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THE UPDATED CHECKLIST OF THE COLLECTED SPECIMENS IN THE ICHTHYOLOGICAL MUSEUM IN SZCZECIN

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Więcaszek B., Piasecki W. 2020. The updated checklist of the collected specimens in the Ichthyological Museum in Szczecin. Acta Ichthyol. Piscat. 50 (4): 543–562.

Abstract. The Ichthyological Collection of the Faculty of Food Sciences and Fisheries, West Pomeranian University of Technology in Szczecin was founded by Professor Eugeniusz Grabda at the Faculty of Fisheries, Agricultural University of Olsztyn in 1955. In 1968, the collection, with the entire faculty moved to Szczecin and immediately started to develop in the wake of the global expansion of the Polish fisheries fleet in the late 1960s and early 1970s. The main focus were the finfish, but other items represented also aquatic invertebrates, reptilians, and mammals. In the early 1980s, the exhibition halls of the museum were closed and converted to an experimental aquarium unit. The collection was gradually moved either to glass display cabinets in the hallways of the building or to the storage. After a major renovation of the building, the museum officially re-opened on 13 February 2020. The collection consists of 759 specimens with 329 dry ones, 430 formalin preserved, three specimens of tunicates, and one of cephalochordate. This paper provides the inventory list of the collection in the taxonomic arrangement of Nelson with updates from recent ichthyological publications. The most unique exhibit is a female of *Acipenser oxyrinchus* Mitchill, 1815 caught in 1965 in the Vistula River (next-to-last specimen captured in Poland in the wild), at present the extinct species in the Baltic Sea basin. Important items of our collection are also *Salmo salar* Linnaeus, 1758 breeders caught in the Drawa River in 1970, currently extinct in Poland in the wild since the 1980s.

Keywords: museum, collection, fish, ichthyology

INTRODUCTION

Polish ichthyology is inseparably associated with the development of the Polish fisheries fleet. Before the Second World War, Poland had rater limited access to the sea and the length of its coastline was only 147 km (76 km excluding the Hel Peninsula). After the war, it greatly increased reaching about 500 km (Zaucha 2016). Moreover, the increase meant also the acquisition of new major seaports, such as Szczecin, Świnoujście, Kołobrzeg, to name just a few. The new ports have increased the potential of Poland, not only in terms of sea transportation but also in terms of excellent conditions for the development of marine fisheries. Indeed, the fisheries expanded quickly, initially covering the Baltic and the North seas. The limiting factor was the lack of fishing vessels because only a few small cutters survived the war. Fortunately, the Polish shipyard industry quickly developed and in 1958 it produced 36 fishing vessels representing a total of 54 420 DWT. In 1964 the influential monthly magazine World Fishing declared that Poland was second in building fishing vessels, closely after Japan (Anonymous 1964). Such rapid development of the Polish shipyard industry was possible because of "the International Socialist Division of Labor" imposed on the Soviet Bloc countries by the COMECON (The Council for Mutual Economic Assistance). The COMECON decided that Poland will be responsible for building ships for all socialist states. As a consequence, the Polish deep-sea fisheries rapidly developed. Each of the three major Polish seaports had its deep-sea fishing company (state-own or cooperative). The first was Gdynia, with the oldest tradition, where *Dalmor* company was established in 1946 (Blady 2012). The second one was *Odra* in Świnoujście in 1948** and the third one was *Gryf*, in Szczecin in 1957***. In the late 1940s and the early 1950s, *Dalmor* employed over a hundred fishermen from the Netherlands, England, Sweden, and Belgium who successfully trained Polish fishermen***. In the 1970s *Gryf* owned 70 deep-sea

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** *http://www.travelmat.com.pl/troch--historii-...html*

*** *http://sedina.pl/phpBB3/viewtopic.php?t=9657&start=30*

vessels (with fishing/processing/freezing capabilities) and employed over four thousand people. The potential of *Dalmor* and *Odra* was comparable.

The first area of oceanic expansion in the late 1960s was the North-west Atlantic with famous fishing grounds such as Georges Bank. Subsequently, Polish fishermen appeared on the fishing grounds of West Sahara and in 1966–1967 and in the early 1970s in Namibia (Marek Lewenstein, personal communication). In 1964 the *World Fishing* wrote about Poland's "record landings in 1963" (Anonymous 1964). The 1970s marked the era of unprecedented expansion and development of Polish fisheries fleets also to more and more distant fishing grounds. In 1982 the UN Convention on the Law of the Sea formally adopted the 200 nautical-mile exclusive economic zones. This marked a turning point in the deep-sea fisheries of many countries. At that time Polish fleets fished mainly in Namibia, the Falklands, the Antarctic, and the selected national EEZ based on individual arrangements (Bering Sea, Sea of Okhotsk, etc.).

Rapidly developing Polish fisheries industry desperately needed qualified professionals. As mentioned before, in the beginning, they were trained by foreign fishermen. Quite soon, vocational schools were established in major ports and new Merchant Navy Academies (Wyższa Szkoła Morska, Akademia Morska) in Gdynia and Szczecin trained future captains and navigators also for the fisheries fleet. There was also a need for specialists covering the biological aspects of fisheries, management, and sea-food processing. As early as 1951 a Fisheries Faculty started its activities in the Agricultural University (Wyższa Szkoła Rolnicza) in Olsztyn. In 1968 the Fisheries Faculty moved to the Agricultural University in Szczecin, where it focused on marine fisheries (as the Faculty of Marine Fisheries) (Kołakowski et al. 2001). Its students enjoyed practical training on vessels of the *Gryf* and *Odra*, but also *Dalmor*. In 1980, one of such interns was the second author of this paper, working on board of M/T *Bogar* (B-418 vessel) for almost 6 months on the fishing grounds of Namibia. The interns and also graduates collected numerous fish specimens which ended up at the home faculty. The specimens were collected from fishing grounds all over the world.

The Ichthyological Collection of the Faculty of Food Sciences and Fisheries, West Pomeranian University of Technology in Szczecin was founded by Professor Eugeniusz Grabda at the Faculty of Fisheries, Agricultural University of Olsztyn, north-eastern Poland in 1955. Prof. Grabda was the dean of the faculty within 1956–1958 (Kołakowski et al. 2001). In 1968, the collection, with the entire faculty, moved to Szczecin and immediately started to expand in the wake of the global expansion of the Polish fisheries fleet in the late 1960s and early 1970s. The main focus were the finfish, but other items represented also aquatic invertebrates, reptilians, and mammals. In the early 1980s, the exhibition halls of the museum were closed and converted to the experimental aquarium unit. The collection was gradually moved either to glass display cabinets in the hallways of the building or to the storage. At that time, after losing its lodging, the museum ceased to formally exist. After a major renovation of the building, the museum officially re-opened on 13 February 2020 (Fig. 1).

In the course of its history, a number of people were involved in the maintaining and supervision of the Museum. The first manager of the collection was Dr Leonard Ejsymont, an ichthyologist, fish parasitologist, and finally the Director of the Plankton Sorting Center of the Sea Fisheries Institute (MIR). From 1974 to 1983 the Museum was supervised by Prof. Andrzej Kompowski (Kołakowski et al. 2001), then, informally, by Prof. Stanisław Krzykawski. The difficult task of the relocation of the specimens in the early 1980s was performed by a young ichthyologist Tomasz Heese (now Professor).

