



**Trinity College Dublin**

Coláiste na Tríonóide, Baile Átha Cliath

The University of Dublin

# 6<sup>th</sup> Annual Botany-Zoology Postgraduate Symposium

2<sup>nd</sup> March 2017



## Programme and Abstracts



# WELCOME

Dear friends and colleagues,

It is with great pleasure that we welcome you all to the Sixth Botany-Zoology Postgraduate Research Symposium in Trinity College Dublin. Following on from successful previous Symposia the Departments of Botany and Zoology have come together again to present and discuss the wide variety of postgraduate research taking place within the School of Natural Sciences. This symposium is an important medium in which postgraduates are encouraged to share their research, ideas and techniques, as well as an opportunity to gain invaluable presentation experience.

The ethos of the symposium is to provide each postgraduate student with a presentation platform that is open to constructive analysis from the audience. Therefore, for each presentation, each audience member is invited and encouraged to fill out feedback forms which will aid each student in the development of their presentation skills. Guidelines for completion of evaluation forms can be found in the end of this booklet.

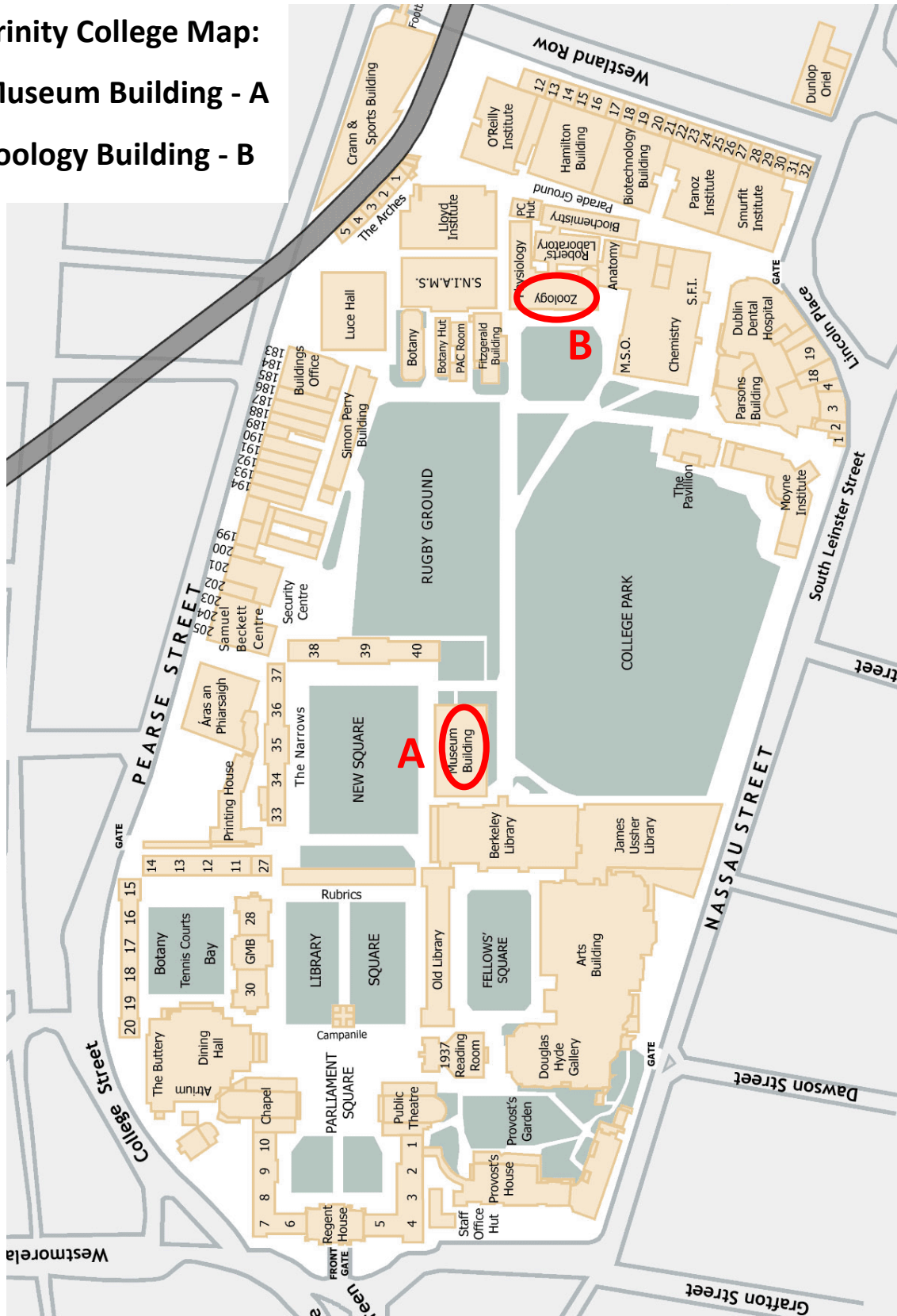
We would like to express our gratitude to Dr. James LaCourse and Dr. Zenobia Lewis for kindly offering up their time to adjudicate the symposium. Furthermore, we would like to thank them in advance for the plenary talks they have prepared. We would also like to thank the staff of the Departments of Botany and Zoology, especially Prof. Yvonne Buckley, Prof. Fraser Mitchell, Dr. Martyn Linnie and Fiona Moloney for their assistance in the planning and organising of this Symposium.

