Abstract

This thesis focused on evolutionary potential of dispersal traits of species in fragmented system represented by oceanic islands. I aimed to look on this topic on different levels. First, I compared traits between closely related endemic and non-endemic species to test for the existence of changes in their dispersal ability (**Paper 2**). Second, I searched for the traits predetermining species ability to colonize islands and to persist there (**Paper 3**). Third, I focused on the evolution of traits related to dispersal and persistence by inferring phylogenetic history of species group arising by adaptive radiation (**Paper 4**). All the objectives were explored on species of the Canary Islands. Dispersal traits were tested as direct dispersal abilities by anemo-, hydro-, exo- and endozoochory (**Paper 2, 3, 4**), in **Paper 4** we also measured seed morphological parameters. The methodology for endozoochorous dispersal was developed in **Paper 1**.

The comparison of dispersal traits between endemic and non-endemic species (**Paper 2**) did not explicitly support the hypothesis about the loss of dispersal ability in island endemics showing that reduction of dispersal ability on islands may not be as general as previously expected. In many cases, endemic species had the same or better dispersal ability than their non-endemic congeners. I suggest that maintenance of good dispersal ability is probably related to species subsequent dispersal among islands as endemic species dispersing better than their non-endemic congeners were reported to occupy more islands within the archipelago.

The importance of dispersal traits for further species dispersal among islands and colonization of new habitats was examined in **Paper 3**. The comparison of traits o closely related species differing in their distribution among islands revealed that no dispersal trait alone can explain the distribution of species among islands. Species presence on islands is the result of combination of both good dispersal ability and traits related to species ability to persist at the locality (e.g. seed size, longevity) as well as abundance of the species in the archipelago.

The evolutionary potential of these traits (**Paper 4**) was examined on subtribe Sonchinae, which has experienced a great radiation in traits related to species persistence (e.g. growth habit, woodiness), in distribution as well as in pappus dimorphism. The results of testing for phylogenetic signal of traits revealed that traits related to species persistence and determinants of distribution are more phylogenetically conserved than dispersal related traits. I also showed that the existence of phylogenetic signal can be constrained by rapid and easy

evolutionary changes as it was demonstrated in the case of pappus length showing high variability in morphology. In contrast, the directly measured dispersal traits showed low variability indicating high level of niche conservatism.

Overall, direct dispersal traits showed fewer patterns and had lower variation than morphological traits related to species dispersal. In addition, all the dispersal traits seem to be of lower importance than traits describing species persistence and distribution. All this indicates that dispersal traits should be studied in the context of other traits related to species persistence and distribution as all the traits act in species colonization ability and its long-term survival on habitats. The conclusions of this thesis are potentially applicable to other fragmented systems including fragmented systems on the mainland.