Small mammals in an urban area: habitat preferences and urban-rural gradient in Nitra city, Slovakia

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ABSTRACT

The small mammal species were investigated in the urbanized environment of Nitra city (Slovakia) in a multiscale-approach: at habitat level and at landscape level (urban-rural gradient). Continuous comprehensive rodent samplings from 2012 to 2015 were conducted in ten study sites, classified into three urban zones (landscape level). The total effort comprised 1,250 specimens of 13 species (Microtus arvalis, Apodemus sylvaticus, A. flavicollis, A. uralensis, Clethrionomys (Myodes) glareolus, M. subterraneus, Micromys minutus, Mus spicilegus, M. musculus, Crocidura suaveolens, C. leucodon, Sorex araneus, S. minutus) gathered in 14950 trapxnights. Environmental variables (habitat level) at each site were processed in the Geographical Information System as a proportion of landscape units around the trapping line and by a phytosociological survey. At the habitat level, we found a relationship between the landscape habitat structure and each species of small mammals. Diversity, species richness and relative abundance of small mammals decreased with the density of the built-up area. At landscape level, urban zones had a significant influence on species diversity, richness and relative abundance of small mammal populations. On the other hand, the presence of small mammal species precisely determined the urban zones, where we identified seven indicative species.

INTRODUCTION

Built-in areas and water-impermeable surfaces make up a large percentage of urban land cover, while remnants of original habitats may still exist there. These natural remnants in an urban context represent the not intensively managed areas of cities, which are fragmented, and small in size (Mahan and O’Conell 2005). Therefore, urban parks and other green spaces can play an important role in the protection of native wildlife in urban landscapes (Ferguson et al. 2001). The urban fauna populations show several significant ecological and behavioural differences in comparison with populations living in non-urban habitats, for instance survival, longevity, migration, density, food sources, and aggression (Liro 1985, Gliwicz et al. 1994, Shochat 2004, Luniak 2004). These differences lead to biological homogenization in urban landscapes (McKinney 2006). The increasing urbanization