

COLEOPTERAN SPECIES (COLEOPTERA: CHRYSOMELIDAE, ATTELABIDAE, BRENTIDAE, BRACHYCERIDAE, CURCULIONIDAE) FROM THE ENTOMOLOGICAL COLLECTION OF THE CODRII NATURE RESERVE MUSEUM

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Abstract. This paper presents a list of 76 coleopteran species belonging to 40 genera, 15 subfamilies and 5 families from the entomological collection of the Codrii Nature Reserve museum. The specimens were collected between 1972 and 1995.

Keywords: Coleoptera, Chrysomeloidea, Curculionoidea, Codrii Nature Reserve, list of species.

Rezumat. Specii de coleoptere (Coleoptera: Chrysomelidae, Attelabidae, Brentidae, Brachyceridae, Curculionidae) din colecția entomologică a muzeului rezervației naturale Codrii. Această lucrare prezintă o listă de 76 specii de coleoptere aparținând la 40 de genuri, 15 subfamilii și 5 familii din colecția entomologică a muzeului rezervației naturale Codrii. Exemplele au fost colectate în perioada 1972 și 1995.

Cuvinte cheie: Coleoptera, Chrysomeloidea, Curculionoidea, Rezervația Naturală Codrii, listă de specii.

INTRODUCTION

The Codrii Nature Reserve (hereinafter - Codrii reserve) is located in the north-west part of the Central Moldavian Plateau. Currently, the reserve occupies 5170 ha. and includes 2 zones: the strictly protected zone and the buffer zone. In order to reduce the anthropogenic impact on the forest ecosystem, a transition zone with an area of 12300 ha was created around the buffer zone. The nature here impresses with the abundance of species (around 900 plant species), some of which are rare or on the verge of extinction.

The Codrii reserve museum was founded on May 18, 2004. The heritage of the museum consists of 34 species of mammals, 88 species of birds, 9 species of reptiles, 9 species of amphibians and 364 species of insects. The present work represents a study of Coleoptera insects from Chrysomeloidea and Curculionoidea superfamilies.

According to previous publications regarding the entomological fauna of the Codrii reserve, 53 species of Chrysomelidae (BELOVA & CALESTRU, 2021; CALESTRU, 2008, 2006; GÎRNEȚ & CALESTRU, 2007; ANDREEV et al., 2005) and 162 of Curculionoidea are known (ANDREEV et al., 2005; POIRAS, 1996).

MATERIAL AND METHODS

The paper is based on the examination of material from the Chrysomeloidea and Curculionoidea superfamilies preserved in the entomological repository or displayed in the exhibition of invertebrates in the Codrii reserve museum.

The material was collected on the territory of the reserve between 1972 and 1995. Most of the specimens were harvested in 1984-1991. The sweep netting method was used to sample insects or by hand, directly from the plants. The Chrysomelidae specimens were collected and determined by prof. Zaharia Neculiseanu and the Curculionoidea by dr.hab. Anton Poiras and dr.hab. Gheorghe Manic. Information about species and dates are reported as found on the labels.

RESULTS AND DISCUSSIONS

A total of 76 species from 40 genera, 15 subfamilies and 5 families of phytophagous beetles (superfamilies Chrysomeloidea and Curculionoidea) have been recorded in Codrii reserve Museum collection. The vast majority of the species belong to Curculionidae family (60 species; 79%). Then follows Chrysomelidae (7 species; 9%), Attelabidae (6 species; 8%), Brentidae (2 species; 3%) and Brachyceridae (1 species; 1%) (Table 1).

