

Contributions to the study of cicada fauna (Hemiptera: Cicadomorpha, Fulgoromorpha) in the Valea Morii – Vâlcele area, Cluj County, Romania

Valentin POPA

Rezumat

Contribuții la studiul faunei de cicadine (Hemiptera, Cicadomorpha, Fulgoromorpha) din zona Valea Morii – Vâlcele, județul Cluj, România

Lucrarea prezintă rezultatele privind fauna de cicadine studiată în localitatea Vâlcele, județul Cluj. În urma cercetărilor sistematice întreprinse de noi în cursul anului 2000 în localitatea Vâlcele am identificat un număr total de 140 specii de cicadine, ceea ce indică prezența unei biodiversități ridicate pe o suprafață de numai 5 km². Cercetările noastre faunistice reprezintă o premieră, deoarece nu avem date de literatură din zona Valea Morii – Vâlcele. De asemenea, în zona cercetată au fost identificate trei specii noi pentru fauna României: *Kybos populi* (Edwards, 1908), *Edwardsiana avellanae* (Edwards, 1888) și *Edwardsiana spinigera* (Edwards, 1924), precum și o specie nouă pentru fauna Transilvaniei: *Edwardsiana ampliata* (Wagner, 1947). Datele zoogeografice privind speciile identificate în zona studiată indică faptul că în zona Valea Morii – Vâlcele domină speciile cu răspândire largă (palearticte și eurosiberiene).

Summary

This article presents the checklist of cicada species (Hemiptera, Cicadomorpha, Fulgoromorpha) identified in the Valea Morii – Vâlcele area, Cluj County, Romania. As a results of our systematic studies performed during 2000 year in the Valea Morii – Vâlcele area we have identified 140 cicada species, which indicate an extreme reach fauna for such a small area (5 km²). There are no faunistic data in literature, concerning the cicada fauna from the studied area. We also, identified in the studied area three new species for the fauna of Romania: *Kybos populi* (Edwards, 1908), *Edwardsiana avellanae* (Edwards, 1888), *Edwardsiana spinigera* (Edwards, 1924) and one species new for the fauna of Transylvania. The zoogeographic data indicate the presence of species with large distribution (Palaeartic and Eurosiberian) in the studied area.

Keywords: cicada fauna, Valea Morii – Vâlcele area, Romania

Introduction

The analysed area is located in the north-western part of Transylvania, south-west from Feleacu, at about 8 km south of Cluj – Napoca city. The valley has 5 km in length, it lies at 600-650 m altitude and it is bordered by high hills of 700-800 m altitude (fig. 1). Although the analysed area has a reduced surface (5 km²), there are many vegetal associations which provide a high ecological diversity.

The climate is moderate – continental. The average annual temperature range between 8.2 – 8.4° C. The air moisture varies between 70 – 80

%. The rainfall amount is scarce, only about 500 mm annually. The dominant soil type is leigated chernozem, brown and yellow-brown forest soils and podzols, NEGUCIOIU & co. (1980).

So far, we have no reference data concerning the cicada fauna of Valea Morii – Vâlcele area. As a consequence, this paper provides faunistic novelties for the fauna of Romania.

Material and methods

The sampling of biological material was performed monthly, from April to August 2000. As sampling methods, we used an entomological net

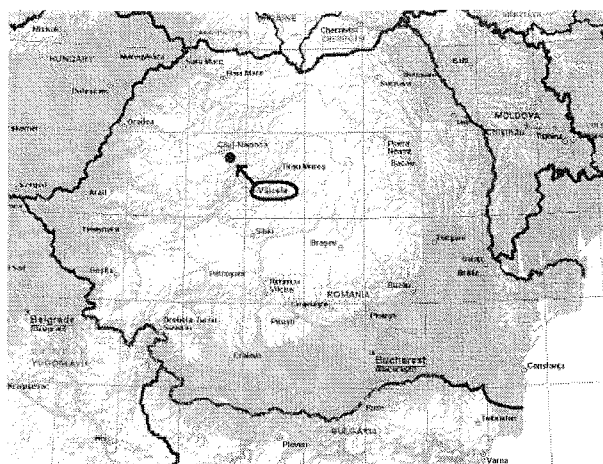


Fig. 1. Location of the studied area

and an umbrella net for the canopy. The cicada species were identified using morphological features, especially the genital system of the males.

