A BRIEF OVERVIEW OF THE GROUND BEETLES (COLEOPTERA: CARABIDAE) OF THE BULGARIAN BLACK SEA COAST

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ABSTRACT

The publication presented a brief overview of the established in the area of the Bulgarian Black Sea coast species from the Carabidae family. Species of ground beetles were characterised by their zoogeographic belonging, degree of endemism and the life form, which they refer to. Carabid’s subsuming to the subdivisions North or South Black Sea coast was pointed.

Key words: Carabidae, ground beetles, Black Sea coast

Introduction

Combination of various environmental factors contributed to the definition of the Black Sea coast as a detached zoogeographical region. [4].

In terms of wildlife, it could be claimed that ground beetles were convenient and expedient group for monitoring and bioindication researches. [2, 3, 11].

Material and methods

An overview of the literary data about species composition [6, 7, 9, 10, 12, 13] of the carabid fauna in zoogeographical region of Bulgarian Black Sea coast was made. Zoogeographical belonging and life-form of the species were analysed and their presence in subdivisions of North and South Black Sea coast was pointed. Degree of endemism was shown about the species with restricted distribution. [5]

According to their zoogeographical belonging species were separated in the following zoogeographical categories and faunal types (Casale, Vigna Taglianti, 1999, Vigna Taglianti1995; Vigna Taglianti et al., 1999, with some changes [8]):

I. Northern Holarctic and Euro-Siberian faunal type:

II. European faunal type:

III. Euroasiatic faunal type:

IV. Mediterranean (s. lato) faunal type (species of the Ancient Mediterraneum):

Categorization of the species in life-forms was made according to the classification of Sharova (1981):
The first figure in the index shows the class of life form, the second – the subclass, the third – the life form group. In brackets after the subclass the series is shown, when it exists.

**Life form class 1. Zoophagous.**

Life form subclass: 1.1 – Phytobios; 1.2 – Epigeobios; 1.3 – Stratobios; 1.4 – Geobios; 1.5 – Psammocolimbets.

Life form groups: 1.1.1 – dendrobionts; 1.1.2 – stem-dwelling hortobionts; 1.1.3 – leaf-dwelling dendohtobionts; 1.2.1 – small walking epigeobionts; 1.2.2 – large walking epigeobionts; 1.2. (1) – large walking dendoepigeobionts; 1.2.3 – running epigeobionts; 1.2.4 – flying epigeobionts; 1.3(1) – series crevice-dwelling stratobionts; 1.3(1).1 – surface & litter-dwelling; 1.3(1).2 – litter-dwelling; 1.3(1).3 – litter & crevice-dwelling; 1.3(1).4 – endogeobionts; 1.3(1).5 – litter & bark-dwelling; 1.3(1).6 – bothrobiobionts; 1.3(1).7 – troglobionts; 1.3(2) – series digging stratobionts; 1.3(2).1 – litter & soil-dwelling; 1.3(2).2 – litter & crevice-dwelling; 1.3(2).3 – bothrobionts; 1.3(2).4 – troglobionts; 1.4.1 – running & digging geobionts; 1.4.2(1) – small digging geobionts; 1.4.2(1) – large digging geobionts 1.5.1 – shore psammobionts.

**Life form class 2. Mixophytophagous.**

Life form subclass: 2.1 – Stratobios; 2.2 – Stratohortobios; 2.3 – Geohortobios.

Life form groups: 2.1.1 – crevice-dwelling stratobionts; 2.2.1 – stratohortobionts; 2.3.1 – harpaloid geohortobionts; 2.3.1(1) – crevice-dwelling harpaloid geohortobionts; 2.3.2 – zabroid geohortobionts; 2.3.3 – dytomeoid geohortobionts.

**Life form class 3. Symphyalous-myrmecophilous.**

**Results and discussion**

On the basis of the collected literary data, for the area of the Bulgarian Black Sea coast were established 462 species of carabid beetles, belonging to 96 genera and 33 tribes. That represented respectively 61% of the species, 83% of the genera and 89% of the tribes of ground beetles occurring in Bulgaria.

