

OBSERVATIONS ABOUT THE INVERTEBRATES FROM THE BIHOR COUNTY (ROMANIA) DURING 2021-2022

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Abstract

*In this paper there were presented data about the invertebrates from the Bihor County, during 2021 – 2022. There were recorded 82 species belonging to 5 classes, 13 orders and 76 genera. There were obtained ecological data of these species, unknown in the scientific literature. The premature appearance of the species *Pieris rapae* L was observed about a month earlier than the period mentioned in the scientific literature. Many species in various stages of development have been observed to be active during the cold season, due to the relatively high temperatures recorded during this period, as a consequence of global warming. The recorded data contribute to the deepening of knowledge about the ecology and spread of these species at the national level, some species being probably mentioned for the first time in the fauna of Bihor County. Most of the species observed are relatively common nationally. In terms of geographical spread, most species are European, others have a wider distribution, being cosmopolitan.*

Keywords: invertebrates, Bihor County, Tinca area.

1. INTRODUCTION

The Bihor county is located in the north – western part of Romania, in the Crișana region. The climate is temperate – continental moderate, the drainage is represented by many rivers and lakes, the relief is varied: plains, hills, mountains.

The disappearance of species or the diminution of their population, the emergence of new species, either accidental in a territory, insufficient faunal data, observing some ecological aspects not published in the scientific literature are just a few reasons that make it absolutely necessary to publish the faunal data observed in nature. Data about the fauna of invertebrates from the Bihor county were published by authors (Ilie 2014 a,b, 2015 a, b, 2017, 2019; Ilie, Marinescu, 2019, 2020 a,b; 2021 a,b).

2. MATERIALS AND METHODS

The insects, spiders (partially) were collected with the entomological net and mollusks by hand. For the identification of the invertebrates were used different sources (Panin, 1951; Dijkstra, 2006; Warchalowski, 2003; Pîrvu, Godeanu, Stroe, 1985; Szekely, 2008; Fuhn, Niculescu – Burlacu, 1971; Platnick, 2020; Bee, Oxford, Smith, 2020; lepiforum.de; pyrgus.de; en.m.wikipedia.org; araneae.nmbe.ch).

3. RESULTS AND DISCUSSIONS

During 2021 – 2022, were identified the following species:

