



Terrestrial invertebrate biosystematics research and events at the New Zealand Arthropod Collection (NZAC), Auckland

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Welcome to *NZAC News*. This electronic newsletter will appear 3 times a year, with the purpose of highlighting recent biosystematics research and publications on terrestrial invertebrates at NZAC, and NZAC activities.

Fauna of New Zealand

The 4 *Fauna of New Zealand* contributions mentioned in *NZAC News 4* have now been published. In addition, more PDFs of previously published contributions have been made available on the website.

Fauna N.Z. 62 by **Ian Townsend** covers the 33 species of trechinae now known from New Zealand (Coleoptera: Carabidae: Trechinae), all species except 1 are endemic. Nearly half the species are confined to caves and are highly modified for an underground (troglobitic) life. Nearly 40% of these troglobitic species are known only from a single population making them highly vulnerable to extinction from local catastrophic events.

Fauna N.Z. 63 by **Marie-Claude Larivière, Murray Fletcher, and André Laroche** catalogues the New Zealand Auchenorrhyncha (Hemiptera) fauna. Currently 12 families, 68 genera, and 196 species are recognised, with 82% of the species being endemic. The regions with the largest number of introduced species are the relatively warm parts of New Zealand as well as its main trading ports or agricultural areas (Auckland, Hawkes Bay, Nelson, Christchurch). The areas known to have the greatest number of local endemics are the Northland and Wellington regions on the North Island, and the Northwest Nelson, Marlborough, Mid Canterbury, Fiordland, and Southland regions on the South Island. A photographic atlas to about 65% of the known fauna is provided through images of the primary types and their type labels, and these images are also available online at <http://www.landcareresearch.co.nz/research/biosystematics/invertebrates/hemiptera/collection/>



Koroana lanceleti

Image of holotype of *Koroana lanceleti* Larivière, 1997 (Cixiidae) with labels, *Fauna N.Z. 63*, page 180.

Fauna N.Z. 64 by **Cor Vink and Nadine Dupérré** describes the 4 closely related species of nurseryweb spiders (Araneae: Pisauridae) found in New Zealand: 3 on the mainland and 1 on the Chatham Islands. All species are endemic to New Zealand and are likely to be related to Australian species. The



Female of *Izatha peroneanella* (Walker, 1864) (Oecophoridae), *Fauna N.Z. 65*, page 106.

Chatham Islands species is known from only 3 islands (South East, Mangere, and Houruakopara Islands) and is nationally endangered due to its restricted range.

Fauna N.Z. 65 by **Robert Hoare** revises the 40 species now recognised (15 new) in the endemic moth genus *Izatha*, popularly named 'lichen tuft moths' (Lepidoptera: Oecophoridae). Most species are beautifully camouflaged when resting on the trunks of our forest trees and shrubs, not only because of their colours, which mimic bark or lichen, but also because of the tufts of raised scales on their wings and mouthparts, which imitate the raised and irregular surface of lichens. Caterpillars of *Izatha* almost all tunnel in dead wood, where they are probably largely digesting the fungal element; one or two caterpillars have been found in bracket fungi and others are known or suspected to feed on lichens. Therefore, *Izatha* species form part of New Zealand's decomposer community, which are essential for recycling the nutrients in our forests and shrublands. Some *Izatha* species are apparently rare, and may be in need of special conservation.

Hoare, R. J. B. 2010. *Izatha* (Insecta: Lepidoptera: Gelechioidea: Oecophoridae). *Fauna of New Zealand 65*, 201 pages.

Larivière, M.-C.; Fletcher, M. J.; Laroche, A. 2010. Auchenorrhyncha (Insecta: Hemiptera): catalogue. *Fauna of New Zealand 63*, 232 pages.

Townsend, J. I. 2010. Trechini (Insecta: Coleoptera: Carabidae: Trechinae). *Fauna of New Zealand 62*, 101 pages.

Vink, C.J.; Dupérré, N. 2010. Pisauridae (Arachnida: Araneae). *Fauna of New Zealand 64*, 60 pages.

