

Summary report on research accreditation

I. General information

Name of organization	Institute of Zoology of the Academy of Sciences of Moldova
Organization type (<i>to underline</i>)	<u>Research institute</u> Higher education institution Ministerial research institute
Research direction(s) of organization	Study of structural-functional organization, of dynamics and evolution of animal populations and communities, development of ways and methods of protection and rational use of animal world.
Correlation with strategic research direction (s) of activity in the field of science and innovation for 2013-2020	The main field of scientific research of the Institute of Zoology follows the three strategic directions of science and innovation activities, approved by the Parliament of Moldova, decision No. 150 of 06/14/2013: 1) Materials, innovative technologies and products; 2) National heritage and social development; 3) Biotechnology.
Evaluated period	2010-2014
Web of organization	www.zoology.asm.md

II. Research capacity (annual average for evaluated period)

Total number of employees	168.8					
Number of scientific researchers	109.4					
Number of researchers who possess honorific titles, scientific degrees, scientific and scientific-didactical titles	ASM full members 2	ASM corresp. Members 1	Professor 11.4	Associated Professor 37.4	Dr.habil. 15.8	Dr. (PhD) 54.2
Number of researchers involved in international projects	European Commission Programmes 10.6	United Nations Programmes and Funds -		Bilateral Programmes financed from the national budget 7.2	Others -	
Number of young researchers (under 35 years old)	PhD students 11.8			Others 27.8		
Financial resources - revenues (thousand MDL)	Public budget 8734.3			Special means 5028.4		
Categories of special means (thousand MDL)	National 2350.0			International 2678.4		
Distribution of expenditures (thousand MDL)	Salary 7775.3	Procurement of scientific equipment 2178.0		Traveling for scientific purposes (travel, accommodation, per-diems, etc.) 728.0	Other 3081.4	

List of 3 basic research methods, equipments, technologies (per accredited field)	Optical microscopy; Inductively coupled plasma/optical emission spectrometry (ICP/OES); DNA extraction and amplification
List of provided scientific services	-
List of editorial activities	Currently IZ publishes in cooperation with other institutes two journals: "Bulletin of ASM. Life Sciences" (Category B) ISSN 1857-064X http://www.bsl.asm.md/node/6 "The Environment" (Category C). ISSN 1810-9551 http://mediu.gov.md/index.php/component/content/article/115-categorii-in-romana/publicatii/mediul-ambient/360-mediul-ambient

III. Distribution of the number of research projects and themes during the evaluated period

ASM institutional projects	2010 3	2011 4	2012 4	2013 4	2014 4
ASM projects in the frame of State Programmes	2010 1	2011 1	2012 1	2013 -	2014 -
ASM technological transfer projects	2010 -	2011 -	2012 -	2013 -	2014 -
ASM projects for equipment procurement	2010 -	2011 -	2012 1	2013 -	2014 -
ASM projects for young researchers	2010 2	2011 2	2012 1	2013 1	2014 2
ASM projects in the frame of bilateral programmes	2010 2	2011 1	2012 1	2013 1	2014 2
International projects/grants	2010 -	2011 -	2012 -	2013 2	2014 2
List of 3 representative international projects/grants	<ol style="list-style-type: none"> 1. MIS ETC 1150 <i>Resources pilot centre for cross-border preservation of the aquatic biodiversity of Prut River</i>; Joint Operational Programme of UE Romania-Ukraine-Republic of Moldova 2007-2013 2. MIS ETC 1676 <i>Cross-border interdisciplinary cooperation for the prevention of natural disasters and mitigation of environmental pollution in Lower Danube Euroregion</i>; Joint Operational Programme of UE Romania-Ukraine-Republic of Moldova 2007-2013 3. 10.820.08.07 BF <i>Environmental adaptation of insects (Insecta: Collembola, Coleoptera, Lepidoptera) to seasonal environmental changes in floodplain of the rivers of Eastern Europe (on example of Belarus and Moldova).</i> 				
Research contracts	2010 1	2011 1	2012 6	2013 7	2014 5
List of 3 representative research contracts	1. National Agency for Rural Development (ACSA)."Biological and hydrobiological research to assess the damage caused to fishery				

