

**COPROPHILOUS AND COPROPHAGOUS BEETLES
IN THE FAECES OF EUROPEAN BISON (*Bison bonasus* LINNAEUS 1758)
FROM THE VÂNĂTORI NEAMȚ NATURAL PARK (NEAMȚ COUNTY, ROMANIA)**

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Abstract. The diversity of coprophilous and coprophagous beetles from the faeces of European bison (*Bison bonasus* LINNAEUS 1758) was studied in July, August, September and October 2011. Altogether 401 individuals: 317 Scarabaeoidea (12 species), 57 Hydrophiloidea (4 species) and 27 Histeroidea (2 species) were caught. The scarabeoids belonged to three families: Aphodiidae (six genera and eight species), Scarabaeidae (two genera and three species) and Geotrupidae (one species). *Acrossus depressus* (KUGELANN 1792) and *Labarrus lividus* (OLIVIER 1789) were collected only in July. *Coprimorphus scrutator* (HERBST 1789) was the only species occurring during the whole study period (July, August, September and October). *Acrossus rufipes* (LINNAEUS 1758) and *Teuchestes fossor* (LINNAEUS 1758) were found in July, August and September. *Aphodius fimetarius* (LINNAEUS 1758) was collected in July, August and October. *Anoplotrupes stercorosus* (SCRIBA 1791) was found in July and September. *Otophorus haemorrhoidalis* (LINNAEUS 1758), *Onthophagus taurus* (SCHREBER 1759) and *Onthophagus illyricus* (SCOPOLI 1763) occurred only in August. *Aphodius coniugatus* (PANZER 1795) and *Caccobius schreberi* (LINNAEUS 1758) were collected only in October. *Aphodius coniugatus* (PANZER 1795) and *Labarrus lividus* (OLIVIER 1789) were recorded in Moldavia Region for the first time.

Keywords: coprophagous, scarabeoids, European bison, Vânători Neamț Natural Park, Moldavia, Romania.

Rezumat. Coleoptere coprofile și coprofage din dejecțiile de zimbbru (*Bison bonasus* LINNAEUS 1758) din Parcul Natural Vânători Neamț (județul Neamț, România). Materialul analizat în această lucrare a fost colectat din dejecții de zimbbru (*Bison bonasus* LINNAEUS 1758), în iulie, august, septembrie și octombrie 2011, din Parcul Natural Vânători Neamț. Pe lângă cele 317 exemplare de Scarabaeoidea (12 specii), au mai fost colectate 57 Hydrophiloidea (4 specii) și 27 Histeroidea (2 specii). În ceea ce privește cele 12 specii de scarabeoidee, *Acrossus depressus* (KUGELANN 1792) și *Labarrus lividus* (OLIVIER 1789) au fost colectate doar în iulie. *Coprimorphus scrutator* (HERBST 1789) a fost singura specie prezentă în probele colectate în toate cele patru luni de studiu. *Acrossus rufipes* (LINNAEUS 1758) și *Teuchestes fossor* (LINNAEUS 1758) au fost identificate în probele din iulie, august și septembrie. *Aphodius fimetarius* (LINNAEUS 1758) a fost colectat în iulie, august și octombrie. *Anoplotrupes stercorosus* (SCRIBA 1791) a fost colectat în iulie și septembrie. *Otophorus haemorrhoidalis* (LINNAEUS 1758), *Onthophagus taurus* (SCHREBER 1759) și *Onthophagus illyricus* (SCOPOLI 1763) au fost prezente doar în probele din august. *Aphodius coniugatus* (PANZER 1795) și *Caccobius schreberi* (LINNAEUS 1758) au fost colectate doar în octombrie. Două specii: *Aphodius coniugatus* (PANZER 1795) și *Labarrus lividus* (OLIVIER 1789) sunt pentru prima dată menționate pentru zona Moldovei.

Cuvinte cheie: coprofage, scarabeoidee, zimbbru, Parcul Natural Vânători Neamț, Moldova, România.

INTRODUCTION

The European bison (*Bison bonasus* LINNAEUS 1758) is a herd vertebrate, which lives in both mixed and solely-male groups. Mixed groups consist of infants, young aged 2-3 years, calves and young adult bulls. The average herd size depends on environmental factors, though on average, they number 8-13 animals per herd. Herds consisting solely of bulls are smaller than the mixed ones, containing two individuals on average. European bison herds are not family units. Different herds frequently interact, combine and quickly split after exchanging individuals (http://en.wikipedia.org/wiki/European_bison).

This species was an autochthonous component of the Carpathian fauna until its final extirpation at the beginning of the 19th century. Last records of free living bison in the Carpathians (1810) are from Transylvania Region (PERZANOWSKI & DEJU, 2005). According to the European Bison Pedigree Book (EBPB), the world population of European bison (*Bison bonasus*) grew up exponentially, at present, the population numbering 3,053 individuals living in 196 enclosed centres and 30 free herds, is distributed in over 33 countries (OLECH, 2005).

