



Vegetation of sea,
oceanic and ecological
islands of Europe

66th ANNUAL SYMPOSIUM

From local to global:
vegetation patterns
across spatial scales
in a changing World

IAVS



16 - 20 SEPTEMBER 2024

Pestana Casino Park Hotel
Funchal, Madeira, Portugal

PROGRAMME AND ABSTRACTS

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Autor: Jorge Capelo

Co-autor(es): Miguel Sequeira, Sandra Mesquita, Célia Bairos

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A COMPLEX INTERPLAY SHAPES PLANT DIVERSITY PATTERNS IN MEDITERRANEAN COASTAL DUNES

Simona Sarmati (Italy)⁴; **Claudia Angiolini** (Italy)¹; **Marta Gaia Sperandii** (Italy)²; **Vojtěch Barták** (Czech Republic)³; **Matilde Gennai** (Italy)⁵; **Alicia Tr Acosta** (Italy)⁴; **Andrea Bertacchi** (Italy)⁶; **Gianmaria Bonari** (Italy)¹; **Bruno Foggi** (Italy)⁵; **Simona Maccherini** (Italy)¹; **Daniele Viciani** (Italy)⁵; **Manuele Bazzichetto** (Italy)³

1 - Department of Life Sciences, University of Siena, Siena (Italy); 2 - Department of Botany and Zoology, Masaryk University, Brno (Czech Republic); 3 - Department of Spatial Sciences, Faculty of Environmental Sciences, Czech University of Life Science, Praha-Suchbát (Czech Republic); 4 - Department of Science, University of Roma Tre, Rome (Italy); 5 - Department of Biology, University of Florence, Florence (Italy); 6 - Department of Agriculture, Food and Environment, University of Pisa, Pisa (Italy)

A long history of human colonisation has profoundly altered coastal plant communities of Mediterranean coastal dunes, as well as their capacity of providing ecosystem services. Analysing the drivers of plant diversity loss is thus crucial for preserving Mediterranean coastal ecosystems.

Using 20 cm resolution orthophotos, we mapped a wide Mediterranean coastal landscape and obtained a set of variables describing the distribution, abundance and size of natural (coastal dune habitats) and anthropogenic (urban areas and tourism facilities) patches. From the orthophotos, we also quantified the shoreline dynamism (coastal erosion and accretion) occurred in the area over a 10-year period. We then analysed how plant species richness, as well as the proportion of typical and ruderal plant species, related to the landscape variables and shoreline dynamism. Also, using piecewise structural equation modelling, we investigated the complex interplay between landscape variables and shoreline dynamism in shaping coastal plant diversity patterns.

The study found no negative impact of anthropogenic activities on coastal vegetation plant species richness. However, disturbances favour ruderal plant species, while typical foredune species decrease. This indicates that (i) focusing on species richness may underestimate the impact of anthropogenic activities on coastal dune vegetation; (ii) human-related activities change the composition of dune vegetation, eventually promoting the establishment of ruderal species, which cannot support the functioning of coastal ecosystems and the provisioning of the related ecosystem services. Finally, structural equation models results highlighted that coastal erosion is an indirect driver of plant diversity loss, through its influence on the coastal landscape configuration.

Keyword: aerial orthophotos, coastal erosion, coastal tourism, dune vegetation, habitat types, land cover map, remote sensing, species guilds, typical species

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PLOUGHING LEGACY IN TRADITIONAL CARPATHIAN GRASSLANDS

Polina Dayneko (Slovakia)^{1,2}; **Dariia Borovyk** (Ukraine)³; **Liubov Borsukevych** (Ukraine)⁴; **Katarína Devánová** (Slovakia)⁵; **Anamaria Iuga** (Romania)⁶; **Corina Iosif** (Romania)⁶; **Anna Kuzemko** (Ukraine)³; **Martin Magnes** (Austria)⁷; **Pavel Šírka** (Slovakia)⁸; **Iveta Škodová** (Slovakia)⁹; **Denys Vynokurov** (Ukraine)^{3,9,10}; **Monika Janišová** (Slovakia)¹

