

TAXONOMICAL DIVERSITY OF TERRESTRIAL COLEOPTERANS (INSECTA: COLEOPTERA) COLLECTED FROM EIGHT DANUBE ISLETS (CĂLĂRAȘI COUNTY)

MELANIA STAN

Abstract. *Faunistic data on the terrestrial beetles of eight Danube islets-Călărași county are presented here for the first time. 106 beetle species which belong to 17 families were identified. The habitat/microhabitat of each species is mentioned. The coleopteran material was collected during the project "Environmental Conservation and Integrate Management of Danube islets, Romania" in 2007 and 2008.*

Keywords: *Coleoptera, diversity, Danube islets, Călărași, Romania.*

Rezumat. *Diversitatea taxonomică a coleopterelor terestre (Insecta: Coleoptera) de pe opt ostroave dunărene (județul Călărași). Lucrarea prezintă date asupra diversității coleopterofaunei de pe opt ostroave dunărene, județul Călărași pentru prima dată. Au fost identificate 106 specii care aparțin la 17 familii. Cel mai bine reprezentate sunt familiile Staphylinidae și Carabidae (45, respectiv 32 specii). Familia Carabidae este bine reprezentată și prin numărul mare de exemplare colectate. Pentru fiecare din cele opt ostroave se menționează speciile identificate, precum și habitatele și microhabitatele de unde exemplarele au fost colectate. Materialul a fost colectat în cadrul proiectului „Conservarea și managementul integrat al ostroavelor de pe Dunăre, România”, în perioada 2007-2008.*

Cuvinte cheie: *Coleoptera, diversitate, ostroave dunărene, Călărași, România.*

INTRODUCTION

The Danube islets are dynamic formations which change their size and shape all the time depending on the hydrological dynamics of the river, the erosion and sedimentation processes, the regime of periodic flooding, the navigation and the management of floodplain forests.

The project "Environmental Conservation and Integrate Management of Danube islets, Romania" - LIFE/NAT/RO/000177 allowed the achievement of hydrologic, petrological and biodiversity studies on eight pilot islets: Albina (km 410), Haralambie (km 400), Ciocănești (km 395), Pisica (km 365), Șoimu (km 353), Turcescu (km 344-342), Cianu Nou (km 342) and Fermecatu (km 324-322).

The floodplain ecosystems (natural floodplain forests, swamps, sand belts and channels) characterise these islets. On Haralambie, Ciocănești, Șoimu and Cianu Nou islets there is natural vegetation consisting of willow forests (*Salix alba*, *S. fragilis*), black poplar forests (*Populus nigra*) and white poplar forests (*P. alba*). The number of ruderal species is reduced, meaning that the anthropogenic impact is insignificant. On Albina and Fermecatu islets, besides the natural vegetation, there are plantations of Euroamerican poplar (*Populus canadensis* x *P. tremula*) as well as a lot of ruderal plants, which means significant human impact. The same situation was observed on Pisica and Turcescu islets.

The eight Danube islets are within two Natura 2000 sites, one of them being declared as Site of Community Interest (SCI) and the other as Special Protected Areas (SPA). Three of the islets (Haralambie, Ciocănești, Șoimu) were declared reserves since November 2004.

For the evaluation of faunistic diversity of these islets the Order Coleoptera is very important being the group with the most described species up to now, its representatives live in different terrestrial and aquatic habitats, and they have an important role in the trophic pattern of area through different categories: predatory species, phytophagous, decompositions (detritophagous, coprophagous, necrophagous).

There are no previous studies regarding the qualitative composition of beetle fauna from Danube islets-Călărași county. In 2005 a few data about rove beetles from four Danube islets: Cama, Dinu, Slobozia and Mocanu-Giurgiu county were published (STAN, 2005).

