

# Cade N. Kane

PhD Candidate (graduating December 2023)  
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## Education

Purdue University	West Lafayette, Indiana	Plant Science	B.S., May 2018	3.65/4.00
Purdue University	West Lafayette, Indiana	Plant Physiology	PhD, December 2023	3.70/4.00

## Publications

1. **CN Kane**, and SAM McAdam. "Abscisic acid driven stomatal closure during drought in anisohydric *Fagus sylvatica*." *Journal of Plant Hydraulics* 9 (2023): 002-002.
2. **CN Kane**, and SAM McAdam. "Abscisic acid can augment, but is not essential for, autumnal leaf senescence." *Journal of Experimental Botany* 74.10 (2023): 3255-3266.
3. SAM McAdam, **CN Kane**, JA Mercado Reyes, AA Cardoso, and TJ Brodribb. "An abrupt increase in foliage ABA levels on incipient leaf death occurs across vascular plants." *Plant Biology* (2022).
4. RT Avila, **CN Kane**, TA Batz, C Trabi, FM Damatta, S Jansen, and SAM McAdam. "The relative area of vessels in xylem correlates with stem embolism resistance within and between genera." *Tree Physiology* (2022).
5. AA Cardoso, **CN Kane**, IM Rimer, and SAM McAdam. "Seeing is believing: what visualizing bubbles in the xylem has revealed about plant hydraulic function." *Functional Plant Biology* (2022).
6. T Suttuyut, RP Auber, M Ghaste, **CN Kane**, SAM McAdam, JH Wisecaver, and JR Widhalm. "Integrative analysis of the shikonin metabolic network identifies new gene connections and reveals evolutionary insight into shikonin biosynthesis." *Horticulture research* 9 (2022).
7. RT Avila, AA Cardoso, TA Batz, **CN Kane**, FM DaMatta, and SAM McAdam. "Limited plasticity in embolism resistance in response to light in leaves and stems in species with considerable vulnerability segmentation." *Physiologia Plantarum* (2021).
8. RT Avila, X Guan, **CN Kane**, AA Cardoso, TA Batz, FM DaMatta, S Jansen, and SAM McAdam. "Xylem embolism spread is largely prevented by interconduit pit membranes until the majority of conduits are gas-filled." *Plant, Cell & Environment* (2021).
9. **CN Kane**, GJ Jordan, S Jansen, and SAM McAdam. "A permeable cuticle, not open stomata, is the primary source of water loss from expanding leaves." *Frontiers in Plant Science* 11 (2020).
10. AA Cardoso, D Visel, **CN Kane**, TA Batz, C García Sánchez, L Kaack, LJ Lamarque et al. "Drought-induced lacuna formation in the stem causes hydraulic conductance to decline before xylem embolism in *Selaginella*." *New Phytologist* 227, no. 6 (2020): 1804-1817.
11. AA Cardoso, TJ Brodribb, **CN Kane**, FM. DaMatta, and SAM McAdam. "Osmotic adjustment and hormonal regulation of stomatal responses to vapour pressure deficit in sunflower." *AoB Plants* 12, no. 4 (2020): plaa025.

12. TA Rush , J Golan, A McTaggart, **C Kane**, RW Schneider, and MC Aime. "Variation in the internal transcribed spacer region of *Phakopsora pachyrhizi* and implications for molecular diagnostic assays." *Plant disease* 103, no. 9 (2019): 2237-2245.

Papers in under review or in preparation:

13. **CN Kane**, Scott A.M. McAdam, TJ Brodribb. "High phenological diversity blurs the predictions of future forest responses to climate change." (under review *New Phytologist*)
14. **CN Kane**, SAM McAdam. "Spatial and temporal freezing dynamics of leaves revealed by timelapse imaging" (under review *The Plant Journal*)
15. CA Baker, **CN Kane**, V Zeisler, H Lerman, A Manandhar, L Schreiber, SAM McAdam. "Tracking the paths of greatest resistance to residual water loss as leaves expand" (under review *New Phytologist*)
16. **CN Kane**, I Rimer, I Paudel, J Dukes, SAM McAdam. "Variation in Hydraulic Traits and Responses to Drought of Understory Temperate North American Trees" (In preparation)
17. **CN Kane**, I Rimer, RP Skelton, CM Smith-Martin, TJ Brodribb, SAM McAdam. "Global Plasticity in Embolism Resistance of *Fagus sylvatica* f. *purpurea*" (In preparation)
18. **CN Kane**, MC Aime, JH Wisecaver, SAM McAdam. "Phylogenetic distribution of Fungal ABA synthesis: Multiple Pathways and Mysterious Function" (In preparation)

