Executive summary 2022

In this project stage, we studied the spatial variation of the characteristics of phenotypic diversity and evaluated the effects of temperature and warming on phenotypic diversity. Phenotypic data of Lacerta agilis and Natrix natrix were collected based on observations downloaded through the Global Biodiversity Information Facility (GBIF) using a phenotype template. The distribution of phenotypes is not uniform along a temperature gradient, thus in the case of the species *Natrix natrix*, dark-colored or melanistic individuals are found in cold areas of the continent, while lighter-colored individuals are found in warmer and arid areas of the continent. Regarding the phenotypes of the Lacerta agilis, we noticed that the green color on the back and side of the animals is dominant in the eastern part of the continent, and the brown color in the colder areas at more northern latitudes. In a future climate context, we performed models of phenotypic diversity of the two species in the context of climate warming on two climate scenarios (RCP26 and RCP85)) simulating the climate at local and regional level according to potential socio-economic scenarios (CCSM4, MIROC5, HadGEM5) related to the year 2070. Based on our models we can observe an opening of favorable niches in the northern part of the area. We also observed an increase in altitude in the distribution of the Natrix natrix species in Romania. The phenotypes of the two species show that their distribution is influenced by climate warming, perhaps the most dramatic effect can be seen in the case of the orange phenotype of the temporal spots of Natrix natrix which will move north until 2070, and in the case of Lacerta agilis all the 3 back color phenotypes will move north from the current distribution and most likely erode the favorable niche in the south of the species' range. The next stage will be the inclusion of extreme weather phenomena on the distribution, development and phenotypic diversity of the two oviparous ectotherm species.

Date

4.12.2022

Project Director

Dr. Iulian Gherghel