# ENTOMOLOGICAL SOCIETY NEWSLETTER

**August 2022**

## FROM THE PRESIDENT,
## Phil Sirvid

Dear members,

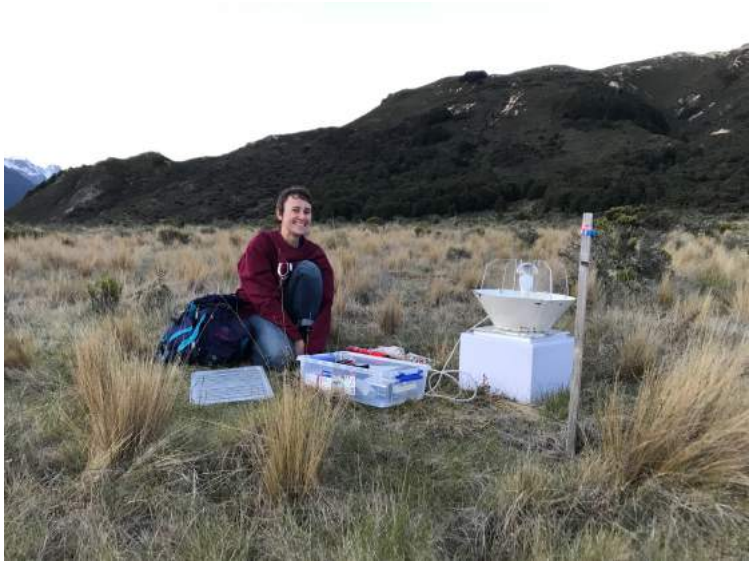
As you've heard by now, we were pleased to confirm the Novotel Rotorua Lakeside as our conference venue for this year. At time of writing, we still need to confirm the conference dinner venue and associated costs. Once we do, we can then finalize registration costs for everyone. While it's disappointing we won't be sharing the event with our Australian counterparts, the ever-changing Covid situation earlier in the year meant they didn't have the certainty they needed to commit to a joint conference. We're looking at when we might next host a joint event. I'd particularly like to thank Stephanie Sopow as our main person on the ground in Rotorua. She's worked incredibly hard on the Society's behalf.

Stephanie's example leads nicely into a subject that has concerned me for a long time and that's recognition for people who have made an outstanding contribution to New Zealand entomology or to the Society. I'm talking of our ever-dwindling list of Fellows and Honorary Members. The Society's Executive Committee hasn't received a nomination in either category in some years. This is a sad state of affairs and I think we need to do better. The procedures for nominating Fellows and Honorary Members are on the website and if anyone needs any guidance, you are welcome to ask me. However, after a conversation with one of the members, it seems simply calling for members isn't working if nobody is making nominations. The suggestion was made that the Executive Committee needs to me more proactive, perhaps asking members with expertise in particular fields to arrange nominations from among their peers. I would like to know what the membership thinks. Are people happy with the system as it stands? If not how can we do better? Please feel free to contact me if you have any thoughts on this.

Phil Sirvid
President

# Entomological Society Newsletter

Student profile:
Elizabeth de Jongh



**1. What was your Master's research about?**

My thesis focused on long-term trends in a moth community near Cass field station in North Canterbury, by repeating a study conducted by Graeme White in the 1960s and 1980s. I was mainly interested in how moth abundance had changed since the 1960s, how certain species of interest changed in abundance over time, and whether certain species traits could predict abundance changes. This research helps provide more evidence of long-term insect trends in Aotearoa New Zealand and globally, and provides information on the current and changing abundances of rare and common moth species, which is relevant to future conservation work. In addition, a vegetation survey was carried out, to see how the plant community changed since White's study, which could have an impact on moth trends, as these grassland moths rely on vegetation for larval food.

**2. What do you like most about your research?**

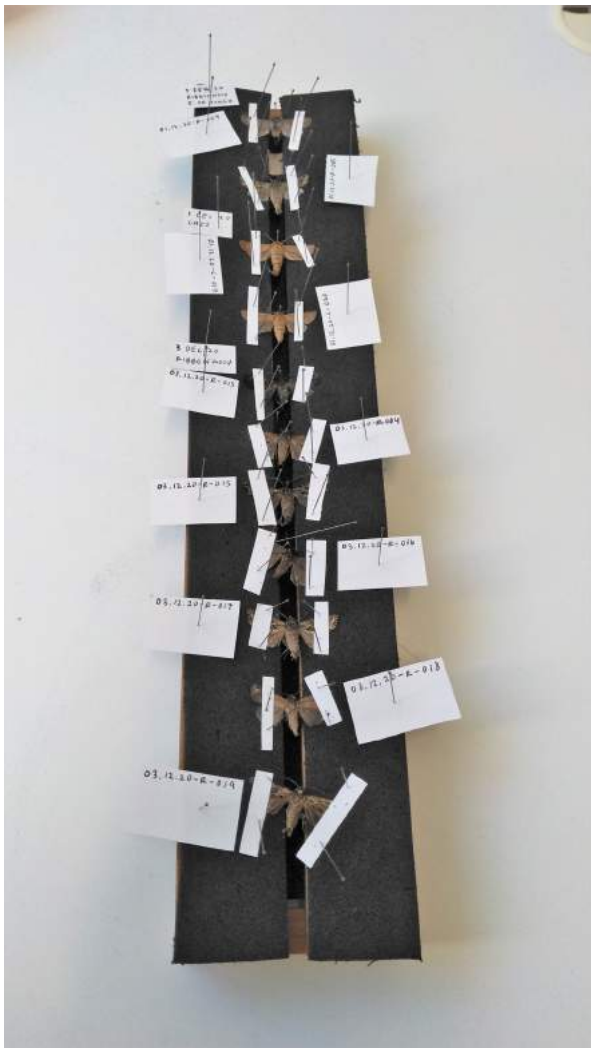
Where I did the field work was definitely a highlight of the research. Cass Field Station is such a spectacular location. Having the chance to do light-trapping there, where there are no competing light sources, meant that I was surrounded by gorgeous sunsets followed by brilliant starry skies. Originally coming from a large city in the US, working up

