



Catalogue of the cetaceans (Mammalia: Cetacea) in selected collections of the Czech Republic, with special respect to the collection of the National Museum, Praha

Jan Robovský¹ and Petr Benda^{2, 3}

¹Department of Zoology, Faculty of Biological Sciences, University of South Bohemia, Branišovská 31, CZ-370 05 České Budějovice, Czech Republic; e-mail: jrobovsky@seznam.cz

²Department of Zoology, National Museum, Václavské nám. 68, CZ-115 79 Praha 1, Czech Republic; e-mail: petr.benda@nm.cz

³Department of Zoology, Charles University, Viničná 7, CZ-128 44 Praha 2, Czech Republic

ABSTRACT. A commented list of cetacean specimens deposited in four main collections in the Czech Republic is presented. The collections include: Department of Zoology, National Museum, Praha; Department of Zoology, Faculty of Science, Charles University, Praha; Institute of Anatomy, First Faculty of Medicine, Charles University, Praha; and Institute of Histology and Embryology, Faculty of Medicine in Plzeň, Charles University, Plzeň. These collections contain 2324 specimens of cetaceans, which belong at least to 24 species from nine families: Balaenidae, Balaenopteridae, Delphinidae, Monodontidae, Phocoenidae, Physeteridae, Platanistidae, Iniidae, and Ziphiidae. Two specimens of another species, *Balaena mysticetus*, have been reported from two other places by literature. The revised Czech collections possess 28.6% of currently recognized cetacean species, and 82% of cetacean families (only Eschrichtiidae and Neobalaenidae are not represented). Most specimens are complete mounted skeletons of *Balaenoptera physalus* and *B. acutorostrata*.

■ Cetacea, museum collections, catalogue.

INTRODUCTION

Cetacean specimens are generally rare in institutional collections, and considering the fact that the Czech Republic is an inland country, expected numbers of such specimens in Czech zoological collections are not high. Indeed, in comparison with other mammal groups, the cetaceans are represented here in relatively small numbers. The largest collection is housed in the National Museum, Praha, but smaller interesting collections were located in three further institutions (see below). Thus far, only minor parts of the cetacean collections housed in the National Museum (Heráň 1966, 1968a, b, Mazák 1976, Neumanová 1997) and in other Czech collections (Mazák & Honců 1983, Mazák 1988) were published.

In this paper we present a revised list of cetacean specimens from three large Czech collections (see below for their list) and add comments on a few cetacean specimens deposited in other Czech collections.

In the course of the taxonomic history of the Cetacea, splitting and lumping of individual taxa repeatedly alternated. Recently, many forms have been lumped in one taxon on the basis of the results of molecular analyses. On the other hand, new forms were detected owing to higher molecular differentiation. For our aim we prefer a splitter mode (e.g. Reeves et al. 2002 and Mead & Brownell 2005, but not Ridgway & Harrison 1989a, b,

1994, 1999). Although some newly separated forms could be very similar to the taxon, in which they were integrated according to the lumped approach), they are in some cases morphologically well identifiable. As a standard reference for the cetacean taxonomy and species content, we used the most recent review by Mead & Brownell (2005).

MATERIAL AND METHODS

We revised cetacean collection parts in the collections listed below in the section ‘Collection acronyms’. In addition, we included in our list data on the specimens from the collection of IHEMF, which were kindly provided by Jitka Kočová and Zbyněk Tonar (IHEMF) and of DCGJ and RMCL. We attempted to identify all skulls using cranial and dental characters. Where only postcranial material or other parts were available, the specific or generic identification is considered only approximate (cf.). The material was identified by the first author (JR) with the use of the following published sources: Hall & Kelson (1959), Van Bree & Purves (1972), Van Bree & Gallagher (1978), Slijper & Harrison (1979), Sokolov (1979), Pilleri et al. (1982), Ridgway & Harrison (1989a, b, 1994, 1999), von Robineau et al. (1994, 1995), Cabrera (1998), Archer & Perrin (1999), Carwardine (2000), Wang et al. (2000), Reeves et al. (2002) and Kemper (2004). Determination of the vertebrae was based mainly on the data by De Castro Fettuccia & Simões-Lopes (2004) and partly also on those by Buchholz & Schur (2004).

Most specimens represent osteological material, the exceptions are exactly noted (alcohol or stuffed specimens). Original Czech descriptions and/or notes on labels attached to specimens or written on specimens are translated to English and given between quotation marks.

We measured skulls (lengths and widths of skull and rostrum, mandible length), isolated vertebrae, penes and narwhal tusks in a standard way (Robineau et al. 1994, 1995). We did not measure forelimbs and scapulae due to their limited diagnostic value. Teeth were measured and taken into consideration in identification of some species, but the data are not presented here due to their variability and/or to their limited diagnostic value. Unless specified, measurements are given in millimetres. Approximate data (ca.) are given when specimens could not be measured exactly due to their preservation and/or inaccessibility, or if they were damaged.

The taxonomic arrangement follows Mead & Brownell (2005).

ABBREVIATIONS

Collection acronyms:

DCGJ – Decanal church of Saint Francis the Seraphic in Golčův Jeníkov

IAMF – collection of the Institute of Anatomy, First Faculty of Medicine, Charles University, Praha, presently deposited in the Institute building at U nemocnice 3, Praha 2 (for details concerning the collection see Seichert et al. 2006);

IHEMF – Institute of Histology and Embryology, Faculty of Medicine, Charles University, Plzeň; currently deposited in the Institute’s building at Karlovarská 48, Plzeň;

ISZ – Department of Zoology, Faculty of Science, Charles University, Praha; currently deposited in its building at Viničná 7, Praha 2;

NMP – National Museum (Natural History), Praha (collection numbers with prefixes

‘P6V’); currently deposited partly in the main museum’s building at Václavské náměstí 68, Praha 1, and partly in the Museum’s depository in Cirkusová 1740, Praha 9; RMCL – Regional Museum in Česká Lípa; currently deposited in the Museum’s building at Náměstí osvobození 297, Česká Lípa.

Measurements: AVH – anterior vertebral height; AVW – anterior vertebral width; BL – baleen length; CA – circumference at apex of penis or narwhal tusk; CB – circumference of the base of penis or narwhal tusk; CBL – condylobasal length; CM – circumference of the middle portion of penis or narwhal tusk; CRL – crown-rump body length; DA – diameter of apex; DB – diameter of the base of baleen, penis, narwhal tusk or isolated teeth (cf. *Orcinus*); DM – diameter of the middle portion of baleen, penis, narwhal tusk or isolated teeth (cf. *Orcinus*); ML – mandible length; MH – coronoid height of mandible; NTL – narwhal tusk length; OL – orbital length; OV – vertebrae number; PL – penial length; PRL – pelvic rudiment width; PRLl – pelvic rudiment width on the left side; PRLr – pelvic rudiment length on the right side; PRW – pelvic rudiment width; PRWl – pelvic rudiment length on the left side; PRWr – pelvic rudiment length on the right side; PVH – posterior vertebral height; PVW – posterior vertebral width; RL – rostrum length; RW – rostrum width at base; SL – skeleton length; TL – total body length (in embryological material it could mean the length of the preserved part of the specimen); VH – height of vertebral or intervertebral disc; VL – vertebra length; VSPL – length of spinal process of the vertebra (*processus spinosus*); VTPL – length of transverse process of a vertebra (*processus transversus*); VW – vertebral or intervertebral disk width; ZW – zygomatic width of skull.

Data on specimens: AN – accesite number; ATNU – alveoli and teeth number in upper jaw; ATNL – alveoli and teeth number in lower jaw; ATNUL – alveoli and teeth number in left upper jaw; ATNUR – alveoli and teeth number in right upper jaw; ATNLL – alveoli and teeth number in left lower jaw; ATNLR – alveoli and teeth number in right lower jaw; N – note; n – number; O – geographical and/or temporal origin; OD – original description or note (other than the inventory number); RN – number of ribs. ATNUL, ATNUR, ATNLL, ATNLR, PRLl, PRLr, PRWl, and PRWr are mentioned where different measurements for the objects from left and right body side were obtained.

THE CATALOGUE

Balaenidae

Balaena mysticetus Linnaeus, 1758

RMCL 5281 and 5282: pair of mandibles. O: unknown, perhaps North Sea, Norway (Mazák & Honců 1983, Mazák 1988); OD: absent. Note: The pair of whale mandibles in the collection of RMCL was identified and described by Mazák & Honců (1983). Since 1976, the mandibles are installed in their natural position in an exhibition hall of the Museum (Mazák 1988). The bones came to the Museum from a private collection of Heinrich Wedrich (1835–1904), a manufacturer at Česká Lípa, well known for his interest in natural history and his rather extensive zoological collection. Wedrich frequently travelled abroad and toward the end of the 19th century he paid several visits to various countries of northern and northwestern Europe, always taking pains to obtain new items for his collection. It is thus probable that the whale jaw bones were acquired in the course of one of these trips – it is only a matter of regret that there is no written evidence, as far as our knowledge goes at least, such as could make the origin of the bones more exactly

known. According to the data by Mazák & Honců (1983), the greatest direct length of the left mandible (RMCL 5282) is 571 cm and of the right one (RMCL 5281) 561 cm, the length along the outer curvature is 595 and 585.5 cm, respectively; for other detailed measurements see Mazák & Honců (1983). They estimated the total body length of this individual at somewhere between 16–16.3 m, which indicates a big female. Both mandibles are complete and relatively well preserved; except their middle parts that had been somewhat damaged on the lateral surfaces and had to be fixed with a plaster (see the figure by Mazák 1988).

