

## The assessment of the global extinction risk of an Alpine spider species threatened by climate change

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There is a great deal of evidence that climate change causes severe reductions in the range of distribution of mountaintop species. *Vesubia jugorum* (Araneae, Lycosidae) is a large-sized wolf spider, occurring in alpine rocky areas above 2,300 m asl in a restricted district of the Western Alpine chain, on the border between Italy and France. By means of Ecological Niche Modelling (ENM), previous studies have demonstrated that due to climate change, the current observed distribution of this species is declining. This work provides the first assessment of the extinction risk of an Alpine spider species threatened by global warming, according to the IUCN Red List Categories and Criteria. Moreover, we present the results obtained by the analysis of the functional traits, based on morphological characters of 80 specimens collected in the field. The analyses aim at corroborating the results obtained by ENM in relation to the identification of the most important areas for the conservation of this species. According to the IUCN assessment, *Vesubia jugorum* is classified as Endangered. This evaluation is related to criterion B, focusing on the geographic range and the estimated reduction of the suitable areas in the near future. Accordingly, the current observed extent of occurrence (EEO) is 4,412 km<sup>2</sup> and the area of occupancy (AOO) is 835 km<sup>2</sup>, falling within the threshold values required for the inclusion in this category. On the basis of the inferred extension in the distribution range and the low number of locations (criteria A and D), the species falls into the category Vulnerable. Similarly to most invertebrate species, criteria C and E are not applicable due to inadequacy of thresholds and for the unavailability of information required for their application. The analysis of functional traits identifies the area of the Argentera-Mercantour massif as the most important area of conservation, hosting the populations characterized by higher performance in terms of body size, and thus representing the key area for future conservation policies. Moreover, according to ENM results, this area was inferred as the region with the highest climatic suitability within the current species range.