

Kuangyi Xu (徐匡奕)

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PERSONAL INFORMATION

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EDUCATION

2018-2023: PhD, Department of Biology, University of North Carolina at Chapel Hill

Supervisors: Maria Servedio, Todd Vision

Dissertation: On the interplay between selfing and population persistence.

2022-2023: MSc, Department of Economics, University of North Carolina at Chapel Hill

Supervisor: Fei Li

Thesis: Relational knowledge transfer with multiple agents.

2014-2018: BSc, School of Physics, Peking University

Supervisor: Yi Tao

Thesis: Fisher's fundamental theorem of natural selection revisited and its biological significance

POSITIONS

2023-present: EEB Postdoctoral Fellow, Department of Ecology & Evolutionary Biology, University of Toronto.

Supervisors: Aneil Agrawal, Matthew Osmond, Stephen Wright

AWARDS & FELLOWSHIPS

2023-2025: **Birgitta Sintring Foundation Postdoctoral Scholarship** (SEK\$1020K)

Department of Ecology & Genetics, Uppsala University (awarded but declined).

2023-2025: **EEB Postdoctoral Fellowship** (CAD\$136000)

Department of Ecology & Evolutionary Biology, University of Toronto.

2021: **W. C. Coker Fellowship in Botany** (\$13K + tuition and health insurance)

Department of Biology, University of North Carolina at Chapel Hill.

2017: **Weiming Elite Program Scholarship** (¥10K)
School of Physics, Peking University.

RESEARCH EXPERIENCE

2018-2023: **Doctoral Dissertation**: On the interplay between selfing and population persistence.

University of North Carolina at Chapel Hill, US

2022-2023: **Master Thesis**: Relational knowledge transfer with multiple agents.

University of North Carolina at Chapel Hill, US

2021: **Research Assistant**: Effects of sexual selection on local adaptation of populations under migration-selection balance with multiple ecological loci.

PI: Maria Servedio, University of North Carolina at Chapel Hill, US

2018-2019: **Research Assistant**: Simulation of ontological dependency on phylogeny.

PI: Todd Vision, University of North Carolina at Chapel Hill, US

PUBLICATIONS

(*: corresponding author; †: authors contributed equally)

13. **Xu, K.*** (2024). How should we measure population-level inbreeding depression? Impacts of standing genetic associations between selfing rate and deleterious mutations. *Frontiers in Plant Science*, 15:1379730. [doi](#)
12. **Xu, K.*** (2024). Effects of selfing on the evolution of sexual reproduction. *Evolution*, 78(5), 879-893. [doi](#)
11. **Xu, K.*** (2024). Evolution of flowering time due to variation in the onset of pollen dispersal among individuals. *Evolution*, 78(3), 401-412. [doi](#)
10. **Xu, K.**, Servedio, M. R., Winnicki, S. K., Moskat, C., Hoover, J. P., Turner, A. M., & Hauber, M. E.* (2023). Host learning selects for the coevolution of greater egg mimicry and narrower antiparasitic egg-rejection thresholds. *Evolution Letters*, 7(6), 413-421. [doi](#)
9. **Xu, K.***, Vision, T. J., & Servedio, M. R. (2023). Evolutionary rescue under demographic and environmental stochasticity. *Journal of Evolutionary Biology*, 36(10), 1525-1538. [doi](#)
8. **Xu, K.*** (2023) Population rescue through an increase of the selfing rate under pollen limitation: plasticity vs. evolution. *The American Naturalist*, 202(3), 337-350. [doi](#)
7. **Xu, K.†**, Lerch, B. A.†, & Servedio, M. R.* (2023). The Fisher process of sexual selection with the coevolution of preference strength. *Evolution*, 77(4), 1043-1055. [doi](#)
6. **Xu, K.*** (2023). Effects of selfing on multi-step adaptation. *Evolution*, 77(2), 482-495. [doi](#)
5. **Xu, K.*** (2022). The genetic basis of selfing rate evolution. *Evolution*, 76(5), 883-898. [doi](#)
4. **Xu, K.*** (2022). Mutation accumulation in inbreeding populations under evolution of the selfing rate. *Journal of Evolutionary Biology*, 35(1), 23-39. [doi](#)
3. **Xu, K.*** (2021). The coevolution of flower longevity and self-fertilization in hermaphroditic plants.