DCGJ, unnumbered: hemimandible, right scapula, cervical rib. O: unknown, possibly North Sea, obtained between 1618–1648 in Stralsund, Germany, by M. M. Goltz (Skřivánek 2003); OD: absent (Mazák 1988). Note: Mazák (1988) described a surprising finding of one mandible (hemimandible), right scapula, and a cervical rib of *B. mysticetus* in DCGJ. All bones were perfectly preserved. This rare and historically unique cetacean material (the oldest known whale specimen in the Czech Republic) was brought as a war loot by the imperial armourer General Martin Maxmillian Goltz [“Golč”] (1590–1653) during the Thirty Years’ War (1618–1648) from Stralsund, Germany (Skřivánek 2003). Greatest direct length of the mandible is 575 cm, its length along the outer curvature is 610 cm. The total body length of this specimen was estimated at somewhere 17–17.5 m (Mazák 1988).

Note: The distribution of *B. mysticetus* has a relic character in high circumpolar latitudes in of the Northern Hemisphere and this species is highly endangered (Reeves et al. 2002). These facts underline the scientific as well as historical value of these rare specimens.

***Eubalaena* Gray, 1864 sp.**

ISZ, unnumbered: one baleen. O: unknown; OD: absent. BL = ca. 1650 (apex broken); DB = 130–140. N: colour black.

Note: Three species are currently recognized in the genus *Eubalaena* Gray, 1864 (see Reeves et al. 2002, Mead & Brownell 2005), incl. *Eubalaena glacialis* (Müller, 1776) in the North Atlantic, *E. japonica* (Lacépède, 1818) in the North Pacific, and *E. australis* (Desmoulins, 1822) in the Southern Hemisphere. The state of preservation of the baleen specimen in ISZ does not allow for species determination.

cf. *Balaenidae* Gray, 1821

ISZ, unnumbered: apex of the penis and transversal section of the penis. O: unknown; OD: “23/108 (possibly 23/198), *Balaena* sp. transversal section of penis, noticeable corp. cavernosa penis and urethrae, urethra”. N: specimen coming probably from the collection by prof. L. Freund.

Balaenopteridae

***Balaenoptera acutorostrata* Lacépède, 1804**

ISZ OM-124: 27–28 baleen. O: unknown; OD: “gift by Dr. Anděra”. BL = 250–290; DB = 130–210. N: colour beige.

IAMF 1089: complete skeleton mounted for exhibition. O: possibly the Baltic Sea (Mazák 1988); OD: absent. SL = 7700 (Mazák 1988). Note: The mounted skeleton of *B. acutorostrata* installed for exhibition in IAMF (Fig. 1) represents one of two complete skeletons of large whales exhibited in the Czech Republic (Mazák 1988). This specimen is assignable to the subspecies *B. a. acutorostrata*.



Fig. 1. The complete mounted skeleton of the Common minke whale (*Balaenoptera acutorostrata*; IAMF 1089) installed for IAMF exhibition. Photo by Alexander Pospěch.

IAMF D24/10 and 24/11: baleen. O: unknown; OD: absent. BL (D24/10 / D24/11) = 125 / 140; DB = 47 / 62. N: two fragment with baleen – one with 12 and other with 26 baleen; their colour is beige.

Balaenoptera cf. acutorostrata

NMP 47899: complete embryonal skeleton in alcohol. O: unknown; OD: “a whale skeleton of so small stage, that the places of the latter baleen seem to appear to be teeth, AN 14/60/497, store of natural products by V. Frič, Prague, No. 1544-II”. OV = 47–48; ATNUL = 24–25; ATNUR = 22; ATNLL = 11; ATNLR = 6–12; N: this preparation was previously mentioned by Neumanová (1997), with its skeleton length of 600 mm; we found these data: SL = ca. 530, CBL = ca. 153, ML = ca. 140, OL = ca. 25; RN = 11 pairs; fingers shrunken.

NMP 47900: complete embryonal skeleton in alcohol. O: unknown; OD: “*Balaenoptera rostrata* (skeleton of *Physalus antgusi* (?))”. OV = 61–62. N: Neumanová (1997) previously mentioned this preparation, with its skeleton length of 1000 mm; we found these data: SL = ca. 930, CBL = ca. 220, ML = ca. 195, OL = ca. 40; RN = 15 pairs; fingers normal.

NMP 91019: foetus in alcohol; whole body. O: unknown; OD: “AN 14/60/5830”. BL = ca. 600; eye length = ca. 10; flipper length = ca. 70; largest flipper height = ca. 25; dorsal fin length = ca. 35; dorsal fin height = ca. 22. N: direct width of the fluke immeasurable. About 41 throat pleats are present. The coloration pattern is similar to *B. acutorostrata* spp. (Arnold et al. 1987, Reeves et al. 2002).

Note: Based on morphological and genetic characters and differences in skin coloration, *Balaenoptera acutorostrata* s.l. has been recently split to two species (see Reeves et al. 2002, Mead & Brownell 2005), Common minke whale (*B. acutorostrata* s. str.) of the cosmopolitan distribution, and Antarctic minke whale (*B. bonaerensis* Burmeister, 1867) of the Southern Hemisphere.

***Balaenoptera borealis* Lesson, 1828**

NMP 90978: one baleen. O: unknown; OD: absent. BL = ca. 650; DB = 240; DM = 185. N: colour black.

IAMF D24/8: 15 baleen. O: unknown; OD: absent. BL = 740; DB = 135. N: colour black.

IAMF D24/23: three baleen. O: unknown; OD: absent. BL = 670; DB = 150. N: colour black.

Balaenoptera cf. borealis

ISZ, unnumbered: one baleen. O: unknown; OD: “2839”. BL = 690 (at apex broken or cutted); DB = 130; DM = 123. N: colour black.

Note: The Sei whale (*B. borealis*) is distributed worldwide from tropical waters to high latitudes, but this range is maybe splitted into various populations of each major oceanic region (see Reeves et al. 2002). However, their systematic validity is questionable, mainly for the limited data on individual movements.

***Balaenoptera physalus* (Linnaeus, 1758)**

NMP 9855: complete skeleton of an adult female, mounted for exhibition. O: stranded in November 1885, Lyngøy Island, Bergen Region, Norway (Mazák 1976, 1988); obtained in 1894, Bergen, Norway (Štěpánek 1960, Heráň 1968a). SL = 22500 (Mazák 1976); OV = 62. Note: Denkstein et al. (1955) and Štěpánek (1975) briefly and Mazák (1976, 1988) in detail described the history of the complete mounted skeleton of the Fin whale (*Balaenoptera physalus*) exhibited for public in NMP. Mazák (1976) summarised: “One of the most attractive specimens in the collections of the Zoological Department of the National Museum in Prague is undoubtedly the complete whale skeleton which is on display in the Gallery of Mammals. This skeleton is one of very a few large whale skeletons that are kept in various museums of the whole world and is remarkably well preserved. The Prague whale skeleton is that of a large female of the Fin Whale, *Balaenoptera physalus*, which was stranded in November 1885 on a rocky shore of the Lyngøy Island in the Bergen area of South Norway (ca. 60° 40' N, 4° 45' E). The late Professor Antonín Frič, then the Chief of the Zoological and Palaeontological Departments, became immediately interested in getting the skeleton of the stranded animal for collection of the National Museum and the financial help from a patriotic party called ‘Jour fixe’ rendered it possible. The skeleton had been bought for a price of 2500 guildens, this being at that time a rather considerable sum of money, and transported – with a certain amount of difficulty – to Prague. Citizens of Prague had their first chance to admire the huge body frame of the sea-giant in November 1888 when it was on display in the then Náprstek’s Industrial Museum (now Náprstek Museum of Asian, African and American Cultures) on Betlémské Square in Prague’s Old Town. When the new building of National Museum on St. Wenceslas Square [Václavské náměstí 68, present-days the main museum building] was completed in 1892, the skeleton was installed in state in the Hall No. 10 (today’s Gallery of Mammals) when it can be seen up to the present. Originally, the skeleton was sustained by a massive metallic construction on which it rested for more than seventy years and only in the framework of the general reconstruction of the zoological collections, that took place from 1965 to 1968, was it re-installed. The re-installation was executed in 1967 and since then the Fin Whale skeleton makes a true dominant to the Gallery of Mammals, being suspended on ten complex steel-pendants from the ceiling above heads of visitors. The skeleton has the length of 22½ metres (73 ft. 8 ins.) and weights 4030 kilograms (8884 lbs.), of which the skull and lower jaws alone would turn the scale at 1553 kilograms (3424 lbs.)” The skeleton still remains in the state described by Mazák

(1976). Obenberger (1949), Denkstein et al. (1955) and Mazák (1976, 1988) published also the photographs illustrating the history and present installation of the skeleton in the NMP exhibition; the photograph of the present position of this skeleton is also included in the the lastly issued guide-book to the natural history exhibition of NMP (Anděra et al. 1999).

