

THE DIVERSITY OF THE COREOIDS (INSECTA: HETEROPTERA: COREOIDEA) FAUNA OF THE GÂRBOAVELE FOREST RESERVATION (GALAȚI COUNTY)

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Abstract. The entomological material was collected in July 2005 and May and August 2007 from Garboavele forest reservation area, located at approximately 20 km from the city of Galați. Garboavele Forest (400 hectares) is located in the Covurlui High Plain at 47-120 m altitude, on black earth, being composed of fluffy oak (41%), acacia (29%), hoarfrosty oak (27%), ash (2%), other species (1%) and the vegetation of this forest is a typical forest steppe. In the studied area we identified 13 species coreoids belonging to 11 genera included into 3 families. Most species of coreoids identified belong to Rhopalidae family (8 species), Coreidae and Alydidae families having a small number of representatives (3, respectively one species). The highest values of number and relative abundance were recorded by *Coreus marginatus* (LINNE, 1758), being the characteristic species and edifying for this type of habitat. From the zoogeographic point of view, in this habitat the paleartic elements (30.77%) and holarctic elements (23.07%) are predominant, the remaining elements, represented by one species (7.7%), being: Euro Asian, Euro Siberian, cosmopolitan, Holomediterranean and Asian. All species identified in the area have a wide spread on the territory of Romania. The species identified for the first time in this type of habitat are *Rhopalus maculatus* (FIEBER, 1837) and *Chorosoma schillingi* (SCHILLING, 1829), belonging to the Rhopalidae family.

Keywords: fauna, ecology, zoogeography, Coreoidea, Garboavele Forest.

Rezumat. Diversitatea faunei de coreoide (Insecta: Heteroptera: Coreoidea) din rezervația Pădurea Gârboavele (județul Galați). Materialul entomologic a fost colectat în lunile iulie 2005 și mai și august 2007 din arealul rezervației forestiere Pădurea Gârboavele aflată la aproximativ 20 km de orașul Galați. Pădurea Gârboavele (400 hectare) situată în Câmpia Înaltă a Covurluiului, pe teritoriul administrativ al comunei. Este situată la 47-120 m altitudine, pe cernoziom cambic, fiind alcătuită din stejar pufos (41%), salcâm (29%), stejar brumăriu (27%), frasin (2%), alte specii (1%), iar vegetația acestei păduri fiind tipic de silvostepă. În zona studiată am identificat 13 specii de coreoide ce aparțin la 11 genuri încadrate în 3 familii. Cele mai multe specii de coreoide identificate aparțin familiei Rhopalidae (8 specii), familiile Coreidae și Alydidae având un număr redus de reprezentanți (3, respectiv o specie). Cele mai mari valori ale abundenței numerice și relative au fost înregistrate de *Coreus marginatus* (LINNE, 1758), ea fiind specia caracteristică și edificatoare pentru acest tip de habitat. Din punct de vedere zoogeografic, în acest habitat predomină elementele paleartice (30,77%) și holarctice (23,07%), restul elementelor, reprezentate prin câte o specie (7,7%), fiind: eurasiatice, eurosiberiene, cosmopolite, holomediterraneene și asiatice. Toate speciile identificate în zona cercetată au o largă răspândire pe teritoriul României. Speciile identificate pentru prima dată în acest tip de habitat sunt *Rhopalus maculatus* (FIEBER, 1837) și *Chorosoma schillingi* (SCHILLING, 1829), aparținând familiei Rhopalidae.

Cuvinte cheie: faună, ecologie, zoogeografie, Coreoidea, Pădurea Gârboavele.

INTRODUCTION

Gârboavele forest, with an area of approximately 400 hectares, is located in the Covurlui High Plain at 1.5 kilometres West of Tulucești, on the administrative territory of this commune. The forest is crossed by two valleys oriented north-south, cut into Levantine clays: Great Valley and Gârboavele Valley; the relief is feebly corrugated, with average heights ranging between 50 and 75 m, with exhibition predominantly south-east and slope between 2°-10°. The underground waters are approximately 15-20 m deep.

