

DATA CONCERNING THE DIVERSITY OF SCARABEOID BEETLES (COLEOPTERA: SCARABAEOIDEA) FROM THE VÂNĂTORI NEAMȚ NATURAL PARK (NEAMȚ COUNTY, ROMANIA)

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Abstract. The material analysed in this paper was collected from the Vânători Neamț Natural Park (Neamț County, Romania) during 2003-2005. The results were completed with the data obtained by searching the entomological collection of “Ion Borcea” Natural Science Museum Complex of Bacău (scarabeoids collected before 2003). In the literature, 86 species were mentioned for the Moldavia region. PANIN (1955, 1957) considered that 41 of these species are spread all over Romania. For Vânători Neamț Natural Park the author identified 22 species of scarabeoids, which are included into 21 genera, 9 subfamilies and 8 families. 8 species are mentioned for the first time for Neamț County: *Oxythyrea funesta* (PODA 1761), *Protaetia (Netocia) cuprea* (FABRICIUS 1775), *Gnorimus nobilis* (LINNAEUS 1758), *Trichius fasciatus* (LINNAEUS 1758), *Oryctes nasicornis* (LINNAEUS 1758), *Geotrupes puncticollis* (MALINOWSKY 1811), *Lucanus cervus* (LINNAEUS 1758) and *Hoplia argentea* (PODA 1761).

Keywords: Vânători Neamț Natural Park, scarabeoids, diversity.

Rezumat. Date privind diversitatea scarabeoideelor (Coleoptera: Scarabaeoidea) din Parcul Natural Vânători Neamț (județul Neamț, România). Studiarea diversității scarabeoideelor din Parcul Natural Vânători Neamț (județul Neamț) a presupus o activitate de teren desfășurată în perioada 2003-2005, care a fost completată de consultarea colecției de entomologie a Complexului Muzeal de Științele Naturii „Ion Borcea” Bacău. În literatură, pentru Moldova, au fost semnalate 86 de specii de scarabeoidee. Pentru Parcul Natural Vânători Neamț, autoarea a identificat 22 de specii, din care 8 specii sunt menționate pentru prima dată pentru județul Neamț: *Oxythyrea funesta* (PODA 1761), *Protaetia (Netocia) cuprea* (FABRICIUS 1775), *Gnorimus nobilis* (LINNAEUS 1758), *Trichius fasciatus* (LINNAEUS 1758), *Oryctes nasicornis* (LINNAEUS 1758), *Geotrupes puncticollis* (MALINOWSKY 1811), *Lucanus cervus* (LINNAEUS 1758) și *Hoplia argentea* (PODA 1761).

Cuvinte cheie: Parcul Natural Vânători Neamț, scarabeoide, diversitate.

INTRODUCTION

The Vânători Neamț Natural Park was established in April 1999, as a subunit of Piatra Neamț Forest District. This protected area covers a 30,818 hectare surface (of which 26,322 hectares forests) located in the northern part of Neamț County (CĂTĂNOIU, 2005).

According to the speciality literature, 86 species of scarabeoids have been mentioned for Moldavia Region, until 2004. PANIN (1955, 1957) considered that 41 of these species are spread all over Romania (without other mentions regarding Moldavia Region). Beside these 41 species, according to the same author, other 22 species can be found in Moldavia Region. In 1970 DĂNILĂ published two papers regarding the diversity of coleopterans from Botoșani and Suceava Counties (64 species of scarabeoids were mentioned for the studied area). In 1997 GOAGĂ & TOMOZEI published an entomofaunistic list (that included 5 species of scarabeoids) for Bisericani (Neamț County). The coprophagous coleopterans from the region of Ceahlău Mountains (Neamț County) were studied by MOGLAN & COJOCARU (2003) and 17 scarabeoid species were mentioned for this region. Starting with 2004, the author published different papers regarding the diversity of scarabeoids from Bacău and Neamț Counties (ARINTON, 2004a, 2004b, 2005a, 2005b, 2005c, 2007a, 2007b, 2007c, 2009a, 2009b; ARINTON & CIORNEI, 2007).

