

## NEWS

### TCBR National Contact Point for Diversitas

TCBR has become the national contact point for Diversitas, an international research programme aiming at integrating biodiversity science for human well-being. DIVERSITAS (the Latin word for "diversity") was established to address the complex scientific questions posed by the loss in biodiversity and ecosystem services and to offer science based solutions to this crisis. For more information, visit: <http://www.diversitas-international.org/about/members/national-members/Ireland>.

### Organic Farming and Biodiversity

New research recently published by PhD student Eileen Power and principal investigator Dr. Jane Stout of the School of Natural Sciences at TCD has shown that organic farming benefits insect biodiversity, insect-flower interactions and pollination of wild plants.

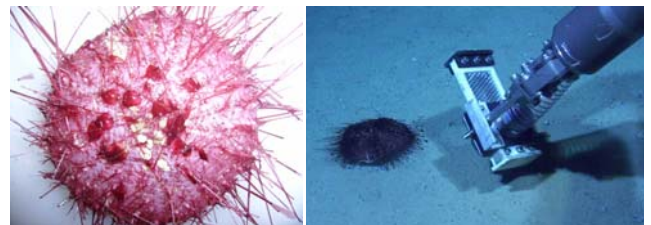
Modern farming, with its reliance on agrichemical inputs, threatens wild plants and the insects such as bees and hoverflies that visit their flowers. The TCD research demonstrated that insect-flower interaction networks on organic farms were larger, and that there were more flowers on organic farms which attracted a higher number of bees, compared with non-organic and conventional counterparts. The study highlighted that insect-flower interaction networks in intensively managed dairy pastures contained far fewer species than semi-natural grasslands. In addition, because there was little overlap between the species of insect that visited each plant species, the networks were ecologically vulnerable to species loss. The study has been published in the *Journal of Applied Ecology* (<http://onlinelibrary.wiley.com/doi/10.1111/j.1365-2664.2010.01949.x/abstract>).



Photographs courtesy of Jane Stout

### Deep-Sea Research at Trinity

A team of scientists is currently exploring the little-studied habitats at the edge of the Irish continental shelf. The TCD researcher Angela Stevenson is part of this team, her work focusing on carbon and nitrogen cycling in deep-sea coral reefs (1.5-3Km depth) via the detritivore food web, namely echinoids. The research will help establish parameters to better protect these biodiverse deep-sea habitats. Investigating deep-sea echinoid feeding ecology is a significant step in understanding deep-sea coral habitats, which form the basis for environmental policy and sustainable resource management of deep-sea coral habitats and fishing stocks.



*Tromikosoma Uranus* (left) - courtesy of Angela Stevenson; *Echinothuriidae* being collected by the mechanical arm of ROV Holland I (right) - courtesy of the Marine Institute from the NUI Galway-led cruise CE11006

The projects' sampling campaigns (collected with the mechanical arm and suction hose of a Remotely Operated Vehicle) are possible due to the generosity of numerous sponsors: the majority of the work is carried out under the Sea Change Strategy with the support of the Marine Institute and the Marine Research Sub-programme of the National Development Plan 2007-2013; the 2011 Exploration Fund grant from the Explorers Club and IRCSET will be also supporting this PhD research on such 'oases in the deep'.

### Biodiversity Forum WebCT Blogg Launched

The TCBR Biodiversity Forum has launched a blogg to publish information and material relating to the activities organised and promoted by the Forum. More importantly, the blogg enables interdisciplinary online discussion and exchange of information/ideas on biodiversity related matters.

Anybody interested in becoming part of the Biodiversity Forum and get registered in the blogg, please e-mail Jesko Zimmermann at: [zimmerjr@tcd.ie](mailto:zimmerjr@tcd.ie).

NEWS

**Best Practice Guidance for Habitat Survey and Mapping**

The Heritage Council has published best practice guidance to standardise and improve habitat survey and mapping methods in order to achieve compatibility among surveys and surveyors, and to ensure quality and consistency of the maps and data produced. The Guidance is intended for use in survey and mapping of terrestrial, freshwater and coastal habitats. Surveys of marine and sublittoral habitats are beyond the scope of this Guidance. See: [http://www.heritagecouncil.ie/fileadmin/user\\_upload/Publications/Wildlife/Habitat\\_Survey\\_Guidance/Habitat\\_Survey\\_Guidance\\_Heritage\\_Council\\_2011.pdf](http://www.heritagecouncil.ie/fileadmin/user_upload/Publications/Wildlife/Habitat_Survey_Guidance/Habitat_Survey_Guidance_Heritage_Council_2011.pdf)

**UK National Ecosystem Assessment and English Biodiversity Strategy Launched**

The first analysis of the UK's natural environment in terms of the benefits it provides to society and continuing economic prosperity has been recently launched (<http://uknea.unep-wcmc.org/>) together with the Biodiversity 2020: A Strategy for England's Wildlife and Ecosystem Services (<http://www.defra.gov.uk/publications/files/pb13583-biodiversity-strategy-2020-110817.pdf>).

