

## Lindsey E. Becker, Ph.D.

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### EDUCATION

2018 - 2023 **Ph.D – North Carolina State University, Raleigh, NC**

Major: Plant Pathology

Advisor: Dr. Marc Cubeta

Dissertation Title: Unlocking the Wheat Seed Mycobiome: an Investigation of Drought Stress on Successive Generations

2015 - 2018 **M.Sc. – North Carolina State University, Raleigh, NC**

Major: Plant Pathology

Advisor: Dr. Marc Cubeta

Thesis Title: Increased Flower Production and Plant Weight of *Calibrachoa x hybrida* by the Soil Fungus *Mortierella elongata*

2006 - 2010 **B.Sc. – The College of Wooster, Wooster, OH**

Major: Biology

Advisor: Dr. Marilyn Loveless

### APPOINTMENTS

2023 - present Postdoctoral Research Scholar, Oregon State University (OSU), Corvallis, OR

2015 - 2023 Graduate Research Assistant, NCSU, Raleigh, NC

2011 - 2015 Laboratory and field technician, Duke University, Durham, NC

2009 - 2010 Undergraduate Research Assistant, Ohio State University, Wooster, OH

### PUBLICATIONS

**Published**.....

2) **Becker L. E.** and Cubeta M.A. 2024. Impact of multigenerational drought on the wheat seed microbiome. *Phytobiomes*: <https://doi.org/10.1094/PBIOMES-08-23-0083-R>

1) **Becker L. E.** and Cubeta M.A. 2020. Increase of flower production and plant weight of *Calibrachoa x hybrida* by the soil fungus *Mortierella elongata*. *Journal of Environmental Horticulture* <https://doi.org/10.24266/0738-2898-38.4.114>

**In Preparation**.....

6) (*Submitted*) **Becker L. E.** and Cubeta M.A. 2024. Leveraging the wheat seed mycobiome for a climate resilient future. *Environmental Microbiology Reports: EMIR-2024-0051*

- 5) **Becker L. E.**, Hawkes C.V., Heiniger R., and Cubeta MA. 2024. Stability of the Wheat Seed Mycobiome Across North Carolina's Longitudinal Gradient. *To be submitted to Phytobiomes. Biorxiv*: <https://doi.org/10.1101/2024.02.22.581680>
- 4) **Becker L. E.**, Marshall D., and Cubeta M.A. 2024. A synergistic culture dependent and independent approach reveals a conserved wheat seed mycobiome. *To be submitted to Mycologia. Biorxiv*: <https://doi.org/10.1101/2024.02.22.581674>
- 3) Benitez M.S, Hersh M., **Becker L.E.**, Vilgalys R., and Clark J. 2024. Fungal community and taxa specialization to host and environment interactions in two temperate forests. *To be submitted to PLOSOne*.
- 2) **Becker L.E.**, Ahmad J., Carbone M.A., Cubeta M.A., and Grunden A.M. 2024. The legacy of drought: multigenerational effects on the wheat seed microbiome post-flowering. *To be submitted to FEMS Microbiology Ecology*.
- 1) **Becker L.E.**, Massman C., Syring K., Busby, P., and Hayes, P. 2024. Genetic mapping of phyllosphere fungal taxa and barley scald resistance identifies candidate loci for microbiome mediated resistance. *To be submitted to Crop Science*.

#### **PEER REVIEW EXTENSION PUBLICATIONS**

- 2) **Becker L. E.**, Adhikari U., Mays T., Shishkoff N., Crouch J.A., Cubeta M.A. 2021. Evaluation of boxwood cultivars for resistance to boxwood blight, 2020. *Plant Disease Management Reports*. Vol 15: OT008
- 1) **Becker L. E.** and Cubeta M. 2020. Evaluation of calibrachoa cultivars for black root rot resistance, 2019. *Plant Disease Management Reports*. Vol 14: OT013