As it is known, the dung beetles communities play an important role as decomposers of animal faeces. The presence of the European bison on a territory “attracts” a specific coprophagous fauna. Therefore, the aim of this paper is to present some contributions to the knowledge of the diversity of coprophagous scarabeoids from the faeces of European bison (*Bison bonasus*).

MATERIAL AND METHODS

The material analysed in this paper was collected in July, August, September and October 2011 in Vânători Neamț Natural Park (Neamț County, Romania). The European bison live in “Dragoș Vodă” Protected Area (for bison and Carpathian fauna), which is a part of Vânători Neamț Natural Park, together with other three protected areas, viz: Forests of Copper, Silver Forest and “Dumbrava” Protected Area (oak wood).

“Dragoș Vodă” Protected Area is one of the biggest from Europe dedicated specially to bison. Located in the northern part of Neamț County, at Vânători-Neamț village, it represents one of the most visited points in the county. This protected area was founded in 1968 and it lies on an area of approximately 11,500 ha (<http://www.visitneamt.com/2009/09/the-aurochs-reservations-and-carpathian-fauna-dragos-voda-neamt-county>) (Fig. 1).

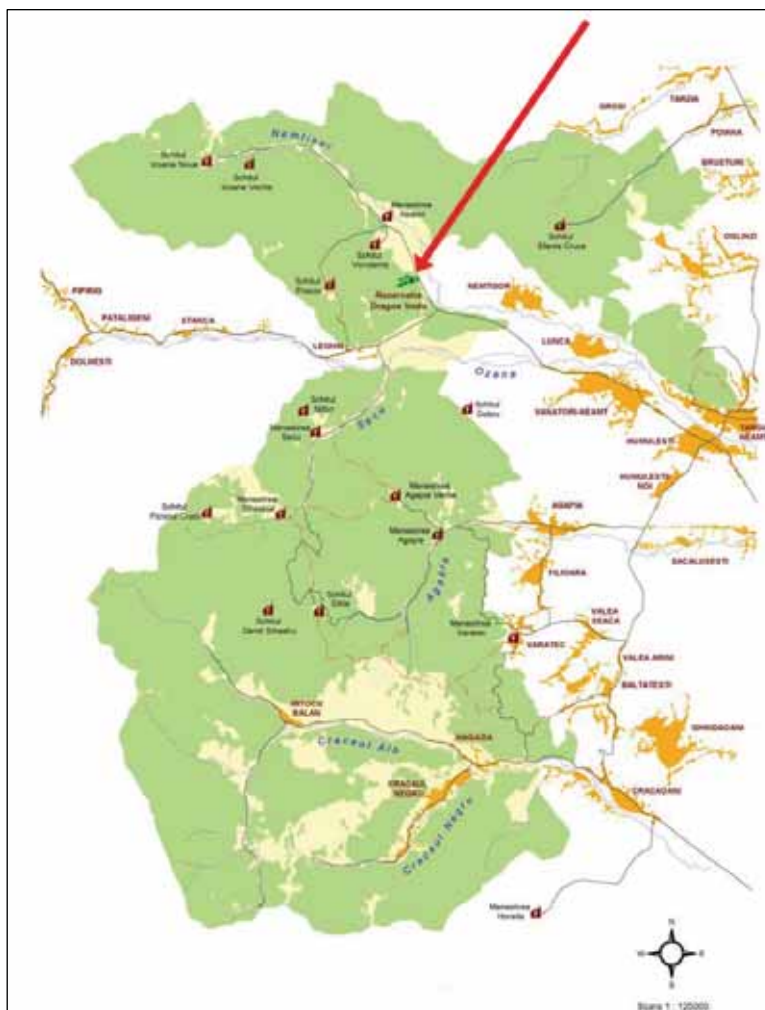


Figure 1. Map of Vânători Neamț Natural Park (Neamț County, Romania)

(<http://www.viziteazaneamt.ro/harta-turistica-neamt/harti-parcul-vanatori>). / Figura 1. Harta Parcului Natural Vânători Neamț (județul Neamț, România) (<http://www.viziteazaneamt.ro/harta-turistica-neamt/harti-parcul-vanatori>).

The coprophilous and coprophagous beetles were collected directly from the European bison faeces. Each dung pad was considered as a sample. The insects have been preserved in alcohol. Together with the scarabeoids, other beetles were also collected (Hydrophiloidea and Histeroidea). The material was identified using the keys by PANIN, 1957, MEDVEDEV, 1965, IENIȘTEA, 1975, 1982, DELLACASA, 1983, and GÎDEI, 2005. Weighted average linkage method was used for hierarchical classifications of the samples and the detrended correspondence analysis for the ordination of the species. The Horn's index was used for similarity measure. All calculations were carried out by the programs Past (HAMMER *et al.*, 2001). The taxonomy and nomenclature used in this paper is in accordance with Fauna Europaea (<http://www.faunaeur.org>).

