

The second half of the last century saw dramatic changes in the countryside of many European Countries, with deterioration of meadow habitats caused by land drainage and abandonment of traditional management, as well as their increasing fragmentation. The strategy many animal species developed to survive in a fragmented habitat is by constituting metapopulations. A metapopulation is a population of populations of the same species, inhabiting different habitat-patches located within a system where each subpopulation is connected to the others by movement of individuals among different habitat-patches.

Dispersal is well recognised as a major driver of evolutionary processes in local populations. Nevertheless, dispersal abilities should also be perceived as a life history trait, being subject to evolutionary changes and phenotypic plasticity. Empirical studies investigating these drivers rarely consider that they may influence differently male and female dispersal. However, due to different optimal mating strategies of males and females, one may expect strong intersexual differences in dispersal, in particular in relation to conspecific density which shapes intraspecific competition and mating chances. Such differences should play a vital role in metapopulation functioning, because while both male and female dispersal contribute to gene flow, only the latter can result in successful colonisations. The main purpose of this research is to document intersexual differences in density-dependent dispersal between local habitat patches of a metapopulation of butterflies, investigating their evolutionary determinants. The following hypotheses will be tested: (1) male dispersal decreases with conspecific density, and is predominantly driven by the availability of mating partners; (2) female dispersal increases with conspecific density, and is predominantly driven by resource availability. The project will involve the collection and analyses of extensive mark-recapture data of a metapopulation of *Lycaena helle*, the Violet Copper butterfly, in which densities of both sexes vary greatly between the spring and the summer season. The research will also investigate the consequences of intersexual differences in dispersal for metapopulation functioning by testing the concordance between simulated colonisation rates under various scenarios of sex-biased dispersal and true colonisation rates derived from long term monitoring data.

Apart from the general significance of the project for metapopulation ecology, many of its results should have direct implications for the conservation of our model organism, i.e. the Violet Copper butterfly. This indicator species typical of wet grasslands, experienced a significant decline in the last 20 years, due to deterioration of habitats, becoming one of the most endangered butterfly species in Europe, listed in the EU Habitats Directive (92/43/EEC) and protected in numerous Natura 2000 sites, including the locality to be investigated in the project (see <http://natura2000.eea.europa.eu/>).