

## **General acknowledgments**

This work was supported by the Deutsche Forschungsgemeinschaft (DFG, German Research Foundation – 319936945/GRK2324). I gratefully acknowledge the support of the German Centre for Integrative Biodiversity Research (iDiv), funded by the German Research Foundation (DFG– FZT 118, 202548816). I would like to especially acknowledge the administrative, media, and IT departments of iDiv for their constant support and help; your support provides us the smoothest working environment we could imagine.

This thesis was made possible by the BEF China platform and its many actors that maintain the facilities and keep the experiment running. I would like to especially thank Dr. Yang Bo, Dr. Li Shan, and Yuxi Xue for their support during the planning and achievement of my field campaigns. Without the responsiveness of Yang Bo to my phone call from the airport customs, Georg and I may still be stuck in Beijing Airport with our ethanol samples since December 2019. Moreover, I would like to thank my local helpers for their amaizing support: 在此,我由衷感谢所有帮助我完成我在中国野外采样和实验工作的人,你们的帮助是我顺利完成毕业论文的关键。我特别要感谢齐进泉同我一同完成野外采样工作,感谢齐益家、邬亚贞、程长容、施圆、徐慧敏、程秋琴等等对我实验室工作的帮助。还有一些帮过我但我不知道全名的人,同样予以衷心感谢。在中国的几个月里,你们给予我的许多热情的帮助,发展的珍贵的友情,我将铭记于心。

I would like to thank the TreeDì consortium and partners. You made this Ph.D. an incredible experience by providing me the best inspiration, support, and help I could imagine from the first day during the recruitment symposium to the redaction of this thesis. I wish to thank Stefan Trogisch for his technical and administrative support; I would not have made it to China without your help.

The TreeDì consortium allowed me to meet amazing people, and I am more than grateful to call them my friends. I would like to thank you so much for your help since 2018, particularly for the last weeks. A special thanks to Andréa Davrinche and Georg Albert, who supported me professionally and personally. I now owe you approximately two hundred diners; you will have to come far North one day. I would like to thank you so much for being present and providing essential inputs to this thesis. I hope we will find even more time to hang out once we are finally done with these theses. Andréa, I may not have survived our fieldwork if it wasn't for you; having another French fellow close by is quite a gift when you are far from anything you

know. Georg, even if I now need to climb three floors to see you, your presence and our talks were always comforting and inspiring to me. I hope we will now find some exciting projects to work on, and finally get a chance to go climbing together.

Furthermore, I would like to thank the members of my PAC for their guidance and crucial advice during our meetings. Sylvia Haider, having you in my PAC was probably one of the best choices I made. You helped me to put things into perspective and provided me guidance on the strategy to adopt for the Ph.D.

I would like to keep some words to thank my two supervisors, Simone Cesarz and Nico Eisenhauer; you are a tremendous supervising team by complementing one another in various ways. I cannot imagine better supervision than yours: you provided me incredible freedom as well as constant support and guidance. I will never thank you enough for your support, especially during the last few weeks when the deadlines became tight. Simone, your emotional support was critical during some difficult periods. Your knowledge of the lab's reality allowed me not to lose myself in too many side projects and random ideas. Nico, your supervision and constant support were the drivers of my success; you're a supervisor and a mentor to me. I hope that next year will be the good one to repeat our half-marathon; this time, let's start slower to survive it toward the end! During my interview, I promised you both that I would learn German, well I am a bit delayed on this project but I still made some kind of progress: Nico und Simone, ich möchte euch von Herzen für eure Unterstützung danken und auch für die Freiheit, die ihr mir gegeben habt. Ich hätte mir keine besseren Betreuer wünschen können.

I would like to thank all my collaborators and co-authors who provided insightful inputs throughout my different projects. I greatly appreciated the guidance and patience of Helge Bruelheide, Thomas Scholten, Steffen Seitz, Goddert von Oheim, Matthias Kunz, and Emma Ladouceur. The scope of this thesis couldn't have been covered without your insights. A special thanks go to my Chinese counterpart, Dr. Jianqing Du, it has been a really great joy for me to work with you during our different collaborations. I believe that our shared first-authored paper is an excellent example of our collaboration and the start of numerous projects together. In addition, I would like to thank Dr. Kai Xue and Prof. Yanfeng Wang for their guidance and time. Dr. Xue, our discussions have always been insightful to me; I thank you very much for sharing your expertise with me.

