

DUMITRU T. MURARIU AT 80IES

EUGEN NITU



Born on 21 Sept. 1940 in Ungureni – a low hilled locality in Botoşani County, Romania – Dumitru spent his childhood among farmers, having as a close friend the school teacher’s boy, Nelu, whose mother was also a teacher. Dumitru will never forget how Nelu’s mother evaluated her son for the second place and considered that Dumitru deserved the first award at the end of the first class. This event gave wings to his parents, who followed his teacher’s advice and they did everything for Dumitru’s education.

After the Second World War, the years were dry and extremely difficult from an economic point of view. In a family with five children, the first priority was to obtain survival resources.

In those precarious conditions his parents decided for their son to continue gymnasium in Ungureni and the College in Botoşani – “August Treboniu Laurian” Lyceum No. 1 for Boys. The higher education was at the Department of Biology-Zoology in the Faculty of Biology-Geography – “Alexandru Ioan Cuza” University in Iassy (Iaşi)/1961–1966.

Starting with autumn of 1966 he worked as a biologist-bacteriologist and haematologist in the specialized Laboratory of the “Pantelimon” Unified Hospital

(Sector 3, Bucharest). In the hospital there was a good biobase with mice, rats, and hares. After he discharged his duties with Laboratory analyses, he experienced infestation with Koch bacillus to captive mammals, to investigate pulmonary tuberculosis. In co-operation with scientists from “Dr. Ion Cantacuzino” Institute he presented an oral communication in a meeting of the Medical Science Society from Bucharest and later the paper was published in “*Ftiziologia*”/*Pthysiology Journal* (1968).

Starting with 1969 he competed for a position of museologist to the “Grigore Antipa” National Museum of Natural History – Bucharest. To graduate in Biology, his dissertation was about Orthoptera insects from Moldova and he wanted to continue as an entomologist. But in Museum the only available position was of mammalogist. Knowing his wide experience in microscopy obtained in the hospital laboratory, the Museum’s Director – Academician Mihai C. Băcescu – urged him to start with documentation on mammals and suggested him to study the *integumentary glands of insectivore mammals*. Of course, this topic was besides his tasks of museographer, which included receiving visitors and guiding them through the basic exhibition.

For adequate research it was necessary to organize in the museum a laboratory of histology and histochemistry, starting with necessary equipment (microtome, microscope, thermostat), staining bath, dehydration as well as necessary consuming materials.

Understanding the complex activities of a scientist in a Natural History Museum, Dumitru started also to learn and manage educational projects specific to a cultural institution.

Firstly, he learned in details the structure and the scientific messages of the basic exhibition displayed on 6,000 m² of show cases, dioramas and biogroupes. Secondly, he started to give lectures to visitors, answering their questions and he analyzed and adopted the visitor’s suggested topics in the programs. Thirdly, he initiated practical activities with scholars, mainly with classes of biology and with students to the Faculties of Biology, Geology, Geography, Veterinary and Human Medicine, Silviculture, Zootechny etc., guiding and explaining them in specialized departments: comparative anatomy, mineralogy and paleontology, bioregions, anthropology, game species, conservation of nature and biodiversity.

The Museum’s tasks included organizing temporary exhibitions, improving and updating the basic/permanent exhibition, editing texts of specialty, replacing and improving old labels and texts, restoration or replacement of old and degraded items.

Dumitru Murariu was also involved in organizing scientific collections, mainly of mammals and other vertebrates, with need of identification or re-identification, labeling, cataloging and writing inventory in order to share them in heritage categories, according to the National Mobile Patrimony Regulations (the last one – Law 182/2000).

In a parallel direction, starting with 1969 Dumitru organized field expeditions to collect, identify and sample tissues from shrews, moles and hedgehogs, to preserve and fix the biological materials for histological and histochemical analyzes. To fix the samples he used Baker formaline, Bouin-Hollande, Carnoy, Gendre, Dubosck-Brasil, Ciaccio, Zenker, Sudan III for lipids, Helly-Susa mixed solution for glycogen, Champy for mytochondries, etc.

Anatomical, histological and histochemical research (with appropriate techniques) led Dumitru to the satisfaction of “discovery” the specialized integumentary glands – very important not only with their tubular and acinous structures, but also from ecological, physiological, ethological and systematical points of view.

