

FAUNISTIC, ECOLOGIC AND ZOOGEOGRAPHIC STUDIES ON THE PENTATOMOIDS AND COREOIDS (HETROPTERA, INSECTA) FROM THE NATIONAL PARK MACIN MOUNTAINS (TULCEA COUNTY)

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Keywords: *faunistic, ecology, zoogeography, Pentatomoidea, Coreoidea*

INTRODUCERE

Macin Mountains are situated in the SE of Romania, Tulcea County, and was built during Hercinic orogenesis. The maximum height of this mountainous massif are somehow over 400 meters and it develops as a parallel peaks, NW-SE oriented, placed where the Danube is turning, in the NW of Tulcea County [Cotul Pisicii (Cat's turning)]. Macin Mountains are one of that tree subunits of well-defined Dobrogean Horst with distinct tectonic and stratigraphic evolution, the other two being Triassic region of Tulcea and Babadag region, which is newly sedimentary basin, finalized in Cretacic era.

The upper and lower relief shapes, defined by the range of tiers, Islander Mountains, valley-lane are, from the genetic and evolutionary view, the result of a long time process of crushing and modeling, started at the end of Paleozoic era. Although they are undersized (sometimes looking like hills), the Macin Mountains individualizes in the north Dobrogean geographic scenery by sharpened and rocky heights, steep slops from where it starts screes to the base.

Generally, the climate is a continental excessive one, with warm summers and mild winters.

The National Park of Macin Mountains has 11140.2 ha, 99.7% representing forest and 0.3% grassland. The characteristic of this park is represented by the forest ecosystems that ensure ecological stability and most propitious habitat for distinctive herbaceous species. The north-dobrogean forests, complex ecosystems of steppe and forest steppe, are mostly constituted from a deciduous brush mixture, where the basic species are common oak, in the north, and the grey oak and fluffy oak, in the south of the park.

The National Park of Macin Mountains own and protect a great diversity of flora and fauna species, most of them being very rare for Romania and the rest of the world and some special habitats of Dobrogea: west-pontic steppes of feather grass, *Thymus zigioides*, Moesic fluffy oak forest with *Paeonia peregrina*, grey oak, linden tree and hornbeam. *Silene compacta* can be found at the northern limit of the worldwide specific spreading

and *Potentilla bifurca*, at the western limit. Some of vulnerable species, included on the Red List, can be founded too: *Campanula romanica*, *Moehringia grisebachii*, *Galanthus plicatus*, and *Dianthus nardiformis*.

Dobrogea's heteroptera studies are dating from the second half of XX century and was made by Geza Horvath, A. L. Montandon, Maurice Jaquet, O. M. Reuter, Sienkiewicz and Paraschivescu (1963), Negru Ștefan (1967), for the south of Dobrogea. For the north of Dobrogea, precisely for the Macin-Tulcea-Niculitel region, the studies was made by Kiss B., in 1976, the author mentioned 239 species of heteroptera which belongs to 28 families.

MATERIAL AND METHOD

The analyzed entomologic material was collected during the 2005 year. Gatherings were made with an entomologic net by the mowing method, manually, directly from the plants and by shaking trees and bushes on the umbrella net. The collected material was separated in samples, killed with ethyl ether and dry-preserved by pricking with entomologic needles and stored in insectarium boxes.

The entomologic material, which I have collected, is from the 5 distinct ecosystems from The National Park of Macin Mountains (Tulcea County):

1. Steppe vegetation with feather grass, sedge (*Carex pilosa*), sweet woodruff (*Asperula odorata*) – on slope, with groups of planted pine, blackthorn, hedgethorn, elder tree, hip – close by Cerna locality, which is situated at 150 meters altitude. The region is enough grazed.
2. Deciduous forest mixture (beech, common oak, hornbeam, cornel tree) – on east-south slope, with forest steppe vegetation on the base (*Euphorbia sp.*, *Campanula romanica*, *Stipa sp.*), at 200 meters altitude;
3. Beech-hornbeam forest mixed with grey oak, in slope disposal western oriented, with forest steppe vegetation interspersed, at 244 meters altitude. Bushes are well represented by *Rosa canina* and *Spiraea crenata*;
4. Rocky vegetation, near granite and kaolin quarries (Culmea Pricopanului), at 335 meters altitude. Herbaceous species are represented by: *Coronilla scorpioides*, *Cachrys alpina*, *Silene compacta*;

5. Beech forest mixed with common oak, placed in the „Pădurea Valea Fagilor” [Beech Valley Forest] Reservation, 10 km. far from Luncavița locality. This forest represents a tertiary relict where are vegetating *Fagus sylvatica*, *Fagus taurica*, *Carpinus betulus*, *Tilia tomentosa*, subbrush like *Corillus avelana* (filbert), *Cornus mas* (cornel tree), and herbaceous vegetation are represented by *Asarum europaeum*, *Sanicula europaea*, *Pulmonaria officinalis*.

