

The Symbiont

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News from the Department of Biodiversity & Systematic Biology (BioSyB)

Winter 2010/11

Editorial

The primary focus for the International Year of Biodiversity has been on conservation and public



understanding of issues around our use and abuse of the natural world. Conservation management has for many years been based on rare or endangered species and habitats, but is now including ecosystem functioning. The latter will require consideration of a much wider spectrum of species and the role of taxonomists in identifying these will be important. We remain far from a total inventory of world species and even here in Wales our own inventory is not complete. Species new to Wales and new to science continue to be described from our marine, freshwater and terrestrial environments. In less well explored regions of the world the proportion of undescribed species is much higher but the shortage of expertise in such regions slows the process of inventory.

With our extensive taxonomic expertise we are able to give support, both at home and overseas, by undertaking surveys of single species or communities, revising taxonomy of critical groups and providing training in identification. In this issue of the Symbiont we give a taste of the variety of projects currently in progress and encourage further partnerships.

Museum collections are a major source of biodiversity data and access to these has been a priority for us. We have adopted a generally open access position as can be seen from the web-based products highlighted in this issue, one of which is a catalogue of specimens of rare or endangered species in the UK.

Dr Graham Oliver
Head of Department

Blind cave spider Survey

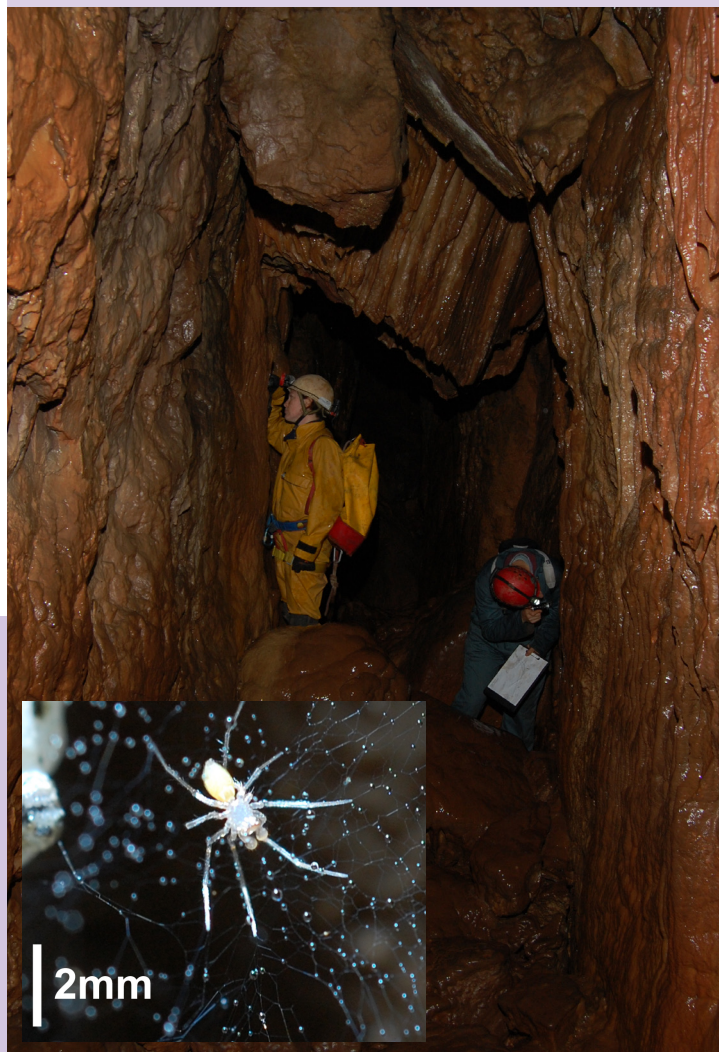
The cave dwelling spider *Porrhomma rosenhaueri* (L. Koch) is considered to be the only species of truly troglotic spider in Britain, meaning that the spider spends its entire life cycle underground. The spider is very rare in the UK and is only known from two cave sites, both of which are in south Wales.

The Lesser Garth Cave population of *P. rosenhaueri* was found in 1979, when it was reported that the population may be quite sizeable but noted that the site was under threat from quarrying in the area. The next reported survey in 1997 found a good population of the spider still present in the cave.

Recently the Department was approached by the Countryside Council for Wales to set up a survey method for the cave to facilitate reliable monitoring of the spider population and the condition of the habitat. The main passage of the cave was surveyed for live spiders and for webs in good condition but with no obvious spider.

The first survey was conducted in September 2009. Seventeen live spiders were found and one was removed to confirm identification. The survey was repeated in December 2009 when only six live spiders were found, suggesting a possible seasonality to adult spider numbers.

