

Entomopathogenic Nematodes: Biotechnology and Use in Biological Control (C002801)

Course size (nominal values; actual values may depend on programme)

Credits	3.0	Study time	90 h	Contact hrs	50.0 h
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Course offerings and teaching methods in academic year 2018-2019

A (semester 2)	English	lecture	40.0 h
		practicum	10.0 h

Lecturers in academic year 2018-2019

Ehlers, Ralf-Udo	WE11	lecturer-in-charge
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Offered in the following programmes in 2018-2019

	crdts	offering
International Master of Science in Agro- and Environmental Nematology	3	A

Teaching languages

English

Keywords

Biotechnology, Steinernema, Heterorhabditis, Mass Production, Breeding, Use in Biocontrol

Position of the course

Rhabditid nematodes are antagonists of insects and slugs in agriculture ecosystems. The aim of this course is to provide knowledge and skills in the biotechnology of entomopathogenic *Steinernema* and *Heterorhabditis* and their associated bacteria, the ecology and behaviour of EPN and in the use of these nematode in control of insects and slugs.

Contents

- The course teaches details in the biology of entomopathogenic nematodes (EPN) necessary to understand biotechnical production strategies in liquid culture. It will introduce into isolation and production of symbiotic bacteria, production of monoxenic nematode cultures, scaling-up EPN liquid culture, harvest, storage and formulation technology and breeding of EPN to improve beneficial traits. Knowledge in EPN ecology and behaviour will be provided necessary to understand their mode of action and efficacy of EPN as biological control agents. Further the lectures will introduce into the use of nematodes against insects in agro-environments, including information on adapted application technology, risk assessment and regulation.

During the practical, participants will learn how to isolate symbiotic bacteria and distinguish phase variants and contaminants. The student will learn how to prepare monoxenic cultures. Simple experiments will be conducted to understand behaviour of nematodes and their resistance to environmental stress. During a visit to a liquid culture plant in Germany students will be introduced into the commercial production and commercialisation of EPN.

Initial competences

The student should have good knowledge of general nematology and techniques in nematology and a basic understanding of biology of EPN, which is provided in the 1st year's courses.

Final competences

- Assess, interpret and compare behaviour and ecology of EPN.
- Knowledge and application of mass production of EPN: harvest, storage and formulation technology.
- Understand the principles of the use EPN in horticulture, agriculture and forestry.

4 Knowledge and application of risk assessment and regulation of EPN in biocontrol.

Conditions for credit contract

Access to this course unit via a credit contract is determined after successful competences assessment

Conditions for exam contract

This course unit cannot be taken via an exam contract

Teaching methods

Lecture, practicum

Extra information on the teaching methods

Classroom lectures (always followed by a brief interactive discussion) and an extensive guided practicum.

Learning materials and price

Lecture material, publications and reviews, living material. Cost: 5 EUR

References

Gaugler, R. ed. (2002): Entomopathogenic Nematology. CAB International Publisher, Wallingford, UK, pp. 388. Grewal, P.S., Ehlers, R.-U., Shapiro-Ilan, D.I., eds. (2005): Nematodes as Biocontrol Agents. CAB International Publisher, Wallingford, UK, pp. 505

Course content-related study coaching

Lecturers, Seminars and Practicals: Ralf-Udo Ehlers

Evaluation methods

end-of-term evaluation

Examination methods in case of periodic evaluation during the first examination period

Written examination, oral examination

Examination methods in case of periodic evaluation during the second examination period

Written examination, oral examination

Examination methods in case of permanent evaluation

Possibilities of retake in case of permanent evaluation

not applicable

Extra information on the examination methods

Written or oral examination.

Theory: Periodic evaluation during lectures and practical session.

Calculation of the examination mark

An oral or written examination will evaluate whether the student disposes of the necessary basic knowledge and whether he/she is able to use it.