

Ko-Hsuan Chen
Assistant Research Fellow
Curriculum Vitae

Biodiversity Research Center, Academic Sinica, Taipei, Taiwan
Email: kohsuanchen@gate.sinica.edu.tw

Professional Preparation

2017 Duke University, Biology, Ph.D.
2010 National Taiwan University, Ecology and Evolutionary Biology, M. Sc.
2008 National Taiwan Normal University, Life Science, B. Sc.

Appointments

2019 Dec-now Assistant Research Fellow, Biodiversity Research Center, Academic Sinica
2017-2019 Postdoctoral Researcher, NFREC, University of Florida

Research Interests

Fungal-plant interactions, functional ecology, microbiome assemblies, fungal systematics

Publications

Peer-reviewed Journals (*corresponding author, ^Uundergraduate and ^Ggraduate students):

- Ko-Hsuan Chen***, Florencia Marcón, Jennifer Durringer, Ann Blount, Cheryl Mackowiak, Hui-Ling Liao*. Leaf mycobiome and mycotoxin profile of warm-season grasses structured by plant species, geography, and apparent black-stromata fungal structure. **Applied and Environmental Microbiology**. *In Press*.
- Ko-Hsuan Chen***, Jessica Nelson*. 2022. A scoping review of bryophyte microbiota: Diverse microbial communities in small plant packages. **Journal of Experimental Botany** 73 (16): 4496-4513.
- Ko-Hsuan Chen***, Hui-Ling Liao, A. Elizabeth Arnold, Hailee Korotkin, Steven Wu, P. Brandon Matheny, François Lutzoni. 2022. Comparative transcriptomics of fungal endophytes in co-culture with their moss host *Dicranum scoparium* reveals fungal trophic lability and moss unchanged to slightly increased growth rates. **New Phytologist** 234 (5): 1832-1847.
- Ko-Hsuan Chen***, Qiao-Yi Xie^U, Chiung-Chih Chang^G, Li-Yaung Kuo*. 2022. Mycobiome detection from a single subterranean gametophyte using metabarcoding techniques. **Applications in Plant Sciences** 10 (2): e11461.
- Hui-Ling Liao*, Gregory Bonito, Khalid Hameed, Steven Wu, **Ko-Hsuan Chen**, Jessy L Labbé, Christopher Warren Schadt, Gerald A Tuskan, Francis Michel Martin, Alan Kuo, Kerrie Barry, Igor V. Grigoriev, Rytas Vilgalys. 2021. Heterospecific neighbor plants impact root microbiome diversity and molecular function of root fungi. **Frontiers in Microbiology** 12:3355.

