

The Symbiont

News from the Department of Biodiversity and Systematic Biology (BioSyB) Issue 7: November 2012

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Editorial

“Try to makes sense of what you see...

Be curious.”

So urged Professor Stephen Hawking at the Opening Ceremony of the London 2012 Paralympic Games, in a celebration of science, creativity and human potential. Some of Amgueddfa Cymru's past exhibitions have celebrated the work of Linnaeus, the 'father of taxonomy', and the underpinning evolutionary thinking of Darwin. Now we look forward to marking in 2013 the contribution to science of A. R. Wallace. One thing these men had in common is that they observed, investigated and strived to make sense of what they could see. While curiosity is not an attribute unique to scientists, it is one of the fuels of scientific discovery. Not least of all, it drives the passion with which taxonomists, ecologists, and amateur naturalists seek to discover, describe and understand our natural world.

Since the Department was created in 1997, our taxonomists have published over 1,000 academic papers and taxonomic reviews. They have discovered 607 (and counting...) species new to science. They have been the first to describe and name them and, in some cases, establish their 'family tree'. Also as a result of their work, collections behind the scenes in the Amgueddfa Cymru exist as a reference for the future. In previous issues of *Symbiont* we have discussed our public outreach work. This issue focuses on some of the recent taxonomic work of the Department and the many research partners with which the Department collaborates, both at home and overseas.

Some of you will know that, in the UK, NERC (Natural Environment Research Council) recently conducted a review of taxonomy. A resulting document, 'Developing a National Strategy in Taxonomy & Systematics', concluded that “the subject, one of the oldest branches of biology, is currently undergoing a period of major transformational change that will determine its future role and structure.” As an institution we are pleased to support a UK Taxonomic Co-ordination Committee and be part of discussions on how we care for our national collections and maintain the UK alleviation of the global taxonomic impediment.

Dr Deborah Spillards, Department Manager

Collecting plant fossils in Ukraine

In September 2012, Chris Cleal (Head of Vegetation History) visited the Donets Coalfield in eastern Ukraine, as part of the project IGCP 575: *Pennsylvanian terrestrial habitats and biotas of south-eastern Euramerica*. As well as studying the geology of this area, the visit provided an opportunity to collect some of the Carboniferous plant fossils that are so abundant there, but which are not represented in Amgueddfa Cymru's collections. In Late Carboniferous times (c. 300 million years ago) the Donets and south Wales were part of a belt of wetlands that extended over much of Europe and North America. Although the vegetation in these two widely separated parts of the wetland was broadly similar, there were differences in the detailed species distributions, probably reflecting differences in habitat and climate. The study of these differences across Europe is one of the main aims of IGCP 575 (for further details see www.igcp575.org).

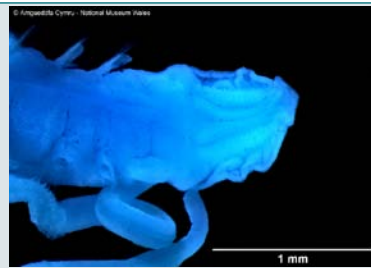


Members of IGCP 575 examining late Carboniferous section near Luganskoe, Ukraine. © J. Sremac (Zagreb)

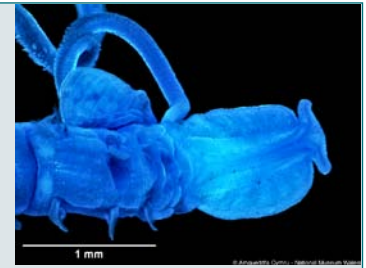
Arabian Peninsula Shovelhead worms

The Magelonidae is a small family (70 species) of polychaetes (marine bristleworms), with a unique flattened head used for digging in sediments. They have two long feeding tentacles, termed palps, that are adorned with papillae.

In 2010, Kate Mortimer (Research Curator, Marine Biodiversity) carried out a review of all known Magelonid species from the seas surrounding the Arabian Peninsula, confirming the presence of five species. Since then, Kate has collaborated with scientists from the Centre d'Estudis Avançats de Blanes, Spain in identifying new material from the same region. Specimens were collected from over 100 locations in seven surveys off the coasts of Iran and Qatar. Additional Red Sea material was also borrowed from the Muséum National d'Histoire Naturelle in Paris. One specimen was particularly interesting due to the presence of uniquely shaped 'horns'. The team named the species *Magelona montera* after the Spanish word for a



Head of *Magelona sinbadi*



Head of *Magelona montera*

bullfighter's hat. A second species was named after the fictional sailor, Sinbad (*Magelona sinbadi*). The review has raised the number of species known in the region from five to eleven, and includes a key to all western Indian Ocean magelonids.

Amgueddfa Cymru staff have now studied 30% of all known *Magelona* species, having described species from Britain, Portugal, Seychelles and Hong Kong. Work is commencing on a review of European *Magelona* species, which will complement other studies by the Marine Biodiversity Section on the British polychaete fauna.

