



Xishuangbanna Tropical Botanical Garden
XTBG Chinese Academy of Sciences

Online courses for fig and fig wasp system



July 18-27, 2022



Online courses for fig and fig wasp system

July 18-27, 2022

Date	Week	Beijing time	Course contents	Teacher (s)	Affiliation
July 18	Mon.	20:00-24:00	Mechanisms of seed and wasp production / Host sanction	Edward Allen Herre	Smithsonian Tropical Research Institute, USA
July 19	Tues.	19:00-23:00	Chemical ecology of fig and fig-wasp interactions	Martine Hossaert-Mckey/Magali Proffit/Li Cao/ Benoit Lapeyre/Anne-Geneviève Bagnères	Center for Evolutionary and Functional Ecology, French National Centre for Scientific Research, France
July 20	Wed.	19:00-24:00	Systematics taxonomy and phylogenomics of fig wasps	Jean-Yves Rasplus /Astrid Cruaud	French National Research Institute for Agriculture, Food and Environment, France
July 21	Thur.	20:00-24:00	<i>Ficus</i> taxonomy	Bhanumas Chantarasuwan	Natural History Museum, National Science Museum, Thailand
July 22	Fri.	20:00-24:00	Fig wasp community and beyond	Simon Segar	Dept. of Crop and Environment Sciences, Harper Adams University, UK
July 23	Sat.	20:00-24:00	Sex ratios of fig wasps	Jaco M. Greeff	Department of Biochemistry, Genetics and Microbiology, University of Pretoria, South Africa
July 24	Sun.	19:00-24:00	Fig wasp pollination and geographic variation	Finn Kjellberg / Xiao-Yong Chen	Center for Evolutionary and Functional Ecology, French National Centre for Scientific Research, France School of Ecological and Environmental Sciences, East China Normal University, China
July 26	Tues.	18:00-22:00	Larval development and trophic level of fig wasps	Rodrigo Augusto Santinelo Pereira	Departamento de Biologia, FFCLRP, Universidade de São Paulo, Ribeirão Preto, SP, Brazil
July 27	Wed.	18:00-22:00	Larval development and trophic level of fig wasps	Rodrigo Augusto Santinelo Pereira	Departamento de Biologia, FFCLRP, Universidade de São Paulo, Ribeirão Preto, SP, Brazil

Course 1: Mechanisms of seed and wasp production & Host sanction



Speaker: Edward Allen Herre
(with Charlotte Jandér)

Affiliation: Smithsonian Tropical Research Institute, USA

Beijing time: 20:00-24:00, July 18
(Mon.), 2022

Speaker introduction:

Edward Allen Herre has researched fig and fig wasp system over 30 years. His research interests include a wide range of study organisms that provide insights into how interactions between species in nature are structured and maintained, whether they benefit one organism or gender more than another, and whether these relationships are stable over time.

Course introduction:

The courses of Prof. Edward Allen Herre will discuss general issues & the implications of changing paradigms in fig and wasp biology: the basic mechanics of how various factors (e.g., foundress number, fruit size, parasites of different kinds) on seed and wasp production, and (for Charlotte Jander) will also cover some recent studies of host sanctions



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Course 2: Chemical ecology of fig and fig-wasp interactions

Speakers: Martine Hossaert-Mckey / Magali Proffit / /Li Cao/Benoit Lapeyre/
Anne-Geneviève Bagnères

Affiliation: Centre d'écologie fonctionnelle et évolutive, CNRS, France

Beijing time: 19:00-23:00, July 19 (Tues.), 2022

Course introduction:

General introduction on plant Volatile Organic Compounds (VOCs) in figs

- Role of 'secondary' compounds in ecosystem functioning.
- What is chemical ecology with focus on VOCs.
- VOCs and figs depending of the other contributions.

Analyses of Cuticular Hydrocarbons (CHCs)

- What are and which roles have the CHCs?
- Some keys for GC-MS determination.
- Technics of separation and derivatisation.