It was concluded that, despite living next to an active quarry, the spider *P. rosenhaueri* is still well established in the Lesser Garth Cave. The cave itself has a rich diversity of cave associated species and is thus an important site for speleobiology (cave biology) in the UK.



Museum staff looking for the cave spider *Porrhomma rosenhaueri* in Lesser Garth Cave, South Wales (Inset; Male spider on web).

Taxonomic training by BioSyB

Why do we have natural history collections? One reason is that they are an irreplaceable source of information about the world we live in. Knowing whether a species of butterfly collected fifty years ago can still be found in the same location today gives us valuable information about that species. Such information can also be used to look at much larger themes of global importance, such as biodiversity loss, habitat deterioration and the effects of global warming.

Recognising and measuring these changes relies wholly on the correct identification of species, but we live at a time when taxonomic skills are in decline. At Amgueddfa Cymru – National Museum Wales we are committed to using our collections and expertise to increase the number of people with taxonomic or identification skills by providing training courses.

BioSyB have offered a variety of different training opportunities over the years. Most recently we have collaborated with SEWBRc (South East Wales Biodiversity Records Centre) to provide identification workshops on beetles, bumblebees, terrestrial slugs and snails, invasive species and lichens. We have provided training related to legislation in several locations in Wales, and our facilities and collections are also used by other specialist groups who conduct taxonomic training at National Museum Cardiff.

The taxonomic knowledge of BioSyB staff is a valuable national asset. Every year our staff are involved in surveys and research that increase our understanding of the biodiversity of Wales. However, measuring biodiversity is a huge task that relies heavily on the dedication of amateur recorders who volunteer their time. The fact that we can provide much of our taxonomic training free or at 'cost' price means that we can reach those enthusiastic amateurs who contribute so much to our knowledge of the world around us.

CoRE Species – Catalogue of Rare and Endangered Species

A new website due to be launched shortly by the Department will allow users to search for specimens of rare and endangered species held in our collections. The catalogue of British specimens of species of conservation concern will include animals, plants and fungi.

Initial priority has been given to species covered by the UKBAP list (Biodiversity Action Plan for the UK) and the Section 42 list (of Species of Principal Importance for Conservation of Biological Diversity in Wales). The database will be extended in future to contain data on all rare and endangered species in our collections.

Data on the website can be accessed in a variety of ways. Users can search directly for a particular species or just browse a general list. Data available will include locality, collection date and collector.

Bog-mosses at

Amgueddfa Cymru — National Museum Wales

The Museum holds the second largest collection of bryophytes in the United Kingdom with some 280,000 specimens. Through loans and queries, our curators make the specimens available to scientists internationally.

Information has been databased for each of the 18,000 Bog-moss (*Sphagnum*) specimens we hold. This remarkable collection covers the complete diversity of *Sphagnum* in Britain (thirty-five species) plus additional species from overseas. The information previously locked in this collection is now accessible in a comprehensive catalogue. This is available electronically on request and will soon be online.

The growth of Bog-mosses gradually creates peat bogs. *Sphagnum* species are essential to maintain the ecological community of this habitat. Wales is a significant area for peat bogs due to its high rainfall and relatively mild winters. This creates habitats such as the raised bog at Cors Caron in Ceredigion, which is of international importance for its wildlife.

The delicate nature of peat bog habitats means that they are constantly under threat. Once damaged they cannot regenerate fast enough to replenish the habitat that is destroyed. Under normal conditions bogs act as a carbon store. The destruction of these habitats contributes to climate change due to the fast release of carbon dioxide from the peat bogs as they decay.

The more information held about *Sphagnum* mosses, the more our understanding will increase of bogs as complex ecological systems. Our collections are an important resource for research and as a taxonomic reference, forming the basis of accurate species identifications.



Sphagnum magellanicum from the H.L.K.Whitehouse stereoscopic slide collection at Amgueddfa Cymru - National Museum Wales.

The 'Borders Dancefly' *Empis limata*

Empis limata is a small predatory fly whose great rarity is reflected in its Red Data Book and UKBAP status. It is confined to a handful of sites along the Welsh border, mostly on the Usk and Monnow rivers where it seems to favour warm sheltered locations on sandy soils.

Dr Adrian Plant (Curator of Diptera) has been conducting surveys to locate new populations in an attempt to understand more about its habitat requirements and life history in order to develop a more rational framework for conservation efforts.



The 'Borders Dancefly' *Empis limata*

Collecting Verrucariaceae in Nepal

The Verrucariaceae are a worldwide family of lichens growing mainly on damp rocks, limestone and soil. Identification is notoriously difficult, but DNA data is providing a firm foundation for a species-concept.

