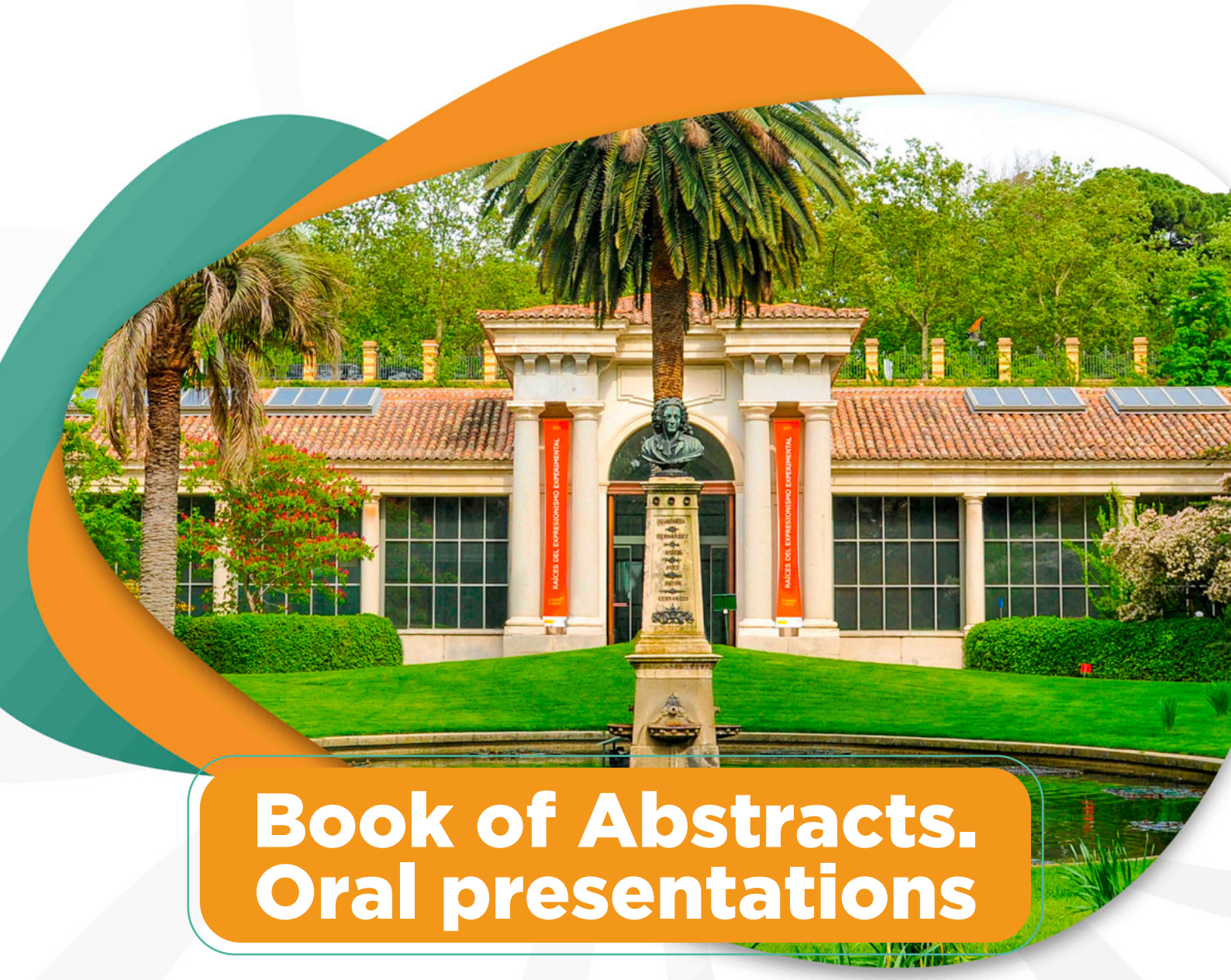
IBC 2024

XX International Botanical Congress Madrid Spain



Book of Abstracts. Oral presentations

July, 21st - 27th, 2024

ibcmadrid2024.com • info@ibcmadrid2024.com

#IBC2024

SEBOT
SOCIEDAD BOTÁNICA ESPAÑOLA

CSIC
CONSEJO SUPERIOR DE INVESTIGACIONES CIENTÍFICAS

REAL JARDÍN BOTÁNICO

Techinical Secretariat:
Fase20 congresos
C/ Narváez 15 1°izq
28009 Madrid - Tel. 902 430 960
www.fase20.com - info@fase20.com

Title of the Work: Title of the Work: : XX International Botanical Congress IBC 2024, Spain. Book of Abstracts. Oral presentations .

