

SUPPLEMENTARY MATERIAL - FIGURE S1-S16 CAPTIONS

All the following panel captions refer to the corresponding panels shown for each species in this file. Panels are organized consistently for each species to facilitate comparative interpretation across the dataset.

Panel 1. Representation of the habitat distribution and genetic diversity and: **(a)** Map showing the Area of Habitat (AOH) with suitable habitat areas shaded in dark green, delineated within the species range as defined by the IUCN shapefile; **(b)** interpolated genetic diversity (GDS-hill-q1) across the species habitat.

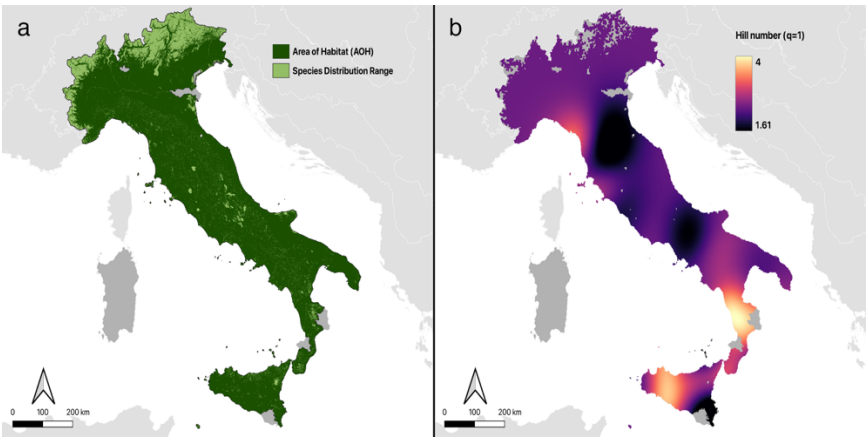
Panel 2. Top 5% intraspecific genetic diversity (Hill $q = 1$) grid cells within the species' suitable range (AOH) across Italy. High-diversity cells (dark green) represent the upper 5% of intraspecific genetic diversity values. The species' AOH is shown in mint green, and national protected areas are outlined in black.

Panel 3. A map displaying the interpolated lineages within the species range, as defined by the AOH map. The gradient on the map ranges from 0 to 1, representing the probability of an area belonging to one lineage versus another.

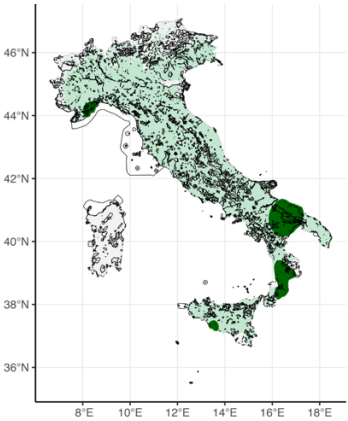
Panel 4. Phylogenetic tree inferred using a coalescent-based BEAST analysis. Tip and branch colors represent the main genetic lineages identified through bGMYC species delimitation. The color scheme used here matches that in Panel 5a, where the spatial distribution of lineages is shown.

Panel 5. Spatial distribution of genetic lineages within and outside protected areas. (a) Map showing the geographic extent of each lineage across Italy, with protected areas overlaid in dark green. (b) Stacked bar plot displaying the percentage of each lineage found inside versus outside protected areas.