From its early beginnings in Olsztyn, the collection required professional maintenance. The person

Fig. 1. HM Rector, Prof. Jacek Wróbel, officially opening the Museum (photo: Wojciech Piasecki)

responsible for the preparation of the exhibition specimens was Mr Edward Kretschmann. He worked in the Museum for many years and was praised for his top-level craftsmanship. Since the mid-1970s he continued his work in the Meeresmuseum in Stralsund, Germany (Streicher 1993). Mr Kretschmann was succeeded by Mr Leon Lachman, Mr Janusz Szepiłło, and recently by Dr Sławomir Keszka.

On 13 February 2020, the museum officially reopened (Więcaszek and Piasecki 2020). This article is intended to present the present status of the museum and a detailed checklist of the fish species in its inventory.

MATERIAL AND METHODS

In the collection checklist presented in this paper, representatives of the phylum Chordata, belonged to three subphyla (Tunicata, Cephalochordata, and Craniata) were described following the taxonomic arrangement of Nelson et al. (2016) and consulting the World Register of Marine Species (WoRMS 2020) and the Eschmeyer's Catalog of Fishes (Fricke et al 2020), and FishBase (Froese and Pauly 2019). Subphylum Craniata comprises representatives of six classes: Myxini, Petromyzonti, Holocephali, Elasmobranchii, Sarcopterygii, and Actinopterygii. The taxonomic arrangement of families within particular classes followed the classification system proposed by Nelson et al. (2016). The spelling of all scientific species names of fishes was verified based on FishBase (Froese and Pauly 2019), the Eschmeyer's Catalog of Fishes (Fricke et al. 2020), and the World Register of Marine Species (WoRMS 2020). The names of mammals and invertebrates were verified based on the latter database. Fossil specimens were described by Prof. A. Jerzmańska in the paper of Kotlarczyk et al. (2006) and arranged taxonomically according to van der Laan (2018).

The collection described in this paper has been registered in the Global Biodiversity Information Facility (GBIF)*.

RESULTS

Exhibition themes. The items collected in the museum are presented in glass cabinets in the hallways of the main building of the Faculty. They include not only fish but also other groups of marine fauna, as well as relevant documents and artifacts. The following themes are currently on display:

- Long-lived shark. A deep-water, 4-meter-long polar shark, *Somniosus microcephalus* (Bloch et Schneider, 1801), caught off Newfoundland in 1971 (Fig. 2). It may be 400 years old! (Contributed by Dr Marek Szulc).
- World sharks. A selection of major species of sharks, rays, skates, and sawfish (Contributed by Dr Marek Szulc).
- Anadromous and catadromous fish. Sturgeons, salmonids, eels, sea lampreys.
- Long-finned pilot whale. A skeleton of a 5-m long female *Globicephala melas* (Fig. 3) accidentally captured in a net in NW Atlantic in early 1970.
- Whaling. Whale bone fragments, harpoons, knives, etc. (Fig. 4) (Contributed by Prof. Juliusz Chojnacki).
- Polish Antarctic research memorabilia. The history of Antarctic research from the perspective of scientists from the Faculty of Marine Fisheries and Food Technology in Szczecin, including photographs of penguins and mammals from the vicinity of the Henryk Arctowski Polish Antarctic Station, King George Island (Fig. 4) (Contributed by Prof. Juliusz Chojnacki).
- Exotic fishes. An aquarium exhibition (Contributed by Prof. Adam Tański).
- Cod, the fish that changed the world. Presentation of the Atlantic cod, *Gadus morhua*, a common fish now facing extinction.
- Plastic sea, the toxic ocean. A suggestive interactive presentation for children, showing threats to the marine environment (Fig. 5) (Contributed by Prof. Adam Tański).

The checklist of the species in the holding of the Museum. Now the fish collection consists of 763 specimens with 329 dry ones and 432 formalin preserved and two frozen species.

In general, a total of 426 extant species are in the holdings of the Museum (three species of Tunicata, one of Cephalochordata and 422 of Craniata) Within the Craniata, one species belongs to Myxini, three to Petromyzonti, six species to Holocephali, 29 species to Elasmobranchii, one to Sarcopterygii, and 382 species to Actinopterygii. The details of the collections are presented in Appendix 1. In addition, six specimens of fossils fish are presented from the Polish Carpathians, on the menilite shales from Lower Oligocene beds (Cenozoic) and they belonged to five families: Clupeidae, Myctophidae, Syngnathidae, Trichiuridae and Serranidae (Actinopterygii) (Appendix 2).

DISCUSSION

Historically, the establishment of natural history museums was inspired by monarchs and/or other rich and educated individuals and was also associated with the rise and expansion of global superpowers in the 18th and 19th centuries. Especially colonial empires, because of their nature, were privileged to gather "curiosities" from exotic territories and uncharted seas and oceans (Farrington 1915). Exhibiting such artifacts was one of the ways to strengthen the imperial image among visitors. By the end of the 19th century, natural history museums became a global standard. Among the oldest and/or best known natural history museums would be worth to mention: Naturhistorisches Museum Wien, Muséum national d'histoire naturelle Paris, Museum für Naturkunde Berlin, Zoological Museum of the Zoological Institute of the Russian Academy of Sciences Saint Petersburg, Museo Nacional de Ciencias Naturales Madrid, Natural History Museum London, and the National Museum of Natural History Washington DC. The majority of them have well established fish collections. Such collections are available also in a multitude of other museums all over the world**.

* *https://www.gbif.org/grscicoll/collection/cf6e19dc-83e6-44fd-b74e-405fd7b2066d*
** *https://en.wikipedia.org/wiki/List_of_natural_history_museums*

Fig. 2. A deep-water, 4-meter-long polar shark, *Somniosus microcephalus*, caught off Newfoundland in 1971 (photo: Beata Więcaszek)

Fig. 3. A skeleton of a 5-m long female of long-finned pilot whale, *Globicephala melas*, accidentally captured in a net in NW Atlantic in early 1970 (photo: Beata Więcaszek)

Fig. 4. Antarctic exhibition including whaling artifacts and Polish Antarctic memorabilia (photo: Beata Więcaszek)

Fig. 5. Plastic in the ocean; a suggestive interactive presentation for children, showing threats to the marine environment (photo: Karolina Półtorak)

A separate category are fish collections maintained by universities. Unfortunately, such collections are usually poorly advertised, have local importance, and host very few descriptive types (if any). Among notable examples are the following collections:

- Faculty of Fisheries Museum, Ege University, Izmir, Turkey (Anonymous 2011),
- Fish Collection and Ichthyology at Kyoto University, Japan (Yoshiaki 2015),
- Systematic Museum, Faculty of Fisheries, Mersin University, Turkey (Çiftçi et al. 2019),
- Fish Collection, University of Michigan Museum of Zoology, USA*,
- Faculty of Fisheries, Recep Tayyip Erdogan University, Turkey**,
- Faculty of Fisheries, Muğla Sıtkı Koçman University, Turkey***,
- Marine Organisms' Collection Center, Izmir Katip Çelebi University, Turkey****,
- UAFMC Fish; University of Arkansas Collections Facility, USA*****,
- Fish Museum, College of Fisheries, Ratnagiri, Maharashtra, India******,
- The Ichthyological Collection of the Faculty of Food Sciences and Fisheries, West Pomeranian University of Technology in Szczecin (Więcaszek and Piasecki 2020).