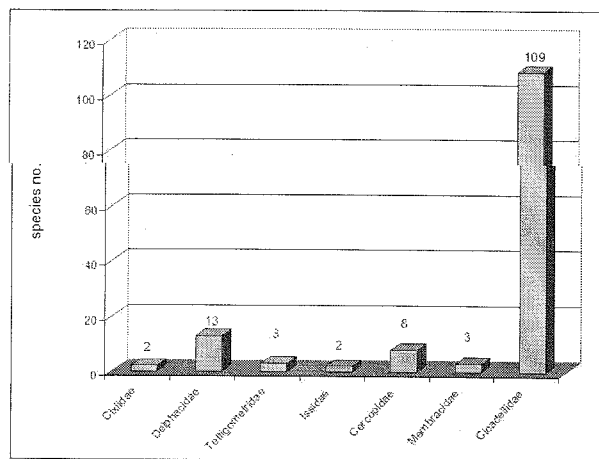


Fig. 2. Distribution of cicada species in families

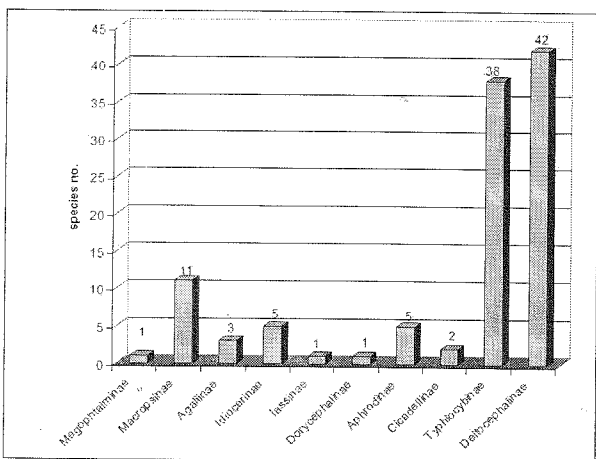


Fig. 3. Distribution of cicada species in subfamilies of the family Cicadellidae

The samples were taken in six types of ecosystems:

1. **Beech and hornbeam forest (Pădurea Mare)** is located on the northern slope of the valley.

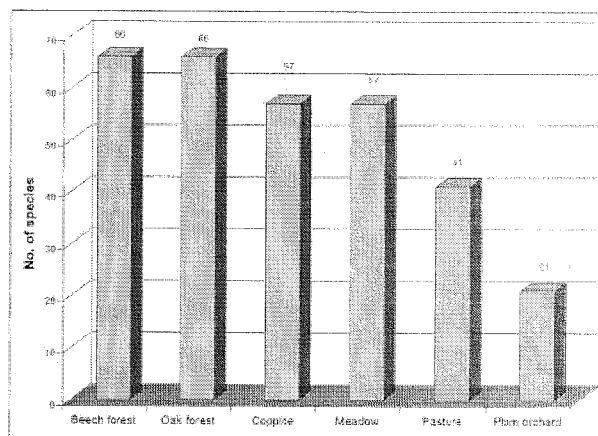


Fig. 4. Distribution of cicada species according to the type of ecosystem

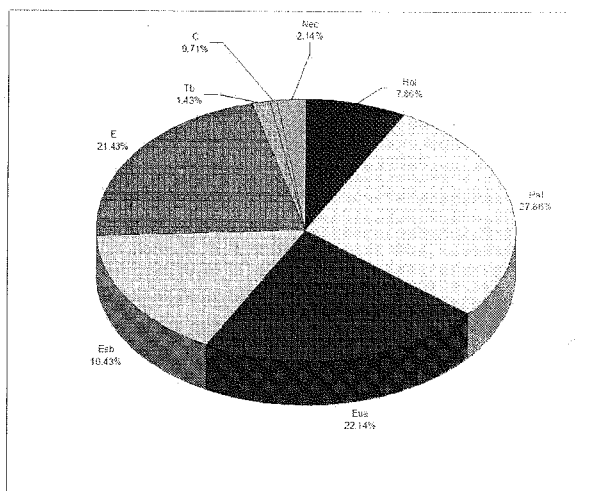


Fig. 5. Zoogeographic spectrum of cicada communities in the Valea Morii / Vâlcele area: Hol - holarctic; Pal - palearctic; Eua - eurasiatic; Eib - eurosiberian; Tb - transboreal; C - cosmopolit; Nec - unknown

The dominant vegetal association is *Carpino – Fagetum sylvaticae* Pauca 1941. The trees layer is composed by *Fagus sylvatica*, *Carpinus betulus*, *Populus tremula*, *Betula pendula*, *Quercus petraea* and *Tilia cordata*. The shrubs layer contains: *Corylus avellana*, *Crataegus monogyna*, *Cornus sanguinea*, *Salix caprea*, *Daphne mezereum*, *Rhamnus frangula*. The herbaceous layer is dominated by *Anemone nemorosa*, *Aposoeris foetida*, *Carex pilosa*, *Lamium galaeobdolon*, *Fragaria vesca*, *Oxalis acetosella*, *Lathyrus vernus*, *Stellaria holostea*.

2. **Oak and hornbeam forest (Pădurea Goruniș)** is located on the southern slope of the valley, displaying two types of vegetal associations: *Quercus robur – carpinetum* Soó et Pocs (1931) 1957 and *Quercus robur – petraea* Borza (1928) 1959. The trees and shrubs layers have

Table 1.

Checklist of cicada species identified in the Valea Morii – Vâlcele area

Abbreviations: Z - zoogeographic data, * - new species for the fauna of Romania, ** - new species for the fauna of Transylvania; Pal - palearctic; Eua - eurasiatic; Esb - eurosiberian; E - european; Hol - holarctic; Tb - transboreal; C - cosmopolit; ? - unknown data

