Curriculum vitae

Prof. Dr. Bernhard Schuldt

Julius-Maximilian-University of Würzburg
Julius-von-Sachs-Institute of Bioscience
Chair of Ecophysiology and Vegetation Ecology
Julius-von-Sachs-Platz 3
97082 Würzburg
Germany

Phone: +49 931 31 89929
+49 170 4835460
Fax: +49 931 31 86235
E-mail: bernhard.schuldt@plant-ecology.de
Web: https://www.biozentrum.uni-wuerzburg.de/en/bot2/schuldt

Birth:	1978 in Vejle, Denmark
Material status:	Married, one child
Nationality:	German, Danish
Languages:	German, English, Danish, Indonesian

Research area

Plant ecology, ecophysiology, plant hydraulics, plant water relations; biodiversity, carbon balance, climate change, drought stress, evolutionary ecology, stomatal control, tree mortality, wood anatomy.

Work experience

2018 - date	W2 Professor for Plant Ecology, Chair of Ecophysiology and Vegetation Ecology, Julius-von-Sachs-Institute of Bioscience, University of Würzburg
2010 - 2018	Postdoctoral researcher, Department of Plant Ecology, Albrecht von Haller Institute for Plant Sciences, University of Göttingen, Germany
2011	Guest Scientist, French National Institute for Agricultural Research, BIOGECO Research Unit, INRA and University of Bordeaux, France, Dr. Sylvain Delzon
2006 - 2010	Scientific assistant, Department of Plant Ecology, Albrecht von Haller Institute for Plant Sciences, University of Göttingen, Germany
2004 - 2005	Guest scientist, Institute for Wood Technology and Wood Biology, Johann-Heinrich von Thünen Institute, Hamburg, Germany, Dr. Gerald Koch
2002 - 2006	Undergraduate assistant, Department of Plant Ecology, Albrecht von Haller Institute for Plant Sciences, University of Göttingen, Germany

Field work

2016	Osa Peninsula, Costa Rica
2006 - 2009	Lore Lindu National Park, Central Sulawesi, Indonesia
2004	Podocarpus National Park, Ecuador

Education

2018	Habilitation (Venia Legendi) in Botany, Georg-August-University of Göttingen, Germany
2006 – 2010	Ph.D. at the Department of Plant Ecology, Albrecht von Haller Institute for Plant Sciences, University of Göttingen, Germany Thesis title: *Effects of experimental drought on hydraulic properties and leaf traits of upper canopy and understory tree species in a perhumid tropical forest in Central Sulawesi, Indonesia*
1999 – 2006	Diploma study of biology at the University of Göttingen, Germany (Major: Botany, Minors: Soil Science and Microbiology) Thesis title: *Altitudinal effects on the water balance of tropical montane rainforest tree species in South-Ecuador*
1989 – 1998	Abitur at the Gymnasium Christianeum, Hamburg, Germany (high school graduation)

Publications

- International peer-reviewed publications: 51
- First or last authorships: 16
- Google Scholar citations: 1,757, h-index: 24, i10 index: 32 (updated May 10, 2021)

Third-party funds (1,509k €)

- German Research Foundation, 259k €, 2021-2024.
- Federal ministry of food and agriculture, 490k €, 2021-2023.
- Bavaria California Technology Centre, 6k €, 2019-2020.
- VW foundation, 84K €, 2017.
- German Research Foundation, 419k €, 2016-2019.
- German Research Foundation, 240k €, 2014-2017.
- Georg-August-University Göttingen, 10k €, 2014.

Teaching experience and supervision

- 10 years of teaching experience at all university levels (Bachelor, Master and Ph.D.)
- Basic and advanced teaching in botany, plant ecology and ecophysiology
- Planning and development of laboratory and field courses
- Educated 24 bachelor and master students
- Supervised and co-supervised 16 Ph.D. students
- Supervised 3 postdocs
- Served as external opponent at 8 Ph.D. defences

Conferences and workshops

- Author or co-author of 28 oral contributions and 13 posters at international conferences
- 12 invited talks at workshops or external seminars
- Organizer or co-organizer/co-convener of 7 international conferences, workshops or sessions