Publisher: Fase 20 Ediciones

C/ Narváez, 15- 1º Izqda.- 28009 MADRID

www.fase20.com

ISBN: ISBN: 978-84-09-63655-6

ra of higher elevations. These trends led together to a significant greening of the European Alps above the tree line. Yet, the vast majority of species is lagging behind recent trends, implying that even if climate change was halted now, its effects were likely to continue. Climate warming is, however, not slowing down but is rather accelerating. Potentially increasing lags might therefore become too large to overcome in the future, resulting in species extirpations. These local to regional extirpations might be reinforced by more competitive and faster shifting neophytes that start to arrive and spread in mountain ecosystems. Predicting these future responses of alpine plant species to global change is crucial to conserve global biodiversity. For accurately predicting the future it is, however, inevitable to first understand the past and its legacy effects.

S.101.2 The importance of facilitative interactions for the plant diversity of alpine plant communities

Lohengrin A. Cavieres[1,2]

1 Departamento de Botánica, Facultad de Ciencias Naturales y Oceanográficas, Universidad de Concepción, Chile. 2 Instituto de Ecología y Biodiversidad (IEB), Chile

Facilitation among plants occurs when the fitness of one species increases in the presence of neighboring plants. It has been suggested that the importance of facilitative interactions among plants increase with the environmental harshness. In high-elevation (alpine) habitats the abiotic harshness increases with elevation, and several studies have addressed how the intensity of facilitation among plants change along elevational gradients. However very few have addressed the frequency and importance of these interactions for the diversity of alpine environments. Using a dataset spanning 78 sites and 5 continents, we assessed the relative importance of facilitative interactions in determining plant diversity in alpine ecosystems. We focused on alpine plant communities dominated by cushion plants, a particular growth form that act as nurse plant for other species. Samples from cushions and open areas were combined in a single matrix accounting for the difference in cover between both microhabitats, and through rarefaction curves we assessed how many more species are added to the community due to the presence of cushions. In general, the presence of cushions consistently increased species richness at the entire community level. The magnitude of these increases in species richness varied with habitat severity where cushion species enhanced species richness more in systems with harsher environments and hence inherently impoverished in local diversity. Facilitative interactions with the nurse species appear to act as a "safety net" sustaining diversity under harsh conditions, demonstrating the importance of positive interactions among species in determining the diversity of alpine habitats in general.

Acknowledgments: Funded by Fondecyt-1211197, ACT-210038, FB-0006.

S.101.3 Endemic species in the aerobiome? Evidence from floristic and aerobiological studies in the Italian Alps

Franziska Zemmer[1,2], Antonella Cristofori[1,2], Fabiana Cristofolini[1], Elena Gottardini[1,2]

1 Environmental Botany Unit, Fondazione Edmund Mach, San Michele all' Adige, Italy. 2 National Biodiversity Future Centre, Palermo, Italy

Pollen as a proxy for plant diversity helps to interpret vegetation and/or to model vegetation shifts under climate change scenarios. Within the BIOALPEC project "Biodiversity in Alpine Ecosystems," we investigate the qualitative-quantitative input of pollen and spores on the bioaerosol of high altitudes exploring implications for ecosystem functioning and biodiversity. Here we present how the local flora and surrounding vegetation are sources of the bioaerosol at alpine receptor sites in Trentino, Italy. The methodology applied involves floristic studies and bioaerosol sampling with passive gravitational traps. We surveyed the flora at different local scales starting from the aerobiological sampler: i) within a circle of 10 m radius; ii) in 5 randomized 2 x 2 m plots within a circle of 100 m radius; iii) along a transect of 1000 m x 2 m. The bioaerosol was analyzed by microscopy and eDNA metabarcoding. Microscopic analysis permits the identification and quantification of pollen, while molecular analysis goes beyond morphological identification allowing for deeper taxonomic resolution and, thus, biodiversity assessment. Results of floristic studies indicate the presence of Italian endemic species,

including *Anthyllis vulneraria subsp. alpestris*, *Galium baldense*, *Knautia baldensis*; and alpine endemits such as *Primula daonensis*; *Eritrichium nanum*, *Arabis caerulea*, *Alchemilla pentaphyllea*, *Achillea erba-rotta subsp moschata*, *Adenostyles leucophylla*, and *Bupleurum stellatum*. The bioaerosol analysis will verify the presence of pollen from endemic species in alpine ecosystems. Complementing floristic data with the results from optical microscopy and eDNA will be a step forward in exploring the potential of air to monitor terrestrial plant biodiversity.