## Seminars and Conference presentations

1. Invited talk "Uncommon gardens: Using urban forests to study plasticity to drought and phenological responses to climate change" American Geophysics Union 2023, San Francisco (December 2023)
2. Invited talk "From Birth to Death: Unraveling the Mysteries of Deciduous Foliage" Purdue Botany and Plant Pathology (November 2023)
3. Poster presentation "Spatial and temporal freezing dynamics of leaves revealed by timelapse imaging" Purdue Botany and Plant Pathology symposium (November 2023)
4. Poster presentation "Evaluating the Impacts of Climate Change on Deciduous Leaf Life Span in Tasmania and Indiana" *New Phytologist: Young researchers in plant science*, Singapore (July 2023)
5. Invited talk "Uncommon gardens: Evaluating the Impacts of Climate Change on Deciduous Leaf Life Span in Tasmania and Indiana" University of Tasmania (June 2023)
6. Invited talk "Abscisic acid can augment, but is not essential for autumnal leaf senescence" Australian Research Council Centre of Excellence for Plant Success in Nature & Agriculture (March 2023)
7. Poster presentation "Evaluating the Impacts of Climate Change on Deciduous Leaf Life Span in Tasmania and Indiana" Fulbright Gala, Canberra Australia (February 2023)
8. Invited talk "Abscisic acid can augment, but is not essential for autumnal leaf senescence" Purdue University (November 2022)
9. Poster presentation "On the Banks of the Wabash: Variation in Hydraulic Traits in the Midwest's 'Amazon' basin" Gordon Research Conference: Multiscale Vascular Plant Biology (June 2022)
10. Invited talk "Diagnosing Leaf Death: The Terminal ABA Spike" Purdue University CPB (May 2022)
11. Poster presentation "Abscisic acid causes autumn deciduousness while frost induced embolism causes marcescence" Xylem International Meeting 4, University of Padua (September 2019)
12. Invited talk "The Role of ABA in Leaf Expansion" University of Ulm (July 2019)
13. Invited talk "The Role of ABA in Leaf Expansion" Trinity College Dublin (May 2019)
14. Poster presentation "Fungal Abscisic Acid Production and how to Measure it in Liquid Culture" Purdue Botany and Plant Pathology symposium (November 2018)

## Teaching

1. Guest lecture Cal State LA BIOL 428 Plant Physiology “Abscisic Acid: drought and beyond” (November 2022)
2. Botany 302: Plant Ecology. Teaching assistant, Purdue Department of Botany and Plant Pathology, West Lafayette, IN. (January 2022-May 2022)
3. Botany 305: Plant Taxonomy and Evolution. Teaching assistant, Purdue Department of Botany and Plant Pathology, West Lafayette, IN. (August 2021-December 2021)
4. Agronomy 320: Plant Genetics. Teaching assistant, Purdue Department Agronomy, West Lafayette, IN. (May 2021-August 2021)
5. Botany 302 Plant Ecology. Teaching assistant, Purdue Department of Botany and Plant Pathology, West Lafayette, IN. (January 2021-May 2021)
6. Agronomy 320: Plant Genetics. Course manager overseeing online content migration, Department of Agronomy, Purdue University, West Lafayette, IN. (January 2019-May 2019)
7. Guest lecture Purdue BTNY 562 Plant Hormone Biology “The Role of Abscisic Acid in Leaf Senescence” (October 2019)
8. Guest lecture Purdue BTNY 305 Plant Taxonomy and Evolution “Autumn ABA dynamics” (December 2018)
9. Botany 316: Plant Anatomy. Lecturer and course coordinator, Purdue Department of Botany and Plant Pathology, West Lafayette, IN. (August 2017-December 2017)
10. Botany 110: Introduction to Plant Science. Teaching assistant, Purdue Department of Botany and Plant Pathology, West Lafayette, IN. (August 2015-December 2015)

