

PRELIMINARY RESEARCH ABOUT OF THE COLEOPTERA (CERAMBYCIDAE AND LUCANIDAE) FOUND IN THE SANATORIU FOREST OF THE GOVORA RIVER BASIN

LAURENTIU NICULESCU¹, ION MITREA²

¹University of Craiova, PhD student- Faculty of Horticulture, 13 A. I. Cuza, 200583, Craiova, launiculescu@yahoo.com, Romania

²University of Craiova, Faculty of Horticulture, Departament of Entomology, 13 A. I. Cuza, 200583, Craiova, mitreaion@gmail.com, Romania

Keywords: *Cerambycidae*, *Lucanidae*, Govora river, forest habitats

ABSTRACT

The territory that we have been studying is situated in the Sanatoriu Forest of the basin of the Govora river basin, Valcea County. Referring to the geo-morphological aspect, this area is part of the Subcarpathian area of Oltenia (Getics Subcarpathians of Valcea). This area represent a real scientific interest, being an area not studied until now. Following research in the forest habitats of the Govora river basin, we have identified five species of the Coleoptera (*Cerambycidae* and *Lucanidae*), belonging to 6 genera and 4 subfamilies. The *Cerambycidae* family it is represented by two subfamilies – *Cerambycinae*, *Lepturinae* and *Prioninae*. From the *Cerambycinae* subfamily was identified for species: *Cerambyx cerdo* (Linnaeus 1758), *Morimus funereus* Mulsant 1862, from *Lepturinae* subfamily, one species *Rhagium* (*Megarhagium*) *sycophanta* (Schrank, 1781) and from the *Prioninae* subfamily, one species *Prionus coriarius* (Linnaeus, 1758). From the *Lucanidae* family, *Lucaninae* subfamily was identified two species: *Lucanus cervus* (Linnaeus, 1758) and *Dorcus parallelipedus* (Linnaeus, 1758). Installing species of the Coleoptera in this area on certain tree species is determined by their trophic preferences. The distribution of the species was observed in habitats edified by the following species: *Quercus petraea*, *Q. dalechampii*, *Q. cerris*, *Carpinus betulus*, *Fagus sylvatica*. During the observations in the entire this area of the Sanatoriu Forest, 139 individuals were identified, both males and females, dead and alive and numerous fragmentes and exoskeleton.

In the research area of this forest the most common species are: *Lucanus cervus* (Linnaeus, 1758) and *Cerambyx cerdo* (Linnaeus 1758).

INTRODUCTION

The territory that we have been studying is situated in the basin of the Govora River, and includes the Sanatoriu Forest. This area belongs from the administrative point of view of Mihaesti Village, Valcea County. Referring to the geo-morphological aspect, this area is part of the Subcarpathian area of Oltenia (Getics Subcarpathians of Valcea) (fig. 1). The hydrographic network of the investigated region is tributary to the Valley of Govora River.

From the investigated area were identified the following types of forest habitats:

- **91E0***- Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salicion albae*) - CLAS. PAL.: 44.3, 44.2 și 44.13; RO habitat type code: R4401, R4402, R4405, R4407, R4408;
- **9130** - *Asperulo-Fagetum* beech forests; CLAS. PAL.: 41.13; RO habitat type code: R4118, R4119, R4120;
- **91M0** - *Pannonian-Balkan* turkey oak sessile oak forests; CLAS. PAL.: 41.76; RO habitat type code: R4132, R4133, R4134, R4136, R4137, R4140, R4142, R4149, R4150, R4151, R4152, R4153, R4154, R4155; (Gafta and Mountford, coord, 2008)



Fig. 1. Aspect of the forest Sanatoriu (Foto L.Niculescu, 2017)

MATERIAL AND METHODS

The studies on the field involved a good bibliographic documentation regarding the physical-geographical frame: the relief, the geology-lithology, the hydrographic network, the soils and the general and local climate. These studies were conducted during May to October 2017. As a result of landslides was collected entomological material, were made brush sampling by age, consistency, cardinal position, the edge area and isolated secular trees.

We used the following methods:

- the method of quantum assessment by searching for dead individuals;
- the method of quantitative evaluation by looking for individuals at rest;
- transects method performed during twilight.