Acknowledgments: This study is conducted within the National Biodiversity Future Centre, NBFC, funded by the National Recovery and Resilience Plan (PNRR MISSION 4 COMPONENT 2, INVESTMENT 1.4 – D.D. 1034 17/06/2022, CN00000033).

S.101.4 Upscaling the functional response of plant communities to summer drought in alpine tundra

Francesco Boscutti*[1,2], Marco Vuerich[1,2], Giacomo Trotta[1,3], Alessandro Petraglia[4], Enrico Braidot[1], Marco Zancani[1], T'ai G.W. Forte[4], Michele Carbognani[4]

*1 Department of Agricultural, Food, Environmental and Animal Sciences (DI4A), University of Udine, Udine, Italy. 2NBFC, National Biodiversity Future Center, Palermo, Italy. 3 Department of Environmental and Life Sciences (DSV), University of Trieste, Trieste, Italy. 4 Department of Chemistry, Life Sciences and Environmental Sustainability, University of Parma, Parma, Italy. *E-mail: francesco.boscutti@uniud.it*

Climate change is causing remarkable impacts on plant species distribution and communities in cold biomes, with particular concern to arctic and alpine tundra. One prominent effect is the progressive increase of vegetation cover that is leading arctic and alpine greening, with far reaching consequences for the species persistence and the overall plant diversity. Nonetheless, the greening magnitude is expected to be significantly shaped by the increasing frequency of summer heat waves and drought, in the alpine domain as well. Climate change induces plants to acclimate by both morphological and physiological traits due to their phenotypic plasticity. A functional trait approach is hence crucial to foresee the responses of dominant species, whose changes could also affect the entire community and ecosystem functioning. To get new insight into the ecological mechanisms involved in these changes, it is important to promote innovative upscaling approaches, for linking field monitoring evidence to remote sensing data. We here present the results of a rain exclusion experiment conducted in alpine tundra (i.e., grasslands and dwarf shrub communities) in two localities of the eastern Alps. We measured individual growth and physiological traits, as well as community and ecosystem response to experimental treatments. Concurrently we carried out close-range and UAV (Unnamed Aerial Vehicle) multispectral surveys, obtaining remote sensing-derived vegetation indices for the upscaling of plant responses. We found that precipitation induced a trait-mediated plant community response affecting the ecosystem functional response. We also found remote sensing-derived indices to be related to the analyzed plant traits, showing promising perspectives for the upscaling of plant responses to drought. Our findings shed new light on the potential use of remote sensing tools for understanding of the response of alpine vegetation to the future climate scenarios, proving to be a promising method for long-term monitoring of such plant communities.

S.101.5 Species responses to harsh environments in Alpine communities with contrasting regional pools

Teresa Morán-López[3,4], Jesús López-Angulo[1,2], David Sánchez Pescador[1,5], Adrián Escudero[1]

1 Área de Biodiversidad y Conservación, Universidad Rey Juan Carlos, Madrid, Spain. 2 Institute of Agricultural Sciences, ETH Zurich, Zurich, Switzerland. 3 Departamento Biología de Organismos y Sistemas, Universidad de Oviedo e Instituto Mixto de Investigación en Biodiversidad (CSIC-Universidad de Oviedo-Principado de Asturias), Oviedo, Spain. 4 Grupo de Ecología Cuantitativa, INIBIOMA, Universidad Nacional del Comahue, CONICET, Bariloche, Río Negro, Argentina. 5 Departamento de Farmacología, Farmacognosia y Botánica, Facultad de Farmacia, Universidad Complutense de Madrid, Madrid, Spain.

Unravelling assembly processes that explain the composition and abundance of coexisting spe-