

Abstract

Bats attract attention due their extraordinary adaptations including their ability to actively fly and echolocate, and extended lifespan, phenotypic diversity, etc. The phylogeny was analysed using cutting-edge molecular methods. However, the molecular revision of several species and species groups is still pending, especially those with wide distribution ranges or cryptic species complexes, even in the western part of the Old World. This specification encompasses Europe, the Middle East, Central Asia, and Africa and it represents the traditional research area for Central European (Czech and Czechoslovak) bat researchers. In my PhD thesis, I aimed to revise the phylogenetic and phylogeographic relationships of six less studied species and/or species groups of bats, using a combination of molecular and morphological phylogenetic approaches. The sequences of both mitochondrial and nuclear genetic markers were generated from over 10 species. These sequences were used to construct phylogenetic trees, haplotype networks, and estimate the time of divergence of studied species. The main results of my PhD thesis were: (1) filling gaps in the knowledge of the distribution ranges of species from the *M. nattereri* species complex (Vespertilionidae) by including and identifying samples from the Middle East; (2) showing that *Myotis emarginatus* (Vespertilionidae) forms a single species with a wide distribution from Europe to Central Asia and creates three lineages/subspecies; and (3) resurrecting of *Coleura gallarum* (Emballonuridae) in the Arabian peninsula and north-eastern Africa, resulting in a total of four *Coleura* species. Next, the big portion of the PhD thesis was centred on horseshoe bats (Rhinolophidae). The most interesting results included (4) the revision of the *Rhinolophus hipposideros* group, with separating *R. midas* from *R. hipposideros*, (5) the separation of the sub-Saharan populations of the *R. ferrumequinum* group as a separate species *R. acrotis* (instead of *R. clivosus*), and (6) the discovery of a new *Rhinolophus* species from the *R. fumigatus* group in Lesotho. Additionally, I helped with the identification of bat species from Zambia in the collections of the National Museum in Prague. My PhD thesis made a contribution to the knowledge of bat evolutionary history in the western part of the Old World and generated novel data that can be utilised in further bat research.