NMP 90979: one baleen. O: unknown; OD: absent. BL = ca. 680, DB = 205, DM = 205. N: colour greenish yellow (from waxy to brownish tinge).

NMP 90980: one baleen. O: unknown; OD: absent. BL = ca. 590; DB = 110. N: colour greenish yellow with dark stripes.

ISZ OM-101/1: one baleen. O: unknown; OD: absent. BL = 470–490; DB = 140 (but maybe sheared). N: colour yellow with darker (black or olivaceous) stripes.

cf. *Balaenoptera physalus*

ISZ, unnumbered: clitoris in alcohol. O: unknown; OD: “XLI-88, 23/107, clitoris of whale (*Balaenoptera physalus*), collected by prof. L. Freund”.

ISZ OM-18: one *bullae ossaeae*. O: Trinity Bay, Newfoundland, Canada, summer 1967, leg. R. Riewe; OD: “OM 18, bone labyrinth, *Balaenoptera physalus*”. Length = 121, height from the left to right: 91-82-79.

cf. *Balaenoptera Lacépède, 1804*

ISZ, unnumbered: dissected eye in alcohol. O: unknown; OD: “XLI-34b, 23/106, *Balaenoptera* sp., eye, lg. Prof. L. Freund”. N: dissection of the eye with the iris, a half of eyeball and a half of eyeball with lens.

ISZ, unnumbered: whole eyeball in alcohol. O: unknown; OD: “*Balaenoptera* sp., XLI-34a, 23/109”. N: specimen coming probably from the collection created by prof. L. Freund.

cf. *Balaenopteridae* Gray, 1864

IAMF D16/14: large thoracic vertebra. O: unknown; OD: “D16/14, *vertebra thoracica*, *Balaenopteridae*”. AVH = 235; AVW = 315; PVH = 230; PVW = 310; VTPL = 410; VSPL = ca. 460; VL = 240.

Delphinidae

***Delphinus* cf. *capensis* Gray, 1828**

NMP 24689: skull without hyoid bones. O: unknown; OD: “*Delphinus delphis*, AN 14/60 1358”. CBL = 425; ZL = 165; RL = 265; RW = 81; ML = 358; MH = ca. 59; ATNU = 48; ATNL = ca. 48.

NMP 25967: skull without hyoid bones. O: unknown, probable year of coll. 1908; OD: “*Delphinus delphis* n. 29 [on the skull], AN 14/60 1357”. CBL = 445; ZL = 179; RL = 280; RW = 83.5; ML = 371; MH = 63.5; ATNU = ca. 49; ATNL = ca. 46.

Note: Long-beaked common dolphin (*Delphinus capensis*) is currently considered a separate species differing from *D. delphis* in body proportions, skin coloration, skull shape and genetic characters (Reeves et al. 2002, Mead & Brownell 2005). In both NMP specimens, the rostrum/skull width ratio corresponds to *Delphinus capensis* (according to van Bree & Purves 1973) (Fig. 2), but the dentition could correspond to *D. capensis* and also to *D. delphis*.

***Delphinus delphis* Linnaeus, 1758**

NMP 24690: skull without hyoid bones. O: unknown; OD: “*Delphinus delphis*, AN 14/60 1359”. CBL = 445; ZL = 188; RL = 269; RW = 90; ML = 363; MH = 64.5; ATNU = ca. 46; ATNL = ca. 46.

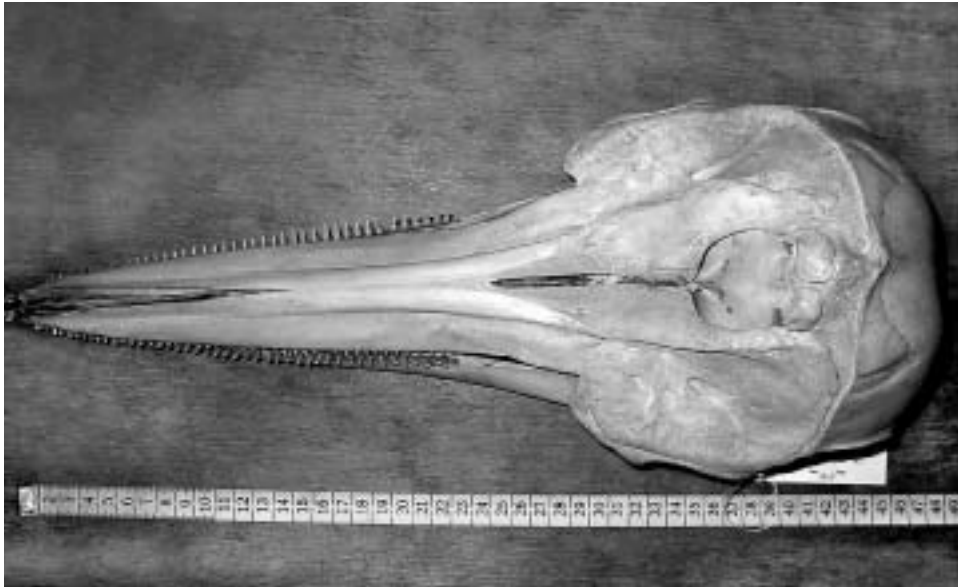


Fig. 2. Skull of the Long-beaked common dolphin (*Delphinus capensis*; NMP 25967). Dorsal view.

NMP 24691: skull without hyoid bones. O: unknown, coll. date 10 April 1914; OD: “*Delphinus delphis* n. 49, AN 14/60 1360”. CBL = 410, ZL = 168, RL = 256, RW = 83, ML = 350, MH = 60. ATNU = ca. 45, ATNL = 48.

NMP 24692: skull without hyoid bones. O: unknown; OD: “*Delphinus delphis*, AN 14/60 1361”. CBL = 473; ZL = 192; RL = 300; RW = 86.5; ML = 386; MH = 71; ATNU = 42; ATNL = 43–44. N: although the rostrum/skull width ratio could imply to the species identification of *Delphinus capensis* (according to van Bree & Purves 1973), but the dentition correspond to *Delphinus delphis*.

NMP 24693: skull without complete hyoid bones. O: unknown; OD: “*Delphinus delphis*, n. 39 [on the skull], AN 14/60 1362”. CBL = 330; ZL = 143; RL = 178; RW = 62; ML = 276; MH = 49; ATNU = 46–48; ATNL = 44. N: only posterior parts of hyoid bones present.

NMP 24694: complete disarticulated skeleton. O: unknown; OD: “*Delphinus delphis*, AN 14/60 1363”. CBL = 359; ZL = 138; RL = 199; RW = 65; ML = 287; MH = 52; ATNU = ca. 47; ATNL = ca. 46.

NMP 24695: skull without hyoid bones. O: unknown; OD: “*Delphinus delphis* n. 37 [on the skull], AN 14/60 1364”. CBL = 420; ZL = ca. 178; RL = 259; RW = 83; ML = 350; MH = 65; ATNU = 48; ATNL = 43.

NMP 24696: complete skull. O: unknown; OD: “*Delphinus delphis*, AN 14/60 1365”. CBL = 425; ZL = 176.5; RL = 268; RW = 88; ML = 364; MH = 65; ATNU = 37; ATNL = 40–41.

NMP 24697: skull without hyoid bones. O: unknown; OD: “*Delphinus delphis*, AN 14/60 1366”. CBL = 395; ZL = 159; RL = 238; RW = 79; ML = 328; MH = 58; ATNU = 48; ATNL = 44.

NMP 24698: skull without hyoid bones. O: unknown; OD: “*Delphinus delphis*, AN 14/60 1367”. CBL = ca. 380; ZL = 162; RL = ca. 235; RW = 76; ML = 330; MH = 61; ATNU = 43; ATNL = 42. N: rostrum bent.

NMP 24699: skull without hyoid bones. O: unknown, probable coll. year 1914; OD: “*Delphinus delphis* n. 52, AN 14/60 1368”. CBL = 407; ZL = 171; RL = 249; RW = 84; ML = 349; MH = 58. ATNU = 54, ATNL = 47.

NMP 24700: skull without hyoid bones. O: unknown, coll. date 14 August 1913; OD: “*Delphinus delphis* n. 50, AN 14/60 1790”. CBL = ca. 353; ZL = ca. 148; RL = ca. 210; RW = 73; ML = 308; MH = 54; ATNU = ca. 47; ATNL = ca. 49. N: the rostral cartilage getted stuck, it could indicate a rostral deformation.

NMP 24701: skull without hyoid bones. O: unknown; OD: “*Delphinus delphis*, AN 14/60 1791”. CBL = 435; ZL = 174; RL = 267; RW = 83; ML = 375; MH = 66; ATNU = 42–43; ATNL = 44.