## Appointments

1. Fulbright Fellow, Australian Research Council Centre of Excellence for Plant Success in Nature & Agriculture, University of Tasmania, Hobart, TAS, Australia (September 2022-July 2023)
2. Graduate Research Associate, Department of Botany and Plant Pathology, Purdue University, West Lafayette, IN (August 2018-December 2023)
3. Center for Plant Biology Trainee Association Secretary and Treasurer, Purdue Center for Plant Biology, Purdue University, West Lafayette, IN (May 2019-May 2021)
4. Senator to the Purdue Graduate Student Government, Purdue University, West Lafayette, IN (August 2019-August 2020)
5. Herbarium Assistant Director, Purdue Herbarium, West Lafayette, IN (August 2017-May 2018)
6. Cornell Summer Research Scholar, Cornell University NYSAES, Geneva, NY (May 2017-August 2017)
7. Resident Assistant, University College Dublin, Dublin, Ireland (March 2017-May 2017)
8. Research Assistant, University College Dublin Péac, Dublin, Ireland (January 2017-May 2017)
9. Research Assistant, Purdue Department of Botany and Plant Pathology, West Lafayette, IN (January 2016-December 2016)
10. Herbarium Digitizer, Purdue Herbarium, West Lafayette, IN (May 2015-July 2018)

## Student Mentoring

1. Conner Baker: Project: Minimum stomatal conductance of developing leaves. (May 2022-Current)
2. Ian Rimer: Vulnerability to embolism of understory species in Midwest forests. (May 2021-Current)
3. Jiacan Sun: Project: Investigating the role of root fungal associates and drought responses in pea and tomato. (September 2022-July 2023)
4. Chris McCarthy: Project: Examination of rehydration kinetics in roots of *Callitris rhomboidei*. (September 2022-July 2023)

5. Hannah Lerma: Project: Development of the stomatal outer cuticular ledge across land plants. (May 2022-September 2022)
6. Dongsheng Wen: Project: Analyzing the relationship between Huber value and xylem vulnerability to embolism. (August 2021-August 2022)
7. Ben Binstock: Project: Stomatal responses to VPD change across plant lineages. (January 2022-September 2022)
8. Ben Turner: Project: Comparing drought resistant to natives and invasives in the Midwest. (January 2022-May 2022)
9. Ethan Smiley: Project: Changes in xylem vulnerability to embolism in the same individual across a season. (August 2021-May 2022)
10. Alexander Haynes: Project 1: Elucidating the fungal ABA production pathway beyond the *Ascomycota*.  
Project 2: Vein density plasticity after drought event in crop and tree species. (August 2021-May 2022)
11. Joel Will: Project: Identification of invasive hybrid swarm elm population in Indiana. (January 2021- September 2022)
12. Morgan Muff: Project: The effect of high NPK fertilization on productivity of moss communities.
13. Drought deciduous species when and where does embolism occur and the implications on leaf abscission. (August 2021- September 2022)
14. Yuxin Shi: Project: Embolism resistance in *Prunus serotina*. (August 2021- September 2022)
15. Joel Mercado-Reyes: Characterization of ABA peaking type dynamics during long term drought. (September 2019-January 2022)
16. Leena Mariani: Project: Effects of shading on stomatal density and vein density in grasses. (August 2021-September 2022)
17. Megan Kuhn: Project: The effect of guard cell chloroplasts on stomatal behavior. (January 2022-September 2022)
18. Kean Kane: Project 1: Investigating the formation of the stomatal outer cuticular ledge and cuticle formation across plant species.  
Project 2: Formation and regrowth of waxy stomatal plugs in conifers.  
Product: “Measuring midday leaf gas exchange, water potential, abscisic acid and chlorophyll content” Poster presentation. (August 2019-January 2021)
19. Emma Miller: Project: Freezing tolerance or freezing resistance in *Lonicera x purpusii*. (January 2021-May 2021)
20. Azolla Ralston: Project: The effect of high VPD on leaf anatomy of aquatic ferns. (January 2020-December 2020)
21. Sophie Westbrook: Project 1: Stomatal density and mechanics are critical for high productivity: insights from amphibious ferns.  
Project 2: Atavistic stomatal responses to blue light in Marsileaceae. (August 2019-May 2020)
22. Josh Randall: Project 1: Hydraulics regulate stomatal responses to changes in leaf water status in the fern *Athyrium filix-femina*.  
Project 2: Extended differentiation of veins and stomata is essential for the expansion of large leaves in *Rheum rhabarbarum*. (July 2018-May 2020)
23. Clara Sanchez: Product: “How plants transport water under negative pressure?”  
<https://youtu.be/tOewOBxG17E> (May 2019- August 2019)
24. Xinyi Guan: Project: Stem and leaf xylem of angiosperm trees experiences minimal embolism in temperate forests during two consecutive summers with moderate drought. (May 2019- August 2019)
25. Matthias Weiner: Project: Comparisons of the centrifugal vs optical methods to measure xylem vulnerability to embolism. (May 2019- August 2019)