RESULTS AND DISCUSSIONS

For studying the diversity of coprophilous and coprophagous beetles from the faeces of European bison, there were analysed 28 samples consisting of 401 individuals: 317 Scarabaeoidea, 57 Hydrophiloidea and 27 Histeroidea (Table 1).

Table 1. The beetles collected from the faeces of European bison – Vânători Neamț Natural Park (2011). / Tabel 1. Coleopterele colectate din dejecțiile de zimbbru – Parcul Natural Vânători Neamț (2011).

Suprafamily	Family	Subfamily	No. of genera	No. of species	No. of individuals
Scarabaeoidea	Aphodiidae	Aphodiinae	6	8	251
	Scarabaeidae	Scarabaeinae	2	3	6
	Geotrupidae	Geotrupinae	1	1	60
Hydrophiloidea	Hydrophilidae	Spaeridiinae	2	4	57
Histeroidea	Histeridae	Histerinae	2	2	27
	5	5	13	18	401

The scarabeoids belonged to three families: Aphodiidae (a single subfamily – Aphodiinae with six genera and eight species), Scarabaeidae (Scarabaeinae subfamily with two genera and three species) and Geotrupidae (Geotrupinae subfamily with a single species) (Table 2).

Table 2. The Coleoptera species collected from the faeces of European bison – Vânători Neamț Natural Park (2011). / Tabel 2. Speciile de coleoptere colectate din dejecțiile de zimbru – Parcul Natural Vânători Neamț (2011).

Family / Subfamily	Species	No. of individuals	%
Aphodiidae / Aphodiinae	<i>Acrossus rufipes</i> (LINNAEUS 1758)	53	13.22
	<i>A. depressus</i> (KUGELANN 1792)	2	0.5
	<i>Aphodius coniugatus</i> (PANZER 1795)	25	6.23
	<i>A. fimetarius</i> (LINNAEUS 1758)	92	22.94
	<i>Coprimorphus scrutator</i> (HERBST 1789)	38	9.48
	<i>Labarrus lividus</i> (OLIVIER 1789)	7	1.75
	<i>Otophorus haemorrhoidalis</i> (LINNAEUS 1758)	1	0.25
	<i>Teuchestes fossor</i> (LINNAEUS 1758)	33	8.23
	8	251	62.60
Scarabaeidae / Scarabaeinae	<i>Onthophagus taurus</i> (SCHREBER 1759)	3	0.75
	<i>O. illyricus</i> (SCOPOLI 1763)	2	0.50
	<i>Caccobius schreberi</i> (LINNAEUS 1758)	1	0.25
	3	6	1.50
Geotrupidae / Geotrupinae	<i>Anoplotrupes stercorosus</i> (SCRIBA 1791)	60	14.96
		1	60
Hydrophilidae / Sphaeridiinae	<i>Cercyon</i> sp. – 2 species	29	7.23
	<i>Sphaeridium lunatum</i> (FABRICIUS 1792)	27	6.73
	<i>S. substriatum</i> (FALDERMANN 1838)	1	0.25
		4	57
Histeridae / Histeridae	<i>Margarinotus obscurus</i> (KUGELANN 1792)	2	0.5
	<i>Hister unicolor</i> (LINNAEUS 1758)	25	6.23
	2	27	6.73
5	18	401	100

The dominant species (Table 2) was *Aphodius fimetarius* (LINNAEUS 1758) (92 individuals – 22.94%) being followed by *Anoplotrupes stercorosus* (SCRIBA 1791) – 60 individuals – 14.96%. The large number of *Anoplotrupes stercorosus* (SCRIBA 1791) can be explained by the fact that they were found in two samples collected in the forest, in September. Other three species were also well represented: *Acrossus rufipes* (LINNAEUS 1758) – 53 individuals (13.22%), *Coprimorphus scrutator* (HERBST 1789) – 38 individuals (9.48%) and *Teuchestes fossor* (LINNAEUS 1758) with 33 individuals (8.23%) (Fig. 2).