Analysis of VOCs and behavioral test

- General technics in chemical ecology.
- Collect of plant VOCs and GC-MS analysis.
- Experiments in insect behavior.

Analyses of VOCs using PTR-ToF-MS

- General functioning of PTR-ToF-MS.
- Examples experiments with *Ficus carica*.

Analyses of electro-antennography

- General functioning of GC-EAD.
- Examples with fig-wasps.



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Course 3: Systematics, taxonomy and phylogenomics of fig wasps

Speakers: Jean-Yves Rasplus /Astrid Cruaud

Affiliation: French National Research Institute for Agriculture, Food and Environment, France

Beijing time: 19:00-24:00, July 20 (Wed.), 2022



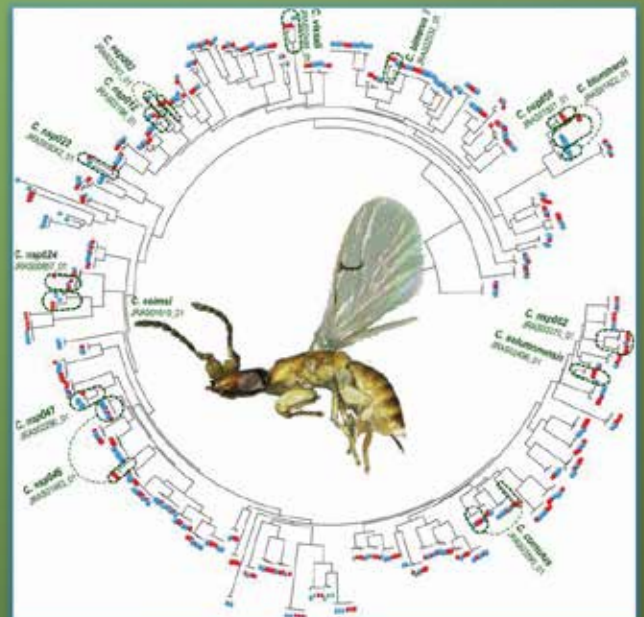
Speaker introduction:

Dr. Jean-Yves Rasplus is an evolutionary biologist and taxonomist working on several groups of insects. He is studying figs and fig wasps since 30 years.

Dr. Astrid Cruaud is a phylogeneticist working on the evolutionary history of several insect groups including pests of crops and their parasitoids.

Course introduction:

The course will cover fig wasp taxonomy (all groups of fig wasps) and methodological aspects of phylogenomics (generalities on capture of UCES (lab protocol / inference bias : Which one ; How to detect them and correct them ?).



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Course 4: *Ficus* taxonomy

Speaker: Bhanumas Chantarasuwa

Affiliation: Natural History Museum,
National Science Museum, Thailand

Beijing time: 20:00-24:00, July 21 (Thur), 2022



Speaker introduction:

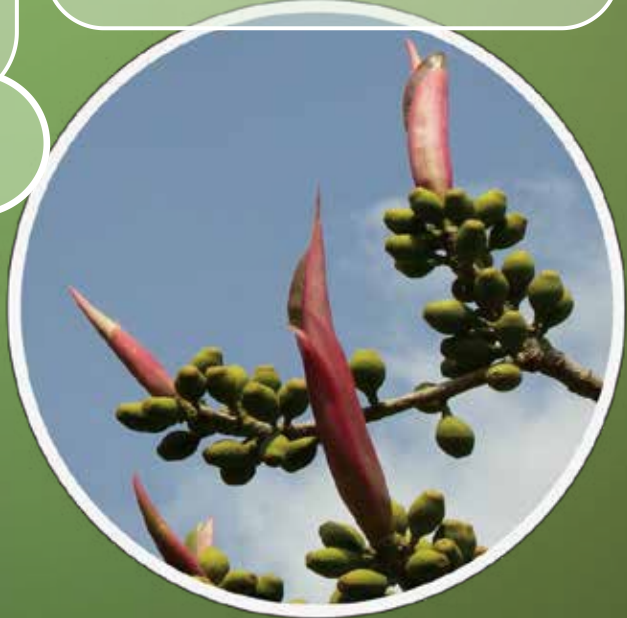
Bhanumas Chantarasuwan mainly studies on *Ficus* taxonomy. He fulfilled B.S. (Forestry) and M.S. (Forestry) from Kasetsart University, Thailand, and Ph.D. (Plant Systematics) from Leiden University, The Netherlands. At present working as a researcher at Natural History Museum of Thailand, National Science Museum Thailand.

