

**DATA ON THE COLEOPTERAN (INSECTA: COLEOPTERA)
FAUNA FROM THE BOGĂȚII FOREST, BRAȘOV COUNTY,
ROMANIA**

NICOLAE LOTREAN

Argeș County Museum, 44 Armand Călinescu Street, 110047, Pitești, Argeș County, Romania,
e-mail: lotrean_n@yahoo.com

MINODORA MANU

Romanian Academy, Institute of Biology Bucharest, Department of Ecology, Taxonomy and Nature
Conservation, 296 Splaiul Independenței Street, 060310, Bucharest, Romania,
e-mail: minodora_stanescu@yahoo.com

ABSTRACT. The communication presents the obtained data regarding the coleopteran fauna from the Bogății Forest protected area, Brașov County. In total, 106 species of coleopteran were identified, being grouped in 30 families. From all these, three species: *Lucanus cervus* (LINNAEUS, 1758), *Cucușus cinnaberinus* (SCOPOLI, 1763) and *Rosalia alpina* (LINNAEUS, 1758) are protected by national and European legislation and the species *Carabus intricatus* LINNAEUS, 1761 is included in the category Near Threatened (NT) by the IUCN.

Keywords: coleopteran, fauna, Bogății Forest ROSCI0137, Romania.

REZUMAT. Date asupra faunei de coleoptere (Insecta: Coleoptera) din Pădurea Bogății, județul Brașov, România. Comunicarea prezintă datele obținute cu privire la fauna de coleoptere din aria protejată Pădurea Bogății, județul Brașov. Au fost identificate 106 specii de coleoptere grupate în 30 de familii. Dintre acestea, 3 specii: *Lucanus cervus* (LINNAEUS, 1758), *Cucușus cinnaberinus* (SCOPOLI, 1763) și *Rosalia alpina* (LINNAEUS, 1758) sunt ocrotite de legislația națională și Europeană, iar specia *Carabus intricatus* LINNAEUS, 1761 este inclusă în categoria Near Threatened (NT) de IUCN.

Cuvinte cheie: coleoptere, faună, pădurea Bogății ROSCI0137, România.

INTRODUCTION

Our study had as main objective the identification and mapping of the species *Rhysodes sulcatus* FABRICIUS, 1787, and possibly other species of xylophagous coleopteran of community interest from the Bogății Forest ROSCI0137. As a secondary objective, was to achieve a preliminary inventory of the coleopteran species from this protected area. In this context, were considered the qualitative, faunistic and less the ones quantitative aspects were considered.

The Bogății Forest (Perșani Mountains) was declared a natural reserve in the year 1971 (Șoneriu & Ularu, 1972) and reconfirmed as a protected area of national interest corresponding to the category an IV-a of International Union for Conservation of Nature (IUCN), natural reserve by faunal, floristic and geological type, in 2000. In 2008, an area of 6,352 hectares becomes community importance site (SCI), with the name Bogății Forest ROSCI0137 (Natura 2000 Standard Form, Bogății Forest ROSCI ROSCI0137; Formularul Standard Natura 2000, Pădurea Bogății ROSCI ROSCI0137).

From a morphological point of view, the Perșani Mountains can be divided into two groups: eastern and western (Albotă & Fesci, 1980). Eastern Group is characterized by heights of over 1,000 meters (peak Cetății - 1,104 meters, peak Horezu - 1,055 meters, Coasta Țiganului - 1,034 meters) (Albotă & Fesci, 1980). Western group, with heights of less than 1,000 meters (maximum altitude is reached by Măgura Pleașa, 873 meters), is formed from the ridges separated by deep valleys (250-400 meters depth) and narrow depressions. The protected area is located in the central part of the Perșani Mountains (Fig. 1), in the Bogatei Mountains subdivision, bordered to south by the Hamaradia Valley and the Vlădeni depression, and to the north by the Olt defile, from Racoș. The Bogatei Mountains have a length of 26 kilometers and a width of 12 kilometers (Munții Perșani – Wikipedia: https://ro.wikipedia.org/wiki/Munții_Perșani).

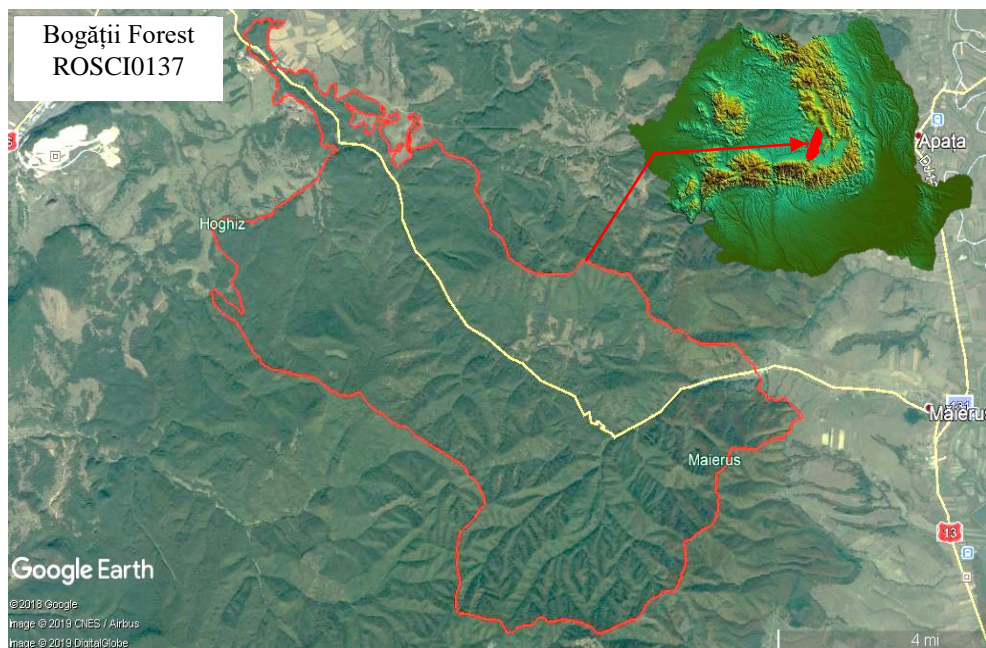


Figure 1 - Location of protected area Bogății Forest (adapted after: Natura 2000 - Standard Data Form and Munții Perșani - Wikipedia).

