

Rowan Arthur Lymbery

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RESEARCH SKILLS

- **Practical skills:** field sampling, laboratory experimental design and execution, *in vitro* fertilizations, sperm competition assays, computer-assisted sperm analysis, sperm chemotaxis assays, fluorescent microscopy, quantitative genetic designs, multivariate selection designs.
- **Molecular genetic techniques:** RNA extraction, DNA extraction, Next-Generation Sequencing, RNA-Seq, transcriptomics, quantitative PCR, microsatellites, mitochondrial DNA, locus-specific genotyping, agarose gel electrophoresis, RNA/DNA QC.
- **Statistical techniques and data analyses:** statistical inference, generalized linear mixed-effects models, model selection and analysis, paired analyses, simulations, randomisation techniques, Bayesian analyses, quantitative genetic analyses, multivariate selection techniques, use and development of R code, bioinformatics.
- **Academic communication skills:** peer-reviewed research papers, review papers, conference and departmental presentations, science communication to media and non-specialist audiences (presentations, articles).

EDUCATION

- **PhD, Evolutionary Biology.** School of Biological Sciences, University of Western Australia (UWA). Completed 2018.
Thesis title: "Sexual selection and sperm-egg interactions in a marine broadcast spawner."
Supervisors: Associate Professor Jonathan Evans, Dr Jason Kennington.
Awarded Robert Street Prize for most outstanding thesis at UWA, and Deans List Honours.
- **Hons, Zoology.** School of Animal Biology, UWA. Completed 2012.
Thesis title: "Additive genetic variance and genotype-by-environment interaction underlie temperature tolerance of embryos in the sea urchin *Heliocidaris erythrogramma armigera*."
Supervisor: Associate Professor Jonathan Evans.
Academic record: First Class Honours, Research Project mark 89%, course GPA 7.000, weighted average mark (WAM) 88.375.
- **BSc.** UWA, completed 2011.
Academic record: course GPA 6.958, WAM 87.125, High Distinctions in 23 of 24 units, Distinction in one unit.
- **Secondary Education:** Western Australian Certificate of Education at Australind Senior High School (ASHS) 2007. Completed Tertiary Entrance Examinations with a rank of 99.6.

EMPLOYMENT HISTORY

- 2020-present **Postdoctoral Researcher** (*Full time*)
Center for Reproductive Evolution, Department of Biology, Syracuse University.
- 2018-2020 **ARC Research Associate** (*Full time*)
Centre for Evolutionary Biology, School of Biological Sciences, UWA
Skills: Planning and conducting research relating to mechanisms of sperm egg interactions and their selective outcomes in broadcast spawners. Skills include field collections, laboratory techniques (gamete collection and trials, molecular techniques), statistical analyses and bioinformatics, scientific writing, co-supervising Honours and PhD students.
- 2017 **Research Officer** (*Casual*)
Centre for Evolutionary Biology, School of Biological Sciences, UWA
Skills: Planning and conducting research relating to mechanisms of sperm egg interactions and their selective outcomes in broadcast spawners. Skills include field collections, laboratory techniques (gamete collection and trials, molecular techniques), statistical analyses and bioinformatics, scientific writing, co-supervising Honours student.
- 2015-2017 **Research Assistant** (*Casual*)
School of Animal Biology, UWA.
Skills: Fish husbandry, maintenance of experimental populations.
- 2014-present **Unit Demonstrator** (*Casual*)
School of Animal Biology, UWA.
Units: Behavioural Ecology, Sex in the Sea, Animal Populations, Evolutionary Genetics, Plant and Animal Biology.
Skills: Teaching theory, lab and field-based techniques, literature review skills, and statistical analyses. Marking undergraduate assignments and reports.
- 2013 **Biologist** (*Full time*).
Bennelongia Environmental Consultants.
Skills: Performing environmental impact assessments, writing reports, handling large datasets and databases.
- 2012 **Laboratory Assistant** (*Casual*)
School of Animal Biology, UWA.
Skills: Sorting marine invertebrate samples, classifying marine invertebrates, data entry.
- 2012 **Unit Demonstrator** (*Casual*)
School of Animal Biology, UWA.
Units: Behavioural Ecology.
Skills: Teaching literature review skills.
- 2008-2009 **Research Assistant** (*Part-time*)
Freshwater Fish Group and Fish Health Unit, Murdoch University.
Skills: Fish husbandry and maintenance, field sampling, laboratory dissections and measurements of fish and molluscs, data entry and analysis.

PUBLICATIONS

Evans, J. P. and Lymbery, R. A. (*In press*) Sexual selection after gamete release in broadcast spawning invertebrates. *Philosophical Transactions of the Royal Society B*. Accepted 9 June 2020.

Hadlow, J. H., Evans, J. P. and Lymbery, R. A. (2020) Egg-induced changes to sperm phenotypes shape patterns of multivariate selection on ejaculates. *Journal of Evolutionary Biology* **33**: 797–807.