The above list is far from being complete. Moreover, some collections lack curators devoted to fish only and are generally vulnerable to the destruction caused by newly-appointed decision makers. This was the case when Prof. Grabda retired and his successor closed our museum…

The zoological nomenclature system is quite dynamic, and there are many approaches to the animal classification systems. Fish classifications, like those of the majority of other taxonomic groups, are being transformed drastically as new molecular phylogenies provide support for natural groups that were unanticipated by previous studies (Betancur-R et al. 2017). In taxonomy, the species is the fundamental "currency unit" of most fields of biology. However, the nomenclature of species is still changing. New scientific discoveries are made, new concepts appear (and often die), our understanding of evolution and relations among species evolves; and it is reflected in changes to the names given to some species (Kottelat and Freyhof 2007).

In the arrangement of the fish families, we followed Nelson et al. (2016), who used restraint in revising classifications and incorporated a judicious mix of the old and the new. There is a tension between using molecular versus morphological variation as phylogenetic data, and in what proportion, analogous to the tension that once existed between adopting a traditional versus a cladistic classification. As claimed by Nelson et al. (2016), resolution of this tension is likely, not imminent, but it enlivens discussion and debate and moves systematic ichthyology onwards. Supporters of compromise between the molecular and morphological studies in fish systematics regret that optimization procedures in tree-

* *https://lsa.umich.edu/ummz/fishes.html.*
** *http://suf.erdogan.edu.tr/tr/page/muze/3414.*
*** *https://sufak.mu.edu.tr.*
**** *https://suurunleri.ikcu.edu.tr/S/15299/deniz-canlilari-koleksiyon-merkezi.*
***** *https://fulbright.uark.edu/deans-office/facilities/university-collections-facility/museum-collections.php.*
****** *https://cofrtn.org/fish-museum.*

building programs are phenetic and no longer employ homology nor synapomorphy, the original foundation of cladistics, what diminishes fish systematics (and not only the fish), and amounts to a crisis (Mooi and Gill 2010, Legg et al. 2013)

Since the last review of the collection in the Ichthyological Museum (Krzykawski et al. 1992), over 10 specimens have been destroyed, mainly due to the works associated with the building renovation. At the same time, the new specimens (over 70) appeared in our collection.

The most unique exhibit is a female of *Acipenser oxyrinchus* Mitchill, 1815 (250 cm of TL) caught in 1965 in the river Vistula (next to the last specimen captured in Poland in the wild). At present *A. oxyrinchus* is considered an extinct species in wild in the basin of the Baltic Sea. The second specimen of the same fish (150 cm of TL) came from the Soviet Union, arrived to our Faculty in 1970, from the Institute of Fisheries in Kaliningrad. The third one (juvenile 20 cm of TL) was found dead in fishermen's nets in the Szczecin Lagoon in 2015 with a tag in the dorsal fin, thus likely coming from the reintroduction action. In our collection there is also a pair of *Salmo salar* Linnaeus, 1758 breeders (over 120 cm of TL) caught in Poland in the Drawa River in 1970. The species has been extinct in Poland in the wild since the 1980s. We have also a very valuable collection of nototheniid fishes from Antarctica collected by scientists from our Faculty during Antarctic expeditions in 1975–1978. Those fishes are representatives of three families Nototheniidae (8 species), Bathydraconidae (2 species), and Channichtyidae (3 species). In 1995 our two graduate students A. Czernij and M. Furmanek brought to our collection over 40 rare, mostly, deep-water species from marine waters of New Zealand: *Harriotta raleighana* Goode et Bean, 1895, *Bythaelurus dawsoni* (Springer, 1971), *Centriscops humerosus* Richardson, 1846, *Pentaceros richardsoni* Smith, 1844, *Taractichthys steindachneri* (Döderlein, 1883), *Alertichthys blacki* Moreland, 1960, and *Himantolophus appelii* (Clarke, 1878). Noteworthy is also the collection of deep-water fish species from all over the world, from the following families: Lophiidae, Antennaridae, Chaunacidae, Ogcocephalidae, Himantolophidae, Ceratodidae, Linophrynidae (10 species), and Rhinochimaeridae (genera *Neoharriotta, Rhinohariotta*; 2 species) as well as from Somniosidae (1 species) and Oxynotidae (1 species). In our collection, we also hold a rare deep-water species—one specimen of *Chiasmodon harteli* Melo, 2009 and one specimen of *Etmopterus spinax* (Linnaeus, 1758) collected in 2016 in the shallow and brackish-water Pomeranian Bay (Baltic Sea).

The museum collections hold also aquatic invertebrates, amphibians, reptilians, and mammals, but they have been cataloged only in part. The most unique among mammals is the skeleton of a 5-m long female of long-finned pilot whale, *Globicephala melas* (Cetacea), with her 2 m calf and the bones of the humpback whale, *Megaptera novaeangliae*, from Antarctica (among others a mandible 4.5 m long and a rib 1.5 m long). However, as many as half of the specimens in the holdings still awaits for classification to the species level. This includes also numerous fish parasites collected throughout seven decades by Eugeniusz Grabda, Jadwiga Grabda, Leonard Ejsymont, Jadwiga Wierzbicka, Wojciech Piasecki, Ewa Sobecka, Jolanta Kempter (Kiełpińska), and numerous graduate students.

The principal role of the Ichthyological Museum is the education of university students and also children from local primary schools. The Museum is also accessible for the general public in the frames of the Museum's motto "In aqua vita nostra". The collection of aquatic animals in our Museum is one of the biggest in Poland, with the biggest number of dry specimens of fish. The unstable status of the Museums discourages deposition of descriptive types, but constantly attracts voucher specimens provided by local ichthyologists. In December 2020 the Ichthyological Museum officially received the name of Professor Eugeniusz Grabda, to honor his long-lasting contribution to the fish collection.

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Appendix 1

The checklist of the collected specimens in the holdings of the Ichthyological Museum of the Faculty of Food Sciences and Fisheries, West Pomeranian University of Technology in Szczecin, Poland; Regnum Animalia; Phylum Chordata

