Soil unsealing in Mediterranean schoolyards: what factors drive ant communities?

Louise Eydoux*[1], Pierre Jay Robert[1], Bernard Kaufmann[2], Mickaël Hedde[3], and Alan Vergnes[1]

[1]Centre d'Ecologie Fonctionnelle et Evolutive – Université Paul-Valéry - Montpellier 3, Ecole Pratique des Hautes Etudes, Centre National de la Recherche Scientifique, Institut de Recherche pour le Développement, Institut National de Recherche pour l'Agriculture, l'Alimentation et l'Environnement, Institut Agro Montpellier, Université de Montpellier – France

[2]Laboratoire d'Ecologie des Hydrosystèmes Naturels et Anthropisés – Université Claude Bernard Lyon 1, Ecole Nationale des Travaux Publics de l'Etat, Centre National de la Recherche Scientifique – France

[3]Ecologie fonctionnelle et biogéochimie des sols et des agro-écosystèmes – Centre de Coopération Internationale en Recherche Agronomique pour le Développement, Institut de Recherche pour le Développement, Institut National de Recherche pour l'Agriculture, l'Alimentation et l'Environnement, Institut Agro Montpellier – France

Résumé

Soil unsealing, the process of removing the impermeable top layer of soil, is increasingly advocated by urban planning policies. The role of unsealed areas in biodiversity conservation, particularly soil biodiversity, remains strongly understudied and especially in understanding the recolonization dynamics of soil biodiversity in these new habitats. Besides, the various types of soil cover resulting from soil unsealing could potentially influence the recolonization kinetics.
This study focused on 79 unsealed plots located in 14 schoolyards along the French Mediterranean coast, investigating ant communities through the placement of 485 baits on unsealed plots. Two variables were considered: the duration since soil unsealing (1 or 2 years) and the type of soil cover (wood chips, plantations mulched with wood chips or lawns).

Remarkably, these unsealed areas act as habitats for ants from their very first years of creation: a rich diversity of ants (21 species; a fifth of the regional pool and 10% of the metropolitan French species) has been observed. Additionally, notable changes in ant communities were evident within a single year: plots unsealed for 2 years exhibited significantly higher ant abundance and diversity compared to those unsealed for 1 year. However, the construction of these spaces influences the present communities, with wood chip-covered areas significantly less rich and abundant in ants compared to other ground cover types.
These preliminary findings represent a promising starting point and offer enthusiastic insights into the potential of such projects for soil biodiversity conservation.

Mots-Clés: Formicidea, soil biodiversity conservation, urban ecology, urban soils

*Intervenant