Scientific services

- Article reviews for 29 international journals
- Grant proposal reviews for 7 funding agencies
- Review board member of 2 journals
- Guest editor for one special issue

Scientific networks

- Founding member of the International Tree Mortality Network (www.tree-mortality.net)
- Task force deputy coordinator of the International Union of Forest research Organizations

Research management

- I have managed a research team of varying dimension for the past 10 years
- My current team is composed of 2 postdocs, 4 Ph.D. students, 2 technicians

Updated May 10, 2021

List of peer-reviewed publications

* *Corresponding author, advisees are underlined.*

51. Fuchs S, Leuschner C, Link RM, **Schuldt B***. Hydraulic plasticity of three broadleaved temperate tree species along a precipitation gradient in Central Germany. *New Phytologist*, accepted, DOI: 10.1111/nph.17448.

50. Fuchs S, **Schuldt B**, Leuschner C. Identification of drought-tolerant tree species through climate sensitivity analysis of radial growth in Central European mixed broadleaf forests. *Forest Ecology and Management*, accepted on 17.04.2021.

49. Dorji Y, **Schuldt B**, Neudam L, Dorji R, Middleby K, Isasa E, Körber K, Ammer C, Annighöfer P, Seidel D. New insights into tree architecture from mobile laser scanning and geometry analysis. *Trees-Structure and Function*, in press, DOI: 10.1007/s00468-021-02124-9.

48. Hartmann H, Link RM, **Schuldt B**. A whole-plant perspective of isohydry: stem-level support for leaf-level plant water regulation. *Tree Physiology*, in press, DOI: 10.1093/treephys/tpab011.

47. Zimmermann J, Link RM, Hauck M, Leuschner C, **Schuldt B**. 60-yr record of stem xylem anatomy and related hydraulic modification under reduced precipitation in ring- and diffuse-porous temperate broad-leaved tree species. *Trees-Structure and Function*, in press, DOI: 10.1007/s00468-021-02090-2.

46. Kaack L, Weber M, Isasa E, Karimi Z, Li S, Pereira L, Trabi C, Zhang Y, Schenk HJ, **Schuldt B**, Schmidt V, Jansen S. Pore constrictions in intervessel pit membranes reduce the risk of embolism spreading in angiosperm xylem. *New Phytologist* 230: 1829-1843, DOI: 10.1111/nph.17282.

45. Arend M, Link RM, Patthey R, Hoch G, **Schuldt B**, Kahmen A. Rapid hydraulic collapse as cause of drought-induced mortality in conifers. *PNAS* 118: e2025251118, DOI: 10.1073/pnas.2025251118.

44. Glatthorn J, Annighöfer P, Balkenhol N, Leuschner C, Polle A, Scheu S, Schuldt A, **Schuldt B**, Ammer C (2021). An interdisciplinary framework to describe and evaluate the functioning of forest ecosystems. *Basic and Applied Ecology* 52: 1-14, DOI: 10.1016/j.baae.2021.02.006

43. Kotowska M, Link RM, Röll A, Hertel D, Hölscher D, Waite P-A, Moser G, Toja A, Leuschner C, **Schuldt B*** (2021). Effects of wood hydraulic properties on water use and productivity in tropical rainforest trees. *Frontiers in Forests and Global Change* 3: 598759. DOI: 10.3389/ffgc.2020.598759. *https://www.frontiersin.org/articles/10.3389/ffgc.2020.598759/abstract*

42. Ellsäßer F, Röll A, Ahongshangbam J, Waite P-A, Hendrayanto, **Schuldt B**, Hölscher D (2020). Predicting tree sap flux and stomatal conductance in a mixed agroforestry system from drone-recorded surface temperatures – a machine learning approach. *Remote Sensing* 14: 4070, DOI: 10.3390/rs12244070. *https://www.mdpi.com/2072-4292/12/24/4070*

41. **Schuldt B***, Buras A, Arend M, Vitasse Y, Beierkuhnlein C, Damm A, Gharun M, Grams TEE, Hauck M, Hajek P, Hartmann H, Hilbrunner E, Hoch G, Holloway-Phillips M, Körner C, Larysch E, Lübbe T, Nelson DB, Rammig A, Rigling A, Rose L, Ruehr NK, Schumann K, Weiser F, Werner C, Wohlgemuth T, Zang CS, Kahmen A (2020). A first assessment of the impact of the extreme 2018 summer drought on Central European forests. *Basic and Applied Ecology* 45: 86-103, DOI: 10.1016/j.baae.2020.04.003. *https://www.sciencedirect.com/science/article/pii/S1439179120300414*

