

AGNATHA IN THE ICHTHYOLOGIC COLLECTION OF THE NATIONAL MUSEUM IN PRAGUE

Bezčelistnatci (Agnatha) ve sbírkách Národního muzea v Praze

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Abstract: The agnatha collection of the National Museum in Prague includes 425 specimens. All available data are presented for each specimen. In the collection there are 60 hagfish specimens (Myxini), of which one is taxidermied, six are skeletons preserved in liquid, and 53 are whole specimens preserved in liquid. Exact number of taxa is still not known. Collection of lampreys includes 365 specimens belonging to three genera and eight species – *Petromyzon marinus*, *Lampetra planeri*, *L. fluviatilis*, *L. zanandreae*, *Eudontomyzon danfordi*, *E. hellenicus*, *E. vladykovi* and *E. stankokaramani*. Majority of specimens, 322, are preserved in liquid, nine are taxidermied, 32 are skeletons in liquid, and two are anatomical preparations in liquid. The collection includes two specimens, which are historical records of presence of *P. marinus* in the Czech Republic. The previously published information about voucher specimens of *P. marinus* and *L. fluviatilis* from the National Museum in Prague was revised.

Key words: lampreys, hagfishes, National Museum in Prague, ichthyologic collection

Introduction

Many museums, both national and local ones, often keep several agnatha specimens in their collections. Some of these materials are historical exponents, acquired by the museums in the past, mainly during the 19th and the first half of the 20th century, often documenting records of now extinct or rare populations. On the other hand, recently collected material provides data about many previously purely studied species. However, most specimens preserved in these collections have not been studied yet.

The National Museum in Prague gathers a rich and interesting collection of agnatha specimens, belonging to both recent classes – lampreys (Cephalaspidomorphi) and hagfishes (Myxini). The data about this material were published only marginally (OLIVA 1995, HANEL 1996 a,b, NEUMANOVÁ 1997). Unfortunately, in the above mentioned works there are some mistakes in the identification and data about collection of some specimens. Moreover, only a part of material (listed in a definitive museum evidence) was included in the works of HANEL (1996 a,b) and NEUMANOVÁ (1997).

The aim of the present work is to provide a complete and updated list of all agnathans in the collection of the National Museum in Prague together with the basic data about them.

Material and methods

All specimens of hagfish and lampreys included in the collection of the National Museum in Prague were revised. For lampreys, we used the systematics according to KOTTELAT & FREYHOF (2007). Unfortunately, it was usually not possible to determine hagfishes exactly due to a lack of the literature on determination. The available data are presented in the following order: catalogue number; number of specimen; type of preservation; date of the capture; locality; country; collector (leg.); note. Sex and length were not determined. All skeletons and anatomical preparations preserved in liquid are mounted on a glass desk, each skeleton in a separate jar. An important part of the agnathan material in the Museum was donated by Jaromír Frič in 1958, the heir of Václav Frič, who owned a firm specialised on trade with variety of natural products (ŠTĚPÁNEK 1975). Although Václav Frič is not the actual collector of this material, he is indicated as a collector.

Abbreviations used:

n – number of specimens;

A – adult (including metamorphosing specimens with developed eyes);

J – ammocoete (larval stage of lampreys);

L – material preserved in liquid (ethanol, formaldehyde);

T – taxidermied material;

SL – skeleton preserved in liquid;

AL – anatomical preparation in liquid;

NM – National Museum in Prague.

The evidence numbers used belong to several categories:

P6V – definitive evidence;

P6p – preliminary evidence (for material included in the evidence after 1959);

P6j and P6d – additional evidence.

For material older than 1959, numbers from original catalogues (accession books) I-V are used, if available.

Results and discussion

The agnathan collection of the National Museum in Prague includes 425 specimens. 60 of them belong to hagfishes. Of these, one is taxidermied, six are skeletons in liquid and 53 are whole specimens preserved in liquid. The exact number of taxa is still unknown, due to a difficult determination. Lampreys, counting altogether 365 specimens, are much more numerous. They belong to three genera and eight species. Majority of specimens, 322, are preserved in liquid, nine are taxidermied, 32 are skeletons in liquid and two anatomical preparations in liquid. The number of lampreys in the collection exceeds the number published by HANEL (1996a) several times, because he included in his work only material from the definitive evidence of the museum and focussed solely on the taxa present in the Czech Republic. The collection of skeletons in liquid is particularly interesting. It is an important documentation of craftsmanship of old taxidermists, as the preparation of skeleton of agnatha is very difficult. The comments on each taxon follow the list of specimens in the taxon.

