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An overview and new findings on the coleopteron-Fauna of Malesia E Madhe Region

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Abstract

Malesia e Madhe Region is an area characterized by very high geo-diversity and entomo-fauna constitutes one of the most significant components. Of the variety of insects, *Coleoptera*s and especially *Carabidae* and *Scarabidae* Family, constitute the richest species in diversity and one of the most important links in the food chains from the ecologic viewpoint. This study is based on the material collected in the spring and autumn of 2011 through 2014. There have been determined 56 species integrated in 51 genders of *Carabidae* and *Scarabidae* Family. On account of this study, a database has been elaborated. All necessary information on the *Coleoptera*s of *Carabidae* and *Scarabidae* families of Malesia e Madhe Region is available in this program. The *Scarabidae* Family is presented by 40 types included in 24 genera. The *Carabidae* Family is presented by 16 types included in 11 genera.

In this study are given the data on 13 new types of the *Coleoptera*-fauna of Malesia e Madhe Region. Seven of them belong to *Carabidae* Family and the rest to *Scarabidae* Family.

Of the coleoptera we determined, there are types (12 types) which are in the list of rare endangered species and are included in the Red Book of the Albanian Fauna. Of them, worth of mentioning are *Calosoma Sycophanta*, *Carabus Coriaceus*, *Osmoderma Eremita*.

The purpose of this paper is to contribute to the recognition of the Malesia e Madhe *Coleoptera*fauna and especially *Carabidofauna* and *Scarabidofauna* of this area.

Keywords: *Coleoptera*fauna, taxonomic data, *Carabidae* Family, *Scarabidae* Family, bio-ecology of species, chorology of species.

1. Introduction

Data on insects and especially those for order *Coleoptera*, might be found in the publications BIELAWSKI & GIESEB (1964) DIECKMAN (1964) HEYROVSKI (1964) Murray (1960, 1962, 1968) and PAPARISTO (2001), STRINIQA (2005).

Following them, in the context of full recognition of the Albanian Entomofauna in this paper are given the data on the species of two families *Carabidae* and *Scarabidae*, as well as the analysis of taxonomic ecological and biogeographical features.

The sheath-wing insects represent the richest order in kind of the class of Insecta (*Coleoptera* represent 80% of them) [1, 2]. They play an important role in the links of the food chains, the process of decomposition, and the pollination of plants. About 300 000 species, widespread in all environments, have been hitherto known [8]. The sheath-wing insects have a varied lifestyle. Some of them are helpful. Like nature caretakers in the biological war, they play a special role in the pollination of plants. The represented of *Carabidae* Family play a particular role in the biological war, may be cited *Coccinella septempunctata*. Some types of the *Scarabidae* Family like *Melolontha melolontha*, *Oxythorea funesta* have been as insects that ruin agricultural and forest products.

2. Material and Methods

The material is collected is conducted during the years 2011-2014, determining the 5 stations Rec, Razëm, Bog, Rrapsh, and Dedaj.

Methods of collection and material are based on the publications listed in the literature, mainly to Colas (1969). The frequency of sampling was random since the survey is a systematic type. The material was collected mainly during spring and autumn. Because of the great diversity of species of families *Carabidae* and *Scarabidae*, collecting methods were varied. The material collection is done with the uptake, Japanese umbrellas, combs methodical, Pitt's traps, nets entomological etc. Collected material is inserted in jars labeled with ether and is scored for each station, collection date, the collector's name and information on the time it is received [4, 13].

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To can to processing, the material is placed in bottles with ethyl alcohol mixture 90% white vinegar, distilled water, in the ratio 80: 5: 15 and a few drops of ether. Further work continued in the laboratory. Once the bottles are derived from insects are inserted and left for 24 hours at room ice in a refrigerator. Later a part of the insects are stored in the refrigerator to be stored in the frozen state and the rest in entomological mattresses. The material collected, and stored in

this way is determined using stereomicroscope based on literature listed [9, 10, 12].

3. Results and Discussion

In this paper, are determined 56 species belonging to *Carabidae* and *Scarabidae* Family, displayed as follows: *Carabidae* Family; encountered in 11 species and 16 types *Scarabidae* Family; encountered in 24 species and 40 types

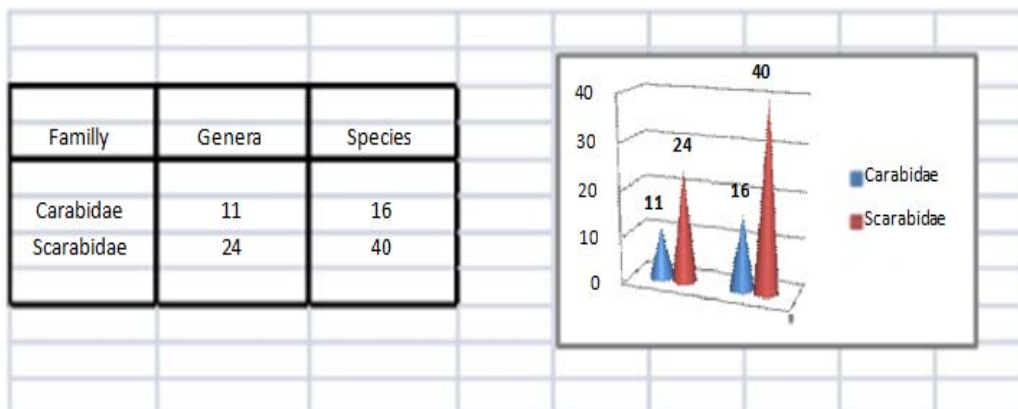


Fig 1: Gene and species according 2 families.

