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**Curriculum Vitae**  
**DR. CHRISTIAN SCHULZ**

**Date of birth:** 14.02.1975 **Place of birth:** Bochum (Germany)

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**Research focus**

Anatomy, morphology, biogeography, phylogeny, and evolution  
of land plants

**Office address**

Ruhr-Universität Bochum (RUB)  
Biology and Biotechnology  
Evolution and Biodiversity of Plants  
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**Home address**

Auf dem Jäger 62  
44892 Bochum  
Tel.: 0234.9826375

## Professional background

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- since 4.2008      **Research associate** for teaching and research. Establishment and management of the research projects "Evolution and biogeography of *Selaginella*" and "Biogeography of conifers" at the Institute for Evolution and Biodiversity of Plants, **Ruhr-Universität Bochum (RUB)**;
- 11 – 12.2012, 6 – 11.2013 parental leave
  - 3.2016 **Invited associate professor** at the **Muséum National d'Histoire Naturelle** (Paris, France).
- 2.2007 – 3.2008      **Research associate** in the project "Evolution of the seed" at the Plant Genomics Consortium, **The New York Botanical Garden** (New York City, USA)  
Cooperation with
- Cold Spring Harbor Laboratory (New York City, USA)
  - New York University (New York City, USA)
  - American Museum of Natural History (New York City, USA)
  - Montgomery Botanical Center (Miami, USA)
- 9.2002 – 1.2007      **Research associate** for teaching and research. Establishment and management of the research project "Evolution and alpha taxonomy of Cupressaceae" at the Institute for Evolution and Biodiversity of Plants, **RUB**
- 8.2001 – 8.2002      **Research associate** in the project, "Federal Information System Genetic Resources (BIG)", funded by the Federal Ministry of Education, Science, Research and Technology (BMBF), **RUB**

## Higher Education

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- 9.2002 – 1.2006      **PhD** at the **RUB** at the Institute for Biodiversity and Evolution of Plants (mark: **1.0 with award**, summa cum laude), topic: "Alpha taxonomy and evolution of Cupressaceae s.l. (cypress family)"
- 10.1995 – 6.2001      **Biology studies** at the **RUB**, degree: Diploma, diploma thesis at the Institute for Evolution and Biodiversity of Plants, subject: "Morphology and morphogenesis of female *Juniperus* cones and their possible significance for the phylogeny of gymnosperms"

## Internship/Practical Training

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- 11.2000 – 5.2001      **Student assistant** at the **Institute of Molecular Botany**, RUB; task: implementation of molecular biological studies of pro- and eukaryotic microorganisms
- 2.1999 – 3.1999      **Student assistant** in the **AG Geobotany**, RUB; on the project "Distribution maps of ferns and flowering plants in North Rhine-Westphalia"
- 7.1996 – 8.1999      **Assistant** at **Ardey Pharm** company (Herdecke); task: implementation of quantitative and qualitative analysis of microorganisms

(in the semester break)

- Additional certificated courses beyond the biology study at the RUB
- Introduction into the theory of chemical bonds (chemistry)
  - Analytical chemistry internship for prospective teachers (chemistry)
  - The logic of Aristotle (philosophy)
  - Nature and culture (philosophy)
  - Theories of school (education)

**Military service**

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10.1994 – 9.1995      Guard Battalion in Cologne and Berlin

**School education**

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8.1985 – 6.1994      Willy-Brandt-Gesamtschule, comprehensive school, Castrop-Rauxel, A-levels  
 8.1984 – 6.1985      Primary school, Bodelschwingher Str., Castrop-Rauxel  
 8.1983 – 6.1984      Primary school, Johannesstraße, Castrop-Rauxel  
 8.1981 – 6.1983      Primary school Klostermoor, Leer

**Languages**

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- German (native language)
- English (fluent in spoken and written word)
- Latin (advanced Latin proficiency exam)
- Spanish (basic)

**Work on the committee and boards**

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Within the university

- Board of Master of Science Biodiversität
- Expert team BioCheck
- Commission Juniorprofessur

Outside the university

- Editorial Board, Frontiers of Plant Science
- Pteridophyte Phylogeny Group (PPG)

**Peer reviews for Journals**

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| ○ Grana              | ○ Cladistics                 |
| ○ Feddes Repertorium | ○ Frontiers in Plant Science |
| ○ Dendrobiology      | ○ Palynology                 |
| ○ Taxon              | ○ Brittonia                  |

**Funding, scholarship, and support**

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1.2015      SYNTHESYS funding (FR-TAF-4025) for herbarium work in Paris  
 9.2014      Open Access Grand (RUB, DFG) for publication costs  
 5.2011      Invitation to the DFG youth academy "systematics of plants and fungi"  
 9.2010      Invitation to the DFG youth academy "systematics of plants and fungi"  
 10.2004      DAAD (Field trip to Mexico and Congress in Oaxaca and Mexico City)  
 9.2003      Ruth und Gerd Massenberg-Stiftung for congress participation (International Symposium Biodiversity and Evolutionary Biology: Frankfurt am Main, Germany)  
 9.2002      Ruth und Gerd Massenberg-Stiftung for congress participation (Botanikertagung: Freiburg im Breisgau, Germany)

## International experience

### Research projects abroad

- 3.2016                      Alpha taxonomy of lycophytes, Muséum National d'Histoire, **Paris** (France)  
 2 – 3.2009                DNA barcoding and molecular phylogeny of Podocarpaceae and Araucariaceae,  
 The New York Botanical Garden, **New York City** (USA)  
 6.2007, 3.2009            Transcription factors in *Zamia*, Montgomery Botanical Center, **Miami** (USA)  
 2.2007 – 3.2008           Evolution of the seed, The New York Botanical Garden; **New York City** (USA)