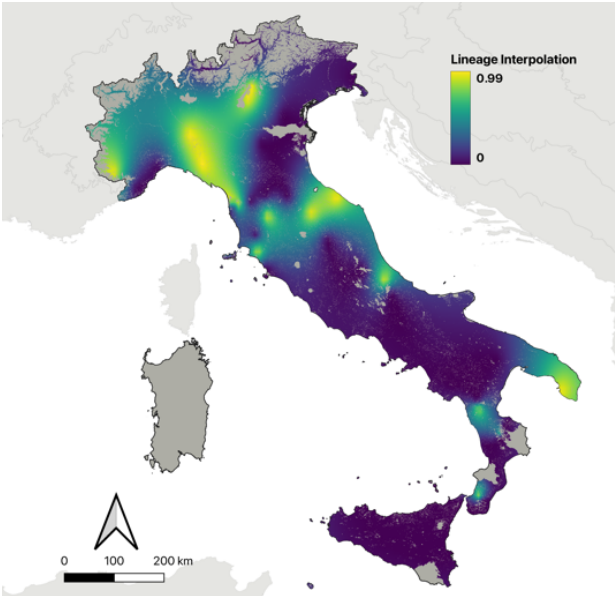
Figure S1 - *Aricia agestis*



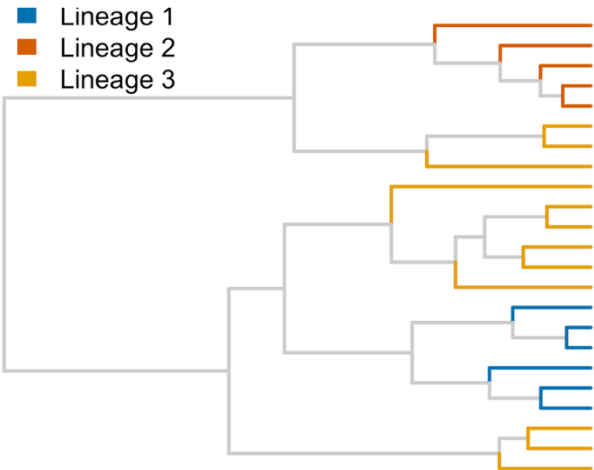
Panel 1



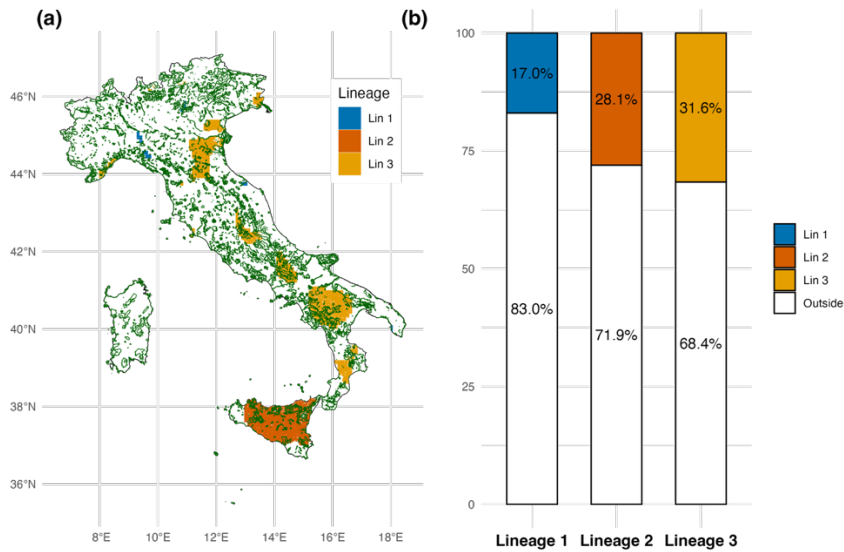
Panel 2



Panel 3



Panel 4



Panel 5

Figure S2 - *Celastrina argiolus*

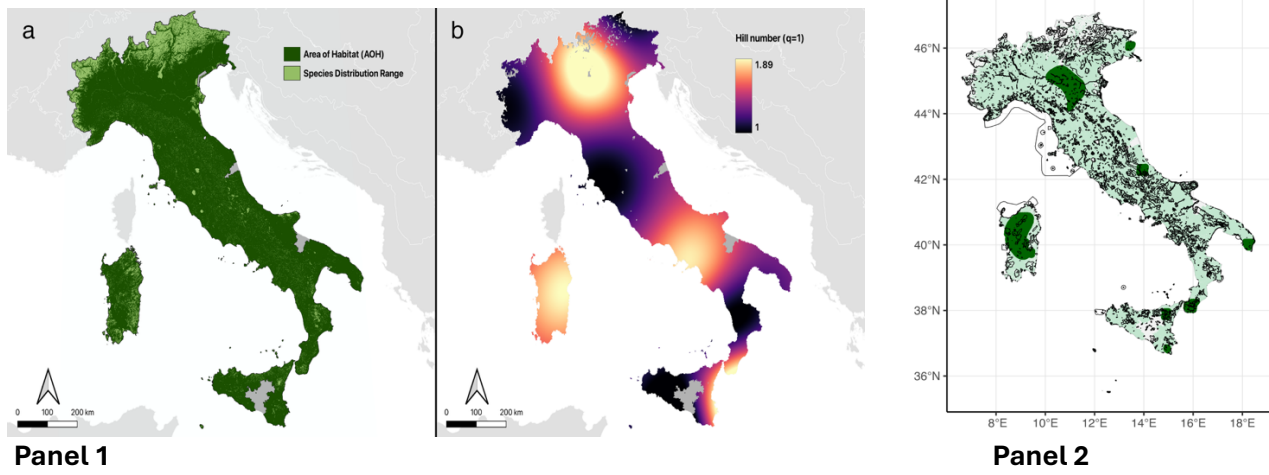