We sincerely hope you enjoy this Symposium and find it a stimulating and interesting event.

The Organising Committee

Andrew Mooney, Rachel Louise Byrne, Sarah Gabel and Anna Kaja Hoeyer

**Trinity College Map:  
Museum Building - A  
Zoology Building - B**



# Schedule

Time	Speaker	Venue
<b>09.30-10.00</b>	<b>Pastry Breakfast</b>	<b>Foyer, Museum Building</b>
<b>10.00-10.45</b>	<b>Keynote Speaker:</b> <b>Dr. James LaCourse</b>	<b>Haughton Lecture Theatre, Museum Building</b>
10.45-11.00	Dongwei Zhao	
11.00-11.15	Eoin MacReamoinn	
11.15-11.30	Conor Owens	
<b>11.30-11.45</b>	<b>Break</b>	
11.45-12.00	Rachel Byrne & Sarah Gabel	
12.00-12.15	Maureen Williams	
12.15-12.30	Sukontip Sirimongkol	
12.30-12.45	Aoibheann Gaughran	
<b>12.45-14.00</b>	<b>Lunch</b>	<b>Foyer, Museum Building</b>
<b>14.00-14.45</b>	<b>Keynote Speaker:</b> <b>Dr. Zenobia Lewis</b>	<b>Haughton Lecture Theatre, Museum Building</b>
14.45-15.00	Anna Kaja Hoeyer	
15.00-15.15	Andrew Mooney & Georgia O'Sullivan	
15.15-15.30	Anne Dubéarnès	
<b>15.30-15.45</b>	<b>Break</b>	
15.45-16.00	Hannah Hamilton	
16.00-16.15	Darren O'Connell	
16.15-16.30	Anindita Lahiri	
16.30-16.45	Gwen Deslyper & Jane Feeney	
16.45-17.00	Paula Tierney	
<b>17.30-18.00</b>	<b>Prize Giving</b>	<b>Zoology Building</b>
<b>18.00</b>	<b>Pizza and Wine Reception</b>	<b>Zoology Building</b>

**Keynote Speaker: Dr. James LaCourse (Liverpool School of Tropical Medicine)**

**Title:** *Journeys Through our Lifelong Learning Careers...*

James La Course has been a Lecturer in Parasitology for the last nine years and Director of Studies for two MSc programmes at Liverpool School of Tropical Medicine for seven years. James will present "*Journeys Through our Lifelong Learning Careers...*" at this year's Postgraduate Symposium. James aims to provide his personal "*meandering outline of observations and reflections*" on his own and various 'anonymised' colleagues' and students' journeys through BSc, MSc, PhD and early-career researcher experiences as 'Lifelong learners'.



James says "*I am normally reluctant to give career direction as such, but would advise in us all to be reflective, responsive and 'to play nicely' as we go through our careers. Having enjoyed working with exceptionally talented students, researchers and colleagues, one might imagine I'd gained the knowledge, and benefitted from the best advice to now confidently stride through my academic career avoiding pitfalls and problems, whilst providing wise words for my students and younger colleagues... gulp!.... But perhaps I feel I've merely blundered unwittingly on with serendipity smiling on me occasionally as I fooled myself into thinking I was 'planning' things...?*" Join James in reflecting on your own experiences and of those around us as we stumble forward, trying our best to get by.



**Keynote Speaker: Dr. Zenobia Lewis (University of Liverpool)**

**Title:** *Be the storm: navigating an academic career*

Zenobia Lewis is a Senior Lecturer in Teaching and Scholarship at the University of Liverpool. Following her PhD at the University of Leeds, she completed post-doctoral positions at the Universities of Exeter and Okayama (Japan), before beginning her role at Liverpool in 2010. Although she is on a teaching-focused contract, she still maintains a research profile within the fields of evolutionary biology and behavioural ecology. Dr. Lewis uses arthropod model systems to investigate questions in sexual selection, sexual conflict and reproductive biology. She has recently become interested in how commensal bacteria, for example gut bacteria, affects behaviour. She is also passionate about equality and diversity in science, being Co-Chair for University of Liverpool's Institute of Learning and Teaching Athena SWAN Team.



Zenobia will be talking about her career path to date, the barriers she has encountered and how she smashed them down.