The protected area stretches on one side and the other of the depression corridor of the Bogății Valley. This is crossed by the national road DN 13, the sector Măieruș-Rupea, which connects the Brașov Depression to the Transylvanian Plateau, crossing the Bogății Forest along its entire length. The territory of the protected area is located in the water catchment area of the Bogății creek (the largest area), affluent of the Olt River and in the basin of the Măeruș creek (Șoneriu & Ularu, 1972). The type of soil is brown, podzolic, typical for mountain forest (Șoneriu & Ularu, 1972).

From a climatic point of view, the area is characterized by relatively cold summers (average temperatures in July are between 14-18 °C) and relatively mild winters (the average temperature in January is -4 °C) (Șoneriu & Ularu, 1972). In the Perșani Mountains, the average annual temperature is between 2 and 8 °C. The average annual number of sunny days is between 80 and 100. Average annual rainfall is between 800 and 1000 mm (Albotă & Fesci, 1980).

According to the Natura 2000 Standard Form, the Bogății Forest is one of the most representative deciduous forests in the country, consisting predominantly of beech, hornbeam and sessile oak (Natura 2000 Standard Form. Bogății Forest ROSCI0137). The largest surfaces are occupied by: Luzulo-Fagetum beech forests (code 9110), approximately 45% of the site's surface, Asperulo-Fagetum beech forests (code 9130), approximately 19% of the site's surface, oak-hornbeam forests Galio-Carpinetum (code 9170), approximately 13% of the site's surface and Dacian beech forests Symphyto-Fagion (code 91V0), approximately 10% of the site's surface. The rest of the habitats: Medio-European limestone beech forests of the Cephalanthero-Fagion (code 9150), Dacian oak & hornbeam forests (code 91Y0) and Alluvial forests with *Alnus glutinosa* (L.) GAERTN and *Fraxinus excelsior* L. (Alno-Padion, Alnion incanae, Salicion albae) (code 91E0), occupy, each, approximately 1% of the site area (Natura 2000 Standard Form. Bogății Forest ROSCI0137). In the distribution of the vegetation is observed inversion phenomenon, the sessile oak is frequent at higher altitudes than beech. The sessile oak is frequent at higher altitudes than beech, which usually occupies the base of the versants.

MATERIALS AND METHODS

During April-August 2014, 98 transects were conducted, these recording altitudes between 513 and 1,091 meters. Six types of habitats have been investigated: **1** - Beech forests, habitats 9110 code (trees of 30 to 100 years) and 91V0 code (trees of 20 to 50 years); 54 transects were made in these habitats. **2** - Beech and hornbeam forests, habitat 9130 code (trees of 30 to 100 years); 7 transects were made in these habitat. **3** - Forests of sessile oak, beech and hornbeam, habitat 9170 code (trees of 50 to 100 years); 24 transects were made in these habitat. **4** - Natural regeneration with beech, hornbeam, spruce, maple, oak, (trees of 10 to 50 years); 7 transects were made in this habitat. **5** - Alluvial forests,

habitat 91E0 code (trees of 10 to 60 years); 4 transects were made in these habitat. **6** - Meadow, 2 transects were made in this habitat.

The transects had a length of 1,000 - 2,000 meters, depending on the configuration of the land and a width of 20 meters. Along the transect were identified and researched the characteristic micro habitats characteristics, sheltered by old trees (standing or fallen), with dead wood, trunks, branches with a diameter of more than 40 cm, rotten hubs, with shell, possibly covered with moss. The material was collected with hand, tweezer or the exhauster, directly from the substrate (boscage, stones, bark, fallen trunks, grasses, shrubs, etc.); the entomological net was used to mow the grassy and bushy vegetation.

The coleopterans classification was adopted after Bouchard (2011). The distribution of species was based on their natural spreading only, using the data from Fauna Europaea, Coleoptera Poloniae, the researches made by Gorodkov (1984), Vigna-Taglianti et al. (1992, 1999), Georgiev and Hubenov (2006), Ratti (2007), Horák and Chobot (2009), Akhmetova and Frolov (2014), Qiao Wang (2017).

RESULTS AND DISCUSSIONS

During the study period, in the perimeter of the protected area, the Bogății Forest ROSCI0137, 106 species of coleopteran were identified, being grouped in 30 families (Tab. 1).

Table 1 - List of the coleopteran species identified in the Bogății Forest with their habitat specification and distribution.

No.	Taxon	1	2	3	4	5	6	Distribution
	Class INSECTA							
	Order COLEOPTERA							
	Suborder ADEPHAGA							
	Family CARABIDAE LATREILLE, 1802							
	Subfamily NEBRIINAE LAPORTE, 1834							
1	<i>Leistus ferrugineus</i> (LINNAEUS, 1758)						+	Eu.-Ca.
2	<i>Nebria brevicollis</i> (FABRICIUS, 1792)						+	Eu.-Ca.
	Subfamily CARABINAE LATREILLE, 1802							
3	<i>Carabus cancellatus</i> ILLIGER, 1798	+	+	+	+			Eu.-Sib.
4	<i>Carabus convexus</i> FABRICIUS, 1775			+				Eu.-Sib.
5	<i>Carabus coriaceus</i> LINNAEUS, 1758	+	+	+	+		+	Eu.
6	<i>Carabus glabratus</i> PAYKULL, 1790	+		+				Eu.-Sib.
7	<i>Carabus intricatus</i> LINNAEUS, 1761	+		+				Eu.