Taxa	Number of specimens	Remarks
Subphylum Tunicata		
Cionidae		
Ciona intestinalis (Linnaeus, 1767)	1F	
Doliolidae		
Doliolum sp.	1F	
Salpidae		
Salpa sp.	1F	
Subphylum Cephalochordata		
Branchiostomidae		
Branchiostoma lanceolatum (Pallas, 1774)	1F	
Subphylum Craniata		
Class Myxini		
Myxinidae		
Myxine glutinosa Linnaeus, 1758	2F	
Class Petromyzonti		
Petromyzontidae		
Lampetra fluviatilis (Linnaeus, 1758)	2F	
Lampetra planeri (Bloch, 1784)	5F	
Petromyzon marinus Linnaeus, 1758	1D, 1F	
Class Holocephali		
Callorhinchidae		
Callorhinchus capensis Duméril, 1865	1D, 1F	
Rhinochimaeridae		
Harriotta raleighana Goode et Bean, 1895	1D	
Neoharriotta pinnata (Schnakenbeck, 1931)	1D	
Rhinochimaera atlantica Holt et Byrne, 1909	2F, 1Z	
Chimaeridae		
Chimaera monstrosa Linnaeus, 1758	1F, 1S	
Hydrolagus alberti Bigelow et Schroeder, 1951	1F	
Class Elasmobranchii		
Heterodontidae		
Heterodontus francisci (Girard, 1855)	1D, 1F	
Alopiidae		
Alopias vulpinus (Bonnaterre, 1788)	1D	
Lamnidae		
Carcharodon carcharias (Linnaeus, 1758)	2D, 2J	
Lamna nasus (Bonnaterre, 1788)	1D	
Scyliorhinidae		
Bythaelurus dawsoni (Springer, 1971)	1D	
Scyliorhinus canicula (Linnaeus, 1758)	1D	
Scyliorhinus stellaris (Linnaeus, 1758)	1D, 1F	
Triakidae		
Mustelus mustelus (Linnaeus, 1758)	1D, 1F	
Carcharhinidae		
Carcharhinus melanopterus (Quoy et Gaimard, 1824)	1D, 1J	
Carcharhinus obscurus (Lesueur, 1818)	1D, 1J	
Prionace glauca (Linnaeus, 1758)	2D, 1F	
Sphyrnidae		
Sphyrna corona Springer, 1940	1D	
Sphyrna lewini (Griffith et Smith, 1834)	1D	
Sphyrna zygaena (Linnaeus, 1758)	1D, 2F	

Appendix continues on next page.

Appendix 1 cont.

Taxa	Number of specimens	Remarks
Etmopteridae		
Etmopterus spinax (Linnaeus, 1758)	1Z	AN
Somniosidae		
Somniosus microcephalus (Bloch et Schneider, 1801)	1D	
Oxynotidae		
Oxynotus centrina (Linnaeus, 1758)	3D, 1F	
Squalidae		
Squalus acanthias Linnaeus, 1758	1D, 2F, 1S	
Squatinidae		
Squatina squatina (Linnaeus, 1758)	1D, 1F	
Pristidae		
Pristis pectinata Latham, 1794	1D	
Torpedinidae		
Tetronarce nobiliana (Bonaparte, 1835)	1D	
Torpedo torpedo (Linnaeus, 1758)	2F	
Torpedo marmorata Risso, 1810	1F	
Rajidae		
Amblyraja georgiana (Norman, 1938)	1D	
Amblyraja radiata (Donovan, 1808)	1D, 1F	+SD
Leucoraja naevus (Müller et Henle, 1841)	1D	
Raja miraletus Linnaeus, 1758	1D	
Rajella caudaspinosa (von Bonde et Swart, 1923)	1D, 1F	
Rhinobatidae		
Pseudobatos planiceps (Garman, 1880)	1F	
Rhina ancylostoma Bloch et Schneider, 1801	1F	
Rhinobatos rhinobatos (Linnaeus, 1758)	1D, 1F	
Myliobatidae		
Myliobatis aquila (Linnaeus, 1758)	3D, 1F	
Mobulidae		
Mobula mobular (Bonnaterre, 1788)	1D	
Class Sarcopterygii		
Lepidosirenidae		
Lepidosiren paradoxa Fitzinger, 1837	1D	
Class Actinopterygii		
Polypteridae		
Erpetoichthys calabaricus Smith, 1865	2D, 2F	
Polypterus senegalus Cuvier, 1829	1D	
Polyodontidae		
Polyodon spathula (Walbaum, 1792)	4D, 2F	
Acipenseridae		
Acipenser baerii Brandt, 1869	1D, 2F	
Acipenser gueldenstaedtii Brandt et Ratzeburg, 1833	3F	
Acipenser medirostris Ayres, 1854	1F	
Acipenser oxyrinchus Mitchill, 1815	3D, 1F	[1*]
Acipenser ruthenus Linnaeus, 1758	2F	
Acipenser stellatus Pallas, 1771	1D, 5F	
Huso huso (Linnaeus, 1758)	2D, 2F	
Huso huso (Linnaeus, 1758) × *Acipenser ruthenus* Linnaeus, 1758	2F	
Lepisosteidae		
Atractosteus tristoechus (Bloch et Schneider, 1801)	1D	
Notacanthidae		
Notacanthus bonapartei Risso, 1840	2F	
Heterenchelyidae		
Panturichthys isognathus Poll, 1953	1F	
Panturichthys mauritanicus Pellegrin, 1913	1F	

Appendix continues on next page.

[*] The largest specimen (female) was one of the last captured in Poland; in the Vistula River in 1965.

Appendix 1 cont.

Taxa	Number of specimens	Remarks
Muraenidae		
Muraena helena Linnaeus, 1758	1D, 1F	
Ophichthidae		
Apterichthus anguiformis (Peters, 1877)	2F	
Ophisurus macrorhynchos Bleeker, 1853	1F	
Congridae		
Bathycongrus bertini (Poll, 1953)	1D	
Conger conger (Linnaeus, 1758)	2D	
Conger oceanicus (Mitchill, 1818)	1D	
Oxyconger leptognathus (Bleeker, 1858)	1F	
Moringuidae		
Moringua raitaborua (Hamilton, 1822)	3F	
Nemichthyidae		
Nemichthys scolopaceus Richardson, 1848	2F	
Anguillidae		
Anguilla anguilla (Linnaeus, 1758)	1D, 5F	SD+20 GE
Anguilla australis Richardson, 1841	1F	
Anguilla dieffenbachii Gray, 1842	1F	
Nemichthyidae		
Nemichthys scolopaceus Richardson, 1848	2F	
Osteoglossidae		
Osteoglossum bicirrhosum Cuvier, 1829	1D	
Engraulidae		
Anchoa starksi (Gilbert et Pierson, 1898)	1F	
Cetengraulis mysticetus (Günther, 1867)	1F	
Engraulis encrasicholus (Linnaeus, 1758)	3F	
Clupeidae		
Alosa aestivalis (Mitchill, 1814)	2F	
Alosa fallax (Lacépède, 1803)	1D, 1F	
Brevoortia tyrannus (Latrobe, 1802)	1D	
Clupea harengus Linnaeus, 1758	2F	
Clupea pallasii Valenciennes 1847	1F	
Konosirus punctatus (Temminck et Schlegel, 1846)	1F	
Opisthopterus equatorialis Hildebrand, 1946	1F	
Opisthonema libertate (Günther, 1867)	1F	
Sardina pilchardus (Walbaum, 1792)	3F	
Sprattus sprattus (Linnaeus, 1758)	1F	
Cyprinidae		
Abramis brama (Linnaeus, 1758)	1D, 1F	
Abramis brama (Linnaeus, 1758) × *Rutilus rutilus* (Linnaeus, 1758)	1F	
Alburnoides bipunctatus (Bloch, 1782)	2F	
Alburnus alburnus (Linnaeus, 1758)	2F	
Ballerus ballerus (Linnaeus, 1758)	1D, 1F	
Ballerus sapa (Pallas, 1814)	1F	
Barbus barbus (Linnaeus, 1758)	1D	
Barbodes everetti (Boulenger, 1894)	1F	
Barbus petenyi Heckel, 1852	1F	
Carassius carassius (Linnaeus, 1758)	1D, 1F	
Carassius gibelio (Bloch, 1782)	1D, 2F	
Chondrostoma nasus (Linnaeus, 1758)	1F	
Ctenopharyngodon idella (Valenciennes, 1844)	1D, 1F	
Cyprinus carpio Linnaeus, 1758	2D, 1F	
Danio rerio (Hamilton, 1822)	1F	
Gobio gobio (Linnaeus, 1758)	2F	
Hypophthalmichthys molitrix (Valenciennes, 1844)	1D	

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Appendix 1 cont.