	<p>resources of the Dniester and Prut rivers after extraction of water for irrigation needs by 11 irrigation systems", coordinator Dr. Habil. Usafii Marin (2012) – 448.3 thousand MDL.</p> <p>2. Thermal Power Plants of Moldova "Biological indicators of environmental status of Cuciurgan reservoir, forecast of ecosystem changes under the influence of anthropogenic factors and measures to minimize the damage caused by the operation of TPP." Coordinator Dr. Biol. Oleg Crepis (2013) - 230.0 thousand MDL.</p> <p>3. Ministry of Environment of the Republic of Moldova "Developing the State Cadastre of fauna and the implementation methodology"(2012).</p>
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IV. Scientific publications

Total number of publications abroad	Books -	Chapters in books 4	Journal papers 120
Total number of publications in ISI journals and books	Books -	Chapters in books 3	Journal papers 30
Total number of publications in the country	Books 15	Chapters in books 9	Journal papers 78
Total number of conference abstracts	International abroad 130	International in the country 229	National -
List of 5 representative publications (per accredited field)	<ol style="list-style-type: none"> 1. BUȘMACHIU, G.; DEHARVENG, L.; WEINER W.M. A new species of the genus <i>Lathriopyga</i> CAROLI, 1910 (Collembola: Neanuridae: Neanurinae) from the Republic of Moldova. <i>Zootaxa</i>. 2010, 1639, 53-58. ISSN 1175-5326. jno.2009 (IF: 0.74). 2. MOVILA, A.; TODERAS, I.; DUBININA, H.; USPENSKAIA, I.; ALEKSEEV, A. N. 2012. Zoonotic peculiarities of <i>Borrelia burgdorferi</i> s.l.: vectors competence and vertebrate host specificity. In <i>Lyme disease. Intech publisher</i>, Rijeka, Croatia, p. 27-52. ISBN 978-953-51-0057-7. 3. OBADĂ, T.; VAN DER PLICHT, J.; MARCOVA, A.; PREPELIȚĂ, A. Preliminary results of studies of the Valea Morilor Upper Palaeolithic site (Chișinău, Republic of Moldova) – a new camp of mammoth hunters. Mammoth and their relatives 2: Biotopes, Evolution, and Human Impact, Le Puy-en-Velay, 2010 (Guest Editors Frédéric Lacomat and Dick Mol). <i>Quaternary International</i>, Vol. 276-277, 2012, 227-241 (IF: 1,874). 4. POIRAS, L.; IURCU-STRĂISTRARU, E.; BIVOL, A.; POIRAS, N.; TODERAȘ, I.; BUGACIUC, M.; BOINCEAN, B. Long-term effects of fertility management on the soil nematode community and cyst nematode <i>Heterodera schachtii</i> population in experimental sugar beet fields, In: book “<i>Soil as world heritage</i>” ed. David Dent, Chestnut Tree Farmhouse, Forncett End. Norfolk, United Kingdom, 2013, Chapter 6, p. 37-43. Springer Dordrecht Heidelberg New York London ISBN: 978-94-007-6186-5 (Print) 978-94-007-6187-2 (Online) (Springer). 5. ZUBCOV, E.; UNGUREANU, L.; TODERAȘ, I.; BILETCHI, L.; 		

	BAGRIN, N. Hydrobiocenosis State of the Prut River in the Sculeni – Giurgulesti Sector. <i>Water Science and Technology Library. Management of Water Quality in Moldova</i> (Ed. Duca G.). Springer, 2014, Volume 69, p. 97-156.
List of 5 citations	<ol style="list-style-type: none"> ZUBCOV, E.I.; ZUBCOV, N.N.; ENE, A.; BILETCHI, L. Assessment of copper and zinc levels in fish from freshwater ecosystems of Moldova. <i>Environmental Science and Pollution Research</i>. 2012, 19(6), 2238–2247. ISSN: 0944-1344 (Print), 1614-7499 (Online). doi: 10.1007/s11356-011-0728-5 (IF: 2.651). Citations: 4. http://citations.springer.com/item?doi=10.1007/s11356-011-0728-5 MUNTEANU NATALIA V., DANISMAZOGLU MEHTAP, MOLDOVAN ANNA I., TODERAS ION K., NALCACIOGLU REMZIYE, DEMIRBAG ZIHNI. The first study on bacterial flora of pest beetles <i>Sciaphobus squalidus</i>, <i>Tatianaerhynchites aequatus</i> and <i>Byctiscus betulae</i> in the Republic of Moldova. <i>Biologia</i>. 2014, 69 (5), 681-690. ISSN: 0006-3088 (print version). doi: 10.2478/s11756-014-0351-2. (IF: 0.696). Citation: 1 MOVILA ALEXANDRU, REYE AL, DUBININA HELEN V., TOLSTENKOV OLEG O., TODERAS ION, HÜBSCHEN JM, MULLER CP, ALEKSEEV ANDREY N. Detection of Babesia Sp. EU1 and members of spotted fever group rickettsiae in ticks collected from migratory birds at Curonian Spit, North-Western Russia // <i>Vector Borne Zoonotic Dis.</i> 2011, 11(1) pp.89-91 (IF: 2.7). Citations: 21 SULESCO, T. M.; TODERAS, I. K.; TODERAS, L. G. Annotated checklist of the mosquitoes of the Republic of Moldova. In: <i>Journal of the American Mosquito Control Association</i>. 2013, No. 29, V. 2. p. 98-101. doi: 10.2987/12-6311R.1 (IF: 0,76). Citations: 7

