

 PARENT SESSION**Contributed Oral Session 43: Landscape Ecology**

Tuesday, August 9, 8:00 AM - 11:30 AM, Meeting Room 518 A, Level 5, Palais des congrès de Montréal

The effects of landscape patchiness and heterogeneity on arthropod communities.

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ABSTRACT- A central theory of landscape ecology predicts that landscape patterns affect the local abundances and movements of organisms and, as a result, the spatial patterns of biodiversity. However, there have been few experimental tests of this theory. Here we present arthropod abundance data from a field experiment in which we explored the effects of landscape patchiness and heterogeneity on arthropod communities. Two gradients of microlandscape treatments were designed to represent increasing levels of patchiness and heterogeneity. The treatments were applied to 10 X 10m plots and replicated four times. Patchiness treatments were composed of 0, 1, 3, or 9 similar-sized patches of unmowed vegetation within a matrix of mowed vegetation (i.e., each treatment contains one or two habitats). The heterogeneous plots were designed with the same arrangement of 0, 1, 3 or 9 patches as in the patchiness treatments, but different habitats (unmowed vegetation, shredded bark, gravel or grass-clipping mulch layers) were applied to the patches to concomitantly increase heterogeneity with patchiness (i.e., a gradient of 1 to 5 habitats). Arthropods were sampled with pitfall traps during 2003-04 from the central mowed patch of each plot. Our hypothesis was that arthropod abundances would increase with increasing patchiness and heterogeneity. We detected significant abundance differences ($P < 0.05$) among the treatments on certain dates for select taxonomic groups. For example, total arthropods, spiders, ants and collembolans were generally more abundant in patchy and heterogeneous microlandscapes than in plots containing only one habitat. However, abundances were often highest in plots containing only one patch of unmowed habitat than in those with higher levels of patchiness or heterogeneity. This suggests that arthropod abundances may exhibit non-linear responses to landscape patterns. Future work will examine the effect of landscape patterns on arthropod movements and diversity between habitats in complex landscapes. Our results reflect the need for rigorous experimental testing of landscape ecology theory in order to better understand the relationships between landscape patterns and animal communities.

Key words: heterogeneity, landscape ecology, collembolans, arthropods