### Field research abroad

- 8.2002, 8.2012            Vogues (France)  
 8.2010                      Singapore  
 8.2010                      Java (Indonesia)  
 7.2009                      Cambodia & Thailand  
 1.2008                      Panama  
 9.2004                      Mexico  
 3 – 4.2003                Drakensberge (South Africa)  
 6.2002/3/5/6              Kursk (Russia)  
 9 – 10.1998                Jatun Sacha (Ecuador)

### Herbarium work abroad

- 2014 – 2016                Muséum National d'Histoire, Paris (France)  
 5.2012                      Herbarium of the National Botanic Garden, Brussels (Belgium)  
 1.2011                      Royal Botanical Garden Kew, London (Great Britain)  
 2007-2016                Nationaal Herbarium Nederland, Leiden (Netherlands)  
 8.2010                      Singapore Herbarium, Singapore (Singapore)  
 8.2010                      Herbarium Bogoriense, Java (Indonesia)  
 7.2009                      Herbarium Bangkok, Bangkok (Thailand)  
 2 – 3.2009                Steere Herbarium, New York (USA)  
 1.2008                      Universidad de Panamá Herbarium, Panama City (Panama)

## Professional Memberships

- Botanical Society Bochum (BoBo)
- Society for Biological Systematic (GfBS)
- The International Association for Plant Taxonomy (IAPT)
- The International Biogeography Society (IBS)
- Botanical Society of America (BSA)

## Publications (peer reviewed)

- (1) **SCHULZ, CH.**; STEVENSON, D.; HOMBERG, J. & STÜTZEL, TH.: Microspore hitchhiking is a key mechanism for long-distance dispersal in *Selaginella* (**in prep.**)
- (2) GRIMMER, F.; LITTLE, D.; STÜTZEL, TH. & **SCHULZ, CH.**: Biogeography of *Sambucus* (Adoxaceae): Are bird migration routes highways for bird-dispersed plants? (**in prep.**)
- (3) GRIMMER, F.; LITTLE, D.; STÜTZEL, TH. & **SCHULZ, CH.**: Molecular phylogeny and character evolution of the genus *Sambucus* (Adoxaceae) (**in prep.**)
- (4) KÜNZEL, D.J. & **SCHULZ, CH.**: EnDa V1.6: an environmental database for field work documentation (**in prep.**)
- (5) ELPE, CH.; KNOFF, P.; STÜTZEL, TH., **SCHULZ, CH.**: Leaf anatomical diversity and character evolution in Taxaceae s.l. (**submitted**)

- (6) PEREIRA, J.B.S.; LABIAK, P.H.; STÜTZEL, TH.; **SCHULZ, CH.**: Evolutionary and biogeographic history of the ancient genus *Isoetes* (**submitted**)
- (7) BAUER, D.; PRADO, J.; TROVÓ, COAN, A.I., STÜTZEL, TH. & **SCHULZ, CH.** 2016: Megaspore investigations of *Selaginella* species from São Paulo, Brazil. – **American Fern Journal** 106(2): 1-32.
- (8) **SCHULZ, CH.**, KLAUS, K.V., KNOPF, P., MUNDRY, M., DÖRKEN, V. AND STÜTZEL, T. 2014: Male cone evolution in conifers: Not all that simple. – **American Journal of Plant Science** 5: 2842-2857. doi: 10.4236/ajps.2014.518300
- (9) LITTLE, D. P., P. KNOPF & **SCHULZ, CH.** 2013: DNA barcode identification of Podocarpaceae—the second largest conifer family. – **PLoS ONE**. doi: 10.1371/journal.pone.0081008
- (10) **SCHULZ, CH.**; HOMBERG, J. & STÜTZEL, TH. 2013: Taxonomic revision of *Selaginella* subgen. *Ericetorum*. – **Systematic Botany**, 38(1): 5-14. doi: 10.1600/036364413X661935
- (11) GRAMZOW, L.; BARKER, E.; **SCHULZ, CH.**; AMBROSE, B.; ASTHON, N.; THEIBEN, G. & LITT, A. 2012: *Selaginella* genome analysis – entering the "homoplasmy heaven" of the MADS world. – **Frontiers in Plant Science** 3 (214): 1-14. doi: 10.3389/fpls.2012.00214
- (12) KNOPF, P.; **SCHULZ, CH.**; LITTLE, D. P.; STÜTZEL, TH. & STEVENSON, D. W. 2012: Relationships within Podocarpaceae based on DNA sequence, anatomical, morphological, and biogeographical data. – **Cladistics** 28: 271-299. doi: 10.1111/j.1096-0031.2011.00381.x
- (13) BANKS, J.A.; NISHIYAMA, T.; HASEBE, M.; BOWMAN, J.L.; GRIBSKOV, M.; DE PAMPHILIS, C.; ALBERT, V.A.; AONO, N.; AOYAMA, T.; AMBROSE, B.A.; ASHTON, N.W.; AXTELL, M.J.; BARKER, E.; BARKER, M.S.; BENNETZEN, J.L.; BONAWITZ, N.D.; CHAPPLE, C.; CHENG, C.; CORREA, L.G.G.; DACRE, M.; DEBARRY, J.; DREYER, J.; ELIAS, M.; ENGSTROM, E.M.; ESTELLE, M.; FENG, L.; FINET, C.; FLOYD, S.K.; FROMMER, W.B.; FUJITA, T.; GRAMZOW, L.; GUTENSOHN, M.; HARHOLT, J.; HATTORI, M.; HEYL, A.; HIRAI, T.; HIWATASHI, Y.; ISHIKAWA, M.; IWATA, M.; KAROL, K.G.; KOEHLER, B.; KOLUKISAAGLU, U.; KUBO, M.; KURATA, T.; LALONDE, S.; LI, K.; LI, Y.; LITT, A.; LYONS, E.; MANNING, G.; MARUYAMA, T.; MICHAEL, T.P.; MIKAMI, K.; MIYAZAKI, S.; MORINAGA, S-I.; MURATA, T.; MUELLER-ROEBER, B.; NELSON, D.R.; OBARA, M.; OGURI, Y.; OLMSTEAD, R.G.; ONODERA, N.; PETERSEN, B.L.; PILS, B.; PRIGGE, M.; RENSING, S.A.; RIAÑO-PACHÓN, D.M.; ROBERTS, A.W.; SATO, Y.; SCHELLER, H.V.; SCHULZ, B.; **SCHULZ, CH.**; SHAKIROV, E.V.; SHIBAGAKI, N.; SHINOHARA, N.; SHIPPEN, D.E.; SØRENSEN, I.; SOTOOKA, R.; SUGIMOTO, N.; SUGITA, M.; SUMIKAWA, N.; TANURDZIC, M.; THEIBEN, G.; ULVSKOV, P.; WAKAZUKI, S.; WENG, J-K.; WILLATS, W.W.G.T.; WIPF, D.; WOLF, P.G.; YANG, L.; ZIMMER, A.D.; ZHU, Q.; MITROS, T.; HELLSTEN, U.; LOQUÉ, D.; OTILLAR, R.; SALAMOV, A.; SCHMUTZ, J.; SHAPIRO, H.; LINDQUIST, E.; LUCAS, S.; ROKHSAR, D. & I.V. GRIGORIEV 2011: The *Selaginella* genome identifies genetic changes associated with the evolution of vascular plants. – **Science** 332, 960-963. doi: 10.1126/science.1203810
- (14) **SCHULZ, CH.**; LITTLE, D. P.; STEVENSON, D. WM.; NOWOGRODZKI, A. & PAQUIOT, D. 2010: Growth and care instructions of a new model species – the lycophyte *Selaginella apoda*. – **American Fern Journal** 100(3): 167-171. doi: 10.1640/0002-8444-100.3.167
- (15) **SCHULZ, CH.**; LITTLE, D. P.; STEVENSON, D. WM.; BAUER, D.; MOLONEY, C. & STÜTZEL, TH. 2010: An overview about morphology, anatomy, and life cycle of a new model species – the lycophyte *Selaginella apoda* (L.) SPRING. – **International Journal of Plant Science** 171(7): 693-712. doi: 10.1086/654902
- (16) **SCHULZ, CH.** & STÜTZEL, TH. 2007: Evolution of taxodiaceous Cupressaceae. – **Organisms Diversity and Evolution** 7: 124-135. doi: 10.1016/j.ode.2006.03.001
- (17) **SCHULZ, CH.** & STÜTZEL, TH. 2006: Variability of male cones in *Chamaecyparis* as an example of Cupressaceae male cones. – **Feddes Repertorium** 117(1-2): 124-135. doi: 10.1002/fedr.200511085
- (18) **SCHULZ, CH.**; KNOPF, P. & STÜTZEL, TH. 2005: Identification key to the Cypress family (Cupressaceae). – **Feddes Repertorium** 116: 96-146. doi: 10.1002/fedr.200411062

