

NEW CONTRIBUTIONS TO THE KNOWLEDGE OF CARABIDAE (COLEOPTERA: CARABIDAE) FROM THE „CODRII TIGHECI” LANDSCAPE NATURE RESERVE

BACAL SVETLANA

Abstract. *The paper represents a faunistic study accomplished on Carabidae family within the „Codrii Tigheci Landscape Nature Reserve” in the period 2003-2007. The fauna of Carabidae, studied by the method of Barber traps, comprises 83 species. The list of collected species is presented with some ecological data.*

Keywords: *edaphic coleopterans, Codrii Tigheci landscape reserve.*

Rezumat. *Noi contribuții la cunoașterea coleopterelor carabide (Coleoptera: Carabidae) din Rezervația peisagistică „Codrii Tigheci”. Lucrarea prezintă un studiu faunistic realizat asupra familiei Carabidae, în cadrul rezervației peisagistice „Codrii Tigheci” în perioada anilor 2003-2007. Fauna coleopterelor carabide investigate prin metoda capcanelor Barber este formată din 83 de specii. Se enumeră lista speciilor colectate cu unele date ecologice.*

Cuvinte cheie: *Carabide, Codrii Tigheci, rezervație peisagistică.*

INTRODUCTION

In the Republic of Moldova, the family Carabidae was studied in many scientific papers. More detailed research of this coleopteran family was realized by NECULISEANU in 2003. Nevertheless, on the republic territory there are still many poor studied ecosystems. One of them is Codrii Tigheci. This paper is based on direct researches accomplished in the „Codrii Tigheci” Landscape Nature Reserve during 2003-2007 on Carabidae family, the study being both faunistic and ecological one.

The „Codrii Tigheci” Landscape Nature Reserve is placed in the axial part of the orografic silvosteppe region – Tigheci Hills, which start from the Codri forest of Central Moldova to the south of the republic and have a length of over 100 km. Unlike the proximal regions - Lower Prut Valley and South Moldova Plain, the Tigheci Hills are characterized by a vertical and horizontal separation of the relief and by the succession of forest and steppe landscapes. The steppe landscapes occupy mostly the interfluvium zone (between Prut and Ialpuș) and were deeply modified in agricultural lands, vineyards and pastures. The forest sectors kept isolated in the axial zone only in the altitude areas and form compact surfaces within the protected area limits with forest vegetation, such as Codrii Tigheci Landscape Nature Reserve (POSTOLACHE, 1995). The nature reserve occupies the surface of 2,519 ha (Legislația ecologică a RM, 1999) or 25.2 km² that represents about 2% from the total surface of 128610 ha or 1286.1 km² of physical-geographical unity Tigheci Hills, traditionally named Codrii Tigheci or Tigheci Plateau (RÂMBU, 1985).

COLLECTING METHODS

The soil traps of Barber type were used for the collecting of the faunistic material. By this method there were collected edaphic coleopterans, which inhabit on the soil surface or in its upper level (KUDRIN, 1966, 1971; TIHOMIROVA, 1975; ȘILENCOV, 1982; KRĂJANOVSCII, 1983a). As traps there were used jars of various volumes (700-1000 ml). These traps were buried in the soil till their upper margin. The concentrate solution of NaCl and acetic acid (CH₃COOH), which have good preservation qualities, were used as fixation solution. At the same time the presence of the fixation excluded the cannibalism between the individuals in the trap and decreased the probability of their escape from traps (BĂZOVA, 1987).

The species identification was accomplished on the basis of external morphology characters. The taxonomic studies used during the identification were accomplished after the following keys of identification: KRĂJANOVSCII O., (1983b).

RESULTS AND DISCUSSIONS

The „Codrii Tigheci” Landscape Nature Reserve has a rich, but poor studied fauna. In the paper of MEDVEDEV and ȘAPIRO (1957) there was presented the whole faunistic list of coleopterans found by these authors in the study period, some coleopteran species are mentioned, collected near Leova village, the most proximal locality from the „Codrii Tigheci” Landscape Nature Reserve.