In this forest we have made 5 transects. The collected material was determined using the following works: Forest Entomology (I. Mircea Ene, 1971) and Fauna R. P. R. (S. Panin and N. Savulescu, 1961).

RESULTS AND DISCUSSIONS

This area represent a real scientific interest, being an area not studied until now. Following research in the forest habitats of the Govora river basin, we have identified five species of the Coleoptera (*Cerambycidae* and *Lucanidae*), belonging to 6 genera and 4 subfamilies. The *Cerambycidae* family it is represented by two subfamilies – *Cerambycinae*, *Lepturinae* and *Prioninae*. From the *Cerambycinae* subfamily was identified for species: *Cerambyx cerdo* (Linnaeus 1758), *Morimus funereus* Mulsant 1862, from *Lepturinae* subfamily, one species *Rhagium (Megarhagium) sycophanta* (Schrank, 1781) and from the *Prioninae* subfamily, one species *Prionus coriarius* (Linnaeus, 1758). From the *Lucanidae* family, *Lucaninae* subfamily was identified two species: *Lucanus cervus* (Linnaeus, 1758) and *Dorcus parallelipedus* (Linnaeus, 1758). Installing species of the *Coleoptera* in this area on certain tree species is determined by their trophic preferences. The distribution of the species was observed in habitats edified by the following species: *Quercus petraea*, *Q. dalechampii*, *Q. cerris*, *Carpinus betulus*, *Fagus sylvatica*. During the observations in the entire this area of the Sanatoriu Forest, 139

individuals were identified, both males and females, dead and alive and numerous fragments and exoskeleton.

In the research area of this forest the most common species are: *Lucanus cervus* (Linnaeus, 1758) and *Cerambyx cerdo* (Linnaeus 1758).

Following the inventory of forest habitats in this area, the following species have been identified:

Order: Coleoptera Linnaeus, 1758

Family: Cerambycidae Latreille, 1802

Subfamily: Cerambycinae Latreille, 1802

Tribus: Cerambycini Latreille, 1804

Genus: Cerambyx Linnaeus, 1758

Subgenus: Cerambyx Linnaeus, 1758

Cerambyx (Cerambyx) cerdo Linnaeus, 1758

Status: protected species - Habitats Directive 92/43/EEC, Annex II and IV; in Romania - OUG 57/2007 Annex 3 and 4A; European Red List of the IUCN 2010 – Category VU

Biology and ecology. This species prefers old forests of oaks and also the beech forest and other deciduous forest. It is a species that supports very limited variations in environmental temperature and feeds on wood, preferring old deciduous forests. Adults are active at night and in the evening.

During the research in this area between May and October, 23 individuals have been identified, 14 males and 9 females, many in the form of whole or fragmented exoskeletons. Observations in the field captured aspects of the two sexes as a result of heightened sexual dimorphism.

Population density has been calculated. For the calculation of this indicator, the number of individuals registered in a transect area shall be reported: $N/2000\text{ m}^2$. So, the value of this indicator is relatively small.

Given the surface of this forest we consider that the populations of this species are in decline. The regression of the populations of this species is closely related to the logging of old oak trees. It is present in the following Natura 2000 habitat types: 91M0 and 9130, where it prefers secular trees, isolated in clearings or at the edge of the forest, especially those partially attacked by various pests.

Order: Coleoptera Linnaeus, 1758

Family: Cerambycidae Latreille, 1802

Subfamily: Cerambycinae Latreille, 1802

Tribus: Cerambycini Latreille, 1804

Genus: Cerambyx Linnaeus, 1758

Morimus funereus Mulsant 1862 (fig. 2)

Status: protected species - Habitats Directive 92/43/EEC, Annex II and IV; in Romania - OUG 57/2007 Annex 3 and 4A; European Red List of the IUCN 2010 – Category VU

Biology and ecology. It prefers trees that have been dried, partially dried or attacked by other pests, as such conditions have been covered by forests for over 45 years.

In this area, the lowest number of individuals was identified from this species: 11 (7 males and 4 females). In the studied territory the species prefers the habitat edified by *Fagus sylvatica*. Most specimens were found on stumps of *Fagus sylvatica*, at the edge of the forest.