In addition to these new contributions, downloadable PDFs are now available from fnz.landcareresearch.co.nz for all 65 contributions published in the series since its inception in 1982. The Editorial Board endorses the principle of Open Access to scientific information on New Zealand terrestrial invertebrates, and this is one reason why the Editorial Board has provided

these free PDF facsimiles on the website. The resolution of images in these PDFs, however, is not as high as the ink-on-paper copies for purchase: as well fine lines and rules in line illustrations may be broken or may not show. These image resolution differences can be seen on the website using as an example the male lucanid stag beetle, *Geodorcus helmsi* (Sharp) published in *Fauna N.Z. 61*.

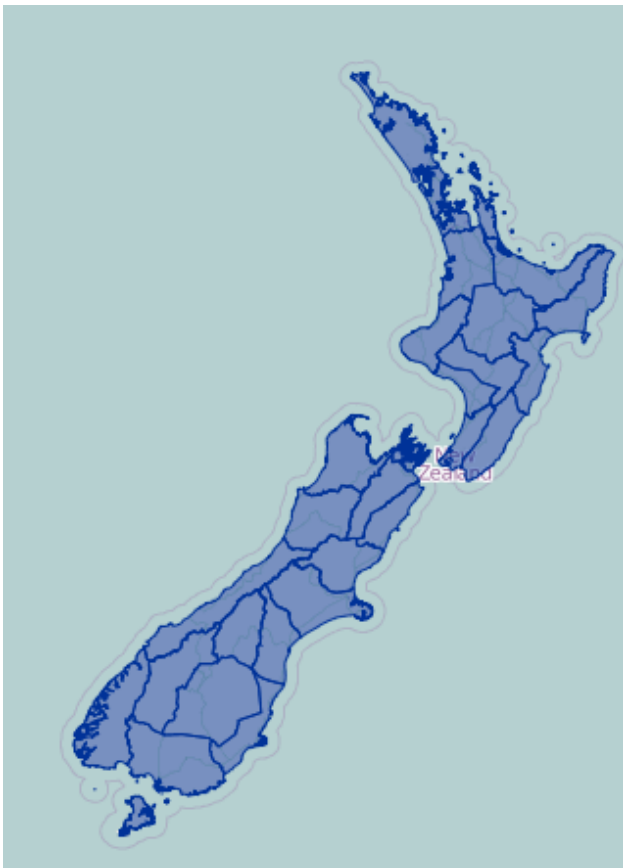
Funding: FRST.

Trevor Crosby

GIS data layer available for the NZAC Area Codes for recording specimen localities

The data layer for New Zealand Area Codes for recording specimen localities ("Crosby codes") is now available from <http://iris.scinfo.org.nz/>. The website allows you to download the file to use in your Geographic Information System (GIS) program, or you can simply use the layer online to check the Area Code polygon boundaries and obtain geocoordinates for particular localities. There is no charge made to download this data layer, but you do need to register your name and email address, and then sign in to download this file as well as any other New Zealand vegetation and soil data layers you may wish to use in your GIS program. Check the conditions of use listed in the Licence, and acknowledge the source of the data in all derivative works: "Data reproduced with the permission of Landcare Research New Zealand Limited". The 1998 paper defining these NZAC Area Codes, and updating the original 1976 paper, is also accessible through this website by a link to the publication on the SIR Publishing website (Crosby, T. K.; Dugdale, J. S.; Watt, J. C. 1998. Area Codes for recording specimen localities in the New Zealand subregion. *New Zealand Journal of Zoology* 25(2): 175–183).

<http://iris.scinfo.org.nz/layer/165-nz-area-codes-for-recording-specimen-localities/>



Leadership transition for Invertebrate Biosystematics Group

On 1 July 2010 **Thomas Buckley** transitioned into leadership of the Invertebrate Biosystematics Group, taking over from **Marie-Claude Larivière** who for the previous 3 years had successfully fulfilled the roles of Research Group Leader and Director of NZAC. The Invertebrates Group sits within the broader Landcare Research Biosystematics Team.

Thomas graduated with an undergraduate degree in zoology from Victoria University of Wellington in 1995 and an honours degree in 1996. His PhD studies, also at Victoria University of Wellington, were on the molecular systematics of New Zealand alpine cicadas (*Maoricicada*). After a 1 year PostDoc at Duke University, North Carolina, on methods of phylogenetic analysis, Thomas took up a FRST PostDoctoral Fellowship at Landcare Research in 2001.