Course introduction:

1. Characteristic of *Ficus*, this part will guide on morphological and anatomical characters of *Ficus* that necessary for species identification.

2. *Ficus* identification, this part will practice on species identification by follow the Flora of China.

3. Fifty species of *Ficus* should know, this part will present on a species of *Ficus* and dominant character for recognize a species.



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Course 5: Fig wasp communities and beyond

Speaker: Simon Segar

Affiliation: Harper Adams University, UK

Beijing time: 20:00-24:00, July 22 (Fri.) , 2022



Speaker introduction

Simon Segar has broad research interests currently focuses on the evolution of host use and chemical ecology of insect herbivores. He uses population genomic methods to study speciation in figs and their pollinating wasps along the slopes of a tropical mountain. He takes a multi-disciplinary approach to study the ecology and evolution of fig wasp communities.



Course introduction

The courses of Dr. Simon Segar will cover the wider community of organisms associated with figs. The focus here will be how we can use these communities (from non-pollinating fig wasps to herbivores of fig leaves) to help advance general concepts in ecology and evolution. What are the pressing questions in the field and how can we go about

answering them? Alongside this will be an outline of some of methods involved, some of the focal organisms and predictions from theory. Fig research is a collaborative effort and the course will aim to be inclusive of all levels.



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Course 6: Sex ratios of fig wasps

Speaker: Jaco M. Greeff

Affiliation: University of Pretoria, South Africa

Beijing time: 20:00-24:00, July 23 (Sat.), 2022



Speaker introduction:

Prof. Jaco Greeff is interested in the Evolution of Sex Ratios and Fig Biology. He has been studying fig wasps for the last thirty years and never fails to be amazed by them. Fig wasps have taught me invaluable lessons about sex ratios.



Course introduction:

While fig wasps' biased sex ratios have been noticed for just over a century our modern understanding of the kin selective benefits thereof is more recent and incomplete. New work, and fresh approaches and interpretations suggest that a different focus is required to move forward. I will detail what kinds of data are required to understand fig wasp sex ratios and look at how these can be analyzed.



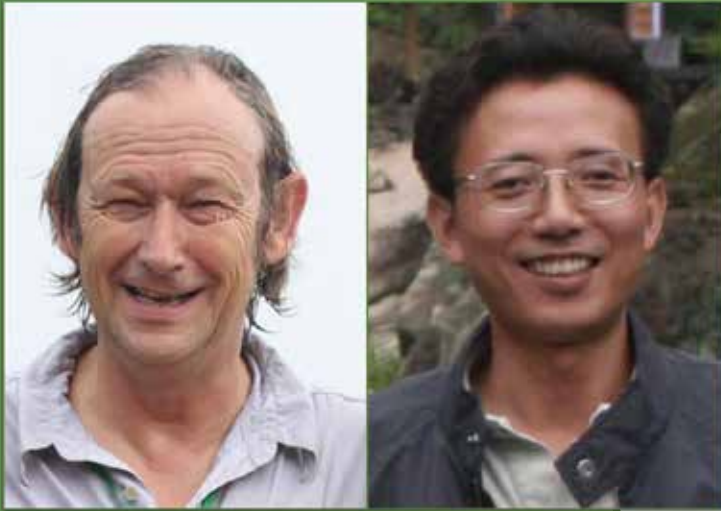
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Course 7: Fig wasp pollination and geographic variation

Speakers: Finn Kjellberg / Xiao-Yong Chen

Affiliation: Centre d'écologie fonctionnelle et évolutive, CNRS, France / East China Normal University, China

Beijing time: 19:00-24:00, July 24 (Sun.), 2022



Speaker introduction

Prof. Finn Kjellberg has investigated all aspects of fig biology since 1981 with an evolutionary biology perspective.