1 - Institute of Botany, Plant Science and Biodiversity Centre, Slovak Academy of Sciences, Bratislava, Slovakia; 2 - Kherson State University, Department of Botany, Kherson, Ukraine; 3 - M.G. Kholodny Institute of Botany, National Academy of Sciences of Ukraine, Kyiv, Ukraine; 4 - Botanical Garden of Ivan Franco National University of Lviv, Lviv, Ukraine; 5 - BROZ – conservation association, Bratislava, Slovakia; 6 - National Museum of the Romanian Peasant, Bucharest, Romania; 7 - Division of Plant Sciences, Institute of Biology, University of Graz, Graz, Austria; 8 - Department of Phytology, Faculty of Forestry, Technical University, Zvolen, Slovakia; 9 - Institute of Biology/Geobotany and Botanical Garden, Martin Luther University Halle-Wittenberg, Halle, Germany; 10 - German Centre for Integrative Biodiversity Research (iDiv) Halle-Jena-Leipzig, Leipzig, Germany

Long-term crop cultivation can strongly affect semi-natural grasslands, potentially resulting in drop of biodiversity, especially during the early successional phases, a change of soil properties, microclimate, etc. However, the degree and scale of this effect may vary depending on many factors, such as land-use patterns. In this study,

we focus on the legacy effect of ploughing on species-rich mountain grasslands in Poienile de sub Munte (Maramureş, Romania). We sampled 56 grassland parcels in the studied village. For each plot, we obtained detailed information from farmers regarding recent and historical management practices, i.e. the year of last ploughing, ploughing continuity and last cultivated crop. Overall, never-ploughed permanent grasslands were the richest in species numbers of all (max. 83) and vascular plants (69), as well as bryophytes (14), while the mean values of species were consistently higher or similar to those found in fallows. There was no significant correlation between ploughing impact and the richness of vascular plant and bryophyte species. Species composition was not affected by ploughing; in contrast, it was best explained by mowing frequency, grazing intensity and soil parameters (calcium and phosphorus content, and pH). To promote faster grassland recovery, farmers usually planted alfa-alfa as the last crop, maintained traditional mowing schedules, applied hayseed, farmyard dung and ash. Our study could help to better understand the impact of traditional grassland management on vegetation, as well as the grassland recovery and restoration process. Financial support: APVV-0226, VEGA 02/0065/23, 09103-03-V01-00018.

Keyword: Grassland management, Ploughing, Manuring, Mowing, Plant diversity, Traditional agriculture

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DROUGHT MITIGATION STRATEGIES TO PROMOTE SUSTAINABLE LIVESTOCK PRODUCTION IN THE GRASSLAND AND SAVANNA BIOMES IN SOUTH AFRICA

Andiswa Finca (South Africa); **Julius Tjelele** (South Africa); **Igshaan Samuels** (South Africa); **Clement Cupido** (South Africa); **Ngoako Letsoalo** (South Africa); **Thantaswa Zondani** (South Africa); **Khululiwe Ntombela** (South Africa); **Gilbert Pule** (South Africa); **Jodene Forster** (South Africa)¹

1 - Agricultural Research Council

South Africa, has recently faced consecutive years of severe drought conditions, which strained natural resources, livestock, and the livelihoods of farmers. Amidst these extended drought episodes, certain farmers exhibited greater resilience and ability to mitigate drought impacts and apply restorative measures than their peers. Therefore, this study's aim was to capture the wisdom underlying their successful mitigation strategies, with the intention to disseminate this knowledge to fellow farmers contending with similar challenges. To achieve this, a total of 60 champion farmers representing a spectrum of livestock farming enterprises and varied production systems within the savanna and grasslands biomes were selected using a purposive sampling technique. The selection criteria which was derived in workshops held with government officials, researchers and agricultural organizations was based on farmer's knowledge, skill and experience to overcome farming challenges and remain resilient. The study employed semi-structured questionnaires with open-ended questions, including demographics, effects of drought on rangeland productivity and livestock, strategies to counter drought-related challenges and restoration techniques applied after drought. The findings highlighted commonalities in coping strategies adopted by farmers across the two biomes. These strategies encompassed destocking, diversification of income streams, and vigilant veld inspection, underscoring farmers' proactive stance in confronting the adversities of drought. Moreover, to counter the effects of drought on rangeland degradation, the farmers applied restoration techniques such as rotational resting, reseeding, contouring and continuous clearing of invasive plants. By integrating the lessons learned from these resilient farmers, the efficacy of drought mitigation within the livestock sector could be enhanced.

Keyword: Drought, Rangeland