

# 150 YEARS OF THE DIVISION OF ZOOLOGY AT THE FACULTY OF SCIENCE, UNIVERSITY OF ZAGREB: A REVIEW OF THE LAST DECADE

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The Division of Zoology at the Department of Biology, Faculty of Science, University of Zagreb, celebrates 150 years of continuous contribution to zoological research, education and public engagement. As one of the oldest and most respected institutions in Croatia dedicated to zoological sciences, the Division has played a central role in shaping the development of zoology and related disciplines at both national and regional levels. This review article marks this significant milestone by providing an overview of the Division's activities and achievements over the past decade (2014 – 2024). Key focus areas include scientific research, with an emphasis on biodiversity, ecological interactions, ecosystem functioning, biomonitoring and evolutionary biology; project involvement and educational contributions, reflecting a strong commitment to curriculum modernization, field-based learning and integration of contemporary pedagogical approaches. The Division continues to play a pivotal role in the Faculty's academic structure, accounting for approximately 40% of teaching at the Department of Biology and actively participating in institutional leadership, professional associations and public science communication. In addition to its extensive publication record and project output, the Division maintains valuable zoological collections, necessary to support the professional development of students, young scientists and educators. The 150th anniversary represents not only a celebration of the Division's legacy but also a reaffirmation of its ongoing dedication to excellence in science, teaching and community engagement.

**Keywords:** zoological research; biodiversity; science education; teaching; scientific projects; academic legacy; institutional history; Croatia

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Zoologijski zavod na Biološkom odsjeku Prirodoslovno-matematičkog fakulteta Sveučilišta u Zagrebu obilježava 150 godina kontinuiranog doprinosa razvoju nacionalnih zooloških istraživanja te strukovnom obrazovanju i strukovnom javnom djelovanju. Kao jedna od najstarijih i najuglednijih institucija u Hrvatskoj posvećenih zoologiji, Zavod je imao ključnu ulogu u oblikovanju razvoja zoologi-

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je i srodnih znanstvenih disciplina na nacionalnoj i regionalnoj razini. Ovaj pregledni rad zaokružuje tu značajnu obljetnicu dajući pregled aktivnosti i postignuća Zavoda u posljednjem desetljeću (2014. – 2024.). Ključna područja obuhvaćaju znanstvena istraživanja, s naglaskom na bioraznolikost, ekološke interakcije, funkcioniranje ekosustava, biomonitoring i evolucijsku biologiju; sudjelovanje u stručnim projektima te doprinos obrazovanju, koji odražavaju snažnu predanost modernizaciji kurikulumu, terenskoj nastavi i primjeni suvremenih pedagoških pristupa. Zavod i dalje ima značajnu ulogu u akademskoj strukturi Fakulteta, ostvarujući oko 40 % nastavne aktivnosti Biološkog odsjeka te aktivno sudjeluje u radu institucijskih tijela, stručnih udruga i popularizaciji znanosti. Uz bogatu izdavačku djelatnost i projektne aktivnosti, Zavod čuva i vrijedne zoološke zbirke koje podržavaju profesionalni razvoj studenata, budućih mladih znanstvenika i nastavnika. Obilježavanje 150. obljetnice nije samo proslava bogate baštine Zavoda, već i potvrda njegove trajne predanosti izvrsnosti u znanosti, nastavi i javnom djelovanju.

**Ključne riječi:** zoološka istraživanja; bioraznolikost; obrazovanje u znanosti; nastava; znanstveni projekti; akademska baština; institucionalna povijest; Hrvatska

## INTRODUCTION

The Division of Zoology at the Department of Biology of the Faculty of Science, University of Zagreb is one of the oldest and most renowned institutions in the field of zoological sciences, both within the University and in the Republic of Croatia, with a 150-year tradition of promoting zoological research and education. From its beginnings in the late 19<sup>th</sup> century (1874) until today, the Division of Zoology has played a significant role in the development of zoology and related sciences on a national and regional level. Throughout its long history, it has influenced generations of scientists, educators and professionals, and has made a significant contribution to the advancement of scientific disciplines, biodiversity conservation and public education.

A comprehensive historical overview of the Division's development – including its organizational growth, scientific breakthroughs and contributions to the community – is documented in detail in publications prepared for major anniversaries since the Division's founding (MATONIČKIN, 1974; LUCIĆ *et al.*, 2014), as well as in the more recent review by ŠPOLJAR *et al.* (2024). Here we focus on the activities of the Division of Zoology over the last ten years, emphasizing the current role of the Division in scientific research, participation in national and international projects, curriculum development and its contribution to strengthening the Faculty of Science and its broader academic positioning. Celebrating the 150th anniversary of the Division of Zoology is not only an opportunity to reflect on its rich history, but also a chance to look to the challenges and opportunities of the future. This milestone is both a moment of pride and a foundation for continued development as the Division continues to build on its recognition and commitment to excellence in science and teaching.

## BRIEF HISTORICAL OVERVIEW

Although major advances in zoological science were taking place across Europe, the conditions necessary for such research in our country, then within the Austro-Hungarian Empire, did not emerge until the second half of the nineteenth century. By that time, the country's socio-economic status finally improved and zoological education was introduced at the university level. By that time, the country's socio-economic status finally improved and zoological education was introduced at the university level. As the scientist and the first professor of zoology, Spiridion Brusina remarked: „At that time, the teaching of zoology as an independent and autonomous science was still unthinkable“ (LUCIĆ *et al.*, 2014).