#### **FUNDING**

***Pending***.....

<b>Year</b>	<b>Role</b>	<b>Funding Opportunity</b>	<b>Award</b>
2023	PI	USDA NIFA AFRI Postdoctoral Fellowship “Evaluating Plant Genotype and Genotype Mixture Effects on Wheat-Associated Microbial Communities and Drought Tolerance”	<i>Pending</i> \$224,559
2023	PI	NSF BIO PRFB Fellowship “Evaluating the function of plant genotype-adapted rhizosphere microbiome and subsequent impacts on plant phenotype under drought stress”	<i>Pending</i> \$240,000

***Funded***.....

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|------|-------------|--|--|
| 2019 | Contributor | NovoNordisk Foundation: Collaborative Crop Resilience Program: <u>INTERACT</u> Decoding the Rhizobiota Interactome for Improved Crop Resilience. <i>Contributed to writing 2 of the 17 objectives outlined in this proposal.</i> |  |
|------|-------------|--|--|

2017	Co-PI	Horticulture Research Institute Grant “Calibrachoa Flowering Promoted by Endophytic <i>Mortierella elongata</i> ”	\$14,000
2017	Co-PI	NCSU Student Government Grant for Plant Pathology Outreach	\$650

### **AWARDS AND FELLOWSHIPS**

<b>Year</b>	<b>Award/Fellowship</b>	<b>Award</b>
2022	Department of Entomology and Plant Pathology Award for Excellence (PhD)	\$500
2021	Best Student Oral Presentation Award, Mycological Society of America	\$200
2020	Mentor Student Travel Award, Mycological Society of America Meeting	\$750
2019	NCSU Graduate Peer Mentoring Collaborative (2 yrs)	\$2,000
2018	Rockey FFAR Program Fellowship (3 yrs)	\$15,000

### **SCIENTIFIC PRESENTATIONS**

#### **Oral Presentations**

- 2023 **Becker, L.E.** Investigation of factors that influence the wheat seed mycobiome. AgMicrobiome Group at Oregon State, Corvallis, OR.
- 2022 **Becker, L. E.,** Hawkes, C.V, Heiniger, R.W., and Cubeta, M.A. Identifying the core wheat seed microbiome at a regional scale. Plant Health, Pittsburgh PA.
- 2022 **Becker L. E.** and Cubeta, M.A. The influence of moderate drought on the wheat seed mycobiome. Mycological Society of America Annual Meeting, Gainesville FL.
- 2022 **Becker, L. E.** and Cubeta, M.A. The influence of moderate drought stress on the wheat seed mycobiome. Collaborative Crop Resilience Program Annual Meeting, Middelfart Denmark
- 2021 **Becker, L. E.** and Cubeta, M.A. Seed to seed: yield and germination response to surface disinfection and moderate drought stress. INTERACT Bi-annual meeting (Virtual)
- 2021 **Becker L. E.** and Cubeta, M.A. Elucidating the seed mycobiome of four wheat cultivars: a culture-based approach. Mycological Society of America Annual Meeting/Botany (Virtual)
- 2021 **Becker L. E.** and Cubeta, M.A. Post-anthesis drought stress impacts wheat physiology, but what about the seed microbiome? INTERACT Annual Meeting (Virtual)
- 2020 **Becker L. E.** and Cubeta, M.A. *In Silico* Analysis of the Wheat Seed Microbiome, Collaborative Crop Resilience Program Semi-Annual Meeting (Virtual)
- 2020 **Becker L. E.** and Cubeta, M.A. New insights into the wheat seed microbiome: an *in silico* approach. Plant Health (Virtual)

- 2020 **Becker, L. E.** and Cubeta, M.A. Unlocking the wheat seed microbiome. Research & Development Team at Novozymes, Durham NC.
- 2017 **Becker L. E.** and Cubeta, M.A. *Mortierella elongata* root endophyte promotes flowering within the *Calibrachoa* floriculture system. Mycology Society of America Annual Meeting, Athens GA.
- 2017 **Becker, L. E.,** Cubeta, M.A., and Vilgalys, R.J. Plant growth promoting activity of the soil fungi *Atractiella* and *Mortierella* within the *Calibrachoa* floriculture system. Mid-Atlantic States Mycology Conference, Raleigh NC
- 2016 **Becker L. E.,** Hameed K., Uehling J.K., Vilgalys R.J., Andrews M., Rebenski J., and Cubeta M.A. Potential plant growth promotion and biological control of pathogenic soil fungi with endophytic strains of *Mortierella elongata*. Mid-Atlantic States Mycology Conference, University Park PA