Thus, in his first yearly scientific workshop in the Museum, Dumitru presented the preliminary results on *Contributions to the knowledge of the integumentary glandular system of Sorex araneus and Talpa europaea* – later published in Museum’s Journal *Travaux du Museum National d’Histoire Naturelle “Grigore Antipa”*, vol. XI/1970.

Starting with documentation in the largest academic libraries and asking for papers from scientists all over the world he organized his own (specialized) library with thousands of articles.

Understanding the direct connection of the integumentary glands with the environmental conditions, with the age of animals and their role in communication among the individuals of a certain species, Dumitru also understood their role in thermoregulation and as additional way to eliminate some important products in interspecific relations as well as a defense role against predators. Biosemiotics was his favorite topic.

Examples refer to the sudoriferous glands and to the sebaceous ones with their secretions to lubricate hairs. Some of them are specialized and at least seasonally they are hypertrophied.

To the insectivore mammal species from the Romanian and European fauna, Dumitru Murariu **identified 10 different types of specialized integumentary glands**, placed in different regions of the body. They are characterized by well-developed structures (at least in the reproduction periods) and produce secretions with specific composition and smell – important signals in communication between individuals of the same species and to defense against predators.

Highlighting the role of the side gland in shrews and of the anal glands in hedgehogs and moles in their home range (marking individual territories) or to recognize partners in reproduction periods, Dumitru **explained some aspects of intra- and interspecific relations inside mammal group – insectivore order**.

On one hand there are close relations between individual period of development and size of glands and, on the other hand – between stage of development of the specialized integumentary glands (e.g., side glands in shrews) and reproduction period of specimens from each species. He also reported facts from the field trips, finding dead shrews, caught by young carnivores and left them later, exactly

because they were confounded with mice. Tasting and smelling the repellent secretions, predators got experience and in their next hunting preys they avoided shrews. Thus, between shrew's predators, only young carnivore mammals (foxes, badgers, least weasels, stoats, wild cats, as well as domestic cats and dogs) are diddling. But real shrew's predators are snakes and prey birds.

In the reproduction periods, these glands are hypertrophied and their secretion is very rich. Except for these periods, the specialized integumentary glands reduce their size and secretions.

With such results from field trips and based on documentation from specialized literature on the complex role of integumentary glands in mammal ecology and biology, **starting with 1971 Dumitru became a Ph.D. student at Chair of Comparative Anatomy – Faculty of Biology, Bucharest's University.** Ph.D. thesis subject was «*Integumentary glands of insectivore (Mammalia) from Romania. Anatomy, histology and histo-chemistry*». The scientific adviser was Emeritus Professor Dr. Docent Gheorghe T. Dornescu. The public defense of the thesis was on 11 July 1975. Up to those time, except for some faunistic and systematic papers he published 11 scientific articles on Ph.D. thesis' topic.

In 1975–1976 Dumitru Murariu **was a Fulbright scholar for 12 months in U.S.A.**, continuing the study of the specialized integumentary glands of insectivores from Europe and North America. Firstly, he worked three months at the National Museum of Natural History (Smithsonian Institute) – Washington D.C. – both in mammal collections and in Museological Department to know local programs of conservation, restoration, projects of temporary exhibitions, programs of activities with visitors. The next two visits (for two weeks each) were at the Natural History Museum in Pittsburgh – Pennsylvania and to Field Museum N.H. in Chicago – Illinois. Most part of stage (nine months) Dumitru worked at the State University of Kansas, in Lawrence city.

In Kansas University he worked and published in co-operation with two American scientists (from the host institution) a paper about *Histology and histo-chemistry of the specialized integumentary glands of eight North American shrew species*.

At the end of his stay in the U.S.A. Dumitru visited several Museums of Natural History, Research Stations and Institutes of Biology, Natural Reservations and Zoos, American Museum of Natural History from New York, Museum of Comparative Zoology – Harvard University – Boston, Massachusetts, Institute of Biology – Lawrence, Kansas, University, M.N. History of Columbia University – State Missouri, Boulder M.N. History – Colorado State, M.N. History from Salt Lake City – Utah State, M.N. History of California University, in Berkeley – Los Angeles, M.N. History and ZOO in San Diego, N.H. Museum of Lubbock – Texas Tech University, M.N. History from Phoenix – Arizona State.

All work stages and visits were excellent opportunities for him to meet and discuss with American scientists, to check his methods of work in histology and

histo-chemistry as well as to establish professional connections with American scientists in theriology, with whom he met later and exchanged ideas in different international meetings. On the other hand, Dumitru Murariu learned techniques for conservation and preparation of biological items for temporary and permanent exhibitions and for scientific collections/natural patrimony.