DATA ON THE COLEOPTERAN (INSECTA: COLEOPTERA) FAUNA FROM THE
BOGĂȚII FOREST, BRAȘOV COUNTY, ROMANIA

No.	Taxon	1	2	3	4	5	6	Distribution
8	<i>Carabus linnei</i> PANZER, 1810	+	+					Cent.-East Eu.
9	<i>Cychrus caraboides</i> (LINNAEUS, 1758)	+	+					Eu.
10	<i>Cychrus semigranosus</i> PALLIARDI, 1825	+	+					Southeast Eu.
	Subfamily TRECHINAE BONELLI, 1810							
11	<i>Bembidion quadrimaculatum</i> (LINNAEUS, 1761)						+	Hol.
12	<i>Tachyta nana</i> (GYLLENHAL, 1810)						+	Pal.
13	<i>Trechus quadristriatus</i> (SCHRANK, 1781)					+		WPal.
	Subfamily HARPALINAE BONELLI, 1810							
14	<i>Pterostichus melanarius</i> (BONELLI, 1810)					+		Eu.-Sib.*
15	<i>Pterostichus niger</i> (SCHALLER, 1783)	+	+	+	+			Eu.-As.*
16	<i>Abax parallelepipedus</i> (PILLER & MITTERPACHER, 1783)	+	+	+				Eu.
17	<i>Amara ovata</i> (FABRICIUS, 1792)					+		Eu.-Sib.
	Suborder POLYPHAGA							
	Family HISTERIDAE GYLLENHAL, 1808							
	Subfamily HISTERINAE GYLLENHAL, 1808							
18	<i>Platysoma compressum</i> (HERBST, 1783)	+	+	+				Eu.-Sib.
	Family LEIODIDAE FLEMING, 1821							
	Subfamily LEIODINAE FLEMING, 1821							
19	<i>Anisotoma castanea</i> (HERBST, 1792)			+			+	Eu.
	Family SILPHIDAE LATREILLE, 1806							
	Subfamily SILPHINAE LATREILLE, 1806							
20	<i>Phosphuga atrata</i> (LINNAEUS, 1758)	+	+					Eu.-As.
21	<i>Silpha obscura</i> (LINNAEUS, 1758)	+						Pal.
	Subfamily NICROPHORINAE KIRBY, 1837							
22	<i>Nicrophorus vespilloides</i> HERBST, 1783	+		+				Eu.-As.*
	Family STAPHYLINIDAE LATREILLE, 1802							
	Subfamily TACHYPORINAE MACLEAY, 1825							
23	<i>Bolitobius cingulatus</i> MANNERHEIM, 1831	+		+				Eu.-As.*
	Subfamily ALEOCHARINAE FLEMING, 1821							
24	<i>Aleochara brevipennis</i> GRAVENHORST, 1806			+			+	Eu.-As.
25	<i>Atheta fungi</i> (GRAVENHORST, 1806)			+				Hol.
	Subfamily SCAPHIDIINAE LATREILLE, 1806							

No.	Taxon	1	2	3	4	5	6	Distribution
26	<i>Scaphidium quadrimaculatum</i> OLIVIER, 1790	+						WPal.
	Subfamily PAEDERINAE FLEMING, 1821							
27	<i>Lathrobium elongatum</i> LINNAEUS, 1767	+	+				+	Eu.
	Subfamily STAPHYLININAE LATREILLE, 1802							
28	<i>Philonthus succicola</i> THOMSON, 1860	+	+					Eu.-Sib.
29	<i>Hesperus rufipennis</i> (GRAVENHORST, 1802)						+	Eu.
30	<i>Ocypus kuntzeni</i> (MÜLLER, 1926)	+						Southeast Eu.
31	<i>Ocypus ophthalmicus</i> (SCOPOLI, 1763)			+				Pal.
	Family GEOTRUPIDAE LATREILLE, 1802							
	Subfamily GEOTRUPINAE LATREILLE, 1802							
32	<i>Anoplotrupes stercorosus</i> (SCRIBA, 1791)	+	+	+	+	+	+	Eu.-Sib.
33	<i>Trypocopris vernalis</i> (LINNAEUS, 1758)					+		Eu.-Ca.
	Family LUCANIDAE LATREILLE, 1804							
	Subfamily LUCANINAE LATREILLE, 1804							
34	<i>Lucanus cervus</i> (LINNAEUS, 1758)			+				Eu.-Ca.
35	<i>Dorcus parallelipedus</i> (LINNAEUS, 1758)			+				WPal.
	Family SCARABAEIDAE LATREILLE, 1802							
	Subfamily APHODIINAE LEACH, 1815							
36	<i>Aphodius ater</i> (DE GEER, 1774)			+		+		Eu.-As.
37	<i>Aphodius fimetarius</i> (LINNAEUS, 1758)			+		+		Pal.*
38	<i>Aphodius subterraneus</i> (LINNAEUS, 1758)	+	+			+		Pal.*
39	<i>Calamosternus granarius</i> (LINNAEUS, 1767)					+		Pal.****
40	<i>Oxyomus silvestris</i> (SCOPOLI, 1763)	+						Eu.-CAs.
41	<i>Pleurophorus caesus</i> (CREUTZER, 1796)					+		Pal.***
	Subfamily SCARABAEINAE LATREILLE, 1802							
42	<i>Caccobius schreberi</i> LINNAEUS, 1767					+		WPal.
43	<i>Euoniticellus fulvus</i> (GOEZE, 1777)					+		Pal.**
44	<i>Onthophagus fracticornis</i> (PREYSSLER, 1790)					+		WPal.
45	<i>Onthophagus ovatus</i> (LINNAEUS, 1767)					+		Eu.-CAs.
	Subfamily CETONIINAE LEACH, 1815							
46	<i>Cetonia aurata</i> (LINNAEUS, 1758)			+			+	Eu.-As.
47	<i>Protaetia aeruginosa</i> (LINNAEUS 1767)			+				Eu.-CAs.
48	<i>Valgus hemipterus</i> (LINNAEUS, 1758)			+				WPal.

