

# SMALL-SCALE HETEROGENEITY IN URBAN ECOSYSTEMS SHAPES PLANT COMMUNITY BIODIVERSITY: A CASE STUDY IN SOUTHERN ITALY

Baldi V.<sup>1,2\*</sup>, Bellino A.<sup>1</sup>, Baldantoni D.<sup>1,2</sup>

<sup>1</sup> Department of Chemistry and Biology "Adolfo Zambelli", University of Salerno, Via Giovanni Paolo II 32, 84084 Fisciano (SA), Italy

<sup>2</sup> National Biodiversity Future Center (NBFC), Piazza Marina 61, 90133 Palermo, Italy

[vbaldi@unisa.it](mailto:vbaldi@unisa.it)

## Background

Urban ecosystems exhibit a high degree of spatial heterogeneity which determines landscape fragmentation and edge effects at small spatial scales. This phenomenon concerns urban green areas, where the combined effects of landscape configuration and management can crucially affect ecological dynamics and the functioning of the urban ecosystem, with potential implications for biodiversity.

## Aims and scope

The present research aims at shedding light on the effects of the small-scale landscape configuration and the management of green areas in shaping the structural and functional biodiversity of the herbaceous plant communities.

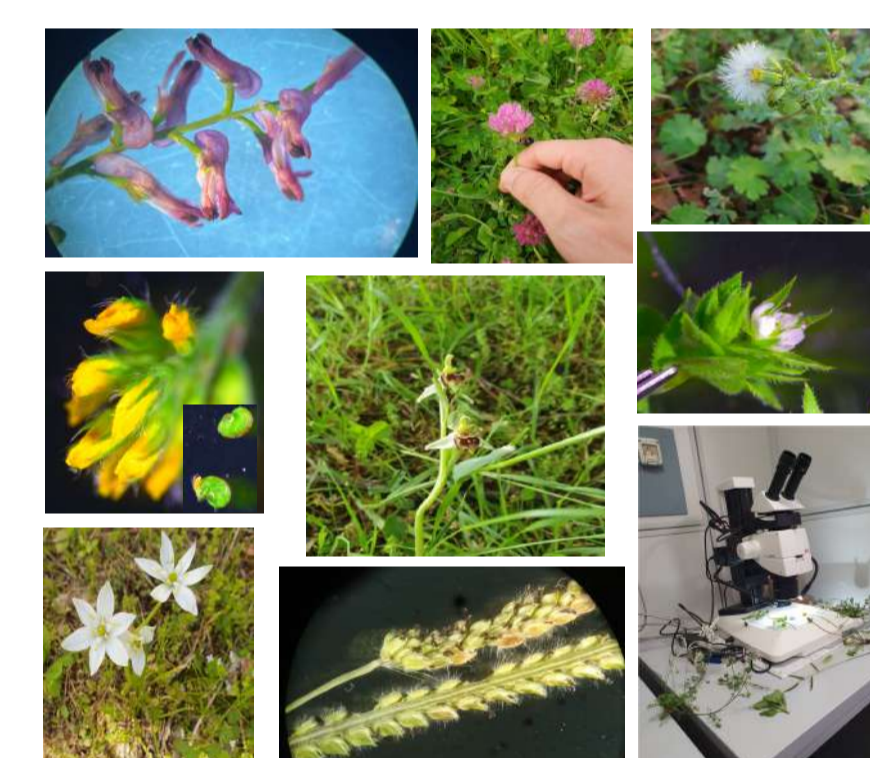
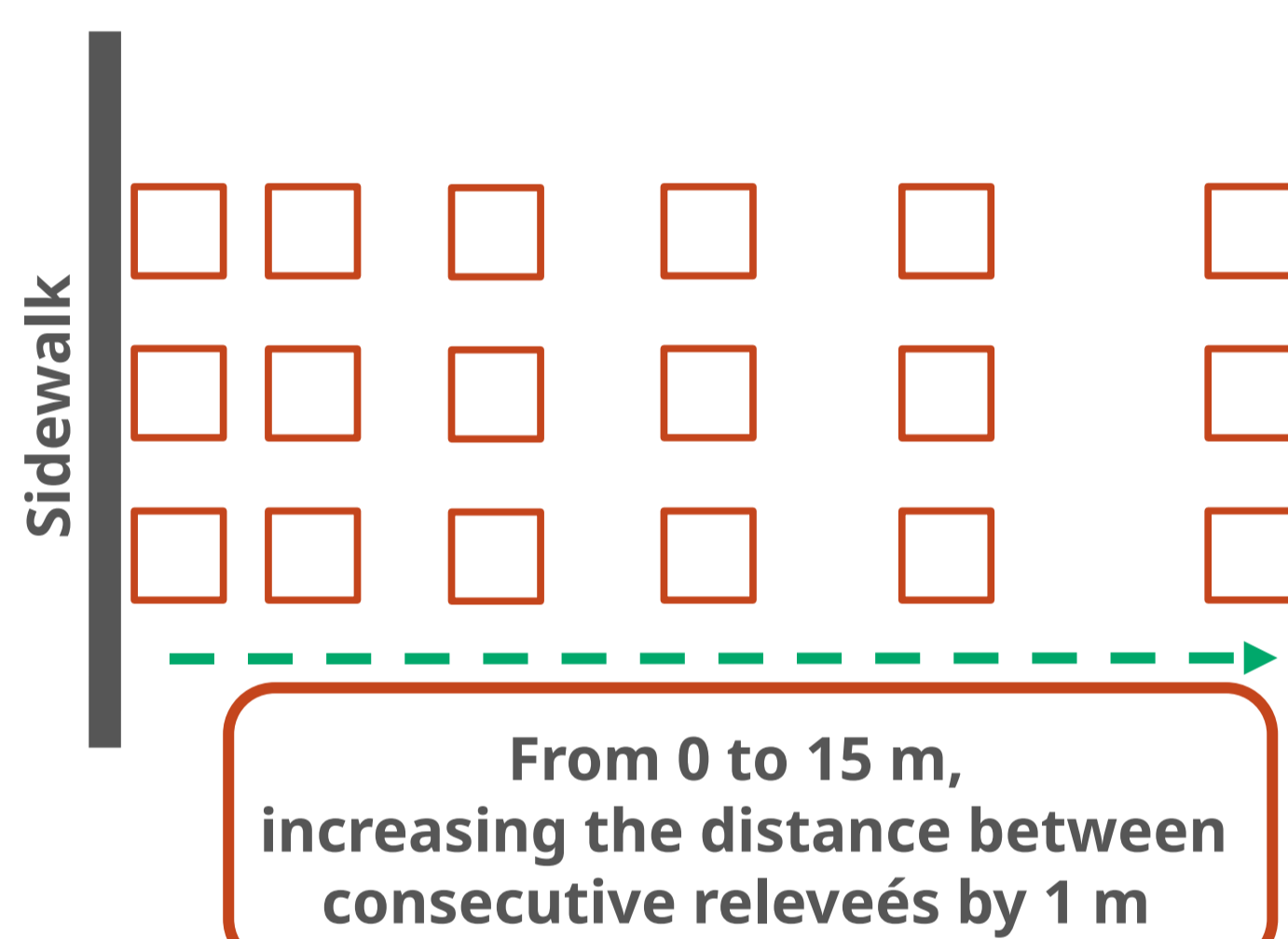
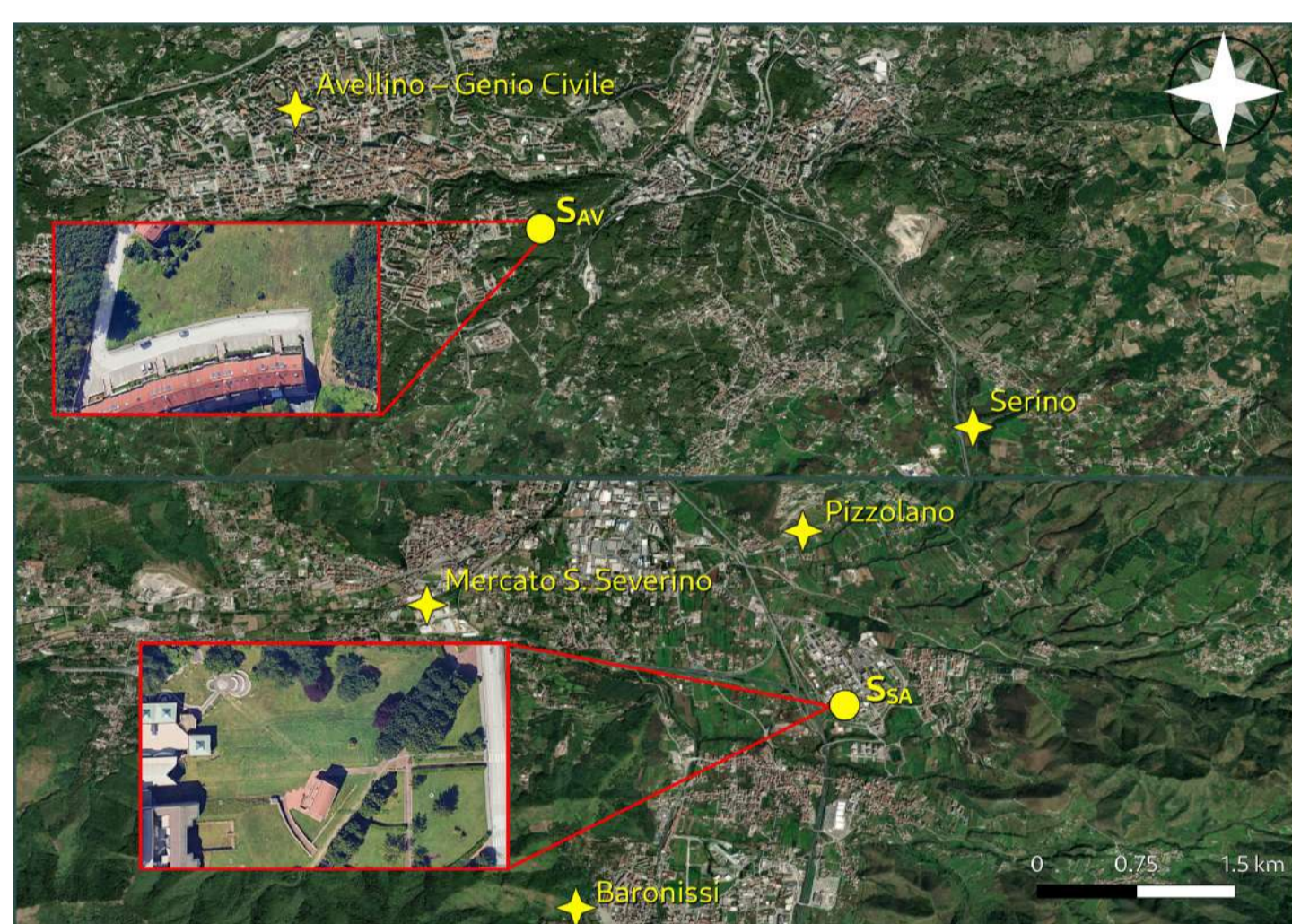
## Study areas and Methodology