He had the opportunity to see different types of educational activities with visitors in museums as well as research techniques in theriology and **to understand the principles of management of scientific and cultural institutions in the biological field** adopted at those time in the U.S.A. Some field trips with scientists from host institutions were also useful to verify his own methods of work and he learned how to organize laboratories for biological research.

In Russia (the former Soviet Union), Dumitru worked in the mammal collections of Museum and Institute of Zoology from Sankt Petersburg, in collections of Museum of Zoology – “Lomonosov” University in Moskow, in “Severtzov” Institute for Ecology and Evolution in Moskow, as well as in some museums from Europe: Berlin M.N.H. – “Humboldt” University, Helsinki, Krakow – Institute of Systematics and Evolution of Animals – Polish Academy of Sciences in Krakow – Poland, Madrid, Vienne, Budapest, Sofia etc.

Coming back to Romania, in 1976 Dumitru Murariu **competed for and won the position of Head of Department of Vertebrate** in “Grigore Antipa” National Museum of Natural History – a position in which it was possible to prove his aptitudes of manager and he set up teams of scientists specialized in vertebrate research and in Restoration & Taxidermy. The programs of the Department were better organized with annually projects, verified along the year on the occasion of monthly reports in seminars.

In the scientific field, Dumitru **opened new topics of national and international interest, such as monitoring and conservation of biodiversity**, complex research of the Danube Delta fauna (before and after its statute of Biosphere Reserve), surveying mammal species from Svistofca, Letea, Caraorman, Sulina, land around Puiu, Roşu and Roşuleţ Lakes, St. George (Delta) forests, Mila 23, Mila 26, Crişan etc.

He extended the vertebrate fauna research to the Danube Plain, from Borcea branch of Danube river, upstream to Drobeta-Turnu Severin and later to Eastern, Western and Southern Carpathians.

In addition to the reported results for some projects co-ordinated by Institute of Biology of the Romanian Academy, of Bucharest’s University, of Ministry of Research and Dvelopment, and of Ministry of Environment, Dumitru published some synthesis: “*Contributions to the knowledge of distribution and ecology of mammals from the Danube Delta and Razelm Lake areas*”, “*Presence of Mus musculus spicilegus in the Danube Delta, together with “parasite” Apodemus agrarius*”, “*Microtus rossiaemeridionalis (today – M. levis) – new species reported for the Romanian fauna*”, “*The statute of Microtus agrestis in the Romanian fauna*” etc.

Collecting and getting fresh samples of small mammals, Dumitru opened collaboration with academic institutions, publishing several papers on different mammal species to **clarify their existence in the Romanian fauna, from the cito-taxonomic point of views**, the new reported species *Microtus rossiaemeridionalis* becoming recognized presence in the country's fauna. Other results referred to *Microtus arvalis*, *M. nivalis*, *M. taticus* (European endemit), *Micromys minutus*, *Eliomys quercinus*, *Sicista betulina*. This last species he reported for the Romanian fauna, based on only one specimen collected from the Biosphere Reserve Rodna Mountain (Pietrosul Rodnei) – Eastern Carpathians. Those specimen was later stuffed and introduced in the basic/public exhibition of « Grigore Antipa » National Museum of Natural History,

These types of papers were very well received by foreign scientists who cited Dumitru's results in their reports and suggested co-operation in England, France, Switzerland, Bulgaria, Canada, United States, Russian Federation.

In 1998, Dumitru presented cito-genetic results, **confirming the existence in the Romanian fauna of *Erinaceus concolor*** – Eastern hedgehog, instead of *E. europaeus*, wrongly reported in all previous mammal Romanian literature. Those results were reported on the occasion of the International Theriological Congress of European Mammal Society and American Society of Mammalogists – in Santiago de Compostella (Spain) (18–24 August 1998).

He also **presented his research results** in the paper “*Comparative anatomy of the mammary glands of some European and North American insectivores*” in the third International Congress of Theriology in Helsinki – Finland (1982), and in 1989 to the fifth International Congress of Theriology (in Rome, Italy) – with the paper “*Specialized integumentary glands of some Holarctic insectivores*”. Both papers were well appreciated and published in Acta Zoologica Fennica No. 173/1985, pp. 243–245, respectively in Abstract of Papers of fifth I.T.C., vol. 2/1989, pp. 995–996.