Class: Cephalaspidomorphi
Order: Petromyzontiformes
Family: Petromyzontidae

***Eudontomyzon danfordi* Regan, 1911**

P6V 5079; n = 1A; T; Tisa drainage, Subcarpathian Ukraine; Ukraine; leg. Vladykov, V.; note: possible syntype of *Lampetra bergi* Vladykov, 1925
P6V 8949-8950; n = 2A; L; 1923; Tisa drainage, Novoselica, Subcarpathian Ukraine; Ukraine; leg. Vladykov, V.; note: syntypes of *Lampetra bergi* Vladykov, 1925
P6V 31097-31098; n = 2A; L; 5.8.1962; brook in Remetské Hamre; Slovakia; leg. Táborský, K.
P6V 31108-31117; n = 10A; L; Stillbach near Vondrášek; Slovakia; leg. Pfeffer; note: locality most probably Ondrašovce near Prešov, Hornád drainage
P6V 32045; n = 1J; L; 15.8.1976; River Cirocha under Starina; Slovakia; leg. Čihař, J., Tauber, V.
P6V 34336; n = 1A; L; July 1985; River Ubl'a, Dúbrava; Slovakia; leg. Šafr, J.
P6V 80728; n = 1A; L; 23.8.1923; Tisa drainage, Plajuk, Subcarpathian Ukraine; Ukraine; leg. Vladykov, V.; note: syntype of *Lampetra bergi* Vladykov, 1925
P6V 80729-80738; n = 10 (1A, 9J); L; Tisa drainage, Subcarpathian Ukraine; Ukraine; leg. Vladykov, V.; note: possible syntypes of *Lampetra bergi* Vladykov, 1925
All 28 specimens of *E. danfordi* originate from the Tisa River drainage in Slovakia or Ukraine. Only one of them is taxidermied; the rest of the material is preserved in liquid. Ten specimens are ammocoetes, 18 are adults. Noteworthy are three syntypes of *Lampetra bergi* Vladykov, 1925.

***Eudontomyzon hellenicus* Vladykov, Renaud, Kott & Economidis, 1982**

uncatalogued; n = 2J; L; 23.8.2009; River Bistrica, upstream of village Čuka; Albania; leg. Šanda, R., Shumka, S.
These specimens are the first record of this species outside Greece. The locality is only second known area with confirmed occurrence of this species in the Ionian Sea basin.

***Eudontomyzon stankokaramani* Karaman, 1974**

P6p 84/2007; n = 7J; L; 25.7.2006; Ohrid Lake; Macedonia; leg. Šanda, R., Šedivá, A., Kohout, J.
This is interesting material: specimens were caught in the littoral of Ohrid Lake, at a polluted site in the mouth of the channel, which connects the Sateska River with the lake. The presence of *E. stankokaramani* in Lake Ohrid was mentioned by Holčík & Šorić (2004).

***Eudontomyzon vladykovi* Oliva & Zanandrea, 1959**

P6p 84/2007; n = 5J; L; 17.7.2006; River Crni Timok, Valakonje; Serbia; leg. Šanda, R., Šedivá, A., Kohout, J.
P6p 84/2007; n = 5J; L; 9.7.2006; River Petrinjčica, Miočinovići; Croatia; leg. Šanda, R., Šedivá, A., Kohout, J.

P6p 84/2007; n = 4A; L; April 2003; River Petrinjčica; Croatia; leg. Deliđ, A.
uncatalogued; n = 1J; L; 26.8.2008; River Una, Bihać; Bosnia and Herzegovina; leg.
Šanda, R., Deliđ, A.

These are important voucher specimens of *E. vladkyovi* from still inadequately known area
of the Sava River drainage in Croatia and Bosnia and Herzegovina, as well as from the
Timok River drainage in Serbia.

