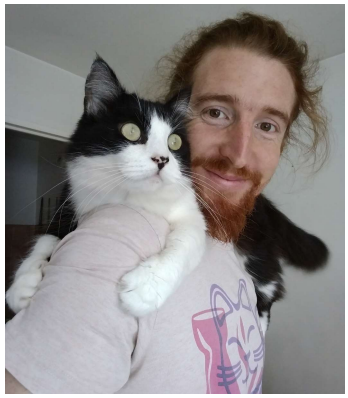

Maximilian Larter

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Research interests

My research focuses on how the environment determines species traits, and how these traits change at a macroevolutionary scale. In turn, I'm looking at how ecology and phenotypes can shape the diversification of lineages. Because traits can be the result of a complex genetic make-up, I'm also interested in the genetic basis of traits, and the mechanisms by which trait evolution happens, e.g. mutations, changes in gene expression.

Reseach Experience

2017 to 2019 **Post-doc - evolutionary biology - U. of Colorado Boulder**
Project: Evolution of the anthocyanin pathway in Iochrominae (NSF grant)
Supervisors: Stacey D. Smith
Summary: In Iochrominae, the ancestral flower color is blue, with the main pigments derived from the anthocyanin delphinidin. Several lineages have independently lost pigmentation altogether resulting in white or yellow flowers. We have found that the mechanism behind these fixed evolutionary losses is convergent down-expression of three of the downstream genes of the anthocyanin pathway.

2012 to 2016 PhD in evolutionary, functional and community ecology - U. of Bordeaux
Thesis title: Evolution of cavitation resistance in conifers (ministerial grant)
Supervisors: Sylvain Delzon and Jean-Christophe Domec
Synopsis: This thesis expands our understanding of the evolution of vascular plants regarding severe drought. We show that embolism resistance varies 9-fold across over 250 conifer species, thanks to changes in bordered-pit anatomy. Combining this unprecedented database with a calibrated phylogeny, we link embolism resistance evolution to increased diversification rate. Furthermore, we describe the remarkable evolution of *Callitris* xylem during the aridification of Australia over the last 30 million years.

2012 Intern - 6 months University of Bordeaux (Sylvain Delzon)
« Evolutionary patterns of cavitation resistance in conifers »

2011 Intern - 6 months University of Bordeaux (Sylvain Delzon)
« Convergent evolution of drought tolerance in conifers »

2010 Intern (2 months) Imperial College London (Guillaume Besnard)
« Population genetics of the olive (Olea europaea) complex »

Publications

2018 Larter M, Dunbar-Wallis A, Berardi A, and D. Smith S. (2018). Convergent evolution at the pathway level: predictable regulatory changes during flower color evolution. *Molecular Biology and Evolution* link

2017 Larter M, Pfautsch S, Domec J.-C, Trueba S, Nagalingum N, Delzon S. (2017). Aridity drove the evolution of extreme embolism resistance and the radiation of conifer genus Callitris. *New Phytologist* 215 (1), 97-112. link

Sáenz-Romero C, Larter M, González-Muñoz N, Wehenkel C, Blanco-Garcia A,

Castellanos-Acuña D, Burlett R, Delzon S. (2017). Mexican conifers differ in their capacity to face climate change. *Journal of Plant Hydraulics*, 4, e003. link

2016 Castagneyrol B, Jactel H, Brockerhoff E, Perrette N, Larter M, Delzon S, Piou D. (2016). Host range expansion is density dependent. *Oecologia*, 1-10. link

Larter M Thesis: The Evolution of Cavitation Resistance in Conifers link

2015 Larter M, Brodribb TJ, Pfautsch S, Burlett R, Cochard H, Delzon S (2015). Extreme aridity pushes trees to their physical limits. *Plant Physiology*, 168. link

2014 Besnard G, Dupuy J, Larter M , Cuneo P, Cooke D, Chikhi L (2014). History of the invasive African olive tree in Australia and Hawaii: Evidence for sequential bottlenecks and hybridization with the Mediterranean olive. *Evolutionary Applications*, 7. link

Bouche PS, Larter M, Domec J-C, Burlett R, Gasson P, Jansen S, Delzon S (2014). A broad survey of hydraulic and mechanical safety in the xylem of conifers. *Journal of Experimental Botany*, link

Conferences, Presentations

2017 Oral talk - **Evolution Meeting** in Portland (OR) – June 21-25th « Linking changes in gene expression to the macroevolution of flower color in Iochrominae (Solanaceae) »

2015 Oral talk - **Xylem International Meeting**, Bordeaux, France. September 7th-9th 2015 « The evolution of cavitation resistance in conifers and the case of world-record Callitris »

Oral talk - **LabEx Day** (LabEx COTE), Bordeaux, October 15th 2015 « Evolution of drought tolerance in Conifers - Callitris in Australia »

2014 Oral talk - **HIE Seminar Series** (University of Western Sydney), Richmond NSW (Australia), May 21st 2014 « The evolution of cavitation resistance in Conifers »

2012 Poster - **Journées de la Société Française de Systématique**, Paris, October 8th-10th 2012 « Global variation and evolution of drought tolerance in Conifers »

Education

2012 to 2016 **PhD in evolutionary, functional and community ecology - U. of Bordeaux**
Thesis title: Evolution of cavitation resistance in conifers (ministerial grant)
Supervisors: Sylvain Delzon and Jean-Christophe Domec
Synopsis: This thesis expands our understanding of the evolution of vascular plants regarding severe drought. We show that embolism resistance varies 9-fold across over 250 conifer species, thanks to changes in bordered-pit anatomy. Combining this unprecedented database with a calibrated phylogeny, we link embolism resistance evolution to increased diversification rate. Furthermore, we describe the remarkable evolution of Callitris xylem during the aridification of Australia over the last 30 million years.

2011 **Master's degree - U. of Bordeaux**
Terrestrial Ecosystem Functioning and Modelling

2008 **Bachelor's Degree - U. of Orléans**
Organismal Biology

Outreach

2016 **"Three minute thesis" - MT180**
Final - U. of Bordeaux

2013 Larter M (2013). Le Pinetum de Bedgebury : « la plus belle collection de conifères du monde ». Jardins de France, 623. link