Figure S3 - *Coenonympha pamphilus*

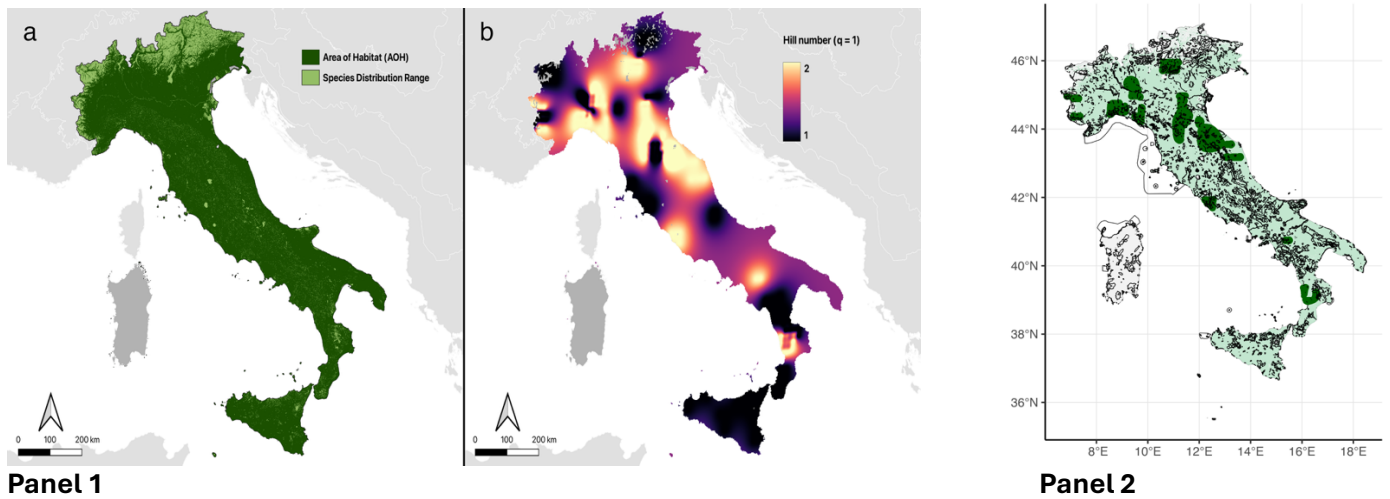


Figure S4 - *Euphydryas provincialis*

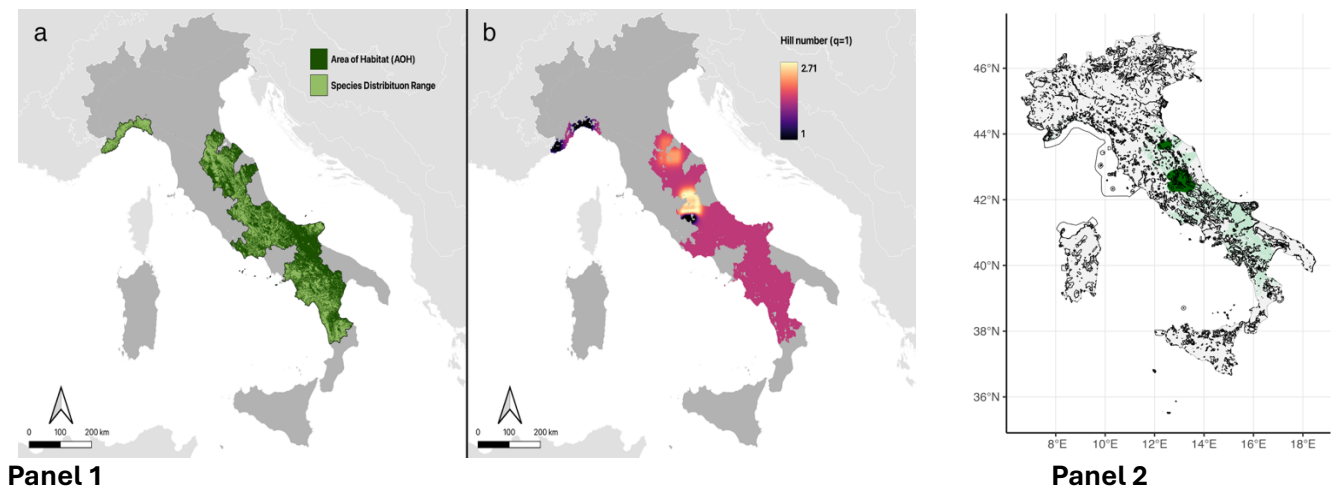
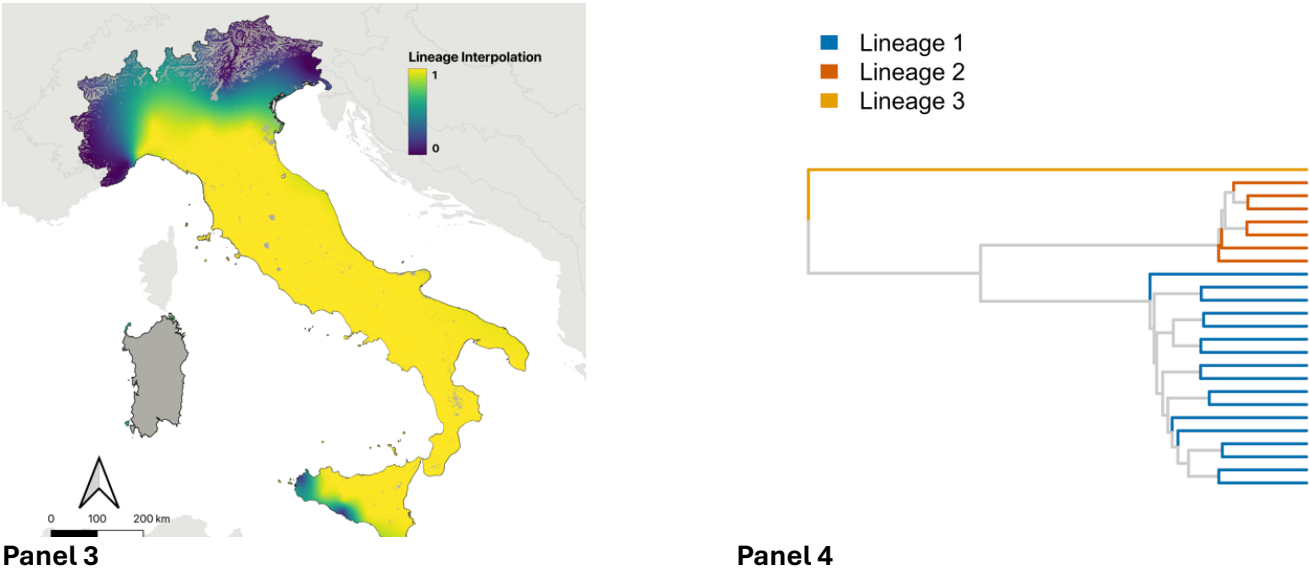
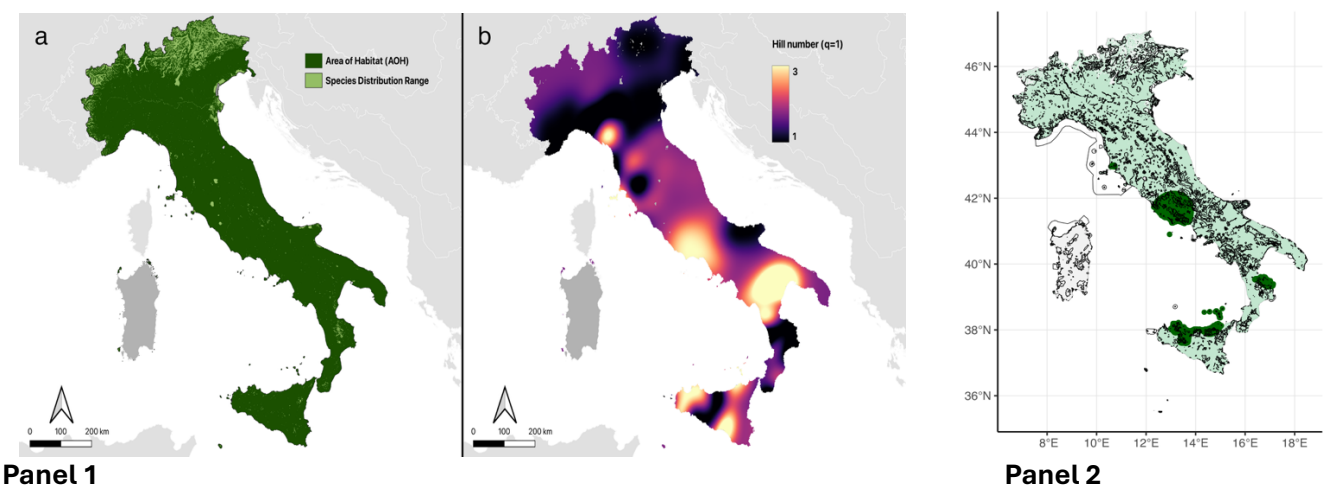
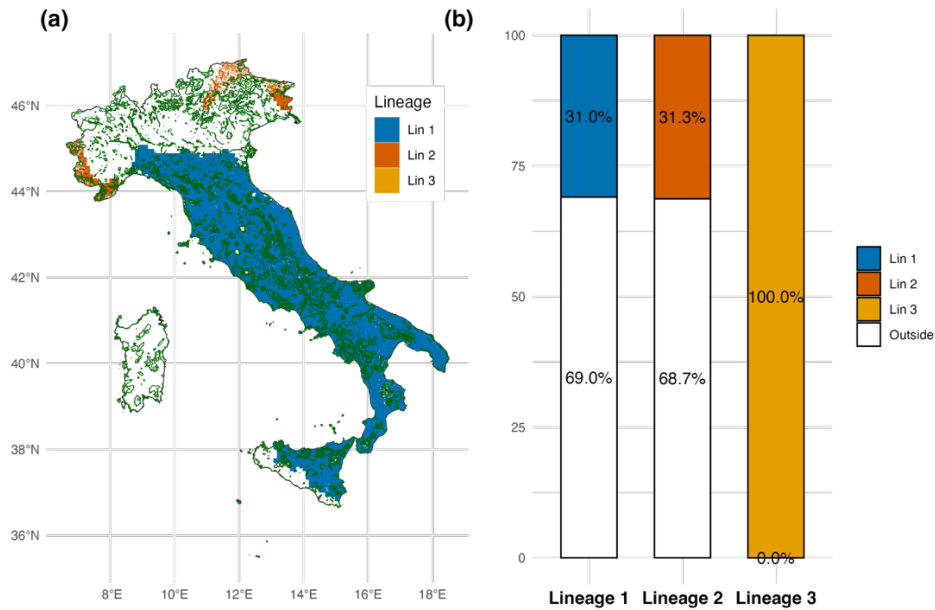


