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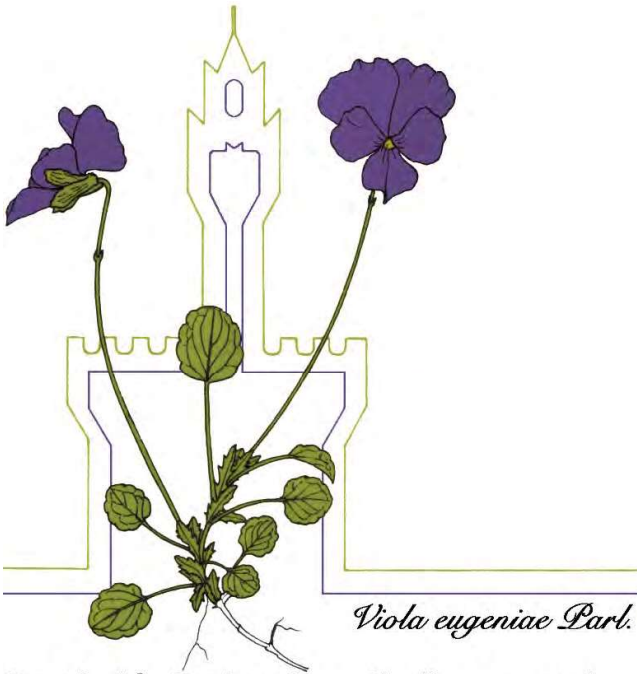

ABSTRACTS

KEYNOTE LECTURES, COMMUNICATIONS, POSTERS

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Agrobiodiversity decline and recovery: a multi-scale issue. A pilot assessment experience in the Po Plain district

Gemma Chiaffarelli[1], Nicolò Sgalippa[2], Ilda Vagge[1]
[1]Department of Agriculture and Environmental Sciences, University of Milan, Via Celoria 2, 20161 Milan, Italy; [2]SAP – Landscape Architecture Studio, Via Piave 1, 24040 Bonate Sopra (BG), Italy

The current agrobiodiversity decline trends, its conservation and promotion are a widely recognized urgency. Since the 1960s, the shift towards intensive, highly mechanized agriculture has severely altered the agroecosystem ecological quality and biodiversity values. The agricultural landscape traits result in highly simplified structural and functional patterns. Impacts are generally recognized at field scale, by recording the impairment level of the diversification and quality of rural spontaneous bio-coenoses. Nonetheless, farm scale, local and extra-local scale dynamics directly and indirectly influence field scale bio-coenoses structural, functional and dynamic traits (1). Hence, multi-scale biodiversity monitoring approaches are needed, to coherently understand and address agrobiodiversity issues. This is especially true in intensively anthropized landscape systems, such as the agricultural ones, where the landscape eco-mosaic health status is significantly affected by human activities. In line with these acknowledgements, we are conducting a study in the Po Plain western district, a highly anthropized region currently experiencing significant impacts on biodiversity, paired to a spread depletion of natural habitats. The study aims at identifying suitable tools for agrobiodiversity monitoring, by testing and comparing multi-level analytical tools. Landscape ecology analyses are led at different scales of analysis, with different levels of detail (2). Quantitative metrics are computed and compared (patch size, matrix, shape indices, diversity and connectivity indices, a landscape metastability index). A newly adapted connectivity index is tested, synthetically accounting for the ecological quality of corridors (development, stratification, continuity and allochthonous degree). Current state and transformation scenarios are evaluated. Results are then crossed with field and farm scale floristic-vegetational analyses (3), to identify significant correlation patterns. We here present the first results on landscape ecology analyses, applied to a pilot farm (Vercelli district) adopting an agroforestry approach, which is compared to the conventional surrounding agricultural settings. These analyses allowed us to account for the positive contributions given by the agroforestry approach towards higher values of landscape diversification, rebalancing the landscape eco-mosaic composition, if compared to farm scale and local scale conventional management. The ongoing multi-disciplinary study of the area allowed us to identify specific design interventions on rural landscape features rehabilitation, both in coherence with the local floristic-vegetational patterns and with the outlined landscape eco-mosaic shortcomings. Hence, transformation scenarios were assessed through connectivity analyses, quantifying the potential positive contribution given by the agroforestry management model expansion. Such results frame the ongoing evaluation of field scale floristic-vegetational qualitative and quantitative traits. This allows the building of an analytical framework for representing both the current agrobiodiversity traits, the reasons behind their negative trends, and the multi-scale factors influencing such patterns, also allowing to display the underlying delivering of Ecosystem Services and Disservices. This approach is intended to inform both farmers, public administrations, and agricultural policies, by orienting them towards targeted interventions for effectively addressing biodiversity issues.

1) W.E. Dramstad, J.D. Olson, R.T.T. Forman (1996) Island Press, 1-80.
2) I. Vagge, G. Chiaffarelli (2023) Agronomy, 13, 233 https://doi.org/10.3390/agronomy13010233
3) I. Vagge, G. Chiaffarelli (2023) Plants 2023, 12, 2012 https://doi.org/10.3390/plants12102012