The forest is located in the sub district of Covurlui Plain with temperate continental climate, with clear sky days (annual) = 94; days with fog = 53; relative air humidity (annual) = 74.9; predominating winds from the NE, N and SV (frequency = 65%), the maximum average temperature = 10.5° C, the minimum average temperature = - 3.1° C (in January), the minimum absolute temperature = - 28.6° C, the maximum average temperature = 20.3° C (in June), the maximum absolute temperature = 39° C, days without frost = 208; days of snow covering the ground = 41, average rainfall per year = approximately 400 mm (at Gârboavele, compared to 426 mm and 380 mm at Galați and at Pechea); the change in the quantity of rainfall annually = between 256-753 mm (extreme quantities); days without rainfall = 80-100 per year. The general character of the local climate is excessive continental.

The predominantly soil is feebly tacked black earth with clay texture and normal structure, formed on loess, sandy deposits (garden ones) or clays (on valleys); sporadically there can be found steppe light brown soil formed on sandy loess.

The vegetation of this forest is a typical forest steppe, consisting of several associations (types) of forest, mostly degraded (cut) with weak consistency trees, abundant flora invading the surrounding steppe, with a reduced power of regeneration (from sprouts) and being obviously modified by the introduction of many species of trees and planted acacias. The flora of this forest has been investigated sporadically; floristic statements regarding this forest are made by ENCULESCU (1924), PAȘOVȘCHI DONIȚA (1968) and especially BORZA (1958) citing from here 140 species of angiosperms. Research carried out on the forest flora of Gârboavele by MITITELU et al., 1968 and SÂRBU et al., 1997, have highlighted that on this restricted area grow over 470 species of angiosperms from which approximately 40 are very rare in the flora of Moldova.

From the very rare species or from the endemic ones, some deserve special protection in this forest park, attended mostly as a place of recreation; *Paeonia peregrina* var *romanica*, *Iris brandzae*, *Asparagus pseudoscaberr*, *Cytisus heuffelii*, *Pirus babadagensis*, *Ulmus ambigua* and *Asperula scutellaris* (cited from the surroundings of this forest – at the Tuluc Valley, in the only place in the country).

Research on terrestrial heteropters in Covurlui Plain were made sporadically by MARCU in 1982, for the reservation forest area Gârboavele Forest being cited 12 species of coreoids. MARCU publishes a list of the south-eastern Moldova heteropters belonging to the estate of the Natural Sciences Museum from Galati, most collection data belonging to Hanu Conachi reservation and to Gârboavele forest reservation, both situated in the county of Galati. Our research completes the heteropters species distribution map in the forest reservation area of Gârboavele forest, and brings data on the ecology of coreoids population in this area.

MATERIAL AND METHODS

The study of coreoids heteropters fauna of the Gârboavele forest reservation area was realized as a result of the entomological material collection in July 2005 and May and August 2007. Collections were made with entomological fillet through manual mowing method directly from the plants and by shaking the cornice of trees and shrubs in umbrella bag. The collected material was separated on samples, killed with ethyl ether and preserved dry by stinging with entomological needles and stored in insectariums boxes.

Determinations were performed in the laboratory using stereomicroscope with the help of different bibliographic sources (KIS 1984, 2001; WAGNER, 1966).

The material was classified on families and subfamilies and species according to the present taxonomic system (DAVIDOVA-VILIMOVA & MCPHERSON 1994 (1995), KIS (1984, 2001).

For each species it is given the number of individuals, numerical abundance and relative abundance in determining the trophic spectrum and zoogeographical being determined by consulting various sources of literature (KIS, 1984, 2001, ROȘCA, 1984).

RESULTS AND DISCUSSIONS

For this type of habitat there were collected 81 individuals belonging to 13 species of coreoids included in 3 families. The largest number of species belongs to Rhopalidae family (8 species), Coreidae family being represented by 4 species and Alydidae family by a single species (Table 1). Compared to the previous studies from this area, *Rhopalus conspersus* (FIEBER, 1837) (Rhopalidae family) is not in my samples, and the *Rhopalus maculatus* (FIEBER, 1837) species and *Chorosoma schillingi* (SCHILLING, 1829) are new for this type of habitat.

Table 1. The ecological and fauna characterization of the coreoids communities from the wet lawns located in the fluffy oak forest and in the acacia forest from Gârboavele.

Tabel 1. Caracterizarea faunistică și ecologică a comunităților de coreoidee din păjiștile mezofile aflate în pădurea de stejar pufos și salcâm de la Gârboavele.