Taxa	Sampling date	Beech forest	Oak forest	Coppice	Meadow	Pasture	Plum orchard	Z
Family Cixiidae Spinola, 1839								
<i>Cixius</i> (s.str.) <i>nervosus</i> (Linnaeus, 1758)	28.06.2000	1	1	1				Pal
	24.07.2000	2		1				
<i>Cixius</i> (<i>Ceratocixius</i>) <i>cunicularius</i> (Linnaeus, 1767)	13.05.2000			1				Pal
Family Delphacidae Leach, 1865								
SubFamily Asiracinae Motschulsky, 1863								
<i>Asiraca clavicornis</i> (Fabricius, 1794)	21.08.2000		1					Pal
SubFamily Stenocraninae Wagner, 1963								
<i>Stenocranus minutus</i> (Fabricius, 1787)	13.05.2000	1						Pal
SubFamily Delphacinae Wagner, 1963								
Tribe Delphacini Leach, 1815								
<i>Stiroma affinis</i> Fieber, 1866	27.05.2000		1					Esb
<i>Laodelphax striatellus</i> (Fallen, 1826)	24.04.2000	18						Pal
	13.05.2000				1			
	28.06.2000			1				
<i>Hyledelphax elegantulus</i> (Boheman, 1847)	14.05.2000		1					Pal
	27.05.2000		4					
<i>Acanthodelphax denticauda</i> (Boheman, 1847)	24.07.2000		1					E
<i>Dicranotropis</i> (s.str.) <i>hamata</i> (Boheman, 1847)	13.05.2000				8			Esb
	14.05.2000		7				1	
	27.05.2000	1		2	1		5	
	24.07.2000			1	1			
	27.08.2000			1				
<i>Xanthodelphax stramineus</i> (Stal, 1858)	13.05.2000			1	1			Esb
	14.05.2000		1					
	27.05.2000				1			
	21.08.2000				15			
<i>Criomorpha moestus</i> (Boheman, 1847)	27.05.2000						1	E
<i>Javesella dubia</i> (Kirschbaum, 1868)	13.05.2000				9		2	Pal
	14.05.2000		3					
	27.05.2000				5		2	
	28.06.2000				3			
<i>Javesella pellucida</i> (Fabricius, 1794)	14.05.2000						1	Hol
<i>Ribautodelphax albostrigatus</i> (Fieber, 1866)	24.04.2000					1	2	Eua
	13.05.2000			1				
	14.05.2000					2		
	24.07.2000		2			6		
<i>Ribautodelphax angulosus</i> (Ribaut, 1953)	14.05.2000					2		Eua

Taxa	Sampling date	Beech forest	Oak forest	Coppice	Meadow	Pasture	Plum orchard	Z
Family Tettigometridae Germar, 1821								
<i>Tettigometra virescens</i> (Panzer, 1799)	24.07.2000					4		E
<i>Tettigometra leucophaea</i> Preyssler, 1792	28.06.2000		1					Eua
<i>Tettigometra (Mitricephalus) macrocephala</i> Fieber, 1865	24.07.2000	2						E
Family Issidae Spinola, 1839								
SubFamily Issinae Spinola, 1803								
<i>Issus coleoptratus</i> (Fabricius, 1781)	14.05.2000		1					E
	27.05.2000		2					
	28.06.2000		2					
	24.07.2000		1					
<i>Issus muscaeformis</i> (Schrank, 1781)	14.05.2000		1					Pal
Family Cercopidae Leach, 1815								
SubFamily Cercopinae Leach, 1815								
<i>Cercopis sanguinolenta</i> (Scopoli, 1763)	14.05.2000	2	4				3	E
	27.05.2000	8	3	3	1	1		
SubFamily Aphrophorinae Amyot & Serville, 1843								
<i>Lepyronia coleoptrata</i> (Linnaeus, 1758)	28.06.2000					2		C
	24.07.2000			2		2		
	21.08.2000					1		
<i>Neophilaenus campestris</i> (Fallen, 1805)	27.05.2000					6		Eua
	28.06.2000	6	2		2	10		
	24.07.2000	1		8	5	9		
	21.08.2000			5	1	1		
<i>Neophilaenus lineatus</i> (Linnaeus, 1758)	28.06.2000				1			Hol
	24.07.2000			1	1	2		
<i>Aphrophora alni</i> (Fallen, 1805)	28.06.2000	5	5	10	1	2		Pal
	24.07.2000	5	2	10				
	21.08.2000		1					
<i>Aphrophora pectoralis</i> Matsumura, 1903	28.06.2000	1		22				Pal
	24.07.2000			8				
<i>Aphrophora salicina</i> (Goeze, 1778)	28.06.2000	1						Pal
<i>Philaenus spumarius</i> (Linnaeus, 1758)	28.06.2000	17	5	11		42		Hol
	24.07.2000	23	12	18	16	28		
	21.08.2000	1		7		7	4	
Family Membracidae Rafinesque, 1815								
SubFamily Centrotinae Amyot & Serville, 1843								
<i>Gargara genistae</i> (Fabricius, 1775)	24.07.2000			11		58		Pal
	21.08.2000			1				
<i>Centrotus cornutus</i> (Linnaeus, 1758)	14.05.2000		3					Esb
	27.05.2000		1					
SubFamily Smiliinae Stal, 1869								
<i>Stictocephala bisonia</i> Kopp & Yonke, 1977	21.08.2000			3			1	Hol
Family Cicadellidae Latreille, 1825								