MATERIAL AND METHODS

The qualitative studies of terrestrial beetles were made on the eight islets: Albina (N: 44° 07. 543'; E 026 52. 426'), Haralambie (N: 44° 08. 431'; E 026 59. 627'), Ciocănești (N: 44° 08. 745'; E 027 04. 105'), Pisica (N: 44° 07. 769'; E 027 22. 209'), Șoimu (N: 44° 09. 730'; E 027 30. 822'), Turcescu (N: 44° 11. 714'; E 027 34. 770'), Cianu Nou (km 342) and Fermecatu (N: 44° 14. 810'; E 027 52. 079').

In 2007 beetle specimens were collected using the following collecting methods:

- pitfall traps (5 for each islet) which were placed in right line parallel with the bank of the Danube and close to it in the thin layer of poplar and willow leaf litter on Haralambie, Ciocănești, Șoimu, Fermecatu islets (the 26th of June - the 28th of August);

- exhauster on the sandy wet bank of the Danube river (Fermecatu, Turcescu, Pisica islets, on the 28th of August and Albina, Ciocănești islets, on the 29th of August), on the clay bank with short vegetation (Haralambie islet, on the 29th of August) and horse dung (Fermecatu, Turcescu islet, on the 28th of August);

- sweep netting (Haralambie and Pisica islets, on the 26th of June);

- hand capture (Albina, Ciocănești, Șoimu, Fermecatu islets, on the 27th of June).

In 2008 were used as collecting methods:

- pitfall traps (4 for each islet) installed in the same way on Albina, Haralambie, Ciocănești, Șoimu, Cînu Nou islets (the 26th of March - the 27th of May);

- exhauster on the sandy wet bank of the Danube river (Șoimu, Fermecatu islets on the 26th of May), on the edge of temporary and permanent pools, in willow forest what presented the traces of the previously floods (Haralambie, Pisica, Fermecatu islets on the 26th of May), on the rotten poplar stump (Turcescu islet on the 26th of May);

- sifting poplar and willow leaf litter (Turcescu, Cînu Nou islets, on the 26th of May and Albina, Haralambie islets, on the 27th of May);

- flotation method (fungi grown on the willow stumps, Fermecatu islet, on the 26th of May);

- shaking the bushes (Turcescu islet, on the 26th of May).

Identified beetle species are presented in Table 1, in alphabetical order, grouped according to families. For each species the islet and the specific habitat or microhabitat are mentioned, where it was collected using abbreviations. Nomenclature of species and families have been updated according to the taxonomic system and nomenclature used in Fauna Europaea (www.faunaeur.org).

RESULTS AND DISCUSSIONS

The specimens of 106 terrestrial beetle species which belong to 17 families were collected from eight Danube islets-Călărași county in 2007 and 2008. Family Carabidae is very well represented by the number of specimens, while Family Staphylinidae is very well represented by the number of species (45), followed by Family Carabidae (32).

Table 1. The taxonomic pattern of the terrestrial beetle fauna on the eight Danube islets (Călărași county).
Tabel 1. Structura taxonomică a faunei de coleoptere terestre de pe opt ostroave dunărene (județul Călărași).