Lymbery, R. A., Kennington, W. J., Cornwall, C.E. and Evans, J. P. (2019) Ocean acidification during pre-fertilization chemical communication affects sperm success. *Ecology and Evolution*, **9**:12302–12310.

Lymbery, R. A., Kennington, W. J. and Evans, J. P. (2018) Multivariate sexual selection on ejaculate traits under sperm competition. *American Naturalist*, **192**: 94-104.

Lymbery, R. A., Kennington, W. J. and Evans, J. P. (2017) Egg chemoattractants moderate intraspecific sperm competition. *Evolution Letters*, **1**: 317-327.

Evans, J. P., Lymbery, R. A., Wiid, K. S., Raman, M. M. and Gasparini, C. (2017) Sperm as moderators of environmentally induced paternal effects in a livebearing fish. *Biology Letters*, **13**: 20170087.

Lymbery, R. A., Kennington, W. J. and Evans, J. P. (2016) Fluorescent sperm offer a method for tracking the real-time success of ejaculates when they compete to fertilise eggs. *Scientific Reports*, **6**: 22689.

Lymbery, R. A. and Evans, J. P. (2013) Genetic variation underlies temperature tolerance of embryos in the sea urchin *Heliocidaris erythrogramma armigera*. *Journal of Evolutionary Biology* **26**: 2271-2282.

Klunzinger, M. W., Beatty, S. J., Morgan, D. L., Lymbery, R., Thomson, G. J. and Lymbery, A. J. (2011) Discovery of a host fish species for glochidia of *Westralunio carteri* Iredale 1934 (Bivalvia: Unionoidea: Hyriidae). *Journal of the Royal Society of Western Australia* **94**: 19-23.

TEACHING EXPERIENCE

- 2018-present **Co-supervisor of PhD**, along with A/Prof Evans and Dr Kennington, for Jessica Hadlow, examining context-dependent selection on gametes.
- 2018-present **Honours/Master Biological Sciences Research Presentation Skills, Tutorial Coordinator**.
Leading interactive lectures and feedback sessions on how to develop a research seminar.
- 2017-2018 **Co-supervisor of Honours Project**, along with A/Prof Evans and Dr Kennington, for Jessica Hadlow, examining multivariate selection on ejaculates in different environments.
- 2017-present **Sex in the Sea, Lecturer, Module Coordinator**, UWA, Semester 2
Lecturing on sexual selection and gamete interactions in marine systems. Practical class on gamete interactions.
- 2014-present **Undergraduate Mentor** for top student in Plant and Animal Biology, providing mentoring support through remainder of undergraduate degree
- 2012, 2014-present **Behavioural Ecology, Unit Demonstrator**, UWA, Semester 2.
Guiding students in undertaking literature reviews.
- 2014-present **Animal Populations, Unit Demonstrator**, UWA, Semester 1.
Field and laboratory-based ecological techniques, statistical analyses.
- 2014-2015 **Evolutionary Genetics, Unit Demonstrator**
Guiding student discussion groups and essay preparation on current topics in genetics and evolutionary biology.
- 2014 **Plant and Animal Biology, Unit Demonstrator**, UWA, Semester 2.
Laboratory techniques, animal classification.

GRANTS/FUNDING

- 2018 UWA School of Biological Sciences Strategic Funding, “Developing collaborations to explore the links between mitochondrial inheritance and sexual selection”.

AWARDS AND PRIZES

2018

- Robert Street Prize, awarded by the Board of the Graduate Research School for the thesis which has made the most outstanding contribution to its field in a given year (UWA)
- Deans List Honours, in recognition of an outstanding thesis (UWA).

2015

- Australasian Evolution Society Student Award supporting oral presentation place at Behaviour 2015 conference (Australasian Evolution Society).
- Best Postgraduate Presentation Prize at Research Day 2015 (School of Animal Biology, UWA)

2014

- Finalist and People’s Choice Award at Three Minute Thesis Competition (UWA).
- Bruce and Betty Green Postgraduate Research Top-Up Scholarship (UWA, *ongoing*).
- Hackett Postgraduate Scholarship (UWA, *ongoing*).

2012

- Hackett Foundation Alumni Honours Scholarship (UWA).
- Aubrey Nicholls Honours Prize in Zoology (UWA).
- Ernest Hodgkin Memorial Prize in Marine Science (UWA).

2011

- UWA Graduates Association Prize for Achievement in Genetics and Evolution (UWA).
- Harry Waring Memorial Prize in Zoology (UWA).

2010

- UWA Graduates Association Prize for Botany and Zoology (UWA).
- UWA Graduates Association Prize for Achievement in Vertebrate Zoology (UWA).
- G.E. Nicholls Prize in Zoology (UWA).
- UWA Graduates Association Prize for Achievement in Introduction to Ecology (UWA).

2009

- UWA Graduates Association Prize for Achievement, in Environmental Economics (UWA).
- UWA Graduates Prize for Biology, Botany, Zoology and Geography (UWA).
- Science Union Prize in Biology (UWA).

Awards from Secondary Education not listed; can be provided on request.

