Developmental genetics and adaptive bases of a major ecological transition - How to walk on water!

Fact Sheet

Project Information

WATER WALKING

Grant agreement ID: 628644

Project closed

Start date	End date
1 April 2015	31 March 2017

Funded under
Specific programme "People" implementing the Seventh Framework Programme of the European Community for research, technological development and demonstration activities (2007 to 2013)

Total cost
€ 194 046,60

EU contribution
€ 194 046,60

Coordinated by
ECOLE NORMALE SUPERIEURE DE LYON
France

Objective

Evolutionary developmental biology has provided invaluable contributions to our understanding of the relationship between genotypic and phenotypic change. Similarly, evolutionary ecology greatly advanced our understanding of the relationship between the phenotype and the environment. To fully understand the evolution of the organismal diversity, a thorough integration of these fields is required, and this remains highly challenging. Semi-aquatic insects (Heteroptera, Gerromorpha) have conquered water surfaces worldwide and represent by far the dominating group of insects in these habitats. Their well-understood ecology of adaptation constitutes the necessary foundation for integrative studies.

We will dissect the developmental genetic basis of key morphological adaptations associated with the ecological transition from ground to water surfaces. A morphological character that has been critical to this transition is the evolution of hydrophobic bristles, whose density, morphology, and orientation, allow the trapping of air at the leg–water interface. A second spectacular adaptation, that followed this invasion, is the occupation of running waters by some members of the family Veliidae. This was facilitated by the evolution of a swimming fan on the tarsus of the propelling mid-legs, which greatly enhances their movement on running waters.

The objective of this project is to develop a multi-level approach to study how the interplay between developmental genetic pathways and the ecological environment can drive morphological evolution. We will take full advantage of the unique foundation in terms of ecology, diversity, and technical tractability that water-walking insects offer, combined with the use of next generation sequencing along with assays of gene function and organismal fitness. This approach is a critical step forwards in evo-devo and will provide a coupling of molecular function to concrete measure of fitness associated with the phenotype.

Fields of science (EuroSciVoc) ℹ

natural sciences > biological sciences > **genetics**

natural sciences > biological sciences > **developmental biology**

natural sciences > biological sciences > ecology > **evolutionary ecology**

natural sciences > biological sciences > zoology > **entomology**

ℹ

Programme(s)

FP7-PEOPLE - Specific programme "People" implementing the Seventh Framework Programme of the European Community for research, technological development and demonstration activities (2007 to 2013)

Topic(s)

FP7-PEOPLE-2013-IEF - Marie-Curie Action: "Intra-European fellowships for career development"

Call for proposal

FP7-PEOPLE-2013-IEF
See other projects for this call

Funding Scheme

MC-IEF - Intra-European Fellowships (IEF)

Coordinator

ECOLE NORMALE SUPERIEURE DE LYON

EU contribution

€ 194 046,60

Total cost

No data

Address

PARVIS RENE DESCARTES 15
69342 Lyon
France

Region

Auvergne-Rhône-Alpes › Rhône-Alpes › Rhône

Activity type

Higher or Secondary Education Establishments

Links

Contact the organisation
Participation in EU R&I programmes
HORIZON collaboration network

Last update: 26 June 2017

Permalink: https://cordis.europa.eu/project/id/628644