GHENT UNIVERSITY

Course Specifications

Valid as from the academic year 2018-2019

Entomopathogenic Nematodes: Taxonomy and Biology (C003107)

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

Credits 3.0	Study time 90 h	Contact hrs	50.0 h

Course offerings and teaching methods in academic year 2018-2019

A (semester 2)	English	practicum	15.0 h
		lecture	35.0 h

Lecturers in academic year 2018-2019

Ehlers, Ralf-Udo	WE11	lecturer-in-charge

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

Rhabditida, Taxonomy, Biology, Entomopathogenic Nematodes, *Steinernema*, *Heterorhabditis*, Symbiotic Bacteria, *Phasmarhabditis hermaphrodita.*

Position of the course

The course is compulsory for those students who choose the Agro-ecosystem module and is given in the 2nd semester, so that the students have acquired the knowledge obtained from the general courses given in the 1st semester.
Rhabditid nematodes are antagonists of insects and slugs in agriculture ecosystems. The aim of this course is to provide knowledge and skills in the taxonomy and biology of entomopathogenic nematodes (*Steinernema and Heterorhabditis*) and the slug parasitic nematode *Phasmarhadbitis hermaphrodita*. The phoretic, trophic and mutualistic relations with associated bacteria will be described.

Contents

- The course will introduce into the taxonomy of rhabditid entomopathogenic nematodes. It will provide knowledge in classical taxonomic methods based on morphometric characters of dauer juveniles and males. Molecular-genetic approaches will be presented. Rhabditid nematodes are feeding on bacterial cells. Entomopathogenic nematodes have a close symbiotic relation with specific enterobacteria of the genera *Xenorhabdus and Photorhabdus*. The lecture will introduce into the taxonomy and biology of the nematodes and their symbiotic bacteria of entomopathogenic nematodes (EPN).
- During the practical, participants will learn how to isolate EPN from infected insects and will be introduced into basic taxonomic skills. Each student will receive a strain of an EPN and learn how to reproduce it on host insects. The strain will then be identify by comparing morphological and morphometric characters of dauer juveniles and male adults of different species. Students will learn to differentiate the developmental stages during the life cycle.

Initial competences

The student should have good knowledge of general nematology and techniques in identification of nematodes by morphological characters, which is provided in the 1st year's general courses.

Final competences

1 Advanced knowledge of taxonomic methods to distinguish different species of EPN.
2 Practical skills in in vivo reproduction of EPN.
3 Practical skills in taxonomic identification of EPN.

4 Advanced knowledge in the biology of EPN and symbiotic bacteria.
5 Knowledge in use of EPN in pest control.
6 Knowledge in in vitro production methods.

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

Guided self-study, lecture, practicum

Extra information on the teaching methods

Lectures and practicals providing the fundamental information necessary to fulfill the self-guided assignment.

Learning materials and price

Lecture material, publications and reviews, living material and preserved nematode material.

References

Grewal, P.S., Ehlers, R.-U., Shapiro-Ilan, D.I., eds. (2005): Nematodes as Biocontrol Agents. CAB International Publisher, Wallingford, UK, pp. 505
Nguyen, K. B. and Hunt (2007): Entomopathogenic Nematodes: Systematics, Phylogeny and Bacterial Symbionts. Nematology Monographs and Perspectives. Brill, Leiden, NL, pp. 816

Course content-related study coaching

Classroom lectures, guided lab sessions and self-organised lab work. Discussion of progress and results via electronic contact with lecturer

Evaluation methods

end-of-term evaluation and continuous assessment

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

Oral examination

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

Oral examination

Examination methods in case of permanent evaluation

Assignment

Possibilities of retake in case of permanent evaluation

examination during the second examination period is possible

Extra information on the examination methods

Non periodic bound evaluation (30%) during lectures and self-organised lab work and at the end of a chapter. Searching for the knowledge that is acquired and exploration of self-collected information.
Period bound: 70%

Calculation of the examination mark

A period bound oral examination and discussion will evaluate whether the students dispose of the necessary basic knowledge and whether they are able to use it. The students will identify nematode species and prepare a report on their results, which will be discussed during the examinations (50%). Oral examination will check the knowledge provided during the lectures (50%).