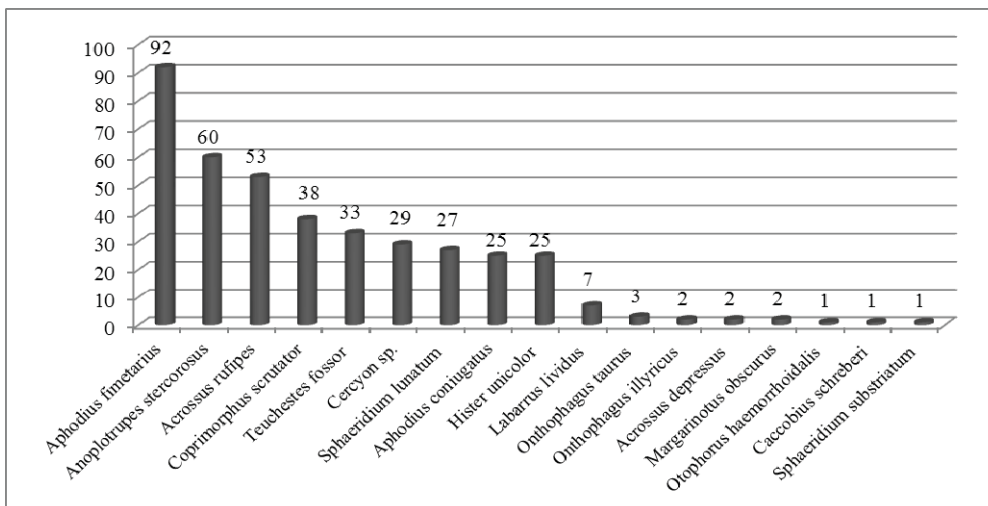


Figure 2. The numerical distribution of the beetle species collected from the faeces of European bison – Vânători Neamț Natural Park (2011). / Figura 2. Distribuția numerică a speciilor coprofile și coprofage colectate din dejecțiile de zimbru – Parcul Natural Vânători Neamț (2011).

Table 3 surveys the 18 coprophilous and coprophagous species found in all samples. According to Horn’s index, the samples form two distinct clusters (Fig. 3). The first cluster includes 2 samples: S4 and S5 – they were collected from the forest and they include a large number of *Anoplotrupes stercorosus* (SCRIBA 1791). The other cluster includes the rest of the samples. One of its subcluster includes 6 samples collected on 1 July 2011. In this subcluster the samples J12 and J13 are separate by the rest because they include *Sphaeridium substriatum* (FALDERMANN 1838) (this species was not found in the other samples collected on 1 July 2011). The other 4 samples (J14, J19, J17 and J11) form a separate subcluster as a result of the presence of three species: *Acrossus rufipes* (LINNAEUS 1758), *Labarrus lividus* (OLIVIER 1789) and *Cercyon* sp. The separation of the samples J14 and J19 from the other two (J11 and J17) is dependent on the increased abundance of *Acrossus rufipes* (LINNAEUS 1758) and decreased abundance of *Cercyon* sp.

The rest of the samples collected on 1 July 2011 (J15, J16 and J18) are included in another subcluster together with the samples collected on 21 July 2011 and two samples collected on 8 October 2011 (O1 and O3). The presence of three species: *Acrossus rufipes* (LINNAEUS 1758), *Acrossus depressus* (KUGELANN 1792) and *Anoplotrupes stercorosus* (SCRIBA 1791) in the sample J16 explains its separation from the rest of the samples. The subcluster of the samples J18, O1 and O3 results from the absences of *Teuchestes fossor* (LINNAEUS 1758).

The samples collected in August and 2 samples collected in September (S1 and S3) form a separated subcluster as a result of the presence of *Hister unicolor* (LINNAEUS 1758). Within this subcluster the sample A3 is separated of the rest because of the presence of 2 species: *Onthophagus taurus* (SCHREBER 1759) and *Onthophagus illyricus* (SCOPOLI 1763). The samples A5 and S1 separates from the subcluster that includes A1, A2, A4 and S3 samples as a result of the absence of *Teuchestes fossor* (LINNAEUS 1758).

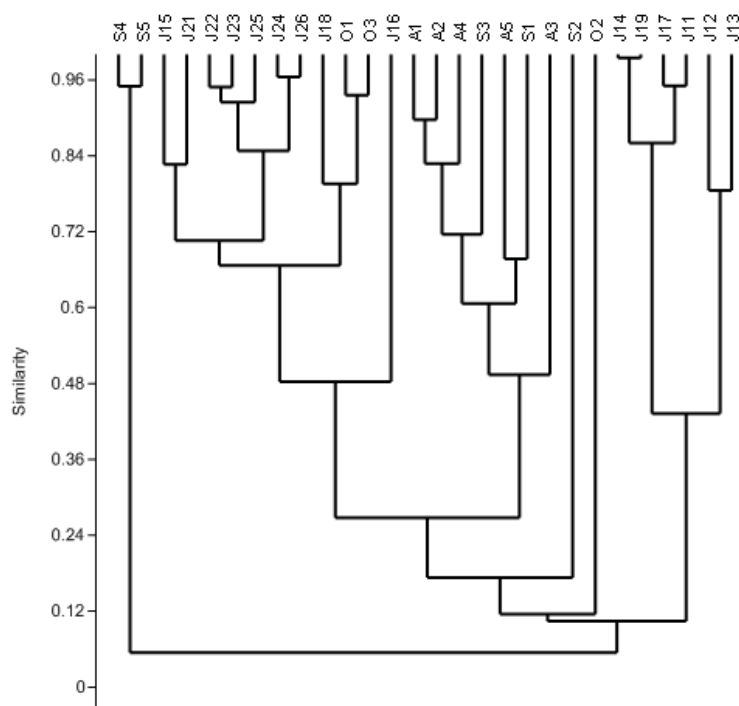


Figure 3. Hierarchical classification of the samples collected from Vânători Neamț Natural Park, using Horn's index of similarity (J11-J19, J21-J26, A1-A5, S1-S5 and O1-O3 – samples collected on 1 July, 21 July, 7 August and respectively on 8 October 2011). / Figura 3. Clasificarea ierarhică a probelor colectate în Parcul Natural Vânători Neamț, folosind indexul de similaritate Horn (J11-J19, J21-J26, A1-A5, S1-S5 și O1-O3 – probele colectate pe 1 iulie, 21 iulie, 7 august și respectiv pe 8 octombrie 2011).