## Student profile (continued): Elizabeth de Jongh

at Cass at night made me realize how much we miss out on with light pollution. Then during the day, there were plenty of hikes around to explore. I believe having the field station for supporting undergrad and postgrad learning and research is a fantastic way to spark and fuel enthusiasm for ecology, and I would have loved to have had the opportunity as an undergrad to do field trips in a similar location

**3. What was a challenge you faced during your research?**

Having to identify over 2,500 moths to species level was quite a task, especially since I hadn't had much insect ID experience beforehand. Thankfully, there is a comprehensive book on Tussock grassland moth identification (White et al. 2002, *Manaaki Whenua Press*) that was my best friend during this time, which I had checked out for as long as possible from the uni library. There were also several expert Lepidopterologists in Aotearoa (Brian Patrick, Robert Hoare) that I am thankful to have received ID help from. Pinning the smaller moths was also a challenge, with some of the micro-Lepidoptera only being a few millimeters long. I had to give up coffee for a while so my hands wouldn't shake too much while pinning!



## KJ Fox Awards: Announcement

The KJ Fox Awards support amateur and student members of the society to attend our annual conference.

Applications for this year's round are due 26th August. For more information, see https://ento.org.nz/awards-and-grants/k-j-fox-awards/

# Entomological Society Newsletter

## Interesting Images:
By David Horne

With the rapid advance of technology, particularly around imaging sensors, it is becoming much easier (maybe not cheaper!) to use high-speed equipment for relatively simple projects. This is compared to previous times where the high-speed cameras were film based. The modern cell-phone camera can do wonderful things, but when one is needing to get very high quality images, under difficult conditions, without a lot of automated processing, then it is necessary to use high-end equipment. In a newsletter, it is not possible to include videos, and so the videos will be linked below.

If you have ever stood and watched the entrance of a bee hive, you notice how quickly the bees zoom in and out, and it is hard to really see what is happening. The following couple of screen grabs are from a video clip I took when first trying out a high-speed camera. The camera resolution was a bit low, but still the footage comes out nicely. This particular hive was on the side of a building with the entrance a small gap between two bricks.

Images: Bee 1, 2, 3, 4, 5.
Video link: https://www.madhornet.co.za/mh-vid/mh_bee2.m4v


## Interesting Images (continued):



As you see in the stills one bee is standing right at the entrance, while others are coming in. It is having to use its front pair of legs to try and fend off the incoming bees. In the last image, you see its lack of success. In the video it lays it all out nicely. This clip was one of many I took, and it was apparent that while the bees could fly and do a well executed landing into the brick at the entrance, many preferred to latch onto a bee already attached to the wall. Remember as well, all these bee movements are at much higher speed than what we are seeing in the footage.

The second video is the same hive, just a wider view.
Video Link: https://www.madhornet.co.za/mh-vid/mh_bee1.m4v

Taken on a much higher specification camera, there is some more interesting footage in the bee theme (note – the file is much larger - https://www.dropbox.com/s/xgsocjmkdxxfqk6/phantom%20insects.mp4?dl=0). Some of the sequences there show a bee very much out of focus and then flying into focus, and out again. This shows a challenging area within the high-speed filming. As some of these cameras can do up to 75 000 frames per second (normal video is 25-35fps), it means that the potential exposure time per frame can be very low. If running at 75 000 fps, you have a maximum exposure

## Interesting Images (continued):

possibility of about 13 µs. This then means that light is a crucial issue. As light is crucial, fast lenses are needed. With aperture wide open, which leads to very shallow depths of field. So the technical challenges around high-speed filming can be considerable. However, the data that you can get is worth it. Within the basic software, its is possible to do certain measurements. So wing beat frequency, flying speed, response time and such like can be easily calculated off the high-speed footage.

Many University Biological Departments do not have access to high-speed cameras, but often the Engineering Departments do. Wander over, strike up a conversation, and interesting collaborations between engineering and biology may ensure. Who knows what it may lead to. For example, who would have thought to use DIC analysis on beetle jaws to look at the forces and deformations?

Taking scientific imaging one step further. Ever seen a hot ant? https://www.madhornet.co.za/mh-vid/telops_ant.m4v

## 21st Anniversary Award Reports: Elizabeth de Jongh

My MSc thesis focused on measuring long-term trends in a moth community near Cass in North Canterbury. Increasing evidence points to concerning global insect declines (e.g., Hallmann et al., 2017, *PLoS One*), with the most prevalent drivers of decline being climate change and land-use changes. However, a lack of reliable historical insect data coupled with geographical bias (with most of the evidence coming from the Northern hemisphere) precludes a full understanding of the phenomenon, especially in the Southern Hemisphere.

## 21st Anniversary Award Reports: Elizabeth de Jongh (continued)

Long-term studies on insect trends in Aotearoa New Zealand are rare, but a notable exception is Graeme White's 28-year study of moth abundance at Cass. From the early 1960s to late 1980s, White (1991, *NZ J Ecol*) found a 56% decline in moth abundance, which he attributed to the spread of the invasive grass, *Agrostis capillaris*. I investigated how moth abundance at Cass has changed since the end of White's study, by repeating White's light-trapping methods in 2020-21, using his original light traps and the exact sites. Broadly, land use at the sites has not changed, and the area looks as it did in 1962. A vegetation survey was conducted to measure detailed changes in the plant community.

Overall, I found that moths continued to decline, with average moth abundance down 57% since the end of White's study in 1988, and down 82% since 1961. The rate of decline of 3% per year has not changed across decades, showing that the decline is both large and ongoing. This trend is concerning, as a majority of the moth species in this community are endemic to Aotearoa. Declines were observed in both common and uncommon moth species, and in both macro- and micro-moths (micro-moths are often not counted in comparable surveys overseas). While unable to pinpoint specific drivers of decline, land use changes and climate change appear to be unlikely factors, as the sites have had consistent land management since the early 1960s, and growing-season temperatures have been largely stable. However, the exotic grass species, *Festuca rubra*, and overall native shrub cover have increased considerably since 1990. *Festuca rubra* may squeeze out native herbs and grasses that moth species rely on.