	Taxons	Al	Ha	Ci	Pi	Șo	Tu	C N	Fe
Suborder Adephaga									
Family Carabidae									
1	<i>Agonum scitulum</i> (DEJEAN, 1828)					a			
2	<i>Amara aenea</i> (DE GEER, 1774)		c					c	
3	<i>Amara familiaris</i> DUFTSCHMID, 1812			c					
4	<i>Anisodactylus binotatus</i> FABRICIUS, 1787	c							
5	<i>Asaphidion flavipes</i> (LINNAEUS, 1761)	c		c, d				d	a
6	<i>Badister bullatus</i> (SCHRANK, 1798)				b				
7	<i>Bembidion lampros</i> (HERBST, 1784)			c					
8	<i>Bembidion laticolle</i> (DUFTSCHMID, 1812)								a1
9	<i>Bembidion quadrimaculatum</i> (LINNAEUS, 1761)		a1						
10	<i>Bembidion semipunctatum</i> (DONOVAN, 1806)	B		a1		a1			
11	<i>Bembidion striatum</i> (FABRICIUS, 1792)		a1						a1
12	<i>Bembidion subcostatum</i> vau NETOLITZKY, 1913			c					
13	<i>Brachinus psophia</i> SERVILLE, 1821							c	
14	<i>Calathus fuscipes</i> (GOEZE, 1777)			C					
15	<i>Carabus cancellatus graniger</i> PALLIARDI, 1825	c	C, c	C, c		C, c			C
16	<i>Chlaeniellus nitidulus</i> (SCHRANK, 1781)	c	C, c	c				d	C
17	<i>Chlaenius festinus</i> (PANZER, 1796)			C					C
18	<i>Chlaenius spoliatus</i> (P. ROSSI, 1792)		C	C, c		C			C
19	<i>Clivina fossor</i> (LINNAEUS, 1758)	c							
20	<i>Dolichus halensis</i> (SCHALLER, 1783)			C		C			C
21	<i>Dyschiriodes aeneus</i> (DEJEAN, 1825)		c	c	b				
22	<i>Elaphrus riparius</i> (LINNAEUS, 1758)		c						
23	<i>Licinus depressus</i> (PAYKULL, 1790)							c	
24	<i>Limodromus assimilis</i> (PAYKULL, 1790)	c	c, d	C, c		a, c		c	
25	<i>Nebria brevicollis</i> (FABRICIUS, 1792)			c					
26	<i>Poecilus cupreus</i> (LINNAEUS, 1758)	c	C, c	C, c	b			c	C, c
27	<i>Pterostichus niger</i> (SCHALLER, 1783)			C					
28	<i>Pterostichus anthracinus</i> (ILLIGER, 1798)	c		C					
29	<i>Pterostichus ovoideus</i> STRUM, 1824	c	c	c		c			
30	<i>Pseudoophonus rufipes</i> (DE GEER, 1774)	c	C, c	C					C
31	<i>Stenolophus discophorus</i> (FISCHER, 1823)			d		b			
32	<i>Stomis pumicatus</i> (PANZER, 1796)	c	C, c	C, c					
Suborder Polyphaga									
Family Hydrophilidae									
33	<i>Sphaeridium scarabaeoides</i> (LINNAEUS, 1758)						h		