DATA ON THE COLEOPTERAN (INSECTA: COLEOPTERA) FAUNA FROM THE
BOGĂȚII FOREST, BRAȘOV COUNTY, ROMANIA

No.	Taxon	1	2	3	4	5	6	Distribution
	Family BUPRESTIDAE LEACH, 1815							
	Subfamily CHRYSOCHROINAE LAPORTE, 1835							
49	<i>Dicerca berolinensis</i> (HERBST, 1779)	+						Eu.-Sib.
	Subfamily AGRILINAE LAPORTE, 1835							
50	<i>Agrius viridis</i> (LINNAEUS, 1758)						+	Pal.
	Family EUCNEMIDAE ESCHSCHOLTZ, 1829							
	Subfamily MELASINAE FLEMING, 1821							
51	<i>Melasis buprestoides</i> (LINNAEUS, 1761)	+	+					Eu.-Sib.
	Family ELATERIDAE LEACH, 1815							
	Subfamily AGRYPNINAE CANDÈZE, 1857							
52	<i>Lacon punctatus</i> (HERBST, 1779)			+				Eu.-Ca.
	Subfamily DENDROMETRINAE GISTEL, 1848							
53	<i>Ctenicera pectinicornis</i> (LINNAEUS, 1758)	+	+					Eu.-Sib.
	Subfamily ELATERINAE LEACH, 1815							
54	<i>Ampedus cinnabarinus</i> (ESCHSCHOLTZ, 1829)	+		+				Pal.
55	<i>Calambus bipustulatus</i> (LINNAEUS, 1767)			+				Eu.-CAs.
56	<i>Stenagostus rhombeus</i> (OLIVIER, 1790)	+	+					Eu.-Ca.
57	<i>Melanotus erythropus</i> (GMELIN, 1790)	+						WPal.
	Family CANTHARIDAE IMHOFF, 1856 (1815)							
	Subfamily CANTHARINAE IMHOFF, 1856 (1815)							
58	<i>Cantharis nigricans</i> (MÜLLER, 1776)						+	Eu.-As.*
59	<i>Rhagonycha fulva</i> (SCOPOLI, 1763)			+			+	Pal.*
	Family DERMESTIDAE LATREILLE, 1804							
	Subfamily DERMESTINAE LATREILLE, 1804							
60	<i>Dermestes lanarius</i> ILLIGER, 1801						+	Pal.
	Family PTINIDAE LATREILLE, 1802							
	Subfamily PTILININAE SHUCKARD, 1839							
61	<i>Ptilinus pectinicornis</i> (LINNAEUS, 1758)	+	+					Eu.-Sib.
	Family TROGOSSITIDAE LATREILLE, 1802							
	Subfamily PELTINAE LATREILLE, 1806							
62	<i>Ostoma ferruginea</i> (LINNAEUS, 1758)			+			+	Eu.-Sib.*
	Family CLERIDAE LATREILLE, 1802							
	Subfamily CLERINAE LATREILLE, 1802							

No.	Taxon	1	2	3	4	5	6	Distribution
63	<i>Opilo mollis</i> (LINNAEUS, 1758)			+				Cos.
	Family EROTYLIDAE LATREILLE, 1802							
	Subfamily EROTYLINAE LATREILLE, 1802							
64	<i>Tritoma bipustulata</i> FABRICIUS, 1775				+		+	Eu.-Sib.
65	<i>Triplax aenea</i> (SCHALLER, 1783)	+					+	Eu.-Ca.
	Family CRYPTOPHAGIDAE KIRBY, 1826							
	Subfamily CRYPTOPHAGINAE KIRBY, 1826							
66	<i>Cryptophagus scanicus</i> (LINNAEUS, 1758)						+	Hol.
	Family SILVANIDAE KIRBY, 1826							
	Subfamily BRONTINAE BLANCHARD, 1845							
67	<i>Uleiota planata</i> (LINNAEUS, 1761)	+	+	+				Eu.-Ca.
	Subfamily SILVANINAE KIRBY, 1837							
68	<i>Silvanus unidentatus</i> (OLIVIER, 1790)			+				Pal.*
	Family CUCUJIDAE LATREILLE, 1802							
69	<i>Cucujus cinnaberinus</i> (SCOPOLI, 1763)	+	+	+				Cent. East-Eu.
	Family ENDOMYCHIDAE LEACH, 1815							
	Subfamily ENDOMYCHINAE LEACH, 1815							
70	<i>Endomychus coccineus</i> (LINNAEUS, 1758)	+	+	+				Eu.
	Family COCCINELLIDAE LATREILLE, 1807							
	Subfamily COCCINELLINAE LATREILLE, 1807							
71	<i>Anatis ocellata</i> (LINNAEUS, 1758)					+		Pal.*
	Family MYCETOPHAGIDAE LEACH, 1815							
	Subfamily MYCETOPHAGINAE LEACH, 1815							
72	<i>Mycetophagus quadripustulatus</i> (LINNAEUS, 1751)	+	+					Pal.
	Family ZOPHERIDAE SOLIER, 1834							
	Subfamily COLYDIINAE BILLBERG, 1820							
73	<i>Colydium elongatum</i> (FABRICIUS, 1787)	+	+					WPal.
74	<i>Bitoma crenata</i> (FABRICIUS, 1775)	+						Pal.*
	Family TENEBRIONIDAE LATREILLE, 1802							
	Subfamily TENEBRIONINAE LATREILLE, 1802							
75	<i>Bolitophagus reticulatus</i> (LINNAEUS, 1767)	+	+					Eu.-Sib.
	Subfamily DIAPERINAE LATREILLE, 1802							
76	<i>Diaperis boleti</i> (LINNAEUS, 1758)	+	+					WPal.