Figure S5 - *Lasiommata megera*



Panel 3

Panel 4



Panel 5

Figure S6 - *Leptidea sinapis*

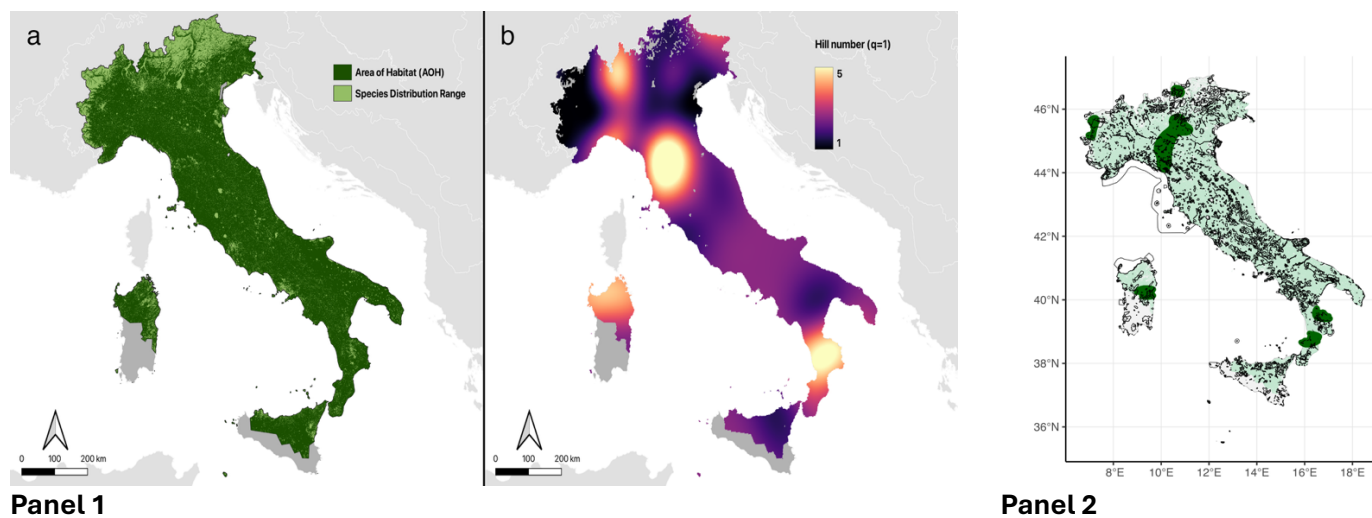


Figure S7 - *Lucanus cervus*

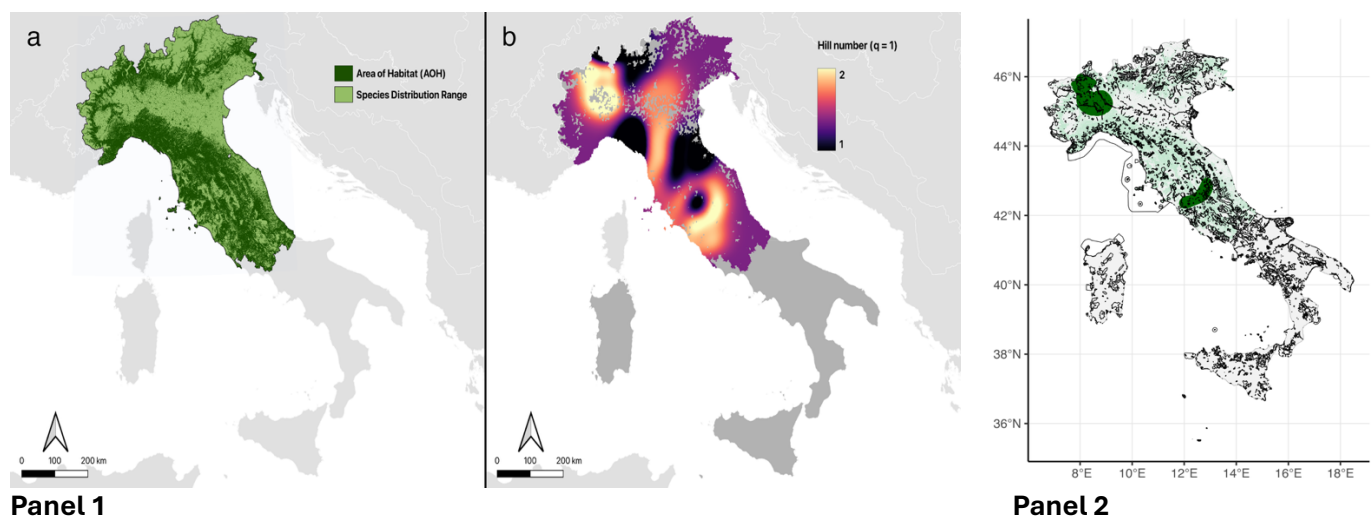


Figure S9 - *Pararge aegeria*

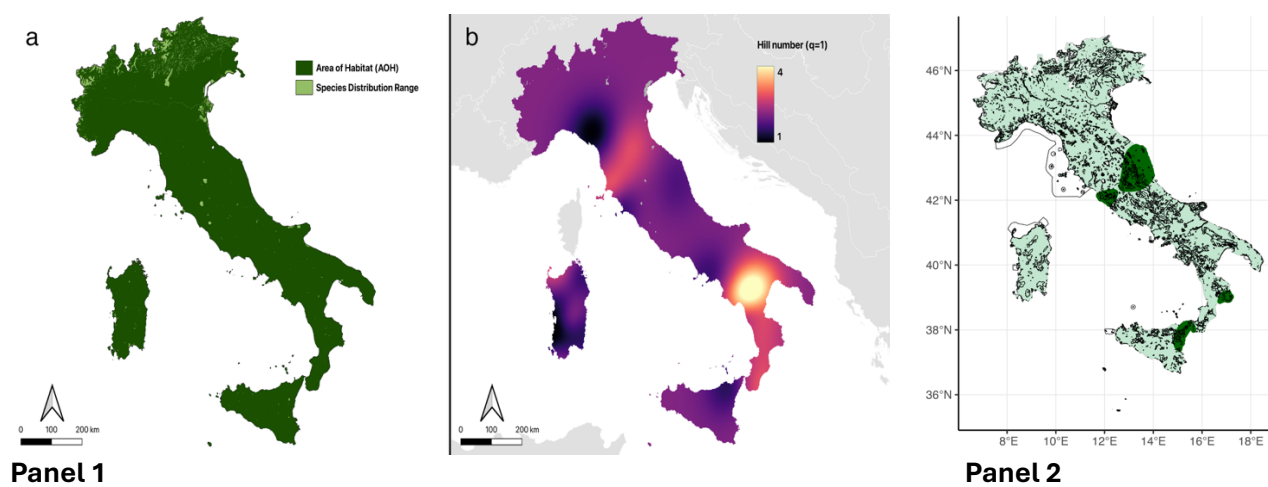
