



SOME SYSTEMATICS AND ECOLOGICAL DATA FOR TRUE BUGS (HEMIPTERA) IN SOME HABITATS IN ALBANIA

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SYNOPSIS

Key words:

Hemiptera,
species dominance,
distribution.

This study presents some qualitative and quantitative comparative data on the species of true bugs (Hemiptera) collected in mountainous, hilly and coastal habitats in Albania. The collection of biological material is performed during the period 2008-2009. In this study we report for Dajti, Kavaja and Petrela stations 63 species, 46 genera and 13 families. We have reported for the first time in Albania three new species.

By analyzing the collected material, the *Pentatomidae* is the most represented family with 17 species and a frequency of 26.09% and with 12 genders or 26.09%.

INTRODUCTION

True bugs are part of the class Insecta. They are inhabitant of terrestrial environments, some families (Notonectidae, Gerridae, etc.) live in freshwater environments. They are phytophags, predators, harmful parasites of crops, aquatic species that feed on with fish larvae damaging this economy (Gollon, 1991; Mc Gavin, 2000; Servadei, 1967). Species of Miridae and Nabidae family are used nowadays in the integrated biological fight for the protection of cultures (Ehanno, 1983-1987; Miller, 1971; Tremblay, 1990).

We have studied these insects in three stations, in Dajti mountain habitats, in hilly area habitats of Petrela and in coastal habitats of Kavaja, trying to give an analytic overview for the species of this order.

MATERIAL AND METHODS

The collection of the scientific material is performed during the June-October 2008-2009 in the mountain habitats of Dajti station, in the hilly habitats of Petrela station and in the coastal habitats of Kavaja station.

The random collection of samples is done before noon (during the hours 09-15h). For the collection of the materials are used mainly entomological nets with a diameter of 80cm. The mowing is realized along the diagonals of equal surfaces of 100m² (10m x 10m) for all the stations in the study, passing five times along each diagonal of the square according to the Colas method (Colas, 1969).

For the collection are also used entomological air nets for flying insects, hydro-biological nets for aquatic insects, entomological comb, tweezers for insects in the woods etc. Collected insects were put in plastic bottles to be transported in laboratory. The bottles are fitted with labels where is specified the date, time and the place of collection, and in special cases also the corresponding habitat description. In some cases, tiny insects and insects with a small size are placed in plastic flacons of 150-200 cc.

In the laboratory the insects were preserved in bottles with a solution containing 95% ethyl alcohol, acetic acid, distilled water in the ratio 80:5:20 (ml) and some ether drops. Insects were raised from the bottles which were konsevuar. They settled in the freezer section with ice for 24 hours. In order to become soft and ready for the determination insects were placed for 24 hours at an excitator in the temperature 90⁰C (Colas, 1969).

Biological material is determined by consulting literature about Hemiptera. (Kiriçenko, 1951; Misja, 1973; Schun & SLATER, 1995; Villa, 2001), the insects were observed with ZEISS stereomicroscope (Carl Zeiss Stemi 2000-C, Series 455044-9901, Optical: W-Pi 10x/23).

RESULTS AND DISCUSSIONS

In our study we have defined the species of Hemiptera collected in each station in the study. For these species we have done a qualitative and quantitative analysis by comparing them by families, and by stations where they were found.

We have provided a list of these species (Table 1) with the respective stations in which we have meet them.

After the complete definition of all the collected insects, we have referred 13 families, 46 genera and 63 species. By comparing our data with those reported by other authors for Albania (Csiki, 1940; Geza, 1916; Frisse, 1967; Horvath, 1916; Josifov, 1970; Schumacher, 1914) we found that the species *Dolichonabis limbatus* Dahlbom, 1851, *Rhyparochromus vulgaris* Schilling 1829 and *Stictopleurus nysioides*

Reuter, 1891 are not reported earlier, this way being marked as new species for Albania (*).

Table 1: List of species for each station.