The initial major advances in the development of natural sciences in Croatia coincided with the founding of the Yugoslav Academy of Sciences and Arts in 1866 and the reorganization of the University in 1874. These milestones created the necessary conditions for scientific research, including the establishment of the Faculty of Philosophy (in Croatian: *Mudroslovni fakultet*), where mathematics and natural science departments were set up. This was the first formal basis for higher education in the natural sciences in Croatia.

The Division of Zoology in Zagreb, then known as the Chair of Zoology (in Croatian: *Katedra za zoologiju*), was officially established in 1874 and formed the nucleus for the foundation of today's Department of Biology. One year later, in 1875, the Zoological-Zootomic Division (in Croatian: *Zoologičko-zootomički zavod*) was established as a scientific center for further zoological research. Teaching began in the winter of the academic year 1876/77. The first professor of zoology, as well as the first curator of the zoological collections and head of the Zoological Department of the National Museum in Zagreb, was academician Spiridion Brusina. At the same time, Brusina played a crucial role in the creation of both this Division and the Zoological Department of the National Museum (now the Zoological Department of the Croatian Natural History Museum, in Croatian: *Hrvatski prirodoslovni muzej*). This also established an institutional link between the Museum and the Faculty, which was formalized in 1876 by the National Museum Act. According to this law, university professors of the respective disciplines also served as directors and curators of the respective museum, whose collections were made available to the faculty departments. Brusina headed the Division for 26 years, until 1901; during this period, he significantly expanded the museum collections, strengthened scientific activity, improved teaching at the Faculty, and played a key role in expanding the Division's teaching staff.

The founding of the Faculty of Science (in Croatian: *Prirodoslovno-matematički fakultet*, PMF) at the University of Zagreb (in Croatian: *Sveučilište u Zagrebu*, SuZ) in 1946 was a decisive turning point. It led to the separation of the natural science chairs and divisions from the Faculty of Philosophy, placing them in the newly founded faculty. In 1945, the Zoological-Zootomic Division was renamed the Zoological Institute (in Croatian: *Zoološki institut*), a title it held until 1960. Despite the renaming, the Zoological Institute remained part of the Croatian National Zoological Museum. In 1950, the Institute, headed by Professor Nikola Fink became an independent institution responsible for scientific and educational work related to zoological courses. By 1968, the Institute had completely relocated to the former building of the High technical school (which is now located at the Faculty of Mechanical Engineering and Naval Architecture) at Rooseveltov trg 6, Zagreb, and has recently been known as the Division of Zoology. It continues to make a significant contribution to the activities of the Department of Biology within the Faculty of Science. After 1945, courses were reorganized and divided through the academic years so that students could acquire a more complete and systematic knowledge of zoology.

To this day, the Division of Zoology in Zagreb is recognized as a central hub for the development of zoology in Croatia. It continues to make an important contribution to both scientific research and education, with a special role played by the Collection of the Division of Zoology (Fig. 1). The Collection comprises three separate parts. The first includes historical (dating back to the 19<sup>th</sup> century) and contemporary animal specimens: 2,182 specimens of invertebrates and vertebrates in the form of individual body parts, skeletons, and life cycles of certain species. The second part contains over



**Fig. 1.** Exhibits from the Collection of the Division of Zoology in Zagreb: **a)** *Euspongia adriatica* (Schmidt, 1862); **b)** Foraminifera sand collected during the Challenger-Expedition; **c)** snail shell exhibits; **d)** nine-banded armadillo, *Dasyurus novemcinctus* Linnaeus, 1758. (source: ŠPOLJAR *et al.*, 2024)

21,000 study specimens of entomofauna collected during former Division projects and for graduation and doctoral theses. The mammal collection of Prof. Beatrica Đulić forms the third part of the Collection. Professor Đulić (1924–2000) was a long-time professor of Vertebrate Zoology and a world-renowned authority on bats. Her collection comprises 13,676 specimens, including 7,896 skulls of small mammals from Croatia, primarily bats. All collections are of great educational value, as they are used for zoological lessons and exercises, and the last two also play an important role in scientific research.

According to the most recent data, at the time of the 150th anniversary of the Division, a total of 64 persons were employed. Of these, 28 were engaged in scientific research and teaching, including one senior lecturer. Additionally, 21 held professional and associated positions (primarily related to projects), a number that has been increasing in recent years. The support staff included three expert advisors, one curator of the zoological collection, one administrator, eight technicians, and three caretakers (Tab. 1).

The following sections of the article provide an overview of activities from 2014 to 2024: (i) Scientific activity, including research initiatives, publications, international collaborations, and contributions to the biological sciences; (ii) Projects, focusing on national and international science, development, and conservation projects in which members of the Division have played a leading role or made a significant contribution; (iii) Teaching activity, offering insight into undergraduate, graduate, and post-graduate programs, teaching innovations, and ongoing curriculum development; (iv)