40. Fuchs S, Hertel D, **Schuldt B**, Leuschner C (2020). Effects of short-term and long-term precipitation reduction on the fine root system of five broadleaf tree species. *Forests* 11: 289, DOI: 10.3390/f11030289. *https://www.mdpi.com/1999-4907/11/3/289*

39. Link RM, Fuchs S, Arias Aguilar D, Leuschner C, Castillo Ugalde M, Valverde Otarola JC, **Schuldt B** (2020). Tree height predicts the shape of radial sap flow profiles of Costa-Rican tropical dry forest tree species. *Agricultural and Forest Meteorology* 287: 107913, DOI: 10.1016/j.agrformet.2020.107913. *https://www.sciencedirect.com/science/article/pii/S0168192320300150*

38. Kattge J, Bönisch G, Díaz S, Lavorel S, Prentice IC, Leadley P, Tautenhahn S, Werner G, … , **Schuldt B**, … , Christian Wirth (2020). TRY plant trait database - enhanced coverage and open access. *Global Change Biology* 26: 119-188, DOI: 10.1111/gcb.14904.
https://onlinelibrary.wiley.com/doi/full/10.1111/gcb.14904

37. Waite P-A, **Schuldt B***, Link RM, Triadiati T, Saad A, Leuschner C (2019). Soil moisture regime and palm height influence embolism resistance in oil palm. *Tree Physiology* 39: 1696-1712, DOI: 10.1093/treephys/tpz061.
https://academic.oup.com/treephys/article/39/10/1696/5499229?guestAccessKey=01b88004-ad03-4523-b4d1-bb205ae34b38

36. Schumann K, Leuschner C, **Schuldt B*** (2019). Xylem hydraulic safety and efficiency in relation to leaf and wood traits in three temperate *Acer* species differing in habitat preferences. *Trees-Structure and Function* 33: 1475-1490, DOI: 10.1007/s00468-019-01874-x.
https://link.springer.com/article/10.1007/s00468-019-01874-x

35. Li S, Li X, Link RM, Li R, Deng L, **Schuldt B**, Jiang X, Zhao R, Zheng J, Li S, Zhao R, Yin Y (2019). Influence of cambial age and axial height on spatial patterns of xylem traits in *Catalpa bungei*, a ring-porous tree species native to China. *Forests* 10: 662, DOI: 10.3390/f10080662.
https://www.mdpi.com/1999-4907/10/8/662

34. Flo V, Martinez-Vilalta J, Steppe K, **Schuldt B**, Poyatos R. A synthesis of bias and uncertainty in sap flow methods. *Agriculture and Forest Meteorology* 271: 362-374, DOI: 10.1016/j.agrformet.2019.03.012.
https://www.sciencedirect.com/science/article/pii/S0168192319301248

33. Dulamsuren C, Abilova SB, Bektayeva M, Eldarov M, **Schuldt B**, Leuschner C, Hauck M (2019). Hydraulic architecture and vulnerability to drought-induced embolism in southern boreal tree species of Inner Asia. *Tree Physiology* 39: 463-473, DOI: 10.1093/treephys/tpy116.
https://academic.oup.com/treephys/article/39/3/463/5153307

32. Klepsch M, Zhang Y, Kotowska MM, Lamarque LL, Nolf M, **Schuldt B**, Torres-Ruiz JM, Quin D, Choat B, Delzon S, Scoffoni C, Cao K-F, Jansen S (2018). Are leaves of three temperate angiosperm species more vulnerable to xylem embolism than branch xylem? *Journal of Experimental Botany* 69: 5611-5623, DOI: 10.1093/jxb/ery321.
https://academic.oup.com/jxb/article/69/22/5611/5088935