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## Student Speakers

### Dongwei Zhao (Botany)

**Supervisors: Prof. John Parnell and Prof. Trevor Hodkinson**

**Title:** *Phylogenetics of Camellia (Theaceae) in Indochina*

Tea, camellias and oil camellias from *Camellia* L. (Theaceae) are commercially highly important. About one third of all known *Camellia* species occur in the Indochinese Peninsula, of which half are endemic. Many new names of *Camellia* are still being described from this area, which may suggest that it was previously under-collected. Almost no work, however, has focused on the phylogenetics of *Camellia* in this area.



This project aims to address these issues using morphological and molecular approaches. Morphological studies, consisting of a comparison and description of various macro-characters of specimens and palynological analyses, is undertaken to clarify the boundaries of species in this notoriously variable genus. DNA markers derived from nuclear (ITS, RPB2, *waxy*) and chloroplast (*psbA-trnH*, *rpl32-trnL*, *rpl16*, *trnL-F*) genomes are selected to generate molecular sequence data, which is used to reconstruct a robust phylogenetic tree. A new classification of this genus will then be proposed based on both morphological and molecular data. Species that have potential to supply new traits to the cultivars of tea, camellias and oil camellias could also be identified.



## Student Speakers

### Eoin MacReamoinn (Zoology)

**Supervisors: Prof. Paula Murphy and Prof. Cliona O'Farrelly**

**Title:** *Development Takes Its Toll: Characterizing TLR Gene Expression During Murine Embryogenesis*

Toll-like receptors (TLRs) are renowned for their fundamental roles in immunological surveillance and response initiation. While TLR proteins in invertebrate species, such as *Drosophila*, carry out functions in the immune system and in “building” the body plan in the embryo, such non-immune functions have not been thoroughly investigated in mammals. Although TLR genes have duplicated independently in these lineages, and may therefore have diverged in aspects of their functionality, limited studies have recently reported the expression of TLRs in the developing mammalian embryo.

We report a systematic study of Tlr gene expression in murine embryos using a meta-analysis of publically available embryonic transcriptome data, whole-mount RNA *in situ* hybridization, and 3D imaging (using Optical Project Tomography), the combination of which has allowed us to record the precise tissues and stages at which these genes become expressed. We have found that the expression of these receptors is particularly enriched within the central nervous system with many Tlrs displaying co-localized expression patterns in developing neural tissues, particularly in the rhombencephalon and neural tube at embryonic day (E) 10.5 and E11.5. These findings are in line with experimental data showing that Tlrs -2, -3, and -4 can influence neural progenitor cell proliferation and self-renewal.



## Student Speakers

### Conor Owens (Botany)

**Supervisors: Prof. Fraser Mitchell and Prof. Jane Stout**

**Title:** *Biodiversity in willow evapotranspiration systems for wastewater treatment*

Constructed wetlands are artificial wetlands designed to mimic the contaminant attenuation ability of naturally occurring wetlands. They are increasingly seen in Ireland and worldwide as a solution to the on-site treatment of wastewater from domestic and other sources in rural areas. They can be a viable alternative to more conventional wastewater treatment systems which require relatively high levels of maintenance. They are likely to become permanent features in our landscape that will proliferate in the future.



Constructed wetlands are often promoted as having a beneficial role with respect to biodiversity but this is rarely rigorously evaluated. This project aims to assess the plant and invertebrate biodiversity of willow evapotranspiration systems, a subtype of constructed wetland suitable for low permeability subsoils, and the contribution they make to the biodiversity of the wider landscape. Factors driving biodiversity in these systems are being investigated with a view to providing management recommendations to maximise this biodiversity.

## Student Speakers

### Rachel Byrne (Zoology)

**Supervisors: Prof. Nicola Marples and Prof. Celia Holland**

**Title:** *Parasites of badgers in Ireland- an untold story*

In Ireland bovine tuberculosis (bTB) is of significant agricultural and economic importance; considerable efforts have been made to eradicate the disease, notably the strategic culling of badgers in bTB endemic regions. Due to the badgers' protected status under the 1974 Wildlife Act, there is now a focus on vaccination-led control programmes.

Single infection caused by one species of parasite is rare. Rather, each individual host tends to harbour an entire community of parasite species. The co-occurrence of microparasites (e.g. bTB) and macroparasites (e.g. helminth worms) can have implications on intensity of disease as well as the efficacy of vaccines. The presence of helminth parasites in badgers or cattle is therefore likely to both increase the susceptibility and severity of infection with bTB, and would also be likely to make the vaccine less effective. Very little is known about the parasite communities of badgers in Ireland. Such information is vital to the management of bTB in badgers and cattle, and to the implementation of the vaccination programme.

This study to investigate the parasite community of badgers will be the first of its kind in Ireland. It will explore the parasite communities in badgers, stratifying the sample between West and East, between Adult and Juvenile and between male and female badgers, allowing the effects of all these factors to be interrogated. The significance of this study however will not just be confined to Ireland as bTB is a disease with a worldwide spread.



