
Plant species variations in common herbaceous patches along an urban-rural gradient

Arnaud Cochard^{*1}, Joséphine Pithon², Véronique Beaujouan¹, Marie Jagaille¹,
Guillaume Pain², and Hervé Daniel¹

¹Unité Propre Paysage et Ecologie (UP PE) – Agrocampus Ouest – 2 rue André Le Nôtre, 49045
Angers Cedex 01, France, France

²Unité Propre Paysage et Ecologie (UP PE) – Ecole Supérieure d'Agricultures – 55 rue Rabelais, B.P.
30748, 49007 Angers Cedex 01, France, France

Abstract

Effects of urbanization on plant species distribution have been extensively studied. Recent studies have highlighted higher plant species richness and a modification of species composition in urban context. These variations are often related to a strong contribution of exotic species and the variability of semi-natural habitats along the rural-urban gradient. The comparison of plant communities in the same habitat type evaluates more specifically the influence of landscape context. Many studies were carried out on woodland vegetation, but effects of urbanization on extensive herbaceous habitats are largely unknown, while they represent large areas on both side of the gradient. The aim of this study is to analyze variations in terms of diversity and composition along the urban - rural gradient, using functional traits to identify the mechanisms filtering species. This study was performed in three cities of north-western France, where 97 1-km² landscapes were selected along a double gradient of urbanization and herbaceous habitat connectivity. Finally, 388 quadrats located in extensive grassland habitat were surveyed and species functional traits were extracted from databases. Using ordination and regression methods, we analyzed which traits were related to contrasted distribution of species along these gradients, and how urban landscape influences floristic similarity. Urban-rural gradient appears to be the most important environmental variables in our analysis, highlighting the effects of urban environment on habitat. Influence on urbanization is weak on diversity indexes and exotic species richness, but species are clearly separated along this gradient, with a difference between ruderals and grassland species.

Keywords: urban rural gradient, functional trait, grassland habitat, floristic similarity, landscape, urban ecology

^{*}Speaker