The Insecta Class, The Lepidoptera Order

- *Vanessa atalanta* (LINNAEUS, 1758) - 33 specimens, Tinca, October – November 10, 2021; one specimen, Oradea, near the Crișul Repede river, November 2, 2021. Common species in Romania, it is found in Europe, North Africa, the Americas and Asia.
- *Colias croceus* (GEOFFROY, 1785) - 17 male specimens, 37 female specimens, Tinca, October – November 22, 2021; one female specimen, Tinca, November 28, 2021, $t = 16^{\circ} \text{C}$; one caterpillar, Tinca, December 20, 22, 2021, $t = 2^{\circ} \text{C}$ (the latest observation of this species in the Tinca area in 2021). Common species in Romania, it is found in Europe, North Africa and Asia Minor.
- *Colias erate* (ESPER, 1805) – 2 female specimens, Tinca, October 19. Relatively common species in Romania, it is found in south – eastern Europe, Asia Minor and Central Asia, North and Eastern Africa.
- *Acronicta rumicis* (LINNAEUS, 1758) – 10 larvae, Tinca, October – November 13, 2021. Common species in Romania, Palearctic species.
- *Macroglossum stellatarum* (LINNAEUS, 1758) – one specimen, Tinca, October 23, 2021; one specimen, Tinca December 2, 2021, $t = 11^{\circ} \text{C}$ (the latest observation of this species in the Tinca area). Common species in Romania, it is found in Europe and South Asia.
- *Emmelina monodactyla* (LINNAEUS, 1758A) – 8 specimens, Tinca, October – November 21, 2021; one specimen, Tinca, December 8, 9, 2021, (the same specimen in the same place), $t = 2^{\circ} \text{C}$ (the last observation of this species in the Tinca area). Relatively common species in Romania, it is found in Europe, Asia, North Africa and North America.
- *Polyommatus icarus* (ROTTEMBURG, 1775) - one female specimen, Tinca, October 21, 2021; one male specimen, Tinca, October 27, 2021. Common species in Romania, Palearctic species.
- *Helicoverpa armigera* (HUBNER, 1808) – two larvae, Tinca, October 20, 26, 2021. Very common species in Romania , it is found in all over the world.
- *Limnaecia phragmitella* (STANTON, 1851) - one specimen, Tinca, October 22, 2021. Relatively common species in Romania, it is found in Europe, North America, Asia, Australia, New Zealand.
- *Autographa gamma* (LINNAEUS, 1758) - one specimen, Tinca, October 23, 2021. Very common species in Romania, Palearctic species.
- *Spilosoma lubricipeda* (LINNAEUS, 1758) - 20 larvae, Tinca, October – November 29, 2021. Common species in Romania, Eurosiberian species.
- *Phragmatobia fuliginosa* (LINNAEUS, 1758) - one caterpillar, Tinca, December 6, 2021, $t = 4^{\circ} \text{C}$; one caterpillar, Tinca, December 20, 2021, $t = 0^{\circ} \text{C}$ (the last observation of this species in the Tinca area in 2021); one caterpillar, Tinca, February 8, 2022, $t = 8^{\circ} \text{C}$; February 20, 22, 2022, $t = 9^{\circ} \text{C}$; March 6, 2022, $t = 7^{\circ} \text{C}$. Common species in Romania, Palearctic species.
- *Noctua pronuba* (LINNAEUS, 1758) – one larva, Tinca, October 27, 2021; one larva, Tinca, November 20, 2021, $t = 10^{\circ} \text{C}$; one larva, Tinca, February 14, 2022, $t = 6^{\circ} \text{C}$; one caterpillar, Tinca, February 16, 2022, $t = 10^{\circ} \text{C}$. Common species in Romania, Palearctic, migratory species.
- *Polygonia c-album* (LINNAEUS, 1758) – one specimen, Tinca, October 28, 2021. Common species in Romania, it is found in Europe, Asia and North Africa.
- *Lycaena phlaeas* (LINNAEUS, 1761) – three female specimens, Tinca, October 29 – 30, 2021. Common species in Romania, Holarctic species.

- *Nomophila noctuella* (DENIS & SCHIFFERMULLER, 1775) – one specimen, Tinca, October 30, 2021. Relatively common species in Romania, cosmopolitan species, in Europe it is a migratory species (according to en.m.wikipedia.org).
- *Helcystogramma triannulella* (HERRICH – SCHAFFER, 1854) - one specimen, Tinca, October 28, 2021. Eurosiberian species.
- *Maniola jurtina* (LINNAEUS, 1758) – one female specimen, Tinca, October 26, 2021. Very common species in Romania, Palearctic species. According to Szekely (2008), the flight period of this species is June – August.
- *Macrothylacia rubi* (LINNAEUS, 1758) - one larva, Tinca, November 6, 2021. Relatively common species in Romania, Eurosiberian species.
- *Agriopis aurantiaria* (HUBNER, 1799) – one male specimen, Tinca, November 3, 2021. Relatively common species in Romania, European species.
- *Hypena rostralis* (LINNAEUS, 1758) – one specimen, Tinca, October 31, 2021; one specimen, Tinca, December 22, 2021, $t = 0^{\circ} \text{C}$; one specimen, Tinca, January 2, 2022, $t = 9^{\circ} \text{C}$ (the last observation of this species in the Tinca area in 2021). Common species in Romania, Palearctic species.
- *Agrochola helvola* (LINNAEUS, 1758) - one specimen, Tinca, October 31, 2021. Common species in Romania, Eurosiberian species.
- *Lacanobia oleracea* (LINNAEUS, 1758) – one larva, Tinca, November 1, 2021. Common species in Romania, Eurosiberian species.
- *Pieris rapae* (LINNAEUS, 1758) – one caterpillar, Tinca, December 2, 2021, $t = 11^{\circ} \text{C}$ (the latest observation of this species in the Tinca area); one specimen, Tinca, March 6, 2022, $t = 7^{\circ} \text{C}$. In this case, the appearance of the species was made about a month earlier than the period inhabited by the literature. The flight period is April – October (Szekely, 2008). Frequent species in Romania, it spread to North Africa, North America, New Zealand and Australia, as a result of accidental introductions (according to en.m.wikipedia.org).