**Tab. 1.** Employees in the Division of Zoology and their positions between 2014 - 2024.

Position	Name	Surname
Full professor with tenure	Goran	Klobučar
	Mladen	Kučinić
	Ivana	Maguire
	Zlatko	Mihaljević
	Maria	Špoljar
	Ivančica	Ternjej
	Davor	Zanella
	Full professor	Tatjana
Damjan		Franjević
Sanja		Gottstein
Goran		Kovačević
Petar		Kružić
Jasna		Lajtner
Renata		Matoničkin Kepčija
Marko		Miliša
Perica		Mustafić
Ines		Radanović
Associate professor		Andreja
	Ivana	Buj
	Tvrtko	Dražina
	Romana	Gračan
	Sandra	Hudina
	Marija	Ivković
	Zoran	Marčić
	Ana	Previšić
	Mirela	Sertić Perić
Anamaria	Štambuk	
Assistant professor	Josip	Skejo
Senior lecturer	Damir	Sirovina, PhD
Senior teaching assistant	Fran	Rebrina, PhD
	Vesna	Gulin Beljak, PhD
Teaching assistant	Dora	Hlebec, PhD
	Matej	Vucić, PhD
Expert advisor	Andreja	Lucić, PhD
	Maja	Novosel, PhD
	Lucija	Šerić Jelaska, PhD
Advisor - curator of the zoological collection	Ana	Ješovnik, PhD
Senior teaching assistant on project	Zuzana	Redžović, PhD
Teaching assistant on project	Pavel	Ankon
	Valentina	Dorić, PhD
	Iva	Kokotović
	Sara	Pleše
	Lea	Ružanović
	Nikola	Renić
Expert associate on project	Sven	Horvatić, PhD
	Lucija	Novoselec

Position	Name	Surname
	Lucija	Onorato
	Ivana	Pozojević, PhD
	Mario	Rumišek
	Goran	Tvrđinić
	Natalija	Vučković, PhD
	Jana	Zekirovski
Administrator	Vlatka	Pehneć
Senior technician	Silvestar	Beljan, PhD
	Jasna	Heinrich
	Ivka	Štefanić
	Siniša	Vajdić
Technician	Jasenka	Brunović-Malenica
	Mirjana	Dimnjaković
	Zdenka	Ivančić
	Nada	Vincek
Caretaker	Branka	Kasal
	Mara	Lukić
	Lorena	Mileusnić

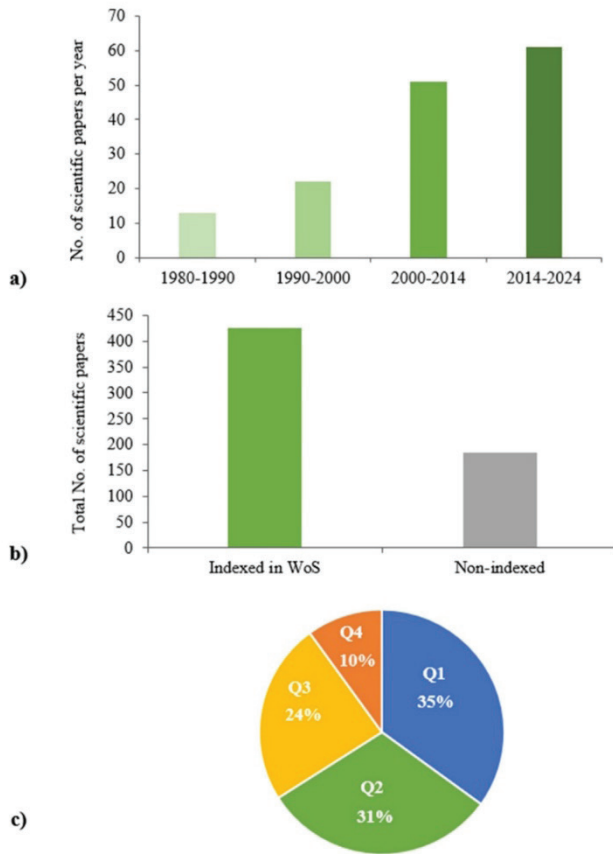
Institutional role of the Division, analyzing the Division's contribution to Faculty organization, professional associations, public engagement, and links with the wider scientific and social community.

## SCIENTIFIC ACTIVITY 2014 – 2024

### Research and Publications

Over the past decade, research at the Division of Zoology has primarily focused on various invertebrate groups, while among vertebrates, fish (ichthyofauna) have been the main research subject. Key research topics include biodiversity across freshwater, marine, terrestrial, and subterranean ecosystems in Croatia and neighbouring regions; ecological studies of abiotic and anthropogenic impacts on organisms and habitats; biotic interactions such as predation and competition; food-web dynamics; and ecosystem functioning and modelling. Other important research areas include biomonitoring and water quality assessment, particularly in the context of the EU Water Framework Directive; ecotoxicological studies on different model organisms; taxonomy based on both morphological and molecular methods; phylogeny and genome evolution; population biology; histological and histochemical research; educational biology, with a focus on developing and applying modern pedagogical approaches to align biology teaching with current trends in STEM education.

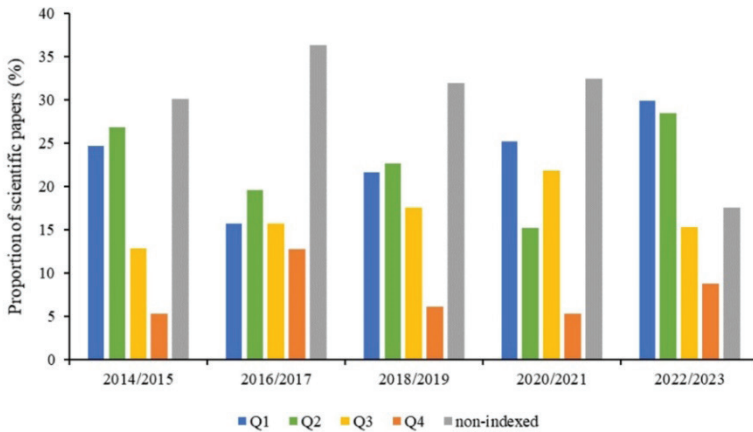
In the last ten years, a total of 611 scientific papers have been published by the staff of the Division of Zoology, which corresponds to around 60 scientific papers per year. A steadily increasing trend in scientific production has been observed over the last four decades (Fig. 2a). This increase in scientific production is partly related to an increase in staff employed in various scientific and professional projects (see section Projects 2014 – 2024 below).