- (19) SCHULZ, CH.; JAGEL, A. & STÜTZEL, TH. 2003: Cone morphology in *Juniperus* in the light of cone evolution in Cupressaceae s. l. – *Flora* 198: 161-177. doi: 10.1078/0367-2530-00088

### **Publications (other)**

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- (20) SCHULZ, CH. 2013: Book review “The Evolution of Plant Form, B.A. Ambrose, M. Purugganan (Eds.). Wiley-Blackwell, Oxford”. – *Journal of Plant Physiology* 170: 1637-1638. doi: 10.1016/j.jplph.2013.08.006
- (21) BAUMJOHANN, K.; SCHULZ, CH. & MINKLEY, N. 2015: Forensische Botanik: Mit Pflanzenresten einen Kriminalfall klären. – *Unterricht Biologie* 410: 23-25.

### **Scientific support/contributions to projects**

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#### **Drawings in**

- Anderson, J.M.; Cleal, C.J. and Anderson, H.M. 2007: A brief history of the gymnosperms. - *Strelitzia* 20.

#### **Scientific advice on**

- Video project: life cycle of *Selaginella apoda*

### **Conference contributions**

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#### **Organisation and assistance**

- 15. International Symposium of Biodiversity and Evolution in Bochum (2001)

#### **Abstracts, talks, and posters**

- (1) KLAUS, K., BAUER, D., STÜTZEL, TH. & SCHULZ, CH. 2016: Historical Biogeography of the ancient genus *Selaginella*: early adaptation to xeric habitats an Pangea. Society for Molecular Biology and Evolution, Gold Coast (Australia). **Poster Award**
- (2) PEREIRA, J.; LABIAK, P.; SCHULZ, CH. & STÜTZEL, TH. 2015: The genus *Isoetes* from the Brazilian Atlantic rain forest: taxonomy and phylogeny. – *Next Generation Pteridology*, Washington (U.S.A.).
- (3) BAUER, D.; KLAUS, K.V.; SCHULZ, CH. & STÜTZEL, TH. 2015: *Selaginella* biogeography of the last 300 million years. – *Next Generation Pteridology*, Washington (U.S.A.).
- (4) BAUER, D.; KLAUS, K.V.; SCHULZ, CH. & STÜTZEL, TH. 2015: Dated phylogeny and biogeography of the genus *Selaginella*. – *International Biogeography Society, 7<sup>th</sup> biennial meeting*, Bayreuth (Germany).
- (5) PEREIRA, J.B. DE S.; SCHULZ, CH.; LABIAK, P.H. & STÜTZEL, TH. 2015: The lycophyte genus *Isoetes* from South America: Evidence to understanding its evolution. – *International Biogeography Society, 7<sup>th</sup> biennial meeting*, Bayreuth (Germany).
- (6) SCHULZ, CH.; KNOPF, P.; LITTLE, D. & STÜTZEL, TH. 2014: Biogeographical analysis of Podocarpaceae. - *XVI Young Systematists Forum*, Paris (France).
- (7) ELPE, C.; KNOPF, P.; SCHULZ, CH. & STÜTZEL, TH. 2014: Sclereids and accessory transfusion tissue within the leaves of Taxaceae compared to related conifer families. - *XVI Young Systematists Forum*, Paris (France).
- (8) PEREIRA, J. B.DE S.; LABIAK, P. H.; STÜTZEL, TH. & SCHULZ, CH. 2013: Phylogeny and biogeography of *Isoetes* (Isoetaceae) from eastern South America. – *XV Young Systematists Forum*, London (England).
- (9) KLAUS, K.; SCHULZ, CH. & STÜTZEL, TH. 2013: Mind the gap: the impact of gaps in phylogenetic sequence datasets on substitution rate estimations. – *55. Phylogenetisches Symposium*, Oldenburg (Germany).