V. Innovation outputs

Total number of patents	Registered in the country 31	Registered abroad -	Implemented 17
Total number of new developed methods and technologies	Registered 6	Non-registered -	Implemented 14
Total number of new scientific products	Registered -	Non-registered -	Implemented -
List of 5 representative innovation outputs (per accredited field)	<ol style="list-style-type: none"> MD Patent 3885 Method of complex treatment of cattle poly parasitosis. CHIHAI Oleg, ERHAN Dumitru, RUSU Stefan, MELNIC Galina, ANGHELTudor, 31.01.2010; MD Patent 4113 Stem of Amphibia Oscillatoria Ag algae - producing lipids. UNGUREANU Laurentia, GHEORGHITA Cristina, 31.12.2011; MD Patent 4196 Stem bacteria <i>Bacillus thuringiensis subsp. Kurstaki</i> – Bioinsecticide to fight weevils. MUNTEANU Natalia, TODERAȘ Ion, MOLDOVAN Anna, MALEVANCIUC Nadejda, TODERAȘ Lidia, RAILEAN Nadejda, 30/09/2013; MD Patent 716 Installation for incubating eggs and storage of fish prelarvae. Crepis Oleg, Usatîi Marin, Toderaș Ion, Șaptefrați Nicholai Usatîi Adrian, Cebotari Andrei, Vatavu Dmitri, 11/30/2014; MD Patent 3794 Method of preparing complementary food for wildlife. 		

VI. Other outputs

Total number of scientific outputs for central and local authorities (draft of law, strategies etc.)	52		
Total number of scientific outputs for educational institutions	Handbooks for higher education 7	Handbooks for pre-university institutions -	Number of researchers – supervisors of license and master theses 15