## 21st Anniversary Award Reports: Elizabeth de Jongh (continued)

I thank the Entomological Society of New Zealand for presenting me with the 21st Anniversary award. My original intent was to use the funds to travel to Auckland to receive expert advice on moth identification, but as this was not possible due to COVID-19 complications, instead the funding went to supporting travel expenses to and from our sample sites. At this stage, we are currently carrying out a few more analyses in preparation before submitting the results to a journal.

### References

Hallmann, C. A., Sorg, M., Jongejans, E., Siepel, H., Hofland, N., Schwan, H., Stenmans, W., Müller, A., Sumser, H., Hörren, T., Goulson, D., & de Kroon, H. (2017). More than 75 percent decline over 27 years in total flying insect biomass in protected areas. PLOS ONE, 12(10), e0185809. https://doi.org/10.1371/journal.pone.0185809

White, E. G. (1991). The changing abundance of moths in a tussock grassland, 1962-1989, and 50- to 70-year trends. New Zealand Journal of Ecology, 15(1), 5–22.

## 21st Anniversary Award Reports: Simon Connelly

# Monogyny and Introgression in New Zealand Fishing Spiders (*Dolomedes*)

By Simon Connelly

*Te Aka Mātuatua - School of Science: University of Waikato*

New Zealand is home to four native species of fishing spider (*Dolomedes*), including two sister species: *D. minor* and *D. aquaticus* which are the focus of my PhD research. There is genetic evidence to show that these two species are undergoing introgression. Introgression is the movement of genes from one species to another, caused by the backcrossing of a hybrid specimen with its parent species. In the case of these spiders, the introgression is one-way (with hybrids only produced by the mating of *D. aquaticus* females and *D. minor* males) and geographically restricted to the lower South Island, despite the species co-occurring throughout the range of *D. aquaticus*.

## 21st Anniversary Award Reports: Simon Connelly (continued)

The reasons for these limitations are currently unknown, but my work is investigating several hypotheses: 1) habitat use differs in the introgression zone, facilitating encounters between the two species; 2) variation in genital morphology (specifically variation in the retrolateral tibial apophysis (RTA)) limits their sperm transfer; 3) variation in courtship behaviour limits mating; 4) timings of reproductive maturity limit mating opportunities.

The preliminary results of my experiments suggest that the two species possess different mating behaviours and systems. For example, unmated *D. aquaticus* females rarely attack males, whereas *D. minor* females often attempt to cannibalise males who try and escape during extremely brief copulations. This divergence in mating behaviours could also have an impact on the introgression, as these could limit sperm transfer between the two species.

Hence, my aims are to investigate the morphological and/or behavioural barriers that limit the geographic range of the introgression, and restrict it to one-way (i.e.: what prevents *D. aquaticus* males mating with *D. minor* females).

I am grateful to have received funding from the New Zealand Entomological Society, via the 21st Anniversary Research Grant. These funds allowed me to travel to Southland to collect specimens of *D. minor* and *D. aquaticus* from within the introgression zone. Working in these locations was a key part of my research, not to mention a highly enjoyable part of my work so far.

These specimens were brought back live to Waikato (despite some concerns from aviation security), where they were used in extensive

## 21st Anniversary Award Reports: Simon Connelly (continued)

mating experiments. I am currently in the process of analysing the results of these experiments and how they fit into my wider PhD findings.

Additionally, I am also working to scan the male genitals of these spiders using micro-CT, to analyse the morphology of the RTA and the impact this could have on introgression.

I cannot wait until these analyses are complete so I can share my full finding with The Society and the scientific community.

## 21st Anniversary Award Reports: Neil Birrell

Since the publication of “Edible Insects: Future Prospects for Food and Feed Security” by the FAO in 2013, there has been a significant increase in the interest of using insects as a source of protein. However, with this popularity comes the risk of exploitation of wild populations of insects through overharvesting. An example of this can be seen in Mexico, where 14 insect species that have been used sustainably for generations by local villagers have been classified as threatened following an increase in demand and inexperienced harvesters from outside the local region. Many of these species have a broad geographic range and can be abundant in one area but not another. However, how can a regulator confirm if an insect came from a particular region?

As part of my PhD, I am investigating whether we can use metabolomics as a way of “fingerprinting” an individual insect to a geographic location. Metabolomics is the study of the small molecules involved in metabolism and it has been used to investigate the provenance of food items such as milk and is a promising candidate to apply to edible insect products.

A selection of huhu grubs

## 21st Anniversary Award Reports: Neil Birrell (continued

*Prionoplus reticularis*, the huhu beetle, is an endemic longhorn beetle and perhaps one of the most well-known edible insect species in Aotearoa New Zealand. The larvae of *P. reticularis* feed on a wide range of timbers, both native and exotic, and are found the length of the country. These traits made the species an ideal candidate to investigate metabolomic fingerprinting with larvae collected from six pine forests along a latitudinal gradient from Invercargill to Auckland.


Above: Freeze drying larvae

To calculate the relative abundance of metabolites, I extracted and derivatised amino acids and fatty acids using methylchloroformate (MCF) and, thanks to

Above: Field work with trainee huhu detection dogs (further training required)

## 21st Anniversary Award Reports: Neil Birrell (continued)

funding from the entomological society, I was also able to include sugar metabolites using trimethylsilyl (TMS). Initially, I was intending to process the TMS samples myself, however, Auckland went into another extended lockdown which made access to the labs impossible. Thankfully, Erica Zarate and Saras Green from the Mass Spectrometry lab at the University of Auckland were able to process the samples for me. With over 200 metabolites extracted from 144 samples, I am now exploring various machine learning techniques to analyse the data.

