



Ecological network of green habitat patches: Grassland vegetation in urban habitats

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Urbanisation is a leading process on the Globe causing a massive loss of natural habitats; it considerably changed natural ecosystems and formed new artificial habitats, seriously affecting urban biodiversity. In parallel variety of habitats were created in urban environments, which may also support species diversity. We investigated the vegetation of urban habitat types (vacant lots, urban parks, and peri-urban grasslands) in the city of Debrecen (East-Hungary). The studied habitat types were characterised by species typical to semi-natural grasslands and ruderal assemblages. Our aim was to (i) identify urban green areas and their connections with the Regional Ecological Network surrounding the city, (ii) and to explore the biodiversity potential of urban habitats. We used five spatial replicates of each habitat type and five random plots (5m × 5m) in every site. Our findings suggest that the species composition of urban habitat types is considerably affected by the specific disturbances and site histories associated with the habitats. The urban parks harboured the lowest number of species and were characterised by the lowest plant diversity. The ratio of weeds and disturbance-tolerants was the highest in the vacant lots due to the high-intensity trampling and soil disturbances. Plant species of vacant lots were more drought-tolerant compared to the species of peri-urban grasslands, which is likely due to the increased level of drainage in the city centres. The ratio of nitrogen-demanding species was lower in urban parks and peri-urban grasslands than in vacant lots. The proportion of alien species was high both in vacant lots and peri-urban grasslands, even though their disturbance regimes differed considerably. The proportion of cosmopolitan species was significantly higher in vacant lots compared to urban parks and peri-urban grasslands. The large proportion of alien and cosmopolitan species together with the continuous human disturbance put native species at a competitive disadvantage, and accordingly the proportion of these species was lowest in the vacant lots. We found that the green space system of the city is well connected to the Regional Ecological Network. We found that 65% of the functional green spaces are potentially connected thus there is a possibility for species typical to semi-natural open habitats to disperse between the green spaces of the city. Our results suggest that the studied urban habitats have some biodiversity conservation potential; they mostly harbour species which can cope with the local environmental conditions of the city parks, such as increased temperature, drought and nutrient enrichment.