VII. Major scientific and innovation achievements

Short description of main scientific results and their confirmation (by awards, citations, development of international projects etc.)	<p>It was enhanced the contribution to universal scientific heritage by identifying and certification as a novelty for science of three new species of springtails and two species of <i>pteromalide</i> (<i>Zootaxa</i>. 2010, vol. 1639, <i>PLoS One</i>, 2012, Volume 7 (9)).</p> <p>For the first time, it has been recognized by the international scientific community the novelty of the phenomenon of vectorisation of babesiosis not only by micromamali, but also by migratory birds (Vector Borne and Zoonotic Diserase, vol.11, number 1. 2011).</p> <p>It was implemented with the support of the Ministry of Environment of Moldova the list of species included in the Third Edition of the Red Book of Moldova, the algorithm and the model for the description of the species, the criteria and the rarity status of the species (Implementation Act no. 04- 07 / 1-39 of 24.09.2013).</p> <p>Ecological-ethological strategies and intra- and interspecific relations of species from genera <i>Sylvia</i> and <i>Phylloscopus</i> in reproductive period were highlighted.</p> <p>There were proposed and argued the criteria for identification of places, which are suitable for the bird species protected at European level.</p> <p>The favorable surface for development of the red deer and other biungulates was evaluated; the propitious areas were determined for wolf, whose population is in the initial phase of restoration in Moldova; it was determined that the fox population exceeds 10 times the optimum density, and poaching reduces the Hare density (extraction > 35% of the fall stock).</p> <p>It was conducted the mapping of breeding sites of ichthyofauna and was structured the list of species and that of associations of hydrobionts for testing them as indicators of the ecological status of aquatic ecosystems.</p> <p>In the middle sector of the Dniester River, a significant decrease was established of the hydrobiont production and a reduction of the intensity of self-purification processes. It is created a database of hydrobiontes for assessing the trophic and environmental status of various types of aquatic ecosystems.</p> <p>For the first time, it was evaluated the distribution, biotope preference, the number and seasonal dynamic of mosquitos attack on humans under the conditions of Moldova; it was studied the Speiser internal transcription polymorphism (ITS2) DNA of mosquito of <i>Anopheles maculipennis</i></p>
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	<p>complex, and the study was conducted of regional zoogeographic fauna. It was performed a comparative analysis of the complex of pathogens of species <i>Ixodes ricinus</i>; there were deciphered the particularities of parasite-host interactions of the <i>Borrelia burgdorferi</i> species and of some small laboratory animals <i>in vivo</i>.</p> <p>It was determined the identity of the species of parasitic phytonematods of crop plants (winter wheat, sugar beet, potatoes) and horticultural ones (grape-vines, apple and peach productive orchards) and explored the degree of harmfulness of morpho-physiological and biochemical changes. It was developed the procedure of the intensification of natural trophic base in the ponds by introducing micro fertilizers (cobalt chloride, manganese chloride or potassium permanganate) before stocking ponds with fish larvae or fry or stocking ponds with one year and two years juveniles.</p> <p>There were elaborated five new nutritional supplements, prepared on the basis of energizators enriched with biologically active substances of natural origin, extracted from the biomass of various species of bacteria and algae, as well as from coordinative organic compounds containing rare microelements, which being administered to bee families in times of poor harvest in nature, provides a significant increase in honey production by 20.0 - 38.9%.</p> <p>The cycle of scientific works "Diversity, protection, and recovery of animal world" that includes four volumes of the series "Animal World", the "Atlas Zoo" and the "Book of fisherman" were mentioned with the National Award 2013.</p>				
Number of researchers invited as speakers at international conferences	2010 1	2011 -	2012 1	2013 1	2014 3
Short description of technological transfer and innovation results and their certification by implementation	<p>One of the priorities of the Institute is the technology transfer of performance results achieved by the implementation of scientific results in fishing, beekeeping, agriculture, hunting, environmental protection and others. The most relevant results proposed for implementation are the following:</p> <p>The method of reproducing the grasshopper. Patent no. 236 of 31.03.2011. Contractor: Laboratory of Ichthyology and Aquaculture, Head of Laboratory: Dr. Hab. Marin Usatfi. Place of implementation: SC "Milpeş-Prim" SRL, Nisporeni (Implementation Act no. 8 of October 4, 2010); Individual Enterprise "Marin - Alexandru" Sadic village, Cantemir district (Implementation Act no. 4 of 27 September 2010).</p> <p>Installation for mowing aquatic plants. Patent no. 233 of 31.03.2011. Contractor: Laboratory of Ichthyology and Aquaculture, Head of laboratory Dr. Hab. Marin Usatfi. Place of implementation: SC "Milpeş-Prim" SRL, Nisporeni district (Implementation Act no. 7 of October 4, 2010); Individual Enterprise "Marin - Alexandru" Sadic village, Cantemir district (Implementation Act No. 5 of 27 September 2010).</p> <p>Practical recommendations for improving the state of ichthyofauna in Belevu lake. Contractor: Laboratory of Ichthyology and Aquaculture, Head of Laboratory Dr. Hab. Marin Usatfi. Place of implementation: Scientific reserve "Prutul de Jos-Lower Prut". (Cooperation Agreement of</p>				

7 December 2010. Implementation Act No. 1 of 15 November 2011).

Procedures for preparing and feeding of wildlife (deer, wild boar). Based on MD patents 3584; 3639; 3794. Contractor: Laboratory of Ornithology, and Laboratory of Mammal Ecology.

Place of implementation: Reserve "Codru", "Plaiul Fagului" (Implementation Act No. 01-07 / 1375 of 22.11.2011).

"Recommendations for the conservation and sustainable use of ichthyofauna of Lower Dniester river, and lakes Dubasari and Costesti-Stânca". Contractor: Laboratory of Ichthyology and Aquaculture, Head of laboratory Dr. Hab. Marin Usatfi. Place of implementation: Ministry of Environment, Fisheries Service; Lakes Dubasari and Costesti-Stânca (Act No.1 of 11.26.2012 Implementation).