The objective of this research work is to present some contributions to the knowledge of the diversity of scarabeoids from Vânători Neamț Natural Park, correlated with anterior mentions in the speciality literature for Moldavia Region.

MATERIAL AND METHODS

Geographically, the Vânători-Neamț Natural Park covers the east mountainside of Stânișoarei Mountains (part of Neamțului Mountains situated in the east-part of the Eastern Carpathians), Neamțului sub-Carpathians (that belong to the Eastern sub-Carpathians) and also the Ozana and Cracău basins. The Vânători-Neamț Natural Park is characterized by three geomorphological areas: mountain area, sub-Carpathian depression area and sub-Carpathian hills area (ARINTON & TOMOZEI, 2010).

All the data presented in this paper were obtained by analysing the insects collected by the author from the Vânători Neamț Natural Park (during 2003-2005) and the beetles collected before 2003 (this material belongs to the entomological collection of “Ion Borcea” Natural Science Museum Complex of Bacău).

As it is known, the scarabeoids represent a very heterogeneous group of insects. Thus, for studying their diversity it is necessary to use different collecting methods. The majority of insects presented in this paper were collected directly from the plants and from the soil. The coprophagous beetles were collected directly from the dung pads. Some insects were collected using pitfalls. The material was identified and preserved in the entomological laboratories of “Ion Borcea” Natural Science Museum Complex of Bacău.

RESULTS AND DISCUSSIONS

For the Vânători Neamț Natural Park (Neamț County), the author identified 22 species of scarabeoids (19 of them were also mentioned earlier for Moldavia Region). Systematically, these 22 species belong to eight families: Aphodiidae (a single subfamily – Aphodiinae with five species), Cetoniidae (with two subfamilies: Cetoniinae – three species and Trichiinae – two species), Dynastidae (Dynastinae subfamily with one species), Geotrupidae (with a single subfamily – Geotrupinae with four species), Lucanidae (a single species), Melolonthidae (a single subfamily Melolonthinae with a single species), Rutelidae (with two subfamilies: Hoplinae – with one species and Rutelinae – also with a species) and Scarabaeidae (Scarabaeinae subfamily with three species) (Table 1).

Table 1. Distribution of species and specimens within the families and subfamilies of scarabeoids.
Tabel 1. Distribuția în cadrul familiilor și subfamiliilor a speciilor și a indivizilor de scarabeoidee.

No.	Families	Subfamily	Number of species	Number of specimens
1.	Aphodiidae	Aphodiinae	5	168
2.	Cetoniidae	Cetoniinae	3	143
3.		Trichiinae	2	5
4.	Dynastidae	Dynastinae	1	3
5.	Geotrupidae	Geotrupinae	4	125
6.	Lucanidae		1	1
7.	Melolonthidae	Melolonthinae	1	2
8.	Rutelidae	Hoplinae	1	8
9.		Rutelinae	1	139
10.	Scarabaeidae	Scarabaeinae	3	18
T	8	9	22	612

Among the 22 species identified for the studied area, 8 species are mentioned for the first time for Neamț County: *Oxythyrea funesta* (PODA 1761), *Protaetia (Netocia) cuprea* (FABRICIUS 1775), *Gnorimus nobilis* (LINNAEUS 1758), *Trichius fasciatus* (LINNAEUS 1758), *Oryctes nasicornis* (LINNAEUS 1758), *Geotrupes puncticollis* (MALINOWSKY 1811), *Lucanus cervus* (LINNAEUS 1758) and *Hoplia argentea* (PODA 1761) (Fig. 1).



Figure 1. Species of scarabeoids identified for the Vânători Neamț Natural Park (Neamț County) (original photos).

Figura 1. Specii de scarabeoidee identificate pentru Parcul Natural Vânători Neamț (Județul Neamț):

- a) *Oxythyrea funesta* (PODA 1761), b) *Protaetia (Netocia) cuprea* (FABRICIUS 1775), c) *Gnorimus nobilis* (LINNAEUS 1758), d) *Trichius fasciatus* (LINNAEUS 1758), e) *Oryctes nasicornis* (LINNAEUS 1758), f) *Geotrupes puncticollis* (MALINOWSKY 1811), g) *Lucanus cervus* (LINNAEUS 1758), h) *Hoplia argentea* (PODA 1761) (fotografii originale).