Fifteen samples were collected in July: 9 on 1 July 2011 (99 beetles – 10 species) and 6 on 21 July 2011 (81 insects – 5 species). For August (7 August 2011) 5 samples were examined – 61 individuals (10 species). 105 beetles (6 species) were identified for the 5 samples collected in September (2 September 2011), 5 species (55 insects) for the 3 samples collected in October (8 October 2011) (Table 4).

Cercyon sp. and *Labarrus lividus* (OLIVIER 1789) were collected only on 1 July 2011: 4 samples collected in that day included both species (J11, J14, J17 and J19) and in the DCA ordination diagram (Fig. 4) they take a little separated position (Fig. 4). *Onthophagus taurus* (SCHREBER 1759) and *Onthophagus illyricus* (SCOPOLI 1763) were collected only in August (A3). *Acrossus rufipes* (LINNAEUS 1758) and *Sphaeridium lunatum* (FABRICIUS 1792) were collected on 1 July, 7 August and 2 September (the first species were well represented in the samples from 1 July and 2 September; the second species were well represented in the samples from 7 August). *Sphaeridium substriatum* (FALDERMANN 1838) and *Otophorus haemorrhoidalis* (LINNAEUS 1758) were represented only by a single specimen collected on 7 August (different samples). *Hister unicolor* (LINNAEUS 1758) and *Coprimorphus scrutator* (HERBST 1789) were collected on 21 July, 7 August, 2 September and 8 October (the second species was also present in one of the samples collected on 1 July). *Aphodius coniugatus* (PANZER 1795) and *Caccobius schreberi* (LINNAEUS 1758) were collected only on 8 October (Fig. 4); therefore they separate from mother species in the ordination diagram. In general, the second ordination axis corresponds with the time sequence of sampling and species predominating in the samples from beginning of July or occurring only in these samples are situated in the left part of the diagram, those predominating in the samples from turn of July and August in the central lower part and those from the samples from October in the right upper part. At the same time, the diagram reflects the mutual excluding of the species *Aphodius fimetarius* (LINNAEUS 1758) on one hand and *Caccobius schreberi* (LINNAEUS 1758) and *Aphodius coniugatus* (PANZER 1795) on other hand in the October samples (Fig. 4, Table 3).

Table 3. Survey of species and number of individuals in samples collected from the faeces of European bison – Vânători Neamț Natural Park (2011).
Tabel 3. Distribuția speciilor și numărul lor de indivizi în probele colectate din dejecțiile de zimbbru – Parcul Natural Vânători Neamț (2011).

Family / species	Date and samples																														
	July 1							July 21							August 7							September 2							October 8		
	1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	1	2	3	4	5	1	2	3	4	5	1	2	3			
Aphodiidae																															
<i>Acrossus depressus</i> (KUGELANN 1792)					1	1																									
<i>A. rufipes</i> (LINNAEUS 1758)	4	1	11	3	1	8	9								1	1	1	1	1	7			4								
<i>Aphodius fimetarius</i> (LINNAEUS 1758)					6	2	4			5	6	2	9	3	26	2															
<i>Teuchestes fossor</i> (LINNAEUS 1758)					2					1	3	3	2	4	5	4	2	1	1												
<i>Labarrus lividus</i> (OLIVIER 1789)	2			2		2		1																							
<i>Coprimorphus scrutator</i> (HERBST 1789)					2					5					1	3	1	3		2	18	2						1			
<i>Otrophorus haemorrhoidalis</i> (LINNAEUS 1758)																1															
<i>Aphodius coniugatus</i> (PANZER 1795)																															
Geotrupidae																															
<i>Anoplotrupes stercorosus</i> (SCRIBA 1791)					1																		34	25							
Scarabaeidae																															
<i>Onthophagus lyricus</i> (SCOPOLI 1763)																															
<i>O. taurus</i> (SCHREBER 1759)																															
<i>Caccobius schreberi</i> (LINNAEUS 1758)																												1			
Hydrophilidae																															
<i>Ceryon</i> sp.	5	5	12	1			5	1																							
<i>Sphaeridium lunatum</i> (FABRICIUS 1792)			5	1											6	1	10	1	2	1											
<i>S. substriatum</i> (FALDERMANN 1838)																															
Histeridae																															
<i>Margarinotus obscurus</i> (KUGELANN 1792)								1																							
<i>Hister unicolor</i> (LINNAEUS 1758)										1	1				1	2	4	1	1	5	2							1			
Number of species	3	3	2	3	4	4	4	2	3	3	3	2	4	4	4	7	5	6	6	3	4	1	3	2	1	3	3	3			
Number of individuals	11	11	13	14	13	5	16	5	11	11	10	6	11	9	34	21	6	18	8	8	12	18	12	38	25	16	22	17			