## Branch Reports: Auckland

The Auckland Branch financial year runs from 1 January to 31 December. Our AGM is on the fourth Thursday of February and our programme of evening meetings and field trips runs from across years April to March the following year.
Programme link for this current year 2022-2023:
https://ento.org.nz/wp-content/uploads/2022/03/AK-Branch-Programme-2022.pdf

**Executive positions 2022:**
Dave Seldon was elected as President of the Auckland Branch.
Alan Flynn was elected as Secretary / Treasurer
The following members were elected to the committee
Grace Hall, Ian Boothroyd, Chris and Olwyn Green, Mark Hillary, Sherly George
Branch poet, historian, and honorary committee member: Robert Hoare

**Monthly meetings:**
The 2021-22 programme had the usual 9 monthly evening meetings. These included our annual dinner which occurred in July 2021. (Due to rising Covid cases in Auckland the July 2022 annual dinner was cancelled.) COVID also meant that a good number of the usual in person talks were postponed or moved online.

# Entomological Society Newsletter

## Branch Reports: Auckland (continued)

**July 2021 – Branch Annual Dinner**

This year we had a military insect themed dinner. For the second year in a row our best dressed and winner of a fine bottle of mead, was Mr Bill Goldstone. Honourable mention goes to Olwyn Green for her “Shot Hole’ effort and to Morgane for her camo-moth Haute couture. It was a wonderful evening with lashings of pizza, dessert, music and excellent conversation. A big thanks to everyone who came and made it a special and enjoyable evening.

**Talks during 2021-2022 covered these topics**

**APRIL 2021** Members Mystery ‘Photos & Narrative Ramblings’ Hosted by the Illustrious Dr Robert Hoare + Flynn’s 10min short ramble on ‘The Mystery of Med-fly in Dargaville’).

**MAY 2021** Chris Green: Actions towards the recovery of the Mahoenui Giant Weta.

DOC now regards this species of giant weta as the most at risk species in the group and requires urgent actions to ensure its long-term survival. Chris elaborated on a variety of actions over the last few years and more to come to help secure the future of this iconic giant weta.

**JUNE 2021** Auckland University Student talks.

‘Come and hear from the future of entomology’

**Venue:** University of Auckland, Mac 1, Level 1, Biology Building

**AUGUST 2021** Ian Boothroyd – ‘Eumadicole midges - film stars of the freshwater world’

**SEPTEMBER 2021** Ian Boothroyd – ‘Some Like it Hot’ A look at the aquatic fauna that live in and around the steamy geothermal areas of New Zealand and the characteristics of these communities and their habitats.

**OCTOBER 2021** Dave Voice ‘Invasive Paropsine Leaf beetles established in NZ’

**NOVEMBER 2021** Robert Hoare - Dryadaulidae – Dancing fungus moths

# Entomological Society Newsletter

## Branch Reports: Auckland (continued)

**MARCH 2022** Phil Sirvid-The New Zealand Harvestmen an Introduction and Some Recent Research

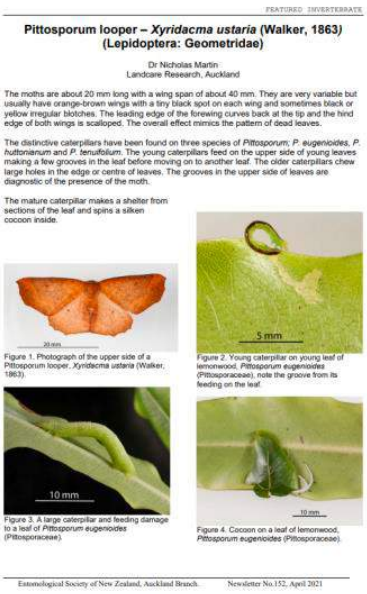
### Field trips 2021

Unfortunately, COVID and associated lockdowns and restrictions impacted all our planned field trips in 2021 which were either postponed or cancelled. The Branch did manage to participate in moth week in July setting up a light trap in Waiatarua Reserve and inviting members of the public along.

In the early part of 2022, the branch managed two successful field trips.
Field trip: February 2022 -Daylighting Wairaka Stream. Looking at Aquatic fauna in a stream that has not seen daylight for many decades.
Field trip: March 2022 Okura walkway – Stillwater. A lovely bit of coastal bush.

### Newsletters

Three newsletters for branch members were produced. These included Featured Invertebrates with each issue
Issue 152 – Pittosporum looper whitefly – *Xyridacma ustaria*
Issue 153– Kauri Bristle Millipede– *Unixenus* sp. 2
Issue 154– Dicksonia fern whiteflies– *Trialeurodes*


FEATURED INVERTEBRATE

**Pittosporum looper – *Xyridacma ustaria* (Walker, 1863) (Lepidoptera: Geometridae)**

Dr Nicholas Martin
Landcare Research, Auckland

The moths are about 20 mm long with a wing span of about 40 mm. They are very variable but usually have orange-brown wings with a tiny black spot on each wing and sometimes black or yellow irregular blotches. The leading edge of the forewing curves back at the tip and the hind edge of both wings is scalloped. The overall effect mimics the pattern of dead leaves.

The distinctive caterpillars have been found on three species of *Pittosporum*; *P. eugenioides*, *P. huttonianum* and *P. tenuifolium*. The young caterpillars feed on the upper side of young leaves making a few grooves in the leaf before moving on to another leaf. The older caterpillars chew large holes in the edge or centre of leaves. The grooves in the upper side of leaves are diagnostic of the presence of the moth.

The mature caterpillar makes a shelter from sections of the leaf and spins a silken cocoon inside.