Table 1. The number of families, subfamilies, tribes, genera, species and specimens.

| Family | Subfamily | Tribe | Number of genera | Number of species | Specimens |
|---------------|------------------|-----------------|------------------|-------------------|-----------|
| Chrysomelidae | Chrysomelinae | Chrysomelini | 3 | 4 | 4 |
| | Cryptocephalinae | Clytrini | 1 | 1 | 1 |
| | | Cryptocephalini | 1 | 2 | 2 |
| Attelabidae | Attelabinae | Attelabini | 1 | 1 | 1 |
| | Rhynchitinae | Byetiscini | 3 | 5 | 5 |
| Brentidae | Apioninae | Apionini | 1 | 2 | 2 |
| Brachyceridae | Eriirhininae | Eriirhinini | 1 | 1 | 1 |
| Curculionidae | Curculioninae | Anthonomini | 1 | 2 | 2 |
| | | Cionini | 2 | 2 | 2 |
| | | Curculionini | 1 | 5 | 5 |
| | | Ellescini | 1 | 1 | 1 |

| | | | | | |
|---|------------------|----------------|----|----|----|
| | | Tychiini | 2 | 3 | 3 |
| | Bagoinae | - | 1 | 1 | 1 |
| | Baridinae | Baridini | 1 | 1 | 1 |
| | Ceutorhynchinae | Ceutorhynchini | 1 | 1 | 1 |
| | Cryptorhynchinae | Gasterocercini | 1 | 1 | 1 |
| | Entiminae | Omiini | 1 | 1 | 1 |
| | | Otiorhynchini | 1 | 10 | 13 |
| | | Peritelini | 1 | 1 | 1 |
| | | Phyllobiini | 1 | 4 | 4 |
| | | Psallidiini | 1 | 1 | 1 |
| | | Sciaphilini | 3 | 3 | 3 |
| | | Sitonini | 1 | 4 | 4 |
| | | Tanymecini | 2 | 4 | 5 |
| | Hyperinae | Hyperini | 2 | 4 | 4 |
| | Lixinae | Cleonini | 2 | 2 | 2 |
| | | Lixini | 2 | 8 | 9 |
| | Molytinae | Lepyriini | 1 | 1 | 1 |
| 5 | 15 | 27 | 40 | 76 | 81 |

We present below the species identified in the processed material. The superfamilies, families, subfamilies and tribes are listed in the presumed phylogenetic position, according to BOUCHARD et al., (2011). Species are arranged in alphabetical order.

Used abbreviations: leg. – collector, det. - determinator, ex. - specimen, dwr. – drawer, loc. - locality;

Names: A.P. - Anton Poiras; Z.N. - Zaharia Neculiseanu; Gh.M. - Gheorghe Manic, S.P. - Serghei Plugaru;

Zoogeographic type: HOL – Holarctic, PAL – Palearctic, WPAL – West-Palearctic, EUS – Euro-Siberian, E – European, EM – Euro-Mediterranean, CB - Carpatho-Balkanic, EUC – Euro-Caucasian, PM – Ponto-Mediterranean, PMA – Ponto-Middle-Asiatic.

SUPERFAMILY CHRYSOMELOIDEA Latreille, 1802

Family Chrysomelidae

Subfamily Chrysomelinae Latreille, 1802

Tribe Chrysomelini Latreille, 1802

Chrysolina marginata (Linnaeus, 1758) = *Chrysomela marginata*: 2 ex., loc. Lozova, 14.06.1991; leg., det. Z.N.; WPAL, drw. 3.

Chrysolina fastuosa (Scopoli, 1763) = *Chrysomela fastuosa*: 2 ex., loc. Lozova, 07.06.1990, leg., det. Z.N.; PAL, drw. 3.

Entomoscelis adonidis (Pallas, 1771): 1 ex., loc. Lozova, 04.07.1988, leg., det. Z.N.; HOL, dwr. 3.

Oreina caerulea (Olivier, 1790) = *Chrysomela caerulea*: 2 ex., loc. Lozova, 14.06.1991, leg., det. Z.N.; E, dwr. 3.

Subfamily Cryptocephalinae Gyllenhal, 1813

Tribe Clytrini Kirby, 1837

Clytra quadripunctata (Linnaeus, 1758): 2 ex., loc. Lozova, 17.07.1988, leg., det. Z.N.; EUS, dwr. 3.