The value of population density indicator is very small. It was found that the species prefers the communities of sunny plants, with the layer of rarefied trees, this species was also found in forests with higher density of trees and shrubs, but in marginal areas.



Fig. 2. *Morimus funereus* in the Sanatoriu Forest (foto L. Niculescu, 2017)

Order: Coleoptera Linnaeus, 1758
Family: Cerambycidae Latreille, 1802
Subfamily: Lepturinae Latreille, 1802
Tribus: Rhagiini Kirby, 1837
Genus: Rhagium Fabricius, 1775
Subgenus: Megarhagium Reitter, 1913

Rhagium (Megarhagium) sycophanta (Schrank, 1781)

Status: is not a protected species.

Biology and ecology. In the Sanatoriu Forest, the preferred habitat of this species: plant communities especially edified by *Quercus petraea*, *Alnus glutinosa*, *Fagus sylvatica* characterized by moderate humidity.

In this area 27 individuals have been identified, 22 males and 15 females.

Also, population density has been calculated. For the calculation of this indicator, the number of individuals registered in a transect area shall be reported: $N/2000\text{ m}^2$. For this species, the value of this indicator has a fairly low value. Most individuals were observed at mating in May on *Fagus sylvatica* or *Quercus petraea* stumps.

Order: Coleoptera Linnaeus, 1758
Family: Cerambycidae Latreille, 1802
Subfamily: Prioninae Latreille, 1802
Tribus: Prionini Latreille, 1802
Genus: Prionus Geoffroy, 1760

Prionus coriarius (Linnaeus, 1758)

Status: common species.

Biology and ecology. This species prefers old forests of oaks and also the beech forest and other deciduous forest. The species is widespread in both the plains and the mountains.

The small number of individuals listed (5 individuals) indicates that in the Sanatoriu Forest, the species does not benefit from favorable conditions for development.

Regarding the size of the population, it should be borne in mind that this species has a small dispersion of populations, a sharp fragmentation of the habitat. Thus, during the period of adult activity, in habitats that seemed favorable, the species was not encountered.

Order: Coleoptera Linnaeus, 1758
Family: Lucanidae Latreille, 1804
Subfamily: Lucaninae Latreille, 1804
Tribus: Lucanini Latreille, 1804

Genus: *Lucanus* Scopoli, 1763

Lucanus cervus (Linnaeus 1758)

Status: Habitats Directive 92/43/CEE, Annex II; in Romania - OUG 57/2007 Annex 3, European Red List of the IUCN 2010 – Category NT

Biology and ecology. This species prefers old forests of oaks and also the beech forest and other deciduous forest.

In the area of the Sanatoriu forest, the species was observed in the following types of Natura 2000 forest habitats: 9130 and 91M0.

Numerous cvercinee trunks, less often beech and carpen, exhibit drillings of *L. cervus*. During the movements in the Sanatoriu Forest between May and October, 54 individuals, male and female, many in the form of whole or fragmented exoskeletons, were recorded. Our research reveals a higher density of individuals of *L. cervus* in the edge of the forest.

Order: Coleoptera Linnaeus, 1758

Family: Lucanidae Latreille, 1804

Subfamily: Dorcinae Mulsant, 1842

Tribus: Dorcini Latreille, Mulsant, 1842 (Cladognathini Felsche, 1898)

Genus: *Dorcus* MacLeay 1819

Dorcus parallelipedus (Linnaeus, 1758)

Status: European Red List of the IUCN 2010 – Category LC

Biology and ecology. This species prefers in the beech forest and other deciduous forest.

In the area, the species was observed in the 9130 Natura 2000 habitat. 19 individuals, male and female, were recorded during the period of activity of the species, respectively from the beginning of May to August, after which field observations no longer highlight this species, although the habitats listed are favourable to them.

CONCLUSIONS

Following research in the Sanatoriu Forest of the Govora river basin, we have identified five species of the *Coleoptera* (*Cerambycidae* and *Lucanidae*), belonging to 6 genera and 4 subfamilies.

Following entomological research, high abundances were recorded in forests of older cvercines, with centuries-old rotten trunks, the layer of rarefied trees, the absent shrub layer, and the reduced grassy layer, which allows a large amount of light radiation to reach the ground.

