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Organisms and Environment

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NEWSLETTER

Spring 2012

IBERS Institute of Biological, Environmental and Rural Sciences

Alex and Dan radio tracking a nocturnal slow loris.

Biodiversity and Conservation in Sabah, Malaysia

During August and September 2011 two 3rd year undergraduate Zoology (C300) students, Alex Cameron and Dan Kelly, undertook a fully funded IBERS research internship with Sabah Parks and *Danau Gireng Field Centre in Sabah, Borneo Malaysia. Working as research assistants, the students* assisted on a variety of projects ranging from cataloguing the amazing diversity of plants and animals within Kota Kinabalu National Park to radio, camera and satellite tracking crocodiles (*Crocodylus porosus*), Bornean elephants (*Elephas maximus borneensis*), proboscis monkeys (*Nasalis larvatus*), slow loris (*Nyticebus menagensis*), sun bears (*Helarctos malayanus euryspilus*) and Bornean cloud leopards (*Neofelis diardi*). In particular, Alex and Dan had the responsibility of radio tracking (Picture 1) the nocturnal slow loris (Picture 2), the first individual of its kind to be radio collared and tracked, over the 4-week period they were at Danau Gireng Field Centre. The research involved locating the individual in dense rainforest every 3 hours throughout the night and noting its position and the habitat characteristics of the area. The data gathered will be collated and used to aid in understanding this species range size and habitat requirements to inform conservation actions such as the size of protected areas. A huge highlight of the trip for both Alex and Dan was assisting the BBC Natural History Department who had come to film the elephants that are regularly seen around the field centre in order to film a documentary about human-elephant conflict as increasing amounts of elephant habitat is converted to plantations.

A slow loris

Both Dan and Alex carried out this work through the Year in Employment (YES) scheme. Alex said "the trip was a life changing experience both in terms of the cultural experience and the scientific skills we developed". Dan went on to add that "the whole experience had given him skills and experiences that were aiding him to complete his degree and in particular make the most out of his third year project".

List of Courses

BSc
Animal Behaviour
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Interested?
Phone **Chantal Thomas** on **01970 621904**
Email: **czt1@aber.ac.uk**

Alas, poor Yorick …

Dr John Gee and the seal skull that starred on BBC Springwatch in 2011. It was borrowed from IBERS' extensive specimen collection and 'found' nestling in the woods at Ynys-hir. As the puzzle of the day, it was identified wrongly by almost all the viewers who emailed answers and, it has to said, by the show's presenters. The alleged grey seal (*Halichoerus grypus*) is actually the smaller common or harbour seal (*Phoca vitulina*) which, confusingly, is much the rarer species around the UK.

IBERS Students and the RSPB Ynyshir Reserve

Students observing bird behaviour at Ynys Hir

Modules with ornithological content are popular in IBERS, with 69 students currently on the third year Biodiversity of Birds module. We are fortunate to have a number of birdwatching sites in our locality, including the Royal Society for the Protection of Birds Reserve at Ynyshir, 12 miles from Aberystwyth (http://www.rspb.org.uk/reserves/guide/y/ynys-hir). This RSPB reserve is on the Dyfi Estuary, itself a UNESCO Biosphere Reserve (http://www.biosfferdyfi.org.uk). In 2011 it was used by the BBC for their 'Springwatch' programmes.

The photo shows students at Ynyshir in March 2011, on an outing led by RSPB staff to learn bird song, a valuable skill for those interested in conservation work. Behavioural studies on group size and vigilance among geese at Ynyshir are a component of our second year Behavioural Ecology module. Ynyshir staff also come to IBERS to lead workshops on bird surveying, and each year a number of students conduct surveys at Ynyshir - 52 bird species in one day being the record.

The whip spider Phrynus marginemaculatus from the Florida Keys, USA.

Fighting in whip spiders: a 'hairy' situation

The amazing sensory systems of some invertebrates mean that they perceive the world around them in an entirely different way to ourselves. And recently published research by IBERS lecturer Roger Santer shows that if we want to understand invertebrate behaviour, we sometimes have to take a look through their 'eyes'.

Whip spiders (also called tailless whip scorpions), are bizarre tropical arachnids with fearsome spiny pedipalps used for prey capture. Like other arachnids, they have four pairs of legs, but the first pair have evolved into hugely elongated 'feelers' that they use to sense their environment, a little like insect antennae (these are called 'whips' and their combined span can be 60cm in some large rainforest species!). When two whip spiders meet they perform ritualised aggressive displays to decide who's boss without resorting to an all-out fight. The most important of these displays involves a whip spider extending one of its whips towards its opponent and rapidly vibrating the whip from side to side. Intriguingly, whip spiders use this display in complete darkness where it cannot be seen, and the vibrating whip doesn't touch the opponent... so how do whip spiders sense this important display?

Two fighting male whip spiders performing the whip vibration display. Each stretches out one whip and rapidly vibrates it from side to side. Based on its opponent's display, a whip spider decides whether to carry on fighting or run away. Photo: Roger Santer.

The key was to be found in the sensory biology of whip spiders. Like some other arthropods they possess extremely fine 'filiform' sensory hairs that are exquisitely sensitive to the tiniest of air movements. In a previous study on a species of whip spider from the Florida Keys, Santer and a colleague showed that the filiform hairs could detect minute air currents produced as an opponent performed the whip vibration display. On its own, this didn't show that whip spiders paid attention to those air movements when deciding whether or not to run away from a bigger, tougher opponent. The next step was to painstakingly 'shave' the filiform hairs from the legs of whip spiders, so that they could not perceive the whip vibration display, and examine their aggressive behaviour. Whilst control whip spiders performed whip vibration and then the loser retreated, shaved whip spiders nearly always resorted to a full physical fight. It seems that air movements caused by whip vibration really were the crucial aggressive signal, and without them, whip spiders could not decide when they were outclassed and should run away. Read more about this study online: http://www.plosone.org/article/info:doi/10.1371/journal.pone.0022473