Behavioral ecology

Master in Life Science, ENS
Bio-M2_E11 | Behavioral Ecology
Year and Semester: M2 | S1
Where: ENS, Biology department
Duration: 30 hours
First and last day of class: November 13 to November 17
Hours: 09:00-12:00 | 14:00-17:00
Maximum class size: 20 students
This course is open to external students. Contact: galliard@bio.ens.psl.eu

Coordination

Jean-François Le Galliard (galliard@bio.ens.psl.eu), Département de biologie, CEREEP-Ecotron IleDeFrance et CNRS, UMR 7618, iEES Paris and Jean-Baptiste André (jeanbaptisteandre@gmail.com), Département d'Etudes Cognitives et CNRS, Institut Jean Nicod

Credits

3 ECTS

Keywords

Behavioral ecology | cooperation | sexual selection | habitat choice | ethology | communication | cultural evolution

Course prerequisites

The targeted audience is advanced undergraduates and graduate students in ecology, evolutionary biology, ethology and cognitive science or related fields, with experience and a strong interest in animal behavior. Participants trained in other fields are welcome provided they had exposure to basic notions of ecology and evolutionary biology.

Course objectives and description

Behavioral ecology is a scientific discipline interested in describing patterns of natural variation in animal behavior and understanding proximate and ultimate causal mechanisms of behavioral variation among individuals, populations and species. This discipline is based on the scientific and methodological foundations of ethology, the science of behavior, and uses observation, experimentation and mathematical modeling approaches in evolutionary biology to understand animal behavior, particularly the role of ecological interactions in the expression and evolution of behavior.

Aims and themes: This course will introduce the basic concepts and methods of behavioral ecology (characterization of animal behaviors and ethology, concepts and methods in analysis of animal communication, proximal and ultimate causes of animal behavior, optimization and game theory). This general framework will be applied to the study of different types of animal behaviors such as cooperation and conflict, sexual selection, dispersal and habitat selection, communication and cultural evolution, and global change ecology. One session will be dedicated to practical work on behavioral data.

Organization: This is an intense week-long course with lectures and a practical session.

Date		Topic	Instructor	Online/Room
Monday Nov 13	9-12	Lect. 1. Behavioral ecology, animal communication and cultural evolution	Jean-François Le Galliard	
	2-5	Lect. 2. Ecophysiology and animal behavior	Jean-François Le Galliard	
Tuesday Nov 14	9-12	Lect. 3. Cooperation and conflicts inside families	Jean-Baptiste André	
	2-5	Lect. 4. Cooperation and conflicts outside families	Jean-Baptiste André	
Wednesday Nov 15	9-12	Lect. 5. Animal personalities	Jean-François Le Galliard	
	2-5	Practical. Ethology with Rethomics	Jean-François Le Galliard	
Thursday Nov 16	9-12	Lect. 6. Sexual conflicts	Jean-François Le Galliard	
	2-5	Lect. 7. Dispersal, habitat choice and optimal foraging	Jean-François Le Galliard	
Friday Nov 17	9-12	Lect. 8. Behavioral thermoregulation	Jean-François Le Galliard	
	2-5			

Assessment

Student evaluation is based on a synthesis and presentation of a research article.

Course material

Online presentations, articles, and textbook readings will be made available to enrolled students. Enrolled students are encouraged to check access to course site and course material on Moodle prior to the start of the training week.

Suggested readings

- Danchin, E. G., Giraldeau, L. A., & Cézilly, F. (2008). Behavioural ecology (p. 872). Oxford University Press.
- Davies, N. B., Krebs, J. R., & West, S. A. (2012). An introduction to behavioural ecology. John Wiley & Sons.
- Piersma, T., & Van Gils, J. A. (2011). The flexible phenotype: a body-centred integration of ecology, physiology, and behaviour. Oxford University Press.