





Using islands as a laboratory: effects of anthropization on pollinators in disturbed urban landscapes

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Abstract:

The Mediterranean lands and Italy represent important hotspots of biodiversity and count numerous endemic species for the various geo-climatic characteristics. However, knowledge on biodiversity and services that it offers to human society is still limited in many contexts, especially on small islands and urban areas. The main objective of this research is to increase our understanding of the ecosystem complexity in order to design targeted interventions and improve resilience, conservation of biodiversity and ecosystem services provisioning. All of this can have implications and applications in urban development and sustainability, landscape regeneration and human health in relationship to biodiversity.

The study focuses on landscape degradation caused by human activities and it evaluates pollinator biodiversity at the Archipelago of Pontine Islands, the Neapolitan Archipelago and in the nearby city of Rome, to compare patterns on the islands with those on the continent. Here, islands are therefore used as open-air laboratories where physical isolation is integrated with the anthropization and land use, in order to characterize the overall effects on pollinators. As a comparison, the data from Rome are collected from a degree of urbanization surrounding the sampling sites.

The samples were collected during May, June and July 2023 with active (entomological net) and passive (Pan Trap) samplings. These are being analyzed with molecular techniques (DNA barcoding), integrated with morphological evaluations and statistical analysis.

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Results showed that the abundance of pollinators is linked to land use. In Rome, although the biodiversity in the urbanized areas is greater than natural, non-urban areas, the abundance is lower instead. This doesn't seem to happen on the islands, perhaps because of more sustainable forms of urbanization.

This study could be useful to draw up guidelines for the protection of biodiversity and to suggest actions to mitigate or restore habitats to local authorities and conservation entities. In this way the ecosystem service of pollination could be guaranteed also in urban areas and therefore generate a positive effect on human life, in terms of economic, society and health.