Po-Ju Ke

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EDUCATION

2014-2019 **Ph.D., Department of Biology, Stanford University**
Dissertation title: "*Temporal development of plant-soil interactions and its effects on community dynamics*"
Advisor: Tadashi Fukami

2011-2013 **M.S., Forestry and Resource Conservation, National Taiwan University**
Thesis title: "*Plant trait and microbial composition interactively determine species variation in plant soil feedback - a modeling approach*"
Advisors: Tzung-Su Ding and Takeshi Miki

2007-2011 **B.S., Forestry and Resource Conservation, National Taiwan University**

PROFESSIONAL APPOINTMENTS

2021-present **Assistant professor, National Taiwan University**
Institute of Ecology and Evolutionary Biology

2019-2021 **Postdoctoral researcher, Princeton University**
Supervisor: Jonathan Levine

2013-2014 **Research assistant, National Taiwan University**
Supervisor: Takeshi Miki

PUBLICATIONS

Published & in press (google scholar profile)
2021

- [16] Grainger, T.N., Senthilnathan, A.*, **Ke, P.-J.***, Barbour, M.A., Jones, N.T. *et al*. (*in press*) An empiricist's guide to using ecological theory. *The American Naturalist*

- [15] Chang, C.-W., Miki, T., Ushio, M., **Ke, P.-J.**, Lu, H.-P., Shiah, F.-K., Hsieh, C.-h. (*in press*) Reconstructing large interaction networks from empirical time series data. *Ecology Letters*

- [14] DeMalach, N., **Ke, P.-J.**, Fukami, T. (*in press*) The effects of ecological selection on species diversity and trait distribution: predictions and an empirical test. *Ecology*
  - See also related preprint on *arXiv*, 1908.07960 [q-bio.PE]

- [13] **Ke, P.-J.**, Levine, J.M. (2021) The temporal dimension of plant-soil microbe interactions: mechanisms promoting feedback between generations. *The American Naturalist*, 198(3), E80-E94

- [12] **Ke, P.-J.**, Zee, P.C., Fukami, T. (2021) Dynamic plant-soil microbe interactions: the neglected effect of soil conditioning time. *New Phytologist*, 231(4), 1546-1558

- [11] Tao, H.-H., Dur, G., **Ke, P.-J.**, Souissi, S., Hsieh, C.-h. (2021) Age-specific habitat preference, carrying capacity, and landscape structure determine the response of population spatial variability to fishing-driven age truncation. *Ecology and Evolution*, 11(11), 6358-6370

2020

- [10] Chang, F.-H., **Ke, P.-J.**, Cardinale, B. (2020) Weak intra-guild predation facilitates consumer coexistence but does not guarantee higher consumer density. *Ecological Modelling*, 424: 109019

- [9] **Ke, P.-J.***, Wan, J.* (2020) Effects of soil microbes on plant competition: A perspective from modern coexistence theory. *Ecological Monographs*, 90(1): e01391
  - Cover featured paper
  - Selected for Postdoctoral Excellence Award, ESA Plant Population Ecology section

2018

- [8] Smith, J.R., Letten, A.D., **Ke, P.-J.**, Anderson C.B., Hendershot, J.N. *et al*. (2018) A global test of ecoregions. *Nature Ecology & Evolution*, 2, 1889-1896
  - See also news cover in *Stanford News* by Rob Jordan "Stanford researchers unveil clues that could lead to more affordable and effective conservation of species"
  - Included in the collection of articles celebrating Alexander von Humboldt 250 anniversary in *Nature Ecology & Evolution*

- [7] **Ke, P.-J.***, Letten, A.D.* (2018) Coexistence theory and the frequency-dependence of priority effects. *Nature Ecology & Evolution*, 2, 1691-1695

- [6] Letten, A.D., Dhami, M.K., **Ke, P.-J.**, Fukami, T. (2018) Species coexistence through simultaneous fluctuation-dependent mechanisms. *Proceedings of the National Academy of Science of the United States of America*, 115(26), 6745-6750
  - Cover featured paper
  - See also news cover in *Stanford News* by Taylor Kubota "Stanford nectar research sheds lights to ecological theory"