Taxa	Number of specimens	Remarks
Hypophthalmichthys nobilis (Richardson, 1845)	3D	
Labeo niloticus (Linnaeus, 1758)	1F	
Leucaspius delineatus (Heckel, 1843)	10F	
Leuciscus aspius (Linnaeus, 1758)	3D	
Leuciscus idus (Linnaeus, 1758)	3D	I1GO
Leuciscus leuciscus (Linnaeus, 1758)	1F	
Phoxinus phoxinus (Linnaeus, 1758)	2F	
Pseudogobio esocinus (Temminck et Schlegel, 1846)	1F	
Rasbora trilineata Steindachner, 1870	2F	
Rhodeus amarus (Bloch, 1782)	1F	
Rhynchocypris percnurus (Pallas, 1814)	1F	
Rutilus rutilus (Linnaeus, 1758)	1F	
Rutilus rutilus (Linnaeus, 1758) × *Alburnus alburnus* (Linnaeus, 1758)	1F	
Scardinius erythrophthalmus (Linnaeus, 1758)	1F	
Squalius cephalus (Linnaeus, 1758)	3F	
Vimba vimba (Linnaeus, 1758)	4F	
Cobitidae		
Botia lohachata Chaudhuri, 1912	1F	
Cobitis taenia Linnaeus, 1758	2F	
Misgurnus fossilis (Linnaeus, 1758)	1D, 1F	
Balitoridae		
Pseudogastromyzon myersi Herre, 1932	1F	
Nemacheilidae		
Barbatula barbatula (Linnaeus, 1758)	2F	
Serrasalmidae		
Piaractus brachypomus (Cuvier, 1818)	1D, 1F, 1Z	
Pygocentrus nattereri Kner, 1858	1D	
Pygocentrus piraya (Cuvier, 1819)	2D	
Characidae		
Hyphessobrycon anisitsi (Eigenmann, 1907)	1F	
Hyphessobrycon eques (Steindachner, 1882)	1F	
Hyphessobrycon pulchripinnis Ahl, 1937	1F	
Callichthyidae		
Corydoras aeneus (Gill, 1858)	3F	
Corydoras paleatus (Jenyns, 1842)	1F	
Loricariidae		
Ancistrus dolichopterus Kner, 1854	1D	
Siluridae		
Silurus glanis Linnaeus, 1758	1D	
Pangasiidae		
Pangasius sp. Valenciennes, 1840	1F	
Bagridae		
Bagrus bajad (Forsskål, 1775)	1F	
Mystus gulio (Hamilton, 1822)	1F	
Malapteruridae		
Malapterurus electricus (Gmelin, 1789)	1F	
Schilbeidae		
Schilbe mystus (Linnaeus, 1758)	1F	
Clariidae		
Clarias gariepinus (Burchell, 1822)	2D, 2F	
Heteropneustidae		
Heteropneustes fossilis (Bloch, 1794)	4F	
Arridae		
Bagre panamensis (Gill, 1863)	1F	
Carlarius heudelotii (Valenciennes, 1840)	1D	

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Appendix 1 cont.

Taxa	Number of specimens	Remarks
Galeichthys feliceps Valenciennes, 1840	2D	
Ictaluridae		
Ameiurus nebulosus (Lesueur, 1819)	2F	
Salmonidae		
Coregonus albula (Linnaeus, 1758)	5F	
Coregonus autumnalis (Pallas, 1776)	1F	
Coregonus ladogae Pravdin, Golubev et Belyaeva, 1938	2F	
Coregonus lavaretus (Linnaeus, 1758)	2D, 1F	Sensu lato
Hucho hucho (Linnaeus, 1758)	2D	
Oncorhynchus keta (Walbaum, 1792)	1F	
Oncorhynchus mykiss (Walbaum, 1792)	2D	
Salmo ohridanus Steindachner, 1892	1F	
Salmo salar Linnaeus, 1758	3D	
Salmo trutta Linnaeus, 1758	3D, 1F	
Salmo letnica (Karaman 1924)	1F	
Salvelinus alpinus (Linnaeus, 1758)	1F	
Salvelinus fontinalis (Mitchill, 1814)	2D	
Salvelinus alpinus × *Salvelinus fontinalis*	1D	
Thymallus thymallus (Linnaeus, 1758)	2D, 2F	
Esocidae		
Esox lucius Linnaeus, 1758	1D, 2H	
Umbridae		
Umbra krameri Walbaum, 1792	3F	
Argentinidae		
Argentina sphyraena Linnaeus, 1758	1F	
Osmeridae		
Mallotus villosus (Müller, 1776)	2F	
Osmerus eperlanus (Linnaeus, 1758)	2F	
Stomiidae		
Chauliodus sloani Bloch et Schneider, 1801	1F	
Synodontidae		
Saurida tumbil (Bloch, 1795)	4F	
Paralepididae		
Notolepis coatsi Dollo, 1908	1F	
Myctophidae		
Gymnoscopelus braueri (Lönnberg, 1905)	1F	
Gymnoscopelus nicholsi (Gilbert, 1911)	1F	
Krefftichthys anderssoni (Lönnberg, 1905)	1F	
Lampadena chavesi Collett, 1905	1F	
Lampridae		
Lampris guttatus (Brünnich, 1788)	1D	
Zeidae		
Zenopsis conchifer (Lowe, 1852)	3F	
Zeus faber Linnaeus, 1758	2D	
Macrouridae		
Coryphaenoides rupestris Gunnerus, 1765	1F	
Malacocephalus occidentalis Goode et Bean, 1885	1F	
Nezumia aequalis (Günther, 1878)	1F	
Tarletonbeania crenularis (Jordan et Gilbert, 1880)	1F	
Moridae		
Lepidion natalensis Gilchrist, 1922	1F	
Merlucciidae		
Merluccius bilinearis (Mitchill, 1814)	1D, 1F	
Merluccius merluccius (Linnaeus, 1758)	1F	
Merluccius productus (Ayres, 1855)	1D	

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Appendix 1 cont.

