

# QIANG YANG

My research interests lie broadly in community ecology and macroecology, in particular in biodiversity, ecological networks, and stability. I am fascinated by the nature of the relationships among these properties, how they scale tropically and spatially, and how they are regulated by environmental change and human activities.

## EDUCATION & RESEARCH

02/2022  
|  
now

● **German Centre for Integrative Biodiversity Research (iDiv)**  
Postdoctoral researcher  Leipzig, Germany

**Project: Synthesizing changes in plant pollinator networks across environmental gradients.** A synthetic understanding of how plant-pollinator networks change across environmental gradients is currently limited by heterogeneity in spatial, temporal and taxonomic grains. Further, new modeling and statistical tools are necessary to quantify the roles of neutral and deterministic factors in driving emergent patterns of spatial network change. This project addresses these gaps by developing a general framework of modeling and statistical tools, mobilizing data, and applying these to understand the effects of elevation on plant-pollinator interactions.

05/2018  
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01/2022

● **University of Konstanz**  
Postdoctoral researcher  Konstanz, Germany

**Project: The redistribution of global floristic diversity by naturalized alien plants.** The uniqueness of the regional species assemblage is losing due to human-facilitated exchanges of alien species. Plants form the foundation of primary productivity of terrestrial ecosystems, and ultimately determine the biodiversity and functions of the system. However, to what extent global floras have lost their uniqueness by alien species has not been quantified at the global scale yet, and we also do not know how much human activities and climate change have contributed to the loss. This project aims to identify the temporal and spatial patterns in floristic uniqueness loss due to naturalization of alien plants, and investigate the biogeographic and anthropogenic drivers underlying these patterns.

## PERSONAL WEBSITE

<https://qiang-yang-ecology.netlify.app>

## CONTACT & SOCIAL

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 [/Qiang\\_\\_Yang](#)

## ASSOCIATE EDITOR

[Functional Ecology](#)

## R PACKAGE

[authorlist](#): To Create the Formatted Author List for Manuscripts with Many Authors

## DATA SKILLS

Advanced level in R, Bash, and Git

Classic statistical analysis using GLMMs, GAMMs, SEM

Dimensionality reduction and ordinations in ecology

Species distribution modelling

Network simulation and analysis

2018

● **Trinity College Dublin**  
PhD in Ecology

📍 Dublin, Ireland

**Thesis: The multidimensionality of ecological stability.** During my PhD study, I 1) used theoretical simulations of network dynamics to investigate how different stability components and the relationship between them are regulated by the intensity of external perturbations, 2) explored the effect of the environmental autocorrelation and correlation on the predictability of various components of ecological stability and 3) verified empirically the decoupling effect of perturbations on the relationship between ecological stabilities using the dataset of the NutNet - a global grassland experimental system.

2012

● **Institute of Hydrobiology, Chinese Academy of Sciences**  
M.S. in Hydrobiology

📍 Wuhan, China

**Thesis: Formation and hydrological control of diatom blooms in Hanjiang River.** I investigated the effect of climatic and hydrological conditions on the formation of diatom blooms, and put forward a feasible strategy for algal bloom control.

2008

● **Ocean University of China**  
B.S. in Marine biology and environment

📍 Qingdao, China

**Thesis: The effect of the ocean current on the diffusion of marine aquaculture pollutants.**

## TEACHING EXPERIENCE

2022,  
2023

● **taught “Interaction Networks” for the master module “Statistics in Biodiversity Sciences” at Martin-Luther-University Halle-Wittenberg.**

2019  
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2021

● **led the Ecology Journal Club in the Department of Biology, University of Konstanz.**

2016  
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2017

● **demonstrated the course *Data Handling and Analysis* to Master students in Environmental Science and Biodiversity & Conservation, Trinity College Dublin.**

2014

● **taught *Structural Equation Modeling with R* and *Data Wrangling with R* to the R Users Group in Trinity College Dublin.**

2012

● **taught *ANOVA and Community Ordination Analysis* to first-year postgraduates in Donghu Experimental Station for Lake Ecosystem, Chinese Academy of Science.**

## FUNDING & AWARDS

2023

● **The Flexpool Support Fund by German Centre for Integrative Biodiversity Research (iDiv) Halle-Jena-Leipzig**

Topic: Impacts of alien species naturalization on the altitudinal gradients of pollination networks.