- (10) PEREIRA, J. B. DE S.; LABIAK, P. H.; STÜTZEL, TH. & SCHULZ, CH. 2013: Phylogeny and biogeography of *Isoetes* (Isoetaceae) from eastern South America. – 55. Phylogenetisches Symposium, Oldenburg (Germany).
- (11) GRIMMER, F.; SCHULZ, CH. & STÜTZEL, TH. 2013: Phylogeny, evolution, and biogeography of *Sambucus* (Adoxaceae). – 55. Phylogenetisches Symposium, Oldenburg (Germany).
- (12) KLAUS, K.; SCHULZ, CH. & STÜTZEL, TH. 2013: Mind the gap: the impact of gaps in phylogenetic sequence datasets on substitution rate estimations. – Annual Meeting of the Society for Molecular Biology and Evolution, Chicago (USA).
- (13) ASHTON, N.; GRAMZOW, L.; BARKER, E.; SCHULZ, CH.; AMBROSE, B.; THEIßEN, G. & A. LITT 2012: *Selaginella* genome analysis entering the „homoplasy heaven“ of the MADS world. – ICAR, Vienna (Austria).
- (14) KNOFF, P.; SCHULZ, CH.; LITTLE, D.P.; STÜTZEL, TH. & STEVENSON, D. 2012: Origin and phylogeny of Podocarpaceae (Coniferopsida). – XIV Young Systematists Forum, London (England).
- (15) KNOFF, P.; SCHULZ, CH.; LITTLE, D.P.; STÜTZEL, TH. & STEVENSON, D. 2011: Comparative phylogeny within Podocarpaceae (Coniferopsida). – XIII Young Systematists Forum, London (England).
- (16) KNOFF, P.; SCHULZ, CH.; LITTLE, D.P.; STÜTZEL, TH. & STEVENSON, D. 2011: A combined phylogenetic reconstruction of the Podocarpaceae based on *rbcl*, *nrITS1*, and *NEEDLY* intron 2 sequence as well as anatomical, morphological, and biogeographical data. – XVIII International Botanical Congress, Melbourne (Australia).
- (17) SCHULZ, CH.; BERG, S. & STÜTZEL, TH. 2010: Cone diagrams of *Selaginella* species of Java island. – 8<sup>th</sup> International Flora Malesiana Symposium, Singapore (Singapore).
- (18) SCHULZ, CH.; BAUER, D.; RICHTER, CH. & STÜTZEL, TH. 2010: Investigation of selected *Selaginella* species of the Malesian flora. – 8<sup>th</sup> International Flora Malesiana Symposium, Singapore (Singapore).
- (19) SCHULZ, CH. & STÜTZEL, TH. 2010: The genus *Selaginella* – in particular Malesian species. – 8<sup>th</sup> International Flora Malesiana Symposium, Singapore (Singapore).
- (20) KNOFF, P.; SCHULZ, CH.; LITTLE, D.P.; STÜTZEL, TH. & STEVENSON, D. 2010: A combined phylogenetic reconstruction of the Podocarpaceae based on *rbcl*, *nrITS1* and *NEEDLY* intron 2 sequence as well as anatomical, morphological, and biogeographical data. – 8<sup>th</sup> International Flora Malesiana Symposium, Singapore (Singapore).
- (21) SCHULZ, CH.; RICHTER, CH. & STÜTZEL, TH. 2009: *Selaginella* species of Java (Indonesia) – Alpha taxonomy and morphology (mega-, microspore, and leaf surface sculpture). – Systematics, Leiden (Netherlands).
- (22) SCHULZ, CH.; HOMBERG, J. & STÜTZEL, TH. 2009: Monograph of the subgenus *Ericetorum* (*Selaginella*) – a new species. – Systematics, Leiden (Netherlands).
- (23) SCHULZ, CH.; LITTLE, D. & STEVENSON, D. 2008: Origin of the bitegmic integument? Investigation in ovules of unitegmic *Zamia furfuracea*. – Cycas Congress, Panama City (Panama).
- (24) SCHULZ, CH.; LITTLE, D.; BRENNER, E. & STEVENSON, D. 2007: Identity genes for male and female organs in cryptogams: preliminary investigations in MADS-box genes in the lycophyte *Selaginella*. – Plant Biology & Botany, Chicago (USA).
- (25) SCHULZ, CH. & STÜTZEL, TH. 2006: Evolution of taxodiaceous Cupressaceae (Coniferopsida). – 17<sup>th</sup> International Symposium Biodiversity and Evolutionary Biology, Bonn (Germany).
- (26) KNOFF, P.; SCHULZ, CH. & STÜTZEL, TH. 2005: Phylogeny within *Cupressus* L. with morphological data. – XVII International Botanical Congress, Wien (Austria).
- (27) MUNDY, M.; JAGEL, A.; MUNDY, I.; SCHULZ, CH. & STÜTZEL, TH. 2005: Evolution of female cones of extant conifers – conflicting data from morphological and molecular studies? – XVII International Botanical Congress, Wien (Österreich).