Taxa	Sampling date	Beech forest	Oak forest	Coppice	Meadow	Pasture	Plum orchard	Z
SubFamily Megophtalminae Kirkaldy, 1906								
<i>Megophtalmus scanicus</i> (Fallen, 1806)	28.06.2000	4	1	2	1			E
	24.07.2000	5						
SubFamily Macropsinae Evans, 1935								
<i>Oncopsis appendiculata</i> Wagner, 1944	28.06.2000	1						E
<i>Oncopsis tristis</i> (Zetterstedt, 1840)	26.06.2000		1					Pal
<i>Oncopsis flavicollis</i> (Linnaeus, 1761)	13.05.2000	10						Pal
	14.05.2000		6					
	27.05.2000	4	6					
	28.06.2000		1					
	24.07.2000	1						
<i>Oncopsis subangulata</i> (J. Sahlberg, 1871)	28.06.2000		2					Esb
<i>Oncopsis carpini</i> (J. Sahlberg, 1871)	27.05.2000		2					E
<i>Pediopsis tiliae</i> (Germar, 1831)	28.06.2000	3						Pal
	24.07.2000	4						
<i>Macropsis infuscata</i> (J. Sahlberg, 1871)	13.05.2000	1						Esb
	27.05.2000			1				
	28.06.2000	2		12				
	24.07.2000			1				
<i>Macropsis marginata</i> (Herrich-Schaffer, 1836)	27.05.2000			2				Pal
	28.06.2000			4				
	24.07.2000			5				
<i>Macropsis notata</i> (Prohaska, 1923)	28.06.2000			18	1			E
	24.07.2000			1				
<i>Macropsis viridinervis</i> Wagner, 1950	13.05.2000			10				E
<i>Hephathus namus</i> (Herrich-Schaffer, 1835)	24.05.2000		2					Eua
SubFamily Agalliinae Kirkaldy, 1901								
<i>Agallia brachyptera</i> (Boheman, 1847)	24.07.2000		3					Eua
<i>Anaceratagallia ribauti</i> (Ossiannilsson, 1938)	28.06.2000				2			Esb
	24.07.2000			3		3		
	21.08.2000			1				
<i>Anaceratagallia venosa</i> (Fourcroy, 1785)	27.05.2000					1		Eua
	24.07.2000					1		
SubFamily Idiocerinae Baker, 1915								
<i>Idiocerus</i> (s.str.) <i>stigmatalis</i> Lewis, 1834	28.06.2000			1				E
	24.07.2000			3				
<i>Idiocerus</i> (<i>Tremulicerus</i>) <i>fulgidus</i> Fabricius, 1775	28.06.2000	1	1	1				Esb
	24.07.2000		1	1				
<i>Idiocerus</i> (<i>Populicerus</i>) <i>laminatus</i> Flor, 1861	28.06.2000	4						Esb
	24.07.2000				14			
<i>Idiocerus</i> (<i>Populicerus</i>) <i>confusus</i> Flor, 1861	28.06.2000	1	3	1	6			Pal
<i>Idiocerus</i> (<i>Populicerus</i>) <i>populi</i> (Linnaeus, 1761)	28.06.2000	6						Pal
SubFamily Iassininae Amyot & Serville, 1843								

Taxa	Sampling date	Beech forest	Oak forest	Coppice	Meadow	Pasture	Plum orchard	Z
<i>Iassus lanio</i> (Linnaeus, 1761)	28.06.2000		2					Pal?
	24.07.2000	2	2		1			
SubFamily Dorycephalinae Oman, 1943								
<i>Eupelix cuspidata</i> (Fabricius, 1775)	27.05.2000					1		Eua
	24.07.2000					2		
	21.08.2000				1			
SubFamily Aphrodinae Haupt, 1927								
<i>Aphrodes bicinctus</i> (Schrank, 1776)	24.07.2000			2				Hol
<i>Aphrodes makarovi</i> Zachvatkin, 1948	28.06.2000	2		1	6	8		Hol
	24.07.2000	12	2	10	5	22		
	21.08.2000						1	
<i>Planaphrodes bifasciatus</i> (Linnaeus, 1758)	28.06.2000			1				Pal
<i>Anoscopus flavostriatus</i> (Donovan, 1799)	24.07.2000	2			1			Pal
<i>Anoscopus serratulae</i> (Fabricius, 1775)	24.07.2000				1			E
SubFamily Cicadellinae Latreille, 1825								
<i>Evacanthus interruptus</i> (Linnaeus, 1758)	28.06.2000	1	2	10				Pal
	24.07.2000	1		2				
<i>Cicadella viridis</i> (Linnaeus, 1758)	28.06.2000			1	1			Pal
	21.08.2000			3	1			
SubFamily Typhlocybinae Kirschbaum, 1868								
Tribe Alebrini Mc Atee, 1926								
<i>Alebra albostriella</i> (Fallen, 1826)	28.06.2000	18	38		1			Eua
	24.07.2000	11	3					
Tribe Dikraneurini Mc Atee, 1926								
<i>Erythria montandoni</i> (Puton, 1880)	24.07.2000		1					E
<i>Emelyanoviana mollicula</i> (Boheman, 1845)	13.05.2000				1	1		Esb
	14.05.2000					1	1	
	27.05.2000							
<i>Forcipata citrinella</i> (Zetterstedt, 1840)	28.06.2000				2			Pal
	21.08.2000				11			
Tribe Empoascini Distant, 1908								
<i>Empoasca decipiens</i> Paoli, 1930	24.04.2000	10						Eua
	14.05.2000		1				2	
	27.05.2000				1			
	28.06.2000	5						
	21.08.2000	1	1			1	1	
<i>Empoasca pteridis</i> (Dahlbom, 1850)	21.08.2000		2					Esb
<i>Empoasca vitis</i> (Gothe, 1875)	24.04.2000	12		2				Pal
<i>Empoasca vitis</i> (Gothe, 1875)	13.05.2000		1	1	1			
	27.05.2000				1			
	21.08.2000				15			
<i>Kybos populi</i> * (Edwards, 1908)	27.05.2000			4	1			Esb
<i>Kybos rufescens</i> Melichar, 1896	28.06.2000			17				Pal