Scarabaeoidea Superfamily
Aphodiidae Family
Aphodiinae Subfamily

1. *Acrossus rufipes* (LINNAEUS 1758)

Literature (earlier records for Moldavia Region): Botoșani and Suceava Counties (DĂNILĂ, 1970a, 1970b), Ceahlău – Neamț County (MOGLAN & COJOCARU, 2003), the Vânători Neamț Natural Park, Neamț County (ARINTON, 2005a), the Doftena Valley, Bacău County (ARINTON, 2005b), Bacău and Neamț Counties (ARINTON, 2007c).

Material: July 27, 2000 (4 specs.), July 17, 2003 (31 specs.), July 19, 2005 (22 specs.).

2. *Aphodius fimetarius* (LINNAEUS 1758)

Literature (earlier records for Moldavia Region): all over Romania (PANIN, 1957); Botoșani and Suceava Counties (DĂNILĂ I., 1970a), Ceahlău – Neamț County (MOGLAN & COJOCARU, 2003), the Vânători Neamț Natural Park, Neamț County (ARINTON, 2005a), the Doftena Valley, Bacău County (ARINTON, 2005b), Bacău and Neamț Counties (ARINTON, 2007c), Holt, Bacău County (ARINTON, 2009a, b).

Material: June 1, 2000 (14 specs.), July 17, 2003 (43 specs.), July 19, 2005 (31 specs.).

3. *Colobopterus erraticus* (LINNAEUS 1758)

Literature (earlier records for Moldavia Region): Northern Moldavia, Bacău (PANIN, 1957); Botoșani and Suceava Counties (DĂNILĂ, 1970a), Ceahlău – Neamț County (MOGLAN & COJOCARU, 2003), the Vânători Neamț Natural Park, Neamț County (ARINTON, 2005a), the Doftena Valley, Bacău County (ARINTON, 2005b), Bacău and Neamț Counties (ARINTON, 2007c), Holt, Bacău County (ARINTON, 2009a, 2009b).

Material: July 27, 2000 (1 spec.), July 17, 2003 (2 specs.), July 19, 2005 (2 specs.).

4. *Copriformus scrutator* (HERBST 1789)

Literature (earlier records for Moldavia Region): Northern Moldavia (PANIN, 1957); Botoșani and Suceava Counties (DĂNILĂ, 1970a), Bacău and Neamț Counties (ARINTON, 2007c), Holt, Bacău County (ARINTON, 2009a, b).

Material: July 7, 2000 (2 specs.).

5. *Teuchestes fossor* (LINNAEUS 1758)

Literature (earlier records for Moldavia Region): Northern Moldavia (PANIN, 1957); Botoșani and Suceava Counties (DĂNILĂ, 1970a), Ceahlău – Neamț County (MOGLAN & COJOCARU, 2003), the Vânători Neamț Natural Park, Neamț County (ARINTON, 2005a), Bacău and Neamț Counties (ARINTON, 2007c), Holt, Bacău County (ARINTON, 2009a, 2009b).

Material: July 7, 2000 (7 specs.), July 17, 2003 (5 specs.), June 23, 2004 (2 specs.), July 19, 2005 (2 specs.).

Cetoniidae Family
Cetoniinae Subfamily

6. *Cetonia aurata* (LINNAEUS 1761)

Literature (earlier records for Moldavia Region): all over Romania (PANIN, 1957); Botoșani and Suceava Counties (DĂNILĂ, 1970a, b), Bisericani – Neamț County (GOAGĂ & TOMOZEI, 1997), Bașta, Neamț County (ARINTON, 2004a), Bacău and Neamț Counties (ARINTON, 2004b), the Vânători Neamț Natural Park, Neamț County (ARINTON, 2005a), the Doftena Valley, Bacău County (ARINTON, 2005b), Poiana Sărată, Bacău County (ARINTON, 2005c), Slănic Moldova, Bacău County (ARINTON, 2007b).