The Coleoptera Order

- *Otiorhynchus sulcatus* (FABRICIUS, 1775) – one specimen, Tinca, October 22, 2021. Species found in Europe and North America, common species in Romania.
- *Chrysolina sturmi* (WESTHOFF, 1882) – one specimen, Tinca, October 18, 2021; one third age larva, Tinca, November 23, 2021. Relatively common species in Romania, it is found in Europe and Western Asia..
- *Galeruca tanacetii* (LINNAEUS, 1758) – one male specimen, Tinca, October 18, 2021. Common species in Romania, Palearctic species.
- *Galeruca pomonae* (SCOPOLI, 1763) – one female specimen, Tinca, November 26, 2021 (the latest observation of the species in the Tinca area). Common species in Romania, European species.
- *Coccinella septempunctata* (LINNAEUS, 1758) – one specimen, Tinca, October 29, 30, 2021; one specimen, Tinca, January 2, 2022, $t = 9^{\circ} \text{C}$; one specimen, Tinca, February 7, $t = 6^{\circ} \text{C}$; one specimen, Tinca, February 9, $t = 7^{\circ} \text{C}$. Common species in Romania, it is found in Europe, Siberia, Africa, Australia, North America.
- *Hydrophilus flavipes* (STEVEN, 1808) – one specimen, Tinca, October 27, 2021. It is found in Europe and Asia Minor, relatively common species in Romania in waters.
- *Meloe decorus* (BRANDT & ERICHSON) – one female specimen, Tinca, November 14, 2021. European species, it is mentioned for the first time in the Tinca area.

- *Chrysolina limbata* (FABRICIUS, 1775) – a third age larva, Tinca, Tinca, November 16, 2021. Relatively common species in Romania, with distribution in Europe to Siberia.
- *Chrysolina herbacea* (DUFTSCHMID, 1825) – a third age larva, Tinca, November 20, 2021. Common species in Romania, it is found in Europe, Asia Minor and Central Asia.
- *Psyllobora vigintiduopunctata* (LINNAEUS, 1758) – many specimens in all the Bihor county, during April – October, 2021; one specimen, Tinca, December 15, 2021, $t = 2^0$ C. Very common species in Romania, European species.
- *Noterus clavicornis* (DE GEER, 1774) – one specimen, Tinca, January 2, 2021, $t = 9^0$ C. Common species in Romania, aquatic, Palearctic species.
- *Dorytomus longimanus* (Forster, 1771) – one specimen, Tinca, February 18, 2022, $t = 11^0$ C. Eurosiberian species, common in Romania.
- *Meloe proscarabeus* (LINNAEUS, 1758) – one female specimen, Tinca, March 4, 2022, $t = 7^0$ C. European species, common in Romania.

The Mantodea Order

- *Mantis religiosa* (LINNAEUS, 1758) – two green male specimens, nine green and one brown female specimens, two ootheca, Tinca, October – November 13, 2021; one ootheca, December 10, 12, 24, 2021. Common species in Romania, it is found in Europe, Asia, Africa and North America.

