Biodiversity – Plant Evolution and Vegetation Analysis					
Identification number	Workload	Credit points	Term of studying	Frequency of occurence	Duration
MN-B-SM (E 7)	360 h	12 CP	1st or 2nd term of studying	each term, 2nd half	7 weeks

1	Type of lessons	Contact times	Self-study times	Intended group size
	a) Lectures	10 h	20 h	max. 4
	b) Practical/Lab	160 h	142 h	max. 4
	c) Seminar	4 h	24 h	max. 4

2 Aims of the module and acquired skills

Students who successfully completed this module …

- have acquired detailed knowledge about the biodiversity of selected algal groups (Higher Plants, Vaucheria, Desmidiaceae) as well as on evolutionary processes such as speciation, and their translation into classification systems.
- are able to work in the field and laboratory on their own using techniques to study plant and algal biodiversity
- are able to apply advanced techniques of light microscopy (confocal laser scanning microscopy), DNA extraction, PCR, sequencing and molecular phylogenetic analyses.
- can independently carry out small scientific projects related to the topic of the module.
- have learned to present research results in oral and written form and to critically discuss scientific publications related to the topic of the module on a professional level.
- are able to transfer skills acquired in this module to other fields of biology.

3 Contents of the module

- Biodiversity and species concepts
- Analysis of plant vegetation
- Plant and algal evolution and phylogeny
- Taxonomy, systematics, botanical nomenclature
- Standard and advanced techniques of light microscopy (Nomarski interference contrast an confocal laser scanning microscopy)
- Sequencing of DNA, work with sequence databases (GenBank, EMBL, BLAST) and alignment programs
- Phylogenetic analyses of molecular and morphological characters, interpretation of phylogenetic trees

4 Teaching/Learning methods

- Lectures; Practical lab and field work; Seminar; Guidance to independent research; Training on presentation techniques in oral and written form

5 Requirements for participation

Enrollment in the Master´s degree course “Biological Sciences”

6	Type of module examinations The final examination consists of three parts:Two hours written examination about topics of the lectures and the practical/lab part (50 % of the total module mark), oral presentation (25 % of the total module mark) and seminar paper(25 % of the total module mark)
7	Requisites for the allocation of credits Regular and active participation; Each examination part at least "sufficient" (see appendix of the examination regulations for details)
8	Compatibility with other Curricula None
9	Significance of the module mark for the overall grade 15 % of the overall grade (see also appendix of the examination regulations)
10	Module coordinator Dr. Linne von Berg, phone 470-2463, e-mail: linnevonberg@uni-koeln.de
11	Additional information Subject module of the Master´s degree course "Biological Sciences", Focus of research: (E) Ecology and Evolution Participating faculty: Dr. K.-H. Linne von Berg, Dr. B. Marin Literature: • Graur, D., Li, W.H. (2000) Fundamentals of Molecular Evolution. 2nd edition, Sinauer Associates; in preparation for the module: Chapter 1, chapter 4 (up to p. 139) and chapter 5 (up to p. 182) • Graham, L. E., Graham J. M., Wilcox, L. W. (2009) Algae. 2nd edition, Pearson; in preparation of the module: Chapters 1, 5, 16 • Barton, N. H., Briggs, D. E. G., Eisen J. A., Patel N. H. (2007) Evolution, Cold Spring Harbor Laboratory Press; in preparation for the module: Chapters 22 and 27 (Chapter 27: http://www.evolution-textbook.org) • Further primary literature will be handed out during the module. General time schedule: Week 1-4 (Mon.-Fri.): Lectures and practical/lab including field excursions; Week 5-6 (Mon.-Fri.): Writing seminar paper and preparation for the seminar talk (held at the end of week 6); Week 7 (Mon.-Fri): Preparation for the written examination Note: The module contains hand-on laboratory work conducted by small groups of students and is taught in course rooms and research laboratories. Additionally several field excursions are included in the module. The module does not contain computer-based practicals/research as a main component. Introduction to the module: May 25, 2020 at 10 a.m., Cologne Biocenter, room 4.502 (fourth floor) Written examination: July 17, 2020, second/supplementary examination August 28, 2020; the latter date may vary if students and module coordinator agree. More details will be given at the beginning of the module.