31. Link RM, **Schuldt B**, Choat B, Jansen S, Cobb A (2018). Size-bias in estimating vessel length distributions. *Journal of Theoretical Biology* 455: 329-341, DOI: 10.1016/j.jtbi.2018.07.036.
https://www.sciencedirect.com/science/article/abs/pii/S0022519318303679

30. Mausolf K, Wilm P, Härdtle W, Jansen K, **Schuldt B**, Sturm K, von Oheimb G, Hertel D, Leuschner C, Fichtner A (2018). Higher drought sensitivity of radial growth of European beech in managed than in unmanaged forests. *Science of the Total Environment* 642: 1201-1208, DOI: 10.1016/j.scitotenv.2018.06.065.
https://www.sciencedirect.com/science/article/pii/S0048969718321363

29. Khansaritoreh E, **Schuldt B**, Dulamsuren C (2018). Hydraulic traits and tree-ring width in Larix sibirica Ledeb. as affected by summer drought and forest fragmentation in the Mongolian forest steppe. *Annals of Forest Science* 75: 30, DOI: 10.1007/s13595-018-0701-2.
https://link.springer.com/article/10.1007/s13595-018-0701-2

28. Zhang Y, Lamarque LL, Rorres-Ruiz JM, **Schuldt B**, Karimi Z, Li S, Quin D-W, Bittencourt P, Pereira L, Cao K-F, Delzon S, Jansen S (2018). Testing the plant pneumatic method to estimate xylem embolism resistance of temperate trees. *Tree Physiology* 38: 1016-1025, DOI: 10.1093/treephys/tpy015.
https://academic.oup.com/treephys/article/38/7/1016/4883211

27. Hartmann H, **Schuldt B**, Sanders TGM, Macinnis-Ng C, Boehmer HJ, Allen CD, Bolte A, Crowther TW, Hansen MC, Ruehr NK, Anderegg WRL (2018). Monitoring global tree mortality patterns and trends.

Report from the VW symposium 'Crossing scales and disciplines to identify global trends of tree mortality as indicators of forest health'. *New Phytologist* 217: 984-987, DOI: 10.1111/nph.14988.
https://nph.onlinelibrary.wiley.com/doi/full/10.1111/nph.14988

26. O'Brien MJ, Engelbrecht BMJ, Joswig J, Pereyra G, **Schuldt B**, Jansen S, Kattge J, Landhäusser SM, Levick SR, Preisler Y, Väänänen P, Macinnis-Ng C (2017). A functional trait toolbox for assessing tree vulnerability to drought-induced mortality. *Journal of Applied Ecology* 54: 1669-1686, DOI: 10.1111/1365-2664.12874.
https://besjournals.onlinelibrary.wiley.com/doi/full/10.1111/1365-2664.12874

25. Kirfel K, Leuschner C, Hertel D, **Schuldt B*** (2017). Influence of root diameter and soil depth on the xylem anatomy of fine- to medium-sized roots of mature beech trees in the top- and subsoil. *Frontiers in Plant Science* 8: 1194, DOI: 10.3389/fpls.2017.01194.
https://doi.org/10.3389/fpls.2017.01194

24. Fuchs S, Leuschner C, Link RM, Coners H, **Schuldt B*** (2017). Calibration and comparison of thermal dissipation, heat ratio and heat field deformation sap flow probes for diffuse-porous trees. *Agricultural and Forest Meteorology* 244-245: 151-161, DOI: 10.1016/j.agrformet.2017.04.003.
https://www.sciencedirect.com/science/article/pii/S0168192317301314

23. Lübbe T, **Schuldt B**, Leuschner C (2017). Acclimation of leaf water status and stem hydraulics to drought and tree neighborhood: alternative strategies among the saplings of five temperate deciduous tree species. *Tree Physiology* 37: 456-468, DOI: 10.1093/treephys/tpw095.
https://academic.oup.com/treephys/article/37/4/456/2547779

22. Hajek P, Kurjak D, von Wühlisch G, Delzon S, **Schuldt B*** (2016). Intraspecific variation in wood anatomical, hydraulic and foliar traits in ten European beech provenances differing in growth yield. *Frontiers in Plant Science* 7: 791, DOI: 10.3389/fpls.2016.00791.
https://doi.org/10.3389/fpls.2016.00791

