

# Aimee Silla

**A**imee Silla is an amphibian reproductive biologist based at the University of Wollongong, Australia. She works to develop reproductive technologies for the conservation of anurans.



(ahead of the year of the frog), educating the public about Amphibian Declines and the urgent need to conserve amphibian species globally. I was drawn to the call and commenced a PhD project focussed on developing reproductive technologies for the conservation of Australian frogs, having no formal training in endocrinology or biotechnologies. Through hard work, perseverance, and a small dose of good fortune, I have developed reproductive technologies for an increasing number of threatened species. I recently brought together global experts to contribute to the publication of *Reproductive Technologies and Biobanking for the Conservation of Amphibians* (edited by Silla, Kouba & Heatwole)\*, this book provides a plat-

form for the continued advancement of the field. I believe that the expansion of research into new technologies and cooperative application of multi-disciplinary approaches, will promote the successful recovery of threatened amphibians.

### *What are you working on currently?*

My research is primarily focussed on developing Reproductive Technologies (RTs) for the recovery of threatened anurans (frogs and toads). RTs encompass a range of techniques that manipulate gametes for the purpose of controlling reproduction and enhancing fertility. My research includes developing hormone therapies to induce gamete-release, short-term gamete-storage, biobanking, and conducting in vitro fertilisations (IVF). I am also interested in comparative studies investigating response

\* Silla AJ, Kouba AJ, Heatwole H, eds. 2022. [Reproductive Technologies and Biobanking for the Conservation of Amphibians](#). Melbourne: CSIRO Publishing.

### *Tell us about your background. How did you first become interested in animal reproductive biology and conservation?*

I grew up on a rural property in Western Australia and knew from a very young age that I was passionate about wildlife. Entering high school my passions became more directed and I was unwavering in my desire to conserve native species and their habitats. I completed a Bachelor of Environmental Science, majoring in Zoology and Land and Water Management at the University of Western Australia. I then completed an honours degree in freshwater restoration ecology and was set to embark on a PhD project in the same field. Shortly before I was due to commence, funding for the project fell through and I needed to design an alternative research project. Fortuitously, the International Union for the Conservation of Nature (IUCN) had recently commenced a campaign



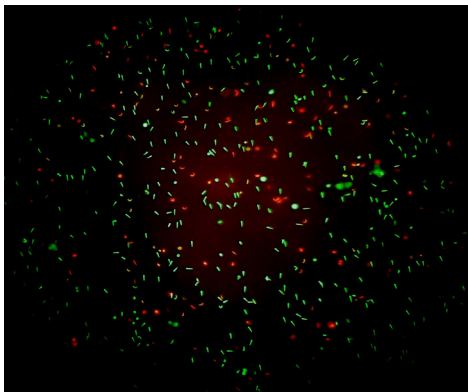
Top left box: Aimee Silla at a field site belonging to the University of Wollongong. Above left: A male critically endangered Booroolong frog, *Litoria booroolongensis*. Above right: Administration of reproductive hormones to a female critically endangered Southern Corroboree frog, *Pseudophryne corroboree*. (Image credits: Aimee Silla).

patterns among species, in order to expedite the application of RTs to novel species.

My research employs evolutionary theory to predict the outcomes of reproductive technologies. In particular, I am interested in investigating phenotypic indicators of male fertility, gamete adaptation to localised fertilisation environments, and how parental genetic incompatibilities affect fertilisation success and offspring viability.

#### *What does a typical day look like for you?*

Depending on the project, field observations and/or collection of wild frogs may be required. This involves entering the breeding site late at night, often during or after rainfall, on hands and knees in the mud to locate and collect frogs- I find nocturnal fieldwork simultaneously tiring and invigorating, witnessing the fascinating reproductive behaviours of species in their natural environment. Laboratory work typically involves administering reproductive hormones in the very early hours of the morning, followed by the collection of sperm using a small glass microcapillary tube gently inserted into the cloaca. Sperm are flushed from the cloaca in a mixture of urine known as spermic urine. Collection and assessment of sperm samples occurs over several hours ( $\geq 12$  hours) post hormone administration.



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#### *What do you most enjoy about your work?*

I am always excited to work with a new species and to marvel at the reproductive and phenotypic diversity of amphibians. I am grateful to be able to dedicate myself toward assisting with the conservation of biodiversity. Finally, I am fortunate to have forged partnerships with an incredible team of conservation practitioners with a shared passion for species recovery. Conservation activities are fraught with challenges, working with a team of dedicated, resilient people that never lose hope for success is inspiring.

*Left:* Using fluorescent microscopy to determine sperm viability (proportion of live/dead sperm) (image credit: Aimee Silla).

#### *What advice would you give to aspiring scientists in this area?*

Research isn't typically rewarded with instant gratification, you need to work hard, maintain motivation, and dedicate yourself with indelible persistence to your goals in order to succeed.

#### *Who are your scientific heroes?*

Charles Darwin, for having the courage to challenge the societal beliefs of his time and lay the foundations for generations of evolutionary biologists. Lazzaro Spallanzani, for performing the first recorded example of IVF almost 300-years ago, disproving 'spontaneous creation' and demonstrating that both frog eggs and semen were necessary for embryonic development. Lastly, Phillip Byrne, my long-standing collaborator who inspires and challenges me every day.

#### **Selected Publications from SEB or affiliated journals.**

Silla AJ, Calatayud NE, Trudeau, VL. 2021. [Amphibian reproductive technologies: approaches and welfare considerations](#). Conservation Physiology 9, coab011.

Silla AJ, McFadden MS, Byrne PG. 2019. [Hormone-induced sperm-release in the critically endangered Booroolong frog \(\*Litoria booroolongensis\*\): effects of gonadotropin-releasing hormone and human chorionic gonadotropin](#). Conservation Physiology 7, coyo80.

Silla AJ, Roberts JD, Byrne PG. 2020. [The effect of injection and topical application of hCG and GnRH agonist to induce sperm-release in the roseate frog, \*Geocrinia rosea\*](#). Conservation Physiology 8, coaa104.