**Fig. 2.** **a)** Average number of scientific papers per year over the last four decades of research activity in the Division of Zoology; **b)** Total number of scientific articles published in journals indexed in the Web of Science (WoS) database compared to non-indexed journals over the last decade (2014-2024) of research activity in the Division of Zoology; **c)** Proportion of scientific articles published in WoS-indexed journals in the same period, divided by their academic ranking (Q1 – top 25%; Q2 – 25-50%; Q3 – 50-75%; Q4 – bottom 25%).

Between 2014 and 2024, the number of articles published in journals indexed in the Web of Science (WoS) database was more than twice as high as the number of articles published in non-indexed journals (Fig. 2b). More than 65 % of the articles were published in high-ranking journals, which are among the top 25 % (first quartile, Q1) or the 25-50 % (second quartile, Q2) of journals in their respective research field (Fig. 2c). These results highlight the high scientific standards and strong international recognition of the Division’s research.

The positive trend in the publication of papers in leading scientific journals is reflected in the distribution by quartile over the years (Fig. 3). While the proportion of scientific papers published in non-indexed journals has remained largely constant over this period, the proportion of papers published in the highest-ranking journals (Q1) has risen continuously from 2016 to 2024 (Fig. 3).



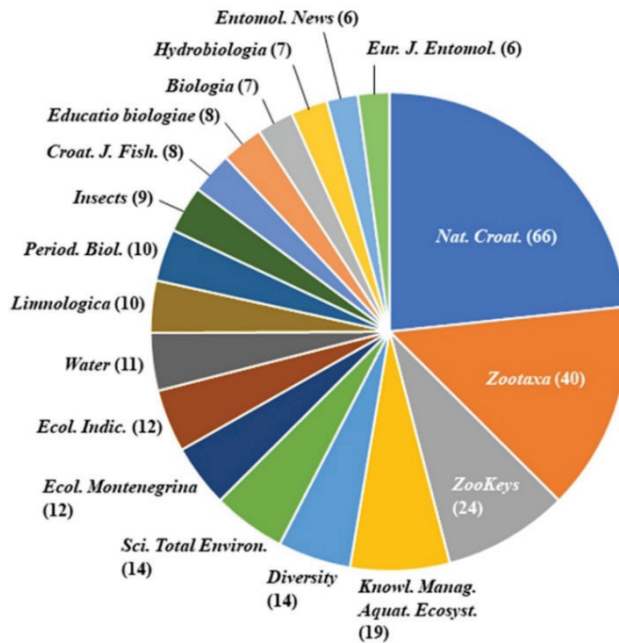
**Fig. 3.** Proportion of scientific papers published over two-year periods in journals indexed in the Web of Science (WoS) database, broken down by their academic ranking (Q1 – top 25%; Q2 – 25-50%; Q3 – 50-75%; Q4 – bottom 25%) compared to non-indexed journals, within the last decade (2014 – 2024) of research activity at the Division of Zoology.

The highest number of scientific papers published by the Division of Zoology staff within the past decade appeared in the journal *Natura Croatica* (Fig. 4), a locally-based journal with a broad natural science scope, reflecting a decades-long affiliation with the Croatian Natural History Museum (Lucić *et al.*, 2014). This is followed by papers published in the renowned taxonomic journals *Zootaxa* and *ZooKeys*. The next most represented category includes journals focused on aquatic ecosystem research and management, owing to the Division's long-standing tradition of limnological research dating back to the 1950s (Lucić *et al.*, 2014). These are followed by journals specializing in biodiversity conservation as well as basic and applied ecology (Fig. 4).

This distribution of publication venues mirrors the Division's mission and vision: to advance taxonomic, faunistic, and ecological knowledge through integrative, field-based and laboratory research. With almost 20 % of the known species in the Croatian fauna incorporated into its research activities, the Division of Zoology has firmly established itself as the leading institution in Croatia for comprehensive zoological research across a broad faunistic spectrum. Further reflecting its scientific impact, the Division has contributed significantly to global biodiversity knowledge by formally describing approximately 130 new species from around the world over the past decade.

Between 2014 and 2024, the staff of the Division of Zoology published a total of 45 scientific books and book chapters, typically contributing between 4 to 8 such works annually. Notably, there was a marked increase in this type of scholarly output in 2022 and 2023, with a peak of 19 contributions published across those two years alone – highlighting a growing recognition of the Division's expertise in specialized fields.

In addition to publishing, Division researchers actively disseminated their work through conferences, averaging 14 international and 7 national congress participations per researcher over the past decade. This high level of engagement not only underscores the international visibility and relevance of their research but also reflects a strong commitment to scientific exchange, collaboration and leadership within both global and regional zoological communities.