About mammal species situation in Romania, Dumitru Murariu published alone or in co-operation faunistic results, ecology, ethology and distribution in different parts of the Romanian Plain, Teleajen Valley, Bucegi Mountains, Vrancei Mts., Hills of Argeş County, North-Western part of Romania (Satu Mare Co.), from Banat, Maramureş, Moldova and Dobrogea. From the Oltenian Plain he reported a population of *Spalax isticus*. Some of **these personal research results are cited in the monographic book *Mammal Species of the World* by Wilson et al. (1993, pp. 755 and 935)**. In the same book his personal results of mammal research (pp. 767 and 935) on *Microtus rossiaemeridionalis*, *Apodemus agrarius* and on *Eliomys quercinus* are cited.

Analysing more than 15,000 pellets, Dumitru published (in co-operation) several papers with precise information on winter food of prey birds, with some considerations on the consumed biomass and mostly on the population dynamics of different mammal species. These surveys were organized along five years in the

same area (Oltenian Plain) and for other 10 years he continued to get data from Iași (Iassy), Bacau, Teleorman and Ilfov Counties as well as from Bucharest – “Ghencea” cemetery and from the Institute of Plant Protection – Băneasa area). This long survey allowed him to compare strigiformes food (rodents, small birds, lizards, frogs, fish) in each season, in urban and rural localities, in natural and in cultivated ecosystems.

At the Romanian Academy Publishing House, he started to issue in 1988 a collection with six volumes, entitled “*From the Life of Mammals*”. The first volume (1988) and the second one (1993) were dedicated to the Terrestrial Mammals. In 1998 he printed the third volume, about arboreal mammals. In 2010 – vol. IV – Underground Mammals. In 2011 – volume V – Flying Mammals and in 2012 – volume VI – Aquatic Mammals. This is the first collection presenting mammals from all over the world in Romanian language, grouped on ecological criteria.

Also, **at the Romanian Academy Publishing House Dumitru Murariu** published in 2000, the first Fascicle of **FAUNA Collection – INSECTIVORA**. In 2001 he published the **second Fascicle – Rodentia**. In 2004 – Fascicle 4 – **Lagomorpha, Cetacea, Artiodactyla and Perissodactyla** (without recent species). In 2005 he published (in co-operation) – **Fascicle 5 – Carnivora**, in the same Series of **Romanian Fauna**.

In 2014 Dumitru started to publish to the Romanian Academy Printing House **Fascicle 1 – INSECTIVORA in English language**, with updated information on morphology, systematics, biology, ecology, distribution and statute of conservation of each species.

In 2016 he published in co-operation (at the same Publishing House) **Fascicle 3 – CHIROPTERA**; the book received Academic reward in 2018. He has in project to publish **Rodents, Lagomorpha, Cetacea, Artiodactyla and Perissodactyla, and Carnivora Fascicles, in English**.

A monographic book (in co-operation) was printed in 2003, edited by Institute of Speleology “Emile Racovitza” and “Grigore Antipa” National Museum of Natural History, entitled “**Chiroptera from Romania**” (“*Chiroptere din România*”) – **a synthesis of 521 pages**, interesting not only for Romania, but for the neighbour countries too.

In 2008 Dumitru published (in co-operation) at the Romanian Academy Printing House **Bibliographia Mammalogica Romaniae – a synthesis with more than 340 pages and more than 4,500 titles** of papers or notes about mammal species from the Romanian fauna.

Other synthesis books were published in co-operation with scientists specialised in chiropterology, geologists, paleontologists – the last one printed at the Bucharest’s University Printing House, entitled “*The First Ecological Reconstruction of Underground Environment from Romania. Ciclovina Uscată Cave*” with 136 pages, structured in eight chapters.

In the applied reserach field he **co-operated to 23 topics of financed projects, for 12 of them being coordinator or director of project** – organising

field trips with a team of 14 scientists. Collected biological materials and observations in the field were checked in laboratory and were the basis to structure reports (partly and final) about biodiversity (documentation to declare different protected areas), impact studies and ecological notice for different investment in some areas of the country: Jijia Valley, Oltului Valley, Jiului Valley, along the Tur river, Nera Valley, Cerna Valley, along the Siret-Bărăgan Channel – from Adjud, Mărășești, Focșani, South of Buzău up to the Ialomița river mouth.

