

Ecological structure of the communities of the endangered and protected *Carabus hungaricus* Fabricius, 1792 (Coleoptera: Carabidae), in Bulgaria

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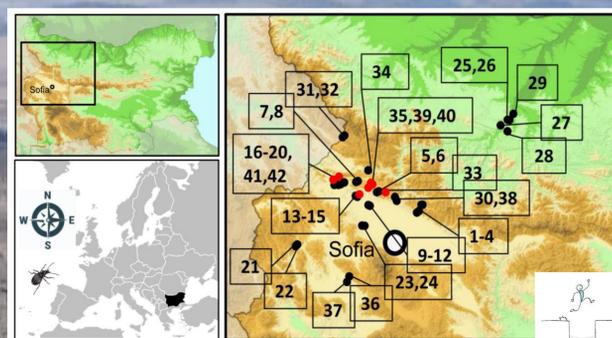
INTRODUCTION & AIM



The endangered *Carabus hungaricus* Fabricius, 1792 (Coleoptera: Carabidae), is protected in Bulgaria, but little is known about its ecological and this study aimed at clarifying these aspects of its communities.

METHOD

In the period May 2021 – December 2023, we explored 42 sample plots in xerophytic landscapes in central-western Bulgaria. They represent the southernmost limits of the steppe fauna in Eurasia. With 252 pitfall traps, 69903 effective trap-days were realised.



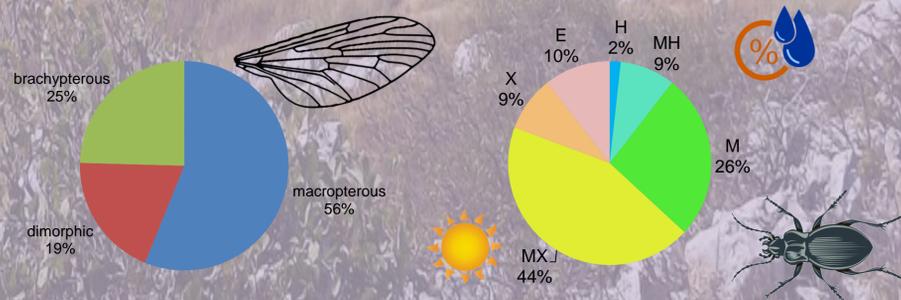
RESULTS & DISCUSSION

Carabus hungaricus was established in seven sites (frequency of occurrence, $F=16.7\%$), with a total of 198 specimens (1.3% of all carabids and almost 4% of the total dynamic density). In these seven sites, all in the range of the Western Stara Planina Mts., we found 57 species, mostly open habitat dwellers.

The two classes of life forms had almost equal proportions, namely, 28 Zoophagous and 29 Mixophytophagous species, which is extraordinary for Bulgaria, but typical for the steppe zone of Eurasia. Such predominance of the mixophytophages (even weak) has never been established in Bulgaria.



Macropterous were 32 species, brachypterous (hind wings shorter than elytra, or missing) were 14 species, and di(poly)morphic (some individuals with fully developed, others with vestigial wings) were 11 species. The relatively low number of winged species is comparable only with typical montane habitats. The established structure of the wing forms in the studied carabid coenosis is consistent with steppe communities from other parts of the biome, which in our opinion is due to the naturalness of the karst steppes in the study area.



In relation to their humidity preferences, mesoxerophilous carabids had the largest share (25 species). Mesophilous were 15 species and 6 species were eurybiontic. Xerophilous and mesohygrophilous groups included five species each.

Hygrophilous was only one species.

The great share of the complex of xerophilous and mesoxerophilous species, more than the half (53%) of all species, is quite remarkable among the other studied in this relation regions in Bulgaria.

The classification analysis indicated the great resemblance between the habitats where the target species *C. hungaricus* lives.

CONCLUSION

In relation to its ground beetle fauna, the studied complex of habitats is quite remarkable for Bulgaria and appears to be stable and characteristic for the steppe biome.