Scientific name	Dajti	Petrela	Kavaja
Family Nabidae			
Genus <i>Nabis</i> Latreille, 1802			
<i>Nabis capsiformis</i> Germar, 1838			+
<i>Nabis pseudoferus</i> Remane, 1949	+		
Genus <i>Dolichonabis</i> Reuter, 1908			
<i>Dolichonabis (Nabis) limbatus</i> Dahlbom, 1851		+	
* <i>Dolichonabis lineatus</i> Dahlbom, 1851			+
Family Miridae			
Genus <i>Macrolophus</i>			
<i>Macrolophus nubilus</i> Herrich – Schäffer, 1835		+	
Genus <i>Deraeocoris</i>			
<i>Deraeocoris serenus</i> Douglas&Scott, 1868	+		
Genus <i>Ginia</i> Polymerus			
<i>Polymerus cognatus</i> Fieber, 1858			+
<i>Polymerus vulneratus</i> Panzer, 1806	+	+	
Genus <i>Lygus</i>			
<i>Lygus rugulipennis</i> Poppius, 1911	+		
Genus <i>Orthops</i>			
<i>Orthops kalmi</i> Linnaeus, 1758	+		+
Genus <i>Stenotus</i>			
<i>Stenotus binotatus</i> Fabricius, 1794	+		+
Genus <i>Brachycoleus</i> Fieber, 1858			
<i>Brachycoleus decolor</i> Reuter, 1887	+		+
Genus <i>Adelphocoris</i>			
<i>Adelphocoris lineolatus</i> Goeze, 1778		+	+
<i>Adelphocoris vandalicus</i> Rossi, 1790	+		
Genus <i>Stenodema</i>			
<i>Stenodema calcaratum</i> Fallén, 1807	+	+	
<i>Stenodema laevigatum</i> Linnaeus, 1758		+	
Genus <i>Trigonotylus</i>			
<i>Trigonotylus ruficornis</i> Geoffroy, 1758	+	+	
Genus <i>Lopus</i>			
<i>Lopus decolor</i> Fallén, 1807	+		+
Family Tingidae			

Genus <i>Catoplatus</i> Spinola, 1837			
<i>Catoplatus fabricii</i> Stål. 1868	+	+	
Genus <i>Dictula</i>			
<i>Dictula echii</i> Schrank, 1782			+
Family Reduviidae			
Genus <i>Pirates</i>			
<i>Pirates hybridus</i> Scopoli, 1763	+		
Genus <i>Coranus</i>			
<i>Coranus subapterus</i> Degeer, 1773			+
Genus <i>Rhynocoris</i>			
<i>Rhynocoris iracundus</i> Poda, 1761	+	+	+
Family Aradidae			
Genus <i>Aradus</i>			
<i>Aradus crenatus</i> Say, 1832		+	
Family Lygaeidae			
Genus <i>Lygaeus</i>			
<i>Lygaeus equestris</i> Linnaeus, 1758	+	+	
<i>Lygaeus pandurus</i> Scopoli, 1763	+	+	+
<i>Lygaeus saxatilis</i> Scopoli, 1763	+	+	
Genus <i>Geocoris</i>			
<i>Geocoris ater</i> Fabricius, 1787			+
Genus <i>Nysius</i>			
<i>Nysius graminicola</i> Kolenati, 1846	+		
Genus <i>Pezocoris</i>			
<i>Pezocoris apicimacula</i> Costa, 1853	+		+
Genus <i>Megalonotus</i>			
<i>Megalonotus chiragra</i> Fabricius, 1794	+		
Genus <i>Trapezonotus</i>			
<i>Trapezonotus arenarius</i> Linnaeus, 1758			+
<i>Trapezonotus dispar</i> Stål, 1873	+		
Genus <i>Rhyporochromus</i>			
* <i>Rhyporochromus vulgaris</i> Schilling, 1829			+
<i>Rhyporochromus phoeniceus</i> Rossi, 1794	+		
Family Pyrrhocoridae			
Genus <i>Pyrrhocoris</i>			
<i>Pyrrhocoris apterus</i> Linnaeus, 1758		+	+
Family Coreidae			
Genus <i>Gonocerus</i>			

