Abstract

Climate change is one of the most important factor determining species ranges. In Europe there is now evidence for northward areal expansion in many Mediterranean insects including the praying mantis (Mantis religiosa). This species is the only representative of the order Mantodea inhabiting central Europe. The northern edge of the species distribution currently reaches latitude 53° North. Although, the praying mantis is well known insect there is not enough evidence about its phylogeography. In this work three mitochondrial genes (COI, COII, Cyt b) were selected for phylogenetic study. Results indicate three statistically supported distinct lineages in Europe: Eastern European, Central European and Western European. Presumably these lineages are consistent with isolation during the last glacial and re-colonization from glacial refugia. Reduced haplotype diversity on the northern edge suggests currently established populations at the northern distribution border. To validate mtDNA results it was also considered four microsatellite loci. Due to different type of inheritance mtDNA and nuclear DNA it is possible to compare two independent genetic datasets. Microsatellite analysis confirmed results obtained on mitochondrial data. Three major genetic clusters were found: east, west and central. Spatial distribution modelling in MAXENT software based on climatic suitability was also executed. Based on the results one can assume that the praying mantis survived the last glacial period on the Mediterranean and Black sea coast and islands.

Keywords: Mantis religiosa, phylogeography, glacial refugia, range margin, spreading, mtDNA, microsatellites, MAXENT