The Odonata Order

- *Sympetrum striolatum* (CHARPENTIER, 1840) – one old female specimen, Tinca, October 31, 2021. Common species in Romania, Eurasian species.
- *Ophiogomphus cecilia* (FOURCROY, 1785) – one female specimen, Tinca, October 18, 23, 26, 28, 29, 2021. Relatively common species in Romania, European species.
- *Sympetrum sanguineum* (MULLER, 1764) – seven female specimens, Oradea, the Crișul Repede river, October 22, 2021; three pairs in copula, Tinca, November 9, 2021; one pair in copula, Tinca, November 10, 15, 2021. Common species in Romania, it is found in Europe, Siberia, North Africa.
- *Aeshna cyanea* (MULLER, 1764) – one female specimen, Tinca, October 29, 2021. Very common species in Romania, Western Palearctic species.
- *Sympetrum fonscolombii* (SELYS, 1840) – one female specimen, Tinca, November 4, 2021. Relatively common species in Romania, it is found in Europe, North Africa, Asia.

The Diptera Order

- *Eristalis pertinax* (SCOPOLI, 1763) – one specimen, Tinca, October 23, 2021; many specimens, Tinca, November 22, 2021. Common species in Romania, European species.
- *Calliphora vicina* (ROBINEAU – DESVOIDY, 1830) – many specimens during November – December, 2021. Common species in Romania, Cosmopolitan species.
- *Bibio hortulanus* (LINNAEUS, 1758) – one male specimen, Tinca, February 25, 2022, $t = 12^0$ C; March 6, 2022, $t = 7^0$ C. European species, common in Romania.

The Hemiptera Order

- *Graphosoma italicum* (MULLER, 1766) – one specimen, Tinca, October 23, 2021. Common species in Romania, Western Palearctic species.
- *Nezara viridula* (LINNAEUS, 1758) – many specimens, Tinca, Miersig, Oradea, Salonta, Măgești, Aleșd, during October – November, 2021; one specimen, Tinca, December 6 - 9, 2021;

three specimens, Tinca, December 11, 2021 $t = 2^0$ C; one specimen, Tinca, December 21, 2021, $t = -3^0$ C; one specimen, Tinca, December 26, 2021, $t = 1^0$ C; one specimen, Tinca, December 30, 2021, $t = 3^0$ C; one specimen, Tinca, December 31, 2021, $t = 8^0$ C; three specimens, Tinca, January 4, 2022, $t = 10^0$ C; two specimens, Tinca, January 5, 2022, $t = 13^0$ C; two specimens, Tinca, February 5, 2022, $t = 5^0$ C; two specimens, Tinca, February 9, 2022, $t = 7^0$ C (the last observation of this species in the cold season in the Tinca area). Frequent species in Romania, Cosmopolitan species.

– *Pyrrhocoris apterus* (LINNAEUS, 1758) – many specimens, Tinca, Oradea, Salonta, Cheşa, Măgeşti, Aleşd, Cociuba Mare, during October – November, 2021; two specimens, Tinca, January 7, 2022, $t = 3^0$ C; one specimen, Tinca, February 9, $t = 7^0$ C. Frequent species in Romania, Palearctic species.

– *Halyomorpha halys* (STAL, 1855) – one specimen, Tinca, December 15, 17, 2021, $t = 2^0$ C. Relatively common species in Romania, it is found in Europe, Asia and Americas.

– *Lygaeus equestris* (LINNAEUS, 1758) – two specimens, Tinca, January 7, 2022, $t = 3^0$ C; February 8, 2022, $t = 6^0$ C; one specimen, Tinca, February 9, 2022, $t = 7^0$ C. European species, very common in Romania.

– *Leptoglossus occidentalis* (HEIDERMANN, 1910) – one specimen, Tinca, January 9, 2020, $t = 1^0$ C. American species, it is an accidental introduced species in Europe (according to en.m.wikipedia.org).

The Orthoptera Order

- *Omocestus rufipes* (ZETTERSTEDT, 1821) – one specimen, Tinca, November 21, 2021. Common species in Romania, Palearctic species.

The Hymenoptera Order

- *Polistes dominula* (CHRIST, 1791) – one specimen, Tinca, November 21, 2021; many specimens, Tinca, November 22, 2021. Very common species in Romania, it is found in Europe, Asia, Africa, Australia, New Zealand and America.