Among the species identified, a particular interest is represented by the species: *Cerambyx cerdo* (Linnaeus, 1758), *Morimus funereus* (Mulsant, 1862) and *Lucanus cervus* (Linnaeus, 1758), which are protected species contained in Annex II of the Habitats Directive.

Species have been found to be rare or missing in wet and cold valleys with much grassland, the dominant *Crataegus* sp., with *Salix* sp., *Populus* sp, *Fraxinus* sp. or in the acacia borders, in shady forests with developed shrub stalk.

BIBLIOGRAPHY

1. Barbuceanu, D., Niculescu, M., Boruz, V., Niculescu, L., Stoleriu, Ursu, A., 2015 - Protected saproxylic Coleoptera in "the forests in the southern part of the Candesti Piedmont", a Romanian Natura 2000 protected area, Analele Universității din Craiova, seria Agricultură – Montanologie – Cadastru (Annals of the University of Craiova - Agriculture, Montanology, Cadastre Series) Vol. XLV, <http://anale.agro-craiova.ro/index.php/aamc/article/view/210/200>

2. **Gafta, D., Mountford, O. Coord.**, 2008 - *Romanian Manual for interpretation of Eu habitats*, ED. Risoprint, Cluj-Napoca, pp. 101
3. **Hawes C.**, 2008 - The stag beetle *Lucanus cervus* (Linnaeus, 1758) (Coleoptera: Lucanidae): a mark-release-recapture study undertaken in one United Kingdom residential garden, *Rev. Écol. (Terre Vie)*, vol. 63: 131-138.
4. **Niculescu, M., Bercea, I., Niculescu, L., Hirjeu, N.**, 2014 - *The forest habitats found in Lespezi Quarry, Dambovita County*, Analele Universității din Craiova, seria Agricultură – Montanologie – Cadastru (Annals of the University of Craiova - Agriculture, Montanology, Cadastre Series) Vol. XLIV 2014, Vol. 1, <http://anale.agro-craiova.ro/index.php/aamc/article/view/199>
5. **Niculescu, M., Făgăraș, M., Niculescu, L.**, 2015, *Environmental rehabilitation and preservation measures in Baita-Craciunesti Quarry*, references: 15th International Multidisciplinary Scientific GeoConference SGEM 2015, www.sgem.org, SGEM2015 Conference Proceedings, ISBN 978-619-7105-39-1 / ISSN 1314-2704, June 18-24, 2015, Book5 Vol. 1, 297-304 pp, DOI: 10.5593/SGEM2015/B51/S20.039
6. **Niculescu Mariana** - *Diversity, distribution and ecology of the freshwater natural habitats from Southern of Oltenia, Romania*- USAMV Bucuresti, **SCIENTIFIC PAPERS-SERIES A-AGRONOMY, Volume: 59**, 2016, <http://agronomyjournal.usamv.ro/index.php/scientific-papers/past-issues?id=602>
7. **Niculescu, Mariana, Alexandru Tudor, Grecu Florina** - *tâThe corology, ecology, phytosociology and hierarchical analysis of the bushes plant communities in the Parang Mountains (Southern carpathians) Romania*, SGEM Vienna Green, Hofburg, 2016, ISBN 978-619-7105-79-7/ISSN 1314-2704, Noiembrie 2016, Book 6 Vol.III, 363-371 pp., <http://www.sgemviennagreen.org/index.php/sgemviennagreen-callforpaper/impact-factor/24-sgemviennagreen-vienna-committee/61-impact-factor>
8. **Panin, S., Savulescu, N.**, 1961 - *Insecta, Coleoptera, Fam. Cerambycidae*, vol. X, fasc. 3, Ed. Academiei R.P.R., 523 pp.
10. **Stan, Melania**, 2013 - *Romanian species of Lucanids (Coleoptera: Scarabaeoidea: Lucanidae) in the collections of "Grigore Antipa" National Museum of Natural History*, *Travaux du Muséum National d'Histoire Naturelle «Grigore Antipa»*, Vol. LVI (2): pp. 173–184.
11. *** *Council Directive 92/43/EEC* of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora, Annex I (Habitats Directive)
12. *** *European Red List of the IUCN 2010*, <https://www.iucnredlist.org/>