Jian-Hao Lin

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Education

Jinan University Guangzhou, China
M.S. in Ecology. GPA: 89.1/100 *Sep. 2021 to Jun. 2024*

- Thesis title: Solving the SLOSS Debates on Designing Natural Reserves Based on Rapid Evolution Theory under the Evolving Metacommunity Framework.
- Honors: First Prize Scholarship.

Jinan University Guangzhou, China
B.S. in Ecology. GPA: 87.8/100 *Sep. 2016 to Jun. 2020*

- Thesis title: The Role of Dormant Propagule Banks in Shaping the Eco-evolutionary Dynamics of Community Assembly under the Evolving Metacommunity Framework.
- Honors: First Prize Scholarship.

Research Interests

- Community ecology, Metacommunity ecology, Theoretical ecology
- Eco-evolutionary dynamics, Biodiversity, Habitat Fragmentation
- Community Assembly, Priority Effect, Species Coexistence
- Agent-based modeling, Individual-based modeling

Research Experience

Department of Ecology in Jinan University Guangzhou, China
Advisor: Bo-Ping Han. *Jul. 2018 to Present*

My research focuses on modeling the eco-evolutionary dynamics in the community assembly under the evolving metacommunity framework, by building individual-based models and mathematical models.

- Developed a Python-based library (i.e., MetaIBM) for building individual-based models in evolving metacommunity ecology and released the library as an open-source project on GitHub.
- Modeled the community assembly in an evolving metacommunity with additional consideration of the dormancy effect of the propagules as a potentially important mediator of metacommunity-level processes.
- Built and simulated an individual-based model to solve the SLOSS debates, based on evolving metacommunity ecology, as to whether designing a single large or several small (SLOSS) natural reserves were a superior means of conserving biodiversity in a fragmented habitat.
- Currently, by building an islands-mainland model and manipulating the colonization orders of species from external species pool, modeling priority effect that is mediated by evolution, resulting in a shift in the tipping points of the alternative stable states.

Department of Computer Science in Jinan University Guangzhou, China
Advisor: Yu-Juan Quan. *December 2016 to June 2018*

- Focused on natural language processing (NLP) in Artificial Intelligence
- Developed an algorithm for Chinese word segmentation based on hidden Markov model

Skills

- Python and R language.
- ArcGIS.
- Machine learning and deep learning.
- Individual-based modelling in Python and the *Netlogo* software.

Conferences

· **Lin, Jian-Hao** & Han, B.P. (2023). Solving the SLOSS debates on designing natural reserves based on rapid evolution theory under the evolving metacommunity framework. *Abstract and oral report presented at the 22nd China Conference on Ecology, Beijing, China.*

· **Lin, Jian-Hao** & Han, B.P. (2021). The role of dormant propagule banks in shaping the eco-evolutionary dynamics in community assembly. *Oral report presented on Academic Workshop of graduate students, Guangzhou, China.*

· **Lin, Jian-Hao** & Han, B.P. (2021). The dormancy effect in the metacommunity. *Oral report presented on Summer Seminar, Sun Yat-sen University, Guangzhou, China.*

Teaching experience

- As a teaching assistant in the course Population and Community Ecology for undergraduate students
- Delivered one of the lectures in the course about the mathematical principles of the neutral theory in ecology under a licensed professor's supervision.

Open-source Project on GitHub

· Developing general computing tool for community ecology [User Manual] [Project Link]

Publications

· **Lin, Jian-Hao**, Quan, Y. J., & Han, B. P. (2024). MetaIBM: A Python-based library for individual-based modelling of eco-evolutionary dynamics in spatial-explicit metacommunities. *Ecological Modelling, 492, 110730*. [pdf]

· **Lin, Jian-Hao**, Han, B. P., Urban, M. C. & De Meester, L. The role of dormant propagule banks in shaping the eco-evolutionary dynamics of community assembly under the evolving metacommunity framework. *Submitted.* [pdf]

· **Lin, Jian-Hao**, & Han, B. P. Solving the SLOSS debates on natural reserve based on rapid evolution theory under the evolving metacommunity framework. *In Prep.* [pdf]

· **Lin, Jian-Hao**. Modelling alternative stable states mediated by evolution using MetaIBM library. *Working Paper.* [pdf]

· Liu, P., Xu, S., **Lin, J.H.**, Li, H., Lin, Q., & Han, B. P. (2020). Urbanization increases biotic homogenization of zooplankton communities in tropical reservoirs. *Ecological Indicators, 110, 105899.*

· Liu, P., Pan, J., **Lin, J.H.**, Wen, Z., Huang, Q., Pajk, F., ... & Han, B. P. (2020). Temperature niche difference and interspecific competition determine the parapatric distribution of two congeneric species in Diaphanosoma. *Preprint*