- Mattia De Vivo*^G, Wen-Hong Wang, **Ko-Hsuan Chen***, Jen-Pan Huang. First detection of *Colletotrichum fructicola* (Ascomycota) on horsehair worms (Nematomorpha). 2021. **Biodiversity Data Journal** 9: 372798.
- Ko-Hsuan Chen***, Reid Longley, Gregory Bonito, Hui-Ling Liao*. 2021. A two-step PCR protocol enabling flexible primer choice and high sequencing yield for Illumina MiSeq meta-barcoding. **Agronomy** 11(7): 1274.
- Hoeksema Jason D*, Averill Colin, Bhatnagar Jennifer M., Brzostek Edward, Buscardo Erika, **Ko-Hsuan Chen**, Hui-Ling Liao, Laszlo Nagy, Nahuel Policelli, Joanna Ridgeway, Alejandro J. Rojas, Rytas Vilgalys. 2020. Ectomycorrhizal plant-fungal co-invasions as natural experiments for connecting plant and fungal traits to their ecosystem consequences. **Frontiers in Forests and Global Change** 3:84.
- Ko-Hsuan Chen**, Ann Blount, Brittany Justesen, Joseph H. Walter, Marcelo Wallau, Hui-Ling Liao*. 2019. First report of the association of *Myriogenospora atramentosa* with the plant genus *Hemarthria*. **Plant Health Progress** 20 (4): 244-246
- Lukas Beule^G, **Ko-Hsuan Chen**, Chih-Ming Hsu, Cheryl Mackowiak, Jose Carlos B. Dubeux, Jr, Ann Blount, Hui-Ling Liao*. 2019. Soil bacterial and fungal communities of six bahiagrass cultivars. **PeerJ** 7: e7014
- Ko-Hsuan Chen***, Hui-Ling Liao, Jean-Philippe Bellenger, François Lutzoni. 2019. Differential gene expression associated with fungal trophic shifts along the senescence gradient of the moss *Dicranum scoparium*. **Environmental Microbiology** 21: 2273-2289. (Featured in Issue Cover)
- Gregory Bonito*, Gian Maria Niccolò Benucci, Khalid Hameed, Deborah Weighill, Piet Jones, **Ko-Hsuan Chen**, Daniel Jacobson, Christopher Schadt, Rytas Vilgalys. 2019. Fungal-bacterial networks in the *Populus* rhizobiome are impacted by soil properties but not host genotype. **Frontiers in Microbiology** 10: 481.
- Hailee B. Korotkin, Rachel A. Swenie, Otto Miettinen, Jessica M. Budke, **Ko-Hsuan Chen**, François Lutzoni, Matthew E. Smith, and P. Brandon Matheny*. 2018. Stable isotope analyses reveal previously unknown trophic mode diversity in the Hymenochaetales. **American Journal of Botany** 105 (11): 1869-1887. (Featured in issue cover)
- Ko-Hsuan Chen***, Hui-Ling Liao, A. Elizabeth Arnold, Gregory Bonito, François Lutzoni. 2018. RNA-based analyses reveal fungal communities structured by a senescence gradient in the moss *Dicranum scoparium* and the presence of putative multi-trophic fungi. **New Phytologist** 218: 1597-1611.
- Ko-Hsuan Chen***, Jolanta Miadlikowska, Katalin Molnár, A. Elizabeth Arnold, Jana M. U'Ren, Ester Gaya, Cécile Gueidan, François Lutzoni. 2015. Phylogenetic analyses of eurotiomycetous endophytes reveal their close affinities to Chaetothyriales, Eurotiales, and a new order – Phaeomoniellales. **Molecular Phylogenetics and Evolution** 85: 117-130.

Grants

- 2021-2022 MOST undergraduate research fund to Qiao-Yi Xie. Mycobiome composition in the subterranean gametophytes of *Ophioderma pendulum*. (NTD 4,8000)
- 2021-2022 PI, MOST #110-2811-B-001-500. "Postdoctoral researcher (Dr. Che-Chih Chen) recruitment". (NTD 879,575)
- 2022-2023 PI, MOST-FNRS #110 -2927-I-001 -509 bilateral fund. Elucidating the ecological role of lichen and bryophyte microbiomes in Montane Cloud Forests of Taiwan.
- 2020-2023 PI, MOST #109-2621-B-001 -006 -MY3. "Identifying the *Sphagnum* microbiome across altitudinal and host differences in Taiwan". (NTD 3,600,000)
- 2018 co-PI, DOE Joint Genome Institute Community Science Program #19504376. "Genetic, community, and ecosystem consequences of co-introduction of mycorrhizal fungi with exotic pines" PI: Hui-Ling Liao
- 2018 co-PI, Florida Cattle Enhancement Board's Grant. "Presence of grass endophytes and mycotoxins in Florida pastures" (USD 52,000) PI: Ann Blount
- 2017 student co-PI, NSF Doctoral Dissertation Improvement Grant #DEB-1701836. "Assessing the Importance of Trophic Lability for Fungal Endophytism Using the Moss *Dicranum scoparium* and its Associated Fungi" (USD 19,517) PI: François Lutzoni