DATA ON THE COLEOPTERAN (INSECTA: COLEOPTERA) FAUNA FROM THE
BOGĂȚII FOREST, BRAȘOV COUNTY, ROMANIA

No.	Taxon	1	2	3	4	5	6	Distribution
77	<i>Corticeus unicolor</i> PILLER & MITTERPACHER, 1783			+			+	Eu.-Ca.
	Family PYROCHROIDAE LATREILLE, 1806							
	Subfamily PYROCHROINAE LATREILLE, 1806							
78	<i>Pyrochroa coccinea</i> (LINNAEUS, 1761)		+					Eu.
	Family CERAMBYCIDAE LATREILLE, 1802							
	Subfamily PRIONINAE LATREILLE, 1802							
79	<i>Prionus coriarius</i> (LINNAEUS, 1758)	+						WPal.
	Subfamily LEPTURINAE LATREILLE, 1802							
80	<i>Leptura aurulenta</i> FABRICIUS, 1792			+				WPal.
81	<i>Stenurella melanura</i> (LINNAEUS, 1758)	+						Eu.-Sib.
82	<i>Stictoleptura rubra</i> (LINNAEUS, 1758)						+	WPal.
83	<i>Stictoleptura scutellata</i> (FABRICIUS, 1781)	+						WPal.
84	<i>Rhagium mordax</i> (DE GEER, 1775)	+	+					Eu.-Sib.
85	<i>Xylosteus spinolae</i> FRIVALDSZKY, 1838	+						Cent. Southeast Eu.
86	<i>Pachytodes cerambyciformis</i> (SCHRANK, 1781)	+						Eu.-Ca.
	Subfamily SPONDYLIDINAE AUDINET-SERVILLE, 1832							
87	<i>Saphanus piceus</i> (LAICARTING, 1784)		+					Eu.-Ca.
88	<i>Tetropium castaneum</i> (LINNAEUS, 1758)				+			Eu.-Sib.
	Subfamily CERAMBYCINAE LATREILLE, 1802							
89	<i>Phymatodes testaceus</i> (LINNAEUS, 1758)			+				Pal.*
90	<i>Ropalopus clavipes</i> (FABRICIUS, 1775)						+	Eu.-Ca.
91	<i>Rosalia alpina</i> (LINNAEUS, 1758)	+		+				Eu.-Ca.
92	<i>Purpuricenus kaehleri</i> (LINNAEUS, 1758)			+				Eu.-Ca.
	Family CHRYSOMELIDAE LATREILLE, 1802							
	Subfamily CHRYSOMELINAE LATREILLE, 1802							
93	<i>Chrysolina haemoptera</i> (LINNAEUS, 1758)					+		Eu.-Ca.
94	<i>Chrysolina polita</i> (LINNAEUS, 1758)						+	Eu.-As.
95	<i>Chrysomela populi</i> (LINNAEUS, 1758)						+	Pal.
96	<i>Oreina intricata</i> GERMAR, 1824						+	Cent. Eu.
97	<i>Oreina plagiata</i> SUFFRIAN, 1861						+	Cent. Eu.
	Subfamily GALERUCINAE LATREILLE, 1802							

No.	Taxon	1	2	3	4	5	6	Distribution
98	<i>Agelastica alni</i> (LINNAEUS, 1758)						+	Eu.-CAs.*
99	<i>Galerucella lineola</i> (FABRICIUS, 1781)						+	Pal.
100	<i>Luperus flavipes</i> (LINNAEUS, 1767)					+		Eu.-CAs.
	Subfamily CRYPTOCEPHALINAE GYLLENHAL, 1813							
101	<i>Clytra laeviuscula</i> (RATZEBURG, 1837)			+				Pal.
	Family ATTELABIDAE BILLBERG, 1820							
	Subfamily ATTELABINAE BILLBERG, 1820							
102	<i>Attelabus nitens</i> (SCOPOLI, 1763)			+				WPal.
	Family CURCULIONIDAE LATREILLE, 1802							
	Subfamily MOLYTINAE SCHÖNHERR, 1823							
103	<i>Lepyryus capucinus</i> (SCHALLER, 1783)						+	Eu.-Sib.*
104	<i>Liparus glabrirostris</i> KUSTER, 1849						+	Eu.
	Subfamily SCOLYTINAE LATREILLE, 1804							
105	<i>Taphrorychus bicolor</i> (HERBST, 1793)	+						Eu.-Ca.
106	<i>Xyleborus monographus</i> (FABRICIUS, 1792)			+				WPal.

Legend: **1** - beech forests, 9110/91V0; **2** - beech and hornbeam forests, 9130; **3** - forests of sessile oak, beech and hornbeam, 9170; **4** - natural regeneration: beech, hornbeam, spruce, maple, sessile oak; **5** - meadow; **6** - riparian, alluvial forests, 91E0; Cos. – Cosmopolitan, Hol. – Holarctic, Pal – Palearctic, Eu.-As. – European-Asian (Palearctic zone), WPal. – West Palearctic, Eu.-Sib. – European-Siberian, Eu.-CAs. – European-Central Asian, Eu.-Ca. – European-Caucasian, Eu. – European, Cent.-East Eu. – Central-East European, Cent. Eu. – Central European, Cent. Southeast Eu. – Central Southeast European, Southeast Eu. – Southeast European; * - introduced species in Nearctic Region, ** - introduced species in Nearctic and Neotropical Regions, *** - introduced species in Nearctic, Neotropical and Afrotropical Regions, **** - introduced species in Nearctic, Neotropical, Afrotropical and Oriental Regions.

Most species identified belong to the Carabide family, 17 species (16.0%), followed by families: Cerambycidae, 14 species (13.2%), Scarabaeidae, 13 species (12.2%), Chrysomelidae, 9 species (8.5%), Staphylinidae, 9 species (8.5%) and Elateridae, 6 species (5.6%). The rest of the coleopteran families recorded less than 5 species.

Most species were identified in the beech forest, 45 species (42.4%) and in the mixed forest: beech, sessile oak and hornbeam, 40 species (37.7%); the opposite pole was represented by the natural regeneration area where the forest was cut off and then started the regeneration process. Here, six species (5.66%) were identified. Lower values, compared to the beech forest, were obtained for riparian area, alluvial forests, 30 species (28.3%) and beech and hornbeam forests, 27

DATA ON THE COLEOPTERAN (INSECTA: COLEOPTERA) FAUNA FROM THE BOGĂȚII FOREST, BRAȘOV COUNTY, ROMANIA

species (25.4%). It should be noted that these values reflect the sampling effort that has been correlated with the area of the respective habitats from the site level. Most transects were made in the habitats where the beech is the dominant species, which at the level of the protected area occupy the largest surface.

From the distribution point of view, the most identified species have Palearctic (17.9%) and European-Siberian (17.9%) spread, followed by the species with European-Caucasian (15.0%), West Palearctic (14.1%), European (9.4%), European-Asian (8.4%) and European-Central Asian (5.6%) distribution. The rest of the zoogeographical elements had a share of less than 5% (Fig. 2). From all 106 identified species of coleopterans, 16 species (15.2%) have expanded their areal, being introduced by humans. These are usually involuntarily recorded into one or more biogeographical regions.

