

Aaron K. Lee

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EDUCATION

University of Minnesota, Twin Cities (UMN), Saint Paul, MN
PhD student in Plant and Microbial Biology, in progress (started Fall 2020)

The College of New Jersey (TCNJ), Ewing, NJ
BS in Biology with honors, magna cum laude, December 2019
Honors Program

Honors Thesis: Honeysuckles in the age of genomics: Leveraging big data to study the evolution of organ fusion in a non-model clade

RESEARCH EXPERIENCE

Research Interests

I am broadly interested in plant evolution. I am specifically interested in using integrative approaches to understand the evolution of plant biodiversity and connecting its climatic and environmental evolutionary drivers to the evolution of its genetic and genomic foundation. I am especially excited about genome and gene family evolution, computational and statistical approaches to comparative phylogenetics, and big data applications in plant biology.

Plant Systematics and Evolution Lab, University of Minnesota

PI: Dr. Ya Yang

PhD Student, August 2020 – present
NSF Graduate Research Fellow, June 2021 – present

Plant Systematics and Evolutionary Biology Lab, TCNJ

PI: Dr. Wendy L. Clement

Mentored Research Student (for-credit), August 2017 – December 2019
Mentored Undergraduate Summer Experience (MUSE), June 2019 – August 2019
Research Technician, January 2020 – July 2020

Evolutionary and Computational Genomics Lab, Michigan State University

PI: Dr. Shin-Han Shiu

Plant Genomics @ MSU (NSF REU), May 2018 – August 2018
Undergraduate Research Assistant (volunteer), August 2018 – December 2019

PUBLICATIONS

- **Lee, AK***, IS Gilman*, M Srivastav, A Lerner, MJ Donoghue, & WL Clement. Reconstructing Dipsacales phylogeny using Angiosperms353: Issues and insights. 2021. *American Journal of Botany*. <https://doi.org/10.1002/ajb2.1695>

- Moore, BM, P Wang, P Fan, **AK Lee**, B Leong, YR Lou, CA Schenck, K Sugimoto, R Last, MD Lehti-Shiu, CS Barry, & SH Shiu. 2020. Within and cross species predictions of plant specialized metabolism genes using transfer learning. *in silico Plants*.
<https://doi.org/10.1093/insilicoplants/diaa005>

*equal authorship

PRESENTATIONS

Oral Presentations

- *Botany 2021 (virtual), 07/22/2021.*
Lee, AK, IS Gilman, M Srivastav, AD Lerner, MJ Donoghue, & WL Clement. Targeted enrichment of Angiosperms353 in the Dipsacales highlights nodes of conflict and clarity.
- *Caryophyllales Project Meeting for NSF DEB-1939226 (virtual), 06/08/2021.*
Lee, AK. Identifying gene modules underlying the repeated evolution of abiotic stress tolerance across the Caryophyllales.
- *Lonicera Spring Retreat 2021 for NSF DEB-1929670 (virtual), 06/03/2021.*
Lee, AK. Update on Hyb-Seq development for *Lonicera*.
- *Botany 2020 (virtual), 07/30/2020.*
Lee, AK, M Bhatti, H Rahman-Vyas, DG Howarth, MJ Donoghue, & WL Clement. Honeysuckle (*Lonicera*, Caprifoliaceae, Dipsacales) NAC subfamily Ia evolution and implications for the evolution of organ fusion.
- *TCNJ senior honors capstone defense (Ewing, NJ), 12/06/2019.*
Lee, AK. Honeysuckles in the Age of Genomics: Using Big Data to Study the Evolutionary History of a Non-Model Clade.
- *Lonicera Retreat 2019 for NSF DEB-1929670 (New Haven, CT), 11/09/2019.*
Lee, AK. Progress on reconstructing a *CUC* gene tree in Dipsacales and Asterids.
- *Plant Genomics @ MSU Research Symposium (East Lansing, MI), 07/26/2018.*
Lee, AK, BM Moore, & SH Shiu. Prediction of specialized metabolism genes in *Solanum lycopersicum*.

Poster Presentations

- *Botany 2022 (Anchorage, AK), 07/25/2022.*
Lee, AK & Y Yang. Molecular evolution and potential convergence in repeated shifts to salinity tolerance in Amaranthaceae *s.l.* (Caryophyllales).
- *EMBO Predicting Evolution (virtual), 06/15/2021.*
Lee, AK & Y Yang. Identifying gene modules underlying the repeated evolution of abiotic stress tolerance across the plant order Caryophyllales.
- *Botany 2019 (Tucson, AZ), 08/29/2019.*
Evolution in Philadelphia Conference (EPiC) (Philadelphia, PA), 09/14/2019
Lee, AK, H Rahman-Vyas, J Walker, MJ Donoghue, SA Smith, DG Howarth, & WL Clement.

Exploring the evolutionary history of the *CUP-SHAPED COTYLEDON (CUC)* gene family in the honeysuckles (*Lonicera*, Caprifoliaceae) and relatives.