According to the accomplished researches, there was emphasized that this family is represented by 83 species from 28 genera, grouped into 16 tribes and 2 subfamilies. The majority of the species are mesophylous, but there are also some hygrophilous species. The carabid species are sometimes used as ecological indicators. Usually the representatives of genera *Calosoma* and *Carabus* decrease their individual number in environmental conditions affected by the antropogenic factors, especially with chemical pollution. On the other hand, some species from genera *Amara*,

Bembidion and *Harpalus* have a high tolerance toward the polluted environment. The bibliographic data confirm that some species of genera *Bembidion*, especially *Bembidion lampros*, *B. quadrimaculatum*, *B. pygmaeum* increase their individual number as long as increases the pollution level (PRISTAVCO, 1991). The carabids have also an important role in the determination of soil types of the deciduous forests: brown forest soil, light grey, dark grey (NECULISEANU, 1995, 1998, 2001, 2003; GHILEAROV, 1963).

Faunistic list of Carabidae collected from the „Codrii Tigheci” Landscape Nature Reserve with some ecological data.
Lista faunistică a coleopterelor Carabidae, colectate în rezervația peisagistică „Codrii Tigheci”, cu unele date ecologice.

Family CARABIDAE,

Tribe NEBRIINI,

1. *Leistus rufomarginatus* (DUFTSCHMID, 1812) - Eurocaucasian, zoophagous, mesoxerobiont.
2. *L. ferrugineus* (LINNAEUS, 1758) - Eurosiberian, zoophagous, mesophylous.
3. *Nebria rufescens* (STROM, 1768) - Transpalearctic, zoophagous, hygrophylous.
4. *N. brevicollis* (FABRICIUS, 1792) - Eurocaucasian, zoophagous, mesophylous.

Tribe NOTIOPHILINI

5. *Notiophilus laticollis* CHAUDOIR, 1850 - Eurocaucasian, zoophagous, mesophylous.
6. *N. palustris* (DUFTSCHMID, 1812) - Westpalearctic, zoophagous, mesophylous.
7. *N. biguttatus* (FABRICIUS, 1779) - Eurosiberian, zoophagous, mesophylous.

Tribe CARABINI

8. *Calosoma inquisitor* (LINNAEUS, 1758) - European, zoophagous, mesophylous, sylvicolous.
9. *Carabus excellens* KRAATZ, 1887 - European, zoophagous, sylvicolous, mesophylous.
10. *C. convexus* FABRICIUS, 1775 - Eurosiberian, zoophagous, mesophylous, sylvicolous.
11. *C. coriaceus* KRAATZ, 1877 - European, zoophagous, sylvicolous, mesophylous.
12. * *C. hortensis* LINNAEUS, 1758 - Palearctic, zoophagous, sylvicolous, mesophylous.

Tribe CLIVININI

13. *Clivina fossor* (LINNAEUS, 1758) - Transpalearctic, mixophagous, mesophylous, sylvicolous.

Tribe TACHYINI

14. *Tachys bistratus* (DUFTSCHMID, 1812) - European, zoophagous, halophylous, sylvicolous.
15. *Tachyta nana* (GYLLENHAL, 1810) - Holarctic, zoophagous, phytophylous, sylvicolous.

Tribe BEMBIDIINI

16. *Bembidion lampros* (HERST, 1784) - Transpalearctic, mixophagous, mesophylous, sylvicolous.
17. *B. biguttatum* (FABRICIUS, 1779) - Eurosiberian, zoophagous, higrophylous, sylvicolous.
18. *B. laticolle* (DUFTSCHMID, 1812) - Euromediterranean, zoophagous, higrophylous, sylvicolous.