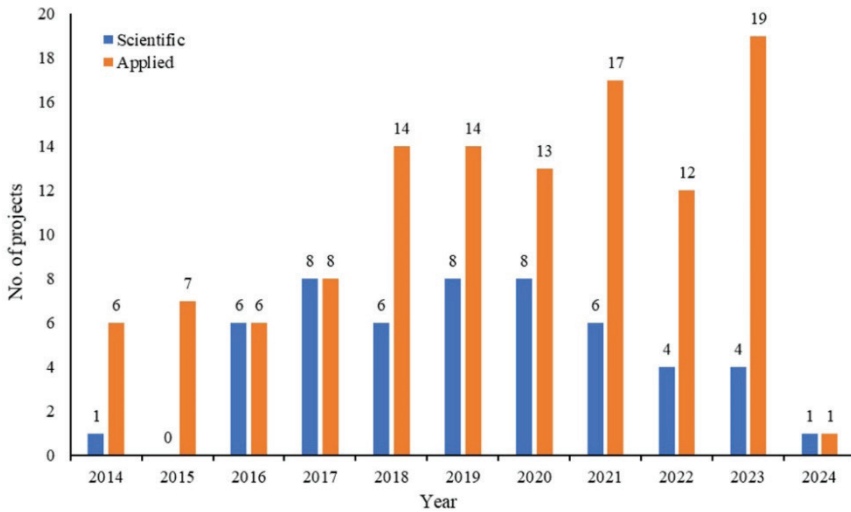
**Fig. 4.** Distribution of scientific papers by journal, representing the contribution of individual journals to the overall research output of the Division of Zoology during the 2014 – 2024 period. The numbers in brackets designate the total number of papers published in a given journal within the 10-year period.

These achievements – spanning academic publishing, public scientific communication and participation in global research networks – further solidify the Division’s legacy as a pillar of zoological science in Croatia and a respected contributor to international biodiversity research.

### Projects 2014 – 2024

Numerous scientific and applied projects have been successfully completed over the last 10 years, which is testament to the extensive project activities of the staff at the Division of Zoology. The results show that 117 applied and 52 scientific projects were carried out in the period 2014 – 2024 (Fig. 5). These diverse projects have enabled and contributed to: the publication of numerous original scientific publications, technical reports and applied studies, the completion of dissertations and master’s theses and, above all, the employment of numerous young assistants and other scientists in these projects. Finally, these projects have made it possible to equip a number of specialized laboratories at the Division of Zoology with state-of-the-art technology and equipment.

The majority of scientific research projects focused on topics such as freshwater ecosystems (lakes and rivers), invertebrates, karst environments, and the impacts of climate change, depending on the specific theme or primary research interest. In contrast, most applied projects were oriented toward fish, artificial lakes, and freshwater ecosystems, with additional emphasis on crayfish, mollusks, and cnidarians, reflecting the Division’s expertise in both aquatic ecology and species conservation.



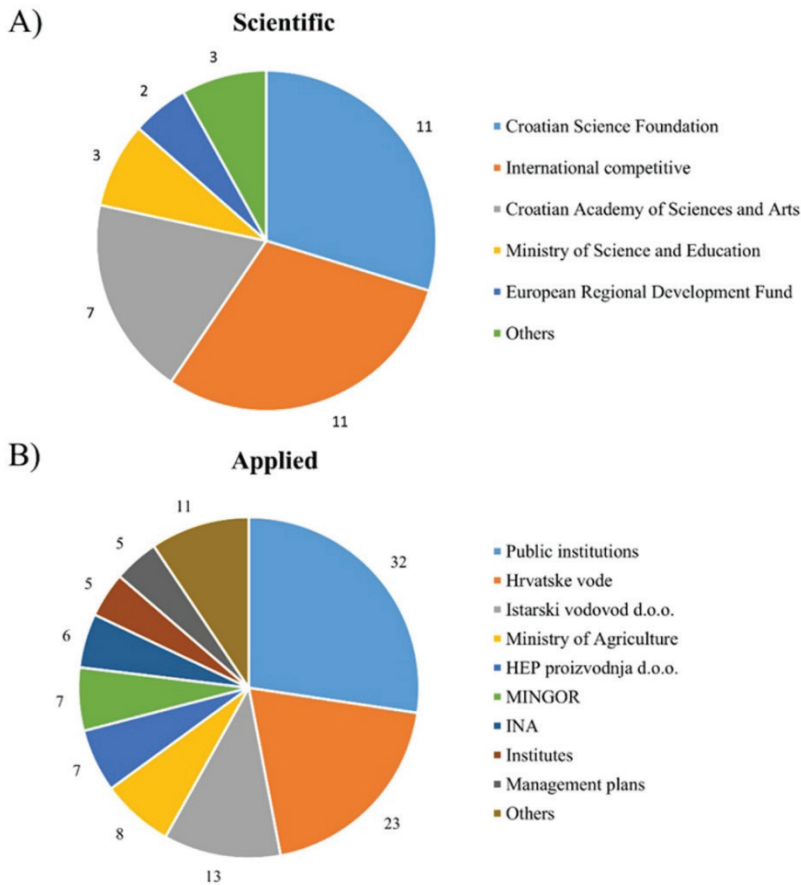
**Fig. 5.** Number of scientific (blue) and applied (orange) projects completed in the Division of Zoology in the last decade (2014 – 2024). As the data was compiled at the beginning of 2024, only two projects are included for this year.

The most productive years for research activity within the Division of Zoology in the last ten years were 2021 and 2023, with 23 projects started or ongoing in each year (Fig. 5). On average, the Division's staff carried out three projects per year, reflecting a constant level of research commitment. The years 2017, 2019 and 2020 are also particularly noteworthy, in which eight research initiatives were completed each year (Fig. 5).

These research efforts were made possible by the support of several important funding bodies, which played a crucial role in the successful implementation of the scientific projects. Key funders included the Ministry of Science and Education, the Croatian Science Foundation (HRZZ), the Unity through Knowledge Fund (UKF), the European Structural and Investment Funds (ESIF), Erasmus, Horizon and the Foundation of the Croatian Academy of Sciences and Arts (HAZU) (Fig. 6).