- (28) SCHULZ, CH.; KNOFF, P. & STÜTZEL, TH. **2005**: Identification key to the cypress family (Cupressaceae). – XVII International Botanical Congress, Wien (Austria).
- (29) SCHULZ, CH.; JAGEL, A. & STÜTZEL, TH. **2004**: Evolution of female cone scales and ovules in Cupressaceae. – Congreso Mexicano de Botanica, Oaxaca (Mexico).
- (30) SCHULZ, CH.; JAGEL, A. & STÜTZEL, TH. **2003**: Axillary and non-axillary ovules in gymnosperms – a new interpretation of the *Juniperus* cone. – International Symposium Biodiversity and Evolutionary Biology, Frankfurt am Main (Germany).
- (31) SCHULZ, CH. & STÜTZEL, TH. **2002**: Axillary and non-axillary ovules in gymnosperms. – Botanikertagung, Freiburg im Breisgau (Germany).
- (32) SCHULZ, CH.; JAGEL, A. & STÜTZEL, TH. **2001**: Seed cone development and ovule position in *Juniperus* sect. *Oxycedrus*. – International Symposium Biodiversity and Evolutionary Biology, Bochum (Germany).

### Oral research presentations

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| 10.2015 | Moosfarne ( <i>Selaginella</i> ). BG Rombergpark, Dortmund (Germany), invited.   |
| 6.2011  | The genus <i>Selaginella</i> . Friedrich-Schiller-Universität, Jena (Germany), invited.  |
| 8.2010  | The genus <i>Selaginella</i> – in particular Malesian species. 8 <sup>th</sup> International Flora Malesiana Symposium, Singapore (Singapore).               |
| 6.2010  | Diversity of the flora of Thailand and Cambodia. RUB, Bochum (Germany).  |
| 12.2009 | MADS-box genes. RUB, Bochum (Germany).   |
| 10.2009 | The genus <i>Selaginella</i> . RUB, Bochum (Germany).  |
| 2.2008  | Efforts to improve the understanding of the evolution of the ovule/integument using <i>Selaginella apoda</i> . New York University, New York (USA), invited. |
| 1.2008  | Origin of the bitegmic integument? Investigation in ovules of unitegmic <i>Zamia furfuracea</i> . Cycas Congress, Panama City (Panama).                      |
| 9.2005  | Digital identification of Cupressaceae. RUB, Bochum (Germany).   |
| 1.2005  | DELTA: Multiple-access identification. RUB, Bochum (Germany).  |
| 12.2004 | Poisonous plants. RUB, Bochum (Germany).   |
| 10.2004 | Evolution of female cone scales and ovules in Cupressaceae. Congreso Mexicano de Botanica, Oaxaca (Mexico), invited.   |
| 1.2004  | Plants of South Africa. RUB, Bochum (Germany).   |
| 12.2003 | Cladistics – Phylogenetic systematics. RUB, Bochum (Germany).  |
| 2.2002  | The genus <i>Juniperus</i> L. RUB, Bochum (Germany).   |

### Teaching (Evolution and Biodiversity of Plants, RUB)

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Assessor of several Bachelor, Master, and Diploma examinations

#### Modules

##### 2016

- Advanced module: Biogeography, bioinformatics, and phylogenetics (WS, practical, botanical guidance)
- Workshop „R in Science“ for the SPP1529 ADATOMICS
- Spring School „Methods in Biology - Statistics in R“
- Basic module: Botanical field work (field trips)

##### 2015

- Guided tour in the Botanical Garden Bochum
- Basic module: Botanical field work (field trips)



- Advanced module: Diversity of plants and fungi (practical, botanical guidance)
- Advanced module: Biogeography, bioinformatics, and phylogenetics (WS, practical, botanical guidance)
- Basic module: Biodiversity and research (practical, botanical guidance)
- Advanced module: Methods of systematics (SS, practical, botanical guidance)

**2014**

- R-course: Data analysis and visualisation
- Basic module: Botanical field work (field trips)
- Advanced module: Diversity of plants and fungi (practical, botanical guidance)
- Advanced module: Methods of systematics (practical, botanical guidance)
- Basic module: Biodiversity and research (practical, botanical guidance)

**2013**

- Basic module: Botanical identification exercises (practical)
- Basic module: Botanical field work (field trips)
- Advanced module: Methods of systematics (summer semester; practical, botanical guidance)
- Advanced module: Methods of systematics (winter semester; practical, botanical guidance)

**2012**

- Basic module: Botanical field work (field trips)
- Advanced module: Methods of systematics (summer semester; practical, botanical guidance)
- Advanced module: Methods of systematics (winter semester; practical, botanical guidance)
- Basic module: Biodiversity and research (practical, botanical guidance)

**2011**

- Basic module: Botanical identification exercises (practical)
- Basic module: Botanical field work (field trips)
- Advanced module: Ferns – no reason for shadowy existence (botanical guidance)
- Advanced module: Tropical plants (botanical guidance)
- Advanced module: Methods of systematics (summer semester; practical, botanical guidance)
- Advanced module: Methods of systematics (winter semester; practical, botanical guidance)
- Advanced module: Diversity of land plants (practical, botanical guidance)
- Basic module: Biodiversity and research (practical, botanical guidance)

**2010**

- Advanced module: Flora and vegetation of Central Europe (field trips, seminar)
- Basic module: Botanical identification exercises (practical)
- Basic module: Botanical field work (field trips)
- Advanced module: Ferns – no reason for shadowy existence (botanical guidance)
- Advanced module: Millinger Waard, Netherlands (field trip)
- Basic module: Biodiversity and research (practical, botanical guidance)