21. Li S, Lens F, Espino S, Karimi Z, Klepsch M, Schenk J, Schmitt M, **Schuldt B**, Jansen S (2016). Intervessel pit membrane thickness as a key determinant of embolism resistance in angiosperm xylem. *IAWA Journal* 37: 152-171, DOI: 10.1163/22941932-20160128.
https://brill.com/view/journals/iawa/37/2/article-p152_4.xml

20. **Schuldt B***, Knutzen F, Delzon S, Jansen S, Müller-Haubold H, Burlett R, Clough Y and Leuschner C (2016). How adaptable is the hydraulic system of European beech in the face of climate change-related precipitation reduction? *New Phytologist* 210: 443-458, DOI: 10.1111/nph.13798.
https://nph.onlinelibrary.wiley.com/doi/full/10.1111/nph.13798

19. Li S, Feifel M, Karimi Z, **Schuldt B**, Choat B, Jansen S (2016). Leaf gas exchange performance and the lethal water potential of five European species during drought. *Tree Physiology* 36: 179-192, DOI: 10.1093/treephys/tpv117.
https://academic.oup.com/treephys/article/36/2/179/2364669

18. Lübbe T, **Schuldt B**, Coners H, Leuschner C (2016). Species diversity and identity effects on the water consumption of tree sapling assemblages under ample and limited water supply. *Oikos* 125: 86-97, DOI: 10.1111/oik.02367.
https://onlinelibrary.wiley.com/doi/full/10.1111/oik.02367

17. Lübbe T, **Schuldt B**, Leuschner C (2015). Species identity and neighbor size surpass the impact of tree species diversity on productivity in experimental broad-leaved tree sapling assemblages under dry and moist conditions. *Frontiers in Plant Science* 6: 857, DOI: 10.3389/fpls.2015.00857.
https://doi.org/10.3389/fpls.2015.00857

16. Kotowska M, Hertel D, Abou Rajab Y, Barus H, **Schuldt B** (2015). Patterns in hydraulic architecture from roots to branches in six tropical tree species from cacao agroforestry and their relation to wood density and stem growth. *Frontiers in Plant Science* 6: 191, DOI: 10.3389/fpls.2015.00191.
https://doi.org/10.3389/fpls.2015.00191

15. Chenlemuge T, Dulamsuren C, Hertel D, **Schuldt B**, Leuschner C, Hauck M (2015). Hydraulic properties and fine root mass of Larix sibirica along forest edge-interior gradients. *Acta Oecologica* 63: 28-35, DOI: 10.1016/j.actao.2014.11.008.
https://www.sciencedirect.com/science/article/abs/pii/S1146609X15000144

14. Jansen S, **Schuldt B**, Choat B (2015). Current controversies and challenges in applying plant hydraulic techniques. *New Phytologist* 205: 961-964, DOI: 10.1111/nph.13229.
https://nph.onlinelibrary.wiley.com/doi/full/10.1111/nph.13229

13. Chenlemuge T, **Schuldt B**, Dulamsuren C, Hertel D, Leuschner C, Hauck M (2015). Stem increment and hydraulic architecture of a boreal conifer (Larix sibirica) under contrasting macroclimates. *Trees-Structure and Function* 29: 623-636, DOI: 10.1007/s00468-014-1131-x.
https://link.springer.com/article/10.1007/s00468-014-1131-x

12. Hoeber S, Leuschner C, Köhler L, Arias Aguilar D, **Schuldt B*** (2014). The importance of hydraulic conductivity and wood density to growth performance in eight tree species from a tropical semi-dry climate. *Forest Ecology and Management* 330: 126-136, DOI: 10.1016/j.foreco.2014.06.039.
https://www.sciencedirect.com/science/article/abs/pii/S037811271400406X

11. Hajek P, Leuschner C, Hertel D, Delzon S, **Schuldt B** (2014). Trade-offs between xylem hydraulic properties, wood anatomy and yield in *Populus*. *Tree Physiology* 34: 744-756, DOI: 10.1093/treephys/tpu048.
https://academic.oup.com/treephys/article/34/7/744/2338059?keytype=ref&ijkey=Qy0rzzveg2NFOiA