Family Silphidae								
34	<i>Necrophorus vespillo</i> (LINNAEUS, 1758)			C		C		C
35	<i>Silpha carinata</i> HERBST, 1783	c						
36	<i>Silpha obscura</i> LINNAEUS, 1758	c					c	
37	<i>Phosphuga atrata</i> (LINNAEUS, 1758)		d	C, c				
Family Staphylinidae								
38	<i>Acrotona muscorum</i> (BRISOUT DE BARNEVILLE, 1860)					a1	h	
39	<i>Alaobia scapularis</i> (SAHLBERG, 1831)	c					h	
40	<i>Aleochara haematoptera</i> KRAATZ, 1858			C		a1, a	a1	C, a1
41	<i>Aleochara intricata</i> MANNERHEIM, 1830							h
42	<i>Aloconota gregaria</i> (ERICHSON, 1839)		b					
43	<i>Atheta elongatula</i> (GRAVENHORST, 1802)		C					
44	<i>Atheta orbata</i> (ERICHSON, 1837)		c	c				
45	<i>Bledius dissimilis</i> ERICHSON, 1840		A					
46	<i>Dinaraea angustula</i> (GYLLENHALL, 1810)			C				
47	<i>Carpelimus exiguus</i> (ERICHSON, 1839)		A		a1		a1	
48	<i>Carpelimus obesus</i> (KIESENWETTER, 1844)							a1
49	<i>Gabrius nigrutilus</i> (GRAVENHORST, 1802)		c					C
50	<i>Gyrophaena joyioides</i> WÜSTHOFF, 1937							e
51	<i>Gyrophaena lucidula</i> ERICHSON, 1837							e
52	<i>Ischnopoda umbratica</i> (GRAVENHORST, 1806)				b	a		b
53	<i>Ischnosoma splendidum</i> (GRAVENHORST, 1806)					C		
54	<i>Lathrobium taxi</i> BERNHAUER, 1902				b			b
55	<i>Leptacinus batychrus</i> (GYLLENHALL, 1827)							h
56	<i>Liogluta longiuscula</i> (GRAVENHORST, 1802)	c						
57	<i>Neobisnius procerulus</i> (GRAVENHORST, 1806)				b			
58	<i>Ocypus nitens</i> (SCHRANK, 1781)		c					
59	<i>Paederus fuscipes</i> CURTIS, 1826	B	A, b		b, i	a1, a	d	a1, a
60	<i>Platystethus cornutus</i> (GRAVENHORST, 1802)							h
61	<i>Platystethus nitens</i> (SAHLBERG, 1832)			c				
62	<i>Philonthus diversiceps</i> BERNHAUER, 1901		b					
63	<i>Philonthus micans</i> (GRAVENHORST, 1802)		b		b		d	b
64	<i>Philonthus punctus</i> (GRAVENHORST, 1802)							C
65	<i>Philonthus succicola</i> THOMSON, 1860			C				
66	<i>Pseudomedon obsoletus</i> (NORDMANN, 1837)				b			
67	<i>Sepedophilus immaculatus</i> (STEPHENS, 1832)	c						
68	<i>Sepedophilus testaceus</i> (FABRICIUS, 1793)			C				
69	<i>Stenus biguttatus</i> (LINNAEUS, 1758)	B	A			a1	a1	a1
70	<i>Stenus boops</i> LJUNGH, 1810	B	A					
71	<i>Stenus comma</i> LE CONTE, 1863		b					
72	<i>Stenus circularis</i> GRAVENHORST, 1802	c						
73	<i>Stenus fuscipes</i> GRAVENHORST, 1802	B	b	a1				b
74	<i>Stenus humilis</i> ERICHSON, 1839			c				
75	<i>Stenus incrassatus</i> ERICHSON, 1839		b					
76	<i>Stenus morio</i> GRAVENHORST, 1806	B	A, b				a1	a1, b
77	<i>Stenus stigmula</i> ERICHSON, 1840	B	A		a1, b			b
78	<i>Stenus providus</i> ERICHSON, 1839				b			
79	<i>Sunius melanocephalus</i> (FABRICIUS, 1792)						d	
80	<i>Tachyporus hypnorum</i> (FABRICIUS, 1775)	c	A	C		C		
81	<i>Tachyusa coarctata</i> ERICHSON, 1837	B						a1
82	<i>Tasgius melanarius melanarius</i> (HEER, 1839)					c		c
Family Cetoniidae								
83	<i>Cetonia aurata</i> LINNAEUS, 1761	F						
84	<i>Valgus hemipterus</i> (LINNAEUS, 1758)	F					f	
Family Coccinellidae								
85	<i>Adalia bipunctata</i> (LINNAEUS, 1758)	f					f	f
86	<i>Coccinella septempunctata</i> LINNAEUS, 1758	F		F				F
87	<i>Oenopia conglobata</i> (LINNAEUS, 1758)		F					
88	<i>Psyllobora vigintiduopunctata</i> (LINNAEUS, 1758)		F	F	F			
Family Dermestidae								
89	<i>Dermestes gyllenhalii</i> LAPORTE DE CASTELNAU, 1840		c	C				C
Family Cleridae								
90	<i>Trichodes apiarius</i> LINNAEUS, 1758	F						
Family Malachidae								
91	<i>Malachius bipustulatus</i> (LINNAEUS, 1758)	f					f	
Family Mycetophagidae								
92	<i>Mycetophagus quadrimaculatus</i> (LINNAEUS, 1761)			C				
Family Zopheridae								
Subfam. Colydiinae								
93	<i>Bitoma crenata</i> (FABRICIUS, 1775)						g	
Family Anthicidae								
94	<i>Anthelephila pedestris</i> (ROSSI, 1790)	c	c, d		b	C, a	c	c
95	<i>Hirticomus hispidus</i> (ROSSI, 1792)				i	C		C