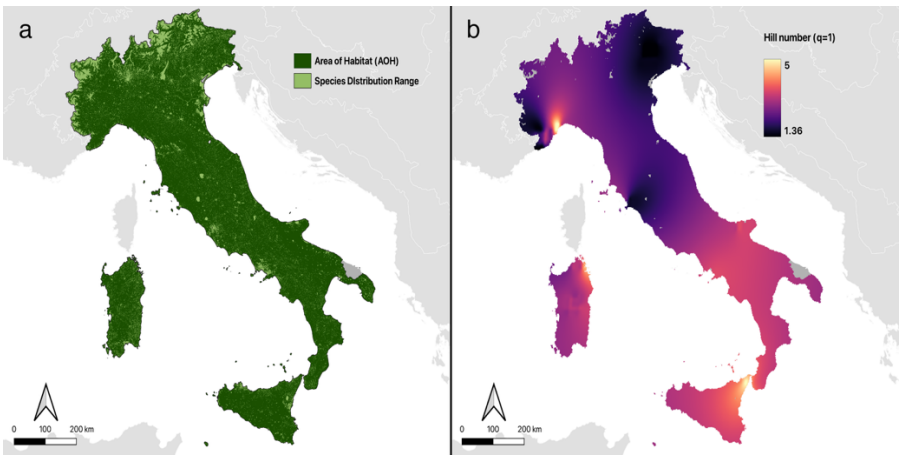
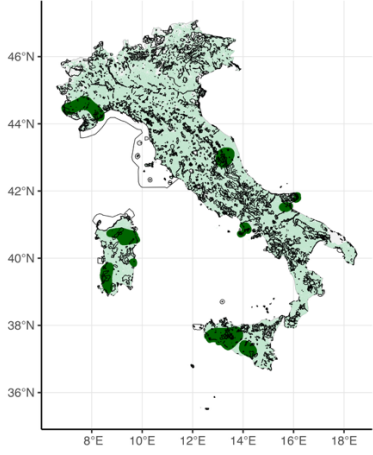


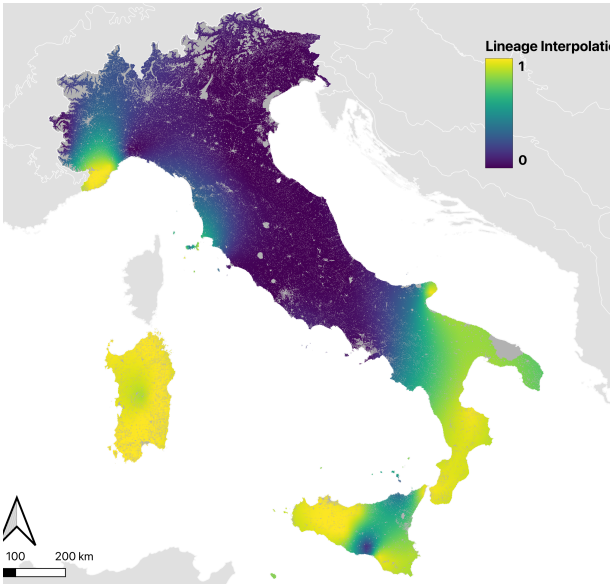
Figure S10 - *Maniola jurtina*



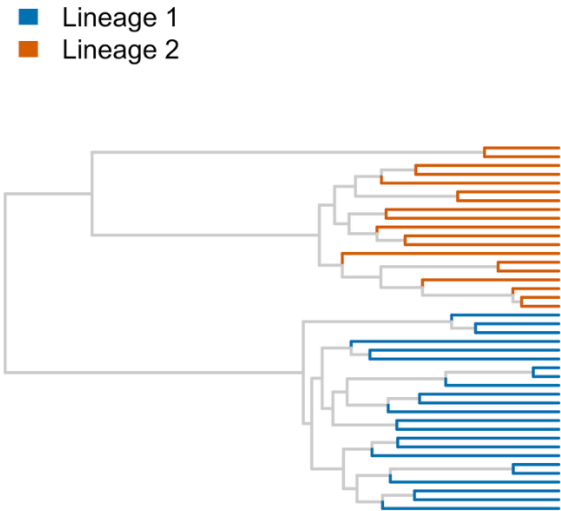
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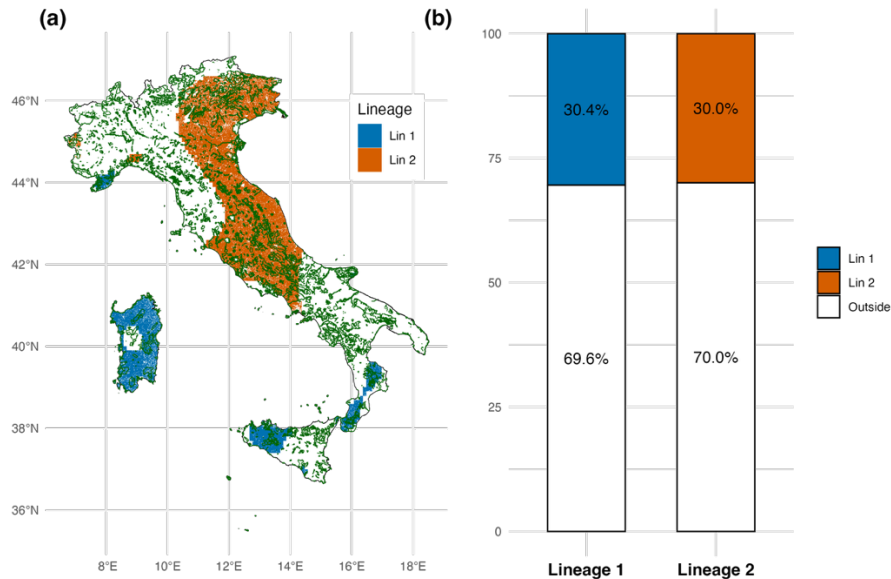
Panel 2



