
Architecture and dynamics of plant-pollinator interaction networks in Martinique's urban gardens

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Résumé

The global decline of pollinators is a major concern for the future of biodiversity and associated ecosystem services. Among all of its drivers, urbanization and the concomitant influx of exotic plant species significantly alter the relative abundance of native flora, potentially causing profound disturbances in the architecture and stability of pollination networks. So far, scientific studies have predominantly focused on continental temperate regions, leaving the ecological response of tropical island ecosystems to urban pressures still poorly understood. This gap is particularly acute in the West Indies where swift-urbanized islands harbour noticeably fewer pollinator species than continental areas and a high rate of endemism. To address this knowledge gap, we conducted a year-long study in ten private and communal garden sites in Fort-de-France and neighbouring towns (Martinique), embedded in varying landscape matrices. We monitored monthly diurnal plant-insect/bird pollinator interactions, and recorded floral abundance, morphological traits on both flowers and insect pollinators, as well as nectar production. We used stochastic block models to cluster plant and pollinator species based on their interaction patterns, random forest models to identify key functional traits and ecological characteristics pivotal to the structure of interactions, and computed network metrics. We discuss our results in the light of the driving forces behind urban pollination networks, focusing on the influence of the floral offer and its seasonal dynamics. Within the broader context of conservation and urban expansion, we question the role of garden practices in preserving pollinator biodiversity and pollination services.

Mots-Clés: Interaction networks, Pollination, Functional traits, Seasonal dynamics, Exotic plants, Gardens, Tropical island

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