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Research School of Biology Newsletter

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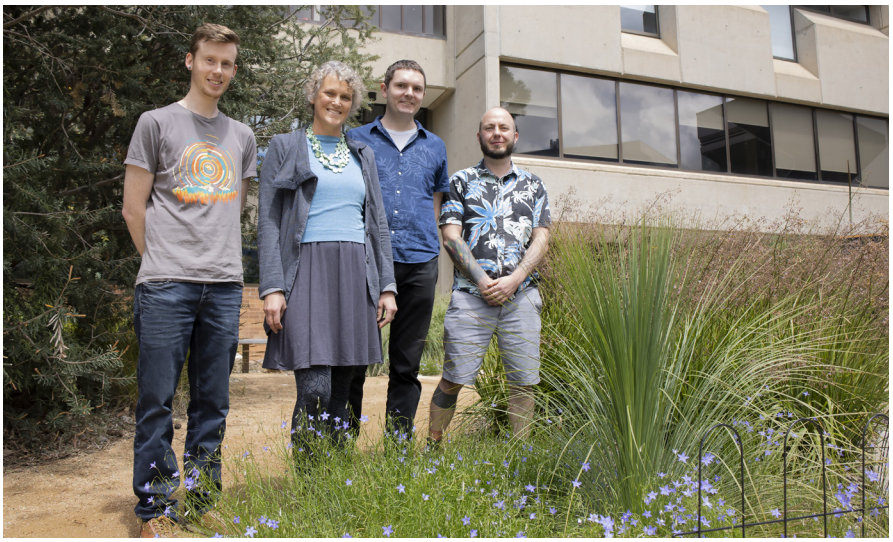
ANU COLLEGE OF SCIENCE

CONGRATULATIONS

Ashley Jones, Benjamin Schwessinger (Schwessinger group, PS), **Scott Ferguson** (Borevitz group, PS), Jo Birch (University of Melbourne), and Todd McLay (Royal Botanic Gardens Victoria) have been awarded $25K in Bioplatforms sequencing funds from the Genomics for Australian Plants initiative to sequence the genome of the grasstree *Xanthorrhoea australis.* Also, **Jemimah Hamilton, Ashley Jones, Ben Schwessinger** (Schwessinger group, PS) **Pieter Arnold,** and **Adrienne Nicotra** (Nicotra group, E&E) have been awarded another $25K in Bioplatforms sequencing funds to sequence the genome of the bluebell *Wahlenbergia ceracea*. **Ashley Jones** and **Benjamin Schwessinger** will also be collaborating with Rose Andrews (University of New England) on *Phebalium stellatum*, which was also awarded $25K. The initiative aims to develop genomics resources to enhance our understanding of the evolution and conservation of the unique Australian flora.



RSB recipients of Bioplatforms Australian plant sequencing funds (L-R) Pieter Arnold, Adrienne Nicotra, Ashley Jones and Benjamin Schwessinger (absent: Jemimah Hamilton, Scott Ferguson). See under 'Congratulations'.

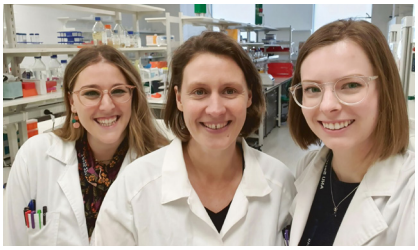
Plant-based vaccine research collaboration

Richard Poire-Lassus and Conviron cabinet. (Image credit: Lawrence Aitken).

A new research collaboration between CEAT and Medicago R&D Inc. aims to develop new methods and tools to non-invasively monitor the growth and performance of plants used in the production of Virus-Like Particles (VLPs). This research will help to optimise the biotechnology for plant-based vaccine development. A five-year collaboration agreement between ANU and Medicago has been signed, consisting of multiple projects, starting with a $1M project to take place over 14 months.

In this initial project, the APPF's Plant Phenomics Group at ANU – including **Tim Brown** and **Richard Poire-Lassus** (Brown group, PS) - is contributing its full range of facilities and expertise in phenomics, bioinformatics, and data visualisation, as well as access to state-of-the-art equipment and infrastructure such as hyperspectral scanning, and sophisticated controlled environment growth chambers.