***Lampetra fluviatilis* (Linnaeus, 1758)**

P6V 5077; n = 1A; T; no data

P6V 5076; n = 1; SL; no data

P6V 6154-6158, 47658-47665; n = 13; SL; leg. Frič, V.; note: dates written on the original
labels of most of those skeletons (August 8th, 1911, November 30th, 1912, December
6th, 1912) most probably refer to the date of preparation of the skeletons.

P6V 6225; n = 1A; T; leg. Frič, V.

Catalogue I, no. d4; n = 1A; L; 1866 or earlier; note: although locality is not mentioned in
the catalogue, it is probable that this specimen originates from the Czech Republic, as
it was stored in the jar with the label “Czech fishes”, together with other old material
of fishes and lampreys from the country.

uncatalogued; n = 2A; L; note: these specimens could originate from the Czech Republic,
as they were stored in the jar with the label “Czech fishes”, together with another old
material of fishes and lampreys from the country.

uncatalogued; n = 1A; L; no data; note: this is most probably the specimen no. 160 in
Oliva (1995)

uncatalogued; n = 9A; L; leg. Frič, V.

uncatalogued; n = 4A; L; no data

uncatalogued; n = 2; AL; note: coloured preparation of the vascular system, an anterior
third of the body

In the ichthyologic collection of NM there are two taxidermies, 14 skeletons in liquid,
two anatomical preparations, and 17 whole specimens in liquid of *L. fluviatilis*. The loca-
lity of origin of any specimen in this material is unknown. *L. fluviatilis* was reported in the
past from the rivers Labe and Vltava in the Czech Republic (FRIČ 1859, 1872, 1908). The
distribution area is unclear. FRIČ (1859) mentioned that this species used to be sold at the
Prague fish market in the spring and that he had this species from one brook in Zbraslav
(south of Prague). Later, FRIČ (1872) noted that this species could have been occasionally
found at the Prague fish market after March and that it was a rare species. FRIČ (1872)
mentioned also that this species migrated through the Labe River upstream further than
Petromyzon marinus, up to the town Týniště nad Orlicí on the River Orlice. Later, MI-
CHEL (1929) in BENDA (2007/2008) mentioned a massive presence of *L. fluviatilis* in the
Ploučnice River in 1927. Most probably, *L. fluviatilis* occurs only in the lower Labe and
Vltava rivers. Its presence in Týniště nad Orlicí could be just a misidentification with *L.*
planeri, which still inhabits the Orlice River drainage (HANEL & LUSK 2002). OLIVA (1995)
measured one female (no. 160) from the collection of the National Museum. He assumed
that it was caught in the Czech Republic. This specimen was most probably identified
according to description in OLIVA (1995) during revision of the material for this work, see
list of material. Unfortunately, the edges of the label on the jar were destroyed and the
number mentioned by OLIVA (1995) is not visible. Furthermore, it is not clear why OLIVA

(1995) assumed that it originated from the Czech Republic. The label on the jar is from the 1930ties, and is blank, while there is no label in the jar.

HANEL (1996 a,b) and later HANEL & LUSK (2005) mentioned material of *L. fluviatilis* from the collection of NM (P6V 30099, 31118-31124). However, a careful revision revealed that these specimens are actually *L. planeri*. Nevertheless, some specimens of *L. fluviatilis* in the collection could be from the drainages of the rivers Labe and Vltava in the Czech Republic. FRIČ (1872) presented data about six specimens caught between March 29th, 1866 and April 25th, 1871, all from the Labe River near Mělník and the Vltava River in Prague. Three specimens of *L. fluviatilis* (see the list of material) were found in a bottle labelled “Czech fishes”, together with other old material of fishes and lampreys from the Czech Republic, partially individually labelled with localities and dates. We can speculate, that the three above mentioned specimens could be some of those mentioned by FRIČ (1872). Only one specimen was labelled precisely (catalogue I, no. d4). Unfortunately, there are no capture data in the catalogue. The catalogue I was written in 1866, thus this specimen could be one of the two specimens caught on March 29th and April 13th, 1866 (FRIČ 1872). Of the two other specimens, one was labelled just *Petromyzon fluviatilis*, while the other was unlabeled.

***Lampetra planeri* (Bloch, 1784)**

P6V 5078; n = 1A; T; Poděbrady; Czech Republic

P6V 5080-5081; n = 2A; L; no data

P6V 06159; n = 1; SL

P6V 6200; n = 1J; T; leg. Frič, V.