The study was carried out in two urban areas in Southern Italy ( $S_{AV}$ ,  $S_{SA}$ ), subjected to similar Mediterranean climate but different management strategies in terms of mowing, fertilization and irrigation.

Three transects of phytosociological relevés were performed at different distances from the sidewalk surrounding the areas to evaluate the edge effect.

Biodiversity investigations:

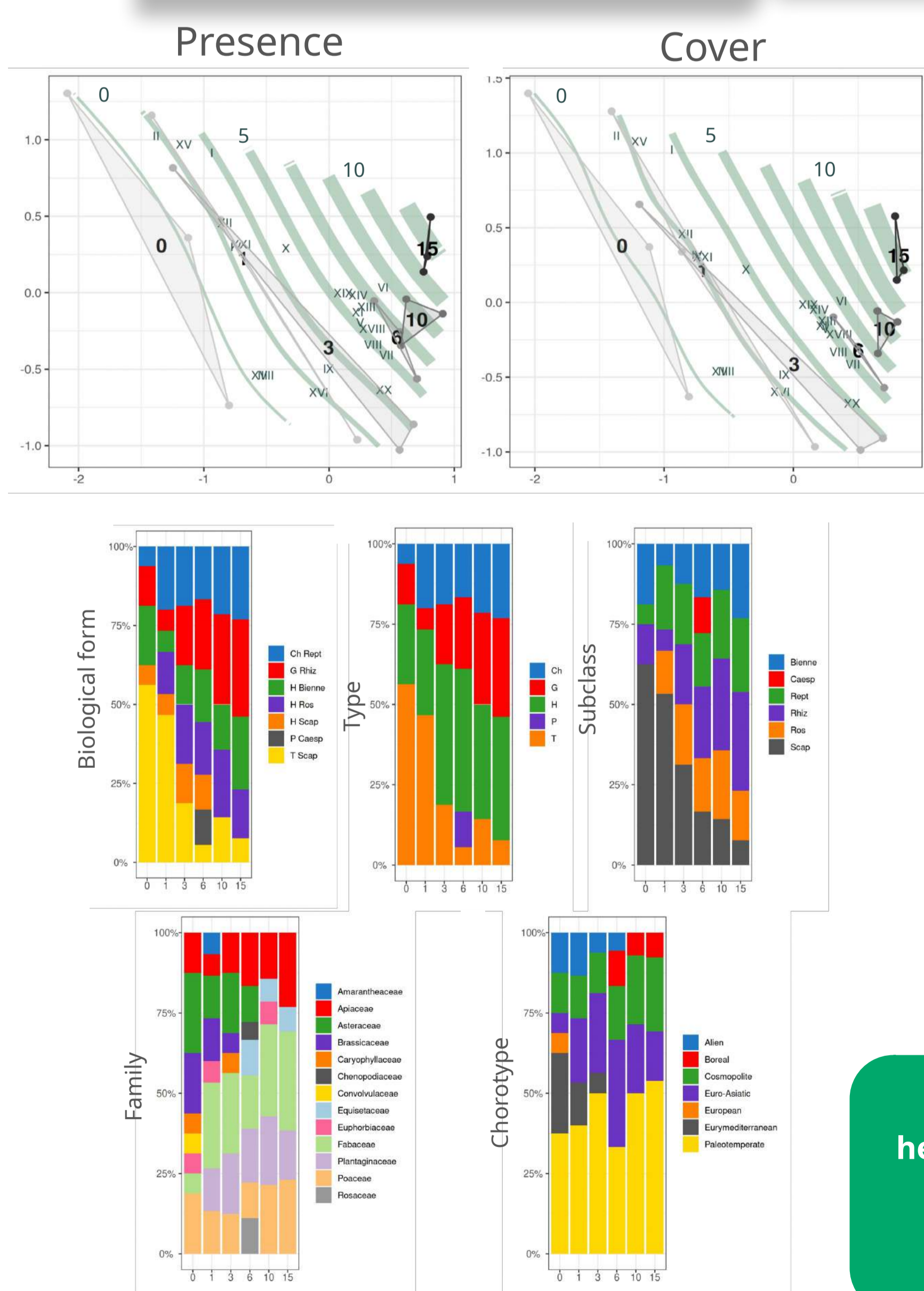
- ◆ Species identification
- ◆ Abundance as cover (Bran-Blanquet scale)
- ◆ Functional traits (Raunkjær biological form, chorotype...)
- ◆ Multivariate structural and functional data analysis.



## Avellino ( $S_{AV}$ )

## Results and Conclusion

## Salerno ( $S_{SA}$ )



Results obtained by means of a distance based redundancy analysis (dbRDA) show that the distance from the sidewalk plays a major role in shaping vegetation biodiversity.

Where vegetation is subjected to occasional mowing and absence of anthropogenic fertilization/irrigation ( $S_{AV}$ ) a clear separation is observed between opportunistic species dominating the margins and species with longer life cycles colonizing the inner parts of the area.

Where vegetation is subjected to frequent mowing ( $S_{SA}$ ) such variations in functional traits are not clearly observable, and opportunistic species, especially alien and cosmopolitan chorotypes, tend to dominate irrespective of the distance from the sidewalk.

Findings shed light on the role of small-scale spatial heterogeneity in shaping vegetation communities in complex urban ecosystems, with potential implications in terms of management, species conservation and preservation of ecosystem functioning.