Academic Awards and Fellowships

- 2017 Outstanding Student Award, International Congress of Botany (USD 300)
- 2016 Conference Travel Award, American Fern Society (USD 240)
- 2016 Conference Travel Award, Graduate School, Duke University (USD 500)
- 2015 Conference Travel Award, Graduate School, Duke University (USD 700)
- 2015 Graduate Fellowship, Mycological Society of America (USD 2,000)
- 2015 Aleane Webb Dissertation Research Award, Duke University (USD 500)
- 2015 Ray J. Tysor Graduate summer fellowship, Duke University (USD 5,500)
- 2015 Joint Genomic Institute 1,000 Fungal Genome Project. (Genome sequencing of *Rickenella fibula*)
- 2014 Best poster, International Mycological Conference, Bangkok, Thailand. (USD 500)
- 2014 Conference Travel Award, Graduate School, Duke University (USD 500)
- 2014 International Travel Award, International Mycological Association. (USD 500)
- 2014 Ray J. Tysor Graduate summer fellowship, Duke University (USD 5,500)
- 2013 Keever Award, Biology Department of Duke University (USD 1,000)
- 2013 Student Travel Award of Mycological Society of America (USD 500)
- 2011 Graduate School First Year Fellowship, Duke University (USD 63,808)
- 2011 Taiwanese Government Study Abroad Fellowship (USD 32,000)
- 2010 The Dean Award of College of Life Science, National Taiwan University
- 2010 Best poster, National Taiwan University and National Taiwan Normal University joint symposium on Ecology & Evolutionary Biology (USD 150)

Posters and Presentations at international conferences (presenter underlined)

Invited conference presentation

Ko-Hsuan Chen, Hui-Ling Liao, Hailee B. Korotkin, P. Brandon Matheny, François Lutzoni. 2017. Functional ecology of mycobiome shifts associated with plant senescence - linking environmental and experimental re-synthesis metatranscriptomics. The XIX International Botanical Congress in Shenzhen, China.

Ko-Hsuan Chen, Hui-Ling Liao, A. Elizabeth Arnold, François Lutzoni. 2016. Metatranscriptomic analysis of the moss *Dicranum scoparium* reveals active fungal communities and functionalities across a senescence gradient. Botany conference. Savannah, GA, USA.

Invited seminar/local symposium presentations

Ko-Hsuan Chen. 2022. MiTalk Young Scientist Workshop. Taiwan.

Ko-Hsuan Chen. 2021. Symposium of Fungal Diversity and Conservation in Cloud Forests. Universidade Federal de Minas Gerais. (on-line)

Ko-Hsuan Chen. 2020. Mycological Society of Taiwan Annual Meeting. Taipei. Taiwan.

Ko-Hsuan Chen. 2020. Plant Molecular Biology Summer Camp. Sitou, Taiwan.

Ko-Hsuan Chen. 2019. Brookhaven National Lab, NSLS-II Lunchtime seminar, Upton, NY, USA.

Ko-Hsuan Chen. 2019. Biology Department, College of Charleston, Charleston, SC, USA.

Ko-Hsuan Chen. 2018. Biodiversity Research Center. Academia Sinica, Taiwan.

Ko-Hsuan Chen. 2018. Institute of Plant Microbiology. Academia Sinica, Taiwan.

Ko-Hsuan Chen. 2018. Department of Plant Pathology, University of Florida, Gainesville, FL, USA.

Ko-Hsuan Chen. 2018. Hawkesbury Institute for the Environment, Western Sydney University. New South Wales, Australia.

Ko-Hsuan Chen. 2018. Advancing Interdisciplinary Invasion Science - Current strengths and emerging opportunities strategizing workshop. The University of Florida, Gainesville, FL, USA.

Contributed international conference presentations/posters

Nhu H. Nguyen, Lotus Lofgren, Anna Bazzicalupo, Joske Ruytinx, Hui-Ling Liao, **Ko-Hsuan Chen**, Amanda Certano, J. Alejandro Rojas, Yi Hong Ke, Brian Looney, H. Van T. Cotter, Jan Colpaert, Alan Kuo, Kerrie Barry, Igor Grigoriev, Thomas Bruns, Rytas Vilgalys, Sara Branco, Peter Kennedy. 2019. A genome atlas of the ectomycorrhizal genus *Suillus*: A model for plant-fungus mutualism belowground. JGI User meeting. San Francisco, CA, USA. (Poster)

Ko-Hsuan Chen, Rytas Vilgalys, Jason Hoeksema, Jonathan Plett, Ian Anderson, Jeff Powell, Alejandro Rojas, Hui-ling Liao. 2019. Anthropogenic pine-ectomycorrhizal fungi co-introduction altering root and soil microbiome