Based on this study, a database that reflects every hitherto achieved result has been designed. In this program, all necessary updated information on the *Coleoptera* of Northern Albania, *Carabidae* and *Scarabidae* Family, that can be accessed.

Analyzing the representans of *Carabidae* family, is evident that the Gene with the highest number of species are *Carabus* with 5 species (*Carabus glabratus*, *Carabus scarabeus*, *Carabus hungaricus* Gene, *Carabus intricatus*, *Carabus cariaceus*) and *Harpalus* with 2 types (*Harpalus afinis*, *latus*). Analyzing the representans of *Scarabidae* family, is evident that the gene with the highest number of species are *Geotrupes*

with 4 (*Geotrupes vernalis*, *Geotrupes sylvaticus*, *Geotrupes mutator*, *Geotrupes spiniger*) and *Anysoplia* with 4 types (*Anysoplia tempestiva*, *Anysoplia erichsoni*, *Anysoplia agricola*, *Anysoplia austriaca*).

Concerning the types referred to for the first time [6, 7], it results that there are 30 new types of the Albanian *Coleoptero*fauna. This study provides a table displaying the types referred to for the first time in detailed. These types belong to the following families:

Carabidae Family represented by 7 types
Scarabidae Family represented by 6 types

Family	Gene	Author	Specie	Author
1.Carabidae	1.Carabus	Thoms	1.Carabus glabratus	Pk
			2.Carabus hungaricus	F
			3.Carabus intricatus	L
			4.Leistus ferrugineus	L
			5.Chlaenius spoliatus	Rossi
2.Scarabidae	6.Geotrupes	Latr	8.Geotrupes mutator	March
			7.Ontophagus	Latr
			9.Ontophagus citellorum	Medv
			8.Phylognatus	Esch
			10.Phylognatus excavatus	Forst
			9.Hoplia	Ill
			11.Hoplia parvula	Kryn
			10.Trichius	F
12.Trichius zonatus	Germ			
	11.Potosia	Mulz	13.Potosia lugubris	Host

Fig 2: Genes and species referred for the first time

In this study, the type composition of *Coleoptero*fauna has a modest addition in its type number, as displayed in Fig.no.3.

Family	Known in Albania	New for Malesia e Madhe	Totally in Albania
Carabidae	119	7	226
Scarabidae	82	6	89

Fig 3: Additions in Coleoptero

Zoogeografic group	Number of species	Percentage
Holarctic	1	6.25
European	2	12.5
Palaartic	8	50
Mediterranean	1	6.25
Euroasiatic	1	6.25
Balkan-Anatolic	1	6.25
Euro-Siberian	2	12.5

Fig 4: Table showing number of species according to chorology for Carabidae Family

Compared to other families, the *Carabidae*, *Scarabidae*, *Cerambycidae*, *Curculionidae*, *Chrysomelidae* Families have the greatest type addition. The zoogeographic analysis [8] of these types in this study shows that they are widely spread in space, and as such they are included in many zoogeographic groups.

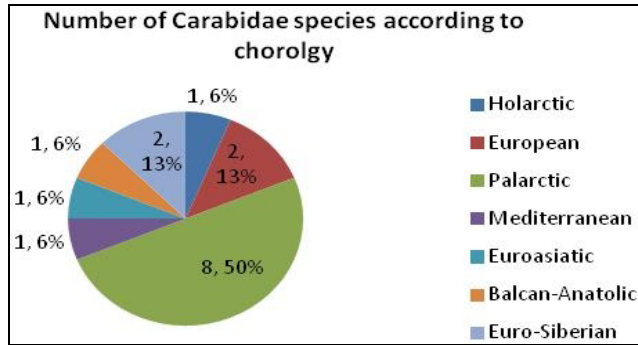


Fig 5: Graph showing number of species according to chorology for Carabidae Family

In this study, these data together with their zoogeographic type pertinence have been displayed in Fig.no.4

Zoogeographic group	Number of species	Percentage
European	8	20
Palarctic	11	27.5
Mediterranean	2	5
Euroasiatic	3	7.5
Balcan-Anatolic	1	2.5
Euro-Siberian	15	37.5

Fig 6: Table showing number of species according to chorology for Scarabidae Family

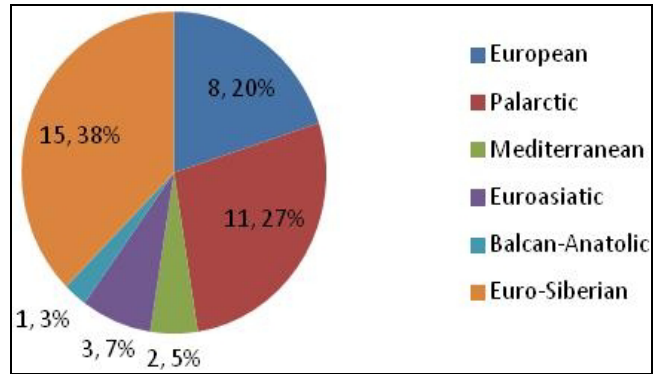


Fig 7: Graph showing number of species according to chorology for Scarabidae Family

The table and the respective graph clearly illustrate the inclusion of the types of zoogeographic groups according to families in the Malësia e Madhe Region in different zoogeographic groups.

