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# Role of species' originality in plant community assembly along an urban gradient in Ile-de-France region

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## Abstract

Urbanization is one of the most intensive, rapid human-driven factors that influence ecosystem dynamics. Many previous studies analysed the effect of urbanization on the spatial distribution of species number and abundance. Yet, little is known about the role of species' originality in community assembly along an urbanization gradient. In a species assemblage, a given species is said original (or inversely redundant) if it shares few (or many) trait values with other species (functional originality/redundancy) in the assemblage and/or if it is distantly (or closely) related with the other species (phylogenetic originality/redundancy). There are more and more evidence that urban filters could be drivers of species coexistence through a trait-based selection of species. In this study, we explored how urban filters could explain species community assembly in terms of functional and phylogenetic originality versus redundancy. We investigated two main questions: are species from urbanized areas more original/redundant in their traits and phylogenetic positions, compared to surrounding suburban, and rural areas? and what are the ecological and evolutionary processes of community assembly linked to urbanization?

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The data we analysed were extracted from a French national citizen-science survey of angiosperm species, named "VigieFlore". We analysed data from 2008 to 2017 in the Ile-de-France region, which includes many towns with Paris as the biggest one and suburban and rural areas. We used Land Use Pattern data to define an urbanization gradient. The composition of each georeferenced plot (1 plot = 10 quadrats of 1m<sup>2</sup>) was considered as a community. We analysed the distribution of species originality across the urbanization gradient, by comparing observed patterns with those expected by chance using a null models where species are randomly assembled. A non-random distribution of species originalities indicates that assembly rules linked to the degree of urbanization shape the functional and phylogenetic composition of communities.