## Grants and Fellowships

1. (\$27,000) Fulbright Australia Futures Kinghorn Fellowship (2022-2023)
2. (\$18,000) Purdue Center for Plant Biology Fellow (2020)
3. (\$1,000) Purdue Botany and Plant Pathology Weier award for outstanding graduate student (2022)
4. (\$1,000) Robert and Karen Thompson Scholarship (2018)
5. (\$1,000) Alva R. Bryan Agriculture Alumni Scholarship (2018)
6. (\$500) Purdue Center for Plant Biology Travel Award (2022)
7. (\$500) Purdue Botany and Plant Pathology Travel Award (2022)
8. (\$500) Purdue Center for Plant Biology Travel Award (2021)
9. (\$500) Purdue Department of Botany and Plant Pathology Outstanding Senior (2018)
10. (\$500) Purdue Department of Botany and Plant Pathology Outstanding Junior (2017)
11. (\$500) Purdue Department of Botany and Plant Pathology Outstanding Sophomore (2016)
12. (\$500) Steven J. Sullivan Memorial Scholarship (2014)
13. (\$300) Finalist in the Purdue TEDX Writing Competition (2014)
14. (\$200) *New Phytologist* Young Researcher Travel Grant (2023)

## Synergistic Activities and Outreach

1. Interviewed about my Fulbright fellowship 'Following up with a Fulbright scholar: Cade Kane' by Lindsey Berebitsky (September 2023)
2. Panelist for ASPB Webinar "Plantae Presents: Building Your Professional Scientific Network" (March 2023)
3. Reviewer for manuscripts in *New Phytologist*, *Frontiers In Forests And Global Change* and *Plant Physiology* journals (Beginning in 2022)
4. Interviewed about Fulbright award for the 'That's what I call science' podcast and radio show (December 2022)
5. Interviewed for Fulbright research (Australian Broadcasting Company, Statewide Mornings Tasmania with Mel Bush) (November 2022)
6. Helped recruit incoming undergraduates to study botany and plant physiology and The University of Tasmania (September 2022)
7. Australian Research Council Centre of Excellence for Plant Success in Nature & Agriculture (Associate HDR Student) (September 2022-Current)
8. Interviewed about Fulbright fellowship 'Plant physiology student wins Fulbright to study triggers of leaf senescence at his advisor's alma mater.' by Nancy Alexander (July 2022)
9. Helped establish and led tours for 1000+ visitors of a public Evolution Garden at Purdue University to teach the public about plant evolution and diversity. (2018-2022)
10. Interviewed about my research for article about research during the COVID-19 pandemic 'Plant scientists maintain critical research to save data and irreplaceable plants' by Nancy Alexander (July 2020)
11. Supervised and mentored undergraduate researchers belonging to under-represented minorities in science. (Since 2020)
12. Run tie dye events for both undergraduate and graduate student botany organizations at Purdue University (2019 and 2022)
13. Wrote an article for *Journal & Courier* about life as a graduate student researcher. (2019)
14. Volunteer at an IPCC Meeting on Setting the Agenda for Future Discussions on Climate Change in Dublin Ireland (February 2017)