Determining performed in the laboratory with the help of stereomicroscope and using different bibliographical resources (Kis 1984, 2001; Wagner, 1966).

Determined material been ordered in families, subfamilies and species in accordance with the actual taxonomic systems (Davidova-Vilimova and McPherson 1994(1995), Kis 1984, 2001).

For each species, I presented the number of individuals, numeric plenty and relative plenty, with a view to find out the trophic and zoogeographic spectrum, in accordance with different bibliographical resources (Kis 1984, 2001, Rosca 1984).

RESULTS AND DISCUSSIONS

Fauna analysis. Following researches, it has been collected 128 individuals of Pentatomoidea, which belongs to 20 species, 14 genera and 3 families, and 112 individuals of Coreoidea, which belong to 16 species, 12 genera and 3 families (table 1).

From Pentatomoidea, the most numerous individuals belongs to the Pentatomidae Family (122); from Scuteleridae Family I have collected only four individuals and from Plataspidae and Cydnidae Families only 1 individual each. These precise individualization and distribution of the individuals by families, for pentatomoids, remain the same for genera level and even for species, the diversity provided by Pentatomidae Family, represented by 11 genera and 16 species, the other families collected, from pentatomoids, represented by a single genus and a single species.

As concerns coreoids, the most numerous individuals collected belong to Rhopalidae Family (70), followed by the Alydidae Family (28) and Coreidae Family (14). Numeric distribution of species by families is distinct than numeric distribution of the individuals, the most numerous species being registered in Rhopalidae Family (10), followed by Coreidae (6), while the Alydidae Family is represented by a single species.

The most numerous species was collected on the mesophile grassland (19 species), pentatomoids being represented by 11 species and coreoids by 8 species. Same value for the number of species was registered in the deciduous forest, E-S oriented and in the rocky vegetation (18 species), but while in the deciduous forest can be found 9 species of pentatomoids and 9 species of coreoids, on the

rocky region can be found 12 species of pentatomoids and 6 species of coreoids. The lowest number of species has registered in the beech forest of Luncavița (5 species).

Ecologic analysis. On the grassland with characteristic steppe vegetation, the highest values of the numeric and relative plenty belongs to *Chorosoma schilling* (P=3.5, RP= 30.76%) (Rhopalidae, Coreoidea) and *Camptopus lateralis* (P=3, RP=26.37%) (Alydidae, Coreoidea). For pentatomoids, in the same ecosystem, relatively high values was registered by *Aelia acuminata* (P=0.63, RP=5.49%). For deciduous forest, E-S oriented, *Graphosoma lineatum* registered the highest values of plenty (P=1.22, RP=21.56%), while in the beech-hornbeam forest, western oriented, the highest values was registered by *Carpocoris purpureipennis* (P=2, RP=29.26%). On the rocky region with herbaceous vegetation *Choroma schillingi*, from coreoids, registered high levels of the reckoned ecologic values (P=2.2, RP=22.91%).

Therefore, it comes out the preferences of some species for certain ecosystems while some other species have a high ecologic plasticity. Thus, *Graphosoma lineatum* has been collected from all 5 ecosystems. *Odontotarsus purpureolineatus*, *Aelia rostrata*, *Carpocoris purpureipenni*, *Carpocoris mediteraneus*, from pentatomoids and *Camptopus lateralis*, *Stictopleurus abutilon*, from coreoids has been identified in 4 ecosystems. *Coptosoma scutellatum*, *Cydnus aterimus*, *Sciocoris sulcatus*, *Eusarcocoris inconspicuus* and *Syromastes rhombeus* has been collected only from the alpine grassland vegetation, while *Enoplops schapha* has founded only in the beech forest of Luncavița.

From the rare species for Romania's fauna, identified [and studied before] in some other region of Tulcea County and identified by us for the first time in our studied ecosystems I have to mention *Carpocoris mediteraneus* (Pentatomidae), *Stictopleurus pleurus*, *Macceventhus caucasicus* (Rhopalidae).

Trophic spectrum. Following trophic spectrum analyses of pentatomoids and coreoids it comes out that the polyphagous species are dominants (23), these representing 68%, the rest of the species being oligophagous. No monophagous species collected.

