Colonization does not necessary mean Invasion

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Abstract

Ornamental horticulture represents a major pathway for the introduction of non-native plants worldwide. As a consequence, a strong positive association of naturalized plants with urban areas has been observed worldwide. This pattern can be explained by the combined presence of source populations (i.e. plantations) and disturbed, anthropogenic habitats. However, a dissociation between urban areas and alien species is expected over time, as species spread across the landscape and colonize more natural habitats. We tested this expected scenario by studying the spread dynamics of the pampa grass (*Cortaderia selloana*) across a 600 km2 study area in Southern France, over an 11-year period. We measured a persistently high propagule pressure (estimation of *ca.* 800 planted stands of C. selloana) and a successful naturalization process (naturalized plants were twice as many as planted ones). However, despite a dynamic colonization process (turn-over of naturalized stands: 38 %), naturalized stands remained two orders of magnitude denser in highly urbanized areas compared to non-urban areas. These results suggest that a positive association between naturalized species and urban areas may not be a transitional phase of a spread dynamics but persist in the long term. Furthermore, despite its colonization dynamics, *C. selloana* remained confined to disturbed areas and did not represent a threat to local biodiversity. This study illustrates how a species can be locally a colonizer without being necessary an invader.

Keywords: horticulture, spread dynamics, plant ecology, species introduction

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