

Green roofs vegetation as a biotechnological solution to improve buildings thermal performance in urban areas

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Abstract

Rapid urban expansion to accommodate the growing population (74% of the European population live in urban areas) led to the replacement of vegetation by construction buildings (heat absorbing structures), bringing negative impacts to the urban environment. Strategies for increasing the use of green infrastructures, such as green roofs (GR), has improved in recent years due to the major role they can play in rising resilience in urban development. Rooftops accounts for ca. 50% of the unused urban surface area and can play a major contribution to the European Green Deal Project goals.

In the present study, thermal performance of GR structures (varying vegetation, substrate composition and depth) in Mediterranean climate conditions has been studied. Results validated that aromatic plants could successfully establish and grow on the harsh environment of Mediterranean rooftops. Substrate temperature profile was measured and potential to minimize temperature fluctuations in roof structure have been assessed. Vegetation surface temperature have been compared to bare substrate to sustain the conclusion that urban vegetation in GR can help to decrease air temperature and mitigate the urban heat island (UHI) effect.

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