

Chemische Ökologie (Chemical Ecology)

Earliest possible year	M.Sc 1 st year or later
Duration	Entire Semester
Credits	3 ECTS, 2 SWS
Course level	M.Sc
Examination	No
Requirement for attending exam	No
Teaching	Lectures held at the University of Hohenheim
Block Placement	Entire Semester, every winter semester
Teaching Language	German/English
Mandatory prerequisites	Complete B.Sc or similar certification (e.g. German Vordiplom) Basic knowledge in ecology (especially Animal ecology), basic knowledge in chemistry
Restrictions	No
Areas of competence the course will address	Advanced knowledge about the complex ways of ecological interactions mediated by chemical cues and the impacts on the evolution of species.
Objectives	The course focuses on the role of chemical cues in the interaction of individuals of one specie or between species. This includes, among others, finding of mating partners, communication between social animals (especially social insects), prey-predator interactions and host-parasit/parasitoid interactions. Also long-term effects of this communication on ecosystems and the evolution of species are discussed.
Contents	Basics of Chemical Ecology: What is Chemoecology? What are Infochemicals? Methods of Chemoecology; Sexual Pheromones: mate finding and impact of the fitness of individuals? Aggregation Pheromones: Why are they used and what are the benefits? Spacing or epidotic Pheromones: Host marking Pheromones/Ovipostion deterring Pheromones. Recognition Pheromones: Nest mate recognition, Kin recognition, Individual recognition, Pheromones in Social Animals: The use of pheromones in social interactions between animals including mammal and insect examples. Recognition, recruiting and alarm pheromones. Kairomones: Prey-Predator and Host-Parasite Interactions; Allomones: Toxins and other chemical defence mechanism. Synomones: Their role in plant-insect interactions. Perception of Infochemicals: Sensory organs in insects and vertebrates. Localisation of odour sources. Chemical Ecology of humans: are humans able to communicate with chemical substances? What Chemicals are used? Is their any impact on human behaviour? Are there other ways for humans to use Infochemicals?

Teaching and learning methods

Lectures, discussions about topics of interest

Literature

Harborne, 1995, Ökologische Biochemie, Spektrum;
Hilker, M., Meiners, T. 2002. Chemoecology of insect eggs and egg deposition. Blackwell.
Schoonhoven, L. M., T. Jermy, J.J.A. van Loon. 1998. Insect Plant biology. Chapman & Hall.
Tristram D. Wyatt 2003. Pheromones and Animal Behaviour: Communication by Smell and Taste. Cambridge University Press, Cambridge, UK.

Responsible

Prof. Dr. Johannes Steidle; jsteidle@uni-hohenheim.de;
Phone: 0711/45923667, FG Tierökologie 220c, Institut für Zoologie, Fakultät Naturwissenschaften

Home Page

University Homepage of Prof. Steidle contains all powerpoint-presentations of the lecture as PDF, password protected.

Scope

Lectures	28 h
Preparation/self-study	56 h
Sum	84 h

Seminar zur Chemischen Ökologie (Seminar Chemical Ecology)

Earliest possible year	M.Sc 1 st year or later
Duration	Entire Semester
Credits	3 ECTS, 2 SWS
Course level	M.Sc
Examination	Oral presentation in English, held alone or in a small group
Requirement for attending exam	Regular attendance
Teaching	Presentation made by the students, including a discussion Introduction on how to you make a presentation?
Block placement	Entire Semester, every winter semester
Language	German/English
Mandatory prerequisites	Complete B.Sc or similar certification (e.g. German Vordiplom) Basic knowledge in ecology (especially Animal ecology), basic knowledge in chemistry
Restrictions	around 28 students
Areas of competence the course will address	Working with primary literature (papers) and reviews; Independent work on topics of chemical ecology; Presentation of results in a short talk?
Objectives	How do I present my work to an audience? The does and don'ts of a talk, Getting used to presentation in English. Independent research on a scientific field, How do I read papers and reviews? Critical discussion of talks, Insight into contemporary research on the field of Chemical Ecology
Contents	Several fields of interest, changing every year Examples from previous years: - Toxin of marine vertebrates and evertebrates - Toxins of snakes - Aggregation Pheromones of Bark beetles - Host-Parasitoid Interactions
Teaching and learning methods	Seminar
Literature	Various journals and books of chemo ecology and related topics e.g.:Harborne, 1995, Ökologische Biochemie, Spektrum Hilker, M., Meiners, T. 2002. Chemoecology of insect eggs and egg deposition, Blackwell.

Schoonhoven, L. M., T. Jermy, J.J.A: van Loon. 1998. Insect Plant biology. Chapman & Hall.

Tristram D. Wyatt 2003. Pheromones and Animal Behaviour: Communication by Smell and Taste. Cambridge University Press, Cambridge, UK.

Responsible

Prof. Dr. Johannes Steidle; jsteidle@uni-hohenheim.de; 0711/45923667
Dr. Till Tolasch; tolasch@uni-hohenheim.de; 0711/ 45924069
FG Tierökologie 220c, Institut für Zoologie, Fakultät Naturwissenschaften

Scope

Seminar	28h
Presentation	½ h
Preparation/self-study	10h
Sum	38,5h

Laborpraktikum Chemische Ökologie (Practical course in Chemical Ecology) (12 ECTS)

Earliest possible year	M.Sc 1 st year or later
Duration	Blocked, 6 weeks, entire afternoon
Credits	12 ECTS; 8 SWS
Course Level	M.Sc
Examination	Two written report on the topics of the course, talk about the outcomes of the research project
Requirement for attending exam	Regular attendance, max. miss 10% of time
Teaching	lectures, discussions, practical work with methods of Chemical Ecology (Bioassays, methods of analytical chemistry), Independent research on topics of Chemical Ecology, Introduction to laboratory work and statistics
Block Placement	end October to end of November
Teaching Language	German/English
Mandatory Prerequisites	Complete B.Sc or similar certification (e.g. German Vordiplom) Basic knowledge of ecology/chemoecology It is useful to also attend to the parallel lecture "Chemische Ökologie"!
Restrictions	12 places
Areas of competence the course will address	Create and test hypotheses, design of experiments, literature studies, statistical methods, ability to write paper-like reports
Course Contents	Methods of Chemical Ecology; How to perform hypothesis driven research; Bioassays and other behavioural studies; Chemical analysis methods like GC-MS. Own 4 week research project, statistical methods used in ecology to analyse collected data.
Teaching and learning methods	Experiments and analyses of experiments, short talks on certain topics prepared by the students, all done in small groups, introduction to each experiment and to statistical methods, discussion about the obtained data, written report
Literature	Harborne, 1995, Ökologische Biochemie, Spektrum; Hilker, M., Meiners, T. 2002. Chemoecology of insect eggs and deposition. Blackwell. egg

Schoonhoven, L. M., T. Jermy, J.J.A: van Loon. 1998. Insect biology. Chapman & Hall. Plant
Tristram D. Wyatt 2003. Pheromones and Animal Behaviour: Communication by Smell and Taste. Cambridge University Press, Cambridge, UK.

Course Responsible

Prof. Dr. Johannes Steidle; jsteidle@uni-hohenheim.de;
0711/45923667
Dr. Till Tolasch; tolasch@uni-hohenheim.de; 0711/ 45924069
FG Tierökologie 220c, Institut für Zoologie, Fakultät Naturwissenschaften

Course Scope

Practicals	120h
Report	10h
Sum	130 h