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# RESEARCH OF THE COLEOPTERA (*Cerambycidae* and *Lucanidae*) FOUND IN THE NATURAL HABITATS OF THE GATEJESTI-BUNESTI FOREST

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***Abstract***

*The territory that we have been studying (since 2016) is situated in the Valcea County, in Gatejesti-Bunesti forest, part of the basin of Govora river. Referring to the geo-morphological aspect, the research area is part of the Subcarpathian area of Oltenia. The conspectus of the coleoptera in the Bunesti-Gatejesti Forest has been elaborated on the basis of personal researches undertaken since 2016, as well as the little bibliographical information regarding this field. The field researches were made from March till November, on scheduled itineraries. The research area is a forest edified by: Quercus patreae, Fagus sylvatica and Carpinus betulus. Following research in the forest habitats of the Govora river basin, we have identified for species of the Coleoptera (Cerambycidae and Lucanidae), belonging to 5 genera and 3 subfamilies. In this forest we realise 20 transects of de 100 m and we identified 160 specimens. Lucanus cervus species is most common. The Cerambycidae family it is represented by two subfamilies - Cerambycinae and Lamiinae. From the Cerambycinae subfamily was identified two species: Cerambyx cerdo (Linnaeus, 1758) and Rosalia alpina (Linnaeus, 1758) and from Lamiinae subfamily was identified one species - Morimus funereus (Mulsant, 1863). From the Lucanidae family, Lucaninae subfamily was identified two species: Lucanus cervus (Linnaeus, 1758) and Dorcus parallelipipedus (Linnaeus, 1758). Installing species of the Coleoptera in this area on certain tree species is determined by their trophic preferences. Among the species identified, a particular interest is represented by the species: Cerambyx cerdo (Linnaeus, 1758), Rosalia alpina (Linnaeus, 1758), Morimus funereus Mulsant 1863 and Lucanus cervus (Linnaeus, 1758), which are protected species contained in Annex II of the Habitats Directive. We consider the study and knowledge of the entomofauna of this territory, whose boidiversity is going through important changes due to the anthropo-zoogenic factors, to be of great importance nowadays.*

***Key words****: Coleoptera, Lucanidae, Cerambycidae, forest habitats, Govora basin.*

## INTRODUCTION

The territory under research is located in the Govora river basin (Valcea County) part of the Subcarpathian area of Oltenia.
The researches were made in the forest Gatejesti-Bunesti. This forest is edified by: *Quercus patrea, Fagus sylvatica* and *Carpinus betulus*. In this area we found the next forest habitats: 91E0* Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*), 9110 *Luzulo-Fagetum* beech forests, 9170 *Galio-Carpinetum* oakhornbeam forests.

## MATERIALS AND METHODS

In this forest we realise 20 transects of the 100 m and we identified 160 specimens.
To characterize their populations, specific methods have been used, summarized below.

**Field studies to identify invertebrate species**

For the identification of the three invertebrate species, observations were made in the field between March and November. In order to confirm the presence or absence of these key species in the investigated areas, we have inspected old *Quercus*, beech, hornbeam etc., woods with decayed wood residues, old trunks, secular shafts with cracks, fallen trees etc., stacks of wood from the exploitation of trees, litter, paths, forest roads.

**Determination of the effective population for each species**

Since the area to be investigated is very large and the counting of all individuals is not possible, indirect methods of assessing the effective population were used.

**Transects** have been delineated, with areas of old trees, trunks, fallen trees, hollows. One transect had the following parameters: L = 100 m and l = 20 m/S = 2000 $m^2$. Along these were the individuals observed on the trunks and the litter, and after the end of the flight period, for the species *Lucanus cervus* and *Cerambyx cerdo* were considered exoskeletons or scabs of exoskeletons. In the case of *Morimus funereus*, no exoskeleton was observed except isolated, as the species probably entered the diapause.
Observations were made on the gender of the individuals, the height from the soil of the observed species, the wood species, the diameter of the tree, the behaviour of the insect, whether solitary or in couple, the moment of the day, the type of habitat, there were taken into account also the head with the mandibles. The twilight transect method was used, recommended by Harvey et al. (2011b) for *Lucanus cervus* and *Cerambyx cerdo*.

## RESULTS AND DISCUSSIONS

The conspectus of the Coleoptera in the Bunesti-Gatejesti forest has been elaborated on the basis of personal researches undertaken since 2016, as well as the little bibliographical information regarding this field. The field researches were made from March till November, on scheduled itineraries.
Following research in the forest habitats of the Govora river basin, we have identified for species of the Coleoptera (Cerambycidae and Lucanidae), belonging to 5 genera and 3 subfamilies.
The Cerambycidae family it is represented by two subfamilies - Cerambycinae and Lamiinae. From the Cerambycinae subfamily was identified two species: *Cerambyx cerdo* (Linnaeus, 1758) and *Rosalia alpina* (Linnaeus, 1758) and from Lamiinae subfamily was identified one species - *Morimus funereus* (Mulsant, 1863).
*Cerambyx cerdo* (Linnaeus, 1758) is a protected species (Natura 2000 Code: 1088 according to Council Directive 92/43/EEC, Annex II, GEO 57/2007 Annex 3) (figure 1). Following the inventory of trees in this forest stand of the forest part, the species is present in the following type of habitat: 9170 *Galio-Carpinetum* oakhornbeam forests, where they prefer the secular trees isolated in the shingles or at the edge of the forest, especially those partially attacked by various pests. The species was highlighted in trees over 70 years old, but it takes time for the number of trees in this forest to reach the appropriate age and be inhabited by the species. The size of the population is closely correlated with the ecological conditions of the trees stand, so between March and November 36 individuals, males and females, alive or dead, were inventoried. A negative impact on the species is the cutting of secular trees, especially in the plateau area. Such activities affect the habitat of the species, and secular trees are rarer in the area. Land observations related to the population of the species under the current pressures make us believe that the manifestation of these threats will have a significant impact in the future.
At *Cerambyx cerdo* sexual dimorphism is obvious, according to the data recorded on the ground, the result of the statistical calculation of this indicator resulted in a 63.9% sex ratio having a supraunit value.

