アリ散布植物における種子形質の適応意義

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<tr><td colspan="2">学　位　論　文　要　旨</td></tr>
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Adaptation for seed dispersal by ants, or myrmecochory, has evolved in more than 10,000 species of flowering plants and is reported in all major continents except for Antarctica. The adaptation is seen in a number of seed traits including the presence of lipid-rich seed appendage called elaiosome and fruiting phenology synchronizing with ant activity. However, the adaptive significance of all these traits still remain unclear chiefly because the benefits of ant-mediated seed dispersal itself is unclear despite of the large number of studies. Moreover, factors underlying variations in seed traits among myrmecochores have little been explored yet, although they suggest the existence of distinct guilds in myrmecochores. This thesis first investigates the adaptive advantage of seed dispersal by ants to explain the evolution and maintenance of seed traits shared by all myrmecochores. Then, I proceed with the factors that potentially lead to the variation in myrmecochores' seed traits.

1) Adaptive advantages of myrmecochory (Chapter 2)

Predator avoidance is consistently supported as the main benefit of mymrecochory by the evidences that seed burial (assumed to result from seed dispersal by ants) lowered the intensity of seed predation, but is recently criticized by several reports showing that ants do not bury seeds at all. I conduct the laboratory experiments using the myrmecochore *Lamium amplexicaule* and a post-dispersal seed predator *Adomeros rotundus*, and showed that even if seeds are not buried, they can still be protected by ants because of the deterrent effect of ants on seed predators.

2) Effect of interference competition among ants on the seed preferences of ants (Chapter 3)

Through the field experiment, I found that the ants' preference for elaiosome weakens as the interference competition among ants intensifies. This suggests that the natural selection on seed traits (in my case, elaiosome presence) varies among regions with the intensity of interference competition among disperser ants, leading to the variation in seed traits.

3) Partner choices of two sedges via fruiting phenology and their consequences (Chapter 4-6)

I focused on the possibility that different requirements for seed dispersal behaviors underlie the interspecific variation in seed traits among sympatric myrmecochores. In Chapter 4, I revealed that the difference in fruiting phenology between two sympatric ant-dispersed sedges affects the relative contribution of long- and short-distance disperser ants. Subsequent chapters clarified that such different partner choices corresponds with different requirement for seed dispersal distances, hence supporting the possibility that requirements for dispersal behaviors varies among myrmecochores, leading to the interspecific difference in seed traits.