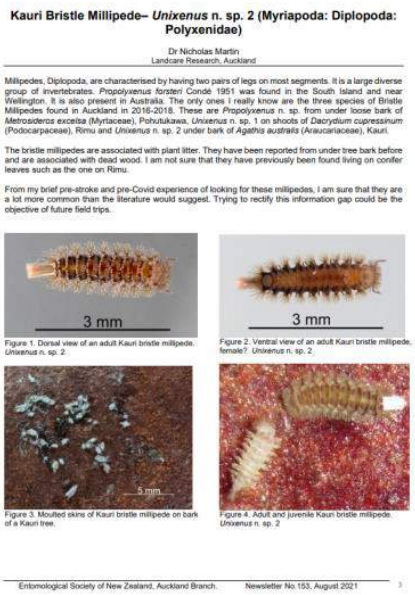
Figure 1. Photograph of the upper side of a Pittosporum looper, *Xyridacma ustaria* (Walker, 1863).

Figure 2. Young caterpillar on young leaf of lemonwood, *Pittosporum eugenioides* (Pittosporaceae), note the groove from its feeding on the leaf.

Figure 3. A large caterpillar and feeding damage to a leaf of *Pittosporum eugenioides* (Pittosporaceae).

Figure 4. Cocoon on a leaf of lemonwood, *Pittosporum eugenioides* (Pittosporaceae).




**Kauri Bristle Millipede– *Unixenus* n. sp. 2 (Myriapoda: Diplopoda: Polyxenidae)**

Dr Nicholas Martin
Landcare Research, Auckland

Millipedes, Diplopoda, are characterised by having two pairs of legs on most segments. It is a large diverse group of invertebrates. *Propolyxenus forsteri* Conde 1951 was found in the South Island and near Wellington. It is also present in Australia. The only ones I really know are the three species of Bristle Millipedes found in Auckland in 2016-2018. These are *Propolyxenus* n. sp. from under loose bark of *Metrosideros excelsa* (Myrtaceae), Pohutukawa, *Unixenus* n. sp. 1 on shoots of *Dacrydium cupressinum* (Podocarpaceae), Rimu and *Unixenus* n. sp. 2 under bark of *Agathis australis* (Araucariaceae), Kauri.

The bristle millipedes are associated with plant litter. They have been reported from under tree bark before and are associated with dead wood. I am not sure that they have previously been found living on conifer leaves such as the one on Rimu.

From my brief pre-stroke and pre-Covid experience of looking for these millipedes, I am sure that they are a lot more common than the literature would suggest. Trying to rectify this information gap could be the objective of future field trips.



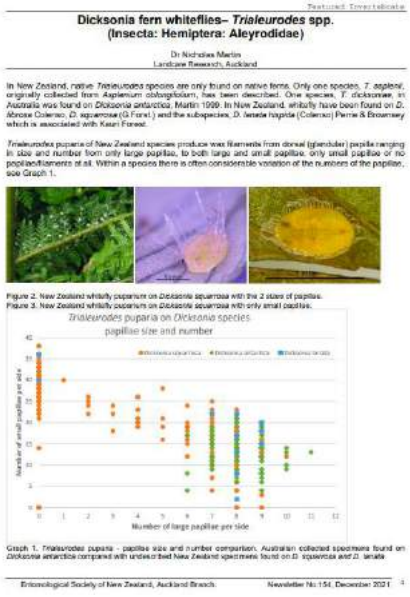
Figure 1. Dorsal view of an adult Kauri bristle millipede, *Unixenus* n. sp. 2

Figure 2. Ventral view of an adult Kauri bristle millipede, female? *Unixenus* n. sp. 2

Figure 3. Moulted skins of Kauri bristle millipede on bark of a Kauri tree.

Figure 4. Adult and juvenile Kauri bristle millipede. *Unixenus* n. sp. 2




Featured Invertebrate

**Dicksonia fern whiteflies– *Trialeurodes* spp. (Insecta: Hemiptera: Aleyrodidae)**

Dr Nicholas Martin
Landcare Research, Auckland

In New Zealand, native *Trialeurodes* species are only found on native ferns. Only one species, *T. asplenii*, originally collected from *Asplenium oblongifolium*, has been described. One species, *T. dicksoniae*, in Australia was found on *Dicksonia antarctica*, Martin 1999. In New Zealand, whitefly have been found on *D. fibrosa* Colenso, *D. squarrosa* (G.Forst.) and the subspecies, *D. lanata hispida* (Colenso) Perrie & Brownsey which is associated with Kauri Forest.

*Trialeurodes* puparia of New Zealand species produce wax filaments from dorsal (glandular) papilla ranging in size and number from only large papillae, to both large and small papillae, only small papillae or no papillae/filaments at all. Within a species there is often considerable variation of the numbers of the papillae, see Graph 1.



Figure 2. New Zealand whitefly puparium on *Dicksonia squarrosa* with the 2 sizes of papillae.
Figure 3. New Zealand whitefly puparium on *Dicksonia squarrosa* with only small papillae.




Graph 1. *Trialeurodes* puparia - papillae size and number comparison. Australian collected specimens found on *Dicksonia antarctica* compared with undescribed New Zealand specimens found on *D. squarrosa* and *D. lanata*



### Membership

During the year our membership increased to 49 paying members.

# Entomological Society Newsletter

## Branch Reports: Wellington – Pepeke group

88 members, 13 have paid for 2022
We have currently $ 524.29
We spent 21.29 for zoom since March 2022 ($106.45), 60 for eatable bug supplies and approx. 70 per meeting for buffet.

