blue flowers is partly due to the limits of our own eyes. From a bee's perspective, attractive bluish flowers are much more common. Among flowers which are pollinated without the intervention of bees or other insects (known as abiotic pollination), none were blue. But when we looked at flowers that need to attract bees and other insects to move their pollen around, we started to see some blue. This shows blue flowers evolved for enabling efficient pollination. Even then, blue flowers remain relatively rare, which suggests it is difficult for plants to produce such colours and may be a valuable marker of plant-pollinator fitness in an environment.

Flowery diets help predatory insects help farmers keep pests in check

Predatory insects have been shown to live longer when they have access to nectar and pollen, according to a new study by researchers at the University of Copenhagen. Thus, flowers don't just benefit insects, they help farmers farm sustainably. Predatory insects are skilled pest controllers whose hunting reduces the need for agricultural pesticides. Until now, it was believed that predatory insects needed prey to survive. But in a systematic review conducted at the University of Copenhagen's Department of Plant and Environmental Sciences, researchers collected, compared and analyzed data from studies around the world to conclude that most predators benefit greatly from flowers, and can even survive for extended periods of time on nectar and pollen alone. Thus, farmers can promote a consistent production of natural enemies to defeat pests by incorporating flowering strips and flowering margins in their fields.

Latch, load and release: Elastic motion makes click beetles click

Click beetles can propel themselves more than 20 body lengths into the air, and they do so without using their legs. While the jump's motion has been studied in depth, the physical mechanisms that enable the beetles' signature clicking maneuver have not. A new study examines the forces behind this super-fast energy release and provides guidelines for studying extreme motion, energy storage and energy release in other small animals like trap-jaw ants and mantis shrimps. Many insects use various mechanisms to overcome the limitations of their muscles. However, unlike other insects, click beetles use a unique hingelike tool in their thorax, just behind the head, to jump. To determine how the hinge

works, the team used high-speed X-rays to observe and quantify how a click beetle's body parts move before, during and after the ultrafast energy release.

Monarch butterfly population moves closer to extinction

The number of western monarch butterflies wintering along the California coast has plummeted precipitously to a record low, putting the orange-and-black insects closer to extinction, researchers announced Tuesday. An annual winter count by the Xerces Society recorded fewer than 2,000 butterflies, a massive decline from the tens of thousands tallied in recent years and the millions that clustered in trees from Northern California's Marin County to San Diego County in the south in the 1980s. Western monarch butterflies head south from the Pacific Northwest to California each winter, returning to the same places and even the same trees, where they cluster to keep warm. The monarchs generally arrive in California at the beginning of November and spread across the country once warmer weather arrives in March. On the eastern side of the Rocky Mountains, another monarch population travels from southern Canada and the northeastern United States across thousands of miles to spend the winter in central Mexico. Scientists estimate the monarch population in the eastern U.S. has fallen about 80% since the mid-1990s, but the drop-off in the western U.S. has been even steeper.

High Temperatures From Climate Change Threaten the Survival of Insects

Insects have difficulties handling the higher temperatures brought on by climate change, and might risk overheating. The ability to reproduce is also strongly affected by rising temperatures, even in northern areas of the world, according to a new study from Lund University in Sweden. Insects cannot regulate their own body temperature, which is instead strongly influenced by the temperature in their immediate environment. In the current study, the researchers studied two closely related species of damselflies in Sweden. The goal was to understand their robustness and ability to tolerate changes in temperature. To study this, the researchers used a combination of field work in southern Sweden and infrared camera technology (thermography), a technology that makes it possible to measure body temperature in natural conditions. This information was then connected to the survival rates and reproductive success of the damselflies in their natural populations. The results show that survivorship of these damselflies was high at relatively low temperatures, 15 – 20 C °. The reproductive capacity, on the other hand, was higher at temperatures between 20 and 30 C °, depending on the species.

Photos from the field: zooming in on Australia's hidden world of exquisite mites, snails and beetles

Environmental scientists see flora, fauna and phenomena the rest of us rarely do. In this series, we've invited them to share their unique photos from the field. Which animals are quintessentially Australian? Koalas and kangaroos, emus, tiger snakes and green tree frogs, echidnas and eastern rosellas, perhaps. And let's not forget common wombats. Inevitably, most lists will be biased to the more conspicuous mammals and birds, hold fewer reptiles and frogs, and likely lack invertebrates — animals without a backbone or bony skeleton — altogether. I'm an invertophile, fascinated by our rich terrestrial invertebrate fauna, so my list will be different. I'm enchanted by stunning dragon springtails, by cryptic little Tasmanitachoides beetles, and by the poorly known allothyrid mites, among thousands of others.