The zoogeographic groups evidence the phenomenon of distribution [7] in space whereas the chorology bears special values with respect to type characteristics.

For Carabidae family, according to chorology, the biggest zoogeographic group is Palarctic with 8 representants, while European and Siberian have 2 representants.

For Scarabidae family, according to chorology, the biggest zoogeographic group is Eurosiberian with 15 representants, while Palarctic has 11 representants.

Of the Coleoptera of Malesia e Madhe Region, there are also 12 types [5] included in the list of the endangered species and as such, they are written in The Red Book of the Albanian Flora and Fauna.



Carbus coriaceus



Carbus glabratus



Calosoma sycophanta



Calosoma inquisitor



Carabus auronitens



Gnorimus nobilis



Gymnopleurus mopsus



Oryctes nasircomis

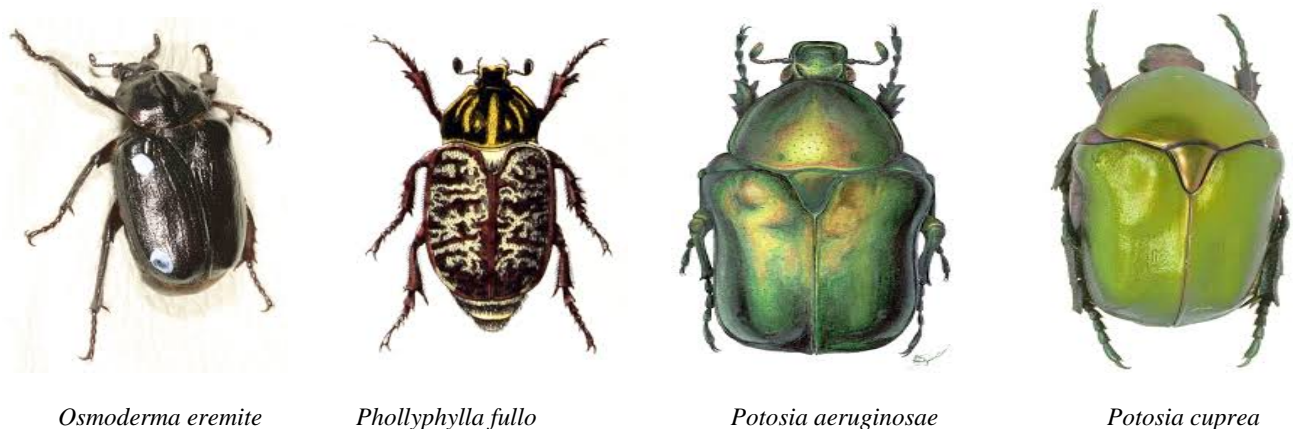


Fig 8: Risked species of *Carabidae* and *Scarabiodae* Family

4. Conclusions

Coleoptera represent the biggest of the animal world and one of the main links in the food chain and the ecosystem. For this reason, a lot of efforts should be made to propagate their values, the role they play in the eco-system, and their economic importance.

As concerns the diversity of the areas and habitats, Malesia e Madhe Region represents one of the areas that draws most interest in the process of the fauna study in our country.

In the course of this study, 56 species representants of Carabidae and Scarabidae families of Coleoptera which belong by 16 species, belonging to 11 genes.

Concerning the types referred for the first time the Carabidae Family has 7 types, while the Scarabidae Family has 6 types. The analysis of the respective geographic revalence of the Carabidae and Scarabidae Family in Malesia e Madhe Region, shows that groups that exhibit the greatest type diversity are Palearctic with 8 species (Carabidae Family) and Eurosiberian with 15 species (Scarabidae Family).

5. Recommendations

Thought completed with new types by study, because of the big number of species (80% of all insects are represented by Coleopteras) the order of Coleopteras in still vaguely familiar and not properly studies. For this reason, we recommend that in the future, owing to the big family diversity and the high degree of difficulty some families pose in the course of their identification, studies on family basis.

For the future study of microscopic Coleoptera, we recommend that the digging method with methodological comb be used at the foot of the trees and trunks then, the material should be either collected with all the substrate selected with the assistance of the aspirator. We recommend that the study of coleopteran be focused on the larval stage, because in most cases, they represent harmful periods in both agriculture and arboriculture.

Special attention should be paid to the study of the biology and ecology of the types and the methods of the biological struggle. To have a complete of their real state, and to determine their habitat, genuine studies should be made in the

Biology of the types with a special status, accomplish in this way their best possible protection.

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