Bridge Hub Water Challenge Team



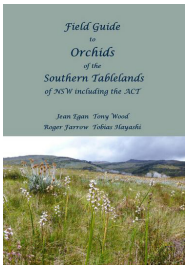
Annamaria De Rosa, Caitlin Byrt and Samantha McGaughey.

The 'AquaporinSolutions' team, consisting of Group Leader **Caitlin Byrt**, **Annamaria De Rosa** and **Samantha McGaughey** (PS), is one of just eight Australian and New Zealand teams selected from 100 applicants to participate in the Bridge Hub 2020 Water Challenge. The team is in contention for a share of up to $250K in prize money and investment. Read more in this CEAT article.

Richard Turner (PhD student, Kruuk group, E&E) was awarded a Holsworth Wildlife Research Endowment ($6.05K) from the Ecological Society of Australia (ESA) for the project 'Causes and consequences of nest predation in a declining population of superb fairy-wrens (*Malurus cyaneus*)'.

Cal Bryant (PhD student, Ball group, PS) was awarded a Holsworth Wildlife Research Endowment ($6.37K) from the Ecological Society of Australia (ESA) for the project, 'Death follows – processes of drought-induced tree mortality'.

New orchid field guide



Tobias Hayashi (Peakall group, E&E), along with colleagues Jean Egan and Roger Farrow, have recently published a photographic field guide, entitled 'Field Guide to the Orchids of the Southern Tablelands of NSW, including the ACT'. The book covers all 181 species of native orchid found in the greater Canberra region.

In mid-October, Tobias and Jean led several orchid walks on Black Mountain to showcase some of the incredible native orchid diversity to the general public - read more in his blog with photos of the Black Mountain orchids.

PHDS SUBMITTED

Eve Cooper (Kruuk group, E&E). 'The age-old question: evolutionary causes & ecological consequences of ageing in the wild'.

PHDS APPROVED

Christiana McDonald-Spicer (Moritz group, E&E). Refugia in the Australian Monsoonal Tropics: stability and what it means for northern Australian lizards.

Jessica Fenker Antunes (Moritz group, E&E). Evolution of reptile diversity in tropical savannas - a study across scales and continents.

OUTREACH

National Press Club presentation

On the 29th of September, **Cailtin Byrt** (PS) was in a panel presenting at the National Press Club, as part of the launch of The Official Reference Guide to Agricultural Biotechnology and GM Crops. Caitlin's talk was entitled 'Welcome to the Biotechnological Revolution'. Footage of the event proceedings is available on Youtube, and the event also prompted a radio interview with ABC Country Hour. (Caitlyn's interview starts at 28 minutes).

FAREWELL

Hilary Stuart-Williams (Farquhar group, PS) came to the Farquhar group in 2001 to baby the mass spectrometers and supervise their usage. Over the years his relationship with them has gradually evolved to weathered tolerance. Following the move to a shack for the duration of the Robertson refurb, the machines developed separation anxiety. This was made worse by the arrival of several isotope lasers, for which Hilary has devoted unconscionable time creating software and hardware interfaces. During the course of this ~20 year ongoing battle with equipment several papers have emerged, typically with a readership inversely proportional to the effort that went into them. Now Hilary has been at RSB about four times longer than in any previous job, so he has either become old and apathetic or has enjoyed his stay and the wonderful people that he has worked with. But hold the partying, he's not gone yet…

This newsletter is archived at biology.anu.edu.au/news-events/newsletters
Layout: Sharyn Wragg
Editing: Scott Keogh & Sharyn Wragg

PAPERS

Accepted

Carlos A. Mendoza-Palmero, Yun Hsiao. *Boegeriella* nom. nov. (Monogenoidea: Dactylogyridae) for *Walteriella* Mendoza-Palmero, Mendoza-Franco, Acosta & Scholz, 2019, a junior homonym of *Walteriella* Kazantsev, 2001 (Coleoptera: Cantharidae). *Systematic Parasitology.*

Cooke IR, Ying H, Foret S, Miller DJ, et al. Genomic signatures in the coral holobiont reveal host adaptations driven by Holocene climate change and reef specific symbionts. *Science Advances.* doi.org/10.1101/2020.02.25.951905

de Villemereuil P, Cockburn A, Kruuk LEB, et al. Fluctuating optimum and temporally variable selection on breeding date in birds and mammals. *Proceedings of the National Academy of Sciences USA.*

Fisher GM, Cobbold SA, Jezewski A, Tjhin ET, Saliba KJ, et al. The key glycolytic enzyme phosphofructokinase is involved in resistance to antiplasmodial glycosides. *mBio*.