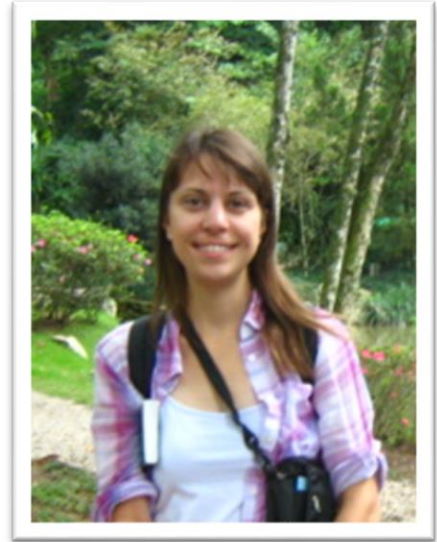
## Student Speakers

### **Sarah Gabel (Botany)**

**Supervisor: Prof. Jane Stout and Dr. Blánaid White (Dublin City University)**

**Title:** *Enhancing natural capital for ecosystem service provision*

Our food production depends on healthy, functioning agricultural ecosystems. Insect pollinators and predators of pests provide key ecosystem services in these systems. Conventional agricultural practices at the local (e.g. the use of pesticides) and landscape (e.g. habitat fragmentation) scales can damage insect populations, but can be mitigated by regulating pesticide use and encouraging floral growth on farmed land. While such mitigating practices can benefit insect populations, floral resources near agricultural land may be exposing insects to pesticide residues.



This project will take a novel approach to test whether flowers in field margins and hedgerows enhance pollinator and natural enemy activity and insect exposure to agrichemicals. Hoverflies will be used as the model species as they are attracted to flowers and can enhance pest control and pollination in crops, but can be adversely affected by agrichemicals. Using the test model species of hoverfly *Episyrphus balteatus* (a pollinating adult with predatory larvae), we will also investigate how chemical exposure affects adult and larval behaviour and mortality in the lab. We hypothesise that flowers will enhance the activity of hoverflies and improve pollination and pest control services, but this benefit will be mediated by exposure to agrichemicals. Previous research has focussed on bees, but hoverflies are important crop pollinators as well, and also provide pest control services. Thus, understanding hoverflies is both necessary and novel. The results of this study can be used to encourage beneficial management activities for ecosystem service providers on farmland.

## Student Speakers

### Maureen Williams (Zoology)

**Supervisors: Dr. Ian Donohue and Prof. Celia Holland**

**Title:** *Energy flow in ecologically important ectotherms is modified by parasitism and temperature*

Parasites are ubiquitous in virtually every ecosystem, though their impact on the structure and functioning of those systems is only now becoming clear. Temperature has been proposed as a major regulator of host-parasite interactions, yet little is known about how a warming climate could influence the effects of parasites on their hosts and overall energy flow through ecosystems.

We explore whether parasitism and warming interact to modify energy flow in ecosystems by comparing individual energy budgets of the ecologically important amphipod *Gammarus duebeni* that were infected with the acanthocephalan parasite *Polymorphus minutus* with those of uninfected individuals of similar size across a broad range of ecologically relevant temperatures. By combining individual energy budgets with experiments examining the effects of temperature on parasitic behavioural manipulation of their hosts, we see a clear pattern where temperature moderates individual respiration and consumption whereas both parasitism and temperature modify behaviour. These findings highlight the importance of the non-trophic effects of parasites in modifying energy flow through ecosystems and affirm the need for experimental and field studies of the impact of temperature in a warming world.





## Student Speakers

### Sukontip Sirimongkol (Botany)

**Supervisors: Prof. John Parnell and Prof. Trevor Hodkinson**

**Title:** *A recent survey of Henckelia (Gesneriaceae) from Thailand*

The genus *Henckelia* is one of the most complicated genera in the family Gesneriaceae. It has been treated as a synonym of other genera but recent molecular phylogenetic studies support it as an individual genus. The circumscription of this genus has been revised by a number of researchers. Four sections were removed from *Henckelia* leaving sect. *Henckelia*. Currently *Henckelia* contains 58 species. They are distributed from Sri Lanka, India through the Himalayas to northern Indo-China, northern Thailand and southern China. Five species are recorded in Thailand. I conducted a recent survey for *Henckelia* in Thailand between August and October 2016. In total, 75 individuals of *Henckelia* were collected. They belong to five species. From this work, *Henckelia rotundata*, which was described in 1922 and for which only type material was available, was rediscovered.