"Method for prophylaxis and treatment of ectoparasites in hens'. Contractor: Laboratory of Parasitology and Helminthology, Head of Laboratory Ass. Prof. Dr. Stefan Rusu. Patent No. 408, 31.03.2012. Place of implementation: the poultry farming households in Moldova. Sanitary-Veterinary Agency for Safety of Products of Animal Origin. (Act of implementation No. 6 of March 7, 2012).

"Food for Phytofagus fish fry" Patent No. 717 of 08/31/2014. Contractor: Laboratory of Ichthyology and Aquaculture, Head of laboratory Dr. Hab. Marin Usatfi. Place of implementation: Individual Enterprise "Marin Alexandru" Sadic village. (Act of implementation No. 2 of 29/07/2013; Implementation Act No. 1 of 17.07.2014). Individual Enterprise "Ghidrin" Făleşti. (Act of implementation No. 3 of 05/08/2013). Individual Enterprise "Peşlig-Com" -Sarata Noua village. (Implementation Act No.4 of 07.08.2013).

"Method of developing the natural food base in ponds". Patent No.249 of 31.08.2012. Contractor: Laboratory of Hydrobiology and Ecotoxicology. Place of implementation: Individual Enterprise "Ghidrin", Făleşti. (Implementation Act No.1 of 17.10.2013).

"Implementation of the legislative rules concerning the Government certification of breeding apiaries." Contractor: Laboratory of Entomology and Apiculture. Place of implementation: Ministry of Agriculture and Food (Implementation Act No. 5 of November 3, 2014).

"Performance Technology of growth and operation of bee families in small and medium apiaries." Contractor: Laboratory of Entomology and Apiculture. Place of implementation: DOOO „Intercomservis, district Râbnita (Implementation Act No. 2 of 15 August 2014); AO „Territorial Extension Center NGO Ocnita, the National Agency for Rural Development (ACSA) (Implementation Act No. 1 of 14martie 2014).

"A method of treatment of the potato against nematode (*Ditylenchus destructor*)". Contractor: Laboratory of Parasitology and Helminthology, Head of Laboratory – Ass. Prof. Dr. Stefan Rusu. Place of implementation: Limited Liability Company "Largo-Terra" Larga village,

	Briceni district. (Implementation Act No. 5 of December 15, 2014).				
	<p>The scientific results of the Institute were awarded with 28 gold, 14 silver and 5 bronze medals, and multiple diplomas at international exhibitions of inventions.</p> <p>The international Jury of the International Specialized Exhibition "Infoinvent 2013" awarded the Institute of Zoology the WIPO Trophy "Innovative Enterprise 2013", and the young researcher Anna Moldovanu –the WIPO Gold Medal "Best inventor junior".</p>				
Number of defended dr./dr. hab. theses per year	2010 2/2	2011 3/2	2012 2/1	2013 1/0	2014 0/1

VIII. Present/further involvement in the Horizon 2020 (FP7)

FP7 ongoing project:

SMARTBEES / FP7-KBBE.2013.1.3-02 "Sustainable Management of Resilient Bee Populations"

IX. Accredited research field and its evaluation by the National Council for Accreditation and Attestation of the Republic of Moldova (very good/good/satisfactory)

Systematics, evolution and sustainable use of diversity of the animal world, monitoring of aquatic and terrestrial ecosystems - very good

X. Category (A/B/C) attributed by the National Council for Accreditation and Attestation of the Republic of Moldova to the organization *Category A*

XI. Institutional development actions planned for the next 5 years (maximum ½ page):

- Two laboratories accredited according to ISO standards;
- Strengthening capacities of participating to international projects, including Horizon 2020;
- Continuing education and training of highly qualified personnel;
- Expanding the technology transfer, and more efficient implementation of scientific achievements and innovations that ensure the sustainable economic development, and obtaining competitive products and services;
- Expanding the relations of scientific-technical cooperation with similar international institutions and scientific organizations;
- Developing the scientific bases of recovery and conservation of biodiversity, useful wildlife reproduction and regulation of the harmful one;
- Developing of advanced technologies in aquaculture, beekeeping, and hunting; developing of biological methods of control of pest and animal species that are vectors of some emerging infections; developing of technological methods of control and prevention of animal parasitosis.