Tribe Cryptocephalini Gyllenhal, 1813

Cryptocephalus sericeus (Linnaeus, 1758): 2 ex., loc. Lozova, 09.06.1989, leg., det. Z.N.; WPAL, dwr. 3.

Cryptocephalus violaceus Laicharting, 1781: 2 ex., loc. Lozova, 12.07.1990, leg., det. Z.N.; E, dwr. 3.

SUPERFAMILY CURCULIONOIDEA Latreille, 1802

Family Attelabidae Billberg, 1820

Subfamily Attelabinae Billberg, 1820

Tribe Attelabini Billberg, 1820

Attelabus nitens (Scopoli, 1763) = *Curculio nitens*, *Attelabus curculionoides*: 1 ex., loc. Lozova, 05.06.1986, leg., det. A.P.; WPAL, dwr. 7.

Subfamily Rhynchitinae Gistel, 1848

Tribe Byctiscini Voss, 1923

Byctiscus betulae (Linnaeus, 1758) = *Curculio betulae*, *Rhynchites betuleti*: 1 ex., loc. Lozova, 09.06.1987, leg., det. A.P.; PAL, dwr. 7.

Tribe Rhynchitini Gistel, 1848

Lasiiorhynchites sericeus (Herbst, 1797) = *Coccygorhynchites sericeus*, *Rhynchites sericeus*: 1 ex., loc. Lozova, 12.05.1972, leg., S.P., det. A.P.; EM, dwr. 7.

Rhynchites pauxillus (Germar, 1823) = *Neocoenorrhinus pauxillus*, *Coenorhinus pauxillus*: 1 ex., loc. Lozova, 16.06.1986, leg., det. A.P.; WPAL, dwr. 7.

Rhynchites auratus (Scopoli, 1763) = *Curculio auratus*, *Epirhynchites auratus*: 1 ex., loc. Lozova, 29.06.1986, leg., det. A.P.; WPAL, dwr. 7.

Rhynchites bacchus (Linnaeus, 1758) = *Curculio bacchus*: 1 ex., loc. Lozova, 10.05.1987, leg., det. A.P.; PAL, dwr. 7.

Family Brentidae Billberg, 1820

Subfamily Apioninae Schönherr, 1823

Tribe Apionini Schönherr, 1823

Apion apricans (Herbst, 1797) = *Protapion apricans* Hbst.: 1 ex., loc. Lozova, 18.07.1986, leg., det. A.P.; PAL, dwr. 7.

Apion fulvipes (Geoffroy, 1785) = *Protapion fulvipes*: 1 ex., loc. Lozova, 18.07.1986, leg., det. A.P.; PAL, dwr. 7.

Family Brachyceridae Billberg, 1820

Subfamily Eriirhininae Schönherr, 1825

Tribe Eriirhinini Schönherr, 1825

Lepidonotaris petax (Sahlberg, 1829): 1 ex., loc. Lozova, 06.07.1987, leg., det. A.P.; PMA, dwr. 8.

Family Curculionidae Latreille, 1802

Subfamily Curculioninae Latreille, 1802

Tribe Anthonomini Thomson, 1859

Anthonomus pomorum (Linnaeus, 1758): 1 ex., loc. Lozova, 12.07.1995, leg., det. Gh. M.; HOL, dwr. 8.

Anthonomus pedicularius (Linnaeus, 1758): 1 ex., loc. Lozova, 12.07.1995, leg., det. Gh. M.; WPAL, dwr. 8.

Tribe Cionini Schönherr, 1825

Cionus hortulanus (Fourcroy, 1785): 1 ex., loc. Lozova, 04.09.1988, leg., det. A.P.; WPAL, dwr. 8.

Stereonychus fraxini (De Geer, 1775): 1 ex., loc. Lozova, 16.06.1987, leg., det. A.P.; EM, dwr. 8.