- [5] **Ke, P.-J.**, Nakazawa, T. (2018) Ontogenetic antagonism-mutualism coupling: perspectives on resilience of stage-structured communities. *Oikos*, 127(3), 353-363

- [4] Miki, T.*, Yokokawa, T.*, **Ke, P.-J.**, Hsieh, I-F., Hsieh, C.-h., Kume, T., Yoneya, K., Matsui, K. (2018) Statistical recipe for quantifying microbial functional diversity from EcoPlate metabolic profiling. *Ecological Research*, 33(1), 249-260

2017

- [3] Letten, A.D.*, **Ke, P.-J.***, Fukami, T. (2017) Linking modern coexistence theory and contemporary niche theory. *Ecological Monograph*, 87(2), 161-177
  - Cover featured paper
  - Selected for Outstanding Ecological Theory Paper Award, ESA Theory section

- See also recommendation by Da-Yong Zhang, Faculty of 1000 Ecology
- Included in BES/ESA joint virtual issue, Biodiversity and Ecosystem Services

2015

- [2] **Ke, P.-J.**, Miki, T. (2015) Incorporating the soil environment and microbial community into plant competition theory. *Frontiers in Microbiology*, 6: 1066

- [1] **Ke, P.-J.**, Miki, T., Ding, T.-S. (2015) The Soil microbial community predicts the importance of plant traits in plant-soil feedback. *New Phytologist*, 206(1), 329-341
  - Cover featured paper
  - See also commentary article by Kardol *et al*. (2015) Peeking into the black box: a trait-based approach to predicting plant-soil feedback. *New Phytologist*, 206(1), 1-4
  - See also recommendation by Bernhard Schmid, Faculty of 1000 Ecology

In revision/In review

- Spaak, J., Millet, R., **Ke, P.-J.**, Letten, A.D., De Laender, F. The effect of non-linear competitive interactions on quantifying niche and fitness differences. (*in review*)
  - See also preprint on *bioRxiv*, 2021.08.30.458252

- Blonder, B., Gaüzère, P., Ray, C., **Ke, P.-J.**, Petry, W.K., Salguero-Gómez, R., Sharpless, W., Violle, C. Trait-based prediction and control: a roadmap for community ecology. (*in review*)

- Henriques, G.J.B.*, Ou, W.J.-A.*, Senthilnathan, A., **Ke, P.-J.**, Grainger, T.N., Germain, R.M. Writing accessible theory in ecology and evolution: Insights from cognitive load theory (*in review*)

In advanced preparation (Full draft available upon request)

- Van Nuland, M.E., **Ke, P.-J.**, Wan, J., Peay, K.G. Different mycorrhizal nutrient acquisition strategies shape tree species competition and coexistence dynamics. (*in prep.*)

- Spaak, J., **Ke, P.-J.**, Letten, A.D., De Laender, F. Different methods lead to different interpretations of species coexistence. (*in prep.*)

- Miki, T., **Ke, P.-J.** Macroscale vertical power-law distribution of bacteria in dark oceans can emerge from microscale bacteria-particle interactions. (*in prep.*)

- Kuang, J., Li, S., Cadotte, M.W., Chen, Y., **Ke, P.-J.**, Bates, C.T., Wan, X., Wang, P., Zhou, J., Shu, W. Root endophytic fungal 'fingerprinting' reflects plant spatial co-occurrence patterns in a subtropical forest. (*in prep*.)

