

OVERVIEW ON THE ROMANIAN FAUNA ACADEMIC COLLECTION

*“People and years pass and are getting off in the mists of time,
rare being those destined to remain alive in the memory
of their descendants, through their work and life”.*
Dragomir Hurmuzescu

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The project of publishing the monographic *Romanian Fauna* Academic Collection - 16 volumes and 307 fascicles expected to be published in the volume Guide published by the Romanian Academy Publishing House (1951), was carried out at a steady pace, starting with the publication of the first volume of Protozoa in the same year. 71 years after the beginning of the activities within the Romanian Fauna Study Group within the Romanian Academy, only 97 fascicles were published (about 26,570 pages), which represent about 30% of the total number of issues expected to be published. With rare exceptions, the completion of the *Romanian Fauna* was interrupted. Therefore, it is necessary to pay more attention or reconsider the importance of research on systematics and animal taxonomy to research on systematics and animal taxonomy, with results that can be published in the *Romanian Fauna*, especially for groups that are not yet represented in this Collection. It is also necessary to update the information published in the *Romanian Fauna* – including by taking in account the latest data obtained in related fields (ecology, physiology, molecular biology, etc.). The updating and completion of the *Romanian Fauna* is necessary both in terms of the importance of fundamental research (taxonomy, systematics, biology, ecology) and the practical significance of species distribution, identification and establishment of strategies for monitoring and protecting endangered species and those with declining populations, the application of optimal control measures in case of invasions of pests, etc.

Keywords: *Romanian Fauna* Academic Collection, taxonomy, systematics, published volumes and fascicles.

THE FUNDAMENTAL AND APPLIED IMPORTANCE OF ANIMAL TAXONOMY AND SYSTEMATICS RESEARCH

Currently, research in many areas of biology, on biodiversity knowledge, the identification of threatened and endangered species, those considered to be important indicators of environmental quality and ecosystem status, the estimation of the population trend for certain scientifically and economically important species, setting of long-term protection measures for species and habitats, biological pest

control, rational use of biological resources for sustainable development, ecological land management, etc. is based on accurate taxonomic, systematic, ecological and zoogeographical knowledge of flora and fauna and the correct identification of taxa.

Knowledge of biodiversity has become a priority for the whole world. Why? Because, more than ever, natural capital is under unprecedented anthropogenic pressure, more and more species endangered with extinction.

The Convention on Biological Diversity and all the events related to this document have highlighted the importance of worldwide taxonomic and systematic research. One of the important objectives mentioned in the international biodiversity study programs is the identification, description, revision and naming of taxa. The correct identification and "problem" of the biological species term definition are the basis for establishing and implementing strategies for biodiversity protection. But, before they can protect and save the species, they need to be known. And the identification of plant and animal species, knowledge of the origin and relationships between them, decoding the diversity of the living world in general are characteristics of taxonomy and systematics, among the oldest sciences in the vast field of biology (Gomoiu & Maican, 2021).

Since the second half of 19th century, the Romanian scientist Grigore Antipa considered that "*Sine systematica, chaos!*", systematic research, along with taxonomy, contributing to the substantiation of many fields of biological sciences.

Starting with the second half of the 20th century, the Romanian taxonomist researchers, although well experts in flora and fauna, hardly succeeded in obtaining funds for projects on knowledge of biodiversity from a taxonomic, systematic, ecological and zoogeographical point of view.

FROM THE HISTORY OF THE *ROMANIAN FAUNA COLLECTION* – "THE TREASURE COLLECTION" OF THE ROMANIAN ACADEMY

In the interwar period, between 1919 and 1948, so suggestively called by Academician Dan Berindei "the time of fulfillment" (History of the Romanian Academy, 2006), Romanian biology had a favourable evolution, with the establishment of new universities, institutes and research stations, due to the economic development and valuable human resource, formed mainly in the countries of western Europe, especially in Germany and France. An important part in the field of descriptive zoology was played by the school created by Andrei Popovici-Bâznoșanu (1876–1969), a real nursery of systematic zoologists, zoogeographers and ecologists, who enjoyed international recognition (Negrea, 2003).

The reorganization in 1948 of the old Academy, into the Academy of the Romanian People's Republic (R.P.R.), significantly influenced the development of botany and zoology research in our country. Knowing the flora and fauna of Romania has become an objective assumed by the new leadership of the Academy. Within this context, in 1949, the Flora and Fauna teams were established, the

inventory of plant and animal species, along with other aspects (geographical, geological research, etc.) representing a major concern, being included in the State Plan, within the Academy activity (Gomoiu & Maican, 2021).

The knowledge of the fauna – “*one of the natural richness of the country*” – was required both theoretically (taxonomically, systematically, ecologically, zoogeographically) and economically, the rational use of this natural resource and pest control requiring accurate knowledge of the composition of the fauna, biology and species distribution (Botnariuc, 1966).

In the “R.P.R. Fauna study group” the most valuable zoologists in the country were included. The activity of this group began by making a general classification of the Animal Kingdom up to the Class level, and to the studied groups up to the Order level. From the beginning, the main purpose of Fauna study group was the elaboration of the fascicles from the *R.P.R. Fauna Series*. This Series, considered by Academician Nicolae Botnariuc “*a national work of success*”, was to be a synthesis of zoological research in our country, containing 16 volumes, each volume including several fascicles.

Fauna of Romania is a fundamental work of national importance that appears under the auspices of the Romanian Academy, initially with the title *Fauna of the People's Republic of Romania* (1951–1965), later *Fauna of the Socialist Republic of Romania* (1965–1989) and *Fauna of Romania* (after 1989).

Among the Romanian biologists who contributed to the initiation of activities within the *Romanian Fauna* we mention: Mihai Băcescu and Theodor Bușniță (for Hydrobiology), Eugen Pora and Nicolae Șanta (Animal Physiology), Radu Codreanu (Animal Morphology), Mihai A. Ionescu (Systematics and Animal Ecology), Mihai I. Constantineanu (parasitoid ichneumonological fauna), Gheorghe Nichita (Limnology), Wilhelm Knechtel (Agricultural Entomology), Constantin C. Georgescu, Grigore Eliescu and Ion Popescu-Zeletin (Forest Entomology and Forestry), and others.

In 1951, at Academician Traian Săvulescu's initiative, president of the Romanian Academy, the volume *Guide* was published (part I), which describes the characteristics of the phyla and classes, the keys to identify classes and orders, the terminology used (Codreanu & Băcescu, 1951).

The research of the *Fauna* team initially targeted a small number of taxa. The criteria underlying the selection of the groups of animals to be processed in the *Romanian Fauna* were determined by the economic importance of the group and the number of existing specialists. Later, as zoological research developed in Romania, the number of those involved and the taxa studied increased considerably.

Since 1949, the *Fauna Collection* has been designed to be published in 16 volumes and 307 fascicles (Nițu, 2006). These works are indispensable for Romanian zoologists, whether beginners or seniors, but also for foreign specialists involved in the creation of monographs of various taxonomic groups or synthesis

works (e.g., *Fauna Europaea*). Fauna fascicles are useful tools for specialists interested in the taxonomy of the group, as well as a wider audience, including professors, students, amateurs, researchers in museums, faculties of natural sciences and environmental protection institutes, etc.

The Fauna fascicles are also useful guides of taxa identification and include both reported species on the Romanian territory and species whose presence in the country should be possible. These “...are designed according to a common plan, with a general part, which deals with the chapters: history, morphology, phylogeny, economic importance and research methods, and a systematic part, including a detailed description of orders, families, genera, species etc., based on the identification keys, as well as the complete data regarding their biometrics, ecology and distribution” (Nițu, 2006).

Over time, the contents of Fauna fascicles have evolved. If at the beginning the works were elaborated on the basis of existing biological materials in older collections, over time the collecting new materials in many areas of the country intensified, and the study of groups became more thorough, which allowed a more complex presentation of the analyzed taxa (Botnariuc, 1966).

The scientific publications in the *Fauna* Collection varied from year to year (Fig. 1 and Fig. 2). In the first 25 years after the first volume, the publications were regular, with at least one issue published annually. The most prolific years, in terms of the number of pages published, were 1960 and 1959, and in terms of the number of issues or fascicles were 1955 and 1951. After 1975, the pace of publication decreased, with no volumes appearing year after year (1976, 1986–1988, 1990–1994, 1996–1999, 2007–2013, 2017–2020).

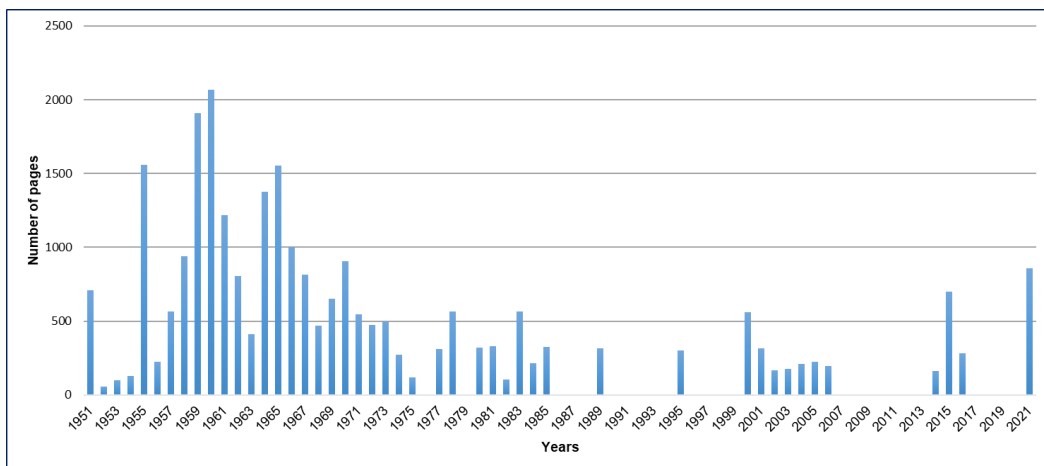


Fig. 1. Annual number of published pages in the *Romanian Fauna*.

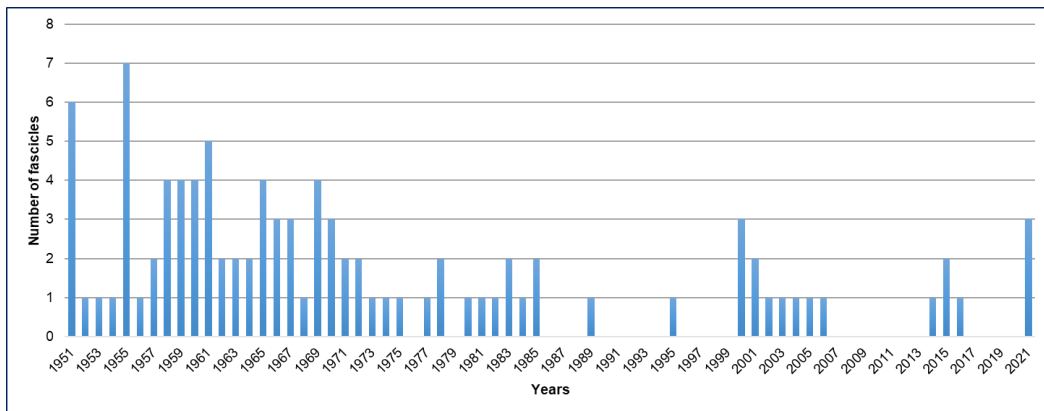


Fig. 2. Annual publication frequency of the *Romanian Fauna* fascicles.

At least one fascicle of each volume appeared. A number of 97 fascicles (including *Guide* volume) were published in the period 1951–2021. They were signed by 72 authors (46 as first author), totaling about 26,570 pages (Table 1). This represents approximately 30% of the total number of issues expected to be published, 38 issues being developed within the former Team of Taxonomy and Animal Systematics, from the Institute of Biology of the Romanian Academy.

Of the 97 published fascicles, 82 (22,593 pages) refer to invertebrates and 14 (3,977 pages) to vertebrates.

From the Insecta Class – the dominant group in terms of the number of animal species, five volumes were expected to be published. In volumes VII, VIII, IX and X were published 33 fascicles, and in volume XI (Lepidoptera and Diptera Orders) appeared 15 fascicles. In volume X, dealing with the Coleoptera Order, with approximately 6,800 known species in the Romania (Nitzu, 2004), only seven fascicles were published, signed by some of the few coleopterologists in the country.

In the periods 2000–2006 and 2014–2021 were published several fascicles of volumes VIII, IX, X, XI (Insecta), XV (Aves) and XVI (Mammalia).

Beginning with 2000, among the publications from volume Mammalia, Dumitru Murariu (Editor-in-Chief of the *Romanian Fauna* since 2021) had a sustained activity, which has substantial contributions to the knowledge of mammals in our country. His experience and professional results are presented in over 25 books about mammals in Romania and around the world, of which seven issues (three in English) are published in the *Romanian Fauna*.

Currently, Academician Dumitru Murariu almost finished Fascicle 5 (Carnivora, in English version) as well as Fascicle 2 (Rodentia, in English too). Also, the issue that deals with the general part of the Hymenoptera Order (of which 12 fascicles were already published) is being finalized by Professor Irina Teodorescu.

Table 1

The list of volumes and fascicles published in the *Romanian Fauna*

Nr. crt.	Volume	Fascicle	Taxonomic group	Authors	Year	Number of pages
1.	GUIDE (first part)			Radu Codreanu, Mihai Băcescu (Coord.)	1951	252
2.	Vol. I PROTOZOA	1	Hypermastigina	Adriana Murgoci	1951	36
3.		2	Rhizopoda, Euamoebidea	Iosif Lepși	1960	435
4.		3	Tubulinea, Cls. Corycida and Cls. Elardia (Ord. Arcellinida)	Stoica Godeanu	2021	417
5.		4	Stramenopiles, Cls. Labirinthulomycetes (Ord. Amphytremida), Cercozoa, Cls. Thecofilosea and Cls. Silicofilosea (Ord. Euglyphida)	Stoica Godeanu	2021	221
6.	Vol. II	1	Plathelminthes, Cls. Monogenoidea	Elena Roman-Chiriac	1960	150
7.		2	Trochelminthes, Rotatoria	Ludovic Rudescu	1960	1192
8.		3	Nematoda, Mermithidae	Dan Coman	1961	62
9.		3	Trochelminthes, Gastrotricha	Ludovic Rudescu	1967	295
10.		4	Trematoda	Elena Chiriac and Maria Udrescu	1973	497
11.		5	Porifera, Potamospongiae	Ludovic Rudescu	1975	117
12.	Vol. III MOLLUSCA	1	Gastropoda, Pulmonata	Alexandru V. Grossu	1955	519
13.		2	Gastropoda, Prosobranchia and Opisthobranchia	Alexandru V. Grossu	1956	222
14.		3	Bivalvia	Alexandru V. Grossu	1962	427
15.	Vol. IV CRUSTACEA, TARTIGRADA	1	Cumacea	Mihai Băcescu	1951	95
16.		2	Phyllopoda	Nicolae Botnariuc and Traian Orghidan	1953	100
17.		3	Mysidacea	Mihai Băcescu	1954	126
18.		4	Amphipoda (brackish forms and freshwater forms)	Sergiu Cărăușu, Ecaterina Dobreanu and Constantin Manolache	1955	410
19.		5	Bathynellacea	Lazăr Botoșăneanu	1959	37
20.		6	Copepoda, Cyclopidae (freshwater forms)	Andriana Damian- Georgescu	1963	207
21.		7	Tardigrada	Ludovic Rudescu	1964	403
22.		8	Copepoda, Calanoida (freshwater forms)	Andriana Damian- Georgescu	1966	131
23.		9	Decapoda	Mihai Băcescu	1967	351
24.		10	Ostracoda, Cytheridae	Francisca-Elena Caraion	1967	165

Table 1 (continued)

Nr crt	Volume	Fascicle	Taxonomic group	Authors	Year	Number of pages
25.	Vol. IV CRUSTACEA, TARTIGRADA	11	Copepoda, Harpacticoida (freshwater forms)	Andriana Damian-Georgescu	1970	254
26.		12	Cladocera	Ștefan Negrea	1983	399
27.		13	Isopoda, Oniscoidea	Vasile Gh. Radu	1983	168
28.		14	Isopoda, Oniscoidea, Crinochaeta	Vasile Gh. Radu	1985	159
29.	Vol. V ARACHNIDA	1	Acarina, Trombidoidea	Zicman Feider	1955	190
30.		2	Acaromorpha, Ixodoidea	Zicman Feider	1965	407
31.		3	Araneae, Fam. Lycosidae	Ion E. Fuhn and Floriana Niculescu- Burlacu	1971	256
32.		4	Araneae, Fam. Clubionidae	Cleopatra Sterghiu	1985	168
33.		5	Araneae, Fam. Salticidae	Ion E. Fuhn and Viorel F. Gherasim	1995	302
34.	Vol. VI	1	Chilopoda, Anamorpha	Zachiu Matic	1966	269
35.		2	Chilopoda, Epimorpha	Zachiu Matic	1972	224
36.	Vol. VII INSECTA (I)	1	Protura	Mihai A. Ionescu	1951	48
37.		2	Diplura	Mihai A. Ionescu	1955	51
38.		3	Ephemeroptera	Constantin Bogoescu	1958	190
39.		4	Orthoptera (Saltatoria, Dermaptera, Blattodea, Mantodea Orders)	Wilhelm K. Knechtel and Andrei Popovici- Bâznoșanu	1959	337
40.		5	Odonata	Filimon Cîrdei and Felicia Bulimar	1965	275
41.	Vol. VIII INSECTA (II)	1	Thysanoptera	Wilhelm K. Knechtel	1951	263
42.		2	Isoptera	Mihai A. Ionescu	1951	24
43.		3	Homoptera, Psylloidea	Ecaterina Dobreanu and Constantin Manolache	1962	379
44.		4	Homoptera - general part	Ecaterina Dobreanu and Constantin Manolache	1969	102
45.		5	Homoptera, Aleyrodoidea, Aleyrodinae	Ecaterina Dobreanu and Constantin Manolache	1969	154
46.		6	Neuroptera (Planipennia)	Béla Kis, Carol Nagler and Constantin Mîndru	1970	346
47.		7	Plecoptera	Béla Kis	1974	273
48.		8	Heteroptera - general part and Superfamily Pentatomoidea	Béla Kis	1984	214
49.		9	Heteroptera, Coreoidea and Pyrrhocorioidea Superfamilies	Béla Kis	2001	99
50.	Vol. IX INSECTA (III)	1	Hymenoptera, Apinae	Wilhelm K. Knechtel	1955	114
51.		2	Hymenoptera, Cynipinae	Mihai A. Ionescu	1957	248
52.		3	Hymenoptera, Apoidea (Fam. Apidae, Subfam. Anthophorinae)	Victoria G. Iuga	1958	271
53.		4	Hymenoptera, Fam. Ichneumonidae, Subfam. Ichneumoninae, Tribe Ichneumoninae- Stenopneusticae	Mihai I. Constantineanu	1959	1249

Table 1 (continued)

Nr crt	Volume	Fascicle	Taxonomic group	Authors	Year	Number of pages
54.	Vol. IX INSECTA (III)	5	Hymenoptera, Fam. Ichneumonidae, Phaeogeninae and Alomyinae Subfamilies	Mihai I. Constantineanu	1965	510
55.		6	Hymenoptera, Cynipoidea, Fam. Ibalidae, Subfam. Ibalinae, Fam. Figitidae, Subfam. Aspicerinae, Anachartinae, Figitinae, Fam. Cynipidae, Eucoilinae and Charipinae Subfamilies	Mihai A. Ionescu	1969	290
56.		7	Hymenoptera, Fam. Ichneumonidae, Ephialtinae, Lycorininae, Xoridinae and Acaenitinae Subfamilies	Mihai I. Constantineanu and Constantin Pisciă	1977	305
57.		8	Hymenoptera, Symphyta, Tenthredinoidea, Fam. Tenthredinidae, Selandriinae, Tenthredininae and Heterarthrinae Subfamilies	Xenia G. Scobiola-Palade	1978	248
58.		9	Hymenoptera, Symphyta, Tenthredinoidea, Fam. Tenthredinidae, Blennocampinae and Nematinae Subfamilies	Xenia G. Scobiola-Palade	1981	328
59.		10	Hymenoptera, Fam. Ichneumonidae, Subfam. Mesochorinae	Mihai I. Constantineanu and Gheorghe I. Mustață	1982	105
60.	11	Hymenoptera, Fam. Braconidae: general part, Cardiochilinae, Microgastrinae, Acaeliinae and Miracinae Subfamilies	Matilda Lăcătușu and Constantin Filipescu	1989	315	
61.	12	Hymenoptera, Fam. Ichneumonidae, Cteniscinae, Tryphoninae, Thymaridinae and Sphinctinae Subfamilies	Mihai I. Constantineanu, Raoul Constantineanu, Irinel Gh. Constantineanu	2000	268	
62.	Vol. X INSECTA (IV)	1	Coleoptera, Fam. Cicindelidae	Sergiu Panin	1952	56
63.		2	Coleoptera, Fam. Carabidae (<i>Cychrus</i> Fabricius and <i>Carabus</i> Linnaeus genera)	Sergiu Panin	1955	148
64.		3	Coleoptera, Fam. Scarabaeidae, Melolonthinae and Ruthelinae Subfamilies	Sergiu Panin	1955	124

Table 1 (continued)

Nr crt	Volume	Fascicle	Taxonomic group	Authors	Year	Number of pages
65.	Vol. X INSECTA (IV)	4	Coleoptera, Fam. Scarabaeidae, Coprinae, Geotrupinae, Aphodiinae, Aegialinae, Hybosorinae, Ochodaeinae, Orphninae, Troginae, Glaphyrinae, Sericinae, Hoplinae, Dynastinae, Valginae, Trichiinae and Cetoninae Subfamilies	Sergiu Panin	1957	319
66.		5	Coleoptera, Fam. Cerambycidae	Sergiu Panin and Nicolae Săvulescu	1961	523
67.		6	Coleoptera, Fam. Carabidae (Tribe Bembidiini)	Eugen Nițu	2006	196
68.		7	Coleoptera, Fam. Buprestidae	Sergiu Panin, Nicolae Săvulescu and Adrian Ruicănescu	2015	390
69.	Vol. XI INSECTA (V)	1	Lepidoptera, Fam. Aegeriidae	Aurelian Popescu-Gorj, Eugen Niculescu and Al. Alexinschi	1958	199
70.		2	Diptera, Fam. Tabanidae	Gheorghe Dinulescu	1958	279
71.		3	Diptera, Fam. Syrphidae	Petru Șuster	1959	287
72.		4	Diptera, Fam. Oestridae	Gheorghe Dinulescu	1961	168
73.		5	Lepidoptera, Fam. Papilionidae	Eugen Niculescu	1961	107
74.		6	Lepidoptera, Fam. Pieridae	Eugen Niculescu	1963	203
75.		7	Lepidoptera, Fam. Nymphalidae	Eugen Niculescu	1965	364
76.		8	Diptera, Fam. Simuliidae	Gheorghe Dinulescu	1966	603
77.		9	Lepidoptera, Fam. Tineidae	Iosif Căpușe	1968	467
78.		10	Lepidoptera, the general part	Eugen Niculescu and Frederic König	1970	306
79.		11	Diptera, Fam. Asilidae	Mihai A. Ionescu and Medeea Weinberg	1971	288
80.		12	Diptera, Fam. Calliphoridae	Andy Lehrer	1972	251
81.		13	Diptera, Fam. Chironomidae	Paula Albu	1980	318
82.		14	Diptera, Fam. Ceratopogonidae (genus <i>Culicoides</i>)	Adriana Damian-Georgescu	2000	142
83.		15	Diptera, Fam. Chironomidae, Subfam. Orthoclaadiinae	Victoria Tatole	2003	175

Table 1 (continued)

Nr crt	Volume	Fascicle	Taxonomic group	Authors	Year	Number of pages
84.	Vol. XII CHAETOGNATHA; ECHINODERMA; STOMOCHORDATA, TUNICATA, CEPHALOCORDATA, CYCLOSTOMATA, CONDRICTHYES	1	Cyclostomata and Chondrichthyes	Petru-Mihai Bănărescu	1969	107
85.	Vol. XIII PISCES (II)		Osteichthyes	Petru-Mihai Bănărescu	1964	972
86.	Vol. XIV AMPHIBIA and REPTILIA	1	Amphibia	Ion Fuhn	1960	289
87.		2	Reptilia	Ion Fuhn and Ștefan Vancea	1961	353
88.	Vol. XV AVES	1	Gaviiformes, Podicipediformes, Procellariiformes, Pelecaniformes	Ion Cătuneanu, János Korodi-Gál, Dan Munteanu, Sergiu Pașcovschi and Emil Vespremeanu	1978	317
89.		2	Galliformes, Ciconiiformes	Dan Munteanu (Coord.); autori: Gabriel Chișamera, Alin David, Simon Dieter, Nicolae Onea, Angela Petrescu, Eliana Sevianu, Alexandru N. Stermin	2015	308
90.	Vol. XVI MAMMALIA	1	Insectivora	Dumitru Murariu	2000	152
91.		1	Insectivora (the english version)	Dumitru Murariu	2014	163
92.		2	Rodentia	Alexandrina Popescu and Dumitru Murariu	2001	214
93.		3	Chiroptera	Nicolae Valenciuc	2002	166
94.		3	Chiroptera (the english version)	Dumitru Murariu, Gabriel Chișamera, D. Ștefan Măntoiu, Irina Pocora	2016	283
95.		4	Lagomorpha, Cetacea, Artiodactyla, Ord. Perissodactyla (without recent species)	Dumitru Murariu	2004	209
96.		4	Lagomorpha, Cetacea, Artiodactyla, Ord. Perissodactyla (without recent species) (the english version)	Dumitru Murariu	2021	221
97.		5	Carnivora	Dumitru Murariu and Dan Munteanu	2005	223

The activity of the *Romanian Fauna* is coordinated by an Editorial Committee, which, over time, has included a number of personalities who, although constrained perhaps by the time and place in which they lived, through the results of research have managed to contribute significantly to the development of zoology in our

country. Among them, we mention: Wilhelm K. Knechtel, Mihai A. Ionescu, Mihai I. Constantineanu, Constantin Manolache, Vasile Gh. Radu, Nicolae Botnariuc, Radu Codreanu, Mihai Băcescu, Constantin Motaş, Petru-Mihai Bănărescu and others.

The contributions of the Romanian specialists, as first authors of the *Romanian Fauna* issues, summarized in the total number of pages and published fascicles, are presented in Fig. 3 and Fig. 4.

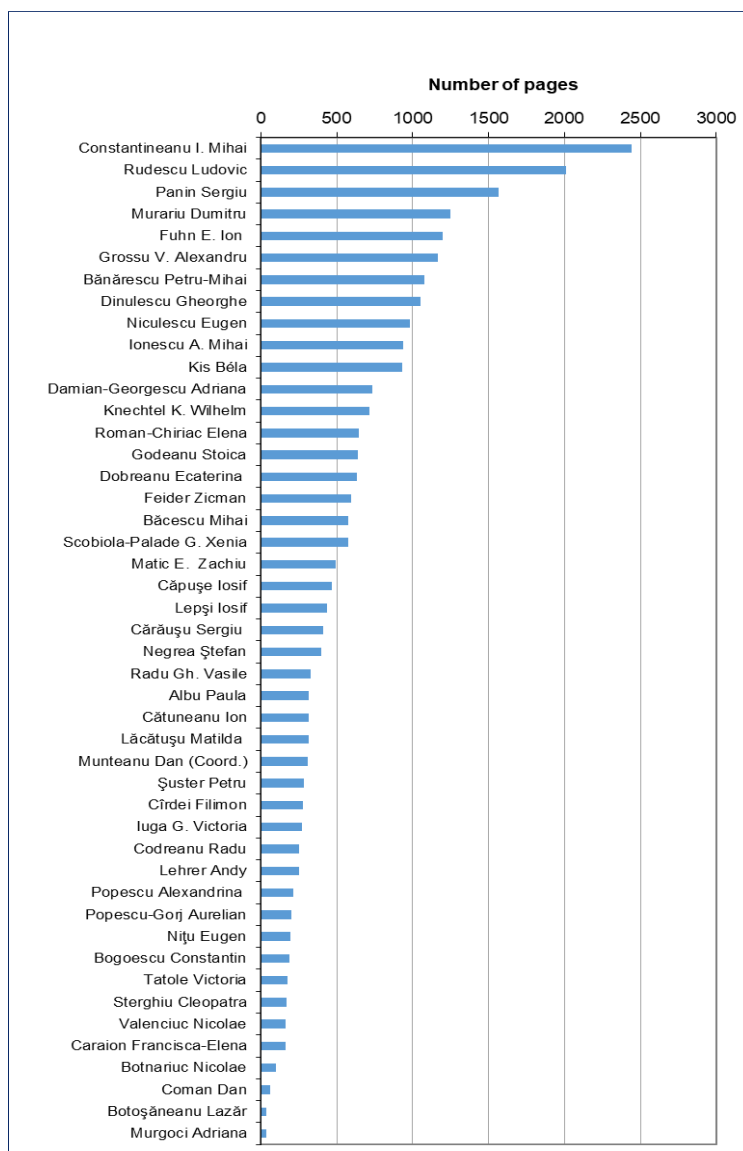


Fig. 3. *Romanian Fauna* – First author contribution by the number of published pages between 1951–2021.

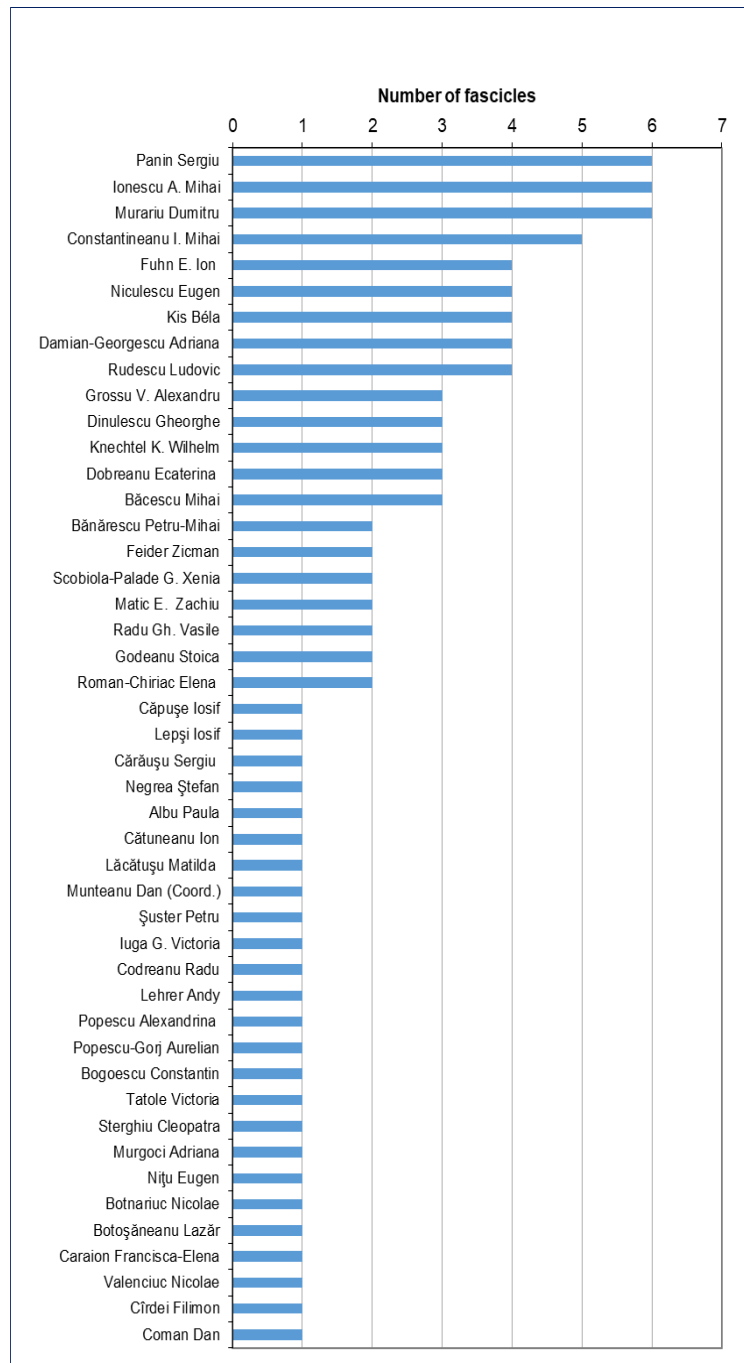


Fig. 4. *Romanian Fauna* - First author contribution by the number of published fascicles between 1951 – 2021.

The information taken from the biographies of some of the first contributors to the *Romanian Fauna*, exemplified below, is eloquent and demonstrates that they were already well-known personalities in the field of zoology, who had published important papers on the systematic group studied, impacting the national and international scientific community. At that time, the international scientific circles were surprised by the “impetuous” appearance of this work, for foreign specialists being a real revelation the existence in Romania of a nucleus of trained zoologists, who were able to accomplish a high work of scientific value in a short time (Radu, 1966).

Mihai I. Constantineanu (1894–1993) – exceptional entomologist, Emeritus university Professor and researcher of international prestige, school creator, specialized in the study of entomophagous insects of Ichneumonidae family, wrote in the *Romanian Fauna* in 1959 a monumental volume of 1,249 pages and, in 1965, a volume of 510 pages. But, Mihai I. Constantineanu had thoroughly mastered the “books of biology”, especially zoology, since the time when he was a student at the high school of zoology – “Alexandru Ioan Cuza” University in Iași, under the guidance of the great naturalists Ion Borcea, Ion Simionescu, Paul Bujor, Ion Scriban, etc. He began studying ichneumonids as early as 1924, when he took specialization courses in Vienna, the Museum of Natural History, and the Plant Protection Station in Austria, and then completed his studies at the Institute of Zoology in Berlin (1927–1929). In addition to studying the Ichneumonidae family, Mihai I. Constantineanu was also interested in certain aspects of pest insects and biological control. He studied the structure of insect eyes, graduating from the “Friedrich Wilhelm” University in Berlin. He continued his specialization in France (1929–1930) at the National Agronomic Institute, the Marine Biological Station at Banyuls-sur-Mer, the Roskoff Marine Station, the National Museum of Natural History in Paris and in Italy – at the Higher Institute of Agronomy at Porches. Together with his students, he also published a series of fascicles from the *Romanian Fauna*: with Constantin Pisciă in 1977, with Gheorghe I. Mustață in 1982, with Raoul Constantineanu and Irinel Gh. Constantineanu in 2000. In the impressive work of Professor Mihai I. Constantineanu (including over 5,500 pages), 2,419 species of ichneumonids from Romania are reported, of which 70 species, 120 subspecies and 176 varieties are new to science (Constantineanu & Constantineanu, 2021).

Knechtel Wilhelm Karl (1884–1967) – Romanian entomologist of German origin, attended Herăstrău High School and studied in Germany, in Stuttgart-Hohenheim (1904–1907). He specialized in plant protection in Naples – Italy, then at the Institute of Biology in Berlin (1912–1914). He has published a series of papers on pest insects, especially on tisanoptera (*Thysanoptera in Romania. Morphological studies; Pest insects in Romania and the means to control them*). He became a Professor at the School of Viticulture in Chișinău – Moldova (1918–1920), then a Professor at the Faculty of Agronomy in Bucharest (1940–1944).

Academician Wilhelm K. Knechtel is considered the founder of the Romanian School of Agricultural Entomology. Within the Entomology Section of the Descriptive Zoology Laboratory of the Faculty of Natural Sciences in Bucharest, coordinated by W. K. Knechtel, five fascicles were published in the *R.P.R Fauna* Collection.

Iosif Lepși (1895–1966) belongs to the gallery of some notable personalities from the interwar period. With higher education in Bucovina, in Chernivtsi, he became a doctor of biological sciences, professor, zoologist, nature researcher, geographer and director of the National Museum of Natural History in Chișinău. He studied, developed and implemented the development programs of the Museum, the various methods of establishing collections and popularizing cultural values in Bessarabia. The *History of Romanian Sciences* (Pop & Codreanu, 1975) mentions that Iosif Lepși published taxonomic papers on ciliates and other free protozoans (Berlin, 1926; Romanian Academy, 1927, 1929), as well as general research in hydrobiology, fauna and geography, especially in Dobrogea. He also wrote two important monographs: *Euamoebidea* (1960) and *Protozoologia* (1965) and carried out the first limnological studies on the Tăbăcărie, Siutghiol and St. Ana lakes.

Victoria Iuga-Raica (n. 1900) was a brilliant representative of Romanian biology. She graduated from private secondary school and high school in Bucharest, but due to the WWI, she had her baccalaureate in Roman city – Moldova, her refuge place. She then attended the Faculty of Natural Sciences in Bucharest, with renowned professors: A. Popovici-Bâznoșanu, Ion Atanasiu, Ludovic Mrazec, Traian Săvulescu. She was enrolling in a Doctorate School at the Department of Animal Morphology, led by the world-renowned scholar and cytologist Dimitrie Voinov, who was also her first husband. From 1920 to 1940 she had a teaching career, going through the ranks of assistant, lecturer and professor at the Faculty of Natural Sciences in Bucharest.

As Head of Department at the “Grigore Antipa” National Museum of Natural History, she founded the Entomology Collection. Between 1949–1959 she also cumulated the position of senior researcher in the Fauna Collective of the Romanian Academy. She has done research internships in various institutions abroad: Aquariums in Trieste and Naples in Italy as well as in Monaco and Roscoff Marine Research Station in France, Museums of natural History in Budapest, Vienna, Paris, London in various laboratories and libraries of Universities in France and England, Institute of Zoology of the Russia (former Soviet Union) Academy from Leningrad (today Sankt Petersburg). The results of her research can be found in over 100 published scientific papers, in which she dealt with topics of cytology, histology, systematics, ecology.

Mihai C. Băcescu (1908–1999) – Romanian zoologist, oceanologist and museologist, full member of the Romanian Academy, attended the Faculty of Natural Sciences in Iași, where he attended lectures given by professors Ion Borcea

and Paul Bujor. From the second year of his studies, he was appointed preparator at the Department of Animal Morphology, specializing in aquatic and marine fauna, especially in crustaceans and fish. In 1933 he began his doctorate training and spent five years at the Agigea Marine Zoological Station and at the Cape Caliacra Resort, managed by the Bio-Oceanographic Institute of Constanța, founded by Dr. Grigore Antipa. In 1938 he defended his doctoral thesis on Mysidaceae in Romanian waters. At the recommendation of Paul Bujor and Emil Racoviță, in 1939 he obtained a scholarship in France, where the young scientist made an excellent impression at the National Museum of Natural History in Paris, the Oceanographic Museum in Monaco and in the various Marine Biology Stations where he worked. Later, he went through the steps of international scientific affirmation, leading the National Museum of Natural History “Grigore Antipa” and in the Romanian Academy, becoming the founder of the Romanian Schools of Biological Oceanography, Carcinology and Museography. Here, Mihai Băcescu created an important school of taxonomists with world-class carcinologists: Modest Guțu, Zaruhi Muradian, Iorgu Petrescu, Ileana Negoescu, etc.

Ludovic Iosif Urban Rudescu (1908–1999) was a hydrobiologist and naturalist, with college and university studies in Chernivtsi – Bucovina. After graduation, he followed various specializations in Berlin, Stockholm, Lund, Uppsala, Gothenburg, etc. In 1948, he became a researcher at the Institute of Cellulose and Paper in Bucharest, then at the Institute of Biology. Doctor in natural sciences, specialized in biology, hydrobiology and reed farming, since 1967 he has been Head of Department at the “Traian Săvulescu” Institute of Biology in Bucharest. He became a member of the American Society of Limnology and Oceanography, the American Society of Microscopy, and the International Society of Limnology. A lover of hiking and hunting, he devoted much of his time to microscopic studies of rotifers, gastrotrichs and tardigrades in the benthos and plankton microfauna, about which he published over 2,000 pages in the *Romanian Fauna* Collection.

Mihail Andrei Ionescu (1900–1988) was a famous entomologist, professor at the University of Bucharest. He graduated from the Faculty of Science in Bucharest and specialized at the Museum of Natural History in Vienna and the Institute of Biooceanography in Split. He became a professor of entomology at the Faculty of Biology - University of Bucharest (1949–1968). He formed a Romanian entomology school by developing entomological education, with eminent disciples (Matilda Lăcătușu, Constanța Tudor, Nicolae Toniuc, Irina Teodorescu, Medeea Weinberg), with whom he had a close collaboration. He made significant contributions in the fields of insect systematics, ecology and zoogeography (Protura, Diplura, Collembola, Termitina, Cynipoidea, Asilidae, etc.).

Alexandru Grossu (1910–2004) is considered one of the most valuable malacologists of the 20th century, who distinguished himself both in his teaching and in his scientific research. From 1951 he was Professor and Cancellor of the

Pedagogical Institute of Bucharest, and from 1955 Professor at the Faculty of Biology - University of Bucharest, for a period of 20 years. The results of his research and his passion for the study of mollusks have been materialized in the description of dozens of new gastropod species for science, in the pages of over 160 scientific articles, including three fascicles (Mollusca) published in the “*Romanian Fauna*” (1955, 1956, 1962).

Petru-Mihai Bănărescu (1921–2009), valuable Romanian zoologist and biogeographer, nationally and internationally recognized for his significant contributions in the fields of zoological taxonomy, systematics and biology of marine and freshwater fish species. The results of his research have been included in over 350 scientific papers, including two issues published in the *Romanian Fauna* (*Pisces-Osteichthyes* and *Cyclostomata and Chondrichthyes*), as well as the volumes: *Principles and problems of zoogeography. Zoogeography, Biogeography* (in collaboration), *Principles and methods of systematic zoology, The Fresh Water Fishes of Europe*. His research has focused on the systematics of the Cyprinidae and Cobitidae families in Europe and Asia, the zoogeography of freshwater fauna, the principles of taxonomy, the problems of species and speciation, and, equally, the problems of nature conservation. The volume *Pisces-Osteichthyes*, published in the *Romanian Fauna* Collection, remains today the most valuable and comprehensive monograph on freshwater and marine fish in our country. At the Institute of Biology of the Romanian Academy, Petru-Mihai Bănărescu created a valuable collection of freshwater fish from Eurasia, North America, partly Africa, this collection being later donated to “Grigore Antipa” National Museum of Natural History, Bucharest.

REASONS FOR UPDATING AND COMPLETION OF THE *ROMANIAN FAUNA* ACADEMIC COLLECTION

Although the publication of the 97 issues in the *Romanian Fauna* is an extremely necessary and valuable achievement, over time, the Romanian zoological community has moved away from the project of publishing and finalizing this national work – a fundamental “document” of nature in our country. At present, 71 years after the publication of the volume *Guide*, with rare exceptions, the completion of the *Fauna* has been interrupted. In comparison, the world of plants in our country is much better known, through the complete publication of the *Romanian Flora*, materialized in 13 volumes, published between 1952–1964, under the coordination of Academician Nicolae Sălăgeanu.

The interest of Romanian zoologists, especially of young people, for the so-called classical sciences (taxonomy, systematics) has decreased, which has contributed to a shortage of specialists in the study of certain groups, especially invertebrates. In the past, in our country, research on invertebrates has been less numerous,

compared to those on vertebrates. Due to their specific diversity and extremely high abundance, invertebrates have a significant ecological impact on the living world, so the training of specialists in the study of invertebrates is urgently needed.

Although traditional methods of working in taxonomy are recognized and give correct and objective results, they also have obvious disadvantages, the training of a specialist in a certain taxonomic group requiring a lot of time, experience and sustained work. According to Popescu (2008) “...it is necessary to maintain at an acceptable level the scientific research that refers to the classical biological disciplines (botany, zoology). In Romania we have the chance to still have very good specialists in classical taxonomy both in botany and in zoology [...]. Molecular taxonomy cannot be done without classical taxonomy. The use of modern methods in taxonomy complements the research undertaken by classical methods”.

CONCLUSIONS AND PROPOSALS

1. For the scientific attestation of all animal species from the natural capital of the country in the *Romanian Fauna* Collection – a work of a large scientific scale, a collective effort is required to complete it, by publishing new fascicles related to taxonomic groups that were not processed, mentioned in the volume *Guide*.

2. Due to the recent progress in the fields of animal systematics and taxonomy, by including new information obtained in related fields (ecology, physiology, molecular biology), it is necessary to update the first edition of the *Romanian Fauna* fascicles.

3. This update is necessary because the systematic classification and nomenclature of species have changed over time, some species have been synonymized both by deepening classical morphology research and by clarifications brought by molecular biology studies. It is also necessary to bring “up to date” the knowledge about the spread of species worldwide and in Romania, to confirm the presence in the country of some species mentioned in the older works, requiring new data collection.

4. In order to continue and update the *Romanian Fauna* first of all it is necessary the identification of qualified human resources, but also the training of new researchers, especially for groups of animals less or not at all represented in *Fauna* – young people with a vocation for zoological research, in close collaboration and exchange of information with specialists in our country and with those abroad.

5. School teachers and university professors, scientific researchers from the Research Institutes of the Romanian Academy and other biological research institutes, museographers of “Grigore Antipa” National Museum of Natural History and other museums of natural sciences, etc. can meet in a *Society of Zoologists in Romania*, following the model of other countries.

6. Zoologists-taxonomists must be more involved in joint projects on the taxonomic study of national fauna, by funding with priority complex research programs on knowledge of specific biodiversity and the distribution and abundance of animal organisms in our country. Young people interested in a career in the field of zoological research may be encouraged to choose for their studies in doctoral theses a group of organisms that have not been treated in the *Romanian Fauna*.

7. Greater attention should be paid to research into the study of invertebrates, the largest group in the Animal Kingdom. Despite their impressive diversity and importance in the living world, interest in the study of “these little animals” has waned due to difficulties in identification and, implicitly, the small number of specialists. Invertebrate species are insufficiently known from a taxonomic, systematic, biological point of view and are less present in the Lists of protected species by national and international regulations, compared to larger animals.

8. For the information contained in the *Romanian Fauna* issues to be accessible to the international scientific community, it is necessary to translate them in English.

9. Romania has a remarkable faunal diversity (about 33,696 animal species are known, of which about 33,085 species of invertebrates and 611 species of vertebrates), of which about a third have been studied. In this context, the continuation and deepening of taxonomy, systematics and zoogeography research in Romania, the results of which will be published in the *Romanian Fauna*, will have to become a priority assumed by the entire zoological community in our country, so that the over 70 years old project of the Romanian Academy to be completed.

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