Nr. crt	Taxon	Zoogeographical area	Gârboavele forest			
			♂	♀	N	X
Coreidae Family						
1	<i>Gonocerus acuteangulatus</i> GOEZE 1778	Hm-AsMj	1		1	0.05
2	<i>Syromastus rhombeus</i> LINNAEUS 1767	P	3	2	5	0.23
3	<i>Coreus marginatus</i> LINNAEUS 1758	Hp	21	23	44	2.09
4	<i>Coriomeris denticulatus</i> SCOPOLI 1763	Hp	1		1	0.05
Alydidae Family						
5	<i>Alydus calcaratus</i> LINNAEUS 1758	H	1		1	0.05
Rhopalidae Family						
6	<i>Corizus hyoscyami</i> LINNAEUS 1758	Hp	1		1	0.05
7	<i>Rhopalus subrufus</i> GMELIN 1790	C	4	3	7	0.33
8	<i>Rhopalus maculatus</i> FIEBER 1837	Eusb		1	1	0.05
9	<i>Brachycarenum tigrinus</i> SCHILLING 1829	P	4	2	6	0.28
10	<i>Stictopleurus punctatonervosus</i> GOEZE 1778	P	1	2	3	0.14
11	<i>Stictopleurus abutilon</i> ROSSI 1790	P	1	1	2	0.09
12	<i>Myrmus miriformis</i> FALLEN 1807	EuAs	2	1	3	0.14
13	<i>Chorosoma schillingi</i> SCHILLING 1829	Eu-AsMc-AsC	1	5	6	0.28
	Total				81	

Legend 1: N-total number of collected samples, X-numerical abundance; Hm-Holomediterranean; Hp-Holopaleartic; AsMc-Asia Minor; ASC-Central Asia; AsMj-Middle Asia, Sp-South Palearctic; C-cosmopolite; P-Paleartic; EuAs-Eurasian; Eusb-Euro Siberia.

Legenda 1: N-număr total de exemplare colectate, X-abundența numerică; Hm-Holomediterranean; Hp-Holopaleartic; AsMc-Asia Mică; AsC-Asia Centrală; AsMj-Asia Mijlocie; Sp-Sud paleartic; C-Cosmopolit; P-Paleartic; EuAs-Eurasiatic; Eusb-Eurosiberian.

From the zoogeographic point of view, in this habitat predominant are the Palearctic elements (4 species) and Holopaleartic elements (3 species), the remaining elements, represented by one species, being: Euro Asian, Euro Siberian, Cosmopolitan, Holomediterranean and Asian.

The species with the highest numerical abundance is *Coreus marginatus* (X = 2.09). It is followed at a big distance by *Rhopalus subrufus* species (X = 0.33), *Brachycarenum tigrinus* (X = 0.28) and *Chorosoma schilling* (X = 0.28). The species with the smallest populations are *Gonocerus acuteangulatus*, *Coriomeris denticulatus*, *Alydus calcaratus*, *Corizus hyoscyami* and *Rhopalus maculatus* (X = 0.05).

The community of terrestrial heteropters belonging to Coreoidea super families, from the forest reservation of Gârboavele, is characterized by very high abundance relative values for *Coreus marginatus* (A = 54.32%), being the single subdominant species. High values of relative abundance for this type of habitat are recorded by the *Syromastus rhombeus* (A = 6.17%), *Rhopalus subrufus* (A = 8.64%), *Brachycarenum tigrinus* (A = 7.40%) and *Chorosoma schillingi* (A = 7.40%) species, all being dominant.

Table 2. Ecological indices of the coreoids communities from the wet lawns located in the fluffy oak forest and in the acacia forest from Gârboavele.
Tabel 2. Indicii ecologici ai comunităților de coreoidee din pajiștile mezofile aflate în pădurea de stejar pufos și salcâm de la Gârboavele.

