

ABSTRACT

The family Helicidae comprises the largest and most widely known land snails of the Western Palaearctic. Yet the knowledge of its diversity until recently relied largely on morphology-based taxonomic work from the early 20th century. Molecular phylogenetic data were needed to resolve several taxonomic issues and to understand the biogeographic history of the group. This thesis focuses on an Eastern Mediterranean group of helicid genera, and in particular on the type genus of the family, *Helix* Linnaeus, 1758. From exploring the diversity and relationships of Eastern Mediterranean and Anatolian lineages, this work follows them on their way from diversification centre up to the postglacial fauna of Central Europe. The results are based on analyses of sequences of mitochondrial genes, conchological examinations, and radiocarbon dating of Holocene subfossils. First, we compared the lineage diversity of *Helix* with the conclusions of a recently published morphology-based taxonomic revision. We assembled a representative dataset covering almost all species of the genus as now recognized, as well as most of potentially related genus-level taxa. We refined the genus limits, revealed several species whose delimitation may require further revision, and pointed out probable differences in how species are being delimited in *Helix* and related genera. Greece, the Aegean, and western Turkey were identified as the core area for the diversity of *Helix* and its relatives; the highest diversity of *Helix* species was found along the Alpidic belt from the western Balkans to southern Turkey. We uncovered an exclusively European *Helix* radiation with centre of diversity in the western Balkans. Then we focused on two *Helix* species from this group, which were long considered synonyms of other, more common species. *Helix straminea* Briganti, 1825, described from central Italy, turned out unrelated to *Helix lucorum* Linnaeus, 1758. While the latter occurs in northern Italy, it is a species of Anatolian origin and likely an introduced one in Italy. *Helix straminea* originated in western Balkans, where it lives in Albania and Macedonia, and colonized the Apennine peninsula most likely across the Adriatic Sea. The other resurrected species is *Helix thessalica* Boettger, 1886, a species similar and related to *Helix pomatia* Linnaeus, 1758. Populations of “*H. pomatia*” from southern Serbia, Bulgaria, Macedonia and Greece; but also some from Romania, Ukraine, Moldova and Russia actually belong to *H. thessalica*. Remarkably, we have found the species also in northern Hungary and central Slovakia, as well as in one river valley in southeastern Czechia. Following the taxonomic revision of *H. pomatia*, we aimed to uncover its glacial refugia and sources of postglacial colonization. Large snails as *H. pomatia* are assumed to be particularly poor dispersers. Yet the published fossil data suggested very early arrival of this species to Czechia and Slovakia, possibly from nearby, northerly located refugia. We have assembled a representative set of samples from across the native range of *H. pomatia*, including areas largely neglected by previous phylogeographic work on land snails (Bosnia, the Carpathians). The data revealed a complex pattern of colonization from more than one refugium, but did not suggest any northern refugia. We revised the oldest post-LGM occurrences from Czechia and Slovakia suggested by literature, and directly dated the preserved shell fragments by radiocarbon to establish the true timing of the species’ arrival to Czechia and Slovakia. The published earliest records turned out unreliable, strongly arguing for direct dating of the preserved shell fragments to estimate the ages of first postglacial occurrences of individual species. However, the results still suggest that *Helix pomatia* was able to rapidly and effectively colonize the newly emerging postglacial habitats. The findings of the individual studies included in the thesis are discussed in light of some concerns over persisting uncertainties in land snail ecology, evolution and taxonomy. I suggest that what constitutes separate species may differ between regions due to differences in climatic stability. These also affect the apparent mobility of species and lineages over long time scales through alterations of their distribution ranges. It is important to study the effectiveness of passive dispersal along with the nature and strength of interactions between species and populations in order to build a robust taxonomy and better understand spatial patterns of snail diversity. A nearby steep gradient of snail diversity between the Mediterranean and Central Europe offers possibilities to further address these issues.