Prof. Xiao-Yong Chen has studied the coevolution of figs and their pollinating wasps since 1989, mostly using molecular markers.

Course introduction:

- Why don't pollinators oviposit in all flowers?
- Why do some pollinate actively?
- What are plant and insect adaptations to mode of pollination?
- Here we illustrate the role of morphology, functional anatomy, physiology and behavior.



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Course 8: Larval development and trophic level of fig wasps



Speaker: Rodrigo Augusto Santinelo Pereira

Affiliation: Universidade de São Paulo, Brazil

Beijing time: 18:00-22:00, July 26, 2022

Speaker introduction

Position: Professor at University of Sao Paulo, Brazil

Interests: Ecology and Evolutionary Biology of fig trees
and their associated organisms

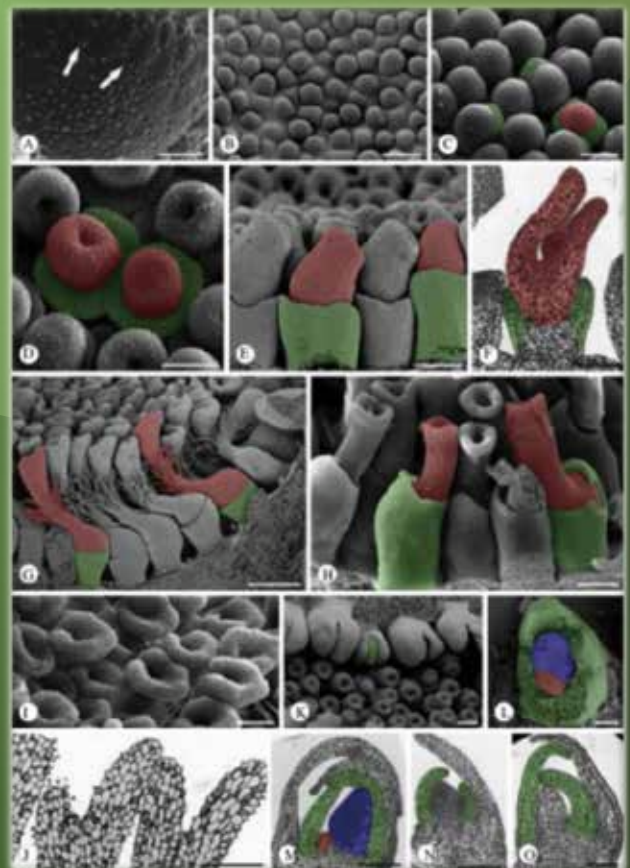
Supervisions: 13 Master, 11 PhD and 3 Post-doc researches

Online CV: <http://lattes.cnpq.br/1476070101239094>

ResearchGate: <https://www.researchgate.net/profile/Rodrigo-Pereira-12>

Course introduction

- Personal presentations
- Course introduction (slides)
- Dissection of C phase figs to describe gall morphology
- Result presentation by students



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Course 9: Larval development and trophic level of fig wasps



Speaker: Rodrigo Augusto Santinelo Pereira

Affiliation: Universidade de São Paulo, Brazil

Beijign time: 18:00-22:00, July 27, 2022

Speaker introduction

Position: Professor at University of Sao Paulo, Brazil

Interests: Ecology and Evolutionary Biology of fig trees
and their associated organisms

Supervisions: 13 Master, 11 PhD and 3 Post-doc researches

Online CV: <http://lattes.cnpq.br/1476070101239094>

ResearchGate: <https://www.researchgate.net/profile/Rodrigo-Pereira-12>

Course introduction

- Dissection of figs at later C phase to describe gall morphology
- Crack open galls to remove adult wasps and identify them
- Data analyses
- Result presentation by students



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