Champion Trees

Amgueddfa Cymru has embarked on a project to curate and digitise its historic photography collections, with the help of a financial gift from the Esmée Fairbairn Foundation. The project will run for three years and will culminate in a website and displays of the images.

One important collection is a group of glass plate negatives depicting images of trees of notable age and size growing in Wales and England. The collection includes about 100 stunning images, dating from 1890 to the mid-1930s, many of which were taken at the request of the former Keeper of Botany, Harold A. Hyde. This collection not only provides evidence of the tree's existence, but also of its habitat at that time. The images have been shared with local tree experts and they have helped us pinpoint the locations of

some of these trees and estimate their age. In some cases, if the tree is still alive, they have helped us to compare our glass plate negatives with contemporary photographs, revealing how the tree has fared over the years and how its environment has altered.

However, this project has also highlighted the plight of these trees, as so few of them have survived due to neglect or changing environment. Hopefully this project will raise awareness of these living, ancient, monuments and inspire others to safeguard our trees for generations to come. Rob McBride, one of our tree researchers, offered great support to the project during his Radio Wales interview marking the start of National Tree Week on 26 November 2012.



Quercus petraea image taken in 1935. This tree pre-dates Monmouth's gated Monnow Bridge, which was built in the 13th century



The tree today!

This work is in copyright, but the copyright holder could not be traced. If you know who the rightful copyright owner is, please contact Amgueddfa Cymru – National Museum Wales.

The identity of *Isothecium alopecuroides* var. *robustum*: systematics and ecology

In September 2012, Ray Tangney (Head of Cryptogamic Botany) travelled to the Pyrenees and Auvergne areas of France to collect moss specimens for study and DNA analysis. The fieldtrip was part-funded by the Systematics Research Fund, which is administered by the Systematics Association and the Linnean Society.

Ray has been researching a small genus of mosses, *Isothecium*, that are widespread in the northern hemisphere. Four species of *Isothecium* are known in western Europe, all are common in woodland. Studies of herbarium specimens held in the Welsh National Herbarium at Amgueddfa Cymru and at the Natural History Museum, London have suggested that an overlooked species may occur in the mountain areas of France.



The valley below the Cirque de Gavarnie, in the Pyrenees National Park. (Inset: *Isothecium alopecuroides* var. *robustum* growing in the Vallee du Marcadau in the Pyrenees National Park)

A high level of variation within each species of *Isothecium* has led taxonomists to further divide each species into a number of varieties. The species *Isothecium alopecuroides*, for example, has 17 varieties. DNA analysis of one of these varieties, *Isothecium alopecuroides* var. *robustum*, showed unexpectedly that its closest relative does not appear to be *Isothecium alopecuroides*, suggesting that it is in fact a separate species.

Localities where the variety *robustum* occurs were identified in herbarium studies, and two areas closest to the UK, the Pyrenees and the Mont Dore/Monts du Forez area in central France, were visited. Collections were made successfully across the areas visited, and much was learnt about the plant's ecology. Generally, it grows on rocks in mixed beech – fir forest at altitudes above 1000 metres and is quite common in many places. Further research to confirm the status and taxonomy of *robustum* will continue using the new material collected.

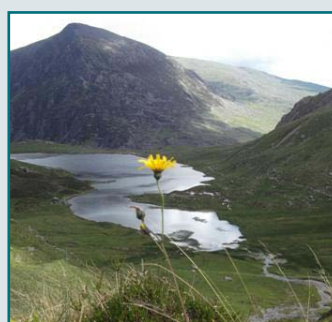
A Year Out: On the Hunt for Hawkweeds



Lauren Cranmer admiring *Hieracium carneddorum* on Moel Sych

Lauren Cranmer, an undergraduate BSc Ecology student from Cardiff University, joined the Biodiversity Department in August 2011 to begin a work placement year as part of her degree. Under the supervision of Dr Tim Rich (Head of Vascular Plants), Lauren worked on a project to assess the conservation requirements of three rare Welsh endemic Hawkweed species: *Hieracium carneddorum*, *H. griffithii* and *H. robertsii*.

Lauren conducted fieldwork in Snowdonia for three weeks in June and July 2012, revisiting the historical sites for these species. The locations where the species grew in the past were collated from specimens from the Welsh National Herbarium, the University of Cambridge, the University of Oxford and the Natural History Museum, London. This information was used to direct field surveys.



A hawkweed standing proudly within its landscape over Llyn Idwal. © Brendan Marrinan, 2012.

Hieracium griffithii and *H. robertsii*, each of which had just a single historical site, were not re-found and have been classified as IUCN threat status *Extinct*, although this is considered provisional for the latter. *Hieracium carneddorum* was found in less than half of its previous sites, and was assessed as *Vulnerable*.