<i>Gonocerus acuteangulatus</i> Goeze, 1778	+		
Genus Coreus			
<i>Coreus marginatus</i> Linnaeus, 1758		+	
Genus Syramastur			
<i>Syramastur rhombeus</i> , Linnaeus, 1767	+	+	
Family Alydidae			
Genus Camptopus			
<i>Camptopus lateralis</i> Germa, 1817	+		
Family Rhopalidae			
Genus Corizus			
<i>Corizus hyoscyami</i> Linnaeus, 1758	+	+	
Genus Stictopleurus			
<i>Stictopleurus abutilon</i> Rossi, 1790	+		
* <i>Stictopleurus nysioides</i> Reuter, 1891			+
<i>Stictopleurus punctatonervosus</i> Goëze 1778	+		
Genus Maccevethus			
<i>Maccevethus lineola</i> Fabricius, 1787	+	+	
Family Scutelleridae			
Genus Odontotarsus			
<i>Odontotarsus robustus</i> Jakwleff, 1883	+	+	
Genus Eurygaster			
<i>Eurygaster austrica</i> Schrank, 1778		+	
<i>Eurygaster maura</i> Linnaeus, 1758	+		
Family Pentatomidae			
Genus Graphosoma			
<i>Graphosoma semipunctatum</i> Fabricius, 1775	+		
<i>Graphosoma lineatum</i> Linnaeus, 1758	+		
Genus Aelia			
<i>Aelia acuminata</i> Linnaeus, 1758	+		
<i>Aelia rostrata</i> Boheman, 1852	+	+	
Genus Mustha			
<i>Mustha spinosula</i> Lefebvre, 1831	+	+	
Genus Apodyphus			
<i>Apodyphus amygdali</i> Germar, 1817	+		
<i>Stagonomus amoenus</i> Brullé, 1832		+	
Genus Dolycoris			
<i>Dolycoris baccarum</i> Linnaeus, 1758	+	+	
Genus Carpocoris			

<i>Carpocoris fuscispinus</i> Boheman, 1851	+	+	
<i>Carpocoris pupureipennis</i> De Geer, 1773			+
Genus <i>Codophila</i>			
<i>Codophila varia</i> Fabricius, 1787	+		
Genus <i>Palomena</i>			
<i>Palomena prasina</i> Linnaeus, 1761	+		
Genus <i>Eurydem</i>			
<i>Eurydema ornatum</i> Linnaeus, 1758		+	+
<i>Eurydema oleraceum</i> Linnaeus, 1758	+	+	
Genus <i>Nezara</i>			
<i>Nezara viridula</i> Linnaeus, 1758	+	+	
Genus <i>Piezodorus</i>			
<i>Piezodorus lituratus</i> Fabricius, 1794	+	+	
Genus <i>Rhaphigaster</i>			
<i>Rhaphigaster nebulosa</i> Poda, 1761	+		

By analyzing the families that were encountered in this study, the distribution according to species and genera is represented in the following (table 2, and figure 1). As it is showed the *Pentatomidae* family is most represented with 17 species or 26.98% of the all studied species; it is followed by *Miridae* family with 13 species or 20.63%; *Lygaeidae* with 10 species or 15.87%; with fewer species are represented *Reduviidae* and *Rhopalidae* with five species each or 7.94%; *Nabidae* family is represented with four species or 6.35%; *Reduviidae* and *Scutelleridae* with three species or 4.76%; with very few species, 2 or 17.3% are represented *Coreidae* and *Tingidae* families; *Aradidae*, *Berytidae*, *Alydidae* and *Pyrrhocoridae* families are represented with only one species or 1.59%

According to genera composition, with a greater diversity is represented the *Pentatomidae* family with 12 genera or 26.9%; *Miridae* family with 10 genera or 21.74%, with less genera is represented *Lygaeidae* family with six genera or 13.04%, also *Rhopalidae* and *Reduviidae* families are represented with few genera, only three or 6.52%; *Nabidae*, *Tingidae*, *Coreidae* and *Scutelleridae* are represented with two genera or 4.35%; whereas, *Aradidae*, *Berytidae*, *Alydidae* and *Pyrrhocoridae* are represented only with one genre or 17.2%.

Table 2: Distribution of the numbers and percentages of species and genres for each families.

Family Hemiptera	No of species	% Species	No of genera	% Genera
<i>Nabidae</i>	4	6.35	2	4.35
<i>Miridae</i>	13	20.63	10	21.74
<i>Tingidae</i>	2	3.17	2	4.35
<i>Reduviidae</i>	3	4.76	3	6.52
<i>Aradidae</i>	1	1.59	1	2.17
<i>Berytidae</i>	1	1.59	1	2.17
<i>Lygaeidae</i>	10	15.87	6	13.04
<i>Pyrrhocoridae</i>	1	1.59	1	2.17
<i>Coreidae</i>	2	3.17	2	4.35
<i>Alydidae</i>	1	1.59	1	2.17
<i>Rhopalidae</i>	5	7.94	3	6.52
<i>Scutelleridae</i>	3	4.76	2	4.35
<i>Pentatomidae</i>	17	26.98	12	26.09
Total	63	100	46	100