New Species of Recluse Spider Named for Leonard Cohen

Recluse spiders (Sicariidae: *Loxosceles*) are one of the most well-known groups of spiders to the public (especially in North America), thanks to their necrotic venom occasionally causing skin lesions, dermonecrosis, skin ulceration, and, in rare cases, death. Currently, more than 140 species of recluse spiders are known from around the globe, most of which have rather restricted ranges, with a few having been introduced to non-native habitats as a result of synanothrophy. Personally, I have been fascinated by these spiders ever since I was a teenager. Although I have been collecting spiders since a very young age, it was the finding of *L. rufescens* as the first recluse spider in Iran that made a turning point for me toward the profession of arachnology and pursing biology as my major in university. Recently, in a paper published in the *Journal of Medical Entomology*, titled "'Burning Violin': The Medically Important Spider Genus *Loxosceles* (Araneae: Sicariidae) in Iran, Turkmenistan, and Afghanistan, With Two New Species," my colleagues Omid Mirshamsi and Yuri M. Marusik and I surveyed the taxonomic and faunistic status of this group in these countries and provided a brief review on the reported cases of loxoscelism from this region. In our investigation, two species new to science were detected, one of which, *Loxosceles coheni*, we named and dedicated to the memory of the famous Canadian singer-songwriter, poet, and novelist Leonard Cohen.

Climate Change Reduces the Abundance and Diversity of Wild Bees

Wild bees are more affected by climate change than by disturbances to their habitats, according to a team of researchers led by Penn State. The findings suggest that addressing land-use issues alone will not be sufficient to protecting these important pollinators. "Our study found that the most critical factor influencing wild bee abundance and species diversity was the weather, particularly temperature and precipitation," said Christina Grozinger, Distinguished Professor of Entomology and director of the Center for Pollinator Research, Penn State. "In the Northeastern United States, past trends and future predictions show a changing climate with warmer winters, more intense precipitation in winter and spring, and longer growing seasons with higher maximum temperatures. In almost all of our analyses, these conditions were associated with lower abundance of wild bees, suggesting that climate change poses a significant threat to wild bee communities." According to Melanie Kammerer, graduate student in entomology, Penn State, few studies have considered the effects of both climate and land use on wild bees. "We thought this was an oversight because, like many organisms, bees are experiencing habitat loss and climate change simultaneously," she said. "By looking at both factors in the same study, we were able to compare the relative importance of these two stressors."

Bacteria carried by mosquitoes may protect them against pesticides

A common bacterial species naturally infecting mosquitoes may actually be protecting them against specific mosquito pesticides, a study has found. Wolbachia -- a bacterium that occurs naturally and spreads between insects -- has become more frequently used in recent years as a means of controlling mosquito populations. Scientists at the University of Reading, and the INBIOTEC-CONICET and the National University of San Juan in Argentina, studied the effect of Wolbachia on a common mosquito species and found those carrying the bacteria were less susceptible to widely used pesticides. Dr Alejandra Perotti, an Associate Professor in invertebrate biology at the University of Reading, and a co-author of the study, said: "This shows the importance of looking more closely at how bacteria in mosquitoes and pesticides interact, especially at a time when new plans are being formulated for which methods to use, where to use them and which species to target." Mosquitoes transmit several diseases like dengue fever, malaria, zika and yellow fever to humans through their bites, and collectively kill more than a million people worldwide every year.

Mystery That Baffled Darwin Solved: Clever Strategy Some Flowers Use to Ensure Effective Pollination by Bees

Study of flowers with two types of anthers solves mystery that baffled Darwin. Some flowers use a clever strategy to ensure effective pollination by bees, doling out pollen gradually from two different sets of anthers. Most flowering plants depend on pollinators such as bees to transfer pollen from the male anthers of one flower to the female stigma of another flower, enabling fertilization and the production of fruits and seeds. Bee pollination, however, involves an inherent conflict of interest, because bees are only interested in pollen as a food source. "The bee and the plant have different goals, so plants have evolved ways to optimize the behavior of bees to maximize the transfer of pollen between flowers," explained Kathleen Kay, associate professor of ecology and evolutionary biology at UC Santa Cruz. In a study published December 23 in *Proceedings of the Royal Society B*, Kay's team described a pollination strategy involving flowers with two distinct sets of anthers that differ in color, size, and position. Darwin was mystified by such flowers, lamenting in a letter that he had "wasted enormous effort over them, and cannot yet get a glimpse of the meaning of the parts."

