



Conference Abstract

# Ground beetles (Coleoptera: Carabidae) react differently to urbanization than other predator groups in a riparian forest in southern Hungary

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## Abstract

Urbanization is one of the most important processes shaping our environment, which causes habitat reduction and alteration which are, in turn, the main reasons for the reduced structural and functional diversity in urbanized environments. Predation is one of the most important ecological functions because of its community-structuring effects. Quantification of predation on invertebrate prey is difficult, because the attacks are mostly cryptic and it is rare when evidence is present. Using dummy prey, which is fixed to a surface, the marks left by predators allows us to identify them. Current evidence indicates that predation pressure is lower in urban than rural areas. According to the natural flow-regime paradigm, extreme events (e.g. floods) constitute a primary adaptive pressure in riparian habitats. We tested the validity of the paradigm in urbanized habitats. Our study site was in and around the city of Szeged (Hungary), along two urbanization gradients selected according to the Globenet protocol along the banks of the river Tisza and Maros. Data collection was conducted from April to October, 2014-2016. Both urbanization gradients included rural, suburban and urban areas, each characterised by an increase in the built up area (0%-25%-50%), intensity of forest management, and visitation rates by city residents. Overall 12672 dummy caterpillars were placed, 6336 were on the ground level and 6336

on tree trunks. The dummy caterpillars (20 mm long, 3 mm thick) were made of light green plasticine, using a modified garlic press, fixed to the bark of trees or on a suitable surface on the ground with superglue, exposed for 24 h. The marks were identified using a hand-held magnifying glass (10 x). Overall the most active predator group was small mammals, followed by insects and birds. Urban predation activity on ground level, caused mainly by carabid beetles was significantly lower than the suburban or rural ones. Carabid predation pressure was higher in suburban than in rural habitats, while all other predator groups (other insects, birds and small mammals) had a decreasing trend towards urban habitats. This means, that all studied predator groups act according to the Gray's increasing disturbance hypothesis, while carabid beetles react to urbanization according to Connell's intermediate disturbance hypothesis. We found no evidence for the natural flow-regime paradigm along the examined urbanization gradients.

## **Keywords**

urban, rural, ecosystem services, ecological function, predation, sentinel prey, caterpillar

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Concept and study design: GL, CE, TM; data collection CE, analysis CE, TM, GL, writing shared by all authors. Author sequence is the "sequence by credit" principle.

## **Conflicts of interest**

The authors declare no conflict of interest.