Family Mordellidae									
96	<i>Variimorda villosa</i> (SCHRANK, 1781)							F	
Family Pyrochroidae									
97	<i>Pyrochroa serraticornis</i> (SCOPOLI, 1763)		F						
Family Tenebrionidae									
Subfamily Lagriinae									
98	<i>Lagria hirta</i> LINNAEUS, 1758		f					F	
Family Cerambycidae									
99	<i>Agapanthia villosoviridescens</i> (DE GEER, 1775)		f						
100	<i>Aromia moschata</i> LINNAEUS, 1758							F	
Family Chrysomelidae									
101	<i>Chrysomela vigintipunctata</i> (SCOPOLI, 1763)							f	
102	<i>Chrysomela populi</i> LINNAEUS, 1758		F						
103	<i>Crepidodera pluta</i> (LATREILLE, 1804)			f				f	
104	<i>Galerucella lineola</i> (FABRICIUS, 1781)			F					
105	<i>Podagrica fuscipes</i> (FABRICIUS, 1775)							F	
106	<i>Phyllotreta ochripes</i> (CURTIS, 1837)			F					
The number of beetle species which were collected on the each Danube islet		30	35	33	17	18	13	12	35

Abbreviations:

Al. Albina islet; Ha. Haralambie islet; Ci. Ciocănești islet; Pi. Pisica islet; Șo. Șoimu islet; Tu. Turcescu islet; C N. Cianu Nou islet; Fe. Fermecatu islet.

A. Danube clay bank with very rare vegetation (2007); a1. Danube sandy wet bank (2007); a. Danube sandy wet bank (2008); B. high Danube bank with willow trees, without litter; b. edge of temporary pool, willow forest (2008); C. thin layer of poplar, willow leaf litter (pitfall traps 2007); c. thin layer of poplar and willow leaf litter (pitfall traps 2008); d. thin layer of poplar litter, close to the bank of the Danube River (sifting litter, 2008); e. fungi grown on willow stumps (2008); F. bushes and herbaceous plants (2007); f. bushes and herbaceous plants (2008); g. rotten poplar stump (2008); h. under dry horse dung (2007); i. hand capture from the soil (2007).

Abrevieri:

Al. Ostrov Albina; Ha. Ostrov Haralambie; Ci. Ostrov Ciocănești; Pi. Ostrov Pisica; Șo. Ostrov Șoimu; Tu. Ostrov Turcescu; C N. Ostrov Cianu Nou; Fe. Ostrov Fermecatu.

A. mal argilos al Dunării cu vegetație scundă (2007); a1. mal nisipos umed al Dunării (2007); a. mal nisipos umed al Dunării (2008); B. mal înalt al Dunării cu salcie; b. mal zonă inundată temporar în pădure de salcie (2008); C. litieră subțire de plop și salcie (capcane de sol, 2007); c. litieră subțire de plop și salcie (capcane de sol 2008); d. litieră subțire de plop în apropierea malului Dunării (cernere litieră, 2008); e. fungi crescuți pe trunchiuri căzute de salcie (2008); F. arbuști și plante ierboase (2007); f. arbuști și plante ierboase (2008); g. trunchi de plop putred (2008); h. sub balegă uscată de cabaline (2007); i. colectare directă de pe sol (2007).