NMP 24702: skull without hyoid bones. O: unknown, probable coll. year 1913; OD: “*Delphinus delphis*, AN 14/60 1792”. CBL = 450; ZL = 184; RL = 280; RW = 91.5; ML = 376; MH = 69.5; ATNU = ca. 46; ATNL = ca. 47. N: on the caudal part of palate a longitudinal gap is visible that indicate one serious inflammation centrum – the left part of the upper teeth row is moreover deformed. The second potential inflammation centrum is located on the right side of mandible (below the posterior part of the lower teeth row) – the mandible and the most posterior part of this tooth-row are strongly deformed. In fact, the second inflammation centrum perforated the mandible from the labial to the lingual part.

NMP 24703: skull without hyoid bones. O: unknown; OD: “*Delphinus delphis*, AN 14/60 1793, n. 42 [on the mandible]”. CBL = 448; ZL = 184; RL = 280.5; RW = 88; ML = 372; MH = 68; ATNU = ca. 45; ATNL = ca. 43.

NMP 24704: complete disarticulated skeleton with complete skull. O: unknown, coll. date 31 June 1905; OD: “*Dephinus delphis* n. 15, AN 14/60 1794, length = 155 cm, body 115 cm, skull 40 cm, n. 316 , 1 go5, once degreased, but it should be degreased still once”. CBL = 386; ZL = 153.5; RL = 226; RW = 72.5; ML = 326; MH = 59; PRL = 46–46.5; PRW = 6–6.5. N: ATNU and ATNL immeasurable (teeth completely covered by a paper-foolium).

NMP 90983: skull without hyoid bones. O: unknown; OD: “*Delphinus delphis* n. 53, m II. H”. CBL = 360; ZL = 155; RL = 223.7; RW = 72.6; ML = 318; MH = 59; ATNU = 47; ATNL = 44.

NMP 90986: skull without hyoid bones. O: unknown; OD: “n. 33, *Delphinus delphis*”. CBL = 340; ZL = 141; RL = 195; RW = 67.3; ML = 284; MH = 52; ATNU = 52; ATNL = 47.

NMP 90989: fragmented skull with a small rest of hyoid bones, without mandibles. O: unknown; OD: “n. 9”. CBL = ca. 330; ZL = immeasurable; RL = ca. 165; RW = ca. 90; ATNU = ca. 45. N: skull strongly damaged, third part of the braincase is absent.

NMP 90990: partly broken skull without mandibles and hyoid bones, one isolated bulla. O: unknown; OD: “*Delphinus* n. 17, V. Frič, Z=33 cm, degreased”. CBL = ca. 346; ZL = 134.5; RL = ca. 175; RW = 62; ATNU = ca. 43. N: braincase partly broken.

NMP 91010: skull without hyoid bones. O: unknown; OD: “41(?)”. CBL = 455; ZL = 190; RL = 283; RW = 88; ML = 378.5; MH = 67.5; ATNU = 47; ATNL = 44.

NMP 91018: skull without hyoid bones. O: unknown; OD: “dolphin, cranium”. CBL = 445; ZL = 188; RL = 274; RW = 90; ML = 380; MH = 71.5; ATNU = ca. 46; ATNL = ca. 43. N: skull mounted with mandibles.

ISZ OM-65: skull without hyoid bones. O: unknown; OD: “OM 65, or H 218”. CBL = 425; ZW = 175; RL = 271.5; RW = 87.5; ML = 370; MH = 61; ATNU = ca. 44; ATNL = 45. N: the specimen is similar to *Delphinus capensis* (see van Bree & Purves 1973) based its rostrum/skull widths ratio, but based on the dentition and in the general shape it corresponds to *Delphinus delphis*.

ISZ H-206: skull without hyoid bones. OD: “H 206 (1045)”. CBL = ca. 410; ZW = 184; RL = ca. 272; RW = 85; ML = 366; MH = ca. 66; ATNU = ca. 38 (but partly pasted) ; ATNL = 44–46. N: rostrum broken in its middle part; occipital condyls partly cutted.

IAMF D24/5: skull without hyoid bones. O: unknown; OD: absent. CBL = 465; ZW = ca. 185; RL = 294; RW = 98; ML = 390; MH = 85; ATNU = 41; ATNL = 45–47. N: part of the skull broken.

cf. *Delphinus delphis*

NMP 24329: left forelimb with scapula. O: unknown; OD: “AN 14/60 3124, *D. d.* n. 47, coll. V. Frič”. N: one finger broken at its apex; the posterior edge of the scapula broken.

NMP 24330: left forelimb with scapula. O: unknown; OD: “AN 14/60 3126, *D. d.* n. 52, coll. V. Frič”. N: in perfect condition.

NMP 24331: left forelimb with scapula. O: unknown; OD: “AN 14/60 3127, *D. d.* n. 48, coll. V. Frič”. N: in perfect condition.

NMP 24332: left forelimb with scapula. O: unknown; OD: “AN 14/60 3128, *D. d.* n. 61, right [on the bone], coll. V. Frič”. N: the left forelimb, not right.

NMP 24333: left forelimb with scapula. O: unknown; OD: “AN 14/60 3130, *D. d.* n. 64, coll. V. Frič”. N: in good condition.

NMP 24334: left forelimb with scapula. O: unknown, coll. date 10 January 1903; OD: “AN 14/60 3132, *D. d.* n. 11, without scapula, coll. V. Frič”. N: several fingers broken.

NMP 24335: left forelimb with scapula. O: unknown, coll. date 27 January 1906; OD: “AN 14/60 3134, *D. d.* n. 37, coll. V. Frič”. N: in perfect condition.

NMP 24336: left forelimb with scapula. O: unknown; OD: “AN 14/60 3136, *D. d.* n. 50, coll. V. Frič”. N: several fingers broken; the posterior edge of the scapula broken.

NMP 24337: left forelimb with scapula. O: unknown, coll. date 20 June 1903; OD: “AN 14/60 3137, hand of *D. d.* n. 17, coll. V. Frič”. N: two fingers partly broken.

NMP 24338: left forelimb with scapula. O: unknown, coll. date 13 May 1905; OD: “AN 14/60 3140, *D. d.* n. 34, coll. V. Frič”. N: anterior edge of the scapula broken.

NMP 24339: left forelimb with scapula. O: unknown; OD: “AN 14/60 3143, *D. d.* n. 54, coll. V. Frič”. N: several fingers partly broken.

NMP 24340: left forelimb with scapula. O: unknown; OD: “AN 14/60 3145, coll. V. Frič, n. 55”. N: in perfect condition.

NMP 24341: left forelimb with scapula. O: unknown; OD: “AN 14/60 3148, *D. d.* n. 44, coll. V. Frič”. N: one finger broken at its apex.

NMP 24342: right forelimb with scapula. O: unknown; OD: “AN 14/60 3125, *D. d.* n. 53, coll. V. Frič”. N: one finger broken.

NMP 24343: right forelimb with scapula. O: unknown; OD: “AN 14/60 3129, *D. d.* n. 63, right, coll. V. Frič”. N: in perfect condition.

NMP 24344: right forelimb with scapula. O: unknown; OD: “AN 14/60 3131, *D. d.* n. 62, left, coll. V. Frič”. N: in good condition.

NMP 24345: right forelimb and left scapula. O: unknown; OD: “AN 14/60 3133, *D. d.* n. 46 [on the scapula], coll. V. Frič”. N: one finger and the posterior edge of the scapula broken.

NMP 24346: right forelimb with scapula. O: unknown; OD: “AN 14/60 3135, *D. d.* n. 53, coll. V. Frič”. N: in perfect condition.

NMP 24347: left forelimb without scapula. O: unknown; OD: “AN 14/60 3139, hand of dolphin, *D. d.* n. 38, without scapula, brought 279i. 1906, m., coll. V. Frič”. N: forelimb broken into two pieces; one finger broken.

NMP 24348: right forelimb with scapula. O: unknown; OD: “AN 14/60 3141, *D. d.* n. 55, coll. V. Frič”. N: in perfect condition.

NMP 24349: right forelimb without scapula. O: unknown, coll. date 27 September 1902; OD: “AN 14/60 3142, *D. d.* n. 15, coll. V. Frič”. N: in perfect condition.

NMP 24350: right forelimb with scapula. O: unknown; OD: “AN 14/60 3144, coll. V. Frič”. N: one finger partly broken.

NMP 24351: right forelimb with scapula. O: unknown; OD: “AN 14/60 3146, *D. d.* n. 51, coll. V. Frič”. N: one finger partly broken.

NMP 24352: right forelimb with scapula. O: unknown; OD: “AN 14/60 3147, *D. d.* n. 57, coll. V. Frič”. N: in perfect condition.

NMP 24353: right forelimb with left scapula. O: unknown, coll. date 20 January 1906; OD: “AN 14/60 3149, *D. d.* č. 36, coll. V. Frič”. N: in perfect condition.

NMP 24354: right forelimb with scapula. O: unknown; OD: “AN 14/60 3150, *D. d.* n. 49, coll. V. Frič”. N: in good condition.

NMP 24633: seven cervical vertebrae. OD: “AN 14/60 3122; 2 [on the first vertebra]”.

NMP 24634: six cervical vertebrae. O: unknown; OD: “AN 14/60 3123a”.

NMP 24642: right forelimb with scapula. O: unknown; OD: “AN 14/60 3175, *D. d.* n. 77, coll. V. Frič”. N: several fingers broken.

