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Conference Abstract

Urban habitats as sources of alien plant invasions

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Abstract

Human-made habitats are hubs of plant invasions in new regions and the most important points of entry. We used the SynHab database, which allows us to analyse how habitat identity shapes plant naturalization patterns worldwide, based on 7,278 alien vascular plant species across 102 regions assigned to 14 basic habitat types, to demonstrate the importance of human-made habitats in plant invasions. They emerged as the most important global reservoir of naturalized plants. Among the six broad habitat groups, they harbour the largest cumulative number of naturalized species, with 5,488 species, far exceeding all other habitats. At the finer level, urban ruderal habitats are especially important, containing 4,890 naturalized species, while agricultural habitats contain 3,169. On average, 75.6% of the regional pool of naturalized aliens occurred in ruderal habitats and 49.0% in agricultural habitats. This makes urban and other heavily transformed human-dominated environments the clearest global centres of plant naturalization. Urban and ruderal habitats combine high propagule pressure, frequent disturbance, and broad resource availability, which together promote naturalization. Human-made habitats also show one of the steepest naturalization species accumulation curves, indicating high vulnerability to invasion when habitat area increases globally. Several drivers of naturalized species richness in human-made habitats are particularly relevant. The strongest was per capita GDP, showing a highly significant hump-shaped relationship and explaining 38% of the variation. Mean annual temperature also had a significant

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hump-shaped effect, while the maximum temperature of the warmest month and precipitation seasonality showed negative relationships, indicating that extreme heat and drought constrain naturalization. Minimum evapotranspiration was also negatively related to richness, while annual precipitation and precipitation of the wettest month showed significant quadratic effects. More generally across habitats, the paper highlights heat, drought stress, disturbance, and proxies of propagule pressure and human activity as major determinants of naturalized species richness. Thus, urban and other human-made habitats are not only the richest in naturalized species, but also among the clearest examples of how economic activity, human density, and environmental modification interact to drive global plant invasions.

Keywords

plant invasion, human-made habitats, global analysis, species richness, envoronmental drivers, anthropogenic drivers.

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Conflicts of interest

The authors have declared that no competing interests exist.