In the last ten years, researchers in the Division of Zoology have carried out a total of 117 professional projects, demonstrating a high demand for their expertise in the wider professional and applied science community. The years 2021 and 2023 were particularly productive, with 17 and 19 completed applied projects respectively (Fig. 5), and represented the peak of professional project activity during this period (Fig. 6).

Among the various disciplines, ichthyology stands out with 55 completed projects, making it the most represented discipline in terms of professional involvement in applied projects. The main source of funding for these projects was collaboration with domestic companies, public institutions and organizations, with a significant share coming from public nature conservation institutions managing Croatia's protected areas, such as Plitvice Lakes National Park, Krka National Park and Papuk Nature Park. Other important partners included public and private sector entities, such as Croatian Waters, the JJ Strossmayer Water Institute, HEP Proizvodnja d.o.o., Istarski vodovod d.o.o., the Ministry of Agriculture and the Ministry of Economy and Sustainable Development (MINGOR). These collaborations were essential for both the financing and



**Fig. 6.** Number of scientific and applied projects carried out at the Division of Zoology between 2014 and 2024, including the main funding sources. The legend depicts the most prevalent funding sources for scientific (A) and applied (B) projects and absolute numbers of project carried out thanks to these funding sources.

successful implementation of the projects. Specifically, 32 projects (27 %) were funded through partnerships with public institutions, while Croatian Waters alone supported 23 projects (19 %), highlighting the strategic importance of institutional cooperation in applied zoological research (Fig. 6).

### Teaching activity 2014 – 2024

Over the past ten years, members of the Division of Zoology have made a substantial contribution to academic lectures at the Department of Biology, Faculty of Science, University of Zagreb. In teaching, the members of the Division contribute about 40 % of the total teaching hours at the Department of Biology, which includes undergraduate programs in Biology, Molecular Biology and Environmental Sciences, and graduate programs in Ecology and Nature Conservation, Experimental Biology, Molecular Biology and Environmental Sciences, as well as integrated teacher education in Biology and Chemistry Education program, and the PhD program in Biology.



**Fig. 7.** Field research conducted by the Division of Zoology staff: **a)** sampling terrestrial invertebrates and protozoans at the Trstenik mire, participants: Vesna Gulin Beljak, Fran Rebrina and Andreja Brigić; **b)** zooplankton sampling in the Sutla River branch, participants: Maria Špoljar and Tvrtko Dražina; **c)** benthic invertebrate sampling in the Suvova River, participants: Valentina Dorić and Jasna Heinrich; **d)** preparations for a dive in Kornati National Park, participants: Petar Kružić and Pavel Ankon. (source: ŠPOLJAR *et al.*, 2024)



**Fig. 8.** Fieldwork for students of the Department of Biology: **a)** at the source of the Cetina River; **b)** in Ježević village in Splitsko-Dalmatinska County; **c)** in Rovinj (Istria Peninsula); **d)** at Lake Vrana near Biograd. (source: ŠPOLJAR *et al.*, 2024)

Between 2014 and 2024, the Division's curricula were significantly modernized. Numerous elective courses were dropped and 23 new electives were introduced to better reflect current scientific advances, technological developments and labor market demands. A number of courses are also offered in English to cater for the increasing number of international students attracted to the Division's programs. Teaching is also enriched by numerous external collaborators, including visiting professors and experts. These partnerships ensure continuity of teaching while diversifying educational content with specialized knowledge.

Fieldwork remains a cornerstone of the Division's teaching strategy (Fig. 7), integrated into the core curricula in the second and third years of undergraduate studies and the first year of graduate studies. For example, the courses *Invertebrates*, *Vertebrates*, *Zoology*, *Animal Ecology*, and *Freshwater Ecology* are supported by field activities led by Division staff. Fieldwork is carried out in Rovinj, Zalesina (Delnice), Zlarin, Ježević (Vrlika) and the Papuk Nature Park, among other locations. These sites, which are located near protected or anthropogenically impacted areas, are supported by facilities such as the Marine Research Centre of the Ruđer Bošković Institute and the Vrlika Ecological Station in Ježević (Fig. 8).

The Division's outstanding achievements in the organization and implementation of field-based courses are internationally recognized. The Vrlika station has hosted students and research teams from institutions such as Queen Mary University of London (since 2013) and Bournemouth University (UK). Division staff have also conducted field studies abroad, notably at Toraighyrov University (Kazakhstan) and the University of Primorska (Slovenia).

Lecturers from the Division of Zoology contribute to academic programs at other faculties at the University of Zagreb, including the Faculties of Agriculture, Economics, Chemical Engineering and Technology, Humanities and Social Sciences and Veterinary Medicine, as well as at external institutions such as the University of Rijeka, the University of Juraj Dobrila in Pula and the University of Zadar. Collaboration also extends to neighboring countries, including Slovenia (University of Primorska, University of Nova Gorica) and Bosnia and Herzegovina (University of Mostar). In cooperation with the Faculty of Humanities and Social Sciences, the Division of Zoology has launched a pedagogical-psychological training program for prospective teachers in 2021, which is run exclusively by members of the Division's Chair of Educational Biology.

In 2024, new undergraduate and graduate programs in Biology and Chemistry Education were approved to start in the 2025/2026 academic year. This provided the opportunity to comprehensively reform many courses taught by teachers from the Division of Zoology, in collaboration with colleagues from the Division's Chair of Educational Biology. The revised curriculum is designed to better prepare future teachers for the challenges posed by the national curricula in Biology and Science classes. At the same time, the Division is developing a new graduate program in Ecology. Compared to the current Ecology and Nature Protection program, this revised curriculum – which is structured around terrestrial, freshwater and marine biology – will be better aligned with current scientific directions and the needs of the labor market in Croatia and the European Union.