- assemblies across a California-Australia invasion gradient. Fungal Genetics Conference. Asilomar, CA, USA. (Poster and Presentation).
- Ko-Hsuan Chen**, Florencia Marcón, Jenny Durringer, Ann Blount, Hui-Ling Liao. 2019. Fungal endophytes and mycotoxin of warm-season grasses in Florida pastures. Fungal Genetics Conference. Asilomar, CA, USA. (Poster).
- Ko-Hsuan Chen**, Hui-ling Liao, Hailee Korotkin, Steven Wu, Brandon Matheny, François Lutzoni. 2018. Differential gene expression linked to fungal trophic switches (symbiotrophism and saprotrophism) using the moss *Dicranum scoparium* and its associated fungi. International Mycological Congress. San Juan, Puerto Rico, USA. (Poster)
- Hui-Ling Liao**, Sara Branco, Nhu Nguyen, Peter Kennedy, Chih-Ming Hsu, **Ko-Hsuan Chen**, Alan Kuo, Kerry Barry, Igor Grigoriev, David Hoyt, Ryan Tapper, Rytas Vilgalys. 2018. Mutualistic coevolution mediating species and population level biodiversity of ectomycorrhizal fungi. International Mycological Congress. San Juan, Puerto Rico, USA. (Presentation)
- Nhu H. Nguyen**, Hui-Ling Liao, **Ko-Hsuan Chen**, Joske Ruytinx, Sara Branco, Amanda Certano, Lotus Lofgren, J. Alejandro Rojas, Yi Hong Ke, H. Van T. Cotter, Jan Colpaert, Alan Kuo, Kerrie Barry, Igor Grigoriev, Thomas Bruns, **Rytas Vilgalys**, Peter Kennedy. 2018. A genome atlas of the ectomycorrhizal genus *Suillus*: Phylogenetic diversity and population genomics of a keystone guild of symbiotic forest fungi. JGI User meeting, San Francisco. CA, USA. (Poster)
- Ko-Hsuan Chen**, Hui-Ling Liao, Hailee B. Korotkin, P. Brandon Matheny, François Lutzoni. 2017. Functional ecology of mycobiome shifts associated with plant senescence - linking environmental and experimental re-synthesis metatranscriptomics. Fungal Genetics Conference in Asilomar, CA, USA. (Presentation and poster)
- Ko-Hsuan Chen**, Hui-Ling Liao, A. Elizabeth Arnold, François Lutzoni. 2016. Metatranscriptomic analysis of the moss *Dicranum scoparium* reveals active fungal communities and functionalities across a senescence gradient. Mycological Society of America, Berkeley, CA USA. (Presentation)
- Hailee B. Korotkin**, **Ko-Hsuan Chen**, Kenneth McFarland, François Lutzoni, P. Brandon Matheny. 2016. Fungal-bryophyte interactions: developing a model system using the fungus *Rickenella fibula*. Annual Yosemite Symbiosis Workshop. Yosemite National Park, CA, USA. (Presentation)
- Hui-Ling Liao**, Yuan Chen, Tom D. Bruns, Kabir G. Peay, John W. Taylor, Sara Branco, Jennifer M. Talbot, Igor Gregoriev, Kerrie Barry, David W. Hoyt, Carrie D. Nicora, Samuel O. Purvine, **Ko-Hsuan Chen**, Rytas Vilgalys. 2016. Common and unique (host-specific) genes involved in ectomycorrhizal symbiosis between *Pinus* and *Suillus*. European Conference on Fungal Genetics. Paris, France. (poster)
- Ko-Hsuan Chen**, Hui-Ling Liao, A. Elizabeth Arnold, François Lutzoni. 2015. Using metatranscriptomics to characterize functional shifts in endophytic fungi at plant senescence: Are endophytic fungi latent saprotrophs? BSA, MSA, ASPB joint meeting. Edmonton, Canada. (Presentation)
- Ko-Hsuan Chen**, Hui-Ling Liao, A. Elizabeth Arnold, François Lutzoni. 2015. Using metatranscriptomics to characterize functional shifts in endophytic fungi at

plant senescence: Are endophytic fungi latent saprotrophs? Fungal Genetics Conference. Asilomar, CA, USA. (Poster)

Ko-Hsuan Chen, Jolanta Miadlikowska, Katalin Molnár, A. Elizabeth Arnold, Jana M. U'Ren, Ester Gaya, Cécile Gueidan, François Lutzoni. 2014. Phylogenetic analyses of eurotiomycetous endophytes reveal their close affinities to Chaetothyriales, Eurotiales, and a new order – Phaeomoniellales. International Mycological Conference. Bangkok, Thailand. (Poster)