## Student Speakers

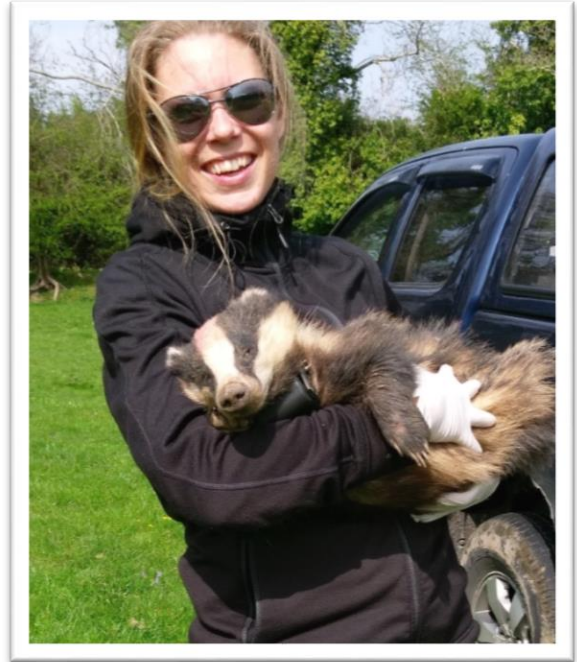
### **Aoibheann Gaughrann (Zoology)**

**Supervisors: Prof. Nicola Marples and Dr. Dave Kelly**

**Title:** *Do Some Males Hold Super-Territories? Alternative Ranging Strategies in a European Badger Population.*

We monitored the ranging of a wild badger population over 7 years using GPS tracking collars. While most adult badgers (males and females) remained within traditional social group boundaries, a number of adult male badgers (on average 22%) regularly exceeded traditional boundaries. These adult males frequently ranged across two (or more) traditional home ranges, so we referred to them as super-territory holders.

While ranging across traditional boundaries has been recorded over short periods of time for extraterritorial mating and foraging forays, or for pre-dispersal exploration, the animals in this study were maintaining their super-territories from 2 to 36 months. This behaviour constitutes a previously unrecognised territorial strategy in male badgers. In Ireland and the UK, badgers act as a wildlife reservoir for bovine tuberculosis (bTB). This alternative ranging strategy may have important implications for disease transmission, both through increased direct interactions with conspecifics and indirect interactions with cattle in the environment, which may inform future control strategies.





## Student Speakers

### **Anna Kaja Hoeyer (Botany)**

**Supervisor: Prof. Trevor Hodkinson and Dr. Brian Murphy**

**Title:** *Endophyte discovery for disease control*

Endophytes are microorganisms that live inside plants without causing symptoms of disease and what is interesting about endophytes is that some of them are able to help plants fight diseases. In this project the focus is on two important diseases of barley and wheat. The first one infects the kernels and is called Fusarium head blight and the second disease can destroy the root system and is called Take-all. Currently root endophytes are being isolated from wild relatives of barley and wheat. Wild grasses are being sampled close to fields at sites with high disease pressure. The hypothesis is that the diversity of endophytes will be higher in perennial wild relatives compared to the annual crops. The roots are surface sterilised using standard techniques and cultured on three different media. The fungal strains will be DNA barcoded and identified. Furthermore, root samples are being prepared for next generation sequencing in order to primarily determine the full diversity of root endophytes and secondly investigate the bias of the culturing method. *In vitro* antagonist tests will be performed in order to reduce the number of potential biocontrol agents. The aim is to obtain four endophytic biocontrol agents that show good results *in vivo*. In addition, the endophytes' mode of action will be described in collaboration with the University of Copenhagen.



## Student Speakers

### Andrew Mooney (Zoology)

**Supervisors: Prof. Yvonne Buckley, Dr Dalia Conde (University of Southern Denmark) and Dr. Kevin Healy**

**Title:** *Zoo and Aquarium Collections in a Changing World*

As global wildlife populations continue to decline, the effective conservation of remaining wildlife is of growing concern and *ex situ* methods, predominantly undertaken by the worlds zoos and aquaria, are becoming increasingly important. However, zoos and aquaria are not solely conservation organisations, they are multifaceted institutions of conservation, education and entertainment, all being balanced simultaneously. These contrasting demands are reflected in the composition of zoo and aquaria collections, with a bias towards large charismatic vertebrates, specifically mammals. It has been recommended that institutions move toward smaller species and lower species richness in order to maximise their conservation potential. However, such drastic collection changes have been cautioned, warning that a loss of large, charismatic mammals could reduce visitor attendance and economic viability, potentially reducing the funds from zoos and aquaria to *in situ* conservation projects and exacerbating the current deterioration of natural habitats.



Whether or not zoos and aquaria need large charismatic mammals in order to remain economically viable has yet to be determined. Using the Species360 database, we aim to investigate the current composition, status, and diversity of the world's zoo and aquaria collections and to examine how these relate to important factors such as visitor attendance and the contributions of zoos and aquaria to *in situ* conservation. This project will provide a deeper understanding of what drives contemporary zoo and aquaria collections in order to help maximise the conservation potential of the worlds zoos and aquaria, both within their own walls and beyond.

