

INTRASPECIFIC BODY SIZE VARIATION IN GROUND BEETLES (COLEOPTERA, CARABIDAE) IN URBAN – SUBURBAN – RURAL – NATURAL GRADIENT

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This study aims to analyse how body size of Ground Beetles (Coleoptera, Carabidae) is controlled by environmental factors. Beetles were sampled in different regions of Russia. Sampling plots included urban, suburban, rural and natural habitats. We have measured elytron length of more than 25000 specimen. The study was conducted on intraspecific level and six species of carabids were investigated. We used Linear Models to estimate the contribution of different environmental factors (region, anthropogenic disturbance, type of habitat vegetation) into the elytron length variation in the studied species of carabids. The response of different species to the anthropogenic press was not identical. Species which shared the same ecological niche showed different directs of elytron length alteration. For example, *Carabus cancellatus* Ill. size decreased in urban habitats, *Carabus granulatus* L. size remained unchanged but in *Carabus aeruginosus* F.-W. we registered sexual dimorphism in contribution of “urban” factor into the elytron length variation. Suburban habitats didn’t contribute significantly into the size variation but in rural habitats elytron length of species studied were larger.

Key words: body size variation, morphometry, Carabidae, urban –suburban – rural - natural gradient.

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INTRODUCTION

Studies of intraspecific variation in the presence of different environmental features are essential to improving the knowledge of species population dynamics and structure. Community and species specific responses need to be related to characteristics of the urbanised landscape, i.e. the urban–rural gradient needs to be operationalised in terms of specific disturbance features (Niemela & Kotze 2009). The question how animal body size changes along urban–rural gradients has received much attention among

specialists in different branches of biology. This is determined by two factors. The first is the expanding urban areas and increased awareness of urbanization impacts on wildlife. The second is the integrity of body size as the trait which affects many life-history traits in insects, e.g. ontogenesis, biomechanical constraints, sexual selection, fecundity, size-specific predation, resource quality and availability, overcrowding, competition, manoeuvrability in flying insects etc. (Berven & Gill 1983, Juliano 1985, Wheeler 1996, Angilletta & Dunham 2003, Dial et al. 2008). Changes in morphological characteristics