A great number of the ground beetles specimens were found in pitfall traps: *Carabus cancellatus graniger* (59 specimens (sps.) Ciocănești islet, 28 sps. Fermecatu islet), *Poecilus cupreus* (142 sps. Fermecatu islet, 7 sps. Ciocănești islet), *Chlaenius spoliatus* (63 sps. Ciocănești islet, 19 sps. Fermecatu islet) and *Pseudoophonus rufipes* (51 sps. Ciocănești islet, 19 sps. Fermecatu islet). In 2008 the pitfall traps were put earlier than in 2007 (at the end of March) and only two ground beetle species were collected in a large number: *Carabus cancellatus graniger* (22 sps. Albina islet, 17 sps. Ciocănești and Șoimu islets, 10 sps. Haralambie islet) and *Limodromus assimilis* (44 sps. Ciocănești islet, 30 sps. Albina islet, 10 sps. Șoimu islet and 9 sps. Haralambie islet). On Pisica and Turcescu islets it was not possible to install the pitfall traps, explaining the absence of ground beetles here. Many areas on the islets were not explored because of their very dense thicket vegetation (for example, Ciocănești islet was explored only close to the Danube bank). The natural communities of Carabidae and Staphylinidae are not so rich in species.

Based on our field observations the edaphic beetles (ground beetles, rove beetles, carrion beetles, dermestid beetles and ant-like beetles) are more frequently on these islets than floricolous and arboricolous species. The most species of ground beetles and rove beetles collected from these islets are humicolous. The species of *Bembidion* genus and rove beetle species *Ischnopoda umbratica*, *Tachyusa coarctata*, *Bledius dissimilis*, *Aleochara haematoptera*, *Carpelimus exiguus*, *Stenus biguttatus* are ripicolous. *Philonthus diversiceps*, *P. micans* are paludicolous species.

Bembidion subcostatum is represented in Romanian fauna only by the subspecies *B. subcostatum vau*, the northern limit of its areal does not overcome 50°lat. N. (NIȚU, 2006). *Lathrobium taxi* a rare rove beetle species was found on two islets (Pisica and Fermecatu) on the edge of temporary pools.

The ground beetles and most of the rove beetles collected from these islets are predatory species. Floricolous and arboricolous species like *Trichodes apiarius*, *Malachius bipustulatus*, *Pyrochroa serraticornis*, *coccinelids* are predators, too. The necrophilous species are represented by four species of Silphidae (one of them *Necrophorus vespillo* being collected in a big number from Șoimu islet-14 sps) and *Dermestes gyllenhalii*. *Coprophilous species*, *Sphaeridium scarabaeoides*, *Aleochara intricata*, *Platystethus cornutus* were found under the dry horse dung. *Mycetophilous species*: *Gyrophana joioides*, *G. lucidula* were found only on Fermecatu islet. *Bitoma crenata* is a saproxylic beetle being collected from the rotten poplar stump. *Phytophagous species* are represented by the species of leaf beetles, cetonids and longhorn beetles.

CONCLUSIONS

We can appreciate that the diversity of beetle fauna on the eight islets is rather similar, the difference regarding the number of species is given by the collecting methods, the choice (and availability) of the collecting sites and the collecting period. This project permitted us to make the first step for the estimation of the taxonomical diversity of terrestrial coleopterans from eight Danube islets-Călărași county.

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REFERENCES

- NIȚU E. 2006. *Coleoptera Familia Carabidae (Tribul Bembidiini)*. In: Fauna României. Insecta. **10**(6). Edit. Academiei Române București: 7-196.
- STAN MELANYA 2005. *Rove beetles (Coleoptera: Staphylinidae) from the Danube floodplain area, Giurgiu sector (Romania)*. Travaux du Muséum National d'Histoire Naturelle "Grigore Antipa". București. **48**: 87-101.
<http://www.faunaeur.org> (accessed 15 mai-30 iunie).

Melania Stan

Grigore Antipa National Museum of Natural History
Str. Kiseleff, no. 1, 011341 Bucharest 2, Romania
E-mail: mstan@antipa.ro

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