SPECIES-AREA RELATIONSHIP AND STRUCTURAL CONNECTIVITY OF HERPEFAUNA IN "LA MADDALENA ARCHIPELAGO" (SARDINIA)

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The theory of island biogeography proposes that the number of species found in an island is determined by immigration and extinction, which depends on the distance to a source of colonists. Species richness does not depend exclusively on area, but also on climate and isolation variables, such as distance to the continent, island age, degree of isolation (distance to nearest island and mainland), the initial biotic composition, ocean currents, human activity, etc. We analysed species-area relationships and structural connectivity of amphibians and reptiles in a group of 51 small islands (Archipelago La Maddalena, Italy) very close to the large island of Sardinia. We tested the relationship of species richness with several environmental factors (area, unique habitats number, topographical variables, distances of each island to Sardinia, to the nearest island, and to the nearest big island) through Generalized Additive Models and connectivity analysis. Each method was performed considering all species, excluding species in 'transit' (those disappearing first after habitat change, e.g. *Podarcis siculus*), including only autochthonous species, including species present on islands smaller than 10000 m^2 (A) or between 10001-100000 m^2 (B) or larger than 100001 m^2 (C). We also excluded, in turn, amphibians, Scincidae, Geckonidae, the four Lacertidae, Colubridae, and one species in turn, in order to understand the importance of variables and connectivity of any taxonomic group. Seventeen species are present in the islands of La Maddalena Archipelago, 3 amphibians and 14 reptiles. Nine islands have no species, 17 host one or two species, and 23 host more than three species (maximum 17). Variables with higher correlations were number of unique habitats, and maximum and SD of altitude. Except for species present in islands of type ABC, all models selected the same variables: SD ruggedness, area, number of unique habitats, and mean and maximum altitude. When excluding Sardinia, highest connectivity corresponded to La Maddalena, followed by Caprera and Spargi.