According to the competitive exclusion principle, two species competing for the same limited resource cannot coexist at constant population values. However, in nature, we might observe hundreds of species that indeed do coexist in communities. Thus, one of the most intriguing questions in ecology is how similar species, which live in the same environment, can coexist without excluding each other through competition. One of the explanations of coexistence of similar species is the competition-dispersal (CD) trade-off hypothesis. Its principal assumption is that coexistence of competing species is possible when the species that are strong competitors are weak dispersers and, because of that, they do not reach all the available areas, leaving free patches for inferior competitors characterised by better dispersal abilities.

The CD trade-off has been demonstrated in many theoretical studies, but theoretical development is far in advance, as compared with empirical investigations. Most of the studies that confirmed CD trade-off focused on plant communities, but also in bacterial communities and animals. In contrast, there were also some studies that did not find any correlation between dispersal and competitive abilities in coexisting species, or confirmed trade-off only partially in both, animals and plants, concluding that the CD trade-off is not a rule for explaining species coexistence and that there is a huge disconnect between empirical findings and theoretical assumptions, thus, future empirical investigation of the trade-off is still needed. In this project I aim to contribute to confirming the CD trade-off hypothesis by experimental testing of the link between the competition of two phytophagous mite species, their colonisation potential, and dispersal abilities, measured as dispersal rate and dispersal distance. I will use obligatory plant-feeding eriophyoid mites: *Aceria tosichella* (wheat curl mite, WCM) and *Abacarus hystrix* (cereal rust mite, CRM). The general hypothesis is that there is a trade-off between competition, dispersal abilities, and colonisation potential in the two coexisting mite species, i.e. one species is a superior competitor but has lower dispersal abilities and colonisation potential than the other one.

Empirical studies with use of phytophagous mites might provide valuable results regarding CD trade-offs hypothesis. It is known that WCM and CRM may differ in their dispersal abilities, and there is some evidence that WCM and CRM are sympatric and coexist on the same host species, thus it is very likely that they compete for resources. However, neither the competitive interactions between them nor the mechanisms allowing their coexistence have been studied yet. Here, I intend to test for the first time whether WCM and CRM compete, by assessing their population dynamics while coexisting or reared separately. Moreover, I will compare their colonisation ability and test the effect of mite species coexistence on their dispersal. WCM and CRM disperse using both the passive mode of dispersal by wind and short-range ambulatory dispersal between host plants, when plants touch each other I plan to investigate both the dispersal rate of passive long-distance movement and dispersal distance in active short-distance movement. Through experiments I will answer the following questions: i) Do WCM and CRM compete for resources? ii) Do WCM and CRM differ in their colonisation abilities? iii) How does the coexistence of WCM and CRM influence their active and passive dispersal?

Both WCM and CRM infest wild grasses and cereals (including wheat), and are of great economic importance. This is especially true for WCM, which reduces wheat production mainly due to the ability to transmit plant viruses, and has the status of an invasive species in China, Uruguay, Argentine, and Brazil. Moreover, there are predictions that its expansion to new areas is likely to be favoured by global warming due to the high thermal tolerance of this mite species. Results of the planned study may provide some explanation for the high dispersal abilities of WCM and, as a consequence, its global spread and invasiveness. By answering these questions, I will learn more about the interactions between these two cereal-feeding eriophyid mite species, and about the effect of coexistence on their dispersal. These empirical results will significantly contribute to the understanding of the mechanisms underlying the CD trade-off.