NMP 24643: left forelimb with scapula. O: unknown; OD: “AN 14/60 3176, *D. d.* n. 78, coll. V. Frič”. N: two fingers are broken at the apex.

NMP 24644: right forelimb with scapula. O: unknown; OD: “AN 14/60 3177, *D. d.* n. 66, coll. V. Frič”. N: the forelimb broken into two pieces (fingers complete).

NMP 24645: left forelimb with scapula. O: unknown; OD: “AN 14/60 3178, *D. d.* n. 69, coll. V. Frič”. N: in perfect condition.

NMP 24646: right forelimb with scapula. O: unknown; OD: “AN 14/60 3179, *D. d.* n. 71, coll. V. Frič”. N: in perfect condition.

NMP 24647 (forelimb) and 24667 (scapula): right forelimb with scapula. O: unknown; OD: “AN 14/60 3180, *D. d.* n. 68 [on the scapula], coll. V. Frič”. N: in perfect condition.

NMP 24648: right forelimb with scapula. O: unknown, probable coll. year 1914; OD: “AN 14/60 3181, *D. d.* n. 80, coll. V. Frič”. N: in good condition.

NMP 24649: left forelimb with scapula. O: unknown; OD: “AN 14/60 3182, *D. d.* n. 65, coll. V. Frič”. N: in perfect condition.

NMP 24650: left forelimb with scapula. O: unknown, probable coll. year 1914; OD: “AN 14/60 3183, *D. d.* n. 79, coll. V. Frič”. N: in good condition.

NMP 24651: right forelimb with scapula. O: unknown; OD: “AN 14/60 3184, *D. d.* n. 70, coll. V. Frič”. N: one finger broken at the apex.

NMP 90984: mandibles. O: unknown; OD: absent. ML = 248/253; MH = 48; ATNL = 46. N: the right mandible is partly damaged in coronoid region.

NMP 90985: mandibles. O: unknown; OD: absent. ML = 343; MH = 59. N: alveoli often confluent – estimated teeth (alveoli) number 44–46.

NMP 91013: left forelimb without scapula. O: unknown; OD: “AN 14/60 3125”. N: in perfect condition.

NMP 91016: mandibles. O: unknown; OD: “given by Náprstek Museum, n. 196 or n. 6791, AN 117/60”. ML = 371; MH = 64.5; ATNLL = 44; ATNLR = 42. N: group of older zoological items collected primarily by the Náprstek Museum and given to NMP en bloc in 1960.

ISZ, unnumbered: fluke. O: unknown; OD: “4/M-1, *Delphinus delphis*, tail, Cetacea”. N: the caudal section length = ca. 270; direct width of the fluke = 215. The colour and

shape could be deformed by the specimen conservation. The colour corresponds to *D. delphis*, but the shape is similar to the state in *Phocoena phocoena* or in a juvenile of *Delphinapterus leucas* rather than in *D. delphis* (see e.g. Carwardine 2000).

ISZ OM-69: lumbar vertebra. O: Primorsk, Bulgaria, 26 August 1961, leg. L. Sigmund; OD: “OM 69, *Delphinus delphis*(?) – vertebra lumbaris”. AVH = 22.5; AVW = 26.7; PVH = 23.2; PVW = 28; VTPL = 65; VSPL = 75–80; VL = 16.5.

ISZ OM-70: right scapula. O: Primorsk, Bulgaria, 26 August 1961, leg. L. Sigmund; OD: “OM 70, *Delphinus delphis*? – scapula sinistra”.

IAMF D24/24: pair of kidneys. O: unknown; OD: absent.

cf. *Delphinus* Linnaeus, 1758

NMP 90991: mandibles. O: unknown; OD: absent. ML = 346; MH = 62; ATNU = 46–48.

NMP 90992: mandibles. O: unknown; OD: absent. ML = 382.5; MH = 68; ATNU = 44–46.

NMP 90996: right forelimb without scapula. O: unknown; OD: “n. 25”. N: in perfect condition.

NMP 90998: right forelimb with scapula. O: unknown; OD: “n. 43”. N: in perfect condition.

NMP 90999: right forelimb with scapula. O: unknown; OD: “n. 28, hand of dolphin with scapula, one finger is absent”. N: several fingers broken.

NMP 91000: left forelimb with scapula. O: unknown; OD: “n. 26, hand of dolphin with scapula, shrunken fingers”. N: one finger partly broken.

NMP 91003: right forelimb without scapula. O: unknown; OD: “n. 5”. N: in good condition.

NMP 91004: left forelimb without scapula. O: unknown; OD: “n. 19, hand of dolphin without scapula”. N: several fingers broken.

NMP 91005: right forelimb with scapula. O: unknown; OD: “n. 27, hand of dolphin with scapula, shrunken fingers”. N: two fingers broken.

NMP 91006: left forelimb with scapula. O: unknown; OD: “n. 42”. N: in perfect condition.

IAMF D24/22: brain in alcohol. O: unknown; OD: absent.

***Globicephala melas* (Traill, 1809)**

NMP 9854: skull without mandibles and hyoid bones. O: unknown; OD: “*Globicephala melaena*, n. 2775, *C. orc. rat.* (*Orcc. rat.*), AN 1048 [on an additional label]”. CBL = 605; ZL = 408; RL = 324; RW = 234; ATNUL = 6; ATNUR = 7.

ISZ OM-92: skull without mandibles and hyoid bones. O: Faroe Islands; OD: “OM-92, *Globicephala* sp. Faroers”. CBL = 630; ZW = 440; RL = 245; RW = 340; ATNUL = 8–9; ATNUP = 9.

ISZ OM-93: skull without mandibles and hyoid bones. O: Faroe Islands; OD: “OM-93, *Globicephala* sp. Faroers”. CBL = 670; ZW = 520; RL = 355; RW = 295; ATNUL = 8–9. N: rostrum right side broken.

IAMF D24/9: skull without mandibles and hyoid bones. O: unknown; OD: “D24/9, *Monodon monoceros*”. CBL = ca. 610; ZW = 435; RL = ca. 310; RW = 240; ATNUL = 4; ATNUR = 4–5. N: rostrum apex broken.

Note: The Long-finned pilot whale (*Globicephala melas*) has been split into three subspecies by some authors (see Reeves et al. 2002); a North Atlantic, a Southern Hemispheric, and an extinct one of the North Pacific. The ISZ specimens (OM-92, OM-93) belong to the North Atlantic population.

***Globicephala* Lesson, 1828 sp.**

IAMF D24/21: mandibles. O: unknown; OD: absent. ML = ca. 505; MH = 153; ATNLL = 9; ATNLR = 8.



Fig. 3. Skull of the White-beaked dolphin (*Lagenorhynchus albirostris*; NMP 10702). Dorsal view.

IAMF D24/x: seventh cervical vertebra. O: unknown; OD: “D24P, 60 Dolphin”. N: vertebra is as twice as larger than in *Tursiops*. AVH = 100; AVW = 104; PVH = 100; PVW = 99.3; VTPL = not presented; VSPL = 82–84; VL = 14.

***Lagenorhynchus acutus* (Gray, 1828)**

IAMF D24/1: complete mounted skeleton without hyoid bones and pelvic rudiments. O: unknown; OD: “D24/1, *Delphinus* sp.” CBL = 367; ZW = 200; RL = 184; RW = 97.5; ML = ca. 300; MH = not exactly measurable; OV = more than 70; ATNU = ca. 30; ATNL = ca. 32. N: the caudal portion of the skeleton bears a flashy fluke, the flipper is present. The fleshy caudal parts is about 190 mm long; flipper length = 230; largest flipper height = 80; left fluke half length = 220; right fluke half length = 210 mm; direct width of the fluke = 380. The specific determination is mainly according to Ridgway & Harrison (1999).

***Lagenorhynchus albirostris* (Gray, 1846)**

NMP 10702: stuffed specimen and skull without hyoid bones (Fig. 3). O: unknown, possibly Denmark, obtained in 1965; OD: “*Lagenorhynchus albirostris*, AN 35/65”. TL = ca. 1600; CBL = 405; ZL = 215; RL = 198; RW = 123; ML = ca. 334; MH = 76.5; ATNU = 26–28; ATNL = ca. 27. N: coloration not fully refined; the anterior apex of mandibles and the angular portion of the right mandible partly broken. The gift by a Danish fishery company and the trading company Koospol to NMP.

***Orcinus orca* (Linnaeus, 1758)**

NMP 9852: complete skull (Fig. 4). O: unknown; OD: absent. CBL = 875; ZW = 530; RL = 435; RW = 248.8; ML = 685; MH = 227; ATNU = 12; ATNL = 12.

NMP 91014: two teeth. O: unknown, possibly South America or even Argentina, coll. Kneitschel; OD: “orca, teeth, V. Frič, AN 90/1960”. Teeth lengths are 123 and 133.5 mm; DM = 39.5; DB = 43 and 43.5.



Fig. 4. Skull of the Killer whale (*Orcinus orca*; NMP 9852). Lateral view.

cf. *Orcinus orca*

NMP 91015: two *bullae ossae*. O: unknown; OD: “dolphin – *bullae ossae*”, “*Orca gladiator* [on the bulla]”. Lengths = 73.5/74 mm, height 68.

