



**Forum Nazionale
della Biodiversità**

20 21 22
maggio 2024
Palermo

Climate-induced habitat alteration shifts patterns of host diversity and disease risk from a One Health perspective

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Land use, climate change, and anthropisation affect the patterns of zoonosis circulation. In this project, we aim to assess the effect of an extreme meteorological event on reservoir diversity and the consequences on tick density and tick-borne microbial community and prevalence (Keesing et al., 2021).

The study area is in Paneveggio-Pale di San Martino Natural Park (northern Italy), which was affected by "Vaia" storm in 2018, causing open fragmented patches. Twelve sites were identified in three different habitat types (post-Vaia windthrow, mixed forest, meadows) at different altitudes. At each site, we conducted Capture-Mark-Recapture live-trapping of small mammals and dragging of host-seeking ticks in 2023. Tick-borne pathogens were detected in ticks by PCR-based methods and in rodent sera by immunofluorescence assay.

As preliminary results, we collected 92 *Ixodides spp.* ticks, 60% from Vaia and 40% from forest sites. We captured 248 small mammal individuals belonging to *Apodemus flavicollis*, *A. sylvaticus*, *Clethrionomys glareolus*, *Microtus spp.* and *Sorex spp.*, all observed in Vaia-affected sites, while only 3 species were observed in forest sites. 64% of small mammals were captured in Vaia windthrows. We identified antibodies against tick-borne encephalitis and Dobrava-Belgrade viruses only in Vaia-affected sites, while there is heterogeneity in bacterial and protozoan prevalence. Windthrow areas of the northeastern Italian Alps are undergoing natural reforestation, providing suitable microhabitats for both small mammals and ticks. Given the spatial overlap of reservoirs and vectors, the circulation of zoonoses may be enhanced in disturbed areas, although with differences depending on specific pathogens.

The authors acknowledge the support of NBFC to Fondazione Edmund Mach, funded by the Italian Ministry of University and Research, PNRR.

Keesing, F., & Ostfeld, R. S. (2021). Impacts of biodiversity and biodiversity loss on zoonotic diseases. *Proceedings of the National Academy of Sciences*, 118(17), e2023540118.