– *Ophion obscuratus* (FABRICIUS, 1798) - one specimen, Tinca, January 2, 2022, $t = 10^0$ C and January 5, 2022, $t = 13^0$ C. Palearctic species, it is active mainly in spring and autumn, but is one of the few species of parasitic wasps that can be active in flight and in winter if the weather is favourable (according to de.m.wikipedia.org).

– *Bombus terrestris* (LINNAEUS, 1758) – one specimen, Tinca, March 3, 2022, $t = 9^0$ C. Native European species, very common in Romania.

The Dermaptera Order

- *Forficula auricularia* (LINNAEUS, 1758) - one specimen, Tinca, December 3, 2021; January 7, 2022, $t = 3^0$ C. Very common species in Romania, it is found in Europe, North America, Western Asia and North Africa.

The Gastropoda Class , The Stylommatophora Order

- *Caucasotachea vindobonensis* (PFEIFFER, 1828) – one specimen, Tinca, October 14, 2021; two specimens, Tinca, November 10, 2021. Common species in Romania, with Pontic, Pannonian and Balkanian distribution.

- *Deroceras laeve* (MULLER, 1774) – 15 specimens, Tinca, October – December 29, 2021; one specimen, Tinca, January 2, 2022, $t = 9^0$ C; one specimen in a wood storage, Tinca, January 24, 25, 2022, $t = 9^0$ C. Common species in Romania, Palearctic species.
- *Limax cinereoniger* (WOLF, 1803) - two specimens, Tinca, October 25, 2021. European species. Common species in Romania.
- *Helix pomatia* (LINNAEUS, 1758) – two specimens, Oradea, November 2, 2021. Common species in Romania, European species.
- *Deroceras reticulatum* (MULLER, 1774) – two specimens, Tinca, November 5, 2021; one specimen, Tinca, February 23, 2022, $t = 3^0$ C. Relatively common species in Romania, it is found in Europe, North Africa.
- *Fruticicola fruticum* (MULLER, 1774) – one specimen, Tinca, November 5, 2021. Common species in Romania, European species.
- *Tandonia budapestensis* (HAZAY, 1880) – one specimen, Tinca, November 9, 27, 2021; seven specimens, Tinca, December 30, 2021, $t = 3 - 4^0$ C; two specimens, Tinca, December 31, 2021, $t = 8^0$ C; one specimen, Tinca, January 1, 2022, $t = 8^0$ C. European species, relatively common species in Romania.
- *Vallonia pulchella* (MULLER, 1774) – one specimen, Tinca, December 23, 2021. Common species in Romania, it is found in Europe and Americas.

The Arachnida Class, The Araneae Order

- *Opilio parietinus* (DE GEER, 1778) – one specimen, Tinca, October 31, 2021; one specimen, Tinca, December 25, 2021, $t = 7^0$ C; two specimens, Tinca, January 4, 2022, $t = 10^0$ C. Common species in Romania, it is found in Europe and North America.
- *Nuctenea umbratica* (CLERCK, 1757) – one specimen, Tinca, October 27, 2021. Relatively common species in Romania, it is found in Europe, North Africa and Asia.
- *Eratigena agrestis* (WALCKENAER, 1802) – one specimen, Tinca, October 7, 25, 2021. Common species in Romania, it is found in Europe, Middle Asia and North America.
- *Larinioides ixobolus* (THORELL, 1873) - one specimen, Tinca, October 27, 2021. Common species in Romania, it is found in Europe to Central Asia.
- *Araneus diadematus* (CLERCK, 1758) – one specimen, Tinca, October 23, 2021. Very common species in Romania, it is found in Europe and North America.
- *Pisaura mirabilis* (CLERCK, 1757) – many specimens, Tinca, Oradea, Salonta, Cociuba Mare, Cheşa, Aleşd, during October – November, 2021; one specimen, Tinca, December 27, 2021, $t = 2^0$ C; two specimens, Tinca, February 9, $t = 7^0$ C; one specimen, Tinca, February 16, 2022, $t = 8^0$ C. Very common species in Romania, it is found in Europe, Siberia, North Africa.
- *Pardosa monticola* (CLERCK, 1757) – one juvenile specimen, Tinca, November 29, 2021. Relative common species in Romania, it is found in Europe, Turkey, Georgia.
- *Leviellus thorelli* (AUSSERER, 1871) – one specimen, Tinca, December 20, 2021, $t = 2^0$ C. Rare species in Europe, it is found in France, Central, Southern and South – Eastern Europe (according to araneae.nmbe.ch).
- *Holocnemus pluchei* (SCOPOLI, 1763) – one specimen, Tinca, January 2, 2022, $t = 9^0$ C. Relatively common species in Romania, it is found in Europe, North Africa, Turkey, Azerbaijan, it is introduced to USA, Argentina, Japan, Australia (according to araneae.nmbe.ch).
- *Tibellus oblongus* (WALCKENAER, 1802) – one juvenile specimen, Tinca, January 2, 2022, $t = 9^0$ C. Common species in Romania, it is found in Europe, North America, North Africa, Asia.