2017

● **Innovation in Sustainability Science Award by Ecological Society of America**

The award is given to the authors of a peer-review paper published in the past five years that exemplifies leading edge work on solution pathways to sustainability challenges.

- 2013 ● **Government of Ireland Postgraduate Fellowship** by Irish Research Council  
Scholarship covering my PhD study.
- 2012 ● **Chang Hua Award** by Chinese Academy of Sciences  
Awarded for research performance.
- 2012 ● **Hai Da Award** by Chinese Academy of Sciences  
Awarded for research performance.
- 2012 ● **Di Ao Award** by Chinese Academy of Sciences  
Awarded for research performance.



## PUBLICATION

- **Dong B, Yang Q, et al. (2023). Naturalization of alien plants is driven by life-form-dependent cultivation biases.**  
*Diversity and Distribution* – Early View at <https://doi.org/10.1111/ddi.13788>
- **Zhang Z, Yang Q, et al. (2023). The poleward naturalization of intra-continental alien plants.**  
*Science Advances* 9: eadi189.
- **Csergo, et al. Spatial phenotypic variability is higher between island populations than between mainland populations worldwide.**  
*Ecography* e06787
- **Fan S, Yang Q, et al. (2023). A latitudinal gradient in Darwin’s naturalization conundrum at the global scale for vascular plants.**  
*Nature Communications* 14: 6244. 📍 Fan and Yang share the first co-authorship.
- **Fristoe, et al. (2023) Evolutionary imbalance, climate and human history jointly shape the global biogeography of alien plants.**  
*Nature Ecology & Evolution* 7: 1633-1644.
- **Dong, et al. (2023) Cultivated alien plants with high invasion potential are more likely to be traded online in China.**  
*Ecological Applications* e2811
- **Donohue, et al. (2023) Accelerated economic recovery in countries powered by renewables.**  
*Ecological Economics* 212:107916
- **Dai YR, et al. (2023) The ecosystem services concept in freshwater ecosystem conservation and restoration: a literature review of the current development.**  
*Aquatic Conservation: Marine and Freshwater Ecosystems* 33: 202-214
- **Bernd L, et al. (2022) Naturalized alien floras still carry the legacy of European colonialism.**  
*Nature Ecology & Evolution* 6: 1723-1732.
- **Omer A, Fristoe T, Yang Q, et al. (2022) Darwin’s naturalization conundrum disentangled: the role of phylogenetic relatedness depends on the invasion stages.**  
*Nature Plants* 8: 906–914.
- **Rocha C, Jiang S, Ibáñez JSP, Yang Q, Mazi K, Koussis AD. (2022) The effects of subterranean estuary dynamics on nutrient resource ratio availability to microphytobenthos in a coastal lagoon.**  
*Science of The Total Environment* 851: 157522.
- **Kinlock NL, et al. (2022) Indirect effects of introduction history on the naturalization success of cultivated species in Great Britain.**  
*Global Ecology and Biogeography* 31: 1104–1119.