Zoogeographic analysis. Analyzing the zoogeographic distribution of the collected species, its find out the weight of Palearctic species (16), higher values being registered for Mediterranean (6 species) and Eurasic (5 species). Zoogeographic spectrum of the collected species registered, in addition, Pontomediterranean elements, Mediterranean, Central Asian, Eurosiberian, each represented by two species, while Ethiopian elements, Holarctic, cosmopolits, South Palearctic are represented by a single species.

Table 1. The number of individuals, numeric plenty and relative plenty to the Pentatomoidea și Coreoidea species collected from the National Park of Macin Mountains in 2005 (Tulcea County)

Family, subfamily, species	N	I			II			III			IV			V		
		N	A	Ar%	N	A	Ar%	N	A	Ar%	N	A	Ar%	N	A	Ar%
Platapidae Family	1															
<i>Coptosoma scutellatum</i> (Geoffroy, 1785)	1										1	0,2				
Cydnidae Family	1															
Cydninae Subfamily	1															
<i>Cydnus aterrimus</i> (Forster, 1771)	1										1	0,2	2,08			
Scutelleridae Family	4															
Odontotarsinae Subfamily	4															
<i>Odontotarsus pupureolineatus</i> (Rossi, 1790)	4	1	0,13	1,09	1	0,11	1,96	1	0,17	2,43				1	0,2	14,28
Pentatomidae Family	122															
Podopinae Subfamily	29															
<i>Acyrosoma leocogrammes</i> (Gmelin, 1781)	3	3	0,38	3,29												
<i>Graphosoma lineatum</i> (Linne, 1758)	26	4	0,5	4,39	11	1,22	21,56	2	0,34	4,87	8	1,6	16,66	1	0,2	14,28
Pentatominae Subfamily	93															
<i>Sciocoris sulcatus</i> (Fieber, 1851)	1										1	0,2	2,08			
<i>Aelia acuminata</i> (Linne, 1758)	10	5	0,63	5,49	1	0,11	1,96	4	0,68	9,75						
<i>Aelia rostrata</i> (Boheman, 1852)	5	1	0,13	1,09	3	0,33	5,88	1	0,17	2,43						
<i>Aelia klugi</i> (Hahn, 1831)	1										1	0,2	2,08			
<i>Neottiglossa leporina</i> (Herrich-Schaffer, 1830)	1							1	0,17	2,43						
<i>Eusarcocoris inconspicuus</i> (Herrich-Schaffer, 1830)	1										1	0,2	2,08			
<i>Staria lunata</i> (Hahn, 1834)	1	1	0,13	1,09												
<i>Carpocoris purpureipennis</i> (De Geer, 1773)	30	4	0,5	4,39	10	1,11	19,60	12	2	29,26	4	0,8	8,33			
<i>Carpocoris mediteraneus</i> (Tamanini, 1958)	6	1	0,13	1,09	3	0,33	5,88	1	0,17	2,43	1	0,2	2,08			
<i>Carpocoris pudicus</i> (Poda, 1761)	6	3	0,38	3,29				3	0,5	7,31						
<i>Dolycoris baccarum</i> (Linne, 1758)	4				1	0,11	1,96				2	0,4	4,16	1	0,2	14,28
<i>Palomena prasina</i> (Linne, 1761)	2				1	0,11	1,96	1	0,17	2,43						
<i>Euryderma ventrale</i> (Kolenati, 1846)	5				1	0,11	1,96				4	0,8	8,33			
<i>Euryderma ornatum</i> (Linne, 1758)	16	4	0,5	4,39				7	0,88	17,07	5	1	10,41			
<i>Euryderma oleraceum</i> (Linne, 1758)	2	1	0,13	1,09							1	0,2	2,08			
Coreidae Family	14															
Coreinae Subfamily	12															
<i>Syromastes rhombeus</i> (Linne, 1758)	1										1	0,2	2,08			
<i>Coreus marginatus</i> (Linne, 1758)	7				7	0,78	13,72									
<i>Enoplops scapha</i> (Fabricius, 1794)	3													3	0,6	42,85
<i>Centrocoris spiniger</i> (Fabricius, 1781)	1	1	0,13	1,09												
Pseudophloeinae Subfamily	2															
<i>Ceraleptus gracilicornis</i> (Herrich-Schaffer, 1835)	1				1	0,11	1,96									
<i>Coriomeris denticulatus</i> (Scopoli, 1763)	1										1	0,2	2,08			
Alydidae Family	28															
<i>Camptopus lateralis</i> (Germar, 1817)	28	24	3	26,37	1	0,11	1,96	1	0,17	2,43	2	0,4	4,16			
Rhopalidae Family	70															
<i>Rhopalus conspersus</i> (Fieber, 1859)	2	2	0,27	2,19												

