



SAFEGUARD

Safeguarding European
wild pollinators



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Safeguard Project

**PRACTICE
ABSTRACT**

Temperature and not landscape composition shapes wild bee communities in an urban environment

Green areas and the connectivity between them are key determinants of cities' ability to sustain pollinators. However, little is known about how wild bees in urban environments will be affected by rising temperatures, which are expected to be of primal importance for pollinator activities.

In our study, we aimed to disentangle the effects of temperature, open habitat cover, and distance from the city centre on wild bee communities in Rome, Italy.

We selected 36 sites along two statistically independent gradients of temperature and open habitat cover, and we sampled wild bee communities using pan-traps for 4 months. We then measured the functional traits of wild bee species (body size, social behaviour, nesting strategy, and diet breadth).

We found that:

- 1 In a highly urbanised environment, temperature is a fundamental driver of pollinator communities;
- 2 More bee individuals and species were present in the warm areas of Rome compared to the cold ones;
- 3 Warming might homogenise bee communities by selecting those traits that make species more easily adaptable to high temperatures, such as small body size and a very flexible diet.

This leads to the prediction that **while heat-tolerant wild bee species will benefit from increasing temperatures, these heat-tolerant communities will be dominated by small-bodied bees with a flexible diet**, rather than by bees specialised in few flowers and larger bees such as bumblebees.

Therefore, **urban greening is key to adapting to the impacts of the urban heat island effect and mitigating it.**

High-quality and connected green spaces could offer climate change refugia for pollinators in urban environments, as well as flower and nesting resources.

Source

Geppert, C., Cappellari, A., Corcos, D., Caruso, V., Cerretti, P., Mei, M., Marini, L. (2023). Temperature and not landscape composition shapes wild bee communities in an urban environment. *Insect Conservation and Diversity*, 16(1), 65–76. <https://doi.org/10.1111/icad.12602>



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