Panel 3

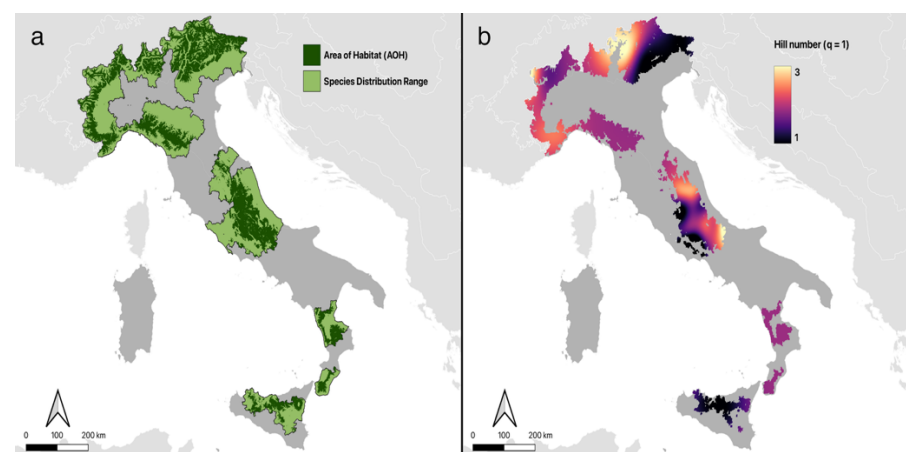


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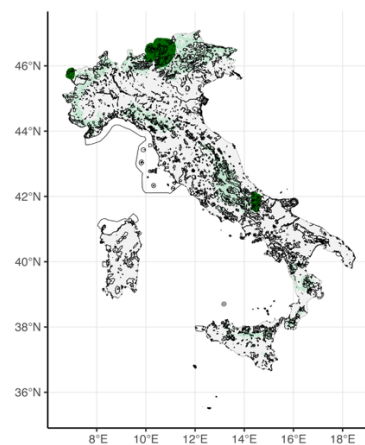