Since he became a permanent staff member at Landcare Research, Thomas' research has focussed on the application of genetic methods to the New Zealand invertebrate fauna, and in particular the systematics and evolution of stick insects. As reported in *NZAC News 3*, Thomas was awarded The Research Medal 2009 by the New Zealand Association of Scientists for "outstanding fundamental or applied research in the physical, natural or social sciences published by a scientist under the age of 40, during the year of the award or the preceding three calendar years."

Thomas' new role includes being the Director of NZAC as well as the Research Group Leader for Invertebrate Biosystematics and Curator for Phasmatodea. **Robert Hoare** continues as Head Curator of NZAC.

NZAC Policies for Collection Management

A policy document outlining collection management in NZAC is now available as a downloadable PDF from the NZAC website.

Hoare, R. J. B.; Crosby, T. K.; Larivière, M.-C. 2010. NZAC — New Zealand Arthropod Collection (including New Zealand Nematode Collection): policies for collection management. 29 September 2010. <http://www.landcareresearch.co.nz/research/biosystematics/invertebrates/nzac/>

7th International Society of Hymenopterists Conference, Kőszeg, Hungary 20–26 June 2010

Along with more than 100 other hymenopterists from around the world, **Darren Ward** reports that he attended the 7th International Congress of Hymenopterists in Kőszeg, Hungary. Highlights included the historic town of Kőszeg; several days of field collecting (see image of European Stag Beetle photographed at Lake Balaton); and all accompanied with plenty of good 'wild' food, e.g., wild boar, and shots of Palinka (fruit brandy) — which was consumed before getting on the bus, during the bus ride, at lunch, after lunch, and on the way home. The scientific programme and abstracts for all presentations are available at <http://hymenopterists.org/files/HymenopteristsCongress2010.pdf>.

New Zealand science was represented by two papers:

Smith, M. A.; Fernández-Triana, J. L.; van Achterberg, K.; Goulet, H.; Hallwachs, W.; Hrcek, J.; Huber, J. T.; Janzen, D. H.; Miller, S.; Quicke, D.; Rodriguez, J.; Sharkey, M. J.; **Ward, D. F.**; Whitfield, J. B.; Zaldivar, A.; Hebert, P. D. N. 2010. An inordinate fondness for parasitoid wasps: DNA barcoding data from a global array of projects. International Society of Hymenopterists Conference, Kőszeg, Hungary 20–26 June 2010.



Above: European stag beetle photographed at Lake Balaton. (Photograph: Darren Ward).

Early, J. W.; Masner, L.; **Ward, D. F.** 2010. Parasitic wasps of the Proctotrupoidea, Platygastroidea and Ceraphronoidea in New Zealand: review and analysis. International Society of Hymenopterists Conference, Kőszeg, Hungary, 20–26 June 2010.

Interactive key to the families of New Zealand Hymenoptera

Darren Ward and **John Early** report that they have prepared an interactive key to the families of New Zealand Hymenoptera, and this is now available online. They note that the New Zealand hymenopteran fauna is extremely poorly known: currently there are around 900 described species in 47 families. However, the true number of hymenopteran species in New Zealand could be in excess of 3000.

This identification guide to the New Zealand families of Hymenoptera was created using Lucid Phoenix, which works as an interactive dichotomous key. Many images required for the key were modified from originals created by Birgit Rhode, Des Helmore, and John Noyes (BMNH) for *Fauna of New Zealand* publications by Noyes & Valentine (1989) and Donovan (2007).

The key is intended as a relatively basic guide to the family-level identification, and feedback on the key is welcome.

Ward, D. F.; Early, J. W. 2010. Guide to the family-level identification of Hymenoptera in New Zealand v1.0. Online LUCID Phoenix key. http://www.landcareresearch.co.nz/research/biosystematics/invertebrates/hymenoptera/family_key/

Request for specimens

WANTED: New Zealand parasitoid wasps, bees, and ants (Hymenoptera) for DNA barcoding. As part of a collaboration with overseas researchers, I would appreciate any N.Z. specimens of Hymenoptera (or alternatively existing CO1 sequences). Please send specimens, live or in 95% ethanol, to Darren Ward at Landcare Research (address and contact details at the foot of page 4); wardda@landcareresearch.co.nz.