MEDIA/OUTREACH

- 2016 “IVF research: WA researchers track blue mussels reproductive success” Research on using sperm dyes to track competitive fertilizations in mussels featured on ABC Radio News, ABC Online and ABC Facebook 2015 “Sexual selection and sperm-egg interactions in a marine broadcast spawner” Research highlight on <http://australasianevolutionsociety.com/> for the Australasian Evolution Society.
- 2015 “Which sperm gets the chocolates?” Recording for the Science Show on ABC Radio National, Australia.
- 2015, “2014 UWA 3MT People’s Choice: A tale of two gametes - Rowan Lymbery.” Animation by 99Scholars, <https://www.youtube.com/watch?v=WsksFOg99vk>

INVITED PRESENTATIONS

- 2019 “Sperm competition and gamete interactions in a marine broadcast spawner”. **Monash University School of Biological Science Seminar Series**, Melbourne, Australia (May 24).
- 2016 “Sexual selection and sperm-egg interactions in a marine broadcast spawner”. **Scientists in Reproductive Technologies 2016**, Perth, Australia (September 3).

CONFERENCE/SYMPOSIUM PRESENTATIONS

- 2019 “Environmental effects on ejaculates and the consequences for offspring fitness”. **Australasian Evolution Society Meeting 2019**, Sydney, Australia (November 25-27).
- 2017 “Sperm competition, gamete choice and genetic mechanisms in a broadcast spawner”. **Australasian Evolution Society Meeting 2017**, Hobart, Australia (December 4-6).
- 2017 “Sperm competition and sperm-egg interactions in a broadcast spawner”. **Biology of Spermatozoa 2017**, Derbyshire, United Kingdom (September 4-8).
- 2015 “A Tale of Two Gametes: complex sperm-egg interactions in a marine broadcast spawner”. **Behaviour 2015**, Cairns, Australia (August 9-14).
- 2012 “Genetic variance in temperature tolerance and potential to adapt to ocean warming in *Heliocidaris erythrogramma armigera*” **Australian Marine Science Association Western Australia 9th Annual Student Workshop**, Rottneest Island, Australia (June 21-22).

INSTITUTIONAL/DEPARTMENTAL PRESENTATIONS

- 2018 “Sperm competition and gamete interactions in a marine broadcast spawner”. UWA School of Biological Sciences, Postgraduate Completion Seminar.
- 2017 “Methods of multivariate selection analysis” UWA Centre for Evolutionary Biology meeting.
- 2017 “Eau de Egg: egg chemoattractants bias sperm competition” UWA School of Biological Sciences Postgraduate Seminar Series.
- 2016 “A Tale of Two Gametes” Presentation of 3 Minute Thesis talk to UWA Senate.
- 2015 “Sex and the sea”, UWA School of Animal Biology Research Day 2015 *Smashing Silos*.
- 2015 “Green eggs and sperm, and other sexual selection stories” UWA School of Animal Biology Postgraduate Seminar Series.
- 2015 “A Tale of Two Gametes: complex sperm-egg interactions in a marine broadcast spawner” UWA Centre for Evolutionary Biology meeting.
- 2015 “Power and effect size simulations for paired data” UWA School of Animal Biology R Group meeting.
- 2014 “Sexual selection on gametes: sperm-egg interactions in a marine broadcast spawner” UWA Centre for Evolutionary Biology meeting and School of Animal Biology Postgraduate Seminar Series.
- 2012 “Genetic variance in temperature tolerance and potential to adapt to ocean warming in *Heliocidaris erythrogramma armigera*” UWA School of Animal Biology Honours Seminars.

PROFESSIONAL SOCIETY MEMBERSHIPS

- International Society for Behavioural Ecology, 2015-present.
- Australasian Evolution Society, 2015-present.
- Society for the Study of Evolution, 2014-present.
- Australian Society for the Study of Animal Behaviour, 2014-present.
- Australian Marine Science Association, 2012.

SERVICE TO UNIVERSITY

- Co-chair of UWA Centre for Evolutionary Biology meetings, 2015-2016.

Rowan Lymbery

- MC for UWA Three Minute Thesis Competition, 2015.
- Member and presenter at UWA School of Animal Biology R Group, 2014-2017.

OTHER RELEVANT EXPERIENCE OR ACHIEVEMENTS

- 2015, PAWSEY Introduction to Supercomputing and Introduction to Linux course.
- 2015, QFAB Extended RNA-Seq Analysis Course.
- 2015, BOC Gascare/Care with Cryogenics Safety Training.
- 2013, Oceans Research Internship in Mossel Bay, South Africa, assisting in practical data collection for research projects on white sharks, benthic sharks, cetaceans and pinnipeds.
- 2011, Volunteer for Department of Parks and Wildlife (DPAW) baseline survey of the Perup Sanctuary.
- 2011-present, Category 3 License to Keep Reptiles and Amphibians as Pets, granted by DPAW.
- 2008, Volunteer for the DPAW Woylie trapping program.

Referees

Associate Professor Jonathan P. Evans
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