



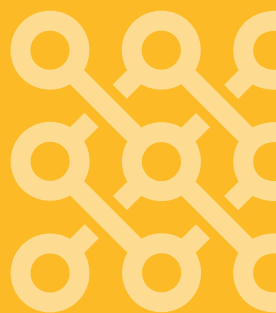
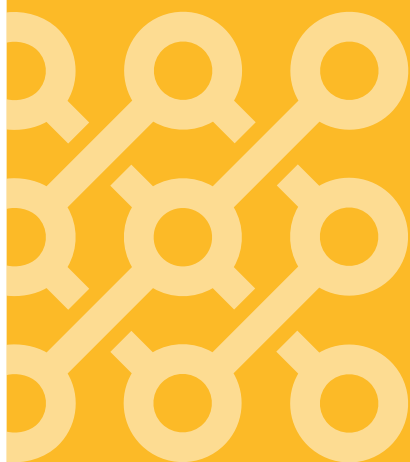
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Sastādītāja / Prepared by: Aija Erta, Latvijas Universitātes Zinātnes departaments (Department of Science of the University of Latvia)

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# DOES THE AIRBORNE POLLEN SPECTRUM OF ALPINE SITES REFLECT LOCAL VEGETATION?

F. Zemmer<sup>1,2</sup>, Cristofori A.<sup>1,2</sup>, F. Cristofolini<sup>1</sup>, E. Gottardini<sup>1,2</sup>

<sup>1</sup>Fondazione Edmund Mach, Environmental Botany Unit, Research Innovation Centre, San Michele all'Adige, Italy

<sup>2</sup>National Biodiversity Future Centre, Palermo, Italy

**Background.** Alpine protected areas function as key refuges for biodiversity and thus play an essential role in the stability of ecosystems. However, the pressures associated with global environmental change increasingly threaten these ecosystems. Habitats included in the Natura 2000 network are regularly monitored to ensure a good conservation state (Council Directive on the conservation of natural habitats and of wild fauna and flora, 1992).

The aim of the study was to investigate the relationship between airborne pollen and vegetation at four Alpine sites in Trentino, Italy, to evaluate the role of pollen biodiversity as a proxy for plant biodiversity across different spatial scales.

**Methods.** Airborne pollen was collected with Sigma-2 passive samplers at four Natura 2000 Alpine sites in Trentino, northern Italy: Rifugio Val di Fumo (1906 m a.s. l., Parco Naturale Adamello-Brenta), Rifugio Altissimo (2057 m a.s. l., Parco Naturale Locale Monte Baldo), Rifugio Rosetta (2577 m a.s. l., Parco Naturale Paneveggio-Pale di San Martino), and Rifugio Cevedale (2608 m a.s. l., Parco Nazionale dello Stelvio). Pollen was identified morphologically using optical microscopy and reference pollen from local flora, while vegetation was surveyed at 10 m, 100 m, and 1000 m around each sampler. Pollen and plant richness, abundance and derived biodiversity metrics were used in the analysis. NMDS (Non-metric Multidimensional Scaling) was used to visualize similarities of pollen between sites.

**Results.** No statistically significant correlations were found between pollen taxon richness and either plant species richness or pollen-equivalent plant taxa at the spatial scales examined. The mean Jaccard similarity indices of four sites at three distances from the aerobiological sample between the pollen taxa and the pollen-equivalent plant taxa were  $0.19 \pm 0.052$ ,  $0.22 \pm 0.063$ ,  $0.26 \pm 0.080$ . NMDS showed that the pollen composition overlaps across all four sites, without forming distinct clusters.

**Conclusions.** While the similarity between pollen and vegetation was weak at the local scale, the pollen spectra of the sites were largely similar in composition at the regional scale. We therefore hypothesize that Alpine airborne pollen samples may reflect vegetation patterns beyond the local scale and could be suitable for regional-scale assessments.

## References

Council Directive on the conservation of natural habitats and of wild fauna and flora, 92/43/EEC (1992). <http://data.europa.eu/eli/dir/1992/43/oj>

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