<i>Rhopalus subrufus</i> (Gmelin, 1790)	1							1	0,17	2,43						
<i>Brachycarenum tigrinus</i> (Schilling, 1829)	1				1	0,11	1,96									
<i>Stictopleurus punctatonevrosus</i> (Goeze, 1778)	4	2	0,27	2,19	2	0,22	3,92									
<i>Stictopleurus crassicornis</i> (Linne, 1758)	2				2	0,22	3,92									
<i>Stictopleurus abutilon</i> (Rossi, 1790)	8	4	0,5	4,39	2	0,22	3,92	1	0,17	2,43	1	0,2	2,08			
<i>Stictopleurus pictus</i> (Fieber, 1861)	4	1	0,13	1,09	2	0,22	3,92							1	0,2	14,28
<i>Maccevevethus caucasicus</i> Kolenati, 1845)	2	1	0,13	1,09	1	0,11	1,96									
<i>Myrmus miriformis</i> (Fallen, 1807)	5							3	0,5	7,31	2	0,4	4,16			
<i>Chorosoma schillingi</i> (Schilling, 1829)	41	28	3,5	30,76				2	0,34	4,87	11	2,2	22,91			
Total number of individuals	238	91			51			41			48			7		
Total number of species	37	19			18			15			18			5		

I –Steppe vegetation with groups of planted pine

II –Beech-hornbeam forest on east-south slope

III – Beech-hornbeam forest mixed with grey oak, in slope disposal western oriented

IV – Rocky vegetation

V – Beech forest mixed with cornel tree

CONCLUSIONS

On the researched regions, I have identified 128 pentatomoids, which belongs to 20 species, 14 genera and 3 families and 112 coreoids, which belongs to 17 species, 12 genera and 3 families.

The richest fauna of pentatomoids and coreoids has registered on the grassland with steppe vegetation (19 species, 9 individuals), while the poorest fauna has registered in the area of "Pădurea Fagilor" Reservation (5 species, 7 individuals).

Most of the identified species belongs to the Pentatomidae Family (16 species), but a significant number of species has been identified in the Rhopalidae Family (10 species).

The highest values of the numeric and relative plenty has registered by *Graphosoma lineatum*, *Aelia acuminata*, *Carpocoris purpureipennis*, *Euryderma lateralis*, *Stictopleurus abutilon*, *Chorosoma schillingi*, from coreoids.

From the rare species for Romania's fauna, identified for the first time in our studied ecosystems I have to mention *Carpocoris mediteraneus*, *Stictopleurus pleurus*, *Macceventhus caucasicus*.

From zoogeographic point of view, 43% of the studied species are Palearctic, significant values coming across by Mediterranean elements (16%) and Eurasian elements (14%).

Polyphagous species represents 68%, oligophagous species representing the rest.

REZUMAT

Materialul biologic a fost colectat în 2005 din 5 tipuri de ecosisteme aparținând Parcului Național Munții Măcin: zonă de pășune cu vegetație de stepă și pâlcuri de pin plantat, zonă cu făgeto-cărpinet dispus în pantă cu orientare EE-S, o alta cu făgeto-cărpinet în amestec cu stejar brumăriu având orientare vestică, zonă cu vegetație de stâncărie, și pădure de fag în amestec cu corn.

În zonele studiate am identificat 126 de pentatomoidee aparținând la 20 de specii, 14 genuri și 3 familii și 112 coreoidee aparținând la 17 specii, 12 genuri și 3 familii.

Cele mai mari valori ale abundenței au fost înregistrate de *Graphosoma lineatum*, *Aelia acuminata*, *Carpocoris purpureipennis*, *Euryderma ornatum* dintre pentatomoidee, și *Camptopus lateralis*, *Stictopleurus abutilon*, *Chorosoma schillingi* dintre coreoidee. Dintre speciile rare pentru fauna țării noastre, identificate pentru prima dată în ecosistemele studiate menționăm *Carpocoris mediteraneus*, *Stictopleurus pictus*, *Macceventhus caucasicus*.

Din punct de vedere zoogeografic 43 % din speciile identificate sunt palearctice, valori ridicate fiind întâlnite și de elemente mediteraneene (16%) și eurasiatice (14%). Speciile polifage sunt într-o proporție de 68%, restul fiind oligofage.

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