Tribe PTEROSTICHINI

19. *Stomis pumicatus* (PANZER, 1796) - European, zoophagous, mesophylous, sylvicolous.
20. *Pterostichus niger* (SCHALLER, 1783) - Transpalearctic, mesophylous., mesophylous.
21. *Pt. chamaeleon* MOTSCHULSKY, 1865 - Eurosiberian, zoophagous, higrophylous, sylvicolous.
22. *Pt. leonisi* APFELBECK, 1904 - Pontică, zoophagous, higrophylous, sylvicolous.
23. *Pt. minor* (GYLLENHAL, 1827) - Eurosiberian, zoophagous, higrophylous, sylvicolous.
24. *Pt. ovoideus* (STURM, 1824) - Eurocaucasian, zoophagous, mesophylous., sylvicolous.
25. *Pt. strenuus* (PANZER, 1797) - Eurosiberian, zoophagous, mesophylous., sylvicolous.
26. *Pt. melanarius* (ILLIGER, 1798) - Eurosiberian, zoophagous, mesophylous, sylvicolous.
27. *Pt. melas* (CREUTZER, 1799) - Euro-mediterranean, mixophagous, mesophylous, sylvicolous.
28. *Pt. hungaricus* DEJEAN, 1828 - Mediterranean, zoophagous, mesophylous, sylvicolous.
29. *Abax parallelipedus* (=ater) (PILL, MITTERPACHER, 1783) - European, zoophagous, mesophylous, sylvicolous.

30. *A. carinatus* (DUFTSCHMID, 1812) - European, zoophagous, mesophylous, sylvicolous.

31. *A. parallelus* (DUFTSCHMID, 1812) - European, zoophagous, mesophylous, sylvicolous.

Tribe SPHODRINI

32. *Calathus distinguendus* CHAUDOIR, 1846 - Mediterranean, mixophagous, mesophylous, sylvicolous.
33. *C. fuscipes* (GOEZE, 1777) - Westpalearctic, mixophagous, mesophylous, sylvicolous.
34. *C. ambiguus* (PAYKULL, 1790) - Euroasiatic, mixophagous, mesoxerobiont, sylvicolous.
35. *C. melanocephalus* (LINNAEUS, 1758) - Transpalearctic, mixophagous, mesophylous, sylvicolous.
36. *C. halensis* (SCHALLER, 1783) - Transpalearctic, mixophagous, mesophylous, sylvicolous.

Tribe PLATYNINI

37. *Platynus assimile* (PAYKULL, 1790) - Transpalearctic, zoophagous, mezohigrophylous, sylvicolous.
38. *Agonum nigrum* DEJEAN, 1828 - Euroasiatic, zoophagous, mesophylous, sylvicolous.
39. *Anchomenus dorsale* (PONTOPPIDAN, 1763) - Transpalearctic, zoophagous, mezohigrophylous, sylvicolous.
40. *Platyderus rufus* (DUFTSCHMID, 1812) - European, zoophagous, mesophylous, sylvicolous.

Tribe AMARINI

41. *Amara aenea* (DE GEER, 1774) - Transpaleartic, phytophagous, mesophylous.
42. *A. plebeja* (GYLLENHAL, 1810) - Euro-mediterranean, phytophagous, mesophylous.
43. *A. communis* (PANZER, 1797) - Transpaleartic, phytophagous.
44. *A. tricuspadata* DEJEAN, 1831 - Euroasiatic, phytophagous, geophylous.
45. *A. eurynota* (PANZER, 1797) - Westpaleartic, phytophagous, geophylous, sylvicolous.
46. *A. familiaris* (DUFTSCHMID, 1812) - Transpaleartic, phytophagous, geophylous.
47. *A. saphyrea* DEJEAN, 1828 - Transpaleartic, phytophagous, geophylous.
48. *A. lucida* (DUFTSCHMID, 1812) - Eurocaucasian, phytophagous, geophylous.
49. *A. ovata* (FABRICIUS, 1792) - Transpaleartic, phytophagous, geophylous.
50. *A. similata* (GYLLENHAL, 1810) - Transpaleartic, phytophagous, geophylous.
51. *A. bifrons* (GYLLENHAL, 1810) - Westpaleartic, phytophagous, mesoxerobiont.
52. *A. municipalis* (DUFTSCHMID, 1812) - Euroasiatic, phytophagous.
53. *A. praetermissa* (C. SAHLBERG, 1827) - Mediterranean, phytophagous.
54. *A. spreta* DEJEAN, 1831 - Euroasiatic, phytophagous, geophylous.
55. *Zabrus tenebrioides* FISCHER VON WALDHEIM, 1817 - Eurocaucasian, phytophagous, geophylous.