## Student Speakers

**Georgia O'Sullivan (Zoology)**

**Supervisor: Prof. Paula Murphy and Dr. Andrew Jackson**

**Title:** *Shaping the jaw – the importance of embryonic movement*

Diversity in form and function across the animal kingdom reflects differences in evolutionary history and developmental processes. The species-specific shape of each element of the skeleton is established during embryonic development, with shape characteristics being crucial for the functional adaptations of organisms. Embryo movement is important for establishing correct shape in certain aspects of the skeleton, such as the limbs and the jaw. During limb development when an embryo cannot move during development, this results in changes in gene expression both spatially in the limb itself and temporally across developmental stages, which results in changes in cell behaviour, which ultimately results in altered skeletal morphology. In the jaw, when the temporalis muscle is either absent or immobilised, shape changes occur in the mandible. However, less is known about the cellular and molecular basis for mandible shape changes. One aspect of my work is to investigate this using quantitative shape analysis, gene expression analysis and cell proliferation studies.



## Student Speakers

### Anne Dubéarnès (Botany)

**Supervisor: Prof. John Parnell, Prof. Trevor Hodgkinson and Dr. Timothy M.A. Utteridge (Royal Botanic Gardens, Kew)**

**Title:** *Systematics of the genus Embelia Burm.f. (Primulaceae – Myrsinoideae)*

In order to work with plants, whether it is to use crops as a food source or plant extracts as a medicine, to conduct ecological or biogeographical studies, or to plan and implement conservation programs, we need to be able to identify the species involved. We need to define entities, groups with clear boundaries, that we can name and work with. This is what I am attempting to do for *Embelia*, a genus of tropical plants belonging to the Primrose family (Primulaceae), and more specifically to the Myrsinoideae subfamily.



Myrsinoideae are a highly variable group, ranging from climbers and shrubs to trees, and characterised by the presence of dark glandular dots on the leaves and fruits. This subfamily contains over 1300 species, divided into approximately 40 genera. Many of these genera are in need of taxonomic revision, as their limits are poorly defined and sometimes rely on ambiguous characters. Among these genera is *Embelia*, a genus of climbing shrubs distributed over the Paleotropics (mostly in South and South-East Asia, Northern Australia, tropical Africa, Madagascar and a few Pacific islands). *Embelia* displays extensive morphological variation both on the reproductive and vegetative organs, however it is only distinguished from other Myrsinoideae by its climbing habit. The relationship with morphologically similar genera, especially *Cybianthus* from the Neotropics, has not been critically evaluated yet. My project aims to combine morphological and molecular data in order to test the monophyly of *Embelia* and to provide a taxonomic framework of its subgenera. This will lead to a better understanding of the structure of this genus and its place in Myrsinoideae.

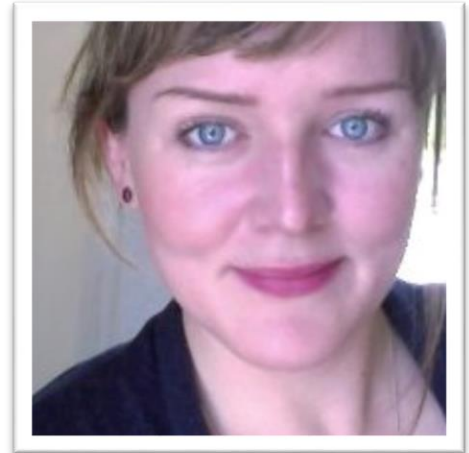
## Student Speakers

### **Hannah Hamilton (Botany)**

**Supervisor: Prof. Jane Stout and Prof. Anna Davies**

**Title:** *'What's in it for us?' The drivers of voluntary business engagement with biodiversity*

Businesses impact and depend on the natural world, and biodiversity loss presents significant and material business risks. Growing numbers of companies are taking voluntary action for biodiversity outside traditional regulatory and legal requirements, and one approach is via on-site biodiversity management. The UK Wildlife Trusts' Biodiversity Benchmark is a voluntary certification scheme for business that recognises and rewards continual biodiversity improvement at site-level. To date, 18 companies (55 sites) from a variety of business sectors in the UK have been certified under the scheme. My project uses social science methods (semi-structured interviews and surveys) to explore the business drivers of voluntary action for biodiversity through the Benchmark, determine the business impacts across sector and company size, and explore stakeholder perceptions of the impacts on biodiversity. To date, interviews have been completed with six Wildlife Trusts' Biodiversity Benchmark Assessors and the data are being analysed. The findings will then be interrogated against the literature in order to inform a survey that will be distributed to Benchmark-certified companies to explore drivers and impacts. The project aims to inform policy, Corporate Social Responsibility strategies, and other initiatives that engage businesses with biodiversity.