***Peponocephala electra* (Gray, 1846)**

NMP 9871: skull without hyoid bones (Fig. 5). O: unknown; OD: “*Delphinus delphis* 2772 I/a 375”. CBL = 440; ZL = 242; RL = 233; RW = 119; ML = 345; MH = ca. 85; ATNUL = 21; ATNUR = 23; ATNLL = 24; ATNLR = 22. N: skull mounted with mandibles.

***Stenella attenuata* (Gray, 1846)**

IHEMF, unnumbered: embryo/foetus in alcohol; whole body. O: unknown; OD: absent. TL = 290, CRL = 190.

***Stenella clymene* (Gray, 1846)**

IAMF D24/3: complete mounted skeleton without pelvic rudiments and hyoid bones. O: unknown; OD: “D24/3, *Delphinus*. CBL = 390; ZW = 190; RL = 230; RW = 90; ML = ca. 340; MH = ca. 63; OV = >71; ATNU = ca. 36; ATNL = ca. 44. N: specific determination according to Archer & Perrin (1999). The caudal portion of the skeleton bears a flashy fluke, which is not in a good condition. The fleshy part is about 75 mm long. Length of the left fluke half = 160, right fluke half = 165 mm, direct width of the fluke = ca. 320.

***Stenella longirostris* (Gray, 1828)**

NMP 9866: complete mounted skeleton without hyoid bones and pelvic rudiments. O: unknown; OD: “AN 1866/211, cat. n. 2767, *Stenella attenuata longirostris*”. CBL = 400; ZL = 155.5; RL = ca. 270; RW = 62; ML = 348; MH = 58; OV = 69; ATNU = 47; ATNL = 52. N: species determination based mainly on Arder & Perin (1999). The base of the rostrum partly broken.



Fig. 5. Skull of the Melon-headed whale (*Peponocephala electra*; NMP 9871). Dorsal view.

IHEMF, unnumbered: embryo in alcohol. O: unknown; OD: absent. CRL = 16.

IHEMF, unnumbered: foetus in alcohol. O: unknown; OD: absent. TL = 66.5.

IHEMF, unnumbered: foetus in alcohol; whole body. O: unknown; OD: absent. TL = 72; CRL = 29.

IHEMF, unnumbered: foetus in alcohol; whole body. O: unknown; OD: absent. TL = 97; CRL = 46.

IHEMF, unnumbered: foetus in alcohol; whole body. O: unknown; OD: absent. TL = 114; CRL = 52.

IHEMF, unnumbered: foetus in alcohol; whole body. O: unknown; OD: absent. TL = 114; CRL = 53.

IHEMF, unnumbered: foetus in alcohol; whole body. O: unknown; OD: absent. TL = 175; CRL = 140.

***Steno bredanensis* (Cuvier, 1828)**

NMP 91012: skull without hyoid bones (Fig. 6). O: unknown; OD: “a 393”. CBL = 508; ZL = 217; RL = 288; RW = 107.2; ML = 420; MH = ca. 92; ATNU = ca. 20–21; ATNL = 20–21. N: skull mounted with mandibles.

***Tursiops aduncus* (Ehrenberg, 1833)**

NMP 48550: skull without mandibles and hyoid bones, one thoracic vertebra. O: Persian Gulf shore near Chahak, 14 km NW of Bandar Genaveh, Iran, 14 October 1998, leg. M. Andreas; OD: “Delphinidae sp., AN 30/2001”. CBL = 455; ZL = 211; RL = 266; RW = 117; ATNU = 24; AVH = 30; AVW = 30; PVH = 32; PVW = 30; VTPL = 35–40; VSPL = 68.

Note: The Indo-Pacific bottlenose dolphin (*Tursiops aduncus*) occurs in the coastal waters of tropical and subtropical latitudes including the Western Pacific and the entire rim of the Indian Ocean, including the Persian Gulf and the Red Sea (Reeves et al. 2002).



Fig. 6. Skull of the Rough-toothed dolphin (*Steno bredanensis*; NMP 91012). Dorsal view.

This species is well identifiable according to the external and skull morphology (Wang et al. 1999, Reeves et al. 2002, Kemper 2004) and molecular characters (Wang et al. 1999). Recently, its species status has been generally accepted (Mead & Brownell 2005). However, some new molecular analyses partly contradict the separation of *T. aduncus* from *T. truncatus* (Krüetzen & Sherwin 2004, Natoli et al. 2004, 2006). In spite of this, we follow the opinion of Mead & Brownell (2005).

The geographic origin of the NMP specimen is agrees with published data. *T. truncatus* is known to occur in the Persian Gulf (Reeves et al. 2002), but Lay (1967) did not list it from Iran. The NMP specimen (Fig. 7) thus may represent the first confirmed record of *T. aduncus* in Iranian waters.

***Tursiops truncatus* (Montagu, 1821)**

NMP 90981: complete skull. O: unknown; OD: “dolphin (*Delphinus* 3)”. CBL = 512; ZL = 273; RL = 295; RW = 137; ML = 447; MH = 103; ATNU = 23; ATNL = 21.

NMP 90982: complete skeleton of disarticulated bones, pelvic rudiment missing, skull complete. O: unknown; OD: “V. Frič, *Delphinus* n. 9”. CBL = 362; ZL = 175.5; RL = 194; RW = 88.5; ML = 309; MH = 67; ATNUL = 24; ATNUR = 22; ATNL = 22–23. N: possibly a juvenile.

IAMF D24/2: complete mounted skeleton. O: unknown; OD: “D24/2, *Delphinus*”. CBL = 470; ZW = ca. 250; RL = ca. 270; RW = ca. 126; ML = ca. 420; MH = ca. 100; PRL = 70; PRW = 7; OV = ca. 60; ATNU = ca. 22; ATNL = ca. 20. N: some present measures are in only approximate values due to inaccessibility of the specimen; species determination is mainly according to Wang et al. (2000).

IAMF D24/4: skull without hyoid bones. O: unknown; OD: “D24/4, *Delphinus* sp.”. CBL = 530; ZW = 259; RL = 290–305; RW = 138; ML = 448; MH = 104; ATNU = 23; ATNL = 23. N: the skull is not determinable precisely according to its dentition, but its measurements correspond to *T. truncatus* (Kemper 2004, Wang et al. 2000).



Fig. 7. Skull of the Indo-Pacific bottlenose dolphin (*Tursiops aduncus*; NMP 48550). Dorsal view.

cf. *Tursiops truncatus*

NMP 24355: right forelimb with scapula. O: unknown; OD: “AN 14/60 3138, n. 20, *D. tursio* – n. 72a, with scapula, perfect, coll. V. Frič”. N: in perfect condition.

NMP 91002: left forelimb without scapula. O: unknown; OD: “n. 18, hand of dolphin (perhaps *tursio*) without scapula”. N: in perfect condition.

ISZ OM-67: caudal vertebra. O: Primorsk, Bulgaria, 26 August 1961, leg. V. Hanák; OD: “OM 67, *Tursiops tursio*(?) – vertebra sacralis”. AVH = 39; AVW = 38; PVH = 44; PVW = 41; VTPL = 35 (anterior left, both posterior) / 40 (anterior right); VSPL = ca. 65; VL = 29.5–30.

ISZ OM-71: fused first and second cervical vertebrae (atlas and axis). O: Primorsk, Bulgaria, 26 August 1961, leg. V. Hanák; OD: “OM 71, *Tursiops tursio*? – vertebra cervicalis I. (atlas)”. First cervical vertebra: VW = 96; VH = 44; VTPL = 21; VSPL = 55; second cervical vertebra: VW = 33.6 (only the centre) or 95 (in the broader sense); VH = 29.4 (only the centre) or 41.2 (in the broader sense); VTPL = 31–33; VSPL = 50; VL (both vertebrae for their fusion) = 24.

cf. *Tursiops Gervais*, 1855

NMP 24638: seven cervical vertebrae. O: unknown; OD: “*Phocoena phocoena*, AN 14/60 3121, V. Frič”. N: the size of vertebrae is much larger than in *Phocoena* and/or *Delphinus*.

NMP 91044: foetus in alcohol; whole body. O: unknown; OD: absent. BL = ca. 320; eye length = ca. 7; blowhole length = ca. 12; flipper length = ca. 50; largest flipper height = ca. 15; direct width of the fluke = ca. 80; dorsal fin length = ca. 35; dorsal fin height = ca. 25. N: some traces of coloration present. The coloration as well as the rostrum shape are similar to *Tursiops* sp.

Monodontidae

***Delphinapterus leucas* Lacépède, 1804**

NMP 9875: skull without hyoid bones. O: unknown; OD: absent; specimen previously labelled as *Globicephala melas*, exhibited under a name *G. melaena* (Heráň 1968b, Mazák 1976). CBL = 595; ZW = 320; RL = 330; RW = 201.2; ML = 453; MH = 115; ATNU = 9; ATNLL = 8; ATNLR = 9.