P6V 6228; n = 1J; T; 27.9.1967; brook in Bystřice near Hradec Králové; Czech Republic; leg. Čihař, J.

P6V 7815-7817; n = 3 (1A, 2J); L; 9.-14.6.1972; brooks around Horská Kvilda, Šumava Mts.; Czech Republic; leg. Čihař, J., Tauber, V.

P6V 31073; n = 1A; L; 8.7.1975; flume in Stožec, Šumava Mts.; Czech Republic; leg. Čihař, J., Tauber, V.

P6V 31074; n = 1J; L; 16.7.1975; right-handed inflow of River Vydra upstream of Rejštejn, Šumava Mts.; Czech Republic; leg. Čihař, J., Tauber, V.;

P6V 31090-31093; n = 4A; L; 1909; Strážov near Klatovy; Czech Republic; leg. Houška, J.

P6V 31094-31096; n = 3J; L; October 1954; River Vltava, Černá v Pošumaví; Czech Republic; leg. Milner

P6V 31099; n = 1J; L; 3.10.1897; Poděbrady; Czech Republic; leg. Frič, A.

P6V 31100-31107; n = 10(4A, 6J); L; 1955; Hostinné; Czech Republic; leg. Hnízdo

P6V 31118-31123; n = 6J; L; 1897; Poděbrady; Czech Republic; leg. Frič, A.

P6V 31124; n = 1J; L; 1897; Poděbrady; Czech Republic; leg. Hellich, J.

P6V 31125-28; n = 14 (10J, 4A); L; May 1911; leg. Frič, V.

P6V 31129; n = 1A; L; 1951; Kličava; Czech Republic; leg. Oliva, O.

P6V 31757-31789; n = 33 (4A, 29J); L; 13.5.1976; right-handed inflow of the River Stěnava near Starostín; Czech Republic; leg. Čihař, J., Tauber, V.

P6V 47667; n = 1; SL

P6V 80023; n = 22A; L; 27.5.1995; Lhota pod Kůstrým; Czech Republic; leg. Pojer, F.; note: ejected by an adult Black Stork (*Ciconia nigra*) while it was ringed

- P6V 80357; n = 5 (3A, 2J); L; 7.11.2002; River Divoká Orlice, Trčkov; Czech Republic; leg. Blahník, P.
- P6p 18/60/289; n = 1; SL; 1907; leg Frič, V.
- P6p 18/60/2; n = 1; SL
- P6p 100/76; n = 2 (1A, 1J); L; 19.6.1976; brook Chvalšinský potok; Czech Republic; leg. Čihař, J., Tauber, V.
- P6j 5/88; n = 1J; L; no data
uncatalogued; n = 2 (1A, 1J); L; 25.9.2003; River Loučná, Opočno; Czech Republic; leg. Šanda, R., Blahník, P.
- uncatalogued; n = 2A; L; 12.10.2005; brook Stebénka, Chloumek; Czech Republic; leg. Šanda, R.
- uncatalogued; n = 1A; L; 12.10.2005; brook Stebénka, Loktuše; Czech Republic; leg. Šanda, R.
- uncatalogued; n = 1J; L; 12.10.2005; brook Stebénka, Stebno; Czech Republic; leg. Šanda, R.
- uncatalogued; n = 1J; L; 5.11.2005; River Jizera, Bukovina; Czech Republic; leg. Šanda, R.
- uncatalogued; n = 1J; L; October 2005; River Svitávka, Kunratice; Czech Republic; leg. Šanda, R., Švátora, M.
- uncatalogued; n = 6J; L; July 1967; flume in Třebechovice; Czech Republic
- uncatalogued; n = 1J; L; 1902; Poděbrady; Czech Republic
- uncatalogued; n = 1; SL; Frič, V.
- uncatalogued; n = 3J; L; Poděbrady; Czech Republic; note: collected most probably in the period 1897-1902
- uncatalogued; n = 3J; L; probably August 1867; Brandýs nad Orlicí; Czech Republic
- uncatalogued; n = 2A; L; Hajnšbach; Czech Republic; leg. Klutschak; note: old material, most probably second half of the 19th century, exact locality unknown
- uncatalogued; n = 1A; L; 1863; Prague; Czech Republic; leg. Lokaj, E.
- uncatalogued; n = 13 (2A, 11J); L; 13.6.1976; brook in Pravětínská Lada; Czech Republic
- uncatalogued; n = 2J; L; Turnov; Czech Republic; leg. Maurer; note: old material, most probably second half of the 19th century
- uncatalogued; n = 7J; L; note – old material, most probably from the Czech Republic, second half of the 19th century
- uncatalogued; n = 16A; L; May 1909; leg. Frič, V.
- uncatalogued; n = 55A; L; May 1911; leg. Frič, V.
- uncatalogued; n = 1A; L; no data