Tribe HARPALINI

56. *Stenolophus teutonius* (SCHRANK, 1781) - Westpaleartic, zoophagous, higrophylous.
57. *S. discophorus* FISCHER VON WALDHEIM, 1823 - Westpaleartic, zoophagous, mesohigrophylous.
58. *S. mixtus* (HERBST, 1784) - Westpaleartic, zoophagous, higrophylous.
59. *Harpalus rufipes* (DE GEER, 1774) - Transpaleartic, phytophagous, mesoxerobiont.
60. *H. rubripes* (DUFTSCHMID, 1812) - Westpaleartic, phytophagous.
61. *H. atratus* LATREILLE, 1804 - Eurocaucasian, phytophagous.
62. *H. serripes* (QUENSEL, 1806) - Westpaleartic, phytophagous.
63. *H. flavicornis* DEJEAN, 1829 - Euro-mediterranean, phytophagous, mesophylous.
64. *H. froelichi* STURM, 1818 - Eurosiberian, phytophagous, mesoxerobiont.
65. *H. flavescens* (PILLER, MITTERPACHER, 1783) - European, phytophagous, mesophylous.
66. *H. tardus* (PANZER, 1797) - Eurosiberian, phytophagous, mesophylous.
67. *H. autumnalis* (DUFTSCHMID, 1812) - Euroasiatic, phytophagous, mesophylous.
68. *H. fuliginosus* (DUFTSCHMID, 1812) = *solitaries* DEJEAN, 1829 - Eurosiberian, phytophagous, mesoxerophylous.
69. *H. distinguendus* (DUFTSCHMID, 1812) - Transpaleartic, phytophagous, mesophylous.
70. *H. amplicollis* MENETRIES, 1848 - Eurosiberian, phytophagous.
71. *Ophonus schaubergerianus* PUEL, 1937 - European, phytophagous, mesophylous.
72. *O. rufibarbis* (FABRICIUS, 1792) - Transpaleartic, phytophagous, mesophylous.
73. *O. azureus* (FABRICIUS, 1775) - Westpaleartic, phytophagous, mesophylous.
74. *O. diffinis* (DEJEAN, 1829) - Mediterranean, phytophagous, mesophylous.

Tribe HARPALINI

75. *Panagaeus bipustulatus* (FABRICIUS, 1775) - European, zoophagous, mesoxerobiont.

Tribe CALLISTINI (CHLAENIINI)

76. *Chlaenius nigricornis* (FABRICIUS, 1787) - Eurosiberian, zoophagous, higrophylous.

Tribe LICININI

77. *Licinus depressus* (PAYKULL, 1790) - Westpaleartic, zoophagous, mesophylous, sylvicolous.
78. *L. silphoides* (ROSSI, 1790) - Euro-mediterranean, zoophagous, mesophylous.
79. *Badister bipustulatus* (FABRICIUS, 1787) - Transpaleartic, zoophagous, mesophylous.

Tribe LEBIINI

80. *Lebia cruxminor* (LINNAEUS, 1758) - Transpaleartic, zoophagous, phytophylous, steppe.

B. Subfamily BRACHYNININAE

Tribe BRACHININI

81. *Brachinus crepitans* (LINNAEUS, 1758) - Westpaleartic, mixophagous, mesophylous.
82. *B. explodens* DUFTSCHMID, 1812 - Westpaleartic, mixophagous, mesophylous.
83. *B. psophia* SERVILLE, 1821 - Westpaleartic, mixophagous, mesohigrophylous.

* - new species for the Republic of Moldova.

CONCLUSIONS

The accomplished researches offer the possibility to emphasize for the „Codrii Tigheci” Landscape Nature Reserve 83 species from 28 genera, 16 tribes and 2 subfamilies.

The species *Carabus hortensis* Linnaeus, 1758 is a new species for the Republic of Moldova.