Insect Factsheets

Nicholas Martin of Plant & Food Research and NZAC research associate, in conjunction with Landcare Research, developed the content specifications for a new series of factsheets about insects and related invertebrates, the first set of which are now available. Written by experts and illustrated with quality photographs, these factsheets also may incorporate information from databases – many of which are constantly being updated. Once written, these computer-generated factsheets have the benefit of being easy to update without major printing costs. In addition, links to these factsheets can be created from other Internet sites.

The first 18 factsheets in the series focus on invertebrates that live on native insects or plants, but the series will include all kinds of invertebrates. Each factsheet usually covers a single species, providing information on its biostatus, distribution, biology, recognition and, if appropriate, control options. Sources of additional information may also be given.

The factsheets are available free of charge and can either be printed or the text and photos downloaded and edited for your own use. This option allows high quality versions of the images to be downloaded separately into your document. Please acknowledge the source of the information and respect the copyright of the images.

Insect Factsheets: Interesting Insects and other Invertebrates. <http://nzacfactsheets.landcareresearch.co.nz/index.html>. New Zealand Arthropod Collection Factsheet Series (ISSN 1179-643X)

Funding: TFBIS (Terrestrial and Freshwater Biodiversity Information Systems) administered by Department of Conservation (DoC).

Recent and Coming Events

In early September **Dr Eric Palevsky** arrived to work with **Zhi-Qiang Zhang** on mite taxonomy and ecology. Eric is an acarologist at the Volcani Center located at the Department of Entomology, Newe-Ya'ar Research Center, Agricultural Research Organization, Israel. He works mainly on the ecology and biological control of mites in Israel, and is here on sabbatical for a year.

In July **Thomas Buckley** attended the American Genetic Association annual symposium on Conservation Genomics in Hilo, Hawai'i. This 3 day workshop drew together people applying Next Generation DNA sequencing methods and conservation genetics. However, the symposium also contained information on new DNA sequencing



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NZ HYMENOPTERA FAMILY KEY

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Guide to the family-level identification of Hymenoptera in New Zealand

methods that can be applied to problems in systematics and phylogenetics. Currently Thomas is spending 2 weeks at the University of Göttingen, Germany working on Phasmatodea projects with colleagues.

Rich Leschen recently went to Europe, and while on an Italian holiday with his wife, stayed with Luca Bartolozzi (Brentidae and Lucanidae, Zoological Museum 'La Specola' University of Florence) and met many colleagues at the insect fair in Modena. While in Torino, Rich visited the Museo Regionale di Scienze Naturali, Torino and spent time with curator Luca Picciau and weevil specialist Massimo Meregalli, University of Torino. Then it was more serious work in London for 2 weeks working with Nathan Lord on New Zealand Zopheridae and hanging out with cerambycid specialist Gino Nearn (both are students at University of New Mexico). Finally 2 weeks were spent in Copenhagen with Alexey Solodobnikov (Zoological Museum ZMUC) and meeting up with Jan Pederson and wife Andrea Schomann, all of whom will be spending time in N.Z. during 2011 working on N.Z. staphylinids, as well as Katie Marske, previously a student of Thomas and Rich's, who is currently working on a postdoc in Copenhagen.

Darren Ward hosted a DOC Threatened Species classification workshop for Hymenoptera on 25 August 2010: attended by Darren Ward, Rudi Schnitzler, and John Early, and from DOC Ian Stringer and Rod Hitchmough.

On 7 and 8 October **Zhi-Qiang Zhang** attended the 3rd meeting on Scientific Publishing in Scientific Institutions organised by EDIT (European Distributed Institute of Taxonomy — <http://e-taxonomy.eu/node/900>) and held in Copenhagen. The theme of the meeting was "Exchanging know-how, dissemination of and access to taxonomic journals". As Chief Editor of *Zootaxa*, Zhi-Qiang gave a presentation on "Journal aggregation and integration for enhancing the access and impact of taxonomic publications". His presentation considered both challenges and opportunities faced by taxonomic publishing in this cyber era. His message was that to meet the challenges of describing the world's rapidly disappearing biodiversity, it is essential to enhance the efficiency, access, and impact of taxonomic publications. One way this can be achieved is by taxonomic journal integration and aggregation. Sharing of resources and collaboration among partners are keys to success. In August **Zhi-Qiang** gave an invited symposium talk "New dimensions in taxonomic descriptions: opportunities and challenges in the cybertaxonomic era" at the XIIIth International Congress of Acarology, 22–28 August in Recife, Brazil.