Taxa	Sampling date	Beech forest	Oak forest	Coppice	Meadow	Pasture	Plum orchard	Z
<i>Kybos virgator</i> (Ribaut, 1933)	27.05.2000			12				Esb
	28.06.2000			4				
	24.07.2000			5				
	21.08.2000			9				
<i>Chlorita paolii</i> (Ossiannilsson, 1939)	14.05.2000					1		Esb
	21.08.2000			2				
<i>Chlorita viridula</i> (Fallen, 1806)	24.07.2000					2		Eua
	21.08.2000			62	53			
Tribe Typhlocybini Kirschbaum, 1868								
<i>Fagocyba cruenta</i> (Herrich-Schaffer, 1838)	28.06.2000	2	12					E
<i>Fagocyba douglasi</i> (Edwards, 1878)	27.05.2000	2	13					E
	28.06.2000	11	3		1			
<i>Edwardsiana ampliata</i> ** (Wagner, 1947)	27.05.2000	3	1					Eua?
<i>Edwardsiana avellanae</i> * (Edwards, 1888)	28.06.2000	5	3					E
<i>Edwardsiana flavescens</i> (Fabricius, 1794)	13.05.2000	3						E
	27.05.2000	8	4					
	28.06.2000	10	7		2			
	21.08.2000	1						
<i>Edwardsiana lethierryi</i> (Edwards, 1881)	28.06.2000		12					E
<i>Edwardsiana salicicola</i> (Edwards, 1885)	28.06.2000			2				Eua
<i>Edwardsiana spinigera</i> * (Edwards, 1924)	28.06.2000		1					E
<i>Linnavouriana sexmaculata</i> (Hardy, 1850)	28.06.2000			1				Pal
<i>Typhlocyba</i> (s.str.) <i>quercus</i> (Fabricius, 1777)	28.06.2000	4	18					Esb
	24.07.2000	3						
<i>Typhlocyba</i> (<i>Zonocyba</i>) <i>bifasciata</i> Boheman, 1851	28.06.2000	2						Eua
<i>Eurhadina concinna</i> (Germar, 1831)	28.06.2000	3	3					E
	24.07.2000	2						
	21.08.2000		1					
<i>Eurhadina pulchella</i> (Fallen, 1806)	28.06.2000	2			1			Pal
	24.07.2000	1	2					
<i>Eupteryx aurata</i> (Linnaeus, 1758)	13.05.2000			4				E
	27.05.2000	8		1			14	
	28.06.2000	1						
	24.07.2000	2	1	4				
	21.08.2000			1				
<i>Eupteryx urticae</i> (Fabricius, 1803)	27.05.2000	3						Eua
<i>Eupteryx urticae</i> (Fabricius, 1803)	21.08.2000	1						
<i>Eupteryx calcarata</i> Ossiannilsson, 1936	27.05.2000	6						Esb
	28.06.2000	2						
<i>Eupteryx cyclops</i> Matsumura, 1906	14.05.2000	1						Esb
	27.05.2000						1	
<i>Eupteryx stachydearum</i> (Hardy, 1850)	27.05.2000	2						Eua
	28.06.2000	3						

Taxa	Sampling date	Beech forest	Oak forest	Coppice	Meadow	Pasture	Plum orchard	Z
<i>Eupteryx stachydearum</i> (Hardy, 1850)	24.07.2000	10	1	1				
<i>Eupteryx tenella</i> (Fallen, 1806)	27.05.2000	1			3			E
	28.06.2000	1						
	24.07.2000	1						
<i>Eupteryx vittata</i> (Linnaeus, 1758)	27.05.2000	2	3		2			E
	28.06.2000	2			1			
	24.07.2000				1			
	21.08.2000	1			7			
<i>Eupteryx notata</i> Curtis, 1937	14.05.2000					1		Esb
<i>Eupteryx notata</i> Curtis, 1937	28.06.2000					1		
Tribe Erythroneurini Young, 1952								
<i>Alnetoidia alneti</i> (Dahlbom, 1850)	28.06.2000	161	275	3	1			Pal
	24.07.2000	123	22					
	21.08.2000	6	2					
<i>Zygina flammigera</i> (Fourcroy, 1785)	21.08.2000		1					Eua
<i>Arboridia parvula</i> (Boheman, 1845)	24.04.2000	6						Eua
	13.05.2000	2						
	27.05.2000			1				
	28.06.2000	4	2					
<i>Arboridia erecta</i> (Ribaut, 1931)	24.07.2000	7	7					E
<i>Arboridia ribauti</i> (Ossiannilsson, 1937)	21.08.2000		1					E
SubFamily Deltocephalinae Fieber, 1869								
Tribe Scaphytopiini Oman, 1943								
<i>Japanamus hyalinus</i> (Osborn, 1900)	24.07.2000	3						Hol
	21.08.2000	1						
Tribe Opsiini Emeljanov, 1962								
<i>Neoditurus</i> (s.str.) <i>fenestratus</i> (Herrich-Schaffer, 1834)	24.07.2000				1			Eua
Tribe Macrostelini Kirkaldy, 1906								
<i>Balclutha punctata</i> (Fabricius, 1775)	24.04.2000	20	2	2	1	1	1	Tb
	13.05.2000			3				
	14.05.2000	5	1		5	4	4	
	27.05.2000	8	1	8	47	1	6	
	28.06.2000	8	8	1	26	2		
	21.08.2000	1			10			
<i>Balclutha rhenana</i> Wagner, 1939	14.05.2000		1		1	2	3	Eua
	27.05.2000			1				
	28.06.2000	14	2	2	5	1		
<i>Balclutha rhenana</i> Wagner, 1939	24.07.2000							
<i>Macrosteles cristatus</i> (Ribaut, 1927)	27.05.2000	1			74		10	Pal
	28.06.2000	1			5	1		
	21.08.2000	1			29		10	
<i>Macrosteles viridigriseus</i> (Edwards, 1924)	27.05.2000	1						E
Tribe Deltocephalini Fieber, 1869								