During her year in the Department, Lauren also wrote a book with Tim Rich, *101 Rare Plants of Wales*, which is due to be published by Amgueddfa Cymru in 2014. She was also employed by the Learning Department to work in the Clore Discovery Centre, and continues to run many of the National Museum Cardiff's Saturday Science Workshops. In October, Lauren returned to Cardiff University to begin the final year of her degree.

News in brief

- Brian Levey (Research Curator, Coleoptera) spent part of September and October in Western Australia on field work collecting Jewel Beetles, focusing on those of the genus *Melobasis*. His primary aims were to collect further material of poorly known West Australian species, and to collect new species for his ongoing revision of this large genus.
- A single specimen of a rarely recorded species of rove beetle *Acrotona sylvicola* (Kraatz) was collected this year, close to the summit of Pen y Fan, the highest mountain in south Wales, in vice county Brecknockshire. There is only one other Welsh record, a specimen collected over 20 years ago. The relatively few published records suggest that the species is usually associated with exposed riverine sediments.
- The Federation of Museums & Art Galleries of Wales has been granted funding, from the UK Museums Association's Esmée Fairbairn Collections Fund, for a 3-year project to link natural science collections across Wales. Amgueddfa Cymru is one of several project partners. Our botany, zoology and geology curators will be carrying out surveys of the natural history collections of the participating museums.
- New observations made by Marine Biodiversity staff of lesser black-backed gulls feeding on invasive crayfish (Steep Holm Island and Pen-y-fan pond, Caerphilly) have been published in the journal *BioInvasions Records*. These findings have important implications for the safety of 'ark' sites set up to protect our native crayfish, a species under great threat from non-indigenous species and disease. Staff have been asked to submit a further article to *Crayfish News* to help disseminate this information quickly.
- On Saturday 15 September, Catalena Angele (Documentation Assistant) organized a beach clean at Ogmere Beach, Vale of Glamorgan attended by 46 members of the public. Amgueddfa Cymru staff have run this annual event for the last nine years, as part of an initiative organized by the Marine Conservation Society. The aim is to encourage people to get involved in marine conservation at a local level. As part of the event, staff from the Biodiversity, Geology and Learning departments ran science-based educational workshops for families. In the workshops children investigated the seaweeds, animals and fossils that can be found on this beautiful stretch of beach.

Community engagement: field meetings

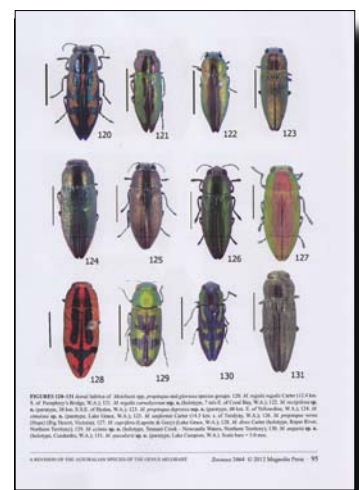
Every weekend, thousands of amateur naturalists in Britain take part in outdoor field meetings led by local experts. These are a long-established way in which our staff share their enthusiasm and specialist knowledge with the community. This summer, two snail and slug searches were led by Ben Rowson (Research Curator, Terrestrial Mollusca) at Coed-y-Bedw (with both the Conchological Society of Great Britain & Ireland and the Wildlife Trust of South & West Wales) and Leckwith Woods (with the Cardiff Naturalists' Society). Each meeting included an introduction to finding and identifying molluscs and recorded several mollusc species new to each area. The records will become publicly available via the local records centre and national recording schemes.

Recent publications

Taxonomic revision of Australian *Melobasis* (Buprestidae) Jewel Beetles

The genus *Melobasis* is one of the largest Australian genera of Buprestidae containing around 214 species, of which about 115 species were previously undescribed. The genus was last revised about 80 years ago, and since that time only a few isolated descriptions of new species have been produced. Until now it has been impossible to identify the members of this genus with any certainty.

This publication is a complete taxonomic revision of Australian species of the genus, including the redescription of all the species. The *Type* specimens of all described Australian species have been examined, and material has been borrowed from all the major Australian and European museums. The revision will include illustrated keys to enable the identification of the species, and colour images of all the species. The revision is to be published in several parts. The first part dealing with 45 species, including 26 new species, was published in September 2012. Four parts are planned in total.



Levey, B. (2012). A Revision of the Australian species of the genus *Melobasis* Laporte & Gory 1837 (Coleoptera: Buprestidae), Part 1 (Introductory material, key to species-groups and keys to species of the *thoracica*, *pusilla*, *formosa*, *propinqua* & *gloriosa* species-groups). *Zootaxa* 3464: 1-107.

Rhagor is the website for our national collections and the stories behind them. A rich selection of articles, image galleries, videos, interactives and more bring the collections alive.

English: www.museumwales.ac.uk/en/rhagor

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