IMPACT OF PLANT AND MICROBIAL DIVERSITY IN STORM-WATER GREEN INFRASTRUCTURES

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ABSTRACT

Increased urbanization has led to excess nutrients in urban ecosystems. Stormwater Green Infrastructure (SGI) is a method to capture these nutrients and prevent runoff. However, an increased understanding of ecosystem processes is needed to create more efficient SGIs. Past studies have shown that plant diversity and soil moisture are the greatest predictors of microbial diversity. However, there is a lack of studies in arid climates. This study seeks to understand how microbial diversity changes with plant diversity and soil components in an arid climate. Research was conducted in an experimental SGI facility consisting of nine plots with three treatments of plant diversity. Soil from two locations within these plots (beneath plants, away from plants) was sampled on three dates between June and September 2019. We analyzed soils for carbon and nitrogen content. DNA was extracted from these samples, data from which we quantified the Shannon Diversity Index. Overall, it was found that plant diversity was unrelated to microbial diversity. However, soil nitrogen content and sampling date were found to be the most statistically significant factors explaining soil microbial diversity. This study lays a foundation for future research in understanding what factors to consider when creating effective SGIs.