Taxa	Sampling date	Beech forest	Oak forest	Coppice	Meadow	Pasture	Plum orchard	Z
<i>Deltocephalus pulicaris</i> (Fallen, 1806)	27.05.2000	1		1	4			Hol
	28.06.2000				7	1		
	24.07.2000				10			
	21.08.2000				36			
Tribe Doraturini Ribaut, 1952								
<i>Doratura exilis</i> Horvath, 1903	28.06.2000				3			Eua
<i>Doratura stylata</i> (Boheman, 1847)	28.06.2000	1				12		Pal
	24.07.2000			3		39		
<i>Doratura impudica</i> Horvath, 1897	28.06.2000					9		Eua
Tribe Athysanini Van Duzee, 1892								
<i>Platymetopius major</i> (Kirschbaum, 1868)	24.07.2000					1		Eua
<i>Allygus mixtus</i> (Fabricius, 1794)	27.05.2000				1			Pal
	28.06.2000		1			1		
<i>Allygus provincialis</i> (Ferrari, 1882)	14.05.2000		1					E
<i>Allygidius</i> (s.str.) <i>commutatus</i> (Fieber, 1872)	24.07.2000	1						Esb
<i>Graphocraerus ventralis</i> (Fallen, 1806)	14.05.2000					1		Pal
	27.05.2000					26		
	28.06.2000		1	1	3	3		
<i>Hardya tenuis</i> (Germar, 1821)	24.07.2000	1						Eua
<i>Rhopalopyx preysleri</i> (Herrich-Schaffer, 1838)	24.07.2000				1	1		Esb
<i>Rhopalopyx vitripennis</i> (Flor, 1861)	27.05.2000					1		Pal
<i>Cicadula</i> (s.str.) <i>quadrinotata</i> (Fabricius, 1794)	27.05.2000	2		2				Pal
<i>Cicadula</i> (s.str.) <i>quadrinotata</i> (Fabricius, 1794)	28.06.2000			2	2			
	21.08.2000				3		1	
<i>Mocydia crocea</i> (Herrich-Schaffer, 1837)	13.05.2000				1			Eua
	24.07.2000	7	2			1		
	21.08.2000	2			1			
<i>Mocydiopsis parvicauda</i> Ribaut, 1939	24.07.2000		1					Eua
<i>Speudotettix subfuscus</i> (Fallen, 1806)	24.04.2000	5						Pal
	13.05.2000	2	3		1			
	27.05.2000	1						
	28.06.2000	2						
<i>Thamnotettix confinis</i> Zetterstedt, 1840	28.06.2000	1						Hol
<i>Athysanus argentarius</i> Metcalf, 1955	28.06.2000			1	1			Eua
<i>Handianus flavovarius</i> (Herrich-Schaffer, 1835)	27.05.2000					3		Eua?
	28.06.2000				1			
<i>Euscelis distinguendus</i> (Kirschbaum, 1858)	28.06.2000				2	2		E
<i>Euscelis incisus</i> (Kirschbaum, 1858)	24.04.2000					1		Eua
	14.05.2000		1			1	1	
	27.05.2000			1	1	1	1	
	28.06.2000				6	1		
<i>Euscelis incisus</i> (Kirschbaum, 1858)	24.07.2000	3		45	6	10		
	21.08.2000			3		1	1	