10. Schmidt-Walter P, Richter F, Herbst M, **Schuldt B**, Lamersdorf N P (2014). Transpiration and water use strategies of two poplar short rotation coppices differing in canopy structure and leaf area. *Agriculture and Forest Meteorology* 195-196: 165-178, DOI: 10.1016/j.agrformet.2014.05.006.
https://www.sciencedirect.com/science/article/pii/S0168192314001233

9. Hertel D, **Schuldt B** (2014) Holzanatomische Untersuchungen der hydraulischen Leitfähigkeit fossiler Birken und Kiefern der Jüngeren Dryas von Dissenchen 18. In: Schopper F (eds.): Ausgrabungen im Niederlausitzer Braunkohlerevier 2011/2012. Arbeitsberichte zur Bodendenkmalpflege in Brandenburg 27: 173-176, ISBN 978-3-910011-85-4.

8. Moser G, **Schuldt B**, Hertel D, Horna V, Coners H, Barus H, Leuschner C (2014). Replicated throughfall exclusion experiment in an Indonesian perhumid rainforest: wood production, litter fall and fine root growth under simulated drought. *Global Change Biology* 20(5): 1481-1497, DOI: 10.1111/gcb.12424.
https://onlinelibrary.wiley.com/doi/full/10.1111/gcb.12424

7. Leuschner C, Moser G, Hertel D, Erasmi S, Leitner D, Culmsee H, **Schuldt B**, Schwendenmann L (2013). Conversion of tropical moist forest into cacao agroforest: Consequences for carbon pools and annual C sequestration. *Agroforestry Systems* 87(5): 1173-1187, DOI: 10.1007/s10457-013-9628-7.
https://link.springer.com/article/10.1007/s10457-013-9628-7

6. **Schuldt B**, Leuschner C, Brock N, Horna V (2013). Changes in wood density, wood anatomy and hydraulic properties of the xylem along the root-to-shoot flow path in tropical rainforest trees. *Tree Physiology* 33(2): 161-174, DOI: 10.1093/treephys/tps122.
https://academic.oup.com/treephys/article/33/2/161/1683429

5. **Schuldt B**, Leuschner C, Horna V, Moser G, Köhler M, van Straaten O, Barus H (2011). Change in hydraulic properties and leaf traits in a tall rainforest tree species subjected to long-term throughfall exclusion in the perhumid tropics. *Biogeosciences* 8(8): 2179-2194, DOI: 10.5194/bg-8-2179-2011.
https://www.biogeosciences.net/8/2179/2011/bg-8-2179-2011.html

4. Horna V, **Schuldt B**, Brix S, Leuschner C (2011). Environment and tree size controlling stem sap flux in a perhumid tropical forest of Central Sulawesi, Indonesia. *Annals of Forest Science* 68(5): 1027-1038, DOI: 10.1007/s13595-011-0110-2.
https://link.springer.com/article/10.1007/s13595-011-0110-2

3. Zach A, **Schuldt B***, Brix S, Horna V, Culmsee H, Leuschner C (2010). Vessel diameter and xylem hydraulic conductivity increase with tree height in tropical rainforest trees in Sulawesi, Indonesia. *Flora* 205: 506-512, DOI: 10.1016/j.flora.2009.12.008.
https://www.sciencedirect.com/science/article/pii/S0367253009001418

2. Zach A, **Schuldt B**, Horna V, Tjitrosemito S, Leuschner C (2010). The hydraulic performance of tropical rainforest trees in their perhumid environment. Is there evidence for drought vulnerability? In: Teja Tscharntke *et al.* (eds.), Tropical rainforests and agroforests under global change, pp. 391-410, Springer-Verlag Berlin Heidelberg, DOI: 10.1007/978-3-642-00493-3_18.
https://link.springer.com/chapter/10.1007/978-3-642-00493-3_18

1. Hertel D, Moser G, Culmsee H, Erasmi S, Horna V, **Schuldt B**, Leuschner C (2009). Below- and above-ground biomass and net primary production in a paleotropical natural forest (Sulawesi, Indonesia) as compared to neotropical forests. *Forest Ecology and Management* 258: 1904–1912, DOI: 10.1016/j.foreco.2009.07.019.
https://www.sciencedirect.com/science/article/abs/pii/S0378112709004940