Ko-Hsuan Chen, Jolanta Miadlikowska, Katalin Molnár, A. Elizabeth Arnold, Jana M. U'Ren, Ester Gaya, Cécile Gueidan, François Lutzoni. 2013. Phylogenetic analyses of eurotiomycetous endophytes reveal their close affinities to Chaetothyriales, Eurotiales, and a new order – Phaeomoniellales. Mycological Society of America. Austin, TX, USA. (Presentation)

Ko-Hsuan Chen, Gregory Bonito, Hannah Reynolds, Chris Schadt, Rytas Vilgalys. 2012. From trees to grasses: Arbuscular mycorrhizal fungi community is shaped by host plant preference. Mycological Society of America. New Haven, CT, USA. (Poster)

Teaching experience

As faculty member:

2020 to now - Coordinator of TIGP Biodiversity Seminar Class (Academia Sinica)

2020 to now - Instructor of TIGP Biodiversity – Population Genetics and Evolution (Academia Sinica)

2020-now Invited lecturer for >15 university departments/ high schools in Taiwan

Prior to Academia Sinica

2018 Lecture, “Introduction to Transcriptomics and Metatranscriptomics” to MS students major in Biotechnology. Online live course for participants in multiple cities in Ecuador. Biotechnology Research Center of Ecuador (CIBE), Guayaquil, Ecuador.

2016 Invited lecturer, Mycology course, Duke University.

2016 Fall - Teaching assistant and lab lecturer (Molecular Biology, BIO201L), Duke University

2015 Invited lecturer, Microbiome Analysis Workshop, Microbiome module, University Program of Genetics and Genomics, Duke University.

2015 Fall - Teaching assistant and lecturer (Mycology, BIO540), Duke University

2015 Spring - Teaching assistant (Microbial Ecology, BIO557), Duke University

2014 Fall - Teaching assistant and lecturer (Mycology, BIO540), Duke University

2014 Spring - Teaching assistant and lab lecturer (Genetics and Evolution, BIO202L), Duke University

2013 Spring - Teaching assistant and lab lecturer (Genetics and Evolution, BIO202L), Duke University

2012 Fall - Teaching assistant and lab lecturer (Molecular Biology, BIO201L), Duke University

2008 Teaching assistant (General Botany), National Taiwan University

Synergistic Activities

Scientific Outreach

Writing or website

- 2022 **Ko-Hsuan Chen**. (In Chinese) Uncover the multi-functions of forest fungi. ([link](#))
- 2022 **Ko-Hsuan Chen**. (In Chinese) From field to laboratory: Research of bryophytes and fungi. ([link](#))
- 2021 **Ko-Hsuan Chen**. (In Chinese) Crosstalk of trees and mycorrhizal fungi in the Anthropocene. ([link](#))
- 2020 Jing-Ting Lin and **Ko-Hsuan Chen**. (In Chinese) Website: Bryophytes of Academia Sinica Campus. ([link](#))
2018. Ann Blount, Sunny Liao, **Ko-Hsuan Chen**, Marcello Wallau, Doug Mayo, Brittney Justesen, Clay Cooper. Are endophytes and mycotoxins in Florida forages affecting cattle performance? Panhandle Ag e-News. University of Florida/Institute of Food and Agricultural Sciences. ([link](#))

Public talk/Events

- 2022 Organizer: Fungi and their plant friends: Academia Sinica Open Day. Taipei, Taiwan.
- 2022 Public talk: Fungi and bryophytes of the Taiwanese cloud forest. Society for Wildlife and Nature. Taipei, Taiwan
- 2018-2019 Organizer for “Art, Garden and Farm Family Festival”. Quincy, FL, USA.
- 2018 Public talk: “An introduction to the Florida county agents about grass endophytes and mycotoxin in Florida pasture”. Forage Workers Tour. Marianna, FL, USA.
- 2018 Science and Ag Career classes for Robert F. Munroe Day School 7th-11th grade students.” Harnessing microbes for sustaining agriculture: An introduction to agriculture-microbiome industries”. Quincy, FL, USA.
- 2017 Tallahassee Science Festival. “Find the Soil Fun Guy”. Tallahassee, FL.
- 2017 Organizer for Darwin Day exhibition “The power of living together: Symbiosis between fungi and plants”. North Carolina Nature History Museum. Raleigh, NC.
- 2016 Invited instructor for the volunteer training program: How to introduce fungi in the field to the general public? Environmental Ethics Foundation of Taiwan. Ilan County, Taiwan.
- 2016 Organizer for Darwin Day exhibition “Evolution of solar-powered symbiotic fungi”. North Carolina Nature History Museum. Raleigh, NC.
- 2013 Volunteer, Fungal Field Lab - Field day activity, Forest View Elementary, Durham, NC.
- 2013 Instructor, Fungal endophytes workshop (NCSSM students), Duke University