Number of attendees has been around 20 for our meetings, both, hybrid and via zoom only

**Our meetings**
…were quite interrupted due to covid. We have had 2 hybrid and 3 zoom only meetings in the last financial year:

- **28th of July– Eating bugs**
  Talk: **"Sky prawns, insect milk & cheesy maggots: insects in our food chain" by Neil Birrell** (Auckland University - via zoom)
  BUGS the Film Will eating insects save our Earth? (2016)
  Competition: Bring your buggy food creation, either inspired by critters or with invertebrate ingredients. Be in the win for great "eating crawlers" products!
  1st Anton: Snails in garlic butter
  2nd Harry: Centipede with black sesame
  3rd Shaun: Mead from honey
- **8th December "Can spiders count?" by Fiona Cross**
  Fiona will be joining us via zoom, so the question is, do you still want to come to Te Papa or to enjoy the presentation sitting on your comfy couch?
  Also, Te Papa requests a vaccination pass, which might make face to face gatherings for some of you obsolete anyway.
- **2nd March Peter Dearden** from Otago Uni will dig in the treasure box of exciting genomic studies of insects. **'How queen bees repress their workers, and how did that evolve?'** Zoom Meeting
- It has been too long! Please join for our bi-monthly talk on **4th May 7 pm** and listen to **Mariana Bulgarella** from VUW, who will talk about **Dipteran parasites on chicks of Galapagos finches**. Gross but fascinating! Zoom Meeting
- We are back to 'in-person-meetings'! **6th July Phil Sirvid** from Te Papa, who will talk about **Harvestmen!**

# Entomological Society Newsletter

## Congratulations Barbara Barrett:

Barbara Barrett was elected a Fellow of the Royal Society of New Zealand in recognition for her contributions to pest management.

To learn more, see https://www.royalsociety.org.nz/who-we-are/our-people/our-fellows/view-our-fellows

## Congratulations Ian Stringer:

Dr Ian Stringer was appointed an Officer of the New Zealand Order of Merit in the Queen's Birthday and Platinum Jubilee Honours List 2022 for services to conservation.

To learn more, see: https://dpmc.govt.nz/honours/lists/qb2022-onzm

## Members in the Media:

Luna Thomas, PhD candidate at the University of Otago, featured on Our Changing World, RNZ on 14th July, 2022. Luna talked about her research with New Zealand stag beetles.

To learn more, visit:
https://www.rnz.co.nz/national/programmes/ourchangingworld/audio/2018848839/the-battling-beetle

## The Wētā

The Wētā is currently inviting submissions for the next issue.

The new online system means that articles are now available online within 1-2 weeks of submission. Many thanks to Simon Hodge and Aaron Harmer for their work to get the new system up and running.

## Conference Announcement:

The Entomological Society of New Zealand's Annual Conference is back on for 2022. This year's conference will be hosted by Stephanie Sopow and colleagues at SCION in Rotorua **26-28th October 2022**. Look out for more future announcements and hope to see you all there!

## Carabidae Survey

By Jim O'Malley

*Plocamostethus planiusculus*

The Wairarapa region is a large alluvial basin bounded by the Tararua Ranges (1500 m asl) to the west and the Eastern Uplands (1000 m asl) to the east. This region was once covered in large expanses of wetland kahikatea forest, podocarp-broadleaf forest and the drier beech-broadleaf forest, now only very small remnants (mostly much less than 1200 ha) remain. The anthropogenic impacts on the landscape have severely reduced the habitat for native flora and fauna.

In scientific terms, there is not much known about the fauna of the Wairarapa region, unless it is a bird, a bat, or a fish, almost nothing has been written about the invertebrates of the region. The only exceptions are specific sampling (baited pitfall traps) of terrestrial invertebrates in the Aorangi Ranges (see Vergara *et al.* 2020) and a small number of aquatic fauna from the lower reaches of the Mangahao and Mangatainoka rivers, northwest Wairarapa (see Collier 1992).

In light of this Sustainable Wairarapa, commissioned Dr Sheldon to further the region's invertebrate knowledge and to see if Carabidae (ground beetles) could be used as indicators of ecosystem, habitat health, as they are in many other countries worldwide (Raino & Nimelä 2003, Driscoll & Weir 2005, Koivula 2011), as well as in New Zealand (Lövei & Cartellieri 2000, Bowie *et al.* 2019). However, it is less clear if the New Zealand endemic species are indicative of a healthy environment as the role of most species is not known or only the ecology/biology is anecdotal at best (Hutchison 2007, Townsend 2013). Larger species within the genera *Mecodema* and *Megadromus* are clearly active predators of a wide range of invertebrates on the forest floor. In addition, these two genera can survive in areas with relatively high numbers of mammalian

## Carabidae Survey (continued)

predators (e.g., rodents, hedgehogs), albeit in lower numbers (Watts 2007). However, the increase in abundance of these ground beetle species after mammalian predator control does not necessarily indicate restoration success of a forest remnant, but just a release from competition for prey or direct predation.

Live pitfall traps were set at different dates (Feb, Mar, Sept 2020–2021) to sample the ground beetle (Carabidae) diversity from a range of habitats across the Wairarapa region, including the eastern and western areas of the Tararua Ranges (Fig. 1). Live pitfall traps are set for one night at each site and all ground beetle specimens are collected into ethanol, and then the bycatch taxa are released.

**3.2 Localities:**


**Figure 1.** Study localities with pitfall traps deployed for ground beetle survey, mid-Wairarapa region, North Island, New Zealand.

The greater majority of caught species/specimens were from Donnelly's Flat which has a diverse cover of mixed podocarp and broadleaf forest, plus the open scrub of the river flats, which remains relatively humid throughout the year. The forest and scrub are ideal habitats for a number of ground beetle species, and three

## Carabidae Survey (continued)

of the ground beetle genera (*Mecodema*, *Plocamostethus*, *Megadromus*) were noted. *Plocamostethus planiusculus* is often the most abundant large ground beetle collected in a number of pitfall trap studies around the lower North Island (Watts *et al.* 2014, Vergara *et al.* 2020). The medium-sized *Holcaspis* species are also associated with forest edges but can also be found in highly disturbed areas as well. The most abundant ground beetle caught was *Ctenognathus adamsi*, a small species that is regularly observed and caught in the lower North Island (Watts *et al.* 2014).

Only two other trapping localities caught Carabidae species, both of which are relatively close to the Tararua Ranges. Trenairs Bush is close to the Waingawa River (Fig. *Megadromus capito* and the small Zolini species (Table 1).