Anti-Aphrodisiac: Male Butterflies Mark Their Mates With Repulsive Smell During Sex to "Turn Off" Other Suitors

Butterflies have evolved to produce a strongly scented chemical in their genitals that they leave behind after sex to deter other males from pursuing their women — scientists have found. Researchers discovered that a chemical made in the sex glands of the males of one species of tropical butterfly is identical to a chemical produced by flowers to attract butterflies. The study published in *PLOS Biology* today (January 19, 2021) identified a gene for the first time that shows butterflies and flowers independently evolved to make the same chemical for different purposes. Scientists led by Professor Chris Jiggins, St John's College, University of Cambridge, mapped production of the scented chemical compound to the genome of a species of butterfly, called Heliconius melponene, and discovered a new gene. Dr. Kathy Darragh, lead author of the paper, said: "We identified the gene responsible for producing this powerful anti-aphrodisiac pheromone called ocimene in the genitals of male butterflies. This shows that the evolution of ocimene production in male butterflies is independent of the evolution of ocimene production in plants.

Photo Corner

All Society member are encouraged to submit any entomological photographs of interest together with a short (or long) description of your observations.

Some insects associated with the rice flower *Ozothamnus diosmofolius*

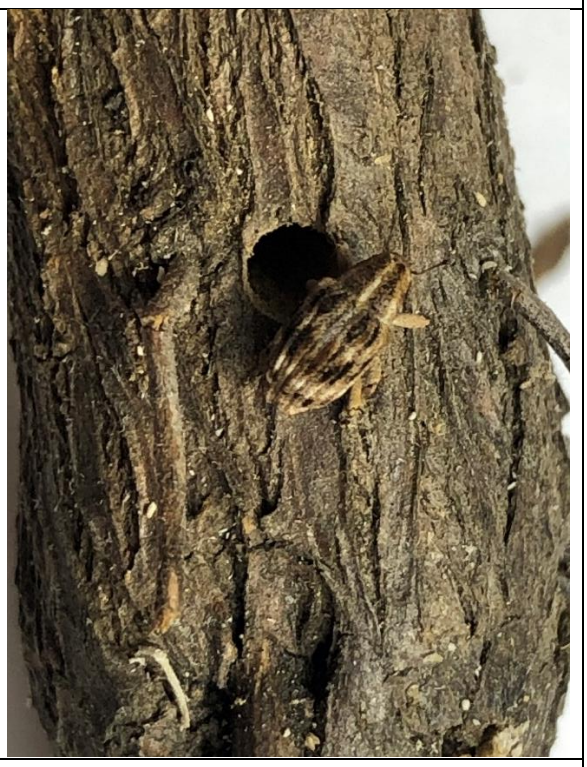
Most people would be familiar with the rice flower (*Ozothamnus diosmofolius)* (Asteraceae) which is common along the east coast of Australia. It flowers prolifically during November and December and attracts a wide range of pollinating insects including beetles, flies and native and introduced bees. For more detail visit here.

The flowers of *O. diosmofolius* not only attract a wide range of insects when flowering but the narrow stems also support a range of timber borers including species of longicorns (Family Cerambycidae) and weevils (Family Curculionidae) and their predators and parasites. A long-term study is underway to document the xylophagous fauna of *O. diosmofolius*. So far two common species of Cerambycidae, *Uracanthus triangularis* and *Platyomopsis nigrovirens* and some, as yet, un-identified weevils have been reared from *O. diosmofolius* stems. The two species of cerambycid beetle commonly found on *O. diosmofolius* flowers, *Stenoderus suturalis* and *Syllitus* sp. (prob. *microps*) have not yet been reared from the stems or branches.

Stenoderus suturalis on *O. diosmofolius* flowers

Syllitus sp. on *O. diosmofolius* flowers

Platyomopsis nigrovirescens **emerging from** ***O. diosmofolius*** **stem.**



As yet unidentified weevil emerging from ***O. diosmofolius*** **stem.**

SOCIETY POSTAL ADDRESS	MEMBERSHIP FEES 2021	
C/- ENTOMOLOGY DEPARTMENT	ORDINARY MEMBERS	$50 ($45 if paid by next AGM)
THE AUSTRALIAN MUSEUM	COMPANY ASSOCIATES	$60
1 WILLIAM STREET	STUDENT MEMBERS	$25 ($20 if paid by next AGM)
SYDNEY NSW 2010	CORPORATE MEMBERS	$150

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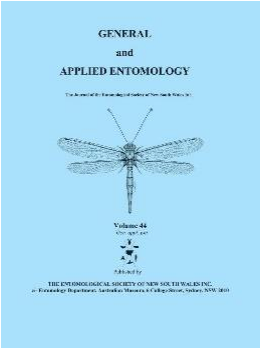
GENERAL and APPLIED ENTOMOLOGY (G&AE)



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