- Omer A, Fristoe T, [Yang Q](#), Maurel N, Weigelt P, et al. (2021) Characteristics of the naturalized flora of Southern Africa largely reflect the non-random introduction of alien species for cultivation. *Ecography* 44: 1812-1825.
- [Yang Q](#), Weigelt P, Fristoe T, Zhang Z, Kreft H, et al. (2021) The global loss of floristic uniqueness. *Nature Communications* 12: 7290. This paper is one of [2021 Top 25 Earth, Environmental, and Planetary Sciences Articles in Nature Communications](#).
- Pouteau R, Thuiller W, Hobohm C, Brunel C, Conn BJ, et al. (2021) Climate and socio-economic factors explain differences between observed and expected naturalization patterns of European plants around the world. *Global Ecology and Biogeography* 30: 1514-1531.
- Pouteau R, Biurrun I, Brunel C, Chytrý M, Dawson W, et al. (2021) Potential alien ranges of European plants will shrink in the future, but less so for already naturalized than for not yet naturalized species. *Diversity and Distributions* 27: 2063-2076.
- Fristoe TS, Chytrý M, Dawson W, Essl F, Heleno R, et al. (2021) Dimensions of invasiveness: Links between local abundance, geographic range size, and habitat breadth in Europe's alien and native floras. *Proceedings of the National Academy of Sciences* 118: e2021173118.
- White L, O'Connor NE, [Yang Q](#), Emmerson MC, Donohue I (2020) Individual species provide multifaceted contributions to the stability of ecosystems. *Nature Ecology & Evolution* 4: 1594-1601.
- van Kleunen M, Xu X, [Yang Q](#), Maurel N, Zhang Z, et al. (2020) Economic use of plants is key to their naturalization success. *Nature Communications* 11: 1-12.
- Shoemaker LG, Sullivan LL, Donohue I, Cabral JS, Williams RJ, et al. (2020) Integrating the underlying structure of stochasticity into community ecology. *Ecology* 101: e02922.
- [Yang Q](#), Fowler MS, Jackson AL, Donohue I (2019) The predictability of ecological stability in a noisy world. *Nature Ecology & Evolution* 3: 251-259.
- Donohue I, Petchey OL, Kéfi S, Génin A, Jackson AL, [Yang Q](#), O'Connor NE. (2017) Loss of predator species, not intermediate consumers, triggers rapid and dramatic extinction cascades. *Global Change Biology* 23: 2962-2972.
- Shi P, Shen H, Wang W, [Yang Q](#), Xie P (2016) Habitat-specific differences in adaptation to light in freshwater diatoms. *Journal of applied phycology* 28: 227-239.
- Donohue I, Hillebrand H, Montoya JM, Petchey OL, Pimm SL, et al. (2016) Navigating the complexity of ecological stability. *Ecology letters* 19: 1172-1185. This paper won the *Innovation in Sustainability Science Award* by Ecological Society of America.
- Zhang D, [Yang Q](#), Xie P, Deng X, Chen J, et al. (2012) The role of cysteine conjugation in the detoxification of microcystin-LR in liver of bighead carp (*Aristichthys nobilis*): a field and laboratory study. *Ecotoxicology* 21: 244-252.

- **Yang Q, Xie P, Shen H, Xu J, Wang P, et al. (2012) A novel flushing strategy for diatom bloom prevention in the lower-middle Hanjiang River.**  
*Water Research* 46: 2525-2534.
- **Xu J, Yang Q, Zhang M, Zhang M, Xie P, et al. (2011) Preservation effects on stable isotope ratios and consequences for the reconstruction of energetic pathways.**  
*Aquatic Ecology* 45: 483-492.



## MANUSCRIPTS IN REVIEW/PREPARATION

- **Yang Q, et al. Effects of nutrient perturbations on the multidimensionality of ecological stability of global grasslands.**  
In preparation, target journal (Nature Ecology & Evolution)
- **Yang Q, et al. Higher perturbation intensities decouple correlation between stability components of ecological networks.**  
In preparation, target journal (Ecology)
- **Ni G, et al. Latitudinal gradient for marine genetic diversity? Lessons from the northwestern Pacific.**  
In preparation, target journal (Ecography)



## CONFERENCE & SYMPOSIUM TALKS

- 2020 ● **The global loss of floristic uniqueness**  
GfÖ Macro2020 📍 Konstanz, Germany
- 2019 ● **Global homogenization of flowering plants by naturalized species**  
15th International Conference on Ecology and Management of Alien Plant Invasions 📍 Prague, Czech Republic
- 2019 ● **Global homogenization of flowering plants**  
International Conference on Current and Emerging Topics in Global Change Ecology of Plants 📍 Taizhou, China
- 2017 ● **Perturbation intensity and the stability of ecological networks**  
Annual Meeting of Ecological Society of America. 📍 Portland, United States
- 2016 ● **Stronger perturbations increase the complexity of ecological stability**  
British Ecological Society Annual Meeting. 📍 Edinburgh, United Kingdom
- 2016 ● **The effect of environmental stochasticity on ecological stability**  
Trinity College Dublin Zoology and Botany Postgraduate Symposium 📍 Dublin, Ireland
- 2015 ● **The effect of perturbation intensity on ecological stability**  
Trinity College Dublin Zoology and Botany Postgraduate Symposium 📍 Dublin, Ireland
- 2014 ● **Multidimensionality of ecological stability**  
Trinity College Dublin Zoology and Botany Postgraduate Symposium 📍 Dublin, Ireland



## CONFERENCE ORGANIZING

- 2020 ● **GfÖ Macro2020**  
together with Trevor Fristoe and Mialy Harindra Razanajatovo 📍 Konstanz, Germany