Current number	Taxon	Gârboavele forest					
		A		F		W	
Coreidae Family							
1	<i>Gonocerus acuteangulatus</i> GOEZE 1778	1,23	D ₂	4,76	C ₁	0,05	W ₁
2	<i>Syromastus rhombeus</i> LINNAEUS 1767	6,17	D ₄	23,80	C ₁	1,47	W ₃
3	<i>Coreus marginatus</i> LINNAEUS 1758	54,32	D ₅	100	C ₄	54,32	W ₅
4	<i>Coriomeris denticulatus</i> SCOPOLI 1763	1,23	D ₂	4,76	C ₁	0,05	W ₁
Alydidae Family							
5	<i>Alydus calcaratus</i> LINNAEUS 1758	1,23	D ₂	4,76	C ₁	0,05	W ₁
Rhopalidae Family							
6	<i>Corizus hyoscyami</i> LINNAEUS 1758	1,23	D ₂	4,76	C ₁	0,05	W ₁
7	<i>Rhopalus subrufus</i> GMELIN 1790	8,64	D ₄	19,04	C ₁	1,64	W ₃
8	<i>Rhopalus maculatus</i> FIEBER 1837	1,23	D ₂	4,76	C ₁	0,05	W ₁
9	<i>Brachycarenum tigrinus</i> SCHILLING 1829	7,40	D ₄	23,80	C ₁	1,76	W ₃
10	<i>Stictopleurus punctatonervosus</i> GOEZE 1778	3,70	D ₃	14,28	C ₁	0,52	W ₂
11	<i>Stictopleurus abutilon</i> ROSSI 1790	2,47	D ₃	9,52	C ₁	0,23	W ₂
12	<i>Myrmus miriformis</i> FALLEN 1807	3,70	D ₃	14,28	C ₁	0,52	W ₂
13	<i>Chorosoma schillingi</i> SCHILLING 1829	7,40	D ₄	19,04	C ₁	1,40	W ₃

Legend 2: A-relative abundance (%); F-frequency (%); W-ecological significance index (%); D-dominance (%); C-Constancy (%)

Legenda 2: A-abundența relativă (%); F-frecvența (%); W-indicele de semnificație ecologică (%); D-dominanța (%); C-constanța (%)

All other coreoids species identified in Gârboavele Forest Reservation are, by the relative abundance values, subdominant (Table 2, Fig. 1).

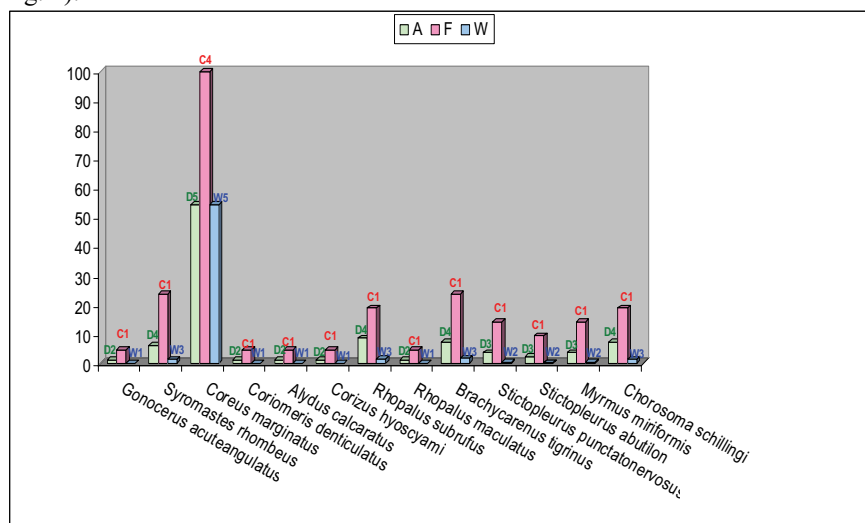


Figure 1. Graphical representation of the ecological indices for the communities from the wet lawns located in the fluffy oak forest and in the acacia forest from Gârboavele (W-ecological significance index, D-dominance, C-constancy).

Figura 1. Reprezentarea grafică a indicilor ecologici pentru comunitățile de coreoidee din pajiștile mezofile aflate în pădurea de stejar pufos și salcâm de la Gârboavele.

CONCLUSIONS

In the studied area we identified 13 species of coreoids belonging to 11 genera included into 3 families.

Most species of coreoids identified belong to Rhopalidae family (8 species), Coreidae and Alydidae families having a small number of representatives (3, one species).

The highest values of number and relative abundance were recorded by *Coreus marginatus*, being the characteristic species and edifying for this type of habitat.

From the zoogeographic point of view, in this habitat predominant are the Palearctic elements (30.77%) and Holarctic elements (23.07%), the remaining elements, represented by one species (7.7%), being: Euro Asian, Euro Siberian, Cosmopolitan, Holomediterranean and Asian.

All species identified in the area have a wide spread in the territory of Romania.

The species identified for the first time in this type of habitat are *Rhopalus maculatus* and *Chorosoma schillingi*, belonging to the Rhopalidae family.

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