In October 2009 Alan Orange (Curator of Lichens) with Som Chhetri, a freelance nature guide, collected Verrucariaceae in streams and other habitats in the Annapurna Conservation Area in Nepal, as part of a collaboration with Sharad Singh and Hem Baral of Himalayan Nature, Kathmandu. The area was a mixture of deciduous forest and rice terraces at altitudes of 1,000 to 2,800 metres. In the warm, damp conditions, leeches were abundant and agile, making lichen collection a much less leisurely and contemplative activity than in Britain.

Approximately 25 species of Verrucariaceae were collected. These will be examined microscopically and DNA sequences will be prepared. Identification of the collections will require much searching in the literature and borrowing of type specimens from other herbaria.

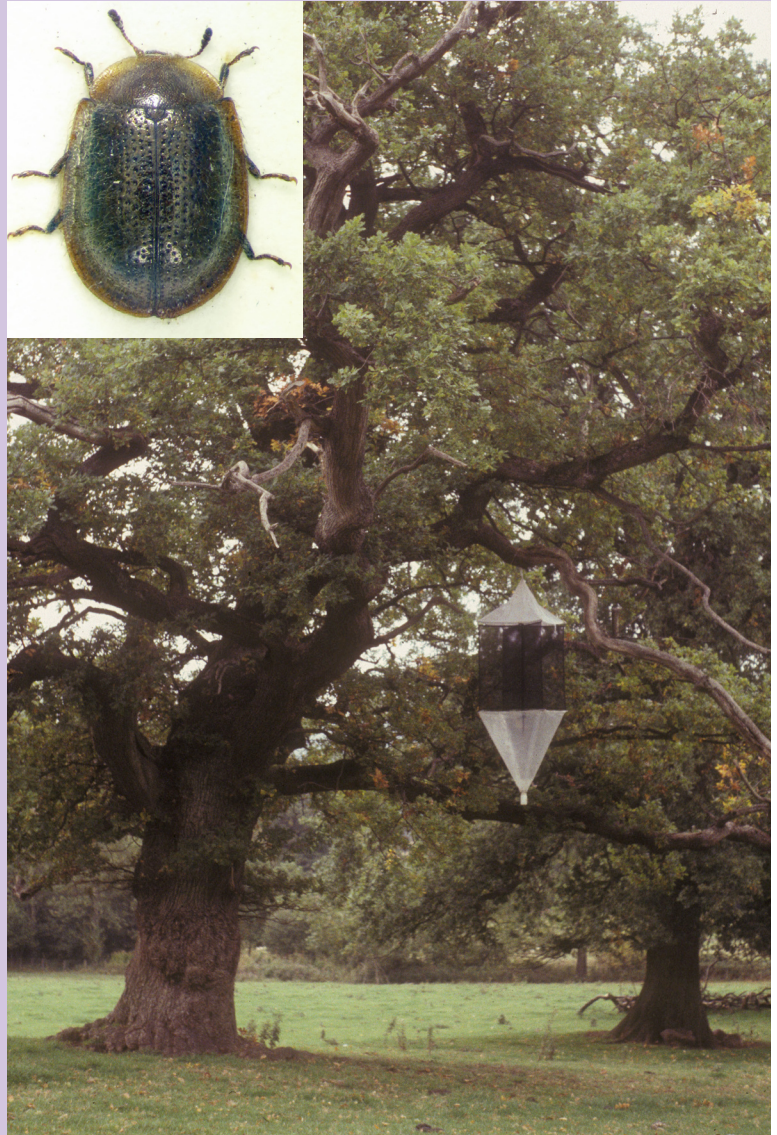
Saproxylic beetles in Wales

Saproxylic beetles are species whose larvae live in timber, decaying wood, wood decay fungi and rot holes in trees. About 450 species of saproxylic beetles are known from Wales. This is roughly one sixth of all known Welsh beetle species.

Many species of saproxylic beetle are nationally scarce or rare, particularly those associated with large old trees containing decaying heartwood, especially oak trees. Such trees are predominantly found in medieval parks, pasture woodlands and other non-commercial ancient woodland sites, so are in themselves a scarce natural habitat.

Because the habitats utilised by the more fastidious saproxylic beetles are scarce both in space and time, sites with large numbers of mature and over-mature trees and a long historical continuity have the richest saproxylic beetle faunas. Previous surveys in Wales by Brian Levey (Curator of Coleoptera) and Mark Pavett (Curator in Entomology), with colleagues from Liverpool Museum, have shown that Dinefwr Deer Park and Powis Castle have these habitats and support rich faunas of saproxylic beetles.