Material: July 27, 2000 (51 specs.), June 27, 2002 (1 spec.), July 17, 2003 (18 specs.), June 22, 2004 (34 specs.), July 19, 2005 (15 specs.).

7. *Oxythyrea funesta* (PODA 1761)

Literature (earlier records for Moldavia Region): all over Romania (PANIN, 1957); Botoșani and Suceava Counties (DĂNILĂ, 1970a, 1970b), the Doftena Valley, Bacău County (ARINTON, 2005b), Poiana Sărată, Bacău County (ARINTON, 2005c), Slănic Moldova, Bacău County (ARINTON, 2007b).

Material: June 22, 2004 (13 specs.), July 19, 2005 (7 specs.).

8. *Protaetia (Netocia) cuprea* (FABRICIUS 1775)

Literature (earlier records for Moldavia Region): all over Romania (PANIN, 1957); Botoșani and Suceava Counties (DĂNILĂ, 1970a), the Doftena Valley, Bacău County (ARINTON, 2005b).

Material: June 22, 2004 (3 specs.), July 19, 2005 (1 spec.).

Trichiinae Subfamily

9. *Gnorimus nobilis* (LINNAEUS 1758)

Literature (earlier records for Moldavia Region): the Doftena Valley, Bacău County (ARINTON, 2005b), Poiana Sărată, Bacău County (ARINTON, 2005c), Slănic Moldova, Bacău County (ARINTON, 2007b).

Material: July 29, 2000 (1 spec.).

10. *Trichius fasciatus* (LINNAEUS 1758)

Literature (earlier records for Moldavia Region): Northern Moldavia (PANIN, 1957); Botoșani and Suceava Counties (DĂNILĂ, 1970a, 1970b), the Doftena Valley, Bacău County (ARINTON, 2005b), Poiana Sărată, Bacău County (ARINTON, 2005c), Slănic Moldova, Bacău County (ARINTON, 2007b).

Material: July 27, 2000 (4 specs.).

Dynastidae Family
Dynastinae Subfamily

11. *Oryctes nasicornis* (LINNAEUS 1758)

Literature (earlier records for Moldavia Region): all over Romania (PANIN, 1957); Botoșani and Suceava Counties (DĂNILĂ, 1970a).

Material: June 20, 1996 (3 specs.).

Geotrupidae Family
Geotrupinae Subfamily

12. *Anoplotrupes stercorosus* (SCRIBA 1791)

Literature (earlier records for Moldavia Region): all over Romania (PANIN, 1957); Botoșani and Suceava Counties (DĂNILĂ I., 1970a), Bacău and Neamț Counties (ARINTON, 2004b), the Vânători Neamț Natural Park, Neamț County (ARINTON, 2005a), the Doftena Valley, Bacău County (ARINTON, 2005b), Poiana Sărată, Bacău County (ARINTON, 2005c), Holt, Bacău County (ARINTON, 2007a), Bacău and Neamț Counties (ARINTON, 2007c), Holt, Bacău County (ARINTON, 2009a, 2009b).

Material: June 20, 1996 (1 spec.), May 30, 2000 (24 specs.), July 17, 2003 (44 specs.), June 23, 2004 (1 spec.), July 19, 2005 (31 specs.).

13. *Geotrupes puncticollis* (MALINOWSKY 1811)

Literature (earlier records for Moldavia Region): all over Romania (PANIN, 1957), Holt, Bacău County (ARINTON, 2007a), Bacău and Neamț Counties (ARINTON, 2007c), Holt, Bacău County (ARINTON, 2009a, 2009b).

Material: July 27, 2000 (21 specs.).

14. *Geotrupes (Geotrupes) stercorarius* (LINNAEUS 1758)

Literature (earlier records for Moldavia Region): Northern Moldavia (PANIN, 1957); Botoșani and Suceava Counties (DĂNILĂ, 1970a), Bisericani – Neamț County (GOAGĂ & TOMOZEI, 1997), Bacău and Neamț Counties (ARINTON, 2007c).

