Biogeography is a key component in understanding speciation, the process of creating new species in nature. It is now widely recognised that the main driving force behind speciation is allopatric speciation (a model in which separation is caused by emerging geographic barriers), while parapatric speciation (no specific external barrier to gene flow) and, in particular, sympatric speciation (no barrier but also no large-scale geographic distance to reduce gene flow between individuals of the same population) are models that still cause much controversy. However, a much more complicated scenario is also possible, in which populations of a given taxon went through a few different types of speciation before reaching the present state.

Longhorned beetles or Cerambycidae, with approx. 35,000 described species, is one of the most abundant families in the largest and most diverse order of animals—beetles (Insecta: Coleoptera). Despite the great diversity of these insects and their economic and ecological importance as forest pests, plant pollinators and wood-degrading organisms, these arthropods are far from being well understood. This applies in particular to the region of Central Asia and the Dorcadionini tribe (Cerambycidae: Lamiinae), which is a taxonomically highly intricate group that includes numerous described species and subspecies, mostly endemic to this region. Since these beetles are flightless—which is quite unique in the family—they have evolved many local forms within their distribution range that usually differ slightly in elytral pattern. While this would not cause much controversy in an area with clear geographical barriers, such as mountain ranges or large rivers, much of the range of these beetles is located on a plateau without such barriers. Yet, this group is extremely diverse and includes taxa that are usually highly difficult to distinguish, and the incredibly diverse and impressive pattern on the wing coverts of most species resembles the pattern of sunflower shells.

It is very interesting to understand what speciation mechanisms, and when, led to this state. Therefore, in this project, I will study the phylogenetic structure of the Central Asian representatives of the Dorcadionini tribe, and by applying an integrative taxonomy approach (which uses various types of data, such as morphological, molecular and ecological data), I will unravel the mystery of abundant radiation in this flightless insects group. My research hypothesis assumes that these beetles have undergone various and often very complex speciation events due to the unique geological and climatic history of this region, especially multiple desertification phases. Apart from the typical allopatric scenarios mainly in the mountainous regions of eastern Kazakhstan, northern Kyrgyzstan, and western Mongolia, it is very likely that this group evolved through mechanisms that include models of mixed geographic speciation and phenomena such as introgressive hybridization, ecotypes, and possibly so-called “ring species”. The hypothesis posits, *inter alia*, a scenario where some taxa, especially in central and southern Mongolia and northern China, evolved in parapatry, independently in multiple populations, during the intensification of the aridification across the region in the period during which the Gobi Desert was formed (~ 24 to 2.6 Ma).

To test this hypothesis, I will revise Central Asian Dorcadionini, and subsequently confront the obtained phylogeny with distribution, topographic and ecological data using an advanced statistical model to explain the evolutionary history of this very complex taxonomically group. Moreover, I will also estimate the divergence time of these beetles in the Central Asian region.

The project is innovative not only because so far there is no data on the phylogeny of this beetle group; its results will also provide new empirical evidence in the area of the increasingly recognised role of ecological adaptation in animal speciation, but also most likely will support two controversial models of speciation (parapatry and sympatry), one of the mixed modes of speciation, and perhaps even the theory of "ring species". Furthermore, the proposed research will certainly expand our knowledge on the development of the Central Asian fauna in general.