Taxa	Number of specimens	Remarks
Muraenolepididae		
Muraenolepis marmorata Günther, 1880	1F	
Muraenolepis microps Lönnberg, 1905	1D	
Phycidae		
Urophycis tenuis (Mitchill, 1814)	1D	
Lotidae		
Enchelyopus cimbrius (Linnaeus, 1766)	1F	
Lota lota (Linnaeus, 1758)	1D	
Molva molva (Linnaeus, 1758)	1D	
Gadidae		
Gadus morhua Linnaeus, 1758	5D, 1F	
Melanogrammus aeglefinus (Linnaeus, 1758)	2D, 1F	
Merlangius merlangus (Linnaeus, 1758)	3F	
Pollachius virens (Linnaeus, 1758)	1D, 1F	
Trisopterus esmarkii (Nilsson, 1855)	3F	
Trisopterus minutus (Linnaeus, 1758)	1F	
Holocentridae		
Sargocentron hastatum (Cuvier, 1829)	1D	
Monocentridae		
Monocentris japonica (Houttuyn, 1782)	2D	
Trachichthyidae		
Gephyroberyx darwinii (Johnson, 1866)	1D	
Paratrachichthys trailli Hutton, 1875	1D	
Berycidae		
Beryx splendens Lowe, 1834	1D	
Carapidae		
Carapus acus (Brünnich, 1768)	1F	
Ophidiidae		
Brotula barbata (Bloch et Schneider, 1801)	1D	
Genypterus blacodes (Forster, 1801)	1D	
Genypterus capensis (Smith, 1847)	1D	
Ophidion barbatum Linnaeus, 1758	1F	
Ophidion smithi (Fowler, 1934)	1F	
Batrachoididae		
Chatrabus melanurus (Barnard, 1927)	1F	
Halobatrachus didactylus (Bloch et Schneider, 1801)	2F	
Kurtidae		
Kurtus indicus Bloch, 1786	1F	
Odontobutidae		
Perccottus glenii Dybowski, 1877	2F	
Gobiidae		
Benthophilus ctenolepidus Kessler, 1877	1D	
Boleophthalmus boddarti (Pallas, 1770)	5F	
Gobius niger Linnaeus, 1758	1F	
Neogobius melanostomus (Pallas, 1814)	3F	
Periophthalmus barbarus (Linnaeus, 1766)	3F	
Pomatostichtus minutus (Pallas, 1770)	1F	
Proterorhinus marmoratus (Pallas, 1814)	1F	
Taenioides cirratus (Blyth, 1860)	1F	
Ambassidae		
Ambassis ambassis (Lacepède, 1802)	3F	
Pomacentridae		
Abudefduf saxatilis (Linnaeus, 1758)	1F	
Chromis chromis (Linnaeus, 1758)	1F	

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Appendix 1 cont.

Taxa	Number of specimens	Remarks
Mugilidae		
Mugil cephalus Linnaeus, 1758	1D	
Polynemidae		
Pentanemus quinquarius (Linnaeus, 1758)	1F	
Polydactylus opercularis (Gill, 1863)	1F	
Cichlidae		
Amatitlania nigrofasciata (Günther, 1867)	2F	
Coptodon zillii (Gervais, 1848)	1F	
Etroplus maculatus (Bloch 1795)	1F	
Oreochromis niloticus (Linnaeus, 1758)	1F	
Pelvicachromis pulcher (Boulenger, 1901)	1F	
Pterophyllum scalare (Schultze, 1823)	3F	
Sarotherodon galilaeus (Linnaeus, 1758)	2F	
Thorichthys meeki Brind, 1918	1D	
Tilapia brevimanus Boulenger, 1911	1F	
Blenniidae		
Parablennius verryckeni (Poll, 1959)	1F	
Exocoetidae		
Cheilopogon heterurus (Rafinesque, 1810)	1F	
Cheilopogon pinnatibarbatus (Bennett, 1831)	1F	
Exocoetus obtusirostris Günther, 1866	1F	
Exocoetus volitans Linnaeus, 1758	2F	
Hemiramphidae		
Hemiramphus brasiliensis (Linnaeus, 1758)	2F	
Rhynchorhamphus georgii (Valenciennes, 1847)	1F	
Belonidae		
Belone belone (Linnaeus, 1760)	2D	
Strongylura scapularis (Jordan et Gilbert, 1882)	1F	
Strongylura strongylura (van Hasselt, 1823)	1F	
Scomberoesocidae		
Cololabis saira (Brevoort, 1856)	1F	
Scomberesox saurus (Walbaum, 1792)	2F	
Poecilliidae		
Poecilia velifera (Regan, 1914)	1F	
Xiphophorus maculatus (Günther, 1866)	1F	
Coryphenidae		
Coryphaena hippurus Linnaeus, 1758	1D	
Rachycentridae		
Rachycentron canadum (Linnaeus, 1766)	1D	
Echeneidae		
Echeneis naucrates Linnaeus, 1758	1D	
Remora osteochir (Cuvier, 1829)	1F	
Carangidae		
Campogramma glaycos (Lacepède, 1801)	2D	
Caranx caballus Günther, 1868	1D	
Caranx crysos (Mitchill, 1815)	1D	
Caranx hippos (Linnaeus, 1766)	2D	
Caranx ignobilis (Forsskål, 1775)	1D	
Caranx rhonchus Geoffroy Saint-Hilaire, 1817	2D	
Caranx senegallus Cuvier, 1833	1D	
Caranx sexfasciatus Quoy et Gaimard, 1825	1D	
Elagatis bipinnulata (Quoy et Gaimard, 1825)	1D	
Lichia amia (Linnaeus, 1758)	2D	
Naucrates ductor (Linnaeus, 1758)	1D, 1F	
Oligoplites refulgens Gilbert et Starks, 1904	1D	

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Appendix 1 cont.

Taxa	Number of specimens	Remarks
Selar crumenophthalmus (Bloch, 1793)	2F	
Selene setapinnis (Mitchill, 1815)	1F	
Seriola rivoliana Valenciennes, 1833	1D	
Trachurus mediterraneus (Steindachner, 1868)	1D, 1F	
Trachurus symmetricus (Ayres, 1855)	2D	
Trachurus trachurus (Linnaeus, 1758)	1D, 2F	
Trachurus trecae Cadenat, 1950	1D	
Trachinotus goreensis Cuvier, 1832	2D	
Trachinotus ovatus (Linnaeus, 1758)	1D	
Sphyraenidae		
Sphyraena barracuda (Edwards, 1771)	1F	
Xiphiidae		
Xiphias gladius Linnaeus, 1758	1D	
Istiophoridae		
Istiophorus platypterus (Shaw, 1792)	1D	
Anabantidae		
Anabas testudineus (Bloch, 1792)	4F	
Osphronemidae		
Betta splendens Regan, 1910	1F	
Trichogaster fasciata Bloch et Schneider, 1801	1F	
Trichogaster lalius (Hamilton, 1822)	1F	
Trichopodus leerii (Bleeker 1852)	1F	
Channidae		
Channa punctata (Bloch, 1793)	1F	
Psettodidae		
Psettodes belcheri Bennett, 1831	1D	
Paralichthyidae		
Ancylopsetta dendritica Gilbert, 1890	1D, 2F	
Paralichthys dentatus (Linnaeus, 1766)	1D	
Bothidae		
Arnoglossus capensis Boulenger, 1898	2D	
Scophthalmidae		
Scophthalmus maeoticus (Pallas, 1814)	1F	
Scophthalmus maximus (Linnaeus, 1758)	2D	
Pleuronectidae		
Glyptocephalus cynoglossus (Linnaeus, 1758)	1F	
Hippoglossoides platessoides (Fabricius, 1780)	2D	
Limanda ferruginea (Storer, 1839)	1D	
Platichthys flesus (Linnaeus, 1758)	5D	
Pleuronectes platessa Linnaeus, 1758	1D	
Pseudopleuronectes americanus (Walbaum, 1792)	1D	
Reinhardtius hippoglossoides (Walbaum, 1792)	1D	
Achiropsettidae		
Mancopsetta maculata (Günther, 1880)	1D	
Soleidae		
Microchirus ocellatus (Linnaeus, 1758)	1F	
Solea solea (Linnaeus, 1758)	1F	
Zebrias zebra (Bloch, 1787)	1F	
Syngnathidae		
Microphis aculeatus (Kaup, 1856)	1F	
Syngnathus acus Linnaeus, 1758	2F	
Syngnathus typhle Linnaeus, 1758	1D, 4F	
Fistulariidae		
Fistularia tabacaria Linnaeus, 1758	2D	
Fistularia petimba Lacepède, 1803	1F	

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Appendix 1 cont.

