Zhitao Jiang

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EDUCATIONAL BACKGROUND

University of California, Davis — **Davis, CA, USA**
Bachelor of Science — *Sep 2021 – Jun 2025*

- **Major:** Biological Sciences; **Minor:** Insect Biology
- **GPA:** 3.40/4.00
- **Honors:** Dean's Honors List in Spring Quarter 2022
- **Core Courses:** General Entomology, Medical Entomology, Behavioral Ecology of Insects, Molecular & Cellular Biology of Plants, Structure & Function of Biomolecules, Cell Biology, Applied Statistics for Biological Sciences

PUBLICATIONS

[1] Huang, J., Wang, S., Yu, C., Su, H., **Jiang, Z.**, et al. (2025). Multi-omics analysis reveals TO gene's association with food selection and lifespan in minor-worker ants post-queen loss. *Ecology and Evolution,* 15(6), e71508. https://doi.org/10.1002/ece3.71508

[2] Huang, J., Yu, C., Wang, S., Bao, J., **Jiang, Z.**, et al. (2025). Genetic structure, dispersal pathways, and northern expansion predictions of *Solenopsis invicta*: A two-decade journey through China's diverse landscapes. *Insect Science*, 0, 1-10. https://doi.org/10.1111/1744-7917.70133

[3] Huang, J., Su, H., **Jiang, Z.,** et al. (2025). The Dealation Pattern of Independent and Alate Virgin Females of *Solenopsis Invicta* (Hymenoptera: Formicidae). *Journal of Insect Science*, 25(5), ieaf089. https://doi.org/10.1093/jisesa/ieaf089

[4] **Jiang, Z.** (first author). Analysis of Intraspecific and Interspecific Egg Recognition and Selection Differences in Red Imported Fire Ant. Manuscript in preparation.

RESEARCH EXPERIENCE

Zhejiang Academy of Agricultural Sciences — **Remote & Zhejiang, CN**
Research Assistant, Advisor: Dr. Jun Huang — *Jun 2023 – Sep 2023, Jul 2024 – Present*

- **Project I: Analysis of recognition and selection differences of nestmate, non-nestmate, and heterospecific *(Tetramorium bicarinatum)* eggs in the ant *Solenopsis invicta***
  - Conducted a systematic study on comparing the recognition and behavioral responses of *S. invicta* to nestmate, non-nestmate, and heterospecific eggs
  - Participated in field collection and rearing of *S. invicta*, conducted field surveys and sample collections of *S. invicta* and *T. bicarinatum* across multiple locations in Zhejiang Province
  - Recorded key behavioral metrics of *S. invicta* under varying queen presence and egg type coditions, analyzed behavioral responses to infer eggs recognition and transport decisions
  - Managed data organization and statistical analyses for over 30 experimental trials, completed data graphs and visualizations, and authored the initial manuscript draft and contributed to subsequent revisions
  - Designed and conducted supplementary experiments manipulating egg surface hydrocarbons and olfactory interference to study chemical recognition mechanisms
- **Project II: The Dealation Pattern of Independent and Alate Virgin Females of *Solenopsis Invicta* (Hymenoptera: Formicidae)**
  - Engaged in multiple experimental and analytical phases investigating the wing-shedding behavior (dealation) and egg recognition and selection in *S. invicta*
  - Managed rearing and behavioral observation of 1,000 alate queens, recorded dealation timing and behaviors every two hours, and defined the peak dealation period to support behavioral classification
  - Monitored dealation of 360 individually reared winged alate queens, dissected brain and wing attachment tissues after natural dealation, and conducted RNA-seq to identify differentially expressed genes (DEGs) between naturally dealated and control groups
  - Organized and analyzed experimental data on dealation timing, circadian rhythms, and diel dealation patterns, and visualized the results with detailed charts and graphs
  - Prepared detailed hand-drawn illustrations of ant morphology and dealation postures, and assisted with reference management and formatting during manuscript preparation
- **Project III: Multi-Omics Analysis Reveals TO Gene's Association With Food Selection and Lifespan in Minor-Worker Ants Post-Queen Loss**
  - Completed preliminary processing of sequencing samples and organization of behavioral experiment data
  - Assisted in the dissection and tissue isolation of *S. invicta* eggs to provide high-quality samples for subsequent RNA sequencing
  - Designed and generated visualizations for experimental results, including figures and charts, contributed to manuscript writing and the organization and formatting of references