HONORS and AWARDS

2020 Postdoctoral Excellence Award in Plant Population Ecology
Plant Population Ecology section of the Ecological Society of America

2017 Outstanding Ecological Theory Paper Award
Theory section of the Ecological Society of America

2015 Volterra Award for the best student talk in mathematical ecology
The 100th Annual Meeting of the Ecological Society of America

2014 Best English Presentation Award
The 61st Annual Meeting of the Ecological Society of Japan
2013 Best Poster Award
The 5th Taiwan-Korea-Japan International Symposium on Microbial Ecology
2012 Presentation Excellence Award
The 3rd Taiwan-Japan Joint Workshop for Young Scholars in Applied Mathematics

INVITED PRESENTATIONS

2021 Kyoto University (Japan). Forest Ecosystem Function Colloquium
National Taiwan University (Taiwan). Department of Plant Pathology and Microbiology
2020 National Taiwan University (Taiwan). Global Change Research Center
National Sun Yat-sen University (Taiwan). Department of Biological Science
National Taiwan University (Taiwan). Institute of Ecology and Evolutionary Biology
National Taiwan Normal University (Taiwan). School of Life Science
2019 National Taiwan University (Taiwan). Institute of Ecology and Evolutionary Biology
2018 Netherlands Institute of Ecology (The Netherlands). Department of Terrestrial Ecology
2016 Stanford University (USA). Department of Earth System Science
2015 University of California San Francisco (USA). Center for Systems & Synthetic Biology
2014 National Cheng Kung University (Taiwan). Department of Life Sciences
2013 Tohoku University (Japan). Graduate School of Life Science

SELECTED CONFERENCE PRESENTATIONS

Contributed talks

2020 **Ke, P.-J.**, Levine, J. Demographic context and soil conditioning rate determine the effects of soil microbes on plant competitive outcome. The 105th ESA Annual Meeting (2020/8, Virtual Annual Meeting)

2018 **Ke, P.-J.**, Fukami, T. Dynamic plant-soil feedback: The neglected effect of soil cultivation length. The 103th ESA Annual Meeting (2018/8, New Orleans, USA)
Ke, P.-J., Fukami, T. The effect of soil cultivation length on plant-soil microbe interaction. Stand Along Conference of the American Society of Naturalists (2018/1, Asilomar, USA)

2017 **Ke, P.-J.**, Fukami, T. Interactive effects of aboveground competition and plant-soil feedbacks on plant species coexistence: Insight from modern coexistence theory. The 102nd ESA Annual Meeting (2017/8, Portland, USA)

2016 **Ke, P.-J.**, Fukami, T. The effect of plant age on soil microbial community structure. The 14th Annual UCSC/Stanford Species Interaction Workshop (2016/12, Santa Cruz, USA)
Ke, P.-J., Fukami, T. The effect of soil cultivation length by plants on soil microbial community structure. The 101th ESA Annual Meeting (2016/8, Fort Lauderdale, USA)

2015 **Ke, P.-J.**, Nakazawa, T. Herbivory-pollination coupling mediated by ontogenetic change in interaction type stabilizes community dynamics. The 100th ESA Annual Meeting (2015/8, Baltimore, USA)
Selected for ESA Volterra Award

2014 **Ke, P.-J.**, Miki, T., Ding, T.-S. Soil microbial community predicts the importance of plant traits in plant-soil feedback. The 12th Annual UCSC/Stanford Species Interaction Workshop (2014/12, Santa Cruz, USA)
Ke, P.-J., Miki, T., Ding, T.-S. Soil microbial composition alters the relative importance of plant traits in determining plant-soil feedback strength. The 61st Annual Meeting of the Ecological Society of Japan (2014/03, Hiroshima, Japan)
Selected for English Presentation Best Award

2013 **Ke, P.-J.**, Miki, T., Ding, T.-S. Litter decomposability and microbial composition interactively determine species variation in plant soil feedback – a theoretical approach. Symposium on Animal Behavior and Ecology (2013/01, Hualien, Taiwan)

2012 **Ke, P.-J.**, Miki, T., Ding, T.-S. Linking plant defense trait and negative plant-soil feedback – a theoretical approach. The 3rd Taiwan-Japan Joint Workshop for Young Scholars in Applied Mathematics (2012/02, Taipei, Taiwan)
Selected for Presentation Excellence Award

Contributed posters

2014 **Ke, P.-J.**, Nakazawa, T. Effects of herbivory-pollination coupling mediated by ontogenetic growth of insects on community dynamics. Congress on Animal Behavior and Ecology (2014/01, Taichung, Taiwan)