Material: August 7, 2000 (1 spec.).

15. *Trypocopris vernalis* (LINNAEUS 1758)

Literature (earlier records for Moldavia Region): Northern Moldavia (PANIN, 1957); Botoșani and Suceava Counties (DĂNILĂ, 1970b); Ceahlău – Neamț County (MOGLAN & COJOCARU, 2003), the Doftena Valley, Bacău County (ARINTON, 2005b), Poiana Sărată, Bacău County (ARINTON, 2005c), Bacău and Neamț Counties (ARINTON, 2007c).

Material: July 6, 2001 (2 specs.).

Lucanidae Family

16. *Lucanus cervus* (LINNAEUS 1758)

Material: July 27, 2000 (1 spec.).

Melolonthidae Family
Melolonthinae Subfamily

17. *Amphimallon solstitiale* (LINNAEUS 1758)

Literature (earlier records for Moldavia Region): all over Romania, except Dobrogea Region (PANIN, 1955); Botoșani and Suceava Counties (DĂNILĂ, 1970a, 1970b), the Vânători Neamț Natural Park, Neamț County (ARINTON, 2005a).

Material: July 18, 2003 (2 specs.).

Rutelidae Family
Hoplinae Subfamily

18. *Hoplia argentea* (PODA 1761)

Literature (earlier records for Moldavia Region): the Doftena Valley, Bacău County (ARINTON, 2005b), Poiana Sărată, Bacău County (ARINTON, 2005c)

Material: June 23, 2004 (8 specs.).

Rutelinae Subfamily

19. *Phyllopertha horticola* (LINNAEUS 1758)

Literature (earlier records for Moldavia Region): Moldavia Region (PANIN, 1955); Botoșani and Suceava Counties (DĂNILĂ, 1970a), Neamț County (ARINTON, 2004b), the Dofteana Valley, Bacău County (ARINTON, 2005b), Poiana Sărată, Bacău County (ARINTON, 2005c).

Material: May 31, 2000 (1 spec.), June 22, 2004 (119 specs.), July 19, 2005 (19 specs.).

Scarabaeidae Family Subfamily Scarabaeinae

20. *Coprins lunaris* (LINNAEUS 1758)

Literature (earlier records for Moldavia Region): all over Romania (PANIN, 1957); Botoșani and Suceava Counties (DĂNILĂ, 1970a), Ceahlău – Neamț County (MOGLAN & COJOCARU, 2003), Holt, Bacău County (ARINTON, 2007a), Bacău and Neamț Counties (ARINTON, 2007c), Holt, Bacău County (ARINTON, 2009a, 2009b).

Material: July 5, 1996 (2 specs.), July 27, 2000 (2 specs.).

21. *Caccobius schreberi* (LINNAEUS 1758)

Literature (earlier records for Moldavia Region): all over Romania (PANIN, 1957); Botoșani and Suceava Counties (DĂNILĂ, 1970a), Ceahlău – Neamț County (MOGLAN & COJOCARU, 2003), Bașta, Neamț County (ARINTON, 2004a), Neamț County (ARINTON, 2004b), the Vânători Neamț Natural Park, Neamț County (ARINTON, 2005a), Bacău and Neamț Counties (ARINTON, 2007c), Holt, Bacău County (ARINTON, 2009a, 2009b).

Material: July 17, 2003 (1 spec.), June 23, 2004 (4 specs.), July 19, 2005 (1 spec.).

22. *Onthophagus (Palaeonthophagus) fracticornis* (PREYSSLER 1790)

Literature: all over Romania (PANIN, 1957); Botoșani and Suceava Counties (DĂNILĂ, 1970a), Ceahlău – Neamț County (MOGLAN & COJOCARU, 2003), Bacău and Neamț Counties (ARINTON, 2004b), the Vânători Neamț Natural Park, Neamț County (ARINTON, 2005a), Bacău and Neamț Counties (ARINTON, 2007c), Holt, Bacău County (ARINTON, 2009a, 2009b).

Material: September 17, 1994 (2 specs.), July 17, 2003 (4 specs.), June 23, 2004 (1 spec.), July 19, 2005 (1 spec.).