– *Pholcus phalangioides* (FUESSLIN, 1775) – one specimen, Tinca, January 4, 2022, $t = 10^0$ C. Common species in Romania, it is found in Europe, Asia, Americas, Africa, Australia, New Zealand.

– *Pisaura novicia* (KOCH, 1878) – one female specimen, Tinca, February 9, $t = 7^0$ C. It is found in the Mediterranean area to Central Asia (according to araneae.nmbe.ch).

– *Enoplognatha thoracica* (HAHN, 1833) – one specimen, Tinca, February 12, 2022. Common species in Romania, it is found in Europe, Turkey, Central Asia, it is introduced to North America (according to araneae.nmbe.ch).

– *Asagena phalerata* (PANZER, 1801) – one specimen, Tinca, February 20, 2022, $t = 9^0$ C. Relatively common species in Romania, Eurasian species.

– *Zora spinimana* (SUNDEVALL, 1833) – one specimen, Tinca, February 27, 2022, $t = 10^0$ C. Eurosiberian species, common in Romania.

The Malacostraca Class, The Isopoda Order

- *Porcellio scaber* (LATREILLE, 1804) – many specimens, Tinca, during April – December 15, 2021; one specimen, Tinca, December 25, $t = 2^0$ C; one specimen, Tinca, December 27, $t = 0^0$ C; two specimens, Tinca, December 29, 2021, $t = 4^0$ C; one specimen, Tinca, December 31, 2021, $t = 8^0$ C; February 22, 2022, $t = 11^0$ C. Very common species in Romania, Cosmopolitan species.

The Oligochaeta Class, The Megadrilacea Order

- *Lumbricus terrestris* (LINNAEUS, 1758) – many specimens, Tinca, during March – November, 2021; one specimen, Tinca, December 10, 23, 29, 2021; one specimen and one pair in copula, Tinca, December 30, $t = 3^0$ C; many specimens and one pair in copula, Tinca, December 31, 2021; January 1, 2022, $t = 8^0$ C; three specimens, Tinca, February 22, 2022, $t = 11^0$ C. Very common species in Romania, Cosmopolitan species.

4. CONCLUSIONS

During 2021 – 2022, in different parts of Bihor county there were recorded 82 species belonging to 5 classes, 13 orders and 76 genera.

The presence of many invertebrate species in various stages of development in the cold season is noted due to the relatively high positive temperatures for this period, as a consequence of global warming. New data on the spread of these species at national level have been obtained. Most of the species observed are relatively common nationally.

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Annex 1



Meloe proscarabeus L. (photo : Ilie A.L.)



Colias croceus Geoffr., larva (photo: Ilie A.L.)



Tandonia budapestensis Haz. (photo: Ilie A.L.)



Asagena phalerata Panz. (photo: Ilie A.L.)



Noctua pronuba L, larva (photo: Ilie A.L.)



Deroceras reticulatum Mull. (photo: Ilie A.L.)



Holocnemus pluchei Scop. (photo: Ilie A.L.)



Dorytomus longimanus Forst. (photo: Ilie A.L.)