Evolution, 75(8), 2114-2123. [doi](#)

2. **Xu, K.***, & Servedio, M. R. (2021). The evolution of flower longevity in unpredictable pollination environments. *Journal of Evolutionary Biology*, 34(11), 1781-1792. [doi](#)
1. **Xu, K.**, Li, K., Cong, R., & Wang, L.* (2017). Cooperation guided by the coexistence of imitation dynamics and aspiration dynamics in structured populations. *Europhysics Letters*, 117(4), 48002. [doi](#)

MANUSCRIPTS UNDER PREPARATION

(*: corresponding author; †: authors contributed equally)

1. **Xu, K.***, & Servedio, M. R. When does sexual selection deplete versus exaggerate genetic variation: is there a lek paradox? (in revision, *PNAS*) [bioRxiv](#)
2. **Xu, K.*** When sexual selection meets genetic drift: the coevolution of male traits and female preferences in finite populations. [bioRxiv](#)
3. **Xu, K.***, & Osmond, M. M. When does the probability of evolutionary rescue increase with the strength of selection? (in revision, *The American Naturalist*) [bioRxiv](#)
4. **Xu, K.*** Analysis of the effects of mating systems on lineage diversification across multiple genera. [bioRxiv](#)
5. MacPherson, A.*†, Caizergues A. E.†, Savary P., **Xu, K.**, Messer P., Akbar M., Fortin M., Holt R., Hoi G., Mideo N., Ness R., Peres-Neto P., Santagalo J., & Johnson M. Six predictions from evolutionary theory for urban environments. (in revision, *Trends in Ecology & Evolution*).

TEACHING EXPERIENCES

University of North Carolina at Chapel Hill (S = Spring, F = Fall)

2023S: Graduate Research Consultant, Math of Life (BIOL 224H/L)

2022F, 2023S: Teaching Assistant, How Cells Function (BIOL103)

2019S - 2020S, 2022S: Teaching Assistant, Ecology and Evolution (BIOL201)

2022S: Guest lecturer, Mathematics of Evolutionary Processes (BIOL 214H)

2020F: Teaching Assistant, Reasoning with Data: Navigating a Quantitative World (MATH/BIOL 115)

PROFESSIONAL SERVICE & OUTREACH

Reviews for: *Ecology Letters*, *Evolutionary Ecology*, *Genetics*, *Global Change Biology*, *International Journal of Plant Sciences*, *Journal of Evolutionary Biology*, *New Phytologist*, *PeerJ*, *Proceedings of the Royal Society B: Biological Science*, *The American Naturalist*

INVITED SEMINARS

2024: **Xu, K.** On the evolution of reproductive modes: outcrossing, selfing and asexual reproduction. Department of Ecology & Evolutionary Biology, School of Life Sciences, Fudan University.

2024: **Xu, K** & Servedio, M. When does sexual selection deplete genetic variance? The “lek paradox”

revisited. Institute of Zoology, Chinese Academy of Sciences.

2024: **Xu, K.** On the evolution of reproductive modes: outcrossing, selfing and asexual reproduction. School of Ecology, Sun Yat-sen University.

2024: **Xu, K.** Selfing as an evolutionary dead end revisited. Wuhan Botanical Garden, Chinese Academy of Sciences.

2022: **Xu, K.** Selfing as an evolutionary dead end? Population Biology seminar, Department of Biology, Duke University.

PRESENTATIONS AT SCIENTIFIC MEETINGS

2025: **Xu, K.** When sexual selection meets genetic drift: the coevolution of male traits and female preferences in finite populations. Asilomar Conference, The American Society of Naturalists. Talk.

2024: **Xu, K.** & Servedio, M. When does sexual selection deplete or exaggerate genetic variation? A formal analysis of the lek paradox. Symposium “*Ecology and the evolution of reproductive traits*”, 3rd Joint Congress on Evolutionary Biology (SSE/ASN/SSB/ESEB). Talk.

2024: **Xu, K.** How should we measure inbreeding depression? Impacts of genetic association on the evolution of selfing. Annual Meeting of the Canadian Society for Ecology and Evolution. Talk.

2024: **Xu, K.,** & Osmond, M. When does stronger selection increase or reduce the probability of evolutionary rescue? Atwood Colloquium in Ecology & Evolution, University of Toronto. Talk.

2022: **Xu, K.** Rescue through an increase of the selfing rate under pollen limitation: plasticity vs. genetic evolution. ESEB (European Society of Evolutionary Biology) Congress. Talk.

2022: **Xu, K.** Rescue through an increase of the selfing rate under pollen limitation: plasticity vs. genetic evolution. Evolution (SSE/ASN/SSB). Talk.

2021: **Xu, K.** The genetic basis of adaptation through the evolution of self-fertilization. Evolution (SSE/ASN/SSB). Talk.

2021: **Xu, K.,** Servedio, M., and Vision, T. Evolutionary rescue under demographic and environmental stochasticity. Virtual meeting, American Society of Naturalists. Talk.