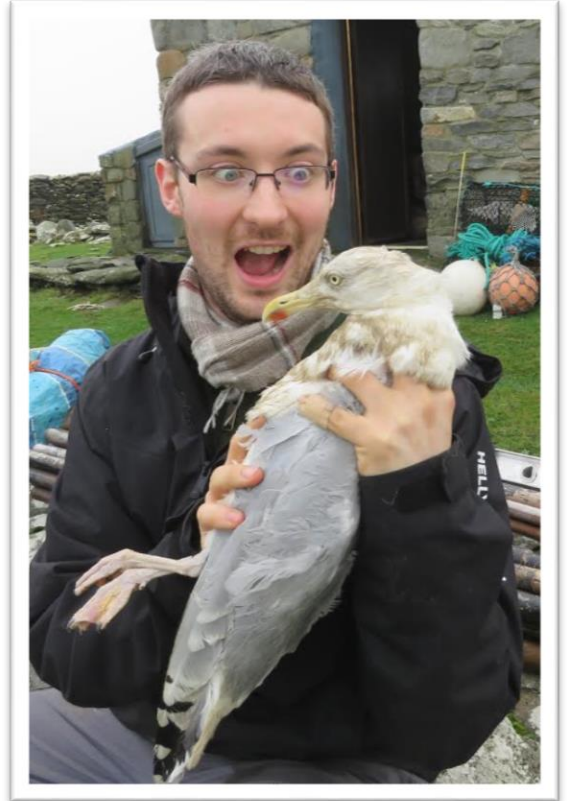
## Student Speakers

**Darren O'Connell (Zoology)**

**Supervisor: Prof. Nicola Marples and Dr. Dave Kelly**

**Title:** *Character release in a great speciator*

Feeding niches are defined by available resources, but resource availability may depend on competition for those resources. Competition for resources is most intense in closely-related species, which are likely to share similar niches. If a competitor disappears from an ecosystem, the remaining species may experience niche release. This, in turn, may lead to character release. In bird species bill length is a strong indicator of feeding niche, as birds' bills are adapted to handle food efficiently. Here we demonstrate a case of character release in a passerine bird in South-east Sulawesi, Indonesia in the absence of a congeneric competitor. The Lemon-bellied White-eye (*Zosterops chloris*) and Pale-bellied White-eye (*Zosterops consobrinorum*) are closely related species which compete for similar resources. White-eyes are known as a "great speciator" lineage and make excellent subjects to study adaptive divergence. When these species were found in sympatry there was evidence of strict niche partitioning, with little overlap in bill lengths between the two species. However, at sites where only the Lemon-bellied White-eye was present its bill length showed increased trait diversity, covering the full range of bill lengths shown by both *Zosterops* species when living in sympatry. This is clear evidence of character release, with the Lemon-bellied White-eye expanding to fill the niche space split between the species in sympatry. Phylogenetic analysis of mitochondrial genes indicates that there's no taxonomic separation between the morphologically different populations of Lemon-bellied White-eyes. These results demonstrate the potential for character release in populations which experience a lessening of competition pressure.



## Student Speakers

### **Anindita Lahiri (Botany)**

**Supervisors: Prof. Trevor Hodkinson, Dr. Brian Murphy, Gerry Douglas (Teagasc) and Dr. Colin Kelleher (National Botanic Gardens of Ireland)**

**Title:** *Root and shoot endophytes of Fraxinus in relation to ash dieback disease.*

Ash, *Fraxinus excelsior*, is an important timber yielding plant in Europe that has been threatened by a widespread fungal disease for the last decade. The ash dieback disease (ADB) is caused by *Hymenoscyphus fraxinues*, a relative of the native fungus *Hymenoschyphus albidus*, which is responsible for decomposition of fallen leaf litter every year. Pathogenic fungal mycelia grow through the plant tissue resulting in formation of lesions on stems and rachises and the blocking of transport tissues in the plant. As a result, infected trees are unable to transport water and other mineral substance from the soil to the branches of ash trees, and eventually develop ADB disease due to lack of nutrition.

Our work involves characterising the microbiome present inside leaves and roots of healthy plants. Isolation of endophytes was conducted on malt extract agar media with sub-culturing to obtain pure cultures. Isolated fungal DNA was extracted using QIAGEN kits and amplified and sequenced for the nuclear ribosomal barcoding DNA region. Sequences obtained were compared with existing barcodes in the GenBank Databases using BLAST searches. In the future, testing will be done on those isolated endophytes as a bio control agent to help improve the resistance of ash trees to ADB disease. Work has begun on the ash tissue culture to allow in-vitro endophyte/pathogen/plant interaction experiments.





## Student Speakers

### Gwendoline Deslyper (Zoology)

**Supervisors: Prof. Celia Holland and Dr. James Carolan (NUI Maynooth)**

**Title:** *A Tale of Two Mice: Resistance and susceptibility to Ascaris in mice and humans*

*Ascaris lumbricoides* is a parasitic nematode which causes ascariasis in humans. It is a neglected tropical disease despite infecting 800 million people worldwide. Children under the age of 15 often experience heavy infections. Symptomatology is dependent on worm burden, with higher worm burdens associated with more severe symptoms. For this reason, children often experience severe symptoms including malnutrition, intestinal obstruction and decreased cognitive development. Regardless of these age related differences it is clear that some people experience heavier worm burden than others. These heavily infected individuals are often called 'wormy people'. This remains true even after several rounds of anthelmintic drugs. Previous research has indicated that the liver is the most likely place where this difference in worm burden occurs. Our project is trying to further investigate the role of the liver in the difference of infection rate.