However, our more recent survey work at St Fagans: National History Museum suggests that even sites containing relatively few mature and over-mature trees can still support a rich fauna of saproxylic beetles. Seventy-one species of saproxylic beetles have been recorded at St Fagans. Seventeen of these are notable or rare species, and are the only known records of some species in Wales.



Canopy interception trap—for sampling Tree dwelling insects (Inset: Saproxylic Beetle - *Thymalus limbatus*)

News in brief

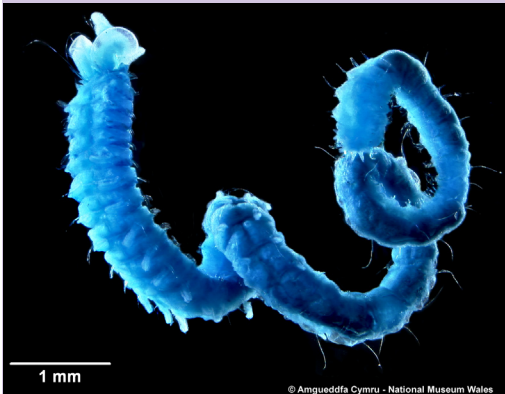
- A new genus of diatoms has been discovered in Nepal by Dr Ingrid Jüttner (Curator of Diatoms) and colleagues from Nepal, London, Belgium and Germany. The group are collaborating to study the cymbelloid diatoms from the Gokyo Valley in the Everest National Park. This is the first comprehensive study of the diatom flora in the area and is part of a wider study of freshwater biodiversity. The new genus, *Oricymba*, and three new species have been described and will be published in the journal *Phycologia* later in 2010.
- Extinct and rediscovered hawkweeds: Surveys of rare hawkweeds carried out in the Brecon Beacons in July 2010, by Dr Tim Rich (Head of Vascular Plants) and volunteer Seren Thomas, have had mixed success. The Penwyllt Hawkweed (*Hieracium pusillifolium*), only known from rocks near Penwyllt and last recorded in 1920, has been exterminated by quarrying. In contrast, five plants of the Hepste Hawkweed (*H. apheles*) were refound near Penderyn, the only place it is known to occur in the world; they were last seen in 1896.
- As part of our 2010 International year of Biodiversity celebrations, the department has opened its stores and laboratories to visitors of all ages. Ranging from delegates of a Linnean Society Conversazione and travel writers attending the Guardian and Observer travel awards, to family groups, visitors have seen collections representing all areas of our expertise. As only a small percentage of our specimens are used in gallery displays, open days and behind-the-scenes visits give a flavour of the vast resource of specimens and data available for research and taxonomic training.
- *Anoterostemma ivanhofi*, a new leafhopper species for the UK.

A chance encounter by Peter Kirby, a Peterborough-based consultant entomologist, while on holiday in Scotland has led to the discovery of a new leafhopper species for the UK. Specimens were sent to Dr Mike Wilson (Head of Entomology) who collected and photographed further individuals, emailing contacts abroad for comment. The species was identified as being *Anoterostemma ivanhofi*, a species first described from Russia in 1876 and then found in Slovenia around the same time. It has barely been found since and was unknown in western Europe until this interesting discovery.

10th International Polychaete Conference (Marine bristleworms)

Dr Andy Mackie, Kate Mortimer and Teresa Darbyshire (Marine Biodiversity section) represented Amgueddfa Cymru – National Museum Wales at the 10th International Polychaete Conference in Lecce, Italy, from 21 to 26 June. Over 170 scientists from six continents attended the conference, presenting research from seas and coasts worldwide.

All three contributions were well received, generating much interest. Two posters (including a new species from near Anglesey: *Uncispio* new species — see photo left) were displayed and a presentation given. Manuscripts of each were submitted for consideration in the conference proceedings to be published in the peer-reviewed journal *Italian Journal of Zoology*.



Recent Publications

Marine Bivalve Shells of the British Isles

Since its release at the beginning of June our new web-based identification guide to British bivalves has received over 2,500 visits from sixty-two countries. This website contains descriptions, images, plates, distribution and ecological information and maps for over 360 species found in British waters from the intertidal zone to 5,000 metres.

This website has been produced by Amgueddfa Cymru – National Museum Wales with financial backing from the Department for Energy and Climate Change. In preparation is an interactive key, further size series images and comparison plates of similar species.

Oliver, P. G., Holmes, A. M., Killeen, I. J. & Turner, J. A. 2010 Marine Bivalve Shells of the British Isles (Mollusca: Bivalvia). Amgueddfa Cymru – National Museum Wales.

Available online at;
<http://naturalhistory.museumwales.ac.uk/britishbivalves>

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/

Welsh: www.amgueddfacymru.ac.uk/cy/rhagor/