NMP 49728: skull without hyoid bones, two isolated *bullae ossae*, 26 isolated teeth. O: unknown (possibly Denmark, in April 1891); OD: “AN 158/70, gift from the Copenhagen Mus., Denmark, dat. IV. 1891 (Beluga-Schädel, M-2, 23 fb)”. CBL = 550; ZL = ca. 295; RL = 275; RW = 177.4; ML = 425; MH = 111; ATNU = 9; ATNL = 9. Length of *bullae ossae* = 45–47 mm. N: one zygomatic bone partly mobile; old museum collection.

NMP 91011: skull without hyoid bones, two isolated *bullae ossae*, 24 isolated teeth. O: unknown; OD: “*Delphinapterus leucas*, AN K-0272”. CBL = 588; ZL = 312; RL = 280(L) / 300(R); RW = 184; ML = 445; MH = 115; ATNU = 10; ATNL = 9. Length of *bullae ossae* = ca. 40 mm.

***Monodon monoceros* Linnaeus, 1758**

NMP 91020: skull without mandibles and hyoid bones. O: unknown; OD: “*Monodon*, AN 87/70”. ZL = 385; RW = 239. N: the rostrum hardly broken (CBL, RL immeasurable), tusk not present, but the alveolar size indicated a male. Very small second (right) tusk present (NTL = 57; diameter = 8).

NMP 91021: smaller unbroken tusk. O: unknown; OD: “315 g, 65 cm, Hhya K 431”. NTL = 655; DB = 25; CB = 70; DM = 21; CM = 66; DA = 7.5; CA = ca. 30; threads number = 4.

NMP 91022: smaller unbroken tusk. O: unknown; OD: “418 g, 80 cm, Kyefss Krmfss”. NTL = 773; DB = 25; CB = 83; DM = 21.5; CM = 70; DA = 10.5; CA = 30; threads number = 5.

NMP 91023: smaller unbroken tusk. O: unknown; OD: “388 g, purchased by Kyifhn Khss”. NTL = 745; DB = 26; CB = 90; DM = 24; CM = 70; DA = 9; CA = 33; threads number = 4.

NMP 91024: larger tusk with abraded apex and base. O: unknown; OD: absent. NTL = 1110; DB = 56; CB = 170; DM = 63; CM = 195; DA = 43; CA = 137; threads number = 4–5.

NMP 91025: larger tusk with broken apex. O: unknown; OD: absent. NTL = 1740; DB = 49; CB = 160; DM = 45.5; CM = 150; DA = 27; CA = 85; threads number = 10.

NMP 91026: larger tusk with abraded base. O: unknown; OD: absent. NTL = 1700; DB = 52.5; CB = 165; DM = 38; CM = 115; DA = 13.5; CA = 50; threads number = 10.

NMP 91027: larger unbroken tusk. O: unknown; OD: absent. NTL = ca. 1860; DB = 53; CB = 160; DM = 50.5; CM = 150; DA = 15; CA = 50; threads number = 8.

NMP 91035: skull without mandibles and hyoid bones. O: unknown; OD: absent. CBL = 570; ZW = 410; RL = 290; RW = 218.4. N: tusk not present, but the alveolar size indicated a male.

NMP 91037: long unbroken tusk. O: unknown; OD: absent. NTL = 1820; DB = 47; CB = 155; DM = 30; CM = 125; DA = 11; CA = 40–50; threads number = 8.

NMP 91043: long broken tusk. O: unknown; OD: absent. NTL = 2255–2285; DB = 54; CB = 180; DM = 31; CM = 120; DA = 20; CA = 60; threads number = 9. N: tusk broken into several parts, the parts carefully pieced together by an iron rod.

IAMF D35/23: skull without mandibles and hyoid bones. O: unknown; OD: absent. CBL = ca. 570; ZW = ca. 375; RL = ca. 310; RW = aprox. 220; NTL = 1475; DB = 48.5; CB = 150; DM = 31.5; CM = 100; DA = 10.4; CA = 45; threads number = 8.

Note: Skull NMP 91020 is interesting because a second small tusk is exposed due to the rostrum being broken (it would probably not be observable in normal state).

Phocoenidae

***Phocoena phocoena* (Linnaeus, 1758)**

NMP 9877: stuffed specimen. O: Nord Sea, 1899 (Herán 1968a); OD: absent. TL = ca. 800; ATNU = 24–25.

NMP 22882: complete skull. O: unknown; OD: “*Phocoena phocoena*, AN 14/60 1802, coll. V. Frič, n. 16 [on the skull]”. CBL = 280; ZL = 149; RL = 125; RW = 71; ML = 206.5; MH = 54; ATNU = 24; ATNL = 22. N: the vomer exposition correspond to *P. vomerina* sensu Hall & Kelson (1959).

NMP 22883: skull without hyoid bones. O: unknown; OD: “*Phocoena phocoena*, AN 14/60 1803, coll. V. Frič”. CBL = 215; ZL = 132; RL = 68; RW = 55.5; ML = 175; MH = 43.5; ATNU = 24; ATNL = 26. N: skull mounted with mandibles; the vomer exposition correspond to *P. vomerina* sensu Hall & Kelson (1959).

NMP 22884: complete skull. O: unknown; OD: “*Phocoena phocoena*, AN 14/60 1804, coll. V. Frič”. CBL = 264; ZL = 146.5; RL = 111.5; RW = 64; ML = 200; MH = 52.5; ATNU = 24; ATNL = 23.

NMP 22885: skull without hyoid bones. O: unknown, coll. date 11 May 1901; OD: “*Phocoena phocoena*, AN 14/60 1805, coll. V. Frič”. CBL = 262; ZL = 141.5; RL = 113; RW = 61.5; ML = 193.5; MH = 49; ATNU = 26; ATNL = 22–24.

NMP 22886: complete skull. O: unknown; OD: “*Phocoena phocoena*, AN 14/60 1806, coll. V. Frič, n. 15 [on the skull and mandible]”. CBL = 270; ZL = 145.5; RL = 120; RW = 64; ML = 204; MH = 55; ATNU = 26; ATNL = 25.

NMP 22887: complete skull. O: unknown; OD: “*Phocoena phocoena*, *Phocoena* n. 18 [on the skull], AN 14/60 1807, coll. V. Frič”. CBL = 275; ZL = 154; RL = 120; RW = 72.5; ML = ca. 213.5; MH = ca. 57; ATNU = 25; ATNL = 24. N: skull mounted with mandibles. The vomer exposition correspond to *P. vomerina* sensu Hall & Kelson (1959).

NMP 22889: complete skull. O: unknown; OD: “*Phocoena phocoena*, AN 14/60 1809, coll. V. Frič, n. 13 [on the skull]”. CBL = 228; ZL = 137; RL = 93; RW = 63.5; ML = 172; MH = 49; ATNU = 24; ATNL = 22–24. N: the vomer exposition correspond to *P. vomerina* sensu Hall & Kelson (1959).

NMP 24705: complete disarticulated skeleton with complete skull. O: unknown, coll. date 24 September 1904, leg. Passerowski; OD: “*Phocaena communis*, n. 14, AN 14/60 1795, once degreased, but it should be degreased still once”. CBL = 221.5; ZL = 131.5; RL = 97; RW = 57.5; ML = 169; MH = 98; PRL = 47–48; PRW = 65–75; OV = 64; ATNU = 22–26; ATNL = 24; Bulla length = 24.5. N: several forelimb fingers partly broken.

NMP 24706: skull without hyoid bones. O: unknown; OD: “*Phocoena communis*, AN 14/60 1796”. CBL = 235; ZL = 142.5; RL = 100; RW = 65.5; ML = 179.5; MH = 42.5; ATNU = 24–26; ATNL = 23. N: the vomer exposition correspond to *P. vomerina* sensu Hall & Kelson (1959).

NMP 90987: complete disarticulated skeleton, pelvic rudiments missing, skull complete. O: unknown; OD: “*Phocoena communis* n. 7”. CBL = 246; ZL = 134.5; RL = 97.2; RW = 66.4; ML = 180; MH = 51; ATNU = 24–25; ATNL = 23–24.

NMP 90988: skull without mandibles. O: unknown; OD: absent. CBL = 243; ZL = 143; RL = 103.5; RW = 72.5;

NMP 91036: complete mounted skeleton without pelvic rudiments. O: unknown; OD: AN 398. CBL = 249.4; ZL = 140.9; RL = 107; RW = 59; ML = 182; MH = 53.3; OV = 55; ATNUL = 28; ATNUR = 24; ATNLL = 23; ATNLR = 26.

ISZ OM-6: skull without hyoid bones. O: unknown; OD: “OM 6, *Delphinus* ssp”. CBL = 277; ZW = 149; RL = 124–125; RW = 66; ML = 215; MH = 54; ATNU = 25; ATNL = 22. N: skull mounted with mandibles.

ISZ OM-91: skull without hyoid bones. O: unknown; OD: “OM 91, or n. 64”. CBL = 267; ZW = 156; RL = 109.4 (L) / 114 (R); RW = 75.3; ML = ca. 202; MH = ca. 55; ATNU = 22; ATNLL = 20; ATNLL = 22. N: the vomer exposition corresponds to *P. vomerina* sensu Hall & Kelson (1959).