### **Poster Presentations**

- 2022 **Becker L. E.,** Ingraham, P.I., and Cubeta, M.A. Examining the legacy of multi- generational drought on the wheat seed mycobiome. Plant Health, Pittsburgh PA
- 2022 **Becker L. E.** and Cubeta, M.A. Elucidating the seed mycobiome of four wheat cultivars: a culture-based approach. Graduate Student Research Symposium, Raleigh NC
- 2021 **Becker L. E.** and Cubeta, M.A. Elucidating the wheat seed mycobiome: a culture-based approach. Mid-Atlantic States Mycology Conference (Virtual)

### **Posters Contributed by Undergraduate Advisees**

- 2018 Ferri, A.M., **Becker, L. E.,** and Cubeta, M.A. Colonization of tomato roots by the soil fungus *Mortierella elongata*. Undergraduate Research Symposium, Raleigh NC
- 2017 Sulzer, J., **Becker, L. E.,** and Cubeta, M.A. Siderophore production by the plant growth promoting fungus *Mortierella elongata*. Undergraduate Research Symposium, Raleigh NC

## **PROFESSIONAL AND ACADEMIC EXPERIENCES**

### **Professional Societies:**

American Phytopathological Society, Mycological Society of America, American Phytopathological Society Pacific Division, American Phytopathological Society Southern Division.

### **Teaching roles:**

- 2024 Guest Lecturer for Fungal Ecology graduate course, OSU
- 2021 Teaching assistant (TA) graduate Introduction to Mycology course, NCSU
- 2016, 2018 TA for undergraduate Kingdom of Fungi course, NCSU

### **Mentoring roles:**

2023- present	Melissa Vergara (OSU PhD Student)
2023- present	Sofia Green (OSU CAREER-REU)
2021-22	Parker Ingraham (NCSU Provost's Scholar)
2018	Alyssa Ferri (NCSU BESST-REU)
2017	Jakob Sulzer (NCSU BESST-REU)

### **SERVICE**

**Peer reviewer:** Plant Disease, Plant Health Progress, Molecular Plant Pathology

**President:** NCSU Plant Pathology Graduate Student Association (PPGSA) (2017-18), Plant Pathology Graduate peer mentoring program (2019-21)

**Member:** Botany and Plant Pathology Plant Microbe Interactions Faculty Search Committee, OSU (2023-24); Graduate Peer Mentoring Collaborative, NCSU (2019-21); Communications Chair for the Student Executive Board of MSA (2018-19), Plant Pathology Academic Affairs Committee Student Representative, NCSU (2017-18), PPGSA (2015-19)

**Moderator:** Plant Health Annual Meeting; Technical Session (2020): "Wheat Microbiome"

### **EXTENSION ACTIVITIES**

2016	Calibrachoa grower visit to identify key diseases, Rockwell, NC
2018	Boxwood grower visit to conduct on-farm field trial, Piney River, VA

### **OUTREACH**

2022	Idea Cafe " <i>Extension to Bridge the Gap Between Agriculture and Consumers</i> " Plant Health. Pittsburgh, NC
2021	" <i>Mycology: Fungi are everywhere!</i> " NC School of Science and Math. Durham, NC (Virtual)
2019	" <i>Fungi and Plants</i> " NC Museum of Natural Sciences (North Carolina Museum of Natural Sciences). Raleigh, NC
2017	NSF STEM Microfungi Collections Consortium High School Biology and Environmental Science Teachers Workshop, MSA Annual meeting. Athens, GA
2017	" <i>Zoom!</i> " Forest View Elementary School. Durham, NC
2015	" <i>What is Plant Pathology?</i> " McGee Middle School. Benson, NC
2015-19	Plant Pathology Exhibit, Bugfest North Carolina Museum of Natural Sciences Raleigh, NC