The author has not found 24 species, which were mentioned earlier for Neamț County, viz. *Euoniticellus fulvus* (GOEZE 1777) (MOGLAN & COJOCARU, 2003), *Onthophagus (Palaeonthophagus) coenobita* (HERBST 1783) (MOGLAN & COJOCARU, 2003), *Onthophagus (Furconthophagus) furcatus* (FABRICIUS 1781) (ARINTON, 2004a, 2004b), *Onthophagus (Palaeonthophagus) nuchicornis* (LINNAEUS 1758) (MOGLAN & COJOCARU, 2003), *Onthophagus (Palaeonthophagus) ovatus* (LINNAEUS 1767) (MOGLAN & COJOCARU, 2003, ARINTON, 2004a, 2004b), *Onthophagus (Palaeonthophagus) ruficapillus* (BRULLE 1832) (ARINTON, 2004a, 2004b), *Onthophagus (Palaeonthophagus) semicornis* (PANZER 1798) (ARINTON, 2004a, b), *Onthophagus (Onthophagus) taurus* (SCHREBER 1759) (MOGLAN & COJOCARU, 2003), *Onthophagus (Palaeonthophagus) vacca* (LINNAEUS 1767) (MOGLAN & COJOCARU, 2003), *Acrossus luridus* (FABRICIUS 1775) (GOAGĂ & TOMOZEI, 1997), *Alocoderus hydrochaeris* (FABRICIUS 1798) (MOGLAN & COJOCARU, 2003), *Aphodius foetens* (FABRICIUS 1787) (MOGLAN & COJOCARU, 2003), *Chilothorax distinctus* (MULLER 1776) (ARINTON, 2004a, 2004b), *Esymus merdarius* (FABRICIUS 1775) (MOGLAN & COJOCARU, 2003), *Euorodalus coenosus* (PANZER 1798) (ARINTON, 2004a, 2004b), *Otophorus haemorrhoidalis* (LINNAEUS 1758) (MOGLAN & COJOCARU, 2003), *Sigorus porcus* (FABRICIUS 1792) (GOAGĂ & TOMOZEI, 1997), *Pleurophorus caesus* (CREUTZER 1796) (ARINTON, 2004a, 2004b), *Rhyssenus germanus* (LINNAEUS 1767) (ARINTON, 2004a, 2004b), *Trox (Trox) hispidus* (PONTOPPIDAN 1763) (ARINTON, 2004a), *Trox (Trox) sabulosus* (LINNAEUS 1758) (ARINTON, 2004a, 2004b), *Trox (Trox) scaber* (LINNAEUS 1767) (PANIN, 1957), *Melolontha melolontha* (LINNAEUS 1758) (ARINTON & CIORNEI, 2007), *Valgus hemipterus* (LINNAEUS 1758) (ARINTON, 2004a).

CONCLUSIONS

1. For studying the diversity of scarabeoid beetles from the Vânători Neamț Natural Park (Neamț County), there have been analysed the insects collected by the author from the studied area (during 2003-2005) and the beetles collected before 2003 (material that belongs to the entomological collection of “Ion Borcea” Natural Science Museum Complex of Bacău).

2. For the Vânători Neamț Natural Park (Neamț County), the author recorded twenty-two species of scarabeoids. Systematically, these 22 species belong to 21 genera, 9 subfamilies and 8 families Aphodiidae, Cetoniidae, Dynastidae, Geotrupidae, Lucanidae, Melolonthidae, Rutelidae and Scarabaeidae.

3. Eight species are mentioned for the first time for Neamț County: *Oxythyrea funesta* (PODA 1761), *Protaetia (Netocia) cuprea* (FABRICIUS 1775), *Gnorimus nobilis* (LINNAEUS 1758), *Trichius fasciatus* (LINNAEUS 1758), *Oryctes nasicornis* (LINNAEUS 1758), *Geotrupes puncticollis* (MALINOWSKY 1811), *Lucanus cervus* (LINNAEUS 1758) and *Hoplia argentea* (PODA 1761).

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