A part of the projects he co-ordinated with the young team of scientists from the Department of Molecular Biology in the “Grigore Antipa” National Museum of Natural History.

Dumitru was also co-ordinator of the **BioCASE International Project, with financial support of the European Community**, to carry out an unitary system of evidence and access to the European natural sciences collections. He involved the “Grigore Antipa” National Museum of Natural History as a central knot for Romania, in relation with European Center from Berlin – Freie Universität.

On the behalf of Bucharest’s M.N.H., Dumitru **co-ordinated the project LIFE00NAT/RO/7187**, financed by European Community (2002–2004) for bat species conservation in the underground roosts from South-West part of Romania. The project was initiated by Green-Cross Romania.

Between 2003 and 2006 he **was a partner** in LIFE Project of Piatra Craiului National Park, being in charge with mammal group. In 2006–2008 Dumitru Murariu was the **key expert for mammals in the UNDP Project** for biodiversity monitoring in Măcin Mountain National Park – Dobrogea.

He also worked **as a partner** to the PHARE Project, co-ordinated by Royal Haskoning Co. from the Netherlands, to a scientific documentation for two islands protected areas and Danube Green Corridor from Timok river to Silistra-Ostrov – Călărași Co.

As **partner** he was involved for mammals biodiversity in a PHARE Project co-ordinated by Institute of Biology of the Romanian Academy and later in the Project co-ordinated by WWF in Romania, for eight islands along the Danube river, upstream and downstream to Călărași locality.

In 2008–2010 and 2011–2013 Dumitru Murariu co-ordinated two bilateral projects of biodiversity conservations, with Shumen University in Bulgaria, respectively with a University in Slovenia. Each of them was finalised with published common papers on surveyed biodiversity.

For more than 15 years Dumitru involved Bucharest’s M.N.H. in a co-operation project with Institute of Systematics and Evolution of Animals, Polish Academy of Sciences in Krakow, and he personally attended eleven workshops with topics on Biogeography of Carpathian Bats.

Dumitru’s published papers are cited in the international literature of mammalogy. Phillip M. Youngman from Canada, cited him in 1982 in Acta Zoologica Fennica No. 166 pp. 4, 7, 15 and 19; Russian academician Vladimir E.

Sokolov cited (page 266) Dumitru's papers on the integumentary specialised glands in his book "*Rukovodstvo po izucheniyu kojnovogo pokrova mlekopitayushchikh*". Moskva: 1–279. Sokolov *et al.*, cited him in their books: "*Histologhia i sezonnyie osobennosti funkcionirovaniya eccrinovykh jelez obyknovennogo eja (Erinaceus europaeus)*". Moskva, "Nauka": 101–109 (cited Murariu D. on pages: 101, 104 and 108); "*Communicativnie (Signalinie) speciphicheskoe kojnye jelezi nasekomoiadnich i rukokrilich fauni SSSR*". Moskva, "Nauka": 1–830 (cited Murariu D. on page 29); "*Speciphicheskoe kojnye jelezi nasekomoiadnich (Mammalia, Insectivora): Sovremennoe sostoianie izuchennosti*". Moskva, "Nauka": 98–128 (cited Murariu D. on pages: 103, 109, 111, 113, 116, 117, 121, 122); Olga Cernova and Suzana Şabadaş (from "Severtsov" Institute of Ecology in Moscow) cited several of Dumitru's papers on skin morphology. Mitchell-Jones *et al.* (1999) cited him on p. 20 in the book "*European Atlas of Mammals*" (Academic Press Printing House). Other citations were made by the senior authors with whom he co-operated and signed different scientific articles: James W. Bee, Robert S. Hoffmann from U.S.A., Boris Kristufek from Slovenia; Wilson and Reeder (1993) from Smithsonian Institute – U.S.A., in the book – "*Mammal Species of the World. A taxonomic and geographic reference*". Smithsonian Institution Press. Washington and London: 1–1206 (cited Murariu D. on pages: 755, 767 and 935); Daad and Edwards (1997) – "*Zoological Record*". Mammalia, **133**, 19: 182 (cited Murariu D. with paper "*Mammal Species from Romania. Categories of conservation*", since 1995); Hafner and Ziswiler (1983) – "*Histologische Untersuchungen an lateralen Integument des Igels Erinaceus europaeus (Mammalia, Insectivora)*". Revue suisse Zool., **90**, 4: 809–816 (cited Murariu D. on pages: 810, 813, 816); Niethammer and Krapp (1982) – in "*Handbuch der Säugetiere Europas*". Akademische verlagsgesellschaft. Wiesbaden, Band 2/I. Rodentia II: 170–451 (cited Murariu D. on page 357, for distribution of the species *Microtus arvalis* in Romania); Stubbe and Stubbe (1998) – "*Ecology and protection of the Common hamster*". Martin-Luther Universität, Halle-Wittenberg: 1–480 (cited Murariu Dumitru on pages 461 and 478).