A mouse model has already been established for the porcine ascarid *A. suum*, where one mouse strain represents heavy infection and the other strain is a model for light infection. Using this mouse model, our group previously identified several differences in the proteomic profile of the mouse livers at day 4 post infection. These results form the basis of the new project, where we will firstly investigate the proteomic profile of the mouse strains on day 7 post infection using mass spectrometry. Additionally, we will examine the different type of immune cells present in the liver during *Ascaris* infection through flow cytometry. Furthermore, we will test the existing *A. suum* mouse model for its usefulness for the human *A. lumbricoides* infection. If successful, this model could be used for the development of a vaccine or potential therapies.

## Student Speakers

### Jane Feeney (Geography)

**Supervisors: Prof. Anna Davies and Prof. Yvonne Buckley**

**Title:** *Valuable biodiversity: Examining the values and impacts of biodiversity offsetting initiatives in Colombia*

Biodiversity is essential for the healthy functioning of ecosystems and the provision of critical ecosystem goods and services such as food, water and climate regulation. However, biodiversity loss remains a global meta-challenge, representing one of the United Nations Sustainable Development Goals. Increasingly, the use of market-based approaches to conservation are being put forward as a way to meet conservation objectives while simultaneously supporting economic growth and development. One of these approaches, biodiversity offsetting, aims to compensate for biodiversity loss as a result of development projects (e.g. infrastructure, mining) by conserving or restoring biodiversity of equivalent 'value' elsewhere. Most of the research on biodiversity offsetting to date focuses on the Global North, particularly the USA and Australia, but as biodiversity offsetting initiatives expand globally, there is a need to critically evaluate their form, governance and impacts in territories beyond the Global North. In Latin America and the Caribbean, the most biodiverse region of the world, Colombia is leading the way in market-based conservation, with a regulatory framework requiring biodiversity offsetting and the first habitat bank in the region. My research project will examine how biodiversity is valued by different groups of actors affected by offsetting activities in Colombia, which and whose values are represented in decision-making processes, and the impacts of applying offsetting in particular contexts within Colombia. As a result, it will progress understanding of the opportunities and challenges offered by biodiversity offsetting, in a Global South context. My current work explores the state of knowledge around biodiversity offsetting and presents the findings from a review of literature on biodiversity offsetting research detailing the focus, scientific approaches and geography of research and researchers involved.



## Student Speakers

### Paula Tierney (Zoology)

#### Supervisor: Prof. Celia Holland

**Title:** *Parasite-mediated effects of an invasive fish on native brown trout*

The role of parasites in biological invasions is becoming increasingly recognised. The differential effects of parasites on native and invasive hosts can amplify or mitigate the negative impacts of invaders on native hosts, thereby mediating the effects of invasions and altering invasion outcomes. Since 1980, the invasive dace (*Leuciscus leuciscus*) has gone from being confined only to the Munster Blackwater to, in 2014, having the highest density of all fish species in the upper River Barrow. Its rapid spread has raised concerns of potential impacts on sympatric native freshwater fish, particularly given the dearth of information on its parasite fauna.

In the first comprehensive study of the parasite community of invasive dace in Ireland, we have compared the parasite fauna of dace at the edge and core of its invasive range with that of native brown trout (*Salmo trutta*) from the same sites. Our results show that while dace acquired acanthocephalan parasites, the parasites were smaller in size than those from brown trout and they did not reach sexual maturity in the invasive fish. Brown trout from the core of the dace's range had a lower infection burden of these parasites, indicating that by taking up but not distributing infective stages of the parasite, the invasive fish may be diluting acanthocephalan infection in brown trout. As heavy acanthocephalan infection can cause severe damage to host fish, we suggest that the presence of this invasive species may ultimately benefit native brown trout.





## **Guidelines for Completion of Presentation Evaluation Forms**

Please evaluate anonymously using the following categories to rank presentations:

### **Organisation**

- Structure of presentation (clear, logical etc.)
- Aims of study (clearly stated and evident throughout the presentation)

### **Scientific Content**

- Background
- Methodology
- Logical progression of scientific ideas

### **Voice**

- Clear, strong etc.

### **Body Language**

- Eye contact with audience
- Position relative to audience
- Gestures/movement

### **Timing**

- Adherence to time limit (7.5/15 minutes: 5/10-minute presentation; 2.5/5 minutes for questions)

### **Audio-Visual Aids**

- Clear, legible text and figures

### **Handling Questions**

- Confidence
- Ability to formulate adequate responses
- Open to suggestions and new ideas



## TCD Botany-Zoology Postgraduate Symposium

### Presentation Evaluation Form

Presenter: \_\_\_\_\_

<b>Category</b>	<b>Excellent</b>	<b>Very Good</b>	<b>Good</b>	<b>Needs Improvement</b>
Organisation				
Scientific Content				
Voice				
Body Language				
Timing				
Audio-visual Aids				
Handling Questions				

Best aspect of talk:

Aspects requiring improvement:

Other points: