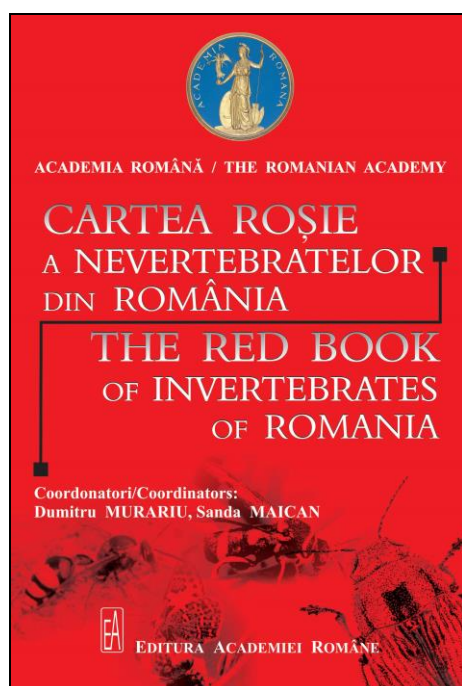


Dumitru MURARIU, Sanda MAICAN (Coord.), 2021. *Cartea Roșie a Nevertebratelor din România/The Red Book of Invertebrates of Romania*. Romanian Academy Publishing House, Bucharest. 49 authors, 451 pages, 364 pictures and habitus drawings, 81 habitats pictures, 364 distribution maps. ISBN 978-973-27-3357-8



Generally, the *Red Books* are public documents that present rare and threatened species of plants, fungi and animals in certain areas. The purpose of the publication of these Books is to help specialists to establish effective measures to protect endangered species and to provide scientific information for Habitat Monitoring Programs and rare or endangered species.

Thus, the Red Books provide scientific information on species and subspecies in the world, help establish measures to biodiversity conservation, clarify (at the time of printing) which species are threatened or even extinct, serve as a scientific basis for research and protection of all species from around the globe.

Among the main objectives of the *National Strategy for Biodiversity Conservation (2010–2020)* and the *EU's 2021–2027 Multiannual Program* is the one related to the elaboration and updating of the Red Lists and Books on the flora and fauna of the member countries.

The project to publish the *Red Book of Invertebrates of Romania (RBIR)*, started in 2016, took place under the coordination of the Department of Biological Sciences of the Romanian Academy and is the continuation of an older initiative that belonged to the late Dr. Dan Munteanu, corresponding member of the Romanian Academy, former president of the *Commission for the Nature Monuments Protection*.

Romania was one of the few countries that did not yet have a *Red Book of Invertebrates*, in the neighboring states being published several years ago Red Books of the entire fauna. In this context, the publication of the *RBIR* is a necessary and commendable contribution, which supports the sustained efforts, globally and nationally, to ensure the survival of endangered species. This is now more important than ever when we are witnessing a sharp, often irreversible, loss of biodiversity on Earth. Globally, increasing species extinction and accelerating declining biodiversity, highlighted by the increasing number of taxa in the category of rare, threatened or endangered species, have become increasingly worrying.

Despite the apparent neglect and lack of interest in invertebrates wildlife protection (at all levels, from government to the most active organizations in biodiversity conservation), invertebrates play key roles in the structure and functioning of ecosystems, due to their specific diversity and extreme abundance. Large, this group represents over 90% of all animal species on Earth.

*RBIR* is a reference monograph, long awaited by the zoological community and by all those interested in nature protection, which covers an important gap in the Romanian literature. This volume joins two other previously published monographs: *The Red Book of Vertebrates of Romania* (2005) and the *Red Book of Vascular Plants in Romania* (2009). In addition to these volumes, this synthesis is bilingual (Romanian/English), thus becoming accessible to foreign specialists.

The work was carried out by a team of 49 zoologists from universities and research institutes in the academic network, including museums of natural sciences in Bucharest, Iași, Sibiu, Cluj-Napoca, Craiova, Constanța, Bacău, Timișoara, Oradea, Brașov under the coordination of Dr. Dumitru Murariu, member of the Romanian Academy, and Dr. Sanda Maican, senior scientist researcher at the Institute of Biology Bucharest of the Romanian Academy. In the absence of a specially funded project, the two coordinators managed to mobilize renowned zoologists, specialists in the study of invertebrates, around the idea of voluntarily developing a *Red Book of Invertebrates*, from the data collected each year, patiently and meticulously by each colleague, in the conditions of a permanent precarious financing.

The volume totals 451 pages and is structured in seven chapters, at the end of each chapter being inserted the *References* related to the species of interest presented in the book.

In the first chapter are analyzed taxa from the Porifera, Cnidaria, Xenacoelomorpha, Nemertea, Bryozoa, Annelida, and Mollusca Phyla and also from the Hexanauplia and Malacostraca (Arthropoda) Classes. Chapter 2 includes representatives of the Arachnida and Chilopoda Classes. Chapters 3, 4, 5 and 6 are dedicated to the insect species of the Odonata, Orthoptera, Mantodea, Coleoptera, Lepidoptera, Hymenoptera and Diptera Orders. The last chapter refers to the Class of Leptocardii in the Chordata Phylum.

Very good quality iconography and a significant number of bibliographic sources, many of them dated recently, come to complete the scientific value of the information presented.

The higher taxa with the rank of Phylum, Class, Order and Family are presented in systematic order, and the genera and species in alphabetical order. The *RBIR* contains information on 364 species of terrestrial, freshwater and marine invertebrates (classified in 16 Classes, 44 Orders and 115 Families) from the Romanian fauna, considered a priority for conservation. Of the total number of species evaluated and included in the monograph, most are represented by insects: 260 species, belonging to seven Orders and 56 Families.

The authors wrote in bilingual format (Romanian/English), for each species evaluated, a complex *Sheet* that includes photos of the habitus (sometimes of the preferred habitat), as well as information on:

- current taxonomic classification;
- general geographical distribution, in Romania as well;
- habitat and ecology of the species;
- protection status in Romania and in other countries;
- estimating the population and population trend of evolution (where there are information);
- the main threats to the species;
- conservation measures.

The distribution map in Romania is presented for each species, the localities/sites where the species was reported being marked with different colors (gray dots - for older mentions, up to 1990, and red dots - for reports after 1990). The presentation of the relevant information for each species with the help of the sheets gives a unitary structure to the paper, despite the large number of authors and the diversity of the taxonomic groups presented.

The conservation status of each species has been established on the basis of criteria developed by the *International Union for Conservation of Nature*. The assessment of the current ecological situation of the 364 invertebrate species has resulted in the following worrying percentage distribution:

- 1.4% - Extinct species (EX);
- 17.0% - Critically Endangered species (CR);
- 31.6% - Endangered species (EN);
- 38.2% - Vulnerable species (VU);
- 8.8% - almost endangered species/Near Threatened (NT);
- 2.7% - species for which there are not enough data to be included in one or another endangered category/Data Deficient (DD);
- 0.3% - species that are not currently endangered/Low Concern (LC).

At the end of the volume is a welcome alphabetical *Index* of the scientific names of the invertebrates evaluated, very necessary for the reader to quickly identify the taxon of interest.

This monograph is a useful working tool for establishing actions to improve the *National Strategy for Biodiversity Conservation* and environmental policy change, which are essential for the protection of natural resources. *RBIR* offers decision

makers the opportunity to complete the list of species in need of protection, to rethink the national network of protected areas based on the contribution and experience of specialists in the country.

It should also be noted that invertebrates are underrepresented in European legislation, not including a number of taxonomic categories presented in the *RBIR*.

Due to the insufficient number of specialists in the taxonomy of some groups of invertebrates, but also the fact that not all specialists have expressed their willingness to participate “voluntarily” in this monograph, some groups of invertebrates (e.g. freshwater unions) do not are found in *RBIR*.

Given that the Red Lists and Red Books are “living” working tools that need to be updated from time to time, depending on the anthropogenic impact and species dynamics, we recommend that the next edition of *RBIR* include the contributions of more specialists and, implicitly, species from taxonomic groups that are not present in this first edition.

The *Red Book of Invertebrates of Romania* is a very important reference source, with rigorously documented information for both specialists in academic institutions (universities, research institutes) and other institutions involved in environmental protection such as: entomologists, other zoologists, agronomists, forestry engineers, etc., as well as for biology teachers in pre-university education.

This monograph will also be useful for various civil society organizations that are carrying out activities of inventory, monitoring and protection of the biodiversity in Romania, as well as for policy makers of protected areas management.

We appreciate the effort of all – authors and coordinators, who contributed to the publication of this first edition of *Red Book of Invertebrates of Romania*, a valuable and true “scientific document” whose importance will be validated by time.

Congratulations to the 49 invertebrate specialists and the two coordinators, who through an unconditional involvement, over a long period of time, managed to complete this important and complex project.

Bucharest, June 6, 2022

Acad. Octavian POPESCU