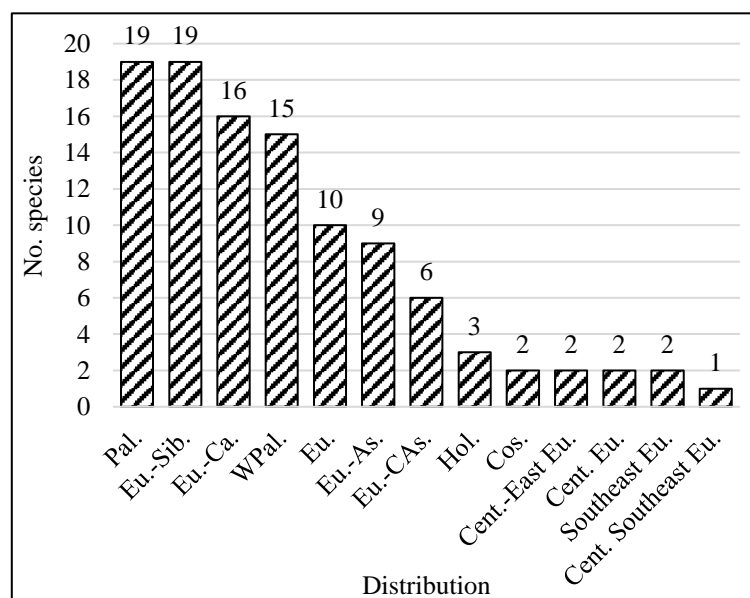


Figure 2 - Distribution of the identified species on zoogeographical groups: Pal – Palearctic, Eu.-Sib. – European-Siberian, Eu.-Ca. – European-Caucasian, WPal. – West Palearctic, Eu. – European, Eu.-As. – European-Asian (Palearctic zone), Eu.-CAs. – European-Central Asian, Hol. – Holarctic, Cos. – Cosmopolitan, Cent.-East Eu. – Central-East European, Cent. Eu. – Central European, Southeast Eu. – Southeast European, Cent. Southeast Eu. – Central Southeast European.

From the conservative point of view, most of the identified species are common. Were identified only three species of coleopterans protected by national and European legislation: *Lucanus cervus* (LINNAEUS, 1758), *Cucujus cinnaberinus* (SCOPOLI, 1763) and *Rosalia alpina* (LINNAEUS, 1758). To these, we can add the species *Carabus intricatus* LINNAEUS, 1761, species included in the

category Near Threatened (NT) by the International Union for Conservation of Nature (IUCN).

There were identified 26 male individuals of the species *Lucanus cervus* (LINNAEUS, 1758), in four locations in the protected area (Fig. 3). *Quercus* L. species dominates the habitats in which the species was identified; trees aged 20 to 100 years.

The species is mentioned in: OUG 57/2007 completed and modified by the Law 49/2011, Annex 3, Habitats Directive - Council Directive 92/43/EEC, Annex 2 and European Convention for the Conservation of the Wild Fauna and Natural Habitats of Bern, Annex 3. It is classed as a European Protected Species (Harvey, 2011). IUCN includes this species in the category of Near Threatened (NT). At European level, there is currently, a declining trend of species populations, especially in northern Europe (IUCN Red List).

The species *Cucujus cinnaberinus* (SCOPOLI, 1763) has been identified in five locations (Fig. 3). Only larvae were found, in forest habitats with dead wood, with beech trees (dominant species), hornbeam, oak and poplar, aged between 30 and 100 years. *Cucujus cinnaberinus* (SCOPOLI, 1763) is one of the rarest coleopterans in Europe and its populations are thought to be declining in several European countries (Mazzei et al., 2010; Horák & Chobot, 2011). It is a predatory species, adults and larvae feed on insects living under the bark of dead trees (Horák et al., 2011). The IUCN includes it in the Near Threatened (NT) category. Population trend of this species increasing (IUCN Red List).

Rosalia alpina (LINNAEUS, 1758) is generally associated with beech forests with the presence of mature, dead (or moribund) and sun-exposed trees occurring in open sites. It is saproxylic, xylophagous, xerothermophilic species (Campanaro, 2017). The species was identified in five locations from the ROSCI0137 Bogății Forest site (Fig. 3). There were five specimens recorded, three males and two females. The IUCN includes it in the Vulnerable (VU) category (IUCN Red List).

Cucujus cinnaberinus (SCOPOLI, 1763) and *Rosalia alpina* (LINNAEUS, 1758) are mentioned in: OUG 57/2007 completed and modified by the Law 49/2011, Annexes 3 and 4A, Habitats Directive - Council Directive 92/43/EEC, Annexes 2 and 4 and European Convention for the Conservation of the Wild Fauna and Natural Habitats of Bern, Annex 2.

The *Carabus intricatus* LINNAEUS, 1761 species can also be added to the aforementioned species. In the protected area, Bogății Forest, it was identified only one exemplary (Fig. 3). The species was found in the beech and conifer forests, along the valleys, from the low mountain and hill areas. More rarely was observed in the plain area (Panin, 1955). The species is included by IUCN in the Near Threatened (NT) category. In Romania, this species is not included in a certain the protected category, but its status may change in the future, in a negative way, due to the disappearance of the natural habitats, where it lives (Lotrean & Manu, 2017).

All of the species mentioned above are species dependent by the mature/old forests with large amounts of dead wood. Forest disappearance and

DATA ON THE COLEOPTERAN (INSECTA: COLEOPTERA) FAUNA FROM THE BOGĂȚII FOREST, BRAȘOV COUNTY, ROMANIA

poor forest management, in particular the removal of dead wood from this type of ecosystems, threaten the survival of these coleopteran species. In recent years, many species of coleopteran have become more and more rare, and their populations are isolated due to the loss of habitats, which increases the risk of their disappearance (Hanski & Gaggiotti, 2004; Lachat et al. 2013).

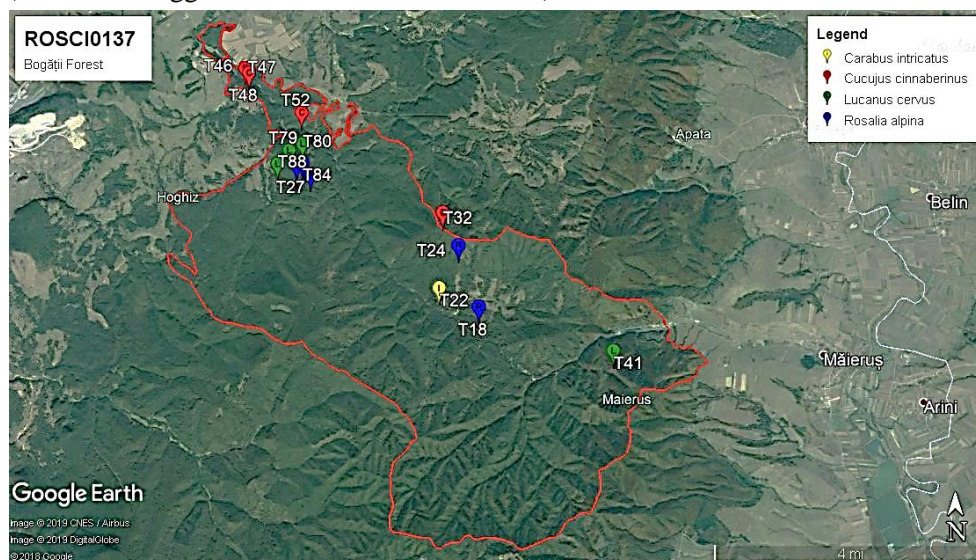


Figure 3 - The location of the transects (T) where protected species have been identified in the Bogății Forest (adapted after: Natura 2000 - Standard Data Form and Munții Perșani - Wikipedia)

In the case of the protected area Bogății Forest, the loss of habitats determined by the exploitation of wood and the construction of forest roads, are the main pressures and threats to address the protected species identified here.

The preservation of forest habitats and their proper management are essential conditions for the maintenance or even numerical growth of the populations of these species, in the perimeter of the protected area Bogății Forest.

The species *Rhysodes sulcatus* (FABRICIUS, 1787), referred to in the Natura 2000 Standard Form, has not been identified within the protected area. The species, considered an indicator of old, natural, primary forests, may be still present in the reserve, but confirmation of its presence is required.

CONCLUSIONS

They was identified 106 species of coleopteran grouped into 30 families. From these, three species: *Lucanus cervus* (LINNAEUS, 1758), *Cucujus cinnaberinus* (SCOPOLI, 1763) and *Rosalia alpina* (LINNAEUS, 1758) are protected by national and European legislation.

The species, *Carabus intricatus* LINNAEUS, 1761, is part of the Near Threatened (NT) species category, in concordance with according to the International Union for Conservation of Nature (IUCN).

The species *Rhysodes sulcatus* (FABRICIUS, 1787), previously mentioned in the Natura 2000 Standard Form, has not been found in the protected area perimeter.

We note that the present study has a preliminary character and is necessary to continue the research in the Bogății forest in order to complete the list of species. It is possible to identify other species of conservative interest.

From the conservative point of view, we consider that without adequate management measures, in the next 15-20 years, the forest habitats that formed the scientific base of the declaration of the protected area could disappear and implicitly the majority of forest coleopteran species identified.

REFERENCES

- AKHMETOVA L. A., FROLOV A. V., 2014 - *A Review of the Scarab Beetle Tribe Aphodiini (Coleoptera, Scarabaeidae) of the Fauna of Russia*. Entomological Review. Pleiades Publishing Inc. **94 (6)**: 846-879.
- ALBOTĂ M., FESCI S., 1980 - *Munții Perșani*. Colecția: Munții noștri. Nr. 22. Ed. Sport-Turism. București. 117 pp.
- BOUCHARD P., BOUSQUET Y., DAVIES A. E., ALONSO-ZARAZAGA M. A., LAWRENCE J. F., LYAL C. H. C., NEWTON A. F., REID C. A. M., SCHMITT M., ŚLIPIŃSKI S. A., SMITH A. B. T., 2011 - *Family-group names in Coleoptera (Insecta)*. ZooKeys **88**: 972 pp. Online to: <https://zookeys.pensoft.net/article/4001/> (accessed: September 2015).
- CAMPANARO A., REDOLFI DE ZAN L., HARDERSEN S., ANTONINI G., CHIARI S., CINI A., MANCINI E., MOSCONI F., ROSSI DE GASPERIS S., SOLANO E., BOLOGNA M. A., SABBATINI PEVERIERI G., 2017 - *Guidelines for the monitoring of Rosalia alpina*. **20**: 165-203. In CARPANETO G. M., AUDISIO P., BOLOGNA M.A., ROVERSI P.F., MASON F. (Eds): Guidelines for the Monitoring of the Saproxylic Beetles protected in Europe. Nature Conservation.
- GEORGIEV G., HUBENOV Z., 2006 - *Vertical distribution and zoogeographical characteristics of Cerambycidae (Coleoptera) Family in Bulgaria*. Acta Zoologica Bulgarica. Sofia. **58(3)**: 315-343.
- GORODKOV K. B., 1984 - *Ranges types of insects of tundra and forest zones of European part of U.S.S.R.* 3-221. In Scarlato O. A., Gorodkov K. B. (Eds): Provisional atlas of the insects of the European part of U. S. S. R. Nauka, Leningrad [In Russian].
- HANSKI I., GAGGIOTTI O., 2004 - *Ecology, genetics and evolution of metapopulations*. Elsevier Academic Press. San Diego. 696 pp.
- HARVEY D. J., GANGE A. C., HAWES C. J., RINK M., 2011 - *Bionomics and distribution of the stag beetle, Lucanus cervus (L.) across Europe*. Insect Conservation and Diversity. **4**: 23-38.
- HORÁK J., CHOBOT K., 2009 - *Worldwide distribution of saproxylic beetles of the genus Cucujus Fabricius, 1775 (Coleoptera: Cucujidae)*. 189-206. In BUSE J., ALEXANDER K. N. A., ASSMANN T. (Eds.): Saproxylic beetles - their role and diversity in european woodland and tree habitats. Proceedings of the 5th