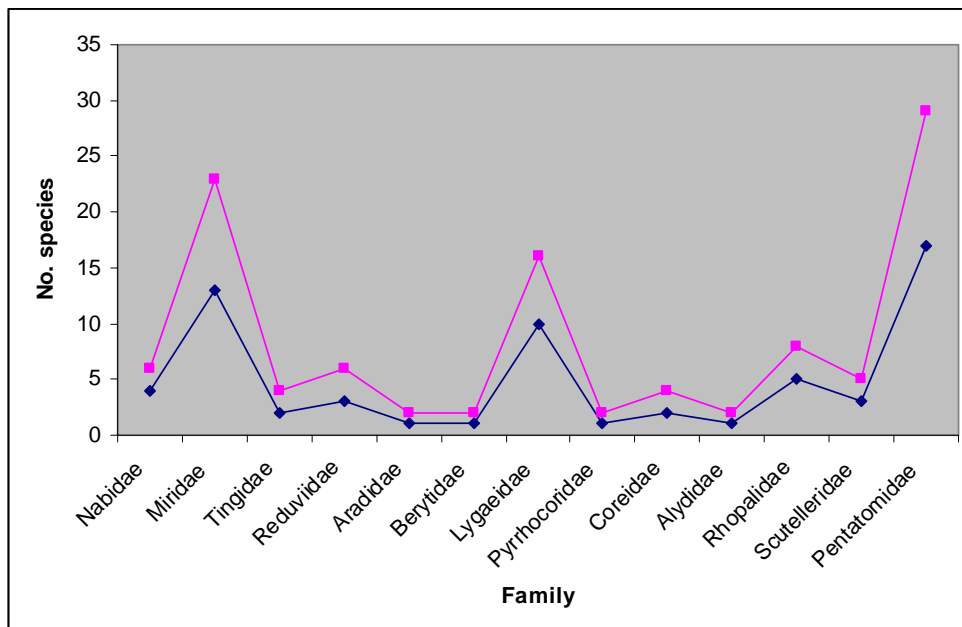


Figure 1: Dependence of the number of species for each families.

Most number of species we found in Dajti, in compare with other stations. We have collected 44 species or 69.84%; Petrela a less diversity with 30 species or 47.61%; the coastal area of Kavaja is represented with 20 species or 31.76% (Table 3; Fig. 2).

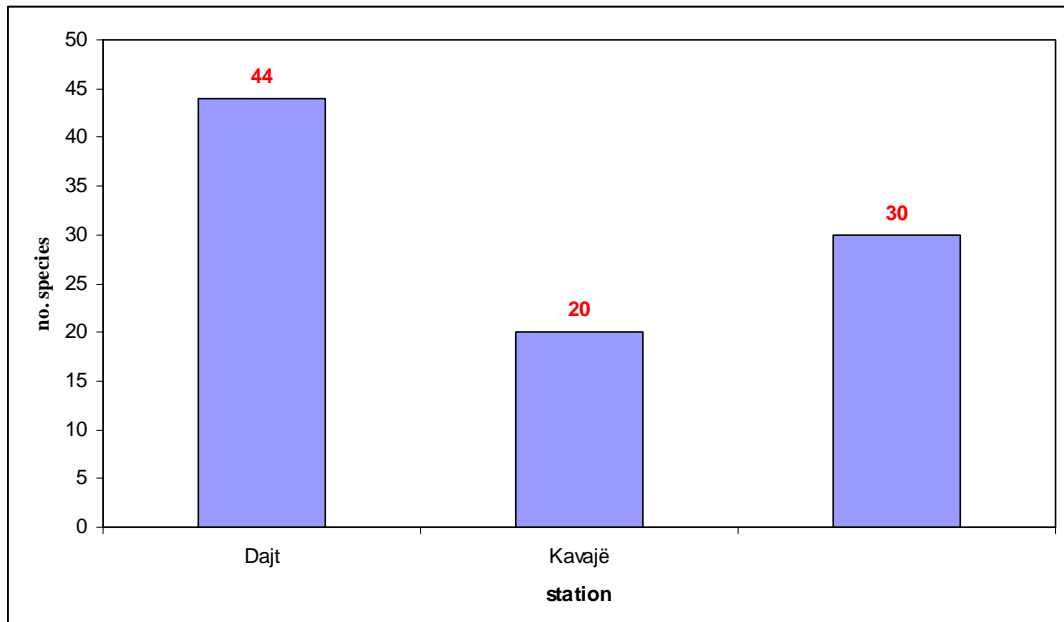
This indicates that habitat of Dajti are more favorable for Hemiptera species. The impact of human factor is smaller, and Habitats are undisturbed. There are more natural biocenosis. Petrela station that has fewer species, suffers a greater interference from humans, which has reduced the natural habitats and has alienate the agricultural parcels in this area;

Kavaja station has the smallest number of species because of the greatest impact of humans in its habitats, and because of the rapid economic touristic development of this area, bringing ecological concerns for the species of true bugs.