Several hundreds of citations are in Romanian literature of biology – most of them by students, on the occasion of preparing different Ph.D. thesis in zoology.

In chronological list of published papers, in addition to the original research results Dumitru Murariu **added some reviews of important books**: "*Mammal Species of the World*"; "*Investigation on Beavers*"; "*Ekologo – functionalinaia morphologhia kojnov pokrova*"; "*Rukovodstvo po izuceniyu kojnova pokrova mlekopitaiuschih*", "*The Mammals of Palaearctic Region*", "*The Mammals of Soviet Union*" – several volumes translated from the Russian language, by Smithsonian Institute in 1988–2001: Vol. I (Artiodactyla and Perissodactyla) in 1988; Vol. 3, No. 8 (Microtinae) in 1992; Vol. 2, Part 2 (Carnivora) in 1992; Vol. 2, Part 1a – Sirenia and Carnivora in 1998; Vol. 2, Part b – Weasels in 2001.

Other reviews refer to publications in Romanian Academy Publishing House (e.g., Fauna of Romanian Chiroptera – Fascicle 3/2002, by Niculai Valenciuc) or

publications of some natural sciences museums from the country (Craiova, Bacău, Tulcea, Constanța), in the book “*Biologists from Romania*”, 2001 etc.

Another series of printed articles and notes are for **museological research**: *Considerations on lectures given to “Grigore Antipa” National Museum of Natural History*; “*Grigore Antipa*” N.M.N.H. represented to the International scientific meetings; *Absolutely necessary knowledge for museologists of natural sciences, Understanding animal evolution based on comparative anatomy proves from “Grigore Antipa” National Museum of Natural History* (published in ICOM NEWS LETTERS, no. 5, 1979); *Mission of Museum in the 21st century* etc.

Dumitru Murariu was invited for 6–10 days to the Museum of Zoology from Moscow, to the Institute of Zoology in former Leningrad (today Sct. Petersburg), to Berlin, Budapest and Vienna Museums of Natural History. To the last museum Dumitru was the only invited Romanian scientist-museologist to a workshop with the topic “*New ways in museological politics from the Central Europe*” and he contributed with suggestions for a Programme of activities in these type of institutions, highlighting **the role of scientific research in museums of natural sciences**. Dumitru insisted about the correlation of the scientific activities with public education programme, scientists having to give examples from their own speciality. Also he mentioned in the same meeting the need of better use of human resources, their motivation with higher salaries, the selection of people with aptitudes for the complex and specific activities in museum, better professional education, connections of museums with academic institutions – universities and institutes of research, the international obligation to preserve cultural and natural heritage in all European Museums, and identification of new financial resources for museums.

In addition to the International Theriological Congresses, Dumitru Murariu **attended many national scientific meetings**: The 56th Annual Meeting of the American Society of Mammalogists (ASM) in Lubbock – Texas/1076; “The First National Conference of Ecology” (Arad/1978); Museum scientific meetings: Focșani (1986; 1987; 1988); Galați (1988; 1989), Oradea (1978), Pitești (1991, 1994, 1996, 1999, 2001, 2003, 2005, 2007), Bacău (1993, 1994, 1995 and 1996), Timișoara (1995), Sibiu (1995), Ploiești (1994, 1995, 1996, 1998, 2000, 2005); The 11th European Symposium for bat Studies (in 2008, Cluj – Romania) etc.

Since the first of January 1976, Dumitru became **a life member of the American Society of Mammalogists**, receiving “*Journal of Mammalogy*” – **the only complete collection in Romania**, deposited to the Romanian Academy Library – 38 volumes/169 Numbers.

Another collection of scientific journals was *MAMMALIA*, donated to the same Library – 17 volumes/72 numbers (1957–1974); in 1961, 1962, 1963, 1964, 1967 and 1972 there were additional numbers as Supplements.

Dumitru Murariu was a member of the Species Conservation Commission inside the International Society for Nature Conservation (IUCN), receiving publication

“Species” and journal WWF News. He is a member of different scientific Societies in Romania and President of the Romanian Federation of Chiropterology.

Starting with 2000 Dumitru is **Ph.D. adviser for Biology field** (Order No. 3775/10.05.2000 of the Ministry of National Education and Scientific Research) assisting 32 Ph.D. students, 23 of them defending already their Ph.D. thesis.

Thus, it was possible to **create a school of zoology (including theriology)** in Romania, with young masters and Ph.D. students from main university centers in the country: Iassy, Cluj, Constanța, Sibiu, Craiova, Brașov, Bucharest.

Inside the Ministry of Culture and National Heritage Dumitru was involved in Commission of Professional Improvement, **giving lectures to museologists from natural sciences museums in the country**: 1986, 1987, 1988, 1993, 1994, 1995, 1997–1999, 2001–2003, 2006, 2008. Those lectures included general topics of museology, new techniques of restoration and taxidermy, cataloging and digitisations of natural heritage evidence, the role of scientific research in museums and field trips for techniques of collecting and preservation of biological materials, by place and continuing identification and research in laboratories up to processing texts with illustration to be published.

Before the use of e-mails he wrote and got separates and books from many scientists all over the world, with their published results of zoological research. If some of his papers could be prepared alone, for some others it was necessary to co-operate, especially to promote interdisciplinary research. Besides geographers, geologists, chemists, physicians, mathematicians etc.), Dumitru also co-operated with biologists specialised in different branches (anatomists, systematians, ecologists, biochemists, geneticians) to correlate transdisciplinary results.

Since November 1989 up to July 2014, Dumitru Murariu was **Editor in Chief of 29 volumes of the scientific journal** – *Travaux du Museum National d’Histoire Naturelle “Grigore Antipa”*. This bulletin was sent (in exchange relations) in more than 150 museums and academic institutions from all over the world.

Dumitru Murariu is member of the Editorial Boards of the **Romania’s FAUNA academic collection** as well as of *Journal of Biology/Zoology; Studies and Communications (Studii și Comunicări)* – Museum of Oltenia and Museum of Brăila; *Annals of the Danube Delta Institute* – Tulcea; *Bulletin of Institute of Zoology* – Academy of Sciences – Moldova Republic; *Studia Chiropterologica* – Institute of Systematics and Evolution of Animals – Polish Academy of Sciences – Krakow, Poland.

In 1991 and 1994 he **organized two scientific expeditions** of “Grigore Antipa” National Museum of Natural History in Indonesia, respectively in Brasil (totally 7 months), with 4, respectively with 6 Romanian scientists. Up to now, they described more than 40 new species (most of them published in Bucharest Museum’s Bulletin, vol 38). In the Museum’s exhibition he introduced three specimens of *Tupaia* – evolutive node of connection between insectivores and other orders of mammals as well as of primitive monkey – *Tarsius* and a specimen

of *Limulus* (Leg. C. Pârvu), many specimens of gastropods, lamellibranchiats and cephalopods, sponges and corals, fish, amphibians, reptiles, birds. A collection with more than 200 fruit-eating bats and thousands of individuals of insects (diptera, coleoptera, hymenoptera, orthoptera, lepidoptera) were also brought from those two scientific expeditions abroad. He brought other biological materials from Northern Africa (mainly from Tunisia and Morocco).

Wanting for the modernisation of the scientific research in a National Museum of N.H., Dumitru Murariu supported the project to organize **a laboratory of molecular biology** with a young team of specialists and all necessary equipment (electrophoresis, sequencing device for DNA etc.) to understand phyletic relations between different groups of beings. These new techniques are complementary to the morphological research – important in alfa-systematics. Thus, it was extended co-operation between scientists in Museum and specialists from other academic institutions in the country and abroad.

If specific functions of an institution can be fulfilled with clear objectives of Programs of activities, on short, medium and long term are necessary financial support and specialized human resources. The Programs should be realistic, necessary for the progress of scientific research, of educational activities and institution's heritage. The same principles he adopted in the management of the "Emile Racovitza" Institute of Speleology (1 April 2015 – 30 June 2016) and of the Institute of Biology of the Romanian Academy, starting with the first July 2016.

On the other hand Dumitru investigated possibilities to carry out some projects for extrabudgetary funds. Printing scientific articles, guides of identification, fascicles of FAUNA and books necessary to all three Departments in the Institute (Ecology, Taxonomy and Nature Conservation; Microbiology; Plant and Animal Cell Biology) is another priority in the Institute's management.

Between 2007 and 2011 Dumitru Murariu **co-ordinated the Project "Grigore Antipa" National Museum of Natural History reinvented after 100 years.** "New Bucharest's Museum N.H." proved to be an important educational center, scientific institute and with invaluable heritage. New dioramas and modern exhibitions with topics of bioregions from Romania and global terrestrials and marine bioregions replaced old systematic arrangement and were very much appreciated by visitors; never before were registered more than 500,000 visitors/year and on the occasion of the yearly Museum's Night (mid of May) the museum was visited by more than 18,000 people.

In the new exhibition there are modern topics such as: *Extinct species; Invasive species; Synanthropic species; Life in extreme environments; Life origin and evolution on Earth; Man and Nature* – with documentary films about human pressure on biodiversity and effects of planetary climate changes etc.

If the project of institution's modernisation was part of his management strategy (as director between 1988 and 2014), the cultural marketing was another topic of understanding and answering to visitors' expectations, to their need of

information. A museum's manager must organize activities for visitors, offer them answers to their questions as well as create an attractive atmosphere, so that people wish to come back for scientific information, leisure and cultural amusements. Dumitru Murariu brought Antipa's M.N.H. in the 21st century.

He has always promoted programs of activities and "services" suitable to visitor's interest: lectures, publications, guiding, temporary exhibitions, scientific meetings. Visitors were fully satisfied with the time spent, wishing to come back to the museum and they declared that "...everything was beyond expectations" and for sure they would advice their friends and relatives to spend some free time in "Grigore Antipa" National Museum of Natural History.

Dumitru Murariu was directly **involved in organizing some temporary exhibitions** with a special scientific and educational value. Two of them (in 2001 and 2002) were **awarded by the Ministry of Culture** (with "Mihai Băcescu" award) and another two (in 2003 and 2004) with the "Grigore Antipa" award.

He involved Bucharest's M.N.H. in co-operation programs with other museums from all over the world, bringing in the country successful temporary exhibitions: with Museum's of Earth from Warsaw – *Amber with succinates around Baltic Sea*; with South American Museums N.H. – *Argentinian Dinosaurs*; with an American Company – "*Human Body*" etc. In only three months each of them attracted 85,000 – 100,000 visitors.

His manager aptitudes and his wish to promote new tendencies in natural sciences field, he organized in the museum a **Department of Biodiversity Conservation and Sustainable Development** starting with 1999. The scientific team was able to compete for applied research projects with financial support from EU Community, IUCN, LifeNATURE, WWF or from Romanian Scientific Agency, Ministry of Environment, Romanian Academy.

For 12 years he was a member of the National Commission of Museums and Collections (within the Ministry of Culture) and he himself edited criteria to re-evaluate natural heritage, today in use in all Museums of Natural Sciences from the country, with collections of botany, zoology, paleontology, mineralogy, ethnography, anatomy and anthropology.

With the Presidential Decree No. 37/7 February 2004 Dumitru Murariu was awarded *Cultural Merit Order*, as Officer degree, Category E – "National Cultural Heritage".

Since 2006 he has been a corresponding member of the Romanian Academy and in 2014 he was elected as a foreign member of the Polish Academy of Sciences and Arts – Krakow.

In 2013 Dumitru Murariu was awarded the Academic Merit of Science Academy of the Republic of Moldova. A medal on the occasion of the 70th anniversary of the same institution was received in 2015.

In 2018 his book *Les pinnipedes antarctiques. Recherches d'Émile Racovitza* printed in 2016 at Éditions universitaires européens in Saarbrücken, Deutschland was awarded the “Academic Merit” Diploma of the Romanian Academy.

Between 1 April 2015 and 30 June 2016 he was deputy director of the “Emile Racovitza” Institute of Speleology of the Romanian Academy and since 1 July 2016 he has been the director of the Institute of Biology of the Romanian Academy – Bucharest, Romania.

Since 2017 Dumitru Murariu has been working with a large team of scientists, specialized in invertebrates, to prepare the first edition of the Red Book of Invertebrates from Romania.

Dear Professor Dumitru Murariu, we wish you HAPPY ANNIVERSARY and many new years of prosperity and numerous new scientific projects completed in the future!

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