Taxa	Number of specimens	Remarks
Centriscidae		
Aeoliscus strigatus (Günther, 1861)	2F	
Centriscops humerosus Richardson, 1846	1F	
Dactylopteridae		
Dactylopterus volitans Linnaeus, 1758	1D	
Callionymidae		
Callionymus lyra Linnaeus, 1758	2F	
Synchiropus phaeton (Günther, 1861)	1F	
Gempylidae		
Paradiplospinus gracilis (Brauer, 1906)	1F	
Ruvettus pretiosus Cocco, 1833	1D	PD
Thyrsites atun (Euphrasen, 1791)	1D	
Trichiuridae		
Trichiurus lepturus Linnaeus, 1758	1D, 1SS	
Scombridae		
Auxis rochei (Risso, 1810)	2D	
Euthynnus alletteratus (Rafinesque, 1810)	2D	
Orcynopsis unicolor (Geoffroy Saint-Hilaire, 1817)	1D	
Sarda sarda (Bloch, 1793)	2D	
Scomber japonicus Houttuyn, 1782	2D, 2F	
Scomber scombrus Linnaeus, 1758	2D, 1F	
Scomberomorus maculatus (Mitchill, 1815)	2D, 2F	
Scomberomorus sierra Jordan et Starks, 1895	1D	
Thunnus obesus (Lowe, 1839)	1D	
Centrolophidae		
Centrolophus niger (Gmelin, 1789)	1D	
Stromateidae		
Pampus argenteus (Euphrasen, 1788)	1F	
Peprilus triacanthus (Peck, 1804)	1F	
Stromateus brasiliensis Fowler, 1906	1D	
Stromateus *fiatola* Linnaeus, 1758	1D, 1F	
Peprilus medius (Peters, 1869)	1F	
Chiasmodontidae		
Chiasmodon harteli Melo, 2009	1SS	
Percophidae		
Bembrops heterurus (Miranda Ribeiro, 1903)	1F	
Trachinidae		
Trachinus araneus Cuvier, 1829	1D	
Trachinus armatus Bleeker, 1861	1F	
Trachinus draco Linnaeus, 1758	2F	
Trachinus radiatus Cuvier, 1829	2D	
Echiichthys vipera (Cuvier, 1829)	1D, 1F	
Uranoscopidae		
Uranoscopus cadenati Poll, 1959	1D	
Uranoscopus scaber Linnaeus, 1758	1D, 1F	
Labridae		
Bodianus speciosus (Bowdich, 1825)	1F	
Labrus bergylta Ascanius, 1767	1D	
Latidae		
Lates niloticus (Linnaeus, 1758)	1F	
Gerreidae		
Eucinostomus gracilis (Gill 1862)	1D	
Eucinostomus melanopterus (Bleeker, 1863)	1F	
Polyprionidae		
Polyprion americanus (Bloch et Schneider, 1801)	1D	

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Appendix 1 cont.

Taxa	Number of specimens	Remarks
Mullidae		
Mullus barbatus Linnaeus, 1758	1F	
Pseudupeneus grandisquamis (Gill, 1863)	2F	
Pseudupeneus prayensis (Cuvier, 1829)	2D, 2F	
Pentacerotidae		
Pentaceros richardsoni Smith, 1844	1D	
Centrarchidae		
Lepomis gibbosus (Linnaeus, 1758)	1F	
Lepomis macrochirus Rafinesque, 1819	1F	
Serranidae		
Anthias anthias (Linnaeus, 1758)	2F	
Centropristis striata (Linnaeus, 1758)	3D	
Cephalopholis taeniops (Valenciennes, 1828)	1D	
Epinephelus aeneus (Geoffroy Saint-Hilaire, 1817)	2D	
Epinephelus goreensis (Valenciennes, 1830)	1D	
Epinephelus marginatus (Lowe, 1834)	1D	
Percidae		
Gymnocephalus cernua (Linnaeus, 1758)	1D, 1F	
Perca fluviatilis Linnaeus, 1758	3D, 1F	
Sander lucioperca (Linnaeus, 1758)	1D, 1F	
Pomatomidae		
Pomatomus saltatrix (Linnaeus, 1766)	2D	
Bramidae		
Brama brama (Bonnaterre, 1788)	2D	
Taractes rubescens (Jordan et Evermann, 1887)	2D	
Taractichthys longipinnis (Lowe, 1843)	1F	
Taractichthys steindachneri (Döderlein, 1883)	1D	
Priacanthidae		
Priacanthus arenatus Cuvier, 1829	1F	
Chaetodontidae		
Chaetodon collare Bloch, 1787	1F	
Chaetodon hoefleri Steindachner, 1881	1F	
Chelmon rostratus (Linnaeus, 1758)	1F	
Pomacanthidae		
Pomacanthus imperator (Bloch, 1787)	1F	
Malacanthidae		
Branchiostegus semifasciatus (Norman, 1931)	1D	
Lopholatilus chamaeleonticeps Goode et Bean, 1879	1D	
Haemulidae		
Brachydeuterus auritus (Valenciennes, 1832)	1D	
Plectorhinchus mediterraneus (Guichenot, 1850)	1F	
Lutjanidae		
Lutjanus melanostigma (Cuvier, 1828)	1D	
Cepolidae		
Cepola macrophthalma (Linnaeus, 1758)	1F	
Nototheniidae		
Dissostichus mawsoni Norman, 1937	2D	
Gobionotothen gibberifrons (Lönnberg, 1905)	1D	
Nototheniops larseni (Lönnberg, 1905)	1D	
Gobionotothen marionensis (Günther, 1880)	1D	
Notothenia rossii Richardson, 1844	3D	
Lepidonotothen squamifrons (Günther, 1880)	2D	
Trematomus hansoni Boulenger, 1902	1D	
Trematomus scotti (Boulenger, 1907)	1F	

Appendix continues on next page.

Appendix 1 cont.

Taxa	Number of specimens	Remarks
Bathydraconidae		
Parachaenichthys georgianus (Fischer, 1885)	1D	
Psilodraco breviceps Norman, 1937	1D	
Channichthyidae		
Chaenocephalus aceratus (Lönnberg, 1906)	2D	
Champsocephalus gunnari Lönnberg, 1905	2D, 2F	
Channichthys rhinoceratus Richardson, 1844	1D	
Pseudochaenichthys georgianus Norman, 1937	1D	
Sebastidae		
Sebastes flavidus (Ayres, 1862)	1D	
Sebastes goodei (Eigenmann et Eigenmann, 1890)	1D	
Sebastes norvegicus (Ascanius, 1772)	1D	
Scorpaenidae		
Pterois russelii Bennett, 1831	1F	
Pterois volitans (Linnaeus, 1758)	1F	
Scorpaena normani Cadenat, 1943	1F	
Scorpaena porcus Linnaeus, 1758	1F	
Scorpaena stephanica Cadenat, 1943	1D	
Aploactinidae		
Acanthosphex leurynnis (Jordan et Seale, 1905)	5F	
Congiopodidae		
Alertichthys blacki Moreland, 1960	1D	
Triglidae		
Chelidonichthys cuculus (Linnaeus, 1758)	1F	
Chelidonichthys lucerna (Linnaeus, 1758)	2D	
Eutrigla gurnardus (Linnaeus, 1758)	1D, 1F	
Pterygotrigla picta (Günther, 1880)	1D	
Peristediidae		
Peristedion cataphractum (Linnaeus, 1758)	1D, 1F	
Hoplichthyidae		
Hoplichthys haswelli McCulloch, 1907	1D	
Zoarcidae		
Iluocoetes fimbriatus Jenyns, 1842	2D	
Lycodes esmarkii Collett, 1875	1F	
Zoarces americanus (Bloch et Schneider, 1801)	2D	
Melanostigma gelatinosum Günther, 1881	1F	
Zoarces viviparus (Linnaeus, 1758)	1D	
Stichaeidae		
Lumpenus fabricii Reinhardt, 1836	1F	
Anarhichadidae		
Anarhichas lupus Linnaeus, 1758	1D, 1F	
Anarhichas minor Olafsen, 1772	1F	
Gasterosteidae		
Gasterosteus aculeatus Linnaeus, 1758	6F	
Pungitius platygaster (Kessler, 1859)	1F	
Pungitius pungitius (Linnaeus, 1758)	3F	
Anoplopomatidae		
Anoplopoma fimbria (Pallas, 1814)	1D	
Hexagrammidae		
Pleurogrammus monopterygius (Pallas, 1810)	1F	
Agonidae		
Agonus cataphractus (Linnaeus, 1758)	2F	
Percis japonica (Pallas, 1769)	1D, 1F	
Podothecus sachi (Jordan et Snyder, 1901)	1F	
Cottidae		

Appendix continues on next page.

Appendix 1 cont.

Taxa	Number of specimens	Remarks
Cottus gobio Linnaeus, 1758 complex	1D	Sensu lato
Cottus poecilopus Heckel, 1837	1D	
Hemitripterus americanus (Gmelin, 1789)	2D	
Myoxocephalus scorpius Linnaeus, 1758	2D	
Taurulus bubalis (Euphrasen, 1786)	1D, 1F	
Psychrolutidae		
Ambophthalmos sp.	1D	
Cyclopteridae		
Cyclopterus lumpus Linnaeus, 1758	2D, 5F	
Moronidae		
Dicentrarchus labrax Linnaeus, 1758	1D	
Ephippidae		
Ephippus goreensis Cuvier, 1831	1D	
Chaetodipterus lippei Steindachner, 1895	1D	
Sciaenidae		
Argyrosomus japonicus (Temminck et Schlegel, 1843)	1D	
Argyrosomus regius (Asso, 1801)	1D	
Acanthuridae		
Acanthurus nigrofuscus (Forsskål, 1775)	1D	
Acanthurus monroviae Steindachner, 1876	1D, 1F	
Zanclus cornutus (Linnaeus, 1758)	1F	
Sparidae		
Boops boops (Linnaeus, 1758)	1F	
Diplodus sargus (Linnaeus, 1758)	1F	
Pagellus bogaraveo (Brünnich, 1768)	2D	
Diplodus puntazzo (Walbaum, 1792)	1D	
Evynnis ehrenbergii (Valenciennes, 1830)	1D, 1F	
Spicara smaris (Linnaeus, 1758)	1F	
Spondyliosoma cantharus (Linnaeus, 1758)	1F	
Stenotomus chrysops (Linnaeus, 1766)	1D	
Caproidae		
Capros aper (Linnaeus, 1758)	1F	
Lophiidae		
Lophius piscatorius Linnaeus, 1758	3D, 1F	
Antennaridae		
Antennarius striatus (Shaw, 1794)	2D, 2F	
Antennarius pictus (Shaw, 1794)	1F	
Chaunacidae		
Chaunax pictus Lowe, 1846	1F	
Ogcocephalidae		
Halieutaea fitzsimonsi (Gilchrist et Thompson, 1916)	2F	
Halieutaea stellata (Vahl, 1797)	1F	
Malthopsis annulifera Tanaka, 1908	1D, 1F	
Himantolophidae		
Himantolophus appelii (Clarke, 1878)	1D	
Ceratiidae		
Ceratias holboelli Krøyer, 1845	1D	
Linophrynidae		
Linophryne lucifer Collett, 1886	1D	
Triacanthidae		
Pseudotriacanthus strigilifer (Cantor, 1849)	1F	
Ostraciidae		
Lactoria cornuta (Linnaeus, 1758)	1D, 1F	
Lactoria diaphana (Bloch et Schneider, 1801)	1D	
Tetrosomus concatenatus (Bloch, 1785)	1D	

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Appendix 1 cont.

Taxa	Number of specimens	Remarks
Tetrosomus gibbosus (Linnaeus, 1758)	1F	
Balistidae		
Abalistes stellaris (Bloch et Schneider, 1801)	1D	
Balistes capriscus Gmelin, 1789	1F	
Balistes vetula Linnaeus, 1758	1D	
Monacanthidae		
Aluterus schoepfii (Walbaum, 1792)	1D	
Stephanolepis cirrhifer (Temminck et Schlegel, 1850)	2D	
Thamnaconus modestus (Günther, 1877)	1F	
Molidae		
Mola mola (Linnaeus, 1758)	1D	
Tetraodontidae		
Dichotomyctere fluviatilis (Hamilton, 1822)	1F	
Ephippion guttifer (Bennett, 1831)	1D	
Lagocephalus laevigatus (Linnaeus, 1766)	1F	
Sphoeroides annulatus (Jenyns, 1842)	1D	
Sphoeroides spengleri (Bloch, 1785)	1F	
Takifugu vermicularis (Temminck et Schlegel, 1850)	1F	
Diodontidae		
Chilomycterus antennatus (Cuvier, 1816)	1D	
Diodon holocanthus Linnaeus, 1758	1D	

D = dry, F = formalin, Z = frozen, S = skeleton, J = jaws, AN = after necropsy, GL = glass-eels, I1GO =1 golden orfe, SD = stages of development, H = head, PD = partly destroyed, SS = stained skeleton,

Appendix 2

Fossils from the Polish Carpathians, menilite shales from Lower Oligocene beds (Cenozoic) gifts from Prof. Anna Jerzmańska, University of Wrocław

Taxa	Number of specimens	Locality	Year of collection
Clupeidae			
Clupea sardinites Heckel, 1850	1	Skopów	1971
Clupea sardinites Heckel, 1850	1	Sanok	1976
Myctophidae			
Eomyctophum sp.	1	Krępak	1979
Syngnathidae			
Syngnathus incompletus Cosmovici, 1887	1	Bachów	1972
Trichiuridae			
Lepidopus glarisianus (Blanville, 1818)	1	Brzozowo	1985
Serranidae			
Serranus budensis (Heckel, 1856)	1	Sanok	1975