The Division is actively involved in academic mobility and has participated in 27 Erasmus+ exchange programs in over 13 countries, including Australia, the UK, It-

aly, Sweden and Israel. Division staff taught at a number of institutions including Macquarie University (Sydney), James Cook University (Cairns), Ca' Foscari University (Venice), AMU (Poznan), Jagiellonian University (Kraków), Lomonosov Moscow State University and the Technical University of Denmark. During the same period, the Division hosted more than 20 Erasmus+ participants from 13 countries, including academic partners from Poland, France, Turkey, Germany and Uzbekistan, thus strengthening international cooperation through joint teaching and research.

In addition to teaching, the Division's staff have made an important contribution to academic publishing by writing university and high school textbooks, practical field manuals, and online educational resources for students and teachers. Mentoring is another important aspect of the Division's academic mission. Between 2014 and 2024, staff members supervised or co-supervised 313 undergraduate theses, 424 master's theses and 41 doctoral dissertations mentored at Croatian and international institutions, while 17 students were honored with the Rector's Award.

### **Institutional role of the Division 2014 – 2024**

The members of the Division of Zoology have been actively involved in the work from the division and department level to the faculty level, and are also involved in the work of committees at the level of the University of Zagreb, state bodies and international institutions. These are often time-consuming and responsible commitments that exceed the planned share of working time and sometimes even the available working time. Throughout its history, the Division has had three academics (Spiridion Brusina, Krunoslav Babić and Milan Meštrov) and three deans (Nikola Fink, Milan Meštrov and Ivan Habdija), and the line is continued by the newly elected Dean Ivančica Ternjej. In the past decade heads of the Division of Zoology were: Ivančica Ternjej (2011 – 2015), Zlatko Mihaljević (2015 – 2020), Davor Zanella (2020 – 2022), and Maria Špoljar (2022 – 2025) (Fig. 9).

The members of the Division of Zoology who were heads of the Department of Biology are Goran Klobučar and Ivančica Ternjej. Six other members of the Division have participated in the work of the Faculty Council of the Faculty of Science over the past ten years. At the level of the Department of Biology, eleven members of the Division of Zoology have performed the duties of assistant heads, while five members have also been representatives of the assistants in the Department Collegium, and five in the Faculty Council. Ivančica Ternjej (Vice Dean for Investment and Development at the Faculty of Science), together with Renata Matoničkin Kepčija and Anamaria Štambuk, coordinates projects of implementation measures for the comprehensive reconstruction of infrastructure and equipment damaged by the earthquake at the Rooseveltov trg 6, main building of Department of Biology, as well as Division of Zoology.

Four members of the Division of Zoology participated as members in the work of the Council for Natural Sciences at the University of Zagreb. At the faculty level, members of the Division participate in the work of several committees: for quality management in teaching, the Ethics Committee, in the development of strategic documents, for reaccreditation and self-analysis, one member of the Division was coordinator for students with disabilities. Members of the Division were involved in the preparation of the national biology final examination for secondary schools. More than ten members of the Division participated in departmental admissions committees, six participated in the Council on Doctoral Studies, while nine members served on the New



**Ivančica Ternjej** (2011. - 2015.)



**Zlatko Mihaljević** (2015. - 2020.)



**Davor Zanella** (2020. - 2022.)



**Maria Špoljar** (2022. - 2025.)

**Fig. 9.** Heads of the Division of Zoology in the period 2014 – 2024. (source: ŠPOLJAR *et al.*, 2024)

Degrees Committee. Ten members of the Division have participated in the work of the Master's Thesis Committee, two in the Rector's Prize Committee, three in the Srećko Jelenić Prize Committee, while another nine members serve in various other departmental committees. Five members hold the position of timetable coordinator for the Department of Biology. Ten members of the Division were study program coordinators and six members were student advisors.

The members of the Division of Zoology have built up a student zoological collection with specimens on which the students work on the material of the individual courses and take exams, take care of the procurement of animal material for practical lessons and look after the library of the Division of Zoology. Outside their own institution, members of the Division are active in various commissions and advisory bodies at the level of the individual ministries (8 members), the Croatian Science Foundation (2), the Croatian Academy of Sciences and Arts (3) and in government councils (1).

The professional associations in which members of the Division of Zoology are involved reflect the diversity of scientific and professional interests of the Division's staff (Fig. 10). Some associations in particular were founded by members of the Division. The four associations with the most members are: Croatian Ecological Society, Croatian Association of Freshwater Ecologists, Croatian Biological Society and Croa-

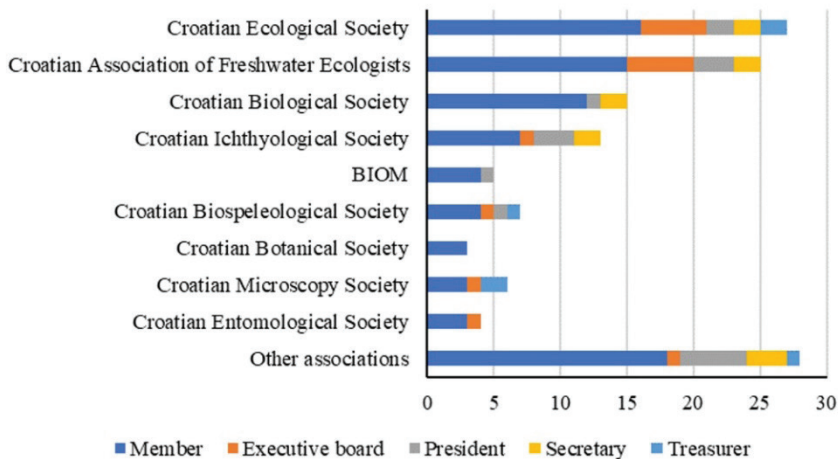
tian Ichthyological Society. Many members of the Division are active in the governing bodies of the associations, from board members to presidents (Fig. 10). In addition to domestic associations, members of the Division of Zoology are involved in the work of 23 international associations, some of which are related to the European region and others are active on a global level. Eight members of the Division are active in higher management levels of these associations. International associations in which several members of the Division are involved are the International Association for Danube Research (IAD), the European Ichthyological Society (EIS), the Freshwater Biological Association (FBA), the Society of Environmental Toxicology and Chemistry (SETAC) and the National Geographic Society (NGS). Members of the Division are also mentors to individual sections of the Biology Students Association (BIUS).

Numerous members of the Division of Zoology were main organizers of scientific conferences and participated in organizational or scientific committees. The continuous involvement of numerous members of the Division in the organization of the Croatian Biological Congress with international participation, which has been held every three years since 1981 and is organized by the Croatian Biological Society, deserves special mention. The Croatian Association of Freshwater Ecologists has organized four symposia on freshwater biology, and in 2019 the very successful and well-attended 11th international Symposium for European Freshwater Science (SEFS11) was held in Zagreb. In 2022, the successful XVI International Rotifer Symposium was held in Zagreb, with four members of the Division on the organizing committee, including the Chair of the Symposium as the main organizer. The Croatian Symposium on Invasive Species with international participation is organized by the Croatian Ecological Society, and five members of the Division were involved in the organization.

Popularization of the biology profession through participation in events organized by the Faculty of Science and the University of Zagreb and other institutions is becoming increasingly important. Numerous students of the Department of Biology participate in these events by presenting research work and interesting aspects of the profession and study programs. Many members of the Division of Zoology took part in the presentation of the Faculty of Science at the University of Zagreb fair; three as coordinators and 13 as speakers. The Biology Night or the consecutive event "Day and Night" at the Faculty of Science attracts numerous visitors every year. Four members of the Division were involved in leading the event, and most members of the Division took part as participants, organizing workshops and lectures with students.

In cooperation with primary and secondary schools, members of Division of Zoology actively contribute to educational biology courses, particularly in teaching methodology, providing ongoing support to future biology and chemistry teachers. They publish the journal for student research in biology (*Bioznalac*) and the journal for biology education (*Educatio Biologiae* - EdBi). Three members of the Division were involved in the development of the curriculum proposal for the comprehensive curriculum reform in biology. Other members of the Division of Zoology also work with schools through lectures, workshops and support in the development of student projects.

The ongoing commitment of members of the Division of Zoology takes place in a number of biology competitions and in the GLOBE competition at national and international level for primary and secondary school students. The national biology competitions, organized by the Education and Teacher Training Agency, require a series of commitments, from the preparation of assignments for the three levels of competi-



**Fig. 10.** Associations in which members of the Division of Zoology have been active, and the positions they have held or currently hold from the time of their employment at the Division to the present. Under “Other associations” are 15 associations in which two or one member of the Division of Zoology is active.

tion, to the careful evaluation of topics and manuscripts of research projects submitted by high school students, to the organization and running of the competition at national level. The participants are often future students of the Department of Biology. Andreja Lucić, expert advisor at the Division of Zoology, has been a member of the expert group of mentors at the Faculty of Science for the International Science Olympiads for 10 years. She has been involved in the selection, preparation and mentoring of the students for International Junior Science Olympiad (IJSO), International Biology Olympiad (IBO) and European Olympiad for Experimental Sciences (EUSO, EOES).

The work of members of the Division of Zoology has been recognized and awarded at several levels. The State Prize for Science – Annual Prize for Young Scientists was awarded to Josip Skejo in 2021. The annual State Prize for the Popularization and Promotion of Science was awarded to Damjan Franjević in 2016. A group of authors (Ivančica Ternjej, Andreja Brigić, Sanja Gottstein, Marija Ivković, Mladen Kerovec, Zlatko Mihaljević and Ana Previšić) won the Croatian Waters Annual Award for the best book for the university textbook “Field and Laboratory Exercises and Statistical Methods in Ecology” in 2020, while Marko Miliša and Marija Ivković received the Croatian Waters Annual Award for the best scientific book in 2023 as editors for the monograph “Plitvice Lakes”, to which many members of the Division of Zoology also contributed. The Faculty Council Award of the Faculty of Science for the outstanding scientific work of a doctoral student or postdoctoral researcher was awarded to Fran Rebrina, Paula Dragičević and Josip Skejo. The Brdo Prize, awarded by the Student Council of the Faculty of Science in the category of best lecturer, went to Tatjana Bakran-Petricioli and Mladen Kučinić, as well as to the assistants of the Division of Zoology: Sandra Hudina, Vesna Gulin Beljak, Lucija Šerić Jelaska, Josip Skejo, Sara Pleše and David Dianežević.

This overview attempts to present some of the activities of the currently employed members of the Division of Zoology, although it is impossible to list everyone involved and their activities by name. The members of the Division will continue their

work in various positions, on committees and associations, as well as in the media and social networks. They will certainly continue to work on shaping national policies and trends related to education, profession and science, managing the parent institution, networking among scientists and experts and popularizing zoology.

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