

UMR7261

**ECOLOGY AND
ENVIRONMENT**

IRBI

INSECT BIOLOGY RESEARCH INSTITUTE

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The IRBI is dedicated to the analysis of insect interactions with their biotic and abiotic environment. The diversity of skills has been perpetuated since the creation of the institute (1961) by bringing together under one roof a number of researchers and faculty members from different disciplines (ecology, physiology, genetics, chemistry, physics, bioinformatics and mathematics), making the IRBI a rare place with an asserted international identity on insect sciences.

To understand the puzzle of life and to face the complexity of biological systems, their functioning and their evolution, the IRBI thus implements a resolutely integrative approach at the interface of organismal biology, ecology and evolutionary biology. The areas of transfer range from biological control for a sustainable agriculture to the development of new technologies for the control of vector and invasive insects in both urban and natural environments, as well as biomimicry or the production of insects for feed and food.

The red-veined darter (*Sympetrum fonscolombii*) © Mike Caffrey

RESEARCH TOPICS

IMIP TEAM - BIODIVERSITY AND FUNCTIONING OF MICROORGANISM / INSECT / PLANT INTERACTIONS

- Understand insect parasitic strategies and the role of their associated symbiotic viruses and bacteria
- Characterize biodiversity and interaction networks around insects through environmental genomic approaches

ESORE TEAM - SOCIAL EVOLUTION AND RESPONSES TO THE ENVIRONMENT

- Explain the evolution of social behaviors and the transitions from a solitary life to integrated societies
- Determine insect response to environmental stresses and the consequences on insect diversity and associated ecosystem services

INOV TEAM - ORGANISMS-ENVIRONMENT INTERACTIONS AND RESPONSES TO GLOBAL CHANGES

- Understand the physical, physiological, and ecological mechanisms of environmental interactions at the individual scale
- Integrate these mechanisms to better predict insect response to global changes

CROSSCUTTING THEME - FOOD AND HEALTH STRATEGIES FOR TOMORROW

- Explore the potential of insects as food and feed as well as their potential for entomoconversion of organic matter through 4 axes:
 - reproduction strategies
 - prevention of health risks
 - optimization of rearing systems
 - metabolism, standards and traceability

EXPERIMENTS

The IRBI has several experimental platforms including:

- a chemical ecology platform
- an evolutionary ecology and functional genomics platform
- a physical ecology and optical metrology platform
- a behavioral ecology and sensory ecology platform
- a functional ecology and thermal biology platform

The institute is also equipped with an insectarium, numerous rearing and highly controlled environment facilities.

TRAINING

The IRBI promotes and encourages students who are pursuing a scientific career through master's and PhDs programs covering the multiple facets of evolutionary and integrative biology with insects as a preferred model.

It develops and participates in:

- a master's degree in Behavioral Ecology, Evolution and Biodiversity
- a Master's degree in Biology-Agrosciences for professional purposes in animal production and food processing
- a European doctoral training in Insect Sciences

COLLABORATIONS

The IRBI leads and participates in many research programs with (inter-)national academic partners.

The IRBI also addresses societal issues through a series of research programs with industries, local authorities, foundations and associations. Resolutely oriented towards international collaborations, the Institute is also developing links with local actors for the conservation of the exceptional natural heritage of the Loire Valley. The IRBI is a founding member of the EntomoCentre network bringing together research forces and regional non-academic structures on entomology.

KEY FIGURES

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CNRS researchers

29

faculty members

13

support staffs

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