Taxonomic structure showed the highest participation of the representatives of tribes Harpalini (131 species) and Bembidiini (53 species). Relatively high was the species richness of the tribes Amarini and Lebiini (32 species each), Pterostichini (29 species), Platynini (21 species), Carabini (20 species), Dyschiriini (17 species), Brachinini and Sphodrini (15 species each), Callistini (13 species), Pogonini (12 species) and Cicindelini (11 species) (Figure 1).

![Figure 1. Taxonomic structure of the ground-beetle fauna of Bulgarian Black Sea coast](image)

Of the 462 species established, 216 occurred in the two subregions of the Black Sea coast zoogeographical region – Northern and Southern. There were, however, species which were typical for one or another subregion. That demonstrated the reasonable subdivision of the coast at Cape...
Emine. For the subregion of Northern Black Sea coast 34 species were characteristic, and in the subregion of Southern Black Sea coast 158 species were found. Only in the subregion South Black Sea coast was met also the Bulgarian endemic *Pterostichus (Pterostichus) merkli*.

Peculiarity was that 54 species, known from the territory of Bulgaria, were not established anywhere else except in the area of the coast. Of these 3 species occurred only in the Northern, 32 – only in the Southern Black Sea coast, and 19 were found in both subregions.

Zoogeographical belonging of the species showed a predominance of the Mediterranean (s. lato) faunal type (145 species). Northern Holarctic and Euro-Siberian faunal type consisted of 101 species, European faunal type had 83 species and to the Euroasiatic faunal type referred 133 species (Figure 3).

Highest was the presence of Balkan-Neareastern (56 species), European-Neareastern (47 species), Palearctic (32 species), European-Centralasian (31 species) and Eurosiberian and Euroasiatic complexes (29 species each). They represented 48% of all taxa. There were 12 endemic species found – 11 Balkan and 1 Bulgarian endemic.

Established for the Black Sea coast species related to the three classes of life-forms, proposed by the Sharova (1981).

Representatives of the class Zoophagous predominated – 298 species (64,5% of all species). Most of the zoophages belonged to the subclass Stratobios (216 species, 47%), followed by Epigeobios (37 species, 8%), Geobios (28 species, 6%), Phytobios (15 species, 3%) and
Psammocolimbets (2 species, 0.4%). Mixophytophages were 163 species (35% of all species). They included 3 subclasses, namely 93 species of Geohortobions (20%), 36 species of Stratohortobions (8%) and 34 species of Stratobions (7%). Symphylous-myrmecephilous was only Paussus turcicus (0.2%). Distribution of the species in reference of their life-forms was shown on Figure 4.

Most numerous were the representatives of series crevice-dwelling, surface & litter-dwelling stratobions from class Zoophagous (105 species, 22.7%) and harpaloid geohortobions from class Mixophytagous (64 species, 13.8%).

Similar patterns in the distribution of species in life-forms was found in study of the carabid fauna of South Dobrudzha (Kodzhabashev, Penev, 2006).

![Figure 4. Life-form structure of the ground-beetle fauna of the Bulgarian Black Sea coast](image)

**Conclusions**

Long-time studies of Bulgarian and foreign researchers in the area of the Bulgarian Black Sea coast had provided enough comprehensive database in respect of the species diversity, including that of the representatives of the family Carabidae.

At this point 462 species of ground beetles have been established, which included more than a half of the species, known from the territory of Bulgaria. This warranted that the Carabidae fauna in researched area could be defined as a very rich, which was probably due to the favourable combination of environmental conditions. Future researches would forward further clarity in that respect.

Established taxonomic structure demonstrated the wide variety of carabid beetles from the Black Sea coast of Bulgaria and reflected the wealth of available habitats.

Zoogeographical structure of the family was proved to be complex and included four main faunal types, of which Mediterranean predominated.

The great diversity of Carabidae life-forms showed features of both Eastern European forest-steppe and Mediterranean type fauna.

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**REFERENCES:**