In the ichthyologic collection of NM there are three taxidermies, five skeletons in liquid, and 228 whole specimens in liquid of *L. planeri*. However, only 132 specimens are with the exact locality marked, all being from the Labe River basin in the Czech Republic. This material provides several interesting historical records about the occurrence of *L. planeri* at some localities (e.g. Prague or Poděbrady). The specimens documenting Black Stork predation on lampreys (POJER & HANEL 1996) can be considered a very interesting material.

***Lampetra zanandreai* Vladykov, 1955**

P6V 80360-80363; n = 4J; L; 18.7.2002; River Morača, Golubovci; Montenegro; leg. Šanda, R.

P6V 80364; n = 1J; L; 17.9.2002; River Zeta, Glava Zete; Montenegro; leg. Šanda, R.

P6V 80365; n = 1A; L; 18.9.2002; River Zeta, Danilovgrad; Montenegro; leg. Šanda, R.

The taxonomic status of the freshwater lampreys from the Morača River drainage is not completely resolved, yet. Above mentioned material was independently determined by two experienced specialists, Claude Renaud and Juraj Holčík. However, ŠORIĆ (1998) mentioned presence of *L. planeri* in the Morača drainage. According to KOTTELAT & FREYHOF (2007), *E. stankokaramani* is the only non-migratory lamprey species inhabiting the Ohrid-Drin-Skadar system.

***Petromyzon marinus* Linnaeus, 1758**

P6V 5072; n = 1A; T; 1866; note: this specimen could originate from the Czech Republic, see comments

P6V 5073; n = 1; SL; 1900; leg. Frič, V.

P6V 5074; n = 1A; L; May 1857; River Labe near Mělník; Czech Republic; leg. Podhorský, H.

P6V 5075; n = 1A; L; 3.6.1869; River Vltava, Praha; Czech Republic; leg. Voithl; note: specimen caught under the Charles bridge

P6V 6144-6150, 6152, 47668-47671; n = 11; SL

P6V 6229; n = 1A; T; no data

P6p 18/60/86; n = 1A; T; leg. Frič, V.

P6d 150/2007; n = 1A; L; no data

uncatalogued; n = 1A; L; 1960; Adriatic Sea, former Yugoslavia; leg. Schwarz

uncatalogued; n = 1A; L; 1914; leg. Frič, V.

uncatalogued; n = 1A; L; 20.5.1913; leg. Frič, V.

uncatalogued; n = 9A; L; leg. Frič, V.

uncatalogued; n = 1A; L; note: this specimen could originate from the Czech Republic, as it was stored in a jar with labelled salmonids, all from the second half of the 19th century from the Czech Republic

uncatalogued; n = 4A; L; no data

In the ichthyologic collection of NM there are three taxidermies, 13 skeletons in liquid and 20 whole specimens in liquid of *P. marinus*. Only three specimens of these have a known locality of capture. One of them was caught in the Adriatic Sea near the coast of former Yugoslavia. The exact locality was not indicated in the label. However, *P. marinus* is quite rare in this area (HOLČÍK et al. 2004).