**2009**

- Advanced module: Biodiversity (seminar, practical)
- Advanced module: Introduction to the biodiversity of the Botanical Garden of the Ruhr University Bochum (seminar, botanical guidance)
- Basic module: Botanical identification exercises (practical)
- Advanced module: Methods of systematics (summer semester; practical, botanical guidance)
- Advanced module: Methods of systematics (winter semester; practical, botanical guidance)
- Basic module: Botanical field work (field trips)
- Advanced module: Flora and vegetation of Central Europe (field trip, seminar)

**2008**

- Optional module: Everyday botany (seminar, practical, botanical guidance)
- Advanced module: Methods of systematics (practical, field trips)
- Basic module: Botanical identification exercises (practical)
- Basic module: Botanical field work (field trips)
- Advanced module: Tropical plants (botanical guidance)
- Advanced module: Ferns (botanical guidance)

**2006**

- Optional module: Everyday botany (seminar, practical, botanical guidance)
- Advanced module: Diversity of land plants (seminar, practical, botanical guidance)
- Advanced module: Eurasian Steppe (Russia) (seminar, practical, field trips)
- Advanced module: Methods of systematics (practical, botanical guidance)
- Basic module: Botanical identification exercises (practical)
- Basic module: Botanical field work (field trips)
- Advanced module: Dendrology (botanical guidance)

**2005**

- Advanced module: Eurasian Steppe (Russia) (seminar, practical, field trips)
- Advanced module: Methods of systematics (practical, botanical guidance)
- Basic module: Botanical identification exercises (practical)
- Basic module: Botanical field work (field trips)

**2004**

- Optional module: Everyday botany (seminar, practical, botanical guidance)
- Advanced module: Methods of systematics (practical, botanical guidance)
- Basic module: Botanical identification exercises (practical)
- Basic module: Botanical field work (field trips)
- Advanced module: Identification of scrubs in winter condition (botanical guidance)
- Advanced module: Tropical plants (botanical guidance)
- student internship in the laboratory (special event)

**2003**

- Advanced module: Morphology and systematic of vascular plants (seminar, practical, botanical guidance)
- Advanced module: Methods of systematics (practical, botanical guidance)
- Basic module: Botanical identification exercises (practical)
- Basic module: Botanical field work (field trips)
- Advanced module: Eurasian Steppe (Russia) (field trips)
- Advanced module: Identification of shrubs in winter condition (botanical guidance)
- Advanced module: Tropical plants (botanical guidance)

**2002**

- Advanced module: Flora and fauna of the Vogues (France) (seminar, practical, field trips)
- Advanced module: Methods of systematics (practical, botanical guidance)
- Basic module: Botanical identification exercises (practical)
- Basic module: Botanical field work (field trips)
- Advanced module: Conifers (botanical guidance)
- Microscopy for children (special event)

**2001**

- Advanced module: Methods of systematics (practical, botanical guidance)
- Basic module: Botanical identification exercises (practical)

- Basic module: Botanical field work (field trips)
- Advanced module: Conifers (botanical guidance)

## 2000

- Basic module: Botanical identification exercises (practical)
- Advanced module: Plant ecology (practical)
- Basic module: Botanical field work (field trips)

## Instructional/supervising function of research projects

### Dissertation

- (1) KLAUS, K. **current**: Substitution rate changes in time and space.
- (2) PEREIRA, J. **current**: Molecular phylogeny and evolution of the genus *Isoetes* L. in South America.

### Diploma thesis

- (3) ERNST, I. **2010**: Anatomy and morphology of stems, rhizophores, and roots in the genus *Selaginella*.
- (4) ROSIN, R. **2009**: Morphological investigations of some selected *Selaginella* species (lycophytes).
- (5) KNOPF, P. **2004**: Alpha taxonomy and evolution of *Juniperus* L. and *Cupressus* L.
- (6) NAUMANN, M. **2003**: Morphology and anatomy of Cupressaceae male cones and its importance for the phylogeny of the Cupressaceae.

### Master thesis

- (7) ELPE, C. **2014**: Alpha taxonomy, anatomy, and evolution of Taxaceae (conifers).
- (8) BAUER, D. **2014**: Spore investigations and biogeographical analysis of selected Brazilian *Selaginella* species.
- (9) GRIMMER, F. **2013**: Phylogeny, evolution, and biogeography of the genus *Sambucus* (Adoxaceae).
- (10) SZCZESNY, S. **2012**: Morphology and evolution of the subgenus *Tetragonostachys* (*Selaginella*).

### Bachelor thesis

- (11) KITTEL, M. **2015**: Biogeography of Araucariaceae.
- (12) SCHIEREN, C.V. **2015**: Anatomy of the axis of *Isoetes*.
- (13) DWOSHAK, B. **2011**: Megaspore ornamentation of *Selaginella* species on Java Island (Indonesia).
- (14) HAUS, M. **2011**: Comparative study of megaspore surfaces of selected *Selaginella* species from Southeast Asia.
- (15) OLES, A. **2011**: Identification, distribution patterns, and ecological niches of *Selaginella* species on the island of Java (Indonesia).
- (16) RICHTER, C. **2009**: Alpha taxonomy and studies of mega-, microspore and leaf surface sculpture on *Selaginella* species from the island Java (Indonesia).
- (17) BAUER, D. **2009**: Alpha taxonomy and morphology of *Selaginella* species from the island Java.
- (18) BERG, S. **2009**: Cone diagrams of the *Selaginella* species of the island Java.
- (19) HOMBERG, J. **2009**: Morphology and evolution of certain isophyllous *Selaginella* species.
- (20) BONGARDT, C. **2006**: Morphological, anatomical, und ontogenetically investigation of female cones of *Araucaria araucana* (MOLINA) K. KOCH.