Panel 5

Figure S11 - *Parnassius apollo*

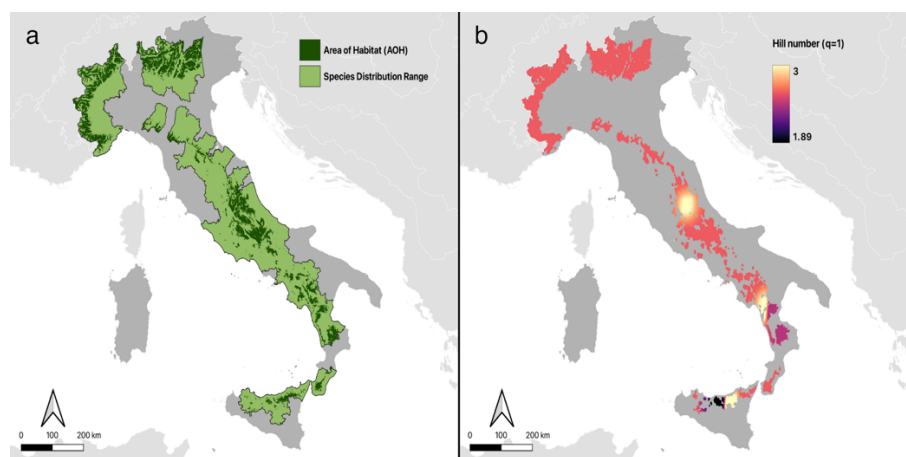


Panel 1

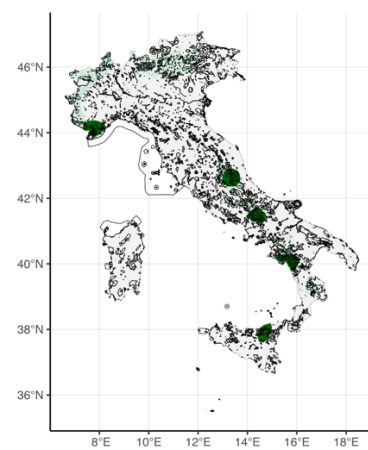


Panel 2

Figure S12 - *Parnassius turatii*

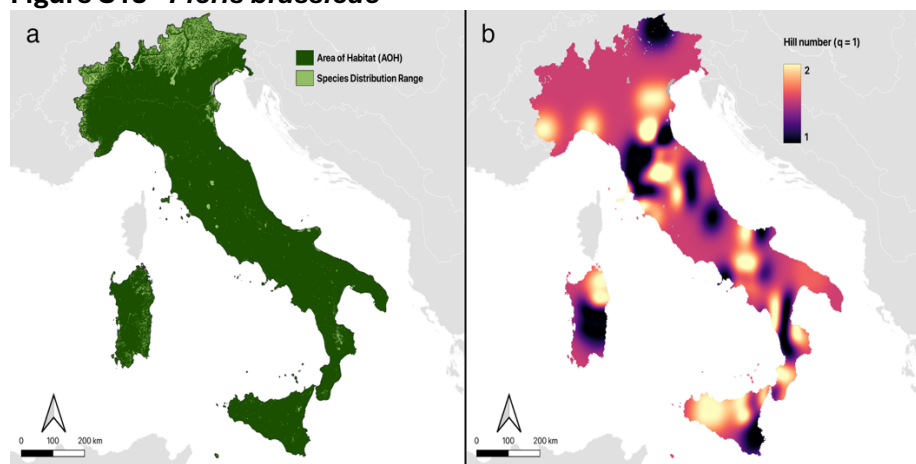


Panel 1

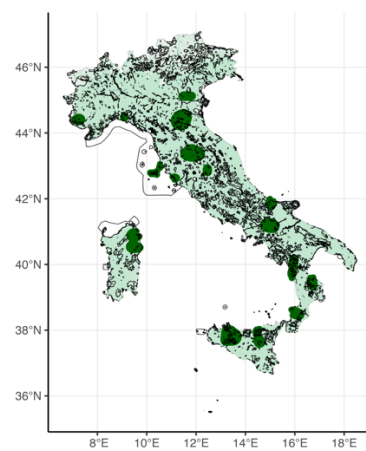


Panel 2

Figure S13 - *Pieris brassicae*

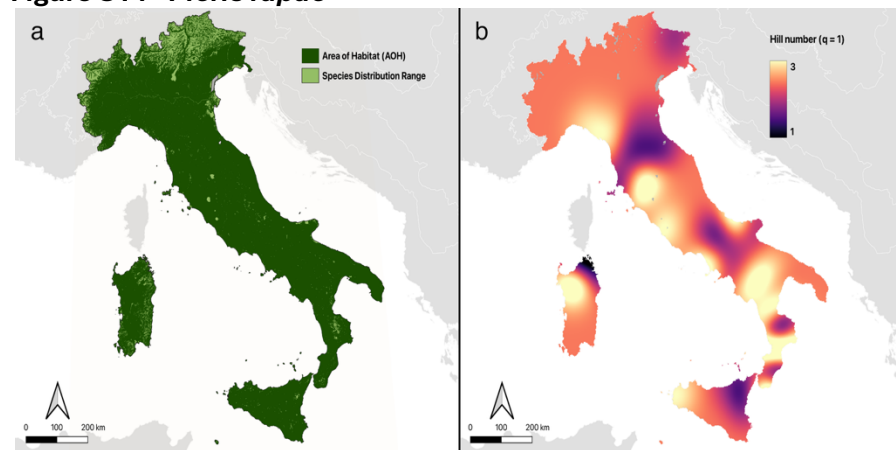


Panel 1

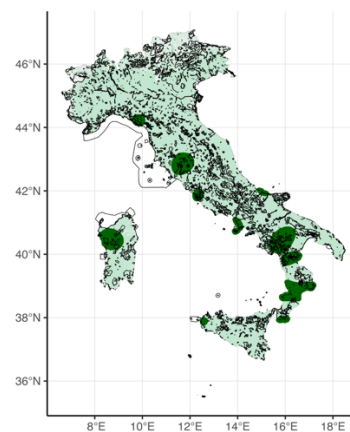


Panel 2

Figure S14 - *Pieris rapae*

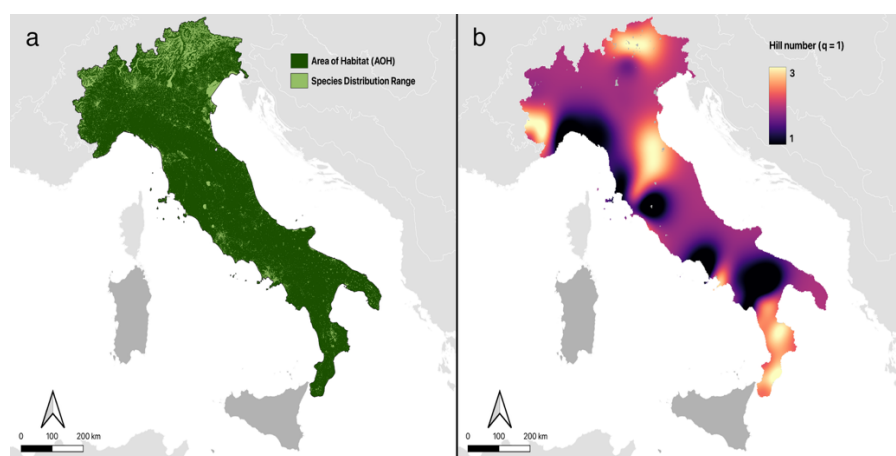


Panel 1

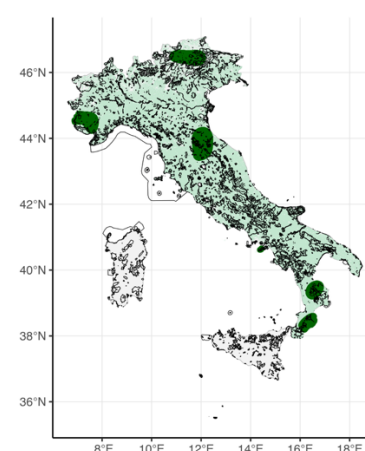