DATA ON THE COLEOPTERAN (INSECTA: COLEOPTERA) FAUNA FROM THE
BOGĂȚII FOREST, BRAȘOV COUNTY, ROMANIA

- Symposium and Workshop on the Conservation of Saproxyllic Beetles. Pensoft. Sofia. 235 pp.
- HORÁK J., VÁVROVÁ E., CHOBOT K., 2010 - *Habitat preferences influencing populations, distribution and conservation of the endangered saproxyllic beetle Cucujus cinnaberinus (Coleoptera: Cucujidae) at the landscape level*. Eur. J. Entomol. **107**: 81-88.
- HORÁK J., CHOBOT K., 2011 - *Phenology and notes on the behaviour of Cucujus cinnaberinus: points for understanding the conservation of the saproxyllic beetle*. North-Western Journal of Zoology. Oradea. Romania. **7 (2)**: 352-355.
- LACHAT T., ECKER K., DUELLI P., WERMELINGER B., 2013 - *Population trends of Rosalia alpina (L.) in Switzerland: a lasting turnaround?* Journal of Insect Conservation. **17(4)**: 653-662.
- LOTREAN N., MANU M., 2017 - *Data on the coleopteran (Insecta: Coleoptera) fauna from the Leaota Mountains (Romania)*. Argesis. Studii și comunicări, Științele Naturii. Muzeul Județean Argeș. Pitești. **XXV**: 77-100.
- MAZZEI A., BONACCI T., CONTARINI E., ZETTO T., BRANDMAYR P., 2011 - *Rediscovering the „umbrella species” candidate Cucujus cinnaberinus (Scopoli, 1763) in Southern Italy (Coleoptera Cucujidae), and notes on bionomy*. Italian Journal of Zoology. **78 (2)**: 264-270.
- PANIN S., 1955 - *Fauna Republicii Populare Române. Familia Carabidae (gen. Cychrus Fabricius și gen. Carabus Linné)*. Editura Academiei Republicii Populare Române. București. **X (2)**. 141 pp.
- RATTI E., 2007 - *I coleotteri silvanidi in Italia (Coleoptera Cucujoidea Silvanidae)*. Boll. Mus. Civ. St. Nat. Venezia. **58**: 83-137.
- STAN M., 2012 - *On the species of Philonthus STEPHENS (Coleoptera: Staphylinidae: Staphylininae: Staphylinini: Philonthina) in the collections of Romanian Natural History Museums*. Travaux du Muséum d’Histoire Naturelle “Grigore Antipa”. Bucarest. **55(2)**: 143-154.
- ȘONERIU I., ULARU P., 1976 - *Rezervația naturală Pădurea Bogății, Brașov*. Lucrările celei de a 3-a consfătuiri itinerante de ocrotirea a naturii pe baze ecologice. Brașov, 11-17 octombrie. 133-140.
- VIGNA TAGLIANTI A., AUDISIO P. A., BELFIORE C., BIONDI M., BOLOGNA A. M., CARPANETO G. M., BIASE A. DE, FELICI S. DE, PIATTELLA E., RACHELI T., ZAPPAROLI M., ZOLA S., 1992 - *Riflessioni di gruppo sui corotipi fondamentali della fauna W-Palearctica ed in particolare Italiana*. Biogeographia. **16**: 159-179.
- VIGNA TAGLIANTI A., AUDISIO P. A., MAURICIO B., BOLOGNA M. A., CARPANETO M. G., BIASE A. DE, FATTORINI S., PIATTELLA E., SINDACO R., VENCHI A., ZAPPAROLI M., 1999 - *A proposal for a chorotype classification of the Near East fauna, in Framework of the Western Palearctic region*. Biogeographia. **20**: 31-59.
- WANG Q. (Ed.), 2017 - *Cerambycidae of the World: Biology and Pest Management*. Series: Contemporary Topics in Entomology. CRC Press. Taylor & Francis Group. Boca Raton London New York. 628 pp.
- ***Coleoptera Poloniae. *Coleoptera Poloniae: KFP Base* - archival page. Online to: <http://coleoptera.ksib.pl/kfp.php?l=en> (accessed: September 2015).

- ***Fauna Europaea. *Fauna Europaea: Coleoptera*. Online to: https://fauna-eu.org/cdm_dataportal/taxon/3cf53a59-439c-4e58-90e0-88fd23e92e49 (accessed: September 2017).
- ***Formularul Standard Natura 2000. *Pădurea Bogății ROSCI0137*. Online to: <http://biodiversitate.mmediu.ro/rio/natura2000/static/pdf/ros-ci0137.pdf> (accessed: September 2015).
- ***Munții Perșani - Wikipedia. Online to: https://ro.wikipedia.org/wiki/Munții_Perșani (accessed: September 2015).
- ***Natura 2000 Standard Data Form. Online to: <http://natura2000.eea.europa.eu/Natura2000/SDF.aspx?site=ROSCI0137> (accessed: September 2015).
- ***World Conservation Monitoring Centre. *Blue Ground Beetle. Carabus intricatus*. The IUCN Red List of Threatened Species. Online to: <https://www.iucnredlist.org/species/3845/10120005> (accessed: September 2015).
- ***World Conservation Monitoring Centre. *Cucujus cinnaberinus*. The IUCN Red List of Threatened Species. Online to: <https://www.iucnredlist.org/species/5935/11921415> (accessed: September 2015).
- ***World Conservation Monitoring Centre. *Stag Beetle. Lucanus cervus*. The IUCN Red List of Threatened Species. Online to: <https://www.iucnredlist.org/species/157554/5094499> (accessed: September 2015).
- ***World Conservation Monitoring Centre. *Rosalia alpina*. The IUCN Red List of Threatened Species. Online to: <https://www.iucnredlist.org/species/19743/9009447> (accessed: September 2015).