Tribe Curculionini Latreille, 1802

Curculio aequatus (Linnaeus, 1767) = *Tatianaerhynchites aequatus*, *Coenorhinus aequatus*: 1 ex., loc. Lozova, 16.06.1986, leg., det. A.P.; WPAL, dwr. 7.

Curculio elephas (Gyllenhal, 1836): 1 ex., loc. Lozova, 01.07.1987, leg., det. A.P.; EM, dwr. 8.

Curculio pellitus (Boheman, 1843): 1 ex., loc. Lozova, 29.05.1987, leg., det. A.P.; EM, dwr. 8.

Curculio glandium Marsham, 1802: 1 ex., loc. Lozova, 02.05.1985, leg., det. A.P.; PAL, dwr. 8.

Curculio villosus Fabricius, 1781: 1 ex., loc. Lozova, 29.05.1987, leg., det. A.P.; PAL, dwr. 8.

Tribe Ellestini Thomson, 1859

Dorytomus longimanus (Foerster, 1771): 1 ex., loc. Lozova, 04.04.1985, leg., det. A.P.; WPAL, dwr. 8.

Tribe Tychiini Gistel, 1848

Lignyodes bischoffi (Blatchley & Leng, 1916): 1 ex., loc. Lozova, 17.07.1989, leg., det. A.P.; HOL, dwr. 8.

Tychius quinquepunctatus (Linnaeus, 1758): 1 ex., loc. Lozova, 18.05.1985, leg., det. A.P.; PAL, dwr. 8.

Tychius flavus Becker, 1864: 1 ex., loc. Lozova, 04.06.1985, leg., det. A.P.; WPAL, dwr. 8.

Subfamily Bagoinae Thomson, 1859

Bagous argillaceus Gyllenhal, 1836: 1 ex., loc. Lozova, 01.07.1987, leg., det. A.P.; WPAL, dwr. 8.

Subfamily Baridinae Schönherr, 1836

Tribe Baridini Schönherr, 1836

Baris scolopacea Germar, 1819: 1 ex., loc. Lozova, 18.07.1986, leg., det. A.P.; WPAL, dwr. 8.

Subfamily Ceutorhynchinae Gistel, 1848

Tribe Ceutorhynchini Gistel, 1848

Nedys quadrimaculatus (Linnaeus, 1758) = *Ceutorhynchus quadrimaculatus*: 1 ex., loc. Lozova, 04.09.1988, leg., det. A.P.; EUS, dwr. 8.

Subfamily Cryptorhynchinae Schönherr, 1825

Tribe Gasterocercini Zherikhin, 1991

Gasterocercus depressirostris (Fabricius, 1792): 1 ex., loc. Lozova, 12.07.1985, leg., det. A.P.; E, dwr. 8.

Subfamily Entiminae Schönherr, 1823

Tribe Omiini Shuckard, 1839

Omius rotundatus (Fabricius, 1792) = *Mylacus rotundatus*: 1 ex., loc. Lozova, 16.04.1986, leg., det. A.P.; WPAL, dwr. 7.