Table 4. List of the coprophilous and coprophagous species collected from Vânători Neamț Natural Park (2011), indicating the number of individuals, mean, standard deviation and frequency calculated for each collecting date. / Tabel 4. Lista speciilor coprofile și coprofage colectate din Parcul Natural Vânători Neamț (2011), cu indicarea numărului de indivizi, valoarea medie, deviația standard și frecvența, calculate pentru fiecare zi de colectare în parte.

Family / species	Date and samples																
	1 July			21 July			07 August			2 September			8 October				
	ind.	mean	s. d.	F [%]	ind.	mean	s. d.	F [%]	ind.	mean	s. d.	F [%]	ind.	mean	s. d.	F [%]	
Aphodiidae																	
<i>Acrossus depressus</i> (KUGELANN 1792)	2	0.22	0.44	22.22													
<i>A. rufipes</i> (LINNAEUS 1758)	37	4.11	4.20	77.78	5	1.00	0.00	100.00	11	2.20	3.19	40.00					
<i>Aphodius finetarius</i> (LINNAEUS 1758)	12	1.33	2.24	33.33	51	8.50	8.92	100.00	2	0.40	0.89	20.00	27	9.00	6.93	100.00	
<i>Teuchestes fossor</i> (LINNAEUS 1758)	2	0.22	0.67	11.11	18	3.00	1.41	100.00	8	1.60	1.52	80.00	5	1.00	2.24	20.00	
<i>Labarrus lividus</i> (OLIVIER 1789)	7	0.78	0.97	44.44													
<i>Coprimorphus scrutator</i> (HERBST 1789)	2	0.22	0.67	11.11	6	1.00	2.00	33.33	7	1.40	1.52	60.00	22	4.40	7.67	60.00	1
<i>Otophorus haemorrhoidalis</i> (LINNAEUS 1758)									1	0.20	0.45	20.00					
<i>Aphodius coniugatus</i> (PANZER 1795)																	
Geotrupidae																	
<i>Anoplotrupes stercorosus</i> (SCRIBA 1791)	1	0.11	0.33	11.11									59	11.80	16.47	40.00	
Scarabaeidae																	
<i>Onithophagus lyricus</i> (SCOPOLI 1763)					2	0.40	0.89	20.00									
<i>O. taurus</i> (SCHREBER 1759)					3	0.60	1.34	20.00									
<i>Caccobius schreberi</i> (LINNAEUS 1758)																	
Hydrophilidae																	
<i>Ceryon</i> sp.	29	3.22	3.99	66.67													
<i>Sphaeridium lunatum</i> (FABRICIUS 1792)	6	0.67	1.66	22.22					20	4.00	3.94	100.00	1	0.20	0.45	20.00	
<i>S. substriatum</i> (FALDERMANN 1838)									1	0.20	0.45	20.00					
Histeridae																	
<i>Margarinotus obscurus</i> (KUGELANN 1792)	1	0.11	0.33	11.11	1	0.17	0.41	16.67									
<i>Hister unicolor</i> (LINNAEUS 1758)					5	0.83	0.75	66.67	12	2.40	1.95	100.00	7	1.40	2.19	40.00	1
Number of samples	9				6				5				5				3
Number of species	10				5				10				6				5
Number of individuals	99				81				61				105				55

Table 5 surveys earlier records of 12 scarabeoid species recorded in the European bison faeces in Moldavia Region. Thus, the majority of the species were mentioned earlier for Bacău, Neamț and Suceava Counties. *Acrossus depressus* (KUGELANN 1792) and *Onthophagus taurus* (SCHREBER 1759) were mentioned for Bacău and Neamț Counties; *Onthophagus illyricus* (SCOPOLI 1763) was recorded earlier in Bacău and Suceava Counties.

This is the first record for *Aphodius coniugatus* (PANZER 1795) and *Labarrus lividus* (OLIVIER 1789) for Moldavia Region (PANIN, in 1957, mentioned that *Labarrus lividus* is spread all over Romania, with no other data).