Taxa	Sampling date	Beech forest	Oak forest	Coppice	Meadow	Pasture	Plum orchard	Z
<i>Streptanus confinis</i> (Reuter, 1880)	24.07.2000	5						Esb
<i>Artianus interstitialis</i> (Germar, 1821)	28.06.2000					20		Eua
	24.07.2000		4	20	7	38		
	21.08.2000			3				
Tribe Paralimnini Distant, 1908								
<i>Arocephalus</i> (s.str.) <i>languidus</i> (Flor, 1861)	24.07.2000					4		Eua
<i>Psammotettix cephalotes</i> (Herrich-Schaffer, 1834)	14.05.2000					2		Pal
<i>Psammotettix cephalotes</i> (Herrich-Schaffer, 1834)	27.05.2000	1			1		2	
	21.08.2000			4				
<i>Psammotettix confinis</i> (Dahlbom, 1850)	14.05.2000					1		Hol
	27.05.2000				15		2	
	28.06.2000				10			
	24.07.2000				3	2		
	21.08.2000				17			
<i>Psammotettix notatus</i> (Melichar, 1896)	13.05.2000	1						E
<i>Adarrus multinotatus</i> (Boheman, 1847)	27.05.2000	1		1				Pal
<i>Errastunus ocellaris</i> (Fallen, 1806)	13.05.2000			2	6			Hol
	27.05.2000			1	10	10		
	28.06.2000			1	11			
	24.07.2000	1	1		9			
	21.08.2000			1			1	
<i>Turrutus socialis</i> (Flor, 1861)	14.05.2000					3		Pal
	27.05.2000		2	4		1		
	28.06.2000					19		
	24.07.2000					17		
	21.08.2000			4	1			
<i>Jassargus</i> (<i>Obtujargus</i>) <i>obtusivalvis</i> (Kirschbaum, 1868)	28.06.2000				3			Eua
<i>Jassargus</i> (<i>Arrailus</i>) <i>flori</i> (Fieber, 1869)	27.05.2000	2	17		4			E
	28.06.2000		6		14			
	24.07.2000		5	1	2			
	21.08.2000				2			
<i>Verdanus abdominalis</i> (Fabricius, 1803)	14.05.2000					1		Esb
	27.05.2000					6		
	28.06.2000				1	4		
<i>Arthaldeus pascuellus</i> (Fallen, 1826)	28.06.2000			1				Pal
<i>Arthaldeus striifrons</i> (Kirschbaum, 1868)	21.08.2000			1				E
<i>Sorhoanus xanthoneurus</i> (Fieber, 1869)	24.07.2000		1		2			Tb
Total number of species		66	66	57	57	41	21	

the same composition as above-mentioned. The herbaceous layer is composed by *Poa nemoralis*, *Asarum europaeum*, *Symphytum tuberosum*, *Trifolium medium*, *Lathyrus niger*.

3. **Coppice** is located along the valley, contains two types of vegetal associations: *Alnetum glutinosae* and *Salicetum cinereae*.
4. **Meadow** is located on the northern slope of the valley, nearby Pădurea Mare. It is a complex ecosystem structured in many microhabitats which are spread as small patches ranging from the moist to dry ones. Dominant vegetal associations are represented by *Schoenetum nigricantis*, *Cariceto-Eriophoretum latifoliae*, *Caricetum vulpinae*. The *Molinietum coeruleae* and *Alopecuretum geniculatae* associations appear as small patches. Mesophilous vegetal associations like: *Trisetetum flavescens*, *Agrosteto-Festucetum rubrae* and also *Nardetum strictae* are found as small patches in the neighbouring area of Pădurea Mare.
5. **Pasture** is located on the southern slope of the valley nearby Pădurea Goruniș. This ecosystem contains only one type of vegetal association, *Agrosteto-Festucetum sulcatae*.
6. **Plum orchard** is a typical anthropic ecosystem containing *Prunus domestica*. The herbaceous layer is composed by *Festuca sulcata*, *Agrostis tenuis* and *Thymus glabrescens*.

The phytocenological description of the analysed ecosystems was performed after POP (1962) and POP & co. (2002).

Results and discussions

As a consequence of our faunistic studies in the Valea Morii-Vâlcele area, 140 cicada species have been identified (Table 1). This result indicates an extremely rich Auchenorrhyncha fauna if we compare these data with those of other previous studies, POPA (2000a, 2000b, 2001).

The 140 identified cicada species belong to 7 families. The richest family is Cicadellidae (109 species), followed by Delphacidae (13 species) and Cercopidae (8 species). The other families are less represented, especially Cixiidae and Issidae (2 species each), fig. 2.

Within the Cicadellidae family, the distribution of species in subfamilies is shown in fig. 3. The best represented subfamily is Deltoccephalinae (42

species), followed by Typhlocybinae (38 species), Macropsinae (11 species), Idiocerinae and Aphrodiinae (5 species each). Macropsinae subfamily is well represented in the analysed area, due to the presence of seven *Salix* species, which provide a rich food resource. The distribution of cicada species in families and subfamilies is performed according to their European representation, HOLZINGER & co., (1997).

The distribution of cicada species according to the type of ecosystem is presented in fig. 4. The highest number of species was registered in forest ecosystems, Pădurea Mare and Pădurea Goruniș (with 66 species each), followed by coppice and meadow (with 57 species each). The ecosystems less represented as number of species are pasture (41 species) and plum orchard (21 species). This distribution on ecosystem types shows a great influence of grazing and anthropic activities on the specific diversity of cicada communities. This distribution of the cicada communities within the analysed ecosystems is due to the presence of a high number of sylvan species in the analysed area, especially belonging to the Typhlocybinae subfamily, well represented as number of species.

The distribution of zoogeographic elements is shown in fig. 5. The best represented zoogeographic elements are the Palearctic ones (29 %), followed by Eurasiatic (22 %), European (21 %) and Eurosiberian (16 %). The other zoogeographic elements are less represented. The zoogeographic spectrum shows a dominance of species with large geographic distribution (palearctic and eurasiatic). These data are in contrast with those founded in Cheile Turzii area (located nearby studied area), POPA & co., (2000a), where the dominant elements are the European ones. The zoogeographic data were performed after OSHANIN (1912), SCHIEMENZ (1987, 1988, 1990, 1996) and HOLZINGER & co. (2003).