REFERENCES

- BACAL S. 2008. *Diversitatea și ecologia coleoptelor epigee (Insecta, Coleoptera) din rezervația peisagistică „Codrii Tigheci”*. Autoreferat al tezei de doctor în biologie. Chișinău: 24 pp.
- NECULISEANU Z. 1995. *Carabidele (Coleoptera, Carabidae) - indicatori ai răspândirii solurilor brune de pădure în Codrii Moldovei*. În: Protecția, redresarea și folosirea rațională a biodiversității lumii animale//Conf. III a Zoologilor din R. Moldova: 48 pp.
- NECULISEANU Z. & RUSU V. 1998. *Mezofauna și unele caracteristici fizico-chimice ale solurilor din diferite tipuri de păduri//Resursele funciare și acvatice. Valorificarea superioară și protecția lor*. 1: 204-205.
- NECULISEANU Z. 2001. *Fauna edafică (Mezofauna) în solurile brune de pădure și agrostațiile adiacente din podișul central al Moldovei//Rezumat IV-a Conf. Zool. R. Moldova*. Chișinău: 144-145.
- NECULISEANU Z. 2003. *Carabidele (Coleoptera, Carabidae) din zona de interferență biogeografică (taxonomie, diversitate, zoogeografie, biologie) și importanța lor practică//Autoreferat al tezei de doctor habilitat în biologie*. Chișinău: 42 pp.
- POSTOLACHE GH. 1995. *Vegetația republicii Moldova*. Chișinău: 220 pp.
- БЫЗОВА Ж, ГИЛЯРОВ М. и др. 1987. *Количественные методы в почвенной зоологии*. Москва: 287 с.
- ГИЛЯРОВ М. С. 1963. *фауна как показатель распространения буроземов в Молдавских Кодрах//Зоологический Журнал*. XLII, вып. 8. С.: 1135-1141.
- КРЫЖАНОВСКИЙ О. Л. 1965. // *Определитель насекомых европейской части*. СССР. 2. Москва-Ленинград: Наука: 646 с.
- КРЫЖАНОВСКИЙ О. 1983а. *Семейство – Carabidae – жуужелицы: сбор, хранение и определение*. Фауна СССР. Жесткокрылые. 1(2). Москва: 191-198 с.
- КРЫЖАНОВСКИЙ О. 1983б. *Жесткокрылые*. Ленинград „Наука”. Фауна СССР. 1: 340 с.
- КУДРИН А. 1966. *Изучение сообществ обитателей поверхности почвы с помощью земляных ловушек//Автореф. дис. канд. биол. Наук. – Ленинград*: 21 с.
- КУДРИН А. 1971. *Об усовершенствовании учетов численности способом ловушек//Зоол. Журнал* 50 (9). Ленинград, С: 1388-1399.
- МЕДВЕДЕВ С. И., ШАПИРО Д. К. 1957. *познанию фауны жуков (Coleoptera) Украины//Тр. Н-и ин-та биол. и биол. Факторов*. N. 30: 173-206 с.
- ПРИСТАВКО В. П. 1991. *Состояние энтомофауны как элемент экологического мониторинга: реакция жуужелиц (Coleoptera, Carabidae) на загрязнения среды нефтепродуктами//Фауна и экология жесткокрылых Белорусии*. Минск „Навука і тэхніка”: 204-211 с.
- РЫМБУ Н. 1985. *Физико-географическое районирование Молдавской. ССР*. Кишинэу: 187 pp.
- ТИХОМИРОВА А. Л. 1975. *Учет напочвенных беспозвоночных*. В кн.: *Методы почвенно-зоологических исследований*. – Москва: 23-33 с.
- ШИЛЕНКОВ В. 1982. *Методы изучения фауны и экологии, жесткокрылых на примере жуужелиц (Coleoptera, Carabidae)*. Иркутск: 30 с.
- ***. *Legislația ecologică a Republicii Moldova (1996-1998)*. Chișinău. 1999: 219 pp.

Bacal Svetlana

of Zoology, Academy of Sciences of Moldova
Academiei str., 1, MD-2028
Chisinau, Republic of Moldova
e-mail: svetabacal@yahoo.com