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A methodological framework for inferring spatial genetic patterns: the case of the genus *Eumerus* (Diptera: Syrphidae) in the Mediterranean

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The Mediterranean is endowed with a great species diversity, often affiliated with evolutionary processes, landscape discontinuities, Quaternary climatic oscillations, and human presence. Here, we discuss the potential of a methodological framework to explore species genetic structure across landscape in insect groups. We have applied the suggested biogeographic framework, and explored spatial patterns of genetic diversity of nine species of the hoverfly genus *Eumerus* in the Mediterranean region (Chroni et al. 2019). More specifically, we assessed intraspecific genetic differentiation, tested for a spatially-explicit Bayesian clustering, and evaluated the inferred results based on landscape discontinuities and presence of isolation-by-distance. Overall, the spatial genetic structure analyses inferred (i) two genetic clusters ascribed to allopatric and peripatric processes, as well as to landscape discontinuities (4 species); and (ii) one genetic cluster pointing into the hypothesis of consisting of relict taxa (5 species). We have also identified genetically-diverging regions in the Mediterranean, and discussed the potential driving forces that gave rise to these spatial genetic patterns.

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