Two specimens were surely caught in the Czech Republic and represent the only extant material of this species from this country. Specimen P6V 5074 was caught in the River Labe near Mělník in May of 1857 and specimen P6V 5075 in the River Vltava under the Charles Bridge in Prague on June 3rd, 1869. Those two specimens are often reported in the literature, unfortunately, mostly with incomplete or wrong data. As the locality of capture of the specimen P6V 5074 it is mentioned only Czech Republic by OLIVA (1995) and HANEL (1996 b). According to the information in FRIČ (1859, 1872), the above mentioned

details on capture data were identified. For specimen P6V 5075, the locality was rightly recorded but year 1863 was presented as datum of capture by OLIVA (1995) and consequently in works of HANEL (1996a) and HANEL & LUSK (2005). This mistake was caused because OLIVA (1995) wrongly thought that the date 1863 included in the catalogue for this specimen is the date of the capture. In fact, this specimen was registered in the evidence as late as in the 1953, and the year in the catalogue was wrongly written. Moreover, there is an original hand written label in the jar, in which the locality and the year 1869 was included. The complete data presented about this specimen in this paper, including the name of the collector, are based on FRIČ (1872).

Furthermore, it is possible, that also taxidermied specimen P6V 5072 is from the Czech Republic. This specimen was included in the first catalogue, from 1866, under no. d5, without any note about its capture. It was taxidermied later by J. Štrofl, who began working in the museum in 1892 (ŠTĚPÁNEK 1975). FRIČ (1872) mentioned that only two specimens of *P. marinus* were collected before 1866, one of which recently labeled P6V 5074. The other was caught in May of 1865 in the Labe River near Prosmky (denominated Prosmik in FRIČ (1872)), now a part of town Lovosice. Finally, also one uncatalogued specimen could originate from the Czech Republic, as it was stored in a jar with individually labelled salmonids, which are all from the Czech Republic and were caught in the second half of the 19th century (see the list of specimens).

HANEL (1996 a,b) and HANEL & LUSK (2005) mentioned a juvenile specimen of *P. marinus* from the Labe River at Poděbrady caught in 1866 under the number P6V 31130. According to the evidence book, it was collected by A. Frič in 1866. However, it was not included in the preliminary evidence earlier than in 1975. There is no specimen of juvenile *P. marinus* in the ichthyologic collection of NM. Furthermore, only specimens of lampreys from Poděbrady are both catalogued and uncatalogued ammocoetes of *L. planeri*. None of them is labelled with year 1866. Most probably, some of the uncatalogued *L. planeri* is the specimen P6V 31130, which was not labelled when evidenced. More lampreys catalogued in the year 1975 were not labelled and there are mistakes in identification and capture data.

Class: Myxini

Order: Myxinifomes

Family: Myxinidae

***Myxine glutinosa* Linnaeus, 1758**

Catalogue III, no. 582; n = 1; L; 1896; Sweden; leg. Deyl, E.

Myxinidae indetermined

P6V 6153, 47702-47705 and P6p 18/60/268; n = 6; SL

P6V 6269; n = 1; T; leg. Frič, V.

Catalogue III, no. 1383; n = 1; L; 1899; leg. Frič, V.; note: originally labelled *Bdellostoma polytrema*

uncatalogued; n = 17; L; 22.6.1912; Yokohama; Japan; leg. Owston, A.

uncatalogued; n = 1; L; Japan; leg. Frič, V.

uncatalogued; n = 4; L; May 1898; Chile; note: originally labelled *Bdellostoma* from Chile

uncatalogued; n = 6; L; 22.6.1912; note: originally labelled *Bdellostoma burgeri*
uncatalogued; n = 18; L; 31.3.1911; note: originally labelled *Bdellostoma burgeri*
uncatalogued; n = 2; L; 1905; leg. Frič, J.
uncatalogued; n = 1; L; leg. Frič, V.
uncatalogued; n = 2; L; no data

Only one specimen of hagfishes was unambiguously determined. The determination is complicated by the fact, that 37 specimens are without locality and 22 originate from the Pacific Ocean. To avoid mistakes, the rest of the material is presented just as undetermined Myxiniidae, with available data about the specimen.

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Shrnutí

Článek přináší přehled 425 položek bezčelistnateců (sliznatek a mihulí) uložených ve sbírkách Národního muzea v Praze. Doklady sliznatek (60 položek) nejsou většinou přesně determinovány (až na jeden exemplář sliznatky *Myxine glutinosa*). Kolekce mihulí obsahuje 365 jedinců náležících do tří rodů a osmi druhů (*Petromyzon marinus*, *Lampetra planeri*, *L. fluviatilis*, *L. zanandreaei*, *Eudontomyzon danfordi*, *E. hellenicus*, *E. vladkykovi* and *E. stankokaramani*).

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