

FAUNISTIC, ECOLOGICAL AND ZOOGEOGRAPHICAL STUDIES ON THE GROUND BEETLES (FAM. CARABIDAE) IN SREBARNA MANAGED NATURE RESERVE

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Summary

Ground beetles (Coleoptera: Carabidae) were studied in Srebarna Nature Reserve in 1992-1998 and 2010. The beetles were captured by using three main techniques: “pitfall” traps, hand collection in the areas around traps, and night capture with lamp. Total of 16 016 specimens from 277 species, taxonomically belonging to 62 genera and 25 tribes were identified for the whole study period. Four species are new to the fauna of Bulgaria and 255 species are reported for the first time from the study area. The ground beetles fauna recorded from the study area represents above 35 % of Bulgarian fauna and above 80 % of the fauna of Dobrudzha. The results are presented in two main parts – faunistic and ecological. In the first part all species and specimens were included in the analyses, while in the second part only these specimens captured by using “pitfall” traps were included.

The faunistic part includes consistent system analysis of the recorded local fauna of the nature reserve and its surroundings, investigating different aspects of the species diversity. The relative abundance of captured species were estimated by 6-grades scale. The species with small significance were above 78 %, sporadic and very rare species were very numerous - 58 % (158 species) and common, mass and background species occurred more frequently (above 22 %), probably due to high anthropogenic pressure and habitats change.

The studies on the taxonomic structure reveal that the tribes Harpalini and Bembidini are represented with the highest number of species, while the tribes Carabini, Pterostichini and Platinini dominate by the number of specimens. It was found that the ordering of tribes by taxonomic significance could indicate changes occurring due to anthropogenic influence. In the same way zoogeographical and ecological structures were used to indicate present day state, changes and tendencies in habitats succession.

The capturing techniques proved that the total list of species could be achieved only by applying different supplementary sampling methods, in all seasons with ground beetles activity. More than half of species, mainly small and slow-moving ones, could not be registered by “pitfall” traps, which could bias the faunistic results if only this sampling method was applied.

The ecological analysis of the specimens collected by using of “pitfall” traps includes the α -diversity of habitats, quality and quantity significance of the dominant, taxonomic, zoogeographical and ecological structure and their indicator abilities for the needs of ecological monitoring.

The habitats classifications made by using species diversity and abundance clearly differentiate habitats in respect of their humidity and plant type and composition. Separation between natural forest and loamy bank as a specific habitats is due to characteristic species and proportions in their distribution.

Gradient analyses by using classification method Twinspan, and ordination methods in CANOCO, reveal the main regularities in distribution of ground beetles species and local associations according to the general ecological gradient. The decisive environmental factors for ground beetles are humidity, vegetation, soil, light, which are often altered by human interventions. Anthropogenic changes in the natural course of habitat succession could be registered by changes in the structure of ground beetles fauna and communities. An attempt has been made in this dissertation. Standardization of information collected for ground beetles and approach to the processing and interpretation of results from the different system classifications and ecological analyses is the basis for creating a modern database serving the practical aspects in the field of applied ecology.