### Advanced modules

- (21) SCHLÜTTING, P. **2016**: Topology differences between different fern phylogenies depending on the marker choice.
- (22) BIENERT, S. **2015**: New *Selaginella* species from New Caledonia.
- (23) WITTE, K.-S. **2015**: Spore morphology of *Selaginella* species from New Caledonia.
- (24) KOLTER, A. **2015**: Optimization of DNA extraction and amplification of markers in *Selaginella*.
- (25) HERTING, J. **2014**: Variation in the information content in *rbcL* and *matK* of land plants.
- (26) JANßEN, M. **2014**: Biogeography of Pinaceae.
- (27) OLES, A. **2014**: Biogeography of Cupressaceae.
- (28) KITTEL, M. **2013**: Phylogeny and evolution of Araucariaceae.
- (29) KALLE, M. **2012**: Megaspore ornamentation of the subgenus *Tetragonostachys*.
- (30) PROTZEK, D. **2011**: Species borders in *Selaginella* using microspores, megaspores and vegetative structures.
- (31) HAUS, M. **2011**: Comparative investigations of megaspore ornamentations of selected species of Indonesia and Thailand.
- (32) DWOSHAK, B. **2011**: Morphology and alpha taxonomy of selected *Selaginella* species of Malaysia and Fidschi.
- (33) NEUMANN, S.-M. **2011**: Morphological investigation of the species complexes *Selaginella involvens-cupressina-biformis-frondosa* and *Selaginella ciliaris-remotifolia*.
- (34) MEIERKAMP, K. **2011**: Morphological investigation of the species complexes *Selaginella intermedia-subalpina* and *Selaginella plana-caudata-canaliculata*.
- (35) OLES, A. **2011**: Morphology and alpha taxonomy of selected *Selaginella* species of Java (Indonesia).
- (36) GRIMMER, F. **2011**: Comparative investigations of megaspore ornamentations of selected species of Borneo, Sumatra, and Sulawesi.
- (37) HOMBERG, J. **2010**: Evolution and morphology of *Selaginella* subgenus *Ericetorum*.
- (38) BAUER, D. **2009**: Anatomy and morphology of *Selaginella apoda* (L.) SPRING.
- (39) MEHRENS, K. **2009**: Phyllotaxis and leaf anatomy of taxodiaceous Cupressaceae.
- (40) HOMBERG, J. **2008**: Comparative investigations of megaspore ornamentations and leaves of selected isophyllous *Selaginella* species.
- (41) SCHREIBER, S. **2005**: Evolution of sporangiophores of selected Cupressaceae species.
- (42) LINNERT, C. **2004**: Flower ontogeny of *Polygala myrtifolia* var. *grandifolia* and its relation to the Fagales.
- (43) REINHOLZ, B. **2004**: Variability of male and female cones of *Chamaecyparis lawsoniana* (A. MURR) PARL.
- (44) DERSIS, M. **2004**: Phylogeny of primitive Cupressaceae based on the morphology und anatomy of male and female cones.
- (45) KOPPENBERG, A. **2003**: Morphology, phylogeny and character evolution within the genera *Thuja* and *Calocedrus*.
- (46) STRECKENBACH, M. **2003**: Anatomy, morphology, phylogeny, and character comparison between the genera *Platycladus*, *Microbiota*, *Fokienia*, and *Tetraclinis*.
- (47) KNOPF, P. **2002**: Evolution, systematics, and character comparison within the genus *Chamaecyparis* SPACH.

**Lectures**

6.2016	Basics in botany and biodiversity <ul style="list-style-type: none"> <li>○ lycophytes</li> <li>○ ferns</li> </ul>
5.2014	Taxonomy <ul style="list-style-type: none"> <li>○ Caryophyllaceae</li> <li>○ Euphorbiaceae</li> <li>○ Boraginaceae</li> </ul>
5.2012	Taxonomy <ul style="list-style-type: none"> <li>○ Rosaceae</li> <li>○ Ranunculaceae</li> </ul>
7.2010	Basics in botany and biodiversity <ul style="list-style-type: none"> <li>○ Monocots I: Acorales, Alismatales</li> <li>○ Monocots II: Asparagales I</li> </ul>
5.2010	Taxonomy <ul style="list-style-type: none"> <li>○ Ranunculaceae</li> <li>○ Rosaceae</li> <li>○ Boraginaceae</li> <li>○ Lamiaceae</li> </ul>
7.2009	Basics in botany and biodiversity <ul style="list-style-type: none"> <li>○ Monocots I: Acorales, Alismatales</li> <li>○ Monocots II: Asparagales I</li> <li>○ Monocots III: Asparagales II</li> <li>○ Monocots IV: Arecales, Poales, Zingiberales</li> <li>○ Gymnosperms I: Gnetopsida, Ginkgopsida</li> <li>○ Gymnosperms II: Cycadopsida, Araucariaceae</li> <li>○ Gymnosperms III: Pinaceae</li> <li>○ Gymnosperms IV: Cupressaceae s.l.</li> <li>○ Gymnosperms V: Taxaceae s.l., Podocarpaceae s.l.</li> </ul>
5.2008	Systematics of plants
5.2006	Eurasian Steppe (Russia) <ul style="list-style-type: none"> <li>Taxonomy           <ul style="list-style-type: none"> <li>○ Rosaceae</li> </ul> </li> </ul>
5.2005	Eurasian Steppe (Russia)
11.2004	Morphology and systematics of vascular plants
6.2004	Poisonous plants
12.2003	Morphology and systematics of vascular plants

**Press to publications and projects**

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***Selaginella* genome**

- (1) *Selaginella* genome adds piece to plant evolutionary puzzle ([PhysOrg.com](#))
- (2) Erbgut von *Selaginella moellendorffii* entschlüsselt ([innovations report](#))
- (3) Heute wie vor 340 Millionen Jahren ([derStandard.at](#))
- (4) *Selaginella* Genom enthüllt Pflanzenevolution ([scinexx](#))
- (5) Einblick in 340 Millionen Jahre Evolution ([Pflanzenforschung](#))
- (6) Erbgut uralten Moosfarns identifiziert ([WAZ](#))
- (7) Genetik und Evolution: Genom des Moosfarns *Selaginella* entschlüsselt ([GIT](#))