Tribe Otiiorhynchini Schönherr, 1826

- Otiiorhynchus multipunctatus* (Fabricius, 1792): 1 ex., loc. Lozova, 20.04.1984, leg., det. A.P.; E, dwr. 7.
Otiiorhynchus hungaricus Germar, 1824: 1 ex., loc. Lozova, 14.05.1987, leg., det. A.P.; CB, dwr. 7.
Otiiorhynchus (Aspaerorrhynchus) raucus (Fabricius, 1777): 1 ex., loc. Lozova, 05.06.1985, leg., det. A.P.; WPAL, dwr. 7.
Otiiorhynchus (Podoropelmes) albidus Stierlin, 1861: 1 ex., loc. Lozova, 02.05.1985, leg., det. A.P.; CB, dwr. 7.
Otiiorhynchus (Podoropelmes) fullo (Schränk, 1781): 1 ex., loc. Lozova, 02.06.1989, leg., det. A.P.; E, dwr. 7.
Otiiorhynchus (Choilisanus) caucasicus Stierlin, 1872: 1 ex., loc. Lozova, 05.05.1989, leg., det. A.P.; EUC, dwr. 7.
Otiiorhynchus (Pendragon) ovatus (Linnaeus, 1758): 1 ex., s. Lozova, 08.05.1990, leg., det. A.P.; HOL, dwr. 7.
Otiiorhynchus (Pseudocryphiphorus) tristis (Scopoli, 1763): 2 ex., loc. Lozova, 09.05.1985, 04.07.1986, leg., det. A.P.; EUS, dwr. 7.
Otiiorhynchus (Cryphiphorus) ligustici (Linnaeus, 1758): 2 ex., loc. Lozova, 20.05.1989, 28.05.1990, leg., det. A.P.; HOL, dwr. 7.
Otiiorhynchus (Cirorhynchus) valachiae Fuss, 1868: 2 ex., loc. Lozova, 17.07.1987, 20.07.1989, leg., det. A.P.; CB, dwr. 8.

Tribe Peritelini Lacordaire, 1863

- Stomodes gyrosicollis* Boheman, 1843: 1 ex., loc. Lozova, 04.09.1990, leg., det. A.P.; HOL, dwr. 7.

Tribe Phyllobiini Schönherr, 1826

- Phyllobius (Nemoicus) oblongus* (Linnaeus, 1758): 1 ex., loc. Lozova, 19.05.1987, leg., det. A.P.; EUS, dwr. 7.
Phyllobius (Metaphyllobius) pomaceus Gyllenhal, 1834 = *Phyllobius urticae*: 1 ex., loc. Lozova, 04.06.1989, leg., det. A.P.; EUS, dwr. 7.
Phyllobius seladonius Brulle, 1832: 1 ex., loc. Lozova, 03.06.1987, leg., det. A.P.; CB, dwr. 7.
Phyllobius pyri (Linnaeus, 1758) = *Phyllobius molli*: 1 ex., loc. Lozova, 12.05.1989, leg., det. A.P.; EUS, dwr. 7.

Tribe Psallidiini Lacordaire, 1863

- Psallidium maxillosum* (Fabricius, 1792): 1 ex., loc. Lozova, 04.06.1989, leg., det. A.P.; PM, dwr. 7.

Tribe Sciaphilini Sharp, 1891

- Eusomus ovulum* Germar, 1824: 1 ex., loc. Lozova, 05.06.1989, leg., det. A.P.; WPAL, dwr. 7.
Sciaphilus asperatus (Bonsdorff, 1785): 1 ex., loc. Lozova, 16.06.1987, leg., det. A.P.; HOL, dwr. 7.
Sciaphobus (Neosciaphobus) squalidus (Gyllenhal, 1834): 1 ex., loc. Lozova, 04.05.1989, leg., det. A.P.; E, dwr. 7.

Tribe Sitonini Gistel, 1848

- Sitona lineatus* (Linnaeus, 1758): 1 ex., loc. Lozova, 16.06.1987, leg., det. A.P.; HOL, dwr. 7.
Sitona longulus Gyllenhal, 1834: 1 ex., loc. Lozova, 16.06.1987, leg., det. A.P.; WPAL, dwr. 7.
Sitona macularius (Marsham, 1802) = *Sitona crinitus*: 1 ex., loc. Lozova, 16.06.1987, leg., det. A.P.; PAL, dwr. 7.
Sitona inops Gyllenhal, 1832: 1 ex., loc. Lozova, 17.05.1985, leg., det. A.P.; WPAL, dwr. 7.