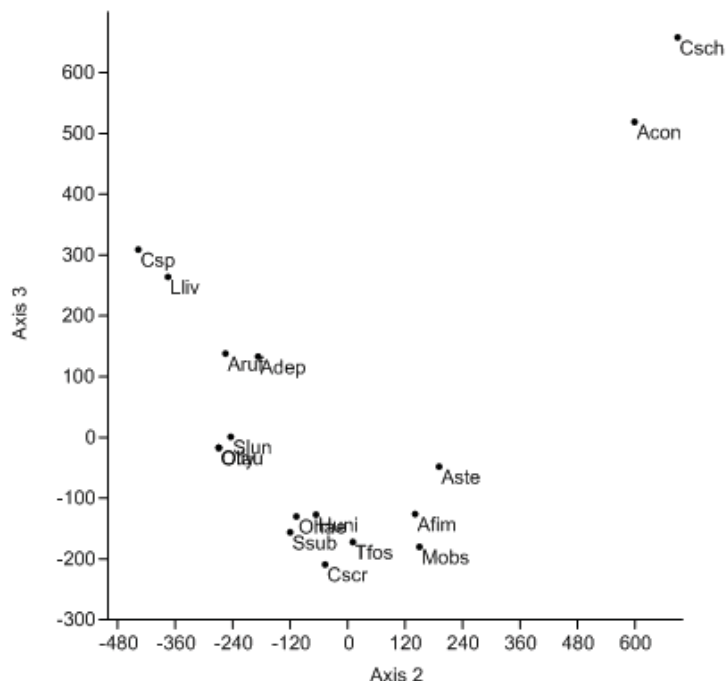


Figure 4. Detrended correspondence analysis of the species collected from Vânători Neamț Natural Park (2011). / Figura 4. Analiza DCA pentru speciile colectate în Parcul Natural Vânători Neamț (2011).

Table 5. The earlier records for Moldavia Region of the scarabeoid species in the faeces of European bison – Vânători Neamț Natural Park (2011). / Tabel 5. Menționările anterioare ale speciilor de scarabeoidee colectate din dejecțiile de zimbriu – Parcul Natural Vânători Neamț (2011).

Species	Earlier records for Moldavia Region	Method
<i>Acrossus rufipes</i> (LINNAEUS 1758)	Suceava County (DĂNILĂ, 1970a, b)	Nemeș collection
	Ceahlău – Neamț County (MOGLAN & COJOCARU, 2003)	Ovidae faeces Bovidae faeces Equidae faeces
	Vânători Neamț Natural Park, Neamț County (ARINTON, 2005a)	Bovidae faeces Equidae faeces
	Dofteana Valley, Bacău County (ARINTON, 2005b)	Equidae faeces
	Bacău and Neamț Counties (ARINTON, 2007b)	Bovidae faeces Equidae faeces
	Vânători Neamț Natural Park, Neamț County (ARINTON, 2011)	Bovidae faeces Equidae faeces
<i>A. depressus</i> (KUGELANN 1792)	Dofteana Valley, Bacău County (ARINTON, 2005b)	Equidae faeces
	Poiana Sărată, Bacău County (ARINTON, 2005c)	Equidae faeces
	Bacău and Neamț Counties (ARINTON, 2007b)	Bovidae faeces Equidae faeces
<i>Aphodius coniugatus</i> (PANZER 1795)	the first record for Moldavia Region	
<i>A. fimetarius</i> (LINNAEUS 1758)	all over Romania (PANIN, 1957)	-
	Suceava County (DĂNILĂ, 1970a)	Nemeș collection
	Ceahlău – Neamț County (MOGLAN & COJOCARU, 2003)	Ovidae faeces Bovidae faeces Equidae faeces
	Vânători Neamț Natural Park, Neamț County (ARINTON, 2005a)	Bovidae faeces Equidae faeces
	Dofteana Valley, Bacău County (ARINTON, 2005b)	Equidae faeces
	Bacău and Neamț Counties (ARINTON, 2007b)	Bovidae faeces Equidae faeces
	Holt, Bacău County (ARINTON, 2009a, b)	Bovidae faeces
	Holt, Bacău County (ARINTON, 2010)	Bovidae faeces
Vânători Neamț Natural Park, Neamț County (ARINTON, 2011)	Bovidae faeces Equidae faeces	