Table 3: The distribution of the number and percentage of species for each area.

The station	Dajti	Petrela	Kavaja	Total
No. of species	44	30	20	63
% species	69.84	47.61	31.76	100

Figure 2: The distribution of number of species for each station.



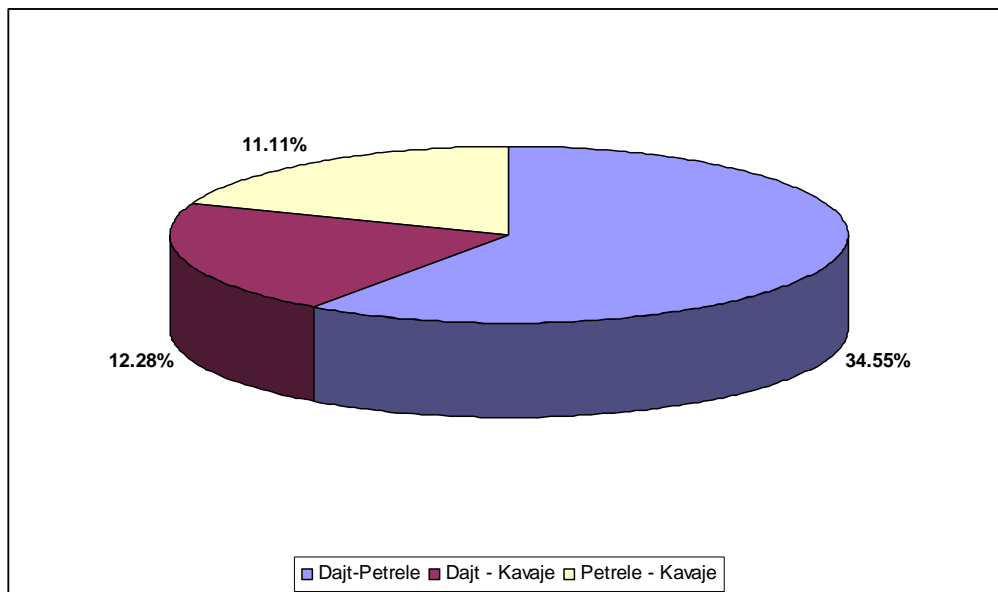
To compare the similarity of habitats between the stations, we have analyzed the similarity between species, with Jaccard Index of Similarity Coefficient (Jaccard, 1901), comparing two different areas with each other (Table 4, Fig. 3). $I_J = \text{Jaccard index}$ $C = \text{No. of common species}$

Table 4: Number of common species and similarity coefficient between stations.

The station	Dajti	Petrela	Kavaja
Dajti	$I_J = 100\%$	C = 19 Dajti = 44 Petrela = 30 $I_J = 34.55\%$	C = 7 Dajti = 44 Kavaja = 20 $I_J = 12.28\%$
Petrela		$I_J = 100\%$	C = 5 Petrela = 30 Kavaja = 20 $I_J = 11.11\%$

We found the highest coefficient, 34.55% and the highest number of common species in the habitats of Petrela and Dajti with 19 species in common; a lower coefficient, 12.28% and a lower number of common species is found in the habitats between Dajti and Kavaja, with 7 species in common; the lowest coefficient 11.11% represented with only five common species, was found in the habitats between Petrela and Kavaja. These results, are explained by the similarity that exists between habitats conditions of Petrela and Dajti as mountain and hilly stations, and with the difference between the mountain and lowland habitats of Kavaja and Dajti stations, with the height above sea level, with the differences in vegetation, etc.

Figure 3: The distribution of the similarity coefficient between stations.



CONCLUSIONS

For the habitats of Dajti, Petrela, and Kavaja stations, we have found 13 families, 46 genera and 63 species. *D. limbatus*, *R. vulgaris*, and *S. nysioides* species are reported for the first time, being listed this way as new species for Albania.

The family *Pentatomidae* is presented with a greater species diversity, 22 species; Dajti station is presented with most number of species, with 44 species followed by the costal habitats of Kavaja station represented with 20 species.

The highest similarity coefficient, 34.55% is found in the habitats of Petrela and Dajti stations; this coefficient is lower, 11.11%, among the habitats of Kavaja and Petrela stations.

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