Триба *Tanymecini* Lacordaire, 1863

- Tanymecus palliatus* (Fabricius, 1787): 2 ex., loc. Lozova, 20.07.1985, leg., det. A.P.; WPAL, dwr. 7.
Tanymecus dilaticollis Gyllenhal, 1834: 1 ex., loc. Lozova, 28.05.1986, leg., det. A.P.; EM, dwr. 7.
Chlorophanus excisus (Fabricius, 1801) = *Curculio excisus*: 1 ex., loc. Lozova, 16.06.1987, leg., det. A.P.; PM, dwr. 8.
Chlorophanus graminicola (Olivier, 1807): 1 ex., loc. Lozova, 09.06.1988, leg., det. A.P.; E, dwr. 8.

Subfamily Hyperinae Marseul, 1863 (1848)

Tribe Hyperini Marseul, 1863

- Coniatus splendidulus* (Fabricius, 1781): 1 ex., loc. Lozova, 04.09.1985, leg., det. A.P.; PM, dwr. 8.
Hypera zoilus (Scopoli, 1763) = *Hypera punctata*: 1 ex., loc. Lozova, 10.06.1984, leg., det. A.P.; HOL, dwr. 8.
Hypera rumicis (Linnaeus, 1758): 1 ex., loc. Lozova, 10.06.1985, leg., det. A.P.; HOL, dwr. 8.
Hypera postica (Gyllenhal, 1813) = *Hypera variabilis*: 1 ex., loc. Lozova, 10.06.1985, leg., det. A.P.; HOL, dwr. 8.

Subfamily Lixinae Schönherr, 1823

Tribe Cleonini Schönherr, 1826

- Cyphocleonus dealbatus* (Gmelin, 1790): 1 ex., loc. Lozova, 06.09.1988, leg., det. A.P.; WPAL, dwr. 8.
Cleonis pigra (Scopoli, 1763): 1 ex., loc. Lozova, 12.07.1987, leg., det. A.P.; HOL, dwr. 8.

Tribe Lixini Schönherr, 1823

- Larinus sturnus* (Schaller, 1783): 1 ex., loc. Lozova, 09.08.1991, leg., det. A.P.; WPAL, dwr. 8.
Larinus turbinatus Gyllenhal, 1836: 1 ex., loc. Lozova, 16.06.1987, leg., det. A.P.; WPAL, dwr. 8.
Larinus obtusus Gyllenhal, 1836: 1 ex., loc. Lozova, 02.07.1987, leg., det. A.P.; WPAL, dwr. 8.
Larinus planus (Fabricius, 1792): 1 ex., loc. Lozova, 16.06.1987, leg., det. A.P.; HOL, dwr. 8.

Lixus subtilis Boheman, 1836: 2 ex., loc. Lozova, 04.06.1985, 11.06.1987, leg., det. A.P.; WPAL, dwr. 8.

Lixus cardui Olivier, 1807: 1 ex., loc. Lozova, 12.06.1990, leg., det. A.P.; PM, dwr. 8.

Lixus iridis Olivier, 1807: 1 ex., loc. Lozova, 09.06.1988, leg., det. A.P.; WPAL, dwr. 8.

Lixus incanescens (Boheman, 1836): 1 ex., loc. Lozova, 04.08.1985, leg., det. A.P.; WPAL, dwr. 8

Subfamily Molytinae Schönherr, 1823

Tribe Lepyriini Kirby, 1837

Lepyryus palustris (Scopoli, 1763): 1 ex., loc. Lozova, 02.09.1990, leg., det. A.P.; HOL, dwr. 8.

Regarding the types of zoogeographic elements for the species in the collection (Fig. 1), 25 species are West-Palearctic elements (32,9%), 14 species are Holarctic elements, (18,4%), 9 Palearctic (11,8%), 7 European (9,2%), 6 Euro-Siberian (7,9%), 5 Euro-Mediterranean (6,6%), 4 Carpatho-Balkan (5,3%), 4 Ponto-Mediterranean (5,3%), 1 Ponto-Middle-Asiatic (1,3%) and 1 Euro-Caucasian (1,3%). There is a wide variety of zoogeographical types, but most species are West-Palearctic elements.