The studies carried out in Valea Morii-Vâlcele area brought up a set of novelties. We have identified three new species for the fauna of Romania: *Kybos populi* (Edwards, 1908), *Edwardsiana avellanae* (Edwards, 1888), *Edwardsiana spinigera* (Edwards, 1924). We also mention *Edwardsiana ampliata* (Wagner, 1947) as new species for the region of Transylvania. For the first time in Romania, DLABOLA (1961) has recorded this species in the region of Muntenia. A further article will be dedicated to these species.

Conclusions

1. In the Valea Morii-Vâlcele area we have identified 140 cicada species, which represent an

extremely rich fauna for a small landscape surface.

2. The best represented family is Cicadellidae and the less represented are Cixiidae and Issidae.

3. Within the Cicadellidae family the best represented subfamilies are Deltocephalinae, Typhlocybinae and Macropsinae.

4. The highest number of cicada species was recorded in forest ecosystems (beech and oak forest). The smallest number of species was recorded in plum orchard, an anthropic ecosystem.

5. In the studied area dominate cicada species with large geographic distribution (Palearctic and Eurosiberian).

6. In the Valea Morii –Vâlcele area, three new species have been identified in the fauna of Romania and one species, new in the fauna of Transylvania.

REFERENCES

- DLABOLA J. 1961. Neue und bisher unbeschriebene Zikaden-Arten aus Rumänien und Italien (Homoptera, Auchenorrhyncha). Acta Soc.Ent.CŠR, **58** (4): 310-323.
- HOLZINGER W. E. & colab. 1997. Vorläufiges Verzeichnis der Zikaden Mitteleuropas (Insecta: Auchenorrhyncha). Beitr. Zikadenk., **1**: 43-62.
- HOLZINGER W. E. & colab. 2003. The Auchenorrhyncha of Central Europe, Fulgoromorpha, Cicadomorpha, excl. Cicadellidae. Brill Acad. Publ., Leiden – Boston, 673 p.
- NEGUCIOIU A. & colab. 1980. Județele patriei – Monografie Cluj. Ed. Sport – Turism, București, 302 p.
- OSHANIN B. 1912. Katalog der Paläarktischen Hemipteren (Heteroptera, Homoptera-Auchenorrhyncha und Psylloidea), Berlin, 187 p.
- POP I. 1962. Vegetația din Valea Morii – Cluj, conservatoare de relice glaciare. Contrib.Bot. : 233 – 239.
- POP I., CRISTEA V. and HODIȘAN I. 2002. Vegetația județului Cluj (studiu fitocenologic, ecologic, bioeconomic și eco – protectiv). Contrib. Bot. **35** (2): 5 – 254.
- POPA V., COJOCNEANU R. 2000a. The cicada fauna (Homoptera: Auchenorrhyncha) from the “Cheile Turului” area and the “Cheile Turzii” Nature Reserve, Romania. Trav. Mus.Hist.Nat.<<Gr. Antipa>>, **42** : 99 – 109.
- POPA V. 2000b. Ecological studies on the cicada populations (Homoptera, Auchenorrhyncha) in the “Cheile Turzii” Nature Reserve, Romania. Entomol.rom., **5** : 91-97.
- POPA V. 2001. Faunistic and ecological researches on the cicada fauna (Homoptera, Auchenorrhyncha) in Cluj and Dej hilly area (Bobâlna, Dăbâca, Vultureni), Romania. Bul.inf.Soc.lepid.rom., **12** (1-4): 231-240.
- SCHIEMENZ H. 1987. Beiträge zur Insektenfauna de DDR: Homoptera – Auchenorrhyncha (Cicadina) (Insecta). Teil I: Allgemeines Artenliste: Überfamilie Fulgoroidea. Faun.Abh.Mus.Tierkd.Dresden, **15** (8): 41-108.
- SCHIEMENZ H. 1988. Beiträge zur Insektenfauna de DDR: Homoptera – Auchenorrhyncha (Cicadina) (Insecta). Teil II: Überfamilie Cicadoidea excl. Typhlocybinae et Deltocephalinae. Faun.Abh.Mus.Tierkd.Dresden, **16** (5): 37-95.
- SCHIEMENZ H. 1990. Beiträge zur Insektenfauna de DDR: Homoptera – Auchenorrhyncha (Cicadina) (Insecta). Teil III: Unterfamilie Typhlocybinae. Faun .Abh.Mus.Tierkd.Dresden, **17** (17): 141-188.
- SCHIEMENZ H. 1996. Beiträge zur Insektenfauna de DDR: Homoptera – Auchenorrhyncha (Cicadina) (Insecta). Teil IV: Unterfamilie Deltocephalinae, Faun.Abh.Mus.Tierkd.Dresden, **20** (10): 153-258.

Valentin POPA
“Babeș – Bolyai” University
Department of Zoology
3400 – Cluj Napoca, Romania
e-mail: valentin@hasdeu.ubbcluj.ro

Received: 25.10.2003

Accepted: 4.11.2003

Printed: 30.12.2003