Figure 1. *Cerambyx cerdo* in the Gatejesti-Bunesti Forest

*Rosalia alpina* (Linnaeus, 1758) is also a protected species (Natura 2000 Code: 1087, according to Council Directive 92/43/EEC, Annex II, GEO 57/2007 Annex 3). In the studied territory the population of this species from a numerical point of view is insignificant. One single male specimen was reported during the flight in a beech phytocenosis.
*Morimus funereus* (Mulsant, 1862) is a protected species (Natura 2000 Code: 1089, according to Council Directive 92/43/EEC, Annex II, GEO 57/2007 Annex 3).
He prefers dry, partially dried or attacked by other pests, such conditions being ensured by

forests over 40 years old. Adults were observed during the day or evening, near the trunks, on the freshly cut trunks, on the logs, on the stems of old trees, with the branches on the lower dry floor or on completely dry trees belonging to different woody species: *Quercus petraea*, *Fagus sylvatica*, *Cerasus avium*. Individuals are located at different heights on the surface of the stems, at the base of these up to 230 cm above the ground. In the forest stands of this forest the population of this species is relatively small, few individuals have been identified. The transects performed showed 1-2 specimens/2000 sq m, sometimes present with individuals of *Lucanus cervus* and *Dorcus parallelipipedus*.

Impacts, current anthropogenic pressures and threats, have a cumulative low or insignificant effect on the species, not significantly affecting its viability in the long run. Several stacks of wood were observed following field research, especially in the Gatejesti area, so that they have been stored for a longer period of time in the forest fund act as traps for the individuals of *Morimus funereus* during mating. Sexual dimorphism is also evident in this species, and for the sex ratio there were taken into account the living individuals observed on the field. Recorded data reveal male dominance.

From the Lucanidae family, Lucaninae subfamily was identified two species: *Lucanus cervus* (Linnaeus, 1758) and *Dorcus parallelipipedus* (Linnaeus, 1758).

*Lucanus cervus* (Linnaeus, 1758) is a protected species (Natura 2000 Code: 1083, according to Council Directive 92/43/EEC, Annex II, GEO 57/2007 Annex 3) (figure 2).

There are many individuals in rare-leafed areas, preferred by *Lucanus cervus*, but also dense, dark. The forest stands are planted on level ground and slopes with a slope of 10-40%. The species is commonly found in plateau areas in *Quercus petraea* phytocoenoses, rarely on the hills, with hornbeam and beech. In terms of population size: during the field trips in the Gatejesti-Bunesti area in March-November, 64 individuals, males and females were inventoried, many in the form of whole or fragmented exoskeletons. The species is rare or lacking in wet and cold valleys with a lot of grooves and coarse and submarine coats developed.

The cumulative effect of impacts on the species is cumulatively low or insignificant, not significantly affecting the long-term viability of the species under the conditions of an appropriate management of the forest fund in that area. A negative impact is carpinization - after deforestation, the hornbeam installs very slightly at the expense of the *Quercus species*, preferred by *Lucanus cervus*; has the effect of reducing the preferred biodiversity habitat. Field observations surprised gender issues as a result of increased sexual dimorphism. Data reveal males dominance, with a 62.5% sex ratio having a supraunit value. In the course of journeys, many individuals were observed in the substrate or covered with litter in August-September.

Figure 2. *Lucanus cervus* in the Gatejesti-Bunesti Forest

*Dorcus parallelipipedus* (Linnaeus, 1758) is not a protected species and is frequently found in the forest stands in the studied territory.

In the forest stands of this forest the population of this species is large, a number of 51 individuals have been identified. The transects performed revealed a relatively large number of copies/2000 square meters. Data reveal male dominance, with a 58.8% sex ratio, also having a supraunit value.

## CONCLUSIONS

Among the species identified, a particular interest is represented by the species: *Cerambyx cerdo* (Linnaeus, 1758), *Rosalia alpina* (Linnaeus, 1758), *Morimus funereus* (Mulsant, 1863) and *Lucanus cervus* (Linnaeus, 1758), which are protected species contained in Annex II of the Habitats Directive. We consider the study and knowledge of the entomofauna of this territory, whose

boidiversity is going through important changes due to the anthropo-zoogenic factors, to be of great importance nowadays.The forests in the studied area abound in rotten trunks, dry trees, wood remains left by tree exploitation. These rotten elements come from different woody species: *Quecus patrea*, *Fagus sylvatica* and *Carpinus betulus*. In the observed forests hygiene and thinning works are done, and the wood is kept in the forest. Numerous trunks of *Quercus petraea*, less rarely *Fagus sylvatiaca*, present drills of *Lucanus cervus, Cerambyx cerdo*. Our research reveals a higher density of individuals of *Lucanus cervus* in the selvages.

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