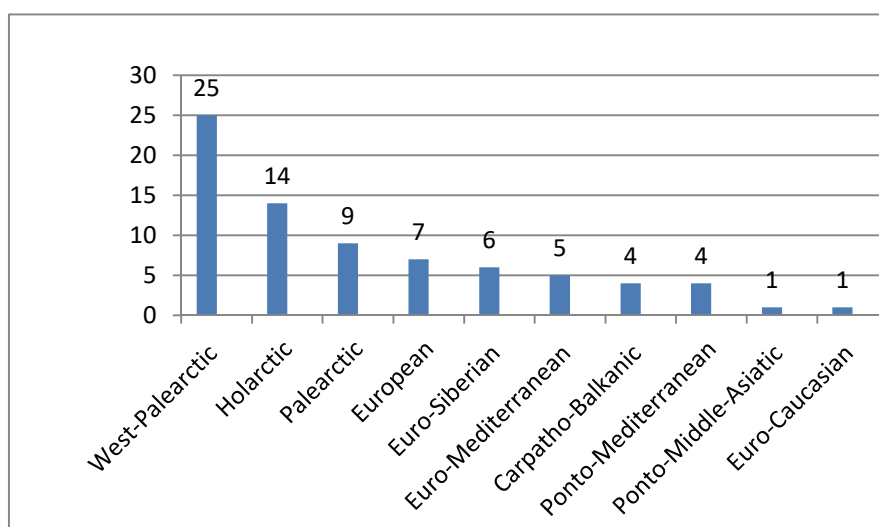


Figure 1. The analysis of species representation according to zoogeographic categories (based on 76 species).

As snout leaf beetles and weevils constitute a highly diverse group of phytophagous insects, many of them are considered harmful pests for both agriculture and forestry. Among the forestry pests, the species that cause damage of varying degrees are *Attelabus nitens* (Scop.), *Byctiscus betulae* (L.), *Curculio aequatus* (L.), *Curculio glandium* Marsh., *Lignyodes bischoffi* (Blatch.), *Otiorhynchus fullo* (Schrnk.), *Phyllobius pyri* (L.), *Rhynchites auratus* (Scop.), *Sciaphobus squalidus* (Gyll.) and *Stereonychus fraxini* (Deg.) (POIRAS, 1996, 1998, 2006).

The most dangerous pests include the ash weevil *Stereonychus fraxini* (Deg.), (STAHI et al., 2016) causing significant damage and drying of ash in Republic of Moldova, and such species as *Curculio glandium* Marsh., *Lignyodes bischoffi* (Blatch), *Otiorhynchus fullo* (Schrnk.) and *Attelabus nitens* Scop. may be considered potential pests that pose a threat only in certain years, with a massive reproduction.

The study of the entomofauna from protected areas in the Republic of Moldova is always relevant and has a special importance in shaping the possible paths of evolution and stable functioning of the forest ecosystems.

CONCLUSIONS

The Chrysomeloidea and Curculionoidea beetle fauna of Codrii reserve is relatively well known.

76 species from the entomological collection of the Codrii reserve museum are presented. They belong to 5 families, 15 subfamilies, 27 tribes, and 40 genera as it follows: Chrysomelidae (2 subfamilies, 3 tribes, 5 genera and 7 species), Attelabidae (2 subfamilies, 2 tribes, 4 genera and 6 species), Brentidae (1 subfamily, 1 tribe, 1 genus and 2 species), Brachyceridae (1 subfamily, 1 tribe, 1 genus and 1 species), Curculionidae (9 subfamilies, 20 tribes, 29 genera and 60 species).

The most important forest pest species is the ash weevil *Stereonychus fraxini* (Deg.), which causes significant economic damages by producing mass defoliation of *Fraxinus* spp. trees.

Taking into consideration the much larger number of species mentioned for the fauna of the reserve, the collection should be developed with other species of Chrysomelidae and Curculionidae as well as with other families of insects.

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