**Trees of Trinity College Dublin Calendar**

As part of the Botany Tercentenary activities and celebrations, TCBR members have contributed to putting together a booklet and calendar with information and photos of the Trinity trees from each season of the year. If you are interested in a copy of the calendar or booklet, please contact Sophia Ní Sheoin at: [botany@tcd.ie](mailto:botany@tcd.ie).

PUBLICATIONS

**Journal Articles**

Dietzsch AC, Stanley DA, Stout JC (2011) Relative abundance of an invasive alien plant affects native pollination processes. *Oecologia*, 212: 1397-1406.

Duffy KJ, Fay MF, Smith RJ, Stout JC (2011) Population genetics and conservation of the small white orchid, *Pseudorchis albida*, in Ireland. *Biology and Environment: Proceedings of the Royal Irish Academy*, 111B: 1-9.

Tanner CJ, Salali GD and Jackson AL (2011) Feeding and non-feeding aggression can be induced in invasive shore crabs by altering food distribution. *Behavioral Ecology and Sociobiology*, 65:249-256.

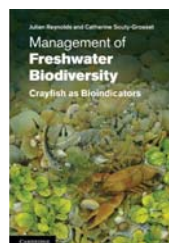
Van Welzen PC, Parnell JAN and Slik JWF (2011) Wallace's Line and plant distributions: two or three phytogeographical areas and where to group Java? *Botanical Journal of the Linnean Society*, 103: 531-545.

Viana M, Graham N, Wilson JG and Jackson AL (2011) Fisheries discards in the Irish Sea exhibit temporal oscillations and trends reflecting underlying processes at an annual scale. *ICES Journal of Marine Science*, 68(1): 221-227.

**Books**

Reynolds J and Souty-Grosset C (2011) *Management of Freshwater Biodiversity: Crayfish as Bioindicators*. Cambridge University Press.

Integrating research into freshwater biodiversity, bioindicators and the roles of keystone species, this book illustrates the far-reaching impacts of human-exacerbated threats on freshwater communities. It uses examples from freshwater crayfish and other large, long-lived decapod crustaceans to explore how communities function, and are controlled, alongside the implications of human demands and conflicts over limited resources, notably the severe impacts on biodiversity in fresh waters. Offering a global perspective on freshwater systems, the book ultimately highlights how the conservation of such keystone invertebrate species will help protect ecosystem quality in the future.



Book cover courtesy of Julian Reynolds and Rachel Arbuckle

EVENTS

The lecture 'Botany in the University of Dublin-Incubation and Emancipation' by Dr James White as part of the Botany Tercentenary celebrations will be held on Wednesday 5th October 2011 at 7.30 pm in the Lecture Theatre in the Botany Building, TCD. For lecture reservations, please e-mail [botany.300years@tcd.ie](mailto:botany.300years@tcd.ie). For more information on events and talks, see: <http://www.tcd.ie/Botany/tercentenary/events/>

REQUESTS

Please send in information concerning current research, calls, news, publications and wildlife photos from field trips for inclusion in our next quarterly newsletter.

Please donate biodiversity books to the TCBR library.

RESEARCH FOCUS

**Sulawesi Birds under TCBR Scrutiny**

Two members of the TCBR, Dr. David Kelly and Dr. Nicola Marples, have been leading expeditions to a set of remote Indonesian islands since 1999, facilitated by Operation Wallacea. The latest expedition was a breakthrough as we now have a Material Transfer Agreement with a university in Sulawesi allowing us to bring home feather samples for DNA and stable isotope analysis. Our archipelago, called the Wakatobi islands, turns out to be fascinating because, like the Galapagos, each island is evolving its own sister species of bird. The first birds we looked at were lemon-bellied white-eyes (see Fig 1) on each of the four main islands. Immediately on one of the islands we found an undescribed species which is not even closely related to the white-eyes it flocks with (Fig 2), and a full description of this species is now underway. The phylogenies of the other white-eyes are under construction but our initial analysis of haplotypes, together with morphometric data, suggests that each island contains a unique population of lemon-bellied white-eyes, which is not inter-breeding with the birds on any other of the islands. Similarly the olive-backed sunbirds (Fig 3) are no longer inter-breeding between the most northerly two islands in the chain and the two most southerly, and it's a similar pattern for the grey-sided flower-peckers (Fig 4).



Lemon-bellied white-eye (Fig1), and undescribed and unrelated species (Fig2). Photographs courtesy of Nicola Marples.

This is particularly surprising as the islands are close together (less than 10 km apart), easily close enough for any of these birds to fly regularly between them, but the lemon-bellied white-eye, in particular, seems to arrive at an island and settle down for the duration. Once settled, there does not appear to be any mixing with other populations, even on the most closely neighbouring islands. Such examples of speciation in progress are very rare and offer unique opportunities to study the process of evolution in detail. The work is planned to continue, and will be taken into a broader phase by our new PhD student, Sean Kelly. His project will look in detail at the three species mentioned

above, and their behavioural interactions, diet and ecology. All three species compete for nectar to some extent, but their relative numbers differ widely on the different islands, making their interactions particularly interesting as a potential driver of speciation. Together with the genetic and morphological data already collected, this type of information will allow us to explore the reasons for divergence of these populations on the four islands of the Wakatobi.



