

PhD Opportunities



CENTRE FOR
EVOLUTIONARY
BIOLOGY

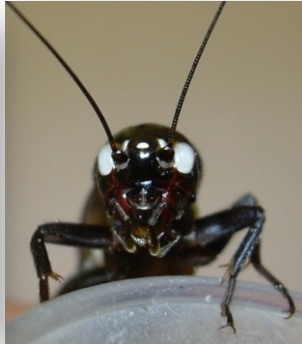
Two PhD candidates are sought for projects on **sexual selection, sexual conflict and the evolution of polyandry** in the **Centre for Evolutionary Biology, The University of Western Australia**, under the supervision of Australian Research Fellow Dr. Francisco Garcia-Gonzalez.

The evolution of polyandry: testing models and mechanisms

Polyandry (females mating with multiple males) allows sexual selection to continue after mating and plays an important role in sexual conflict. Consequently, understanding the adaptive significance of this behaviour is a major goal in evolutionary research. A key question for addressing models proposed to explain the maintenance of polyandry is whether male fertilization success is heritable. Furthermore, explaining the mechanisms underlying the evolution of polyandry is proving to be a major challenge. The project will address these questions and many more using suitable model systems (insects and other invertebrates) and exciting innovative experimental designs.

Paternal effects and sexual selection

A recent study has revealed trans-generational effects in the form of paternal effects (environmental influences on the offspring genotype that are due to the expression of genes in their fathers) determining juvenile viability in a cricket species (where the paternal contribution is limited to the transfer of the ejaculate to the female during mating). Such findings are suggestive of cross-generational benefits (beyond those strictly determined by genetic transmission) that could promote the evolution of polyandry. Further evidence for this contention has since been provided in the fruit fly, the archetypical model system for sexual conflict research. This project will focus on the mechanisms underlying paternal effects and their consequences for the outcome of sexual interactions and the evolution of female multiple mating using *Drosophila melanogaster*.



Further reading:

- Garcia-Gonzalez & Evans. 2011. Fertilization success and the estimation of genetic variance in sperm competitiveness. *Evolution*, 65: 746-756.
- Garcia-Gonzalez. 2011. Sexual Selection and Experimental Evolution. In: *Encyclopedia of Life Sciences (ELS)*. John Wiley & Sons.
- Garcia-Gonzalez & Simmons 2010. Male-induced costs of mating for females compensated by offspring viability benefits in an insect. *J Evol Biol*, 23: 2066-2075.
- Garcia-Gonzalez F & Simmons LW. 2007. Paternal indirect genetic effects on offspring viability and the benefits of polyandry. *Curr Biol*, 17: 32-36.
- Garcia-Gonzalez F. 2008. The relative nature of fertilization success: implications for the study of post-copulatory sexual selection. *BMC Evol Biol*, 8:140.

Candidates are required to be highly motivated and have an interest in evolutionary biology research. They need to be competitive for an Australian Postgraduate Award or international scholarships (see www.ceb.uwa.edu.au/opportunities and www.scholarships.uwa.edu.au/home/postgrad). Funding to the projects is provided by the Australian Research Council and The University of Western Australia. Some components of the work will involve collaborative work with local, national or international researchers. The **Centre for Evolutionary Biology** (www.ceb.uwa.edu.au) offers a highly interactive and stimulating environment where excellence in research and training to achieve independence in the academic career are promoted.

Expressions of interest and CV detailing relevant experience and academic grades should be directed to paco.garcia@uwa.edu.au.



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