2013 **Ke, P.-J.**, Miki, T., Ding, T.-S. Soil microbial composition alters the effect of plant traits on species variation in plant soil feedback. The 5th Taiwan-Korea-Japan International Symposium on Microbial Ecology (2013/10, Jhongli, Taiwan)
Selected for Best Poster Award

2012 **Ke, P.-J.**, Miki, T., Ding, T.-S. What determines species variation in plant-soil feedback strength? Linking plant defense and litter traits through a theoretical approach. The 3rd Japan-Taiwan Ecological Workshop (2012/11, Sapporo, Japan)
Ke, P.-J., Miki, T., Ding, T.-S. Linking plant defense trait and negative plant-soil feedback – a theoretical approach. Joint Meeting of The 59th Annual Meeting of ESJ and The 5th EAFES International Congress (2012/03, Otsu, Japan)

GRANTS and FUNDINGS

2021-6 Yushan Scholar Program, Taiwan Ministry of Education ($540,310)

2018 Travel Grant, Modelling population dynamics with PSPM workshop ($1,200)
Eco-Evo Travel Grant, Stanford Biology Department ($500)
Education Travel Grant, Stanford Biosciences Office of Graduate ($600)

2017 Studying Abroad Scholarship, Taiwan Ministry of Education ($34,000)
Eco-Evo Travel Grant, Stanford Biology Department ($600)
Education Travel Grant, Stanford Biosciences Office of Graduate ($600)

2016 Eco-Evo Travel Grant, Stanford Biology Department ($600)

Education Travel Grant, Stanford Biosciences Office of Graduate ($600)

2015 Education Travel Grant, Stanford Biosciences Office of Graduate ($1,000)

2011 Foundation for the Advancement of Outstanding Scholarship Travel Grant ($1,500)
The Memorial Scholarship Foundation for Mr. Lin Hsiung Chen ($3,000)
Lungshan Temple Scholarship for Outstanding Students ($1,800)

TEACHING and MENTORING EXPERIENCE

Teaching

Biological Modelling	Every spring semester since 2021, National Taiwan University
Population Biology	Every other fall semester since 2021, National Taiwan University
Theoretical Ecology	Every fall semester since 2021, National Taiwan University

Teaching assistance

2017/01-2017/03	Introduction to Research in Ecology and Evolutionary Biology Stanford University
2015/10	Guest lecture: Positive interactions in community ecology University of San Francisco (Invited by: Matt Knope)
2015/09-2015/12	Ecology Stanford University
2012/09-2013/06	Introduction to Forest Biodiversity National Taiwan University
2012/02	Forest Camp Practice National Taiwan University
2011/09-2012/01	Basics in Theoretical Ecology National Taiwan University

Undergraduate mentoring

2020/06-2020/08	Princeton Summer Research Program (Shigetatsu Nishigai)
2017/06-2017/08	Stanford VPUE Summer Research Program (Ben LeRoy, Nancy Chang)
2016/06-2016/08	Stanford VPUE Summer Research Program (Michelle Li, Anna Verwillow)

ACADEMIC and SCIENTIFIC SERVICE

Seminar Organization

2015/09-2016/06 Organize Stanford Biology Department's Eco-Evo lunch seminar series

Professional society service

2017/12-2020/03 Student liaison of the Theoretical Ecology Section of ESA

Journal manuscript referee (number of assignments)

American Naturalist (2)
Ecology (5)
Ecological Monographs (1)
Ecology Letters (6)
Functional Ecology (2)
Journal of Applied Ecology (1)
Journal of Ecology (1)
Nature Ecology & Evolution (3)

Oikos (1)
Plant and Soil (2)
Plos One (7)
Proceedings of the Royal Society: B (2)
Theoretical Ecology (2)
Trends in Ecology and Evolution (2)

Grant proposal and book referee
National Science Foundation, Division of Environmental Biology, USA
Springer, book chapter in "Diversity of Functional Traits and Interactions (Mougi A. eds; 2020)"