Lemon-bellied white-eye (Fig3), and undescribed and unrelated species (Fig4). Photographs courtesy of Nicola Marples.

**Biodiversity Research in 'Legume Futures' Project**

An EU project with 18 international partners from 12 countries, the aim of Legume Futures is to develop and assess legume-supported cropping systems that raise the economic and environmental performance of European agriculture. PhD student Susannah Cass is studying biodiversity in experimental systems and crop types across Europe. She has designed protocols for vegetation, earthworm and ground invertebrate biodiversity surveys and every few days brings another package of preserved worms to her in the post. The coming year will involve a lot of species identification as well as the production of soil activity probes and hopefully some nematode sampling as well. More information about Legume Futures can be found on the project website: [www.legumefutures.eu](http://www.legumefutures.eu).

**Progress on PLANFORBIO**

The PLANFORBIO field teams have been all around Ireland this summer studying the ground flora of plantations of Scots pine, oak and Lodgepole pine and native oak and yew woodlands. A team, led by Post-doctoral researcher Linda Coote and assisted by Aisling Walsh, Eoin Daly and Alexandre Jéké, focused on plantations. The team found that the higher light levels in Scots pine and oak plantations meant that the ground flora was well developed, while darker Lodgepole pine plantations had little ground flora. The second field team focused on the impacts of grazing on native woodlands and was led by PhD student, Miles Newman, assisted by



**RESEARCH FOCUS**

undergraduate student Emily Wallace and by Alexandre Jéke. They found noticeable differences in the vegetation between heavily grazed areas and those where grazing was excluded. Our colleagues in UCC studied the birds, spiders and beetles at many of the same sites. We hope that the combined datasets can be used to inform the management of both plantations and native woodlands in order to increase their value for biodiversity. For more information, please visit: <http://planforbio.ucc.ie>.



*Durrow abbey SP plantation (left) and Derrycunihy oak woodland, Killarney (right).*

*Photographs courtesy of Linda Coote.*

**Economically Viable and Environmentally Sustainable Commercial Production of Biomass**

An article published by Dr. Jens Dauber (researcher at vTI, Braunschweig, Germany and until recently manager of the SIMBIOSYS project at TCD) and co-authored by TCBR members Dr. Jane Stout and Professor Mike Jones, explains that policy makers must critically consider the impact large-scale commercial production of biomass crops could have on biodiversity when drafting guidelines for rapidly developing sustainable energy crops. According to Dr. Dauber, “We need to stimulate interdisciplinary research into environmental, economic and socio-economic perspectives of bioenergy production which can facilitate integrating biodiversity and ecosystem service issues into risk assessment and sustainability appraisal. The aim of such integrated consideration is to guide decision makers in turning potential loose-loose into win-win situations for climate change mitigation, rural economy and biodiversity conservation.”

**Biodiversity Research in Honduras**

Considered the third largest amongst the world’s biodiversity hotspots, the Mesoamerican forests are home to spectacular endemic species which include around 17,000 plant species. And so it is hardly surprising that tropical ecologists get excited about the prospects of conducting research in this part of the world. Under the umbrella of Operation Wallacea (a network of academics from European and North American

universities), two of the TCBR members Dr. Daniel Kelly and Dr. Anke Dietzsch went out this summer to face the challenge and beauty of surveying tree biodiversity in one of Central America’s cloud forests. As in previous years, the destination was Cusuco National Park, which is situated in the northwest of Honduras overlooking the Caribbean Sea and rising up to 2425m. Cusuco’s montane forest covers 23,440 hectare (about twice the area of Dublin City) and hosts as many and more tree species as can be found in the whole of Europe. Along an altitudinal gradient commencing at c. 1300 m, several major habitat types, including lower and upper montane broadleaf forests, lower and upper montane pine forests and dwarf forest, were studied using 20 x 20m square plots, which are part of a long-term monitoring network. So far, 294 different tree taxa have been recorded, and there are certainly more to be discovered among the several hundred herbarium specimens collected this year. Together with the results of entomologists, arachnologists, herpetologists, mammal ecologists and geneticists working alongside the botanists, this work acts as a baseline inventory of the up to now unknown species richness of this area and provides valuable data for long-term monitoring and conservation. Further, it is likely to reveal new species to science as e.g. *Hondurodendron urceolatum*, a new tree genus discovered by D. Kelly and co-workers in Cusuco National Park in 2004. And with some luck and the good care of the gardeners at the Trinity College Botanic Gardens we may be able to admire some of the new and unknown tree species of Honduras grown from live seeds collected this year.



*Flora and fauna surveys in Cusuco National Park, Honduras. Photographs courtesy of Anke C. Dietzsch.*

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