<i>Coprimorphus scrutator</i> (HERBST 1789)	Northern Moldavia (PANIN, 1957)	-
	Suceava County (DĂNILĂ, 1970a)	Nemeș collection
	Bacău and Neamț Counties (ARINTON, 2007b)	Bovidae faeces Equidae faeces
	Holt, Bacău County (ARINTON, 2009a, b)	Bovidae faeces
<i>Labarrus lividus</i> (OLIVIER 1789)	Vânători Neamț Natural Park, Neamț County (ARINTON, 2011)	Bovidae faeces Equidae faeces
	the first record for Moldavia Region (PANIN, 1957 mentioned that this species is spread all over Romania)	
<i>Otophorus haemorrhoidalis</i> (LINNAEUS 1758)	Northern Moldavia (PANIN, 1957)	-
	Suceava County (DĂNILĂ, 1970a)	Nemeș collection
	Ceahlău – Neamț County (MOGLAN & COJOCARU, 2003)	Bovidae faeces
	Holt, Bacău County (ARINTON, 2007b)	Bovidae faeces
	Holt, Bacău County (ARINTON, 2009a, b)	Bovidae faeces
<i>Teuchestes fossor</i> (LINNAEUS 1758)	Holt, Bacău County (ARINTON, 2010)	Bovidae faeces
	Northern Moldavia (PANIN, 1957)	-
	Suceava County (DĂNILĂ, 1970a)	Nemeș collection
	Ceahlău – Neamț County (MOGLAN & COJOCARU, 2003)	Bovidae faeces
	Vânători Neamț Natural Park, Neamț County (ARINTON, 2005a)	Bovidae faeces Equidae faeces
	Bacău and Neamț Counties (ARINTON, 2007b)	Bovidae faeces Equidae faeces
	Holt, Bacău County (ARINTON, 2009a, b)	Bovidae faeces
	Holt, Bacău County (ARINTON, 2010)	Bovidae faeces
<i>Onthophagus taurus</i> (SCHREBER 1759)	Vânători Neamț Natural Park, Neamț County (ARINTON, 2011)	Bovidae faeces Equidae faeces
	all over Romania (PANIN, 1957)	-
	Ceahlău – Neamț County (MOGLAN & COJOCARU, 2003)	Ovidae faeces Bovidae faeces
	Poiana Sărată, Bacău County (ARINTON, 2005c)	Equidae faeces
	Bacău and Neamț Counties (ARINTON, 2007b)	Bovidae faeces Equidae faeces
	Holt, Bacău County (ARINTON, 2009a, b)	Bovidae faeces
<i>O. illyricus</i> (SCOPOLI 1763)	Holt, Bacău County (ARINTON, 2010)	Bovidae faeces
	Suceava County (DĂNILĂ, 1970a)	Nemeș collection
	Poiana Sărată, Bacău County (ARINTON, 2005c)	Equidae faeces
	Bacău County (ARINTON, 2007b)	Bovidae faeces Equidae faeces
	Holt, Bacău County (ARINTON, 2009a, b)	Bovidae faeces
<i>Caccobius schreberi</i> (LINNAEUS 1758)	Holt, Bacău County (ARINTON, 2010)	Bovidae faeces
	all over Romania (PANIN, 1957)	-
	Suceava County (DĂNILĂ, 1970a)	Nemeș collection
	Ceahlău – Neamț County (MOGLAN & COJOCARU, 2003)	Ovidae faeces Bovidae faeces
	Bașta, Neamț County (ARINTON, 2004a, b)	pitfalls
	Vânători Neamț Natural Park, Neamț County (ARINTON, 2005a)	Bovidae faeces
	Bacău and Neamț Counties (ARINTON, 2007b)	Bovidae faeces pitfalls
<i>Anoplotrupes stercorosus</i> (SCRIBA 1791)	Holt, Bacău County (ARINTON, 2009a, b)	Bovidae faeces
	all over Romania (PANIN, 1957)	-
	Suceava County (DĂNILĂ, 1970a)	Nemeș collection
	Bacău and Neamț Counties (ARINTON, 2004b)	pitfalls
	Vânători Neamț Natural Park, Neamț County (ARINTON, 2005a)	Bovidae faeces Equidae faeces pitfalls from the soil
	Dofteana Valley, Bacău County (ARINTON, 2005b)	Equidae faeces from the soil
	Poiana Sărată, Bacău County (ARINTON, 2005c)	Equidae faeces
	Holt, Bacău County (ARINTON, 2007a)	lighting trap
	Bacău and Neamț Counties (ARINTON, 2007b)	Bovidae faeces Equidae faeces pitfalls from the soil
	Holt, Bacău County (ARINTON, 2009a, b)	Bovidae faeces
	Vânători Neamț Natural Park, Neamț County (ARINTON, 2011)	Bovidae faeces Equidae faeces pitfalls from the soil

CONCLUSIONS

1. For studying the diversity of coprophilous and coprophagous beetles from the faeces of European bison, there were analysed 28 samples collected in July, August, September and October 2011.

2. Together with the 317 Scarabaeoidea (12 species), other beetles were also collected: 57 Hydrophiloidea (4 species) and 27 Histeroidea (2 species).

3. *Acrossus depressus* (KUGELANN 1792) and *Labarrus lividus* (OLIVIER 1789) were collected only in July. *Coprimorphus scrutator* (HERBST 1789) was the only species occurring during the whole study period (July, August, September and October). *Acrossus rufipes* (LINNAEUS 1758) and *Teuchestes fossor* (LINNAEUS 1758) were found in July, August and September. *Aphodius fimetarius* (LINNAEUS 1758) was collected in July, August and October. *Anoplotrupes stercorosus* (SCRIBA 1791) was found in July and September. *Otophorus haemorrhoidalis* (LINNAEUS 1758), *Onthophagus taurus* (SCHREBER 1759) and *Onthophagus illyricus* (SCOPOLI 1763) were occurred only in August. *Aphodius coniugatus* (PANZER 1795) and *Caccobius schreberi* (LINNAEUS 1758) were collected only in October.

4. Two species were found for the first time in the Moldavia Region: *Aphodius coniugatus* (PANZER 1795) and *Labarrus lividus* (OLIVIER 1789).

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