Marie-Claude Larivière gave an invited presentation on cybertaxonomy and other web-tools at a N.Z. Invertebrate Conservation Network scoping workshop, University of Canterbury, Christchurch, 19 July 2010.

Gustavo Hormiga, Department of Biological Sciences, The George Washington University, Washington, D.C. and his colleague **Nikolaj Scharff** from the Zoological Museum (ZMUC), Copenhagen visited NZAC in March and spent one day looking through the unsorted spider material for malkarid specimens. They are both working on a worldwide revision of the spider family Malkaridae, and were pleased to find 23 specimens which were then sent onto them on loan. Gustavo had previously borrowed all 6 specimens that were available in NZAC. The malkarid fauna of New Zealand is completely undescribed. These small spiders live in moist leaf litter and are not easily found, so in general they are not very abundant in collections. <http://www.gwu.edu/~spiders/>

The N.Z. Minister of Science and Innovation, **Hon. Wayne Mapp**, visited NZAC on 24 September 2010, and head curator **Robert Hoare** outlined to him how NZAC specimens are used in research projects, and as input into conservation and biosecurity decisions.

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Left: Alexey Solodobnikov and Jan Pederson, Copenhagen. Right: Gino Nearn, Rich, and Nathan Lord, London (at the Stanhope).

Publications

This section includes recent publications by staff associated with NZAC, or publications by other researchers using NZAC specimens or expertise of NZAC staff.

Buckley, T. R.; Marske, K.; Attanayake, D.. 2010. Phylogeography and ecological niche modelling of the New Zealand stick insect *Clitarchus hookeri* (White) support survival in multiple coastal refugia. *Journal of Biogeography* 37: 682-695.

Buckley, T. R.; Attanayake, D.; Nylander, J. A. A.; Bradler, S. 2010. The phylogenetic placement and biogeographical origins of the New Zealand stick insects (Phasmatodea). *Systematic Entomology* 35: 207-225.

Derraik, J. G. B.; Heath, A. C. G.; Rademaker, M. 2010. Human myiasis in New Zealand: imported and indigenously-acquired cases; the species of concern and clinical aspects. *New Zealand Medical Journal* 123 (1322): 1–18. <http://www.nzma.org.nz/journal/123-1322/4333/>

Henderson, R. C.; Sultan, A.; Robertson, A. W. 2010. Scale insect fauna (Hemiptera: Sternorrhyncha: Coccoidea) of New Zealand's pygmy mistletoes (*Korthalsella*: Viscaceae) with description of three new species: *Leucaspis albotecta*, *L. trilobata* (Diaspididae) and *Eriococcus korthalsellae* (Eriococcidae). *Zootaxa* 2644: 1–24.

Hong, X.-Y.; Zhang, Z.-Q.; Li, G.-Q. 2010. Tetranychidae of China: a review of progress, with a checklist. *Zoosymposia* 4: 133–150.

Teulon, D. A. J.; Larivière, M.-C. 2010. TFBIS funded specimen information—aphids. <http://www.landcareresearch.co.nz/research/biosystematics/invertebrates/nzac/tfbis/Aphids.asp>

Zhang, Z.-Q.; Hong, X.-Y.; Fan, Q.-H. ed. 2010. Xin Jie-Liu centenary: progress in Chinese acarology. Auckland, Magnolia Press. 345 p. <http://www.mapress.com/zoosymposia/content/2010/v4/index.htm>

Significant website updates:

Buckley, T. R. The New Zealand stick insect web site. www.landcareresearch.co.nz/research/biosystematics/invertebrates/phasmatodea/

Fauna of New Zealand website. fnz.landcareresearch.co.nz.

Larivière, M.-C.; Fletcher, M. J. 2004–2010: The New Zealand leafhoppers and treehoppers (Hemiptera: Auchenorrhyncha): web-based identification keys and checklist. Updated 11 October 2010. *The New Zealand Hemiptera Website, NZHW 02*. <http://hemiptera.landcareresearch.co.nz/>

Larivière, M.-C.; Rhode, B.E.; Laroche, A. 2006–2010: New Zealand Cicadas (Hemiptera: Cicadidae): A virtual identification guide. Updated 15 October 2010. *The New Zealand Hemiptera Website, NZHW 05*. <http://hemiptera.landcareresearch.co.nz/>