Panel 2

Figure S15 - *Polyommatus icarus*

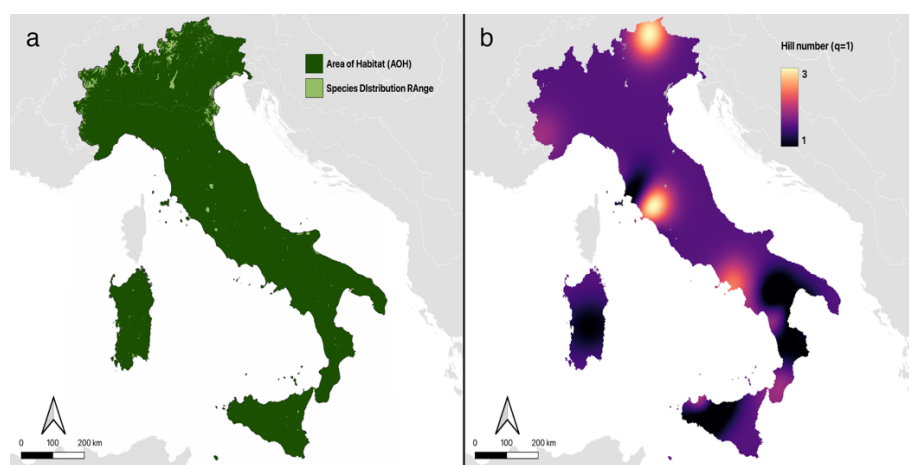


Panel 1

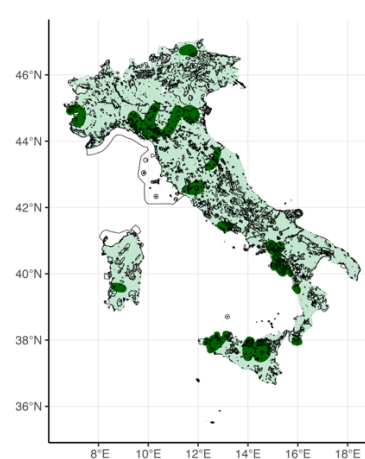


Panel 2

Figure S16 - *Vanessa cardui*

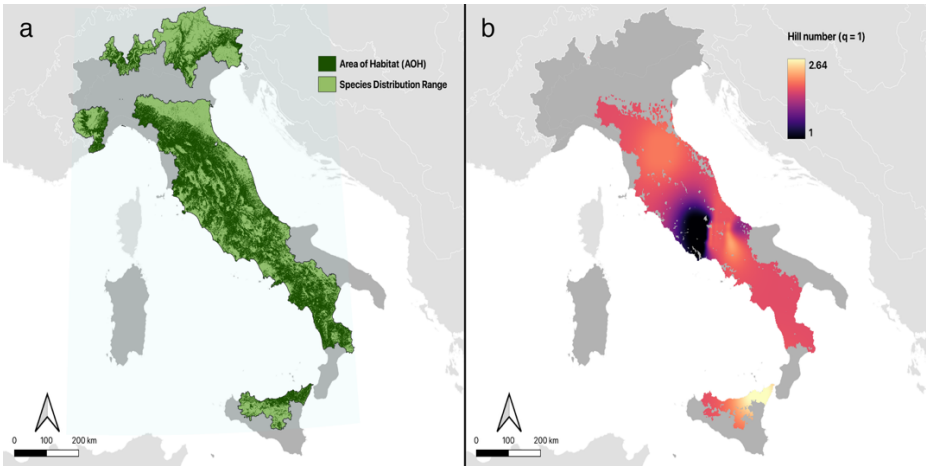


Panel 1

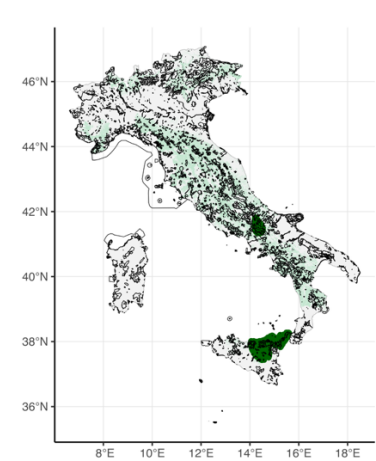


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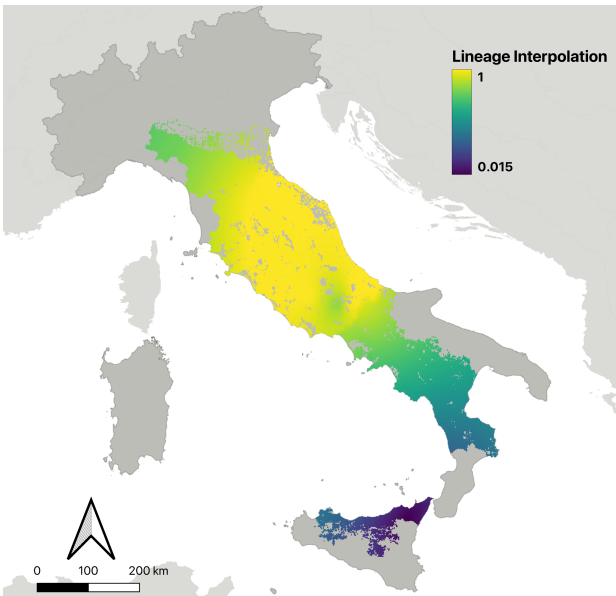
Figure S17 - *Rosalia alpina*



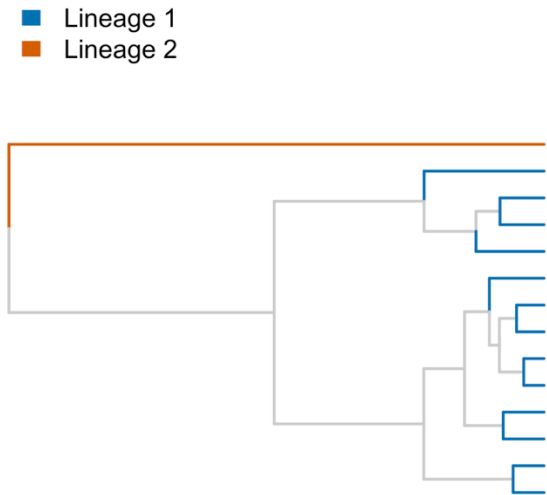
Panel 1



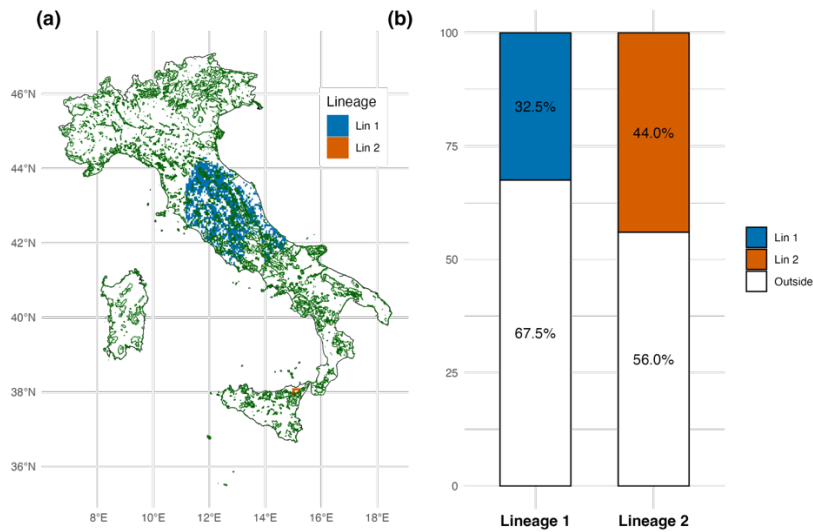
Panel 2



Panel 3



Panel 4



Panel 5