- *TriBeta NE District 2 Convention (Bloomsburg, PA), 03/23/2019.*
TCNJ Celebration of Student Achievement (Ewing, NJ), 05/08/2019.
Lee, AK, H Rahman-Vyas, DG Howarth, MJ Donoghue, & WL Clement. Exploring the evolutionary history of the *CUP-SHAPED COTYLEDON (CUC)* gene family in the honeysuckles (*Lonicera*, Caprifoliaceae) and relatives.
- *Pennsylvania Botany Symposium (State College, PA), 11/02/2018. Awarded first place, undergraduate poster.*
Zhang, L*, **AK Lee***, H Rahman-Vyas*, DG Howarth, & WL Clement. Morphological and genomic insights into the evolution of *Lonicera* (Caprifoliaceae).
- *Mid-Michigan Symposium for Undergraduate Research Experiences (East Lansing, MI), 07/24/2018.*
Lee, AK, BM Moore, & SH Shiu. Evolutionary features inform prediction of specialized metabolism genes in *Solanum lycopersicum*.
- *TCNJ Celebration of Student Achievement (Ewing, NJ), 05/02/2018.*
Mid-Atlantic Ecological Society of America (Newark, NJ), 04/07/2018.
Fertakos, ME*, L Zhang*, **AK Lee***, & WL Clement. Insights from 120 years in the past: Using historical specimens to study plant phenology in Mercer County, NJ.

*co-presenters

TEACHING, MENTORSHIP, & OUTREACH

Professional Development

- Teaching in Higher Education (GRAD 8101), Spring 2021, UMN Preparing Future Faculty program

Teaching Experience

- Course Assistant, TCNJ, Fall 2019: Foundations of Biological Inquiry (BIO 201)

Research Student Mentorship

- Erin Boehme, University of Minnesota '22
Undergraduate Research Assistant, co-mentored with Rebekah Mohn (Summer 2021)

Outreach and Career Mentorship

2022	PLANTS Mentor, Botany 2022
2021	Mentor, Underrepresented Students in STEM Twin Cities
2021	Grand Awards Judge, Minnesota Science and Engineering Fair (virtual)
2020 – present	Undergraduate Student Mentor, Field Guides UMN
2020 – 2021	K-12 Tutor, EduMate NYC (virtual)
2019 – 2020	STEMNauts Tutor, Children's Home Society of New Jersey
2018 – 2019	BioGuides (TCNJ Biology Department tour guide)
2018 – 2019	Science and Math Peer Tutor, TCNJ Tutoring Center
2018 – 2019	Science and Math Tutor, HomeFront Family Campus
2018	Science Fair Judge, Hopewell Elementary Science Fair
2017	GED Math Tutor, Trenton Violence Reduction Strategy

FELLOWSHIPS & AWARDS

2021	\$ 138,000	Graduate Research Fellowship (National Science Foundation)
2020	\$ 300	Undergraduate Research Award (American Society of Plant Taxonomists)
2020		Young Botanist Award (Botanical Society of America)
2019	\$ 7,500	Barry Goldwater Scholarship
2019	\$ 2,500	Novo Nordisk Student Scholarship (TCNJ)
2019	\$ 5,000	Mentored Undergraduate Summer Experience Award (TCNJ)
2019	\$ 250	Phi Kappa Phi Student-Faculty Research Award (TCNJ)
2018		First Place, Undergraduate Poster Award (PA Botany Symposium 2018)

SKILLS & TRAINING

Courses and Workshops

- Short Course in Plant Development and Morphology, June 2022, Arnold Arboretum at Harvard University
- Tropical Botany Field Course, May 2022, Fairchild Tropical Botanical Garden

Bioinformatics

Genome and transcriptome assembly, Sequence alignment, Phylogenetic analysis (maximum parsimony, maximum likelihood, Bayesian analysis), Phylogenomics (coalescent analysis, concatenated analysis), Phylogenetic comparative methods, Local BLAST search, and Machine learning (scikit-learn)

Programming Languages

(in decreasing familiarity) Python, Bash, R, Perl, Java, and C++

Software

Geneious, Mesquite, Mega, RStudio, Microsoft Office, Adobe Illustrator & Photoshop (working familiarity), and GIMP

Molecular Biology/Benchwork

DNA extraction (Qiagen kit), Cloning, PCR, Quantitative RT-PCR, Gel electrophoresis, DNA quantification (Nanodrop, BioAnalyzer), and *Saccharomyces cerevisiae* and *Drosophila melanogaster* genetics

Fieldwork

Central Minnesota, Massachusetts (Arnold Arboretum)

Languages

Mandarin (native speaker, proficient reader, intermediate writer) and Cantonese (native speaker, intermediate reader/writer)

SERVICE

Leadership and Service

2022 – 2023	Vice President, PMB Graduate Student Association (Phytograds)
2022 – 2023	Seminar Committee, Department of Plant and Microbial Biology, UMN
2022 – 2023	Finance Committee, American Society for Plant Taxonomists
2021	Mentor, BSA GRFP Writing Workshop (virtual)
2019	Student Conference Assistant, Botany 2019
2019	Awards/Fellowships/Internships Chair, TCNJ Honors Student Advisory

2018 – 2019 TCNJ Honors Student Advisory Board
2018 – 2019 Secretary, Chi Upsilon Chapter of TriBeta
2017 – 2018 Holiday Co-Chair, Chi Upsilon Chapter of TriBeta

Journal Reviews

Systematic Biology

Society Memberships

American Society of Plant Taxonomists (ASPT), Beta Beta Beta National Biological Honor Society (TriBeta), Botanical Society of America (BSA), Phi Beta Kappa, Society for Molecular Biology and Evolution (SMBE), Society for Systematic Biologists (SSB)