Abstract

The life strategies of parasites and evolutionary mechanisms forming their diversity are particularly various and become frequent objects of study. The Ph.D. thesis deals with one of the obligate ectoparasitic haematophagous groups of insects, the species of the genus *Cimex* (Heteroptera: Cimicidae). Unlike in most other ectoparasites, the strategy of cimicids consists of remaining hidden in the shelter of their host. They use the host body only to feed and disperse. The advantage of the lower competition with other ectoparasites is counterbalanced by the need for particularly stable blood source, for which the cimicids choose social hosts living in colonies. The most frequent and the original hosts of cimicids are bats.

The host range of particular species of Cimicidae is often rather broad. The morphological analysis of the *Cimex pipistrelli* species group showed, however, differentiation according to host bat species. This suggests a need for adaptation to particular host species within the usual range. The differentiation was not found reflected in the mitochondrial DNA. It is thus possible that cimicids can exhibit phenotype plasticity. The host associated morphological variability likely caused as many as three species of *C. pipistrelli* group to be described from Europe, from which two were shown invalid.

Cimicids readily feed on substitute hosts which can be distant from those within their usual host range. However, a long term survival requires a large degree of adaptation which development may not be possible when a continuous gene flow from populations on the original hosts is occurring. Beside bats, the bed bug *Cimex lectularius* parasitizes humans as well. Based on mitochondrial and nuclear DNA and morphology it is clear that the bed bugs from bats and humans follow separate evolutionary trajectories for at least tens of thousands years. Furthermore, despite the synanthropy of the bat species from which the samples came, no contemporary gene flow was detected.

The host switches from bats to birds repeatedly led to an increase in biodiversity of Cimicidae. The mitochondrial DNA suggested that the species of the former genus *Oeciacus* associated with birds of the family Hirundinidae each evolved independently by a switch from bats. However, these species were shown to represent an inner group of the genus *Cimex*. The morphological differences between the species of the genus *Cimex* and the former genus *Oeciacus*, visible at the first sight, are thus only a consequence of their different host specialization.