Hajduk G, Cockburn A, Osmond H, & Kruuk L. Complex effects of helper relatedness on female infidelity in a cooperative breeder. *Behavioural Ecology.*

Jähnig SC, Baranov V, Altermann F, Cranston PS, et al. Revisiting global trends in freshwater insect biodiversity. *WIREs WATER* (Interdisciplinary reviews).

Khan HA, Nakamura Y, Furbank RT & Evans JR. Effect of leaf temperature on estimating physiological traits of wheat leaves from hyperspectral reflectance. *Journal of Experimental Botany*. doi.org/10.1101/2020.05.21.109652.

Kócsi Z, Murray T, Dahmen H, Narendra A, & Zeil J. The Antarium: a reconstructed visual reality device for ant navigation research. *Frontiers in Behavioral Neuroscience, section Individual and Social Behaviors.*

Mason B, Cooke I, Moya A, Hayward DC, Andrade N, Forêt S, Ying H, Ball EE, et al. AmAMP1 from *Acropora millepora* and damicornin define a family of coral-specific antimicrobial peptides related to the Shk toxins of sea anemones. *Developmental & Comparative Immunology.* doi.org/10.1016/j.dci.2020.103866.

Natusch DJD, Esquerre D, Lyons JA, Keogh JS, et al. Phylogenomics, biogeography and taxonomic revision of New Guinean pythons (Pythonidae, Leiopython) harvested for international trade. *Molecular Phylogenetics and Evolution.* doi.org/10.1016/j.ympev.2020.106960.

Sakoda K, Yamori W, Groszmann M, & Evans JR. Stomatal, mesophyll conductance and biochemical limitations to photosynthesis during induction. *Plant Physiology.*

Taheri M, Ashok D, Sen, Verma, NK, et al. Stability of ZIF-8 nanopowders in bacterial culture media and its implication for antibacterial properties. *Chemical Engineering Journal*.

Published

Braby M & Lams G. Protected taxonomic status for *Papilio harpalyce* Donovan, 1805 (Lepidoptera: Pieridae), a junior primary homonym of *Papilio harpalyce* Cramer, 1777 (Lepidoptera: Nymphalidae). *Australian Entomologist*. URL.

Iglesias Carrasco M, Aich U, Jennions MD, & Head ML. Stress in the city: meta-analysis indicates no overall evidence for stress in urban vertebrates. *Proceedings of the Royal Society (London), Series B.* doi.org/10.1098/rspb.2020.1754.

Iglesias Carrasco M, Harrison L, Jennions MD, & Head ML. Combined effects of rearing and testing temperature on sperm traits. *Journal of Evolutionary Biology.* doi.org/10.1111/jeb.13710.

Mens C, Hastwell AH, Su H, Gresshoff PM, Mathesius U, Ferguson BJ. Characterisation of *Medicago truncatula* CLE34 and CLE35 in nitrate and rhizobia regulation of nodulation. *New Phytologist.* doi.org/10.1111/nph.17010.

Mohamed AR, Andrade N, Moya A, Ying H, Ball EE, Miller DJ, et al. Dual RNA-sequencing analyses of a coral and its native symbiont during the establishment of symbiosis. *Molecular Ecology.* doi.org/10.1111/mec.15612.

Nelson MN, Jabbari JS, Turakulov R, et al. The first genetic map for a Psoraleoid legume (*Bituminaria bituminosa*) reveals highly conserved synteny with Phaseoloid legumes. *Plants (Basel)*. doi.org/10.3390/plants9080973.

Ritchie, AM, Hua, X, Cardillo, M, Yaxley, KJ, Dinnage, R, & Bromham, L. Phylogenetic diversity metrics from molecular phylogenies: modelling expected degree of error under realistic rate variation. *Diversity & Distributions.* doi.org/10.1111/ddi.13179.