PhD Research Proposal Form
China Scholarship Council (CSC) - ENS Group

FIELD: Biology

Thesis subject title: **Studying the genetic basis of male-female co-evolution in water striders**

Name of the French doctoral school: Biologie Moléculaire Integrative et Cellulaire (BMIC)

Name of the Research team: Developmental Genomics and Evolution

Website: https://igfl.ens-lyon.fr/equipes/a.-khila-developmental-genomics-and-evolution

Name of the Supervisor: Abderrahman Khila

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Lab Language: English

Research Proposal Abstract: Males and females share most or all of the genome yet their evolutionary interests are rarely aligned resulting in widespread evolutionary conflict (Arnqvist and Rowe, 2005). Sexual conflict manifests as sexually antagonistic selection favoring different values of expression, in each sex, of traits for which the sexes share the genetic basis. Despite its ubiquity, few studies have addressed the impacts of sexual conflict on genome evolution. Consequently, our understanding of how sexually antagonistic selection favors the spread of alleles with sex-specific benefits in natural populations, as well as their developmental genetics and intersexual coevolutionary dynamics is limited. This PhD project will determine the genes involved in the development male and female co-evolving traits (Pruvôt et al. 2024). This will be done using state of the art techniques including comparative transcriptomics, analyses of gene expression using hybridization chain reaction, RNA interference (Khila et al. 2012; Pruvôt et al. 2024) or Crispr/Cas9 genome editing techniques.

References :

- Arnqvist, G., Rowe, L., 2005. Sexual conflict. Princeton University Press, Princeton, N.J.
- Khila, A., Abouheif, E., Rowe, L., 2012. Function, developmental genetics, and fitness consequences of a sexually antagonistic trait. **Science** 336, 585-589.
- Pruvôt, C., Armisen, D., Roux, P., Arnqvist, G., Rowe, L., Husby, A., Khila, A., 2024. A shared genetic basis for sexually antagonistic male and female adaptations in the toothed water strider. **Evolution Letters**.

Type of PhD :

1.Full PhD

- Regular PhD (leading to a single French diploma) : YES