**Table 1:** The total number of individuals of the Carabidae (ground beetle) species collected at each of the localities in the greater Masterton area, Wairarapa for all the collecting events of 2020–2021. The ground beetles are listed in size from largest (*Mecodema*) to smallest. A total of 78 specimens from five ground beetle genera were caught in three of the six collecting localities. The highest abundance (74) and biodiversity (4) was at Donnelly Flat (Table 1.).

| Carabidae Genera | Donnelly Flat | Millenium Reserve | Trenair's Bush | Carter Scenic Res. | Rewa Bush Conservation Area | Rewanui Forest Park |
|---|---|---|---|---|---|---|
| *Mecodema simplex* | 4 | | | | | |
| *Plocamostethus planiusculus* | 12 | | | | | |
| *Megadromus capito* | 4 | | 2 | | | |
| *Holcaspis* sp. | 8 | | | | | |
| *Ctenognathus adamsi* | 46 | | | 1 | | |
| *Zolini* sp. | | | 1 | | | |

## Carabidae Survey (continued)

The greater majority of caught species/specimens were from Donnelly's Flat which has a diverse cover of mixed podocarp and broadleaf forest, plus the open scrub of the river flats, which remains relatively humid throughout the year. The forest and scrub are ideal habitats for a number of ground beetle species, and three of the ground beetle genera (*Mecodema*, *Plocamostethus*, *Megadromus*) were noted. *Plocamostethus planiusculus* is often the most abundant large ground beetle collected in a number of pitfall trap studies around the lower North Island (Watts *et al.* 2014, Vergara *et al.* 2020). The medium-sized *Holcaspis* species are also associated with forest edges but can also be found in highly disturbed areas as well. The most abundant ground beetle caught was *Ctenognathus adamsi*, a small species that is regularly observed and caught in the lower North Island (Watts *et al.* 2014).

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The lack of diversity and abundance of ground beetles in the eastern areas (other than Donnelly Flat) is most likely due to the Wairarapa region being affected by a prolonged drought, which has most likely caused a reduction in the activity of ground beetles. These conditions will also affect the amount of prey available, further reducing the adult predator population.

Sustainable Wairarapa thanks Dr Seldon and the Charisa Entomological and Natural History Trust who was made possible by funding Dr Seldon's expenses and time.

## Postgraduate completions:

Kelly, M. (2022). Examining behavioural differences in predator aware and predator naïve Wellington tree wētā, *Hemideina crassidens*. (Thesis, Master of Science). University of Otago. http://hdl.handle.net/10523/12830.
Supervised by Sheri Johnson and Cilla Wehi.

## Postgraduate submissions:

Brockelsby, W. The flax weevils of Mana Island (Thesis submitted, Master of Science). Massey University.
Supervised by Maria Minor and Travis Glare.

## Publications from Members:

**Mark Anderson:**
Anderson, M., Hartley, S. & Wittmer, H.U. (2022) Distribution, density and habitat association of the Cook Strait click beetle (*Amychus granulatus* Coleoptera: Elateridae) on Te Pākeka/Maud Island, New Zealand. *New Zealand Journal of Zoology*. https://doi.org/10.1080/03014223.2022.2071303,

## Postgraduate opportunities: Research student needed to unravel taxonomic tangle

The search is on for PhD student with a fascination for the future of New Zealand butterflies – but there's a twist.

This student also needs to be interested in the fascinating history of how they were originally named (a story of intrigue and dodgy dealings from 270 years ago), be prepared to dissect butterflies for analysis and then study DNA sequencing so they can be scientifically named.

It's a big call but it's also vital. That's because 90 per cent of butterflies in Aotearoa are endemic and irreplaceable if they die out.

## Research student needed to unravel taxonomic tangle (continued)

To change this identification crisis, a small group of butterfly enthusiasts, school groups, and some of New Zealand's leading scientists have teamed up with the Moths and Butterflies of New Zealand Trust (MBNZT) to create *The Butterfly Discovery Project*.

The project will begin with common copper, our largest group of native butterflies.

Dr George Gibbs, the "grandfather of butterflies in New Zealand" is concerned that only four species of copper butterflies have been scientifically named, yet there could be at least 24. "Unless they are properly identified and we have an understanding of their habitats, they are at risk of extinction," explains the xx- year-old retired entomologist.

"Unravelling their phylogeography – their evolutionary history in relation to changing landscapes – could tell us a lot about climate change and landscape evolution in this country."

The delicate black and gold butterflies can be found throughout New Zealand from coastal areas to sub alpine regions.

Dr Gibbs has designed a poster, hoping to attract PhD candidates. He would like to see it displayed in science departments all around the country.

Dr Gibbs has included the controversial painting of the copper butterfly from 1775, which appears to have been based on a description rather than a specimen. He prefers the depiction by New Zealand artist Flox which he says is far more accurate.

