

Advancing lichen monitoring for sustainable cities and ecosystems

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In a world that is experiencing rapid urbanization and intensifying anthropogenic pressures, lichens remain among the most effective and versatile bioindicators of environmental quality and changes. Traditionally used to monitor air pollution and ecosystem health, lichen biomonitoring has evolved from qualitative surveys to advanced, quantitative approaches integrating molecular and physiological tools with robust statistical modeling. Today, lichens are applied to assess pollution, climate change, nitrogen deposition, but also to provide insights into heat stress patterns or detect emerging pollutants such as microplastics and novel atmospheric contaminants, both in urban and natural environments. Their responses can be used to evaluate the effectiveness of green infrastructure and other nature-based solutions, offering a cost-effective way to guide and monitor sustainability strategies. Moreover, lichen-based citizen science initiatives are increasingly engaging the public, broadening spatial coverage, and raising environmental awareness, ultimately providing additional sources of data. This symposium will explore cutting-edge methods, novel applications, and the role of lichens in addressing contemporary environmental challenges.