- **Project IV: Genetic Evolution and Diffusion of *Solenopsis Invicta* after Its Invasion of China for More Than 20 Years**
  - Completed collection and dissection of *S. invicta* samples to secure specimens for whole-genome sequencing
  - Assisted in figure design and optimized phylogenetic trees using Figtree in data presentation
  - Consulted experts from UC Davis and relevant phylogeographic literature to refine analysis method from phylogenetic to haplotype-based
  - Integrated reviewer feedback to develop a refined genetic subdivision strategy, facilitated critical discussions with advisor, and finalized manuscript formatting and reference management

University of California, Davis **Davis, CA, USA**

Undergraduate Researcher, Williams's Lab, Advisor: Dr. Neal M. Williams *Jan 2024 – Present*

- **Project: The impact of Non-native Parasites on the Reproduction of Mason Bees (*Osmia spp.*)**
  - Conducted large-scale dissections and species identification of mason bees (nearly 10,000 individuals) to assess offspring health, developmental stages, and parasite diversity
  - Measured cocoon characteristics from X-ray images to evaluate brood size, sex, developmental status, and parasitism with high precision
  - Carried out ongoing quarterly analyses tracking mason bee population health, including mortality rates, parasite infection rates and species diversity, species composition within *Osmia spp.*, sex ratios, and developmental condition
  - Documented an escalating annual prevalence of non-native parasites from 2023 to 2025

Individual Field Project, Undergraduate Coursework, Advisor: Dr. Philip S. Ward *Mar 2025 – Jun 2025*

- **Project: Foraging Behavior of *Apis mellifera* Across Flower Species in the UC Davis Arboretum**
  - Designed and implemented a field study to investigate how floral traits influence nectar and pollen foraging behavior of *A. mellifera*
  - Conducted behavioral observations using focal continuous recording method to analyze how *A. mellifera* adjust foraging strategies and optimize energy use based on floral traits
  - Categorized and compared foraging times across 12 flower morphologies (nearly 150 data sets per flower) to explore the relationship between floral structure and *A. mellifera* collection strategies
  - Analyzed experimental data, wrote a research report that demonstrated *A. mellifera* adjust their foraging methods based on floral structure, and obtained a high project grade of 49/50

OUTREACH ACTIVITIES

Western Monarch Count on Mare Island **Vallejo, CA, USA**

Volunteer *Oct 2025 – Present*

- Monitored overwintering monarchs and assessed roost and habitat quality, including aggregation size, windbreak conditions, nectar and water resources, and disturbances, and recorded data per standard protocols
- Assisted with on-site operations and rapid environmental assessments, including site setup, safety checks, volunteer coordination, tree health status, and vegetation changes, and escalated issues to the site lead

Science Popularization on Vector-Borne Diseases **Remote**

Founder *Jul 2024 – Present*

- Initiated and developed an online public outreach project to raise awareness about vector-borne diseases
- Authored educational articles to inform the public about prevention strategies

Insect Specimen (*Gyascutus. Spp.*) Collection and Digitization **Davis, CA, USA**

Volunteer *Oct 2024 – Jan 2025*

- Digitized specimen records (species name, locality, elevation, collection date, collector, determinator, specimen code) to enhance accessibility for research and educational purposes

***Artedius fenestralis* Wikipedia Page Contribution** **Remote**

Editor *Oct 2024 – Nov 2024*

- Authored and expanded new content on *A. fenestralis* to Wikipedia, covering distribution and habitat, diet, reproduction, growth, conservation status, and associated nematodes

***Solenopsis invicta* Monitoring and Public Education** **Zhejiang, CN**

Volunteer *Jun 2023 – Sep 2023*

- Monitored *S. invicta* in affected areas and conducted public education sessions
- Educated local residents on prevention methods through oral explanations and distribution of informational brochures

SKILLS & INTERESTS

- **Languages:** Mandarin (native), English (proficient)
- **Computer Skills:** Proficient in Microsoft Office (Excel, Word, PowerPoint), Adobe Photoshop, R, FigTree, LibreOffice
- **Laboratory Skills:** Core microbiology techniques including aseptic handling and culturing; DNA/RNA extraction and purification; chemical analysis methods such as UV-Vis spectroscopy, melting point determination, and paper chromatography; proficient in operating and preparing samples for compound, stereo, and electron microscopes