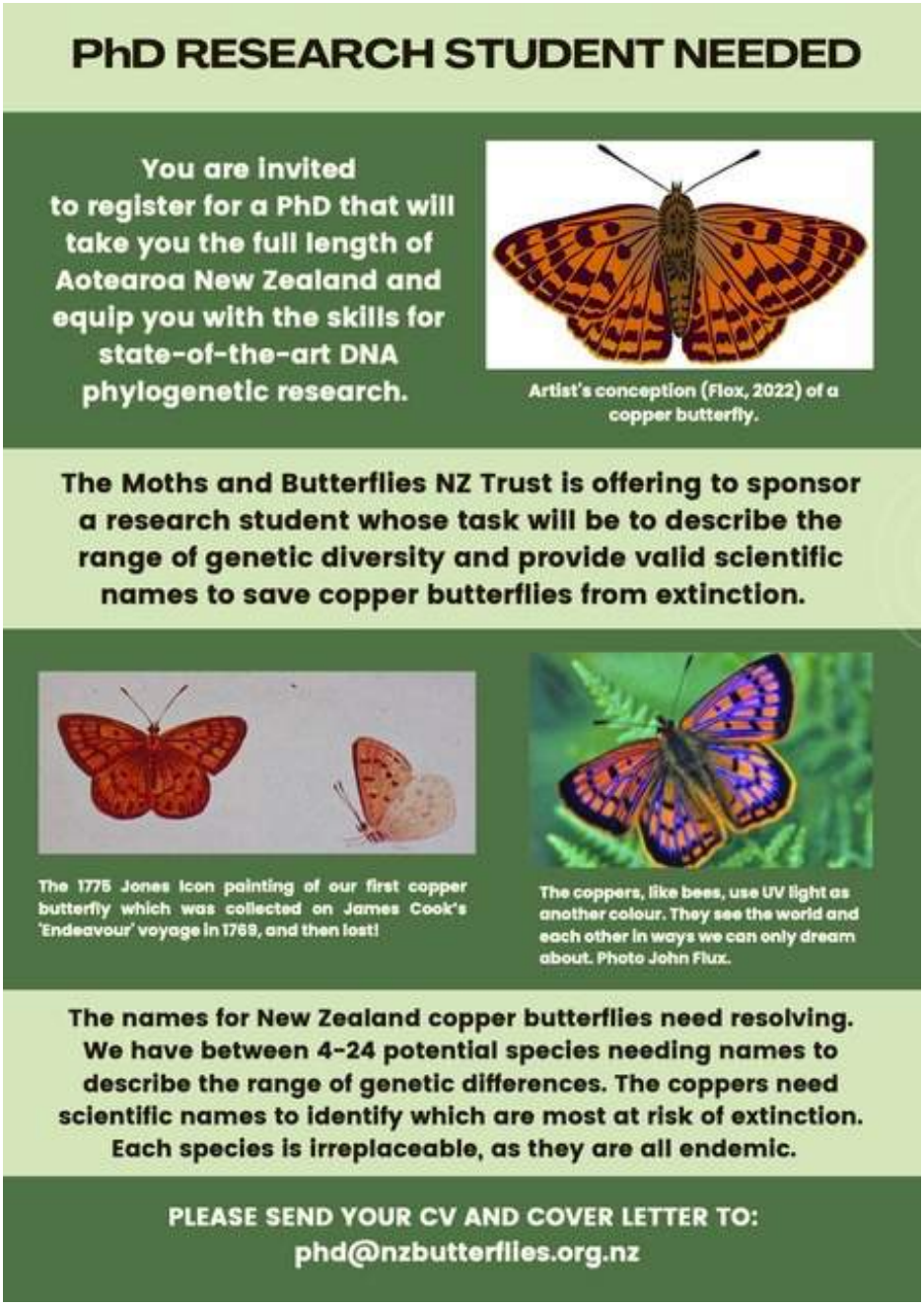
The successful candidate will work under the supervision and guidance of The University of Auckland Professor Thomas Buckley and Dr Robert Hoare of Manaaki Whenua Landcare Research.

Ideally, the student would qualify for a University of Auckland Doctoral Scholarship (https://www.auckland.ac.nz/en/study/scholarships-and-awards/find-a-scholarship/the-university-of-auckland-doctoral-scholarships-43-all.html), which includes a stipend and not having to

## Research student needed to unravel taxonomic tangle (continued)

pay any university fees. The only costs then would be for laboratory work and field trips. However, the organisers want a student who is passionate about the project, so they are prepared to raise seed funding for fees and living costs.

The MBNZT has set up a Givealittle page, which aims to raise the funds to form a genealogical tree: https://givealittle.co.nz/cause/save-nzs-butterflies



## Research student needed to unravel taxonomic tangle (continued)

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## Noteworthy

Dr Gibbs made a $50,000 donation to the Butterfly Discovery Project in recognition of his grandfather, who first introduced him to the world of insects and butterflies. The young George was fascinated by the detailed collections and colour drawings his grandfather did.
“I would like the donation to be thought of as a memorial to the work of G V Hudson – the first truly endemic entomologist to apply himself to the question of endemic copper butterfly variations.”

Like his grandfather, Dr Gibbs endeavoured to rectify the taxonomic mix-up that relates back to one of Cook’s Endeavour voyages, when the copper butterflies that had been collected in NZ were traded before they could be stored in a museum. Instead, their identification was based solely on description, then painted by William Jones in 1775. As a result, all our copper butterflies have been lumped together into four groups, whereas there may be more than 20 species! To help their survival, proper identification through DNA analysis and morphology is required.

## Projects: 100 years moths Zealandia

By Julia Kasper

We have run 3 moth trips in 2022 with 11 different volunteers across those trips. Eric and I also ran a Matariki Pepeke hikoi with Otari, which was attended by about 20-30 members of the public. We’ve now catalogued 216 species in the valley over 3 years, with another 48 found via the site iNaturalist.

# Entomological Society Newsletter

## Call outs:

Acrocreidae
By Shaun Thompson

Hello, I am a PhD student revising the Acroceridae of New Zealand. The Acroceridae (also known as “spider flies”) are a group of naturally uncommon flies that are endoparasitoids of spiders. They are represented by three genera: *Apsona*, *Helle* and *Ogcodes*.

I am very keen to acquire specimens of Acroceridae from any group. They only occur from late October until late March (but are most abundant from November to January). They can be found in a variety of habitats, but *Ogcodes* is especially abundant in grassy wetlands. *Helle* and *Apsona* can most easily be found visiting flowers, especially those of the *Celmisia* genus.

If anyone encounters these flies this summer, I would greatly appreciate it if they sent them to me (and I would be happy to cover costs of sending).

If you have these flies or want to know more details, my contact email is shaun.thompson@tepapa.govt.nz

Wanted: Sightings native bees in Wellington!

Wellington Pepeke's youngest member Tora has received a grant from the Wellington Zoo local conservation grant. Congratulations Tora! Tora is 5 years old and already a bug expert. He wants to support our native bees by raising the awareness in the public.

For Tora’s NZ native bee project, we are looking for localities of their breeding habitats around wellington. Help Tora by uploading photos of these bees to iNaturalist! We want to map the populations and erect information signs nearby.
We also build portable habitat that can be used in the backyard mainly for *Leioproctus*.

# Entomological Society Newsletter

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