Teaching and Mentorship

Academia Sinica

Postdoctoral Scholars:

Rong-Chien Lin. 2020-now

Che-Chih Chen 20. 21-2022 (now faculty member at National Museum of Natural Science, Taiwan)

PhD students:

Chung-Yo Lee. 2022-now, National Taiwan Normal University, Taiwan
Chiung-Chih Chang. 2021-now, TIGP, Academia Sinica, Taiwan

Master students:

Qiao-Yi Xie. 2022-now, National Taiwan University, Taiwan
Chia-Ann Cho. 2021-now, National Taiwan University, Taiwan
Connie Cheng. 2021-now, National Sun Yat-sen University, Taiwan

Undergraduate students:

Mori Chen. 2022. National Chung-Hsing University, Taiwan.
Jing-Ting Lin. 2020. National Taiwan University, Taiwan.
Qiao-Yi Xie. 2020. National Taiwan Normal University, Taiwan.

Graduate thesis committees:

PhD programs:

Shannon Skarha. 2021-now, Duke University, USA
Mark Angelo Castillo Bucay. 2022. Academia Sinica, Taiwan.
Danilo Tandang. 2022. Academia Sinica, Taiwan.
Ren-Cheng Liu. 2021. Tunghai University, Taiwan
Mattia De Vivo. 2020-2021. Academia Sinica, Taiwan.

Master programs:

Yi-Cheng Lin. 2022. National Taiwan University.
Yi-Chen Tsai. 2021. National Taiwan Normal University.

Prior to Academia Sinica

Anna Iriarte. 2018. Undergraduate student. University of Florida, Quincy, FL.
Shuli-Yin. 2018. Visiting scholar. University of Florida, Quincy, FL.
Lukas Beule. 2017. Visiting MS student. University of Florida, Quincy, FL.
Jenny Li. 2014. Undergraduate student. Duke University, Durham, NC.

Services

Academic Service

2020 Symposium Organizer, Ecological and evolutionary consequences of plant-fungal invasions, New Phytologist Trust. To be held at Campinas-SP, Brazil (Canceled due to Covid19).
2014-2016 Seminar coordinator of Duke University Systematics Discussion Group and Seminar series.
2010 Symposium organizer. National Taiwan University and National Taiwan Normal University joint symposium on Ecology & Evolutionary Biology. Taipei, Taiwan.

Journal reviewer

Environmental Microbiology
The ISME Journal
Mycological Progress
Scientific Reports
Polar Biology
Fungal Ecology
Journal of Microbiology
Frontiers in Microbiology
Journal of Fungi

Fieldwork experiences

2020- now Bryophytes and fungi across Taiwan
2018 *Pinus radiata* root and soil collection, CA, USA.
2018-2019 Warm season grass sampling, FL, USA.
2018 *Pinus radiata* and *Eucalyptus* and their associated fungi collection, New South Wales, Australia
2018 Pine-Cogon grass invasion site root-soil collections. Gainesville, FL, USA
2014-2017 *Dicranum scoparium* associated fungi sampling, Duke Forest, Durham, NC, USA
2013 Fungal endophyte sampling, Wood Buffalo National Park, Alberta, Canada
2012 White pine rhizosphere sampling, Nepaug State Forest, CT, USA
2009-2010 Diatrypaceous fungi sampling, Taiwan

Professional Affiliations

Mycological Society of America
Genetics Society of America
Botanical Society of America

Websites

Lab website: <https://kohsuanchen.wixsite.com/fungi>
Bryophytes in Academia Sinica: <http://bryophytes.biodiv.tw/> (in Chinese, produced by Jing-Ting Lin, Undergraduate intern)