

[The newsletter from the Botany Department at Trinity College Dublin](#)

Publications

Journal of Experimental Botany: **Simon Hodge** co-authored a paper titled "[Elevated CO₂ effects on nitrogen assimilation and growth of C₃ vascular plants are similar regardless of N-form assimilated.](#)" It has been previously argued that some crop plants such as wheat, and C₃ plants in general, will not respond well to nitrate nutrition under climate change scenarios involving increased atmospheric carbon dioxide concentration. This is because elevated CO₂ inhibits the photoreduction of NO₃, and so reduces total plant nitrogen assimilation and ultimately growth. This paper argues that the weight of evidence in the literature indicates this is not actually the case, and provides new results for common bean and wheat that suggest that the effects of elevated atmospheric CO₂ on N assimilation and growth of C₃ vascular plants will be similar regardless of the N form supplied.

Arthropod-Plant Interactions: **Simon Hodge** published a paper titled "[Aphid-induction of defence-related metabolites in *Arabidopsis thaliana* is dependent upon density, aphid species and duration of infestation.](#)" Plants display a wide range of chemical defence responses to sap-feeding herbivorous insects: for example, phytohormones such as jasmonic acid and salicylic acid, and defence related-compounds such as phytoalexins, can all be induced when plants are challenged by aphids. When reviewing the literature on aphid-plant interactions, however, inconsistencies occur among studies in terms of which plant defences are induced and the effects of these defences on the challenging aphids. This paper explicitly examined if some of this variation in results could be caused by inconsistencies in the experimental set ups used by different researchers. We found that the occurrence and intensity of many plant defence responses was dependent upon the species and number of aphids used to initiate the challenge, and how long the aphids were left on the plants before plant material was harvested. The study reinforces the need to consider components of the experimental system when making inter-study comparisons, both within the realm of insect-plant interactions and the wider ecological literature in general.

Thai Forest Bulletin: **Orporn Phuekklai**, **Sarawood Sungkaew** (ex TCD Botany), **Somran Suddee** (ex TCD Botany), **Trevor Hodkinson** and colleagues published a [new record of lithophytic orchid *Dendrobium chrysocrepis* for Thailand](#) in the *Thai Forest Bulletin (Botany)*.



Figures from the paper.

Estuaries and Coasts: **Steve Waldren** has co-authored a paper in *Estuaries and Coasts* led by **Marcin Penk**, titled [Nutrients in saltmarsh soils are weakly related to those in adjacent coastal waters](#). This research shows that saltmarsh soils are unlikely to serve as general sentinels of nutrient conditions in their corresponding water bodies, and may need separate assessment criteria and management tools.



Australian Systematic Botany: **John Parnell** and his former Ph.D. student, **Conor Meade** (who is now on the staff at Maynooth University), have just published a major paper revising an important part of the tropical family Annonaceae as follows:

Meade, C.V. and Parnell, J.A.N. (2018). A revised taxonomy for *Uvaria* (Annonaceae) in continental Asia. *Australian Systematic Botany*, 31: 311–356.

Journal for Nature Conservation: **Steven Waldren** co-authored a paper titled “Development of a scoring method to identify important areas of plant diversity in Ireland.”

Walsh, A., Sullivan, C., Waldren, S. & Finn, J. (2019). Development of a scoring method to identify important areas of plant diversity in Ireland. *Journal for Nature Conservation*, 47: 1-11.

The Wetland Book II: Distribution, Description, and Conservation: **Steven Waldren** co-authored a paper titled “Turloughs.”

Irvine, K., Coxon, C., Gill, L., Kimberley, S. & Waldren, S. (2018). Turloughs. In: *The Wetland Book II: Distribution, Description, and Conservation*, eds C. Max Finlayson, C.M., Milton, G.R., Davidson, N.C & Prentice, R.C. Springer.

Accomplishments

John Parnell's [interview with the alumni office](#), published in the alumni's e-zine, received much attention from the public, with the highest open rate (47%) since the e-zine started in 2012. His two recorded interviews on the [herbarium](#) and [Trinity's campus](#) have also been watched by over 3,000 people.

Projects and Funding

EPA funding has been awarded to **Matt Saunders** for a 4-year project on “Smart observations of management impacts on peatland function (SmartBog)”. Working with **John Connolly** and **Kevin McGuinness** (DCU), **Declan Delaney** (UCD), **Shane Regan** (NPWS), **Paul Leahy** (UCC), **Matteo Sottocornola** (WIT) and **Catherine Farrell** (BnM), this project will utilise an inter-disciplinary approach to assess the impact of anthropogenic management of peatlands, through drainage and land use conversion on carbon and greenhouse gas emissions. This project will use high-resolution hyperspectral and Copernicus Sentinel-2 satellite based imagery to identify peatland land use and drainage extent, and will combine this information with land-atmosphere and fluvial C/GHG emission measurements and low cost IoT sensors to derive a habitat condition and peatland drainage map that can be aligned to a GHG emission factor. Ultimately, this project will develop a web-based interactive data visualization dashboard that provides the outputs of this work in an accessible format to support key stakeholders in policy development and decision making to enhance the sustainable management of peatland systems in Ireland.

EPA funding has been awarded to **Jane Stout** for a 4-year project on “Irish Natural Capital Accounting for Sustainable Environments (INCASE)”. Working with **Mary Kelly Quinn** (UCD), **Stephen Kinsella** (UL), **Cathal O’Donoghue** (NUIG), **Hannah Hamilton** (IFNC) and the IDEEA consultancy, this project will take a transdisciplinary approach to developing national natural capital accounts in Ireland. Overall, we aim to develop capacity and a framework for natural capital accounting in Ireland to assist with decision-making and prioritisation of investment into restoring natural capital stocks by agencies in the future.

Meetings and Conferences



Anna Kaja Hoeyer presenting at the Symposium.

Anna Kaja Hoeyer and **Trevor Hodkinson** attended the H2020 ETN CerealPath Annual Symposium Meeting at the University of Natural Resources and Life Sciences, Vienna (5-7 December). Anna Kaja presented her PhD work on the biocontrol of cereal diseases using endophytic fungi.



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MERRY CHRISTMAS AND HAPPY NEW YEAR!



PHYTOBYTES needs your input! Whether you are student or staff, please send any news you have, big or small, to Sarah (gabels@tcd.ie) with the subject heading “Phytobytes”. Let’s share the latest news and always be aware of what is happening at Botany!