In addition, I would like to thank my informal collaborators and previous supervisors who brought me insight and guidance before and during this journey, namely, Sonia Kéfy, Vasilis Dakos, Paul Kardol, Clydecia Spitzer, Stephan Hättenschwiler, Nicolas Fanin, and François-

Xavier Joly. Stephan, Nicolas, and F-X, your guidance during my last field campaign brought me some hope when the sky was pretty cloudy. Further, I wish to acknowledge the help that the Theory in Biodiversity Science group members provided. Particularly, I would like to thank Benjamin Rosenbaum for his help during my statistical analyses and Benoît Gauzens for his scientific advice and friendship. Benoît, from next week onward, I might be able to finally find some time to join the Wednesday rugby trainings.

I want to express my deep appreciation to the Experimental Interaction Ecology (EIE) group members. I am particularly grateful for the administrative assistance given by Svenja Haenzel and the technical support provided by Alfred Lochner, Anja Zeuner, and Linnea Smith. You provided amazing help, which allowed me to work in an incredible environment. In addition, I would like to thank all my EIE colleagues for their scientific and personal support in the past few years. You always provided me the best of your craft, and you were always ready to help whatever was needed. I am particularly grateful for the advice given by Stephanie Jurburg, who became a mentor and a great friend, always available for a chat and to provide insightful guidance (as well as some scientific confrontations). Likewise, I am particularly grateful for the help of Lise Thouvenot. Working with you was of an incredible professional help, and the friendship we developed in the past few years was of great personal help. In the end, we probably lost hours/days chatting and gossiping in front of your door, but these moments were somehow needed too.

Moreover, I would like to thank my officemates that changed over the years but always bring a great office atmosphere. I wish to thank Helen Phillips, you were always around and present, especially when some situations became pretty overwhelming. Even though it was short, I was really glad to share the office with Guillaume Patoine and Ana Bonato Asato for some time. Our coffee machine investment is definitely one of the best of my all Ph.D. Furthermore, I am glad to have some time left with our two office newbies. You seem to be pretty strong not to be fed-up with Marie and me yet (or maybe you are, but you're too polite to tell us)! Last but not least, I would like to give special thanks to Marie Sünnemann for our great friendship and her support on a daily basis. You have endured my complaints for quite some time now and I wouldn't have survived these last weeks if it wasn't for you. More than an officemate, you're an incredible friend; I couldn't thank you enough for your constant professional and emotional support.

Without any doubt, I would like to acknowledge my students for their help with field and lab work. Thanks to your enrollment and work, I discovered the joys (and sometimes drawbacks)

of supervision. Georg Hähn, you were my first student, and you put the level pretty high for anyone coming after you. I enjoyed our work together; you always did way more than I would have expected and provided crucial help during our different field campaigns. I am sure that you will make a fantastic scientist. I will never forget our work and trips, especially, the climb of the yellow mountains! I am already looking forward to our next race together: pick a sport and I will follow. Henriette Christel, I am glad that I met you in China and had the chance to supervise your master thesis. I am glad to see you taking the path of the Ph.D., and I am looking forward to seeing your progress and successes.

I would like to give a special thanks to COVID19; its constant presence and evolution prevented any routine in my life for almost two years. What better celebration could I have dreamed of for my birthdays than two quarantined Zoom parties?

I couldn't have completed this thesis without the constant support of my family and friends. Most were already cited above; I would like to add a special note to my Twitter friends (@barretocra and @GanaultPierre), we never or only quickly met in person, but you were a supportive presence all along this journey.

J'aimerais remercier mes amis de longue date. Paul Anfrey, je te remercie pour ta présence depuis de nombreuses années. Merci d'avoir continué à entretenir notre amitié même lorsque j'étais moins disponible. Adeline Dabé et Paul Ramette, merci de rester ces amis fidèles malgré la distance et nos rares contacts. Il fait toujours bon de vous revoir même après s'être perdus de vue pendant des années.

J'aimerais remercier mes parents pour leur constant soutien. Vous avez toujours su être là et me pousser sans jamais questionner mes décisions. Vous m'avez offert la chance de choisir ma voie et de poursuivre mes envies. Merci également d'avoir rempli mon cellier en me procurant moult pâté et conserve à chacun de mes passages.

Pour finir je voudrais remercier ma compagne Célia Lutrat. Nous allons bientôt en avoir fini avec nos thèses, ceci n'aura pas toujours été simple pour nous mais nous nous en sortons! Merci d'avoir été présente pour moi et de m'avoir soutenu même lorsque j'ai décidé de partir m'installer à l'autre bout de l'Allemagne. Merci d'avoir su être patiente (ton point fort!) toutes ces années et d'avoir su me sortir la tête du guidon. Sans toi, je me serais sûrement perdu en chemin. Merci d'être à mes côtés et de me soutenir, j'espère pouvoir en faire autant pour toi maintenant. Le plus beau reste à venir pour nous, tous les deux d'une façon ou d'une autre (plus les deux chats et le petit chien).