**Podocarpaceae phylogeny**

- (8) Conifers without cones? ([Montgomery Botanical News](#))

- (9) Living collections research on tropical conifers presented at MBC ([MBC News Archive](#), February 20, 2009)

### Podocarpaceae barcoding

- (10) Weltweit größte Steineiben-Sammlung in Bochum ([PRESSEINFORMATION RUB](#))  
 (11) Barcodes für Bäume ([AKTUELLPORTAL RUB](#))  
 (12) Barcodes für Bäume: Forscher bestimmen genetische Fingerabdrücke von bedrohten Nadelhölzern ([idw](#))  
 (13) Barcodes for trees: researchers identify genetic fingerprints of endangered conifers ([AlphaGalileo](#))  
 (14) Barcodes for Trees: Researchers Identify Genetic Fingerprints of Endangered Conifers ([Science Daily](#))  
 (15) Bochumer Uni sammelt bedrohte Bäume (WAZ)  
 (16) Barcodes für Bäume: Forscher bestimmen genetische Fingerabdrücke von bedrohten Nadelhölzern ([Bionity.com](#))  
 (17) Barcodes für Bäume: Forscher bestimmen genetische Fingerabdrücke von bedrohten Nadelhölzern ([analytica-world.com](#))  
 (18) Researchers identify genetic fingerprints of endangered conifers ([EurekAlert!](#))  
 (19) Barcodes for trees: Study identifies genetic fingerprints of endangered conifers ([Science News Daily](#))  
 (20) Barcodes for trees: Study identifies genetic fingerprints of endangered conifers ([e! Science News](#))  
 (21) Researchers Identify Genetic Fingerprints of Endangered Conifers ([Science Newsline](#))  
 (22) Barcodes for trees: Study identifies genetic fingerprints of endangered conifers ([vnc](#))

## Skills

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### Teaching

- Establishment and teaching of classes, lessons, and guidance
- University Educational Qualification Program (basic module)
  - HD1: Implementation and design of university courses
  - HD2: Fill the role as a teacher with life – Who am I, and if so how many?
  - HD3: Interact and teach cleverly in courses
  - HD4: Blended learning in teaching
  - HD5: Who disturbs?! – Difficult situations in courses
  - HD6: Collegial Advisory Group
  - HD7: Teaching internship
  - HD8: Written reflection of the basic module
- University Educational Qualification Program (advanced module)
  - HD11: One against all? Design successfully huge courses
  - HD14: A picture says more than 1000 words
  - HD18: Teaching and instructing in University Context
  - HD19: Performance evaluation
  - HD20: Competence oriented tests - With good by examples
  - HD25: Supervising students projects

### Taxonomic work

- Knowledge of species in conifers und *Selaginella*
- Knowledge of species in the flora of Germany
- Knowledge of species in some plant groups of France, Russian, Austria, Panama, Mexico, Singapore, Cambodia, Thailand, South Africa, Ecuador, Indonesia
- Calculation of identification keys

### Morphological work

- Specimen preparation
- Microtome technic
- Light microscopy (bright field, dark field, fluorescence, phase contrast)
- Scanning electron microscopy, Critical-Point-Drying, Sputtering

**Molecular work**

- DNA and RNA extraction
- PCR, Reverse Transcription PCR, Real-Time-quantitative-PCR, Klonierung
- In-situ hybridisation

**Bioinformatics work**

- Sequence editing
- Evolution model calculation
- Alignment
- Phylogenetic tree analysis
- Biogeographic Analysis
- Molecular clock analysis
- Phylogenetic tree formatting

**Statistical analysis**

- R, Excel

**Image editing**

- Pixel graphics
- Vector graphics

**Establishment and performance of field trips****Programming languages****Work with databases**

- Plant database
- Image database
- Reference database

**Care and building up of Ex-situ collections**

- Cupressaceae (RUB)
- *Selaginella* (RUB)

## Computer skills

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Good to very good knowledge about following computer programs:

### Primer design

- Primer3

### Sequence editor

- PhyDE
- BioEdit
- seaview
- MEGA

### Sequence alignment

- Muscle
- MAFFT
- TCoffee
- ClustalW

### Sequence manipulation/analysis

- Sequencer
- Gblocks
- 2xread
- Winclada
- SeqConverter
- SplitsTree
- GRate
- SeqState
- SequenceMatrix
- Geneious

### Substitutions models

- Modeltest
- jModeltest
- MrModeltest

### Phylogenetic reconstruction

- RAxML
- TNT
- MrBayes
- PAUP
- MEGA

### Biogeographical analysis

- S-DIVA
- RASP
- Lagrange
- Mesquite
- DIVA-GIS
- Quantum-GIS
- ArcGIS
- BioGeoBEARS

### Molecular clock analysis

- BEAST
- multidivtime
- r8s

### Tree editing

- Treegraph
- FigTree
- Tred
- TreeView
- Dendroscope

### Database

- Systax
- Access
- analySIS

### Reference management

- EndNote
- Citavi

### Image processing

- Photoshop
- CorelDraw

### Spreadsheet analysis/Statistics

- Excel
- R

### Presentation

- PowerPoint

### Word processing

- Word

### Homepage design

- Dreamweaver
- HTML

### Identification keys/Taxon descriptions

- DELTA
- Xper2
- Lucid

### Programming languages

- Perl
- Pascal
- Comal
- Basic
- R

### Back-up systems

- Syncback

### Email/calendar

- Outlook

Bochum, 6. Mai 2016