ISZ OM-224: complete mounted skeleton. O: unknown; OD: “*Delphinus delphis*, OM 224”. CBL = 236; ZW = 139; RL = 100; RW = 65; ML = 177; MH = 53; PRL = 97; PRW = 9–10; OV = ca. 63; ATNU = 22; ATNL = 21–22. N: the vomer exposition corresponds to *P. vomerina* sensu Hall & Kelson (1959).

IAMF D24/15: complete mounted skeleton without hyoid bones. O: unknown; OD: “D24/15, 1474”. CBL = 239; ZW = 135; RL = 97; RW = 70.3; ML = 182; MH = 48; PRL = 59–59.6; PRW = 7–7.7; OV = 58; ATNU = immeasurable, ATNL = 21. N: the vomer exposition corresponds to *P. vomerina* sensu Hall & Kelson (1959); designated as *Delphinus* sp. by Seichert et al. (2006).

IHEMF, unnumbered: embryo/foetus in alcohol. O: unknown; OD: absent. TL = 167.

cf. *Phocoena phocoena*

NMP 24635: seven cervical vertebrae. O: unknown; OD: “*Delphinus delphis*, AN 14/60 3123b”. N: the size and shape of vertebrae is similar to those of *Phocoena*, not *Delphinus*.

NMP 24636: six cervical vertebrae. O: unknown; OD: “AN 14/60 3119, V. Frič”.

NMP 24637: six cervical vertebrae. O: unknown; OD: “AN 14/60 3120, V. Frič, n. 31”.

NMP 24652: left forelimb with right scapula. O: unknown; OD: “AN 14/60 3185, coll. V. Frič”. N: in perfect condition.

NMP 24653: left forelimb without scapula. O: unknown; OD: “AN 14/60 3186, collectio V. Frič”. N: several fingers partly broken.

NMP 24654: left forelimb without scapula. O: unknown; OD: “AN 14/60 3187, V. Frič”. N: in good condition, fingers shrunken.

NMP 24655: right forelimb with scapula. O: unknown; OD: “AN 14/60 3188, V. Frič”. N: one finger broken, the posterior edge of the scapula cracked.

NMP 24656: right forelimb with scapula. O: unknown; OD: “AN 14/60 3189, V. Frič”. N: in perfect condition.

NMP 24657: right forelimb without scapula. O: unknown; OD: “AN 14/60 3190, V. Frič”. N: several fingers partly broken.

NMP 24658: left forelimb with scapula. O: unknown; OD: “AN 14/60 3191, V. Frič”. N: scapula cracked in its half.

NMP 24659: right forelimb with scapula. O: unknown; OD: “AN 14/60 3192, V. Frič”. N: in perfect condition.

NMP 24660: left forelimb with scapula. O: unknown; OD: “AN 14/60 3193, coll. V. Frič”. N: in perfect condition.

NMP 24661: left forelimb with scapula. O: unknown; OD: “AN 14/60 3194, V. Frič”. In: one finger partly broken.

NMP 24662: right forelimb with scapula. O: unknown; OD: “AN 14/60 3195, V. Frič”. N: in perfect condition.

NMP 24663: left forelimb with scapula. O: unknown; OD: “AN 14/60 3196, V. Frič”. N: one finger partly broken.

NMP 24664: left forelimb with scapula. O: unknown; OD: “AN 14/60 3197, V. Frič”. N: in perfect condition.

NMP 24665: left forelimb with scapula. O: unknown; OD: “AN 14/60 3198, *P. p.* n. 46, coll. V. Frič”. N: in perfect condition.

NMP 24666: right forelimb with scapula. O: unknown; OD: “AN 14/60 3199, V. Frič”. N: in perfect condition.

NMP 24667: right forelimb with scapula. O: unknown; OD: “AN 14/60 3200, V. Frič”. N: in perfect condition.

NMP 24668: right forelimb with scapula. O: unknown; OD: “AN 14/60 3201, leg. V. Frič”. N: in perfect condition.

NMP 24669: right forelimb with scapula. O: unknown; OD: “AN 14/60 3202, V. Frič”. N: one finger broken.

IAMF 24/16: hyoid bones. O: unknown; OD: absent. N: probably associable with the skeleton IAMF D24/15.

cf. *Phocoena* Cuvier, 1816

NMP 91009: four isolated scapulae (two left and two right ones), one isolated right forelimb without scapula and three forelimbs with scapulae. O: unknown; OD: “One isolated scapula = spare scapula of *Phocoena*; three forelimbs with scapula = n. 15, 16, 17 + *Phocoena* or in the case of n. 17 + *Phocoena communis*”.

IAMF D24/7: skull of a juvenile individual, without mandibles and hyoid bones. O: unknown; OD: “D24/7, dolphin”. CBL = 164; ZW = 84; RL = 67; RW = 40. N: due to an absence of teeth and confluence of alveoli, the number of teeth or alveoli are indeterminable.

IAMF 24/14: mandibles. O: unknown; OD: absent. ATNL = 20–22. N: cf. *Phocoena phocoena*. N: mandible bases broken, their lengths and widths are immeasurable.

Note: The Harbor porpoise (*Phocoena phocoena*) is discontinuously distributed in the northern temperate and sub-arctic waters. For a long time, only two subspecies were recognised (*P. p. phocoena* and *P. p. relicta*), but molecular analyses by Wang et al. (1996) supported high divergence between the North Pacific and North Atlantic populations. *P. phocoena* is currently separated into three subspecies, which inhabit North Pacific (*P. p. vomerina* Gill, 1865), North Atlantic (*P. p. phocoena*), and Black Sea, Sea of Azov and the Aegean Sea (*P. p. relicta* Abel, 1905), respectively (see Reeves et al. 2002).

Hall & Kelson (1959) distinguished *vomerina* from *phocoena* according to the morphology of the palatine region of the skull; the vomer should separate posteroventral parts of palatine bones in *vomerina*. Such a state is present in some of the revised specimens (see above) and it could suggest their North Pacific origin. However, it is necessary to note that the ‘*vomerina*’ state of this character (sensu Hall & Kelson 1959) is present also in representatives of the Black Sea population of *P. phocoena*; the first author (JR) observed this vomer exposition in a small series of skulls of *P. phocoena* collected in the Black Sea and dispersed in several private collections. The Black Sea origin seems to be more appropriate for the specimens in the revised Czech collections.

Physeteridae

***Physeter catodon* Linnaeus, 1758**

NMP 91029: mandibles. O: unknown, obtained in 1884 from Bremen, Germany; a gift by A. Kareš (Štěpánek 1975); OD: absent. ML = 2300; MH = 360; ATNLL = 21; ATNLR = 22.

IHEMF, unnumbered: Tail of an /foetus in alcohol. O: unknown; OD: absent. TL = 315.

Platanistidae

Platanista gangetica (Roxburgh, 1801)

NMP 9865: complete mounted skeleton without hyoid bones and pelvic rudiments. O: unknown, obtained in 1861 by A. Frič (Frič 1861, Heráň 1966, Štěpánek 1975); OD: absent. CBL = ca. 410; ZW = 159.2; RL = 255; RW = 24.7; ML = ca. 360; MH = 54.7; OV = 47; ATNU = 23–28; ATNL = 26–29. Note: This skeleton was purchased in 1887 by the collection curator Antonín Frič from the Gerrard Co., London (Heráň 1966), but no additional information is available. Heráň (1966) mentioned the following measurements: total length of the skeleton = 130 cm, skull length = 42 cm, length of neck and trunk = 49 cm, tail length = 38.5 cm. Using the identification data by Pilleri (Pilleri & Gühr 1977, Pilleri et al. 1982) we confirmed the taxonomic affiliation of the NMP specimen (Fig. 8) to *P. gangetica* s. str. (cf. Heráň 1966, 1968b).

Iniidae

Inia geoffrensis (A. de Blainville, 1817)

NMP 9856: stuffed female specimen. O: unknown, obtained in 1930 from Hamburg, Germany (Heráň 1968a, Štěpánek 1975); OD: absent. TL = ca. 1200.

NMP 91007: skull without hyoid bones (Fig. 9). O: unknown; OD: absent. CBL = 365; ZL = 158; RL = 233; RW = 71; ML = 322; MH = 75; ATNU = 27; ATNL = 27.

Note: Based on morphological character analysis, Pilleri et al. (1982) distinguished three forms of two species within the genus *Inia* d'Orbigny, 1834, viz. *I. g. geoffrensis*, *I. g. humboldtiana* Pilleri et Gühr, 1978, and *Inia boliviensis* d'Orbigny, 1834. Recently, the latter form was again included as a subspecies in *geoffrensis* (Reeves et al. 2002, Mead & Brownell 2005). However, the suggestion by Pilleri et al. (1982) was recently well supported by a genetic analysis (May-Collado & Agnarsson 2006). Unfortunately, we were not able to identify exact species/subspecies affiliations of the NMP specimens according to the latter opinion.

Ziphiidae Gray, 1865 spp.

IAMF D24/19 and D24/20: pair of mandibles, cut at the middle part. O: unknown; OD: “D24/19+20, Balaenopteridae sp.”. ML = >660 (but considerably reduced by the cutting); DA (D24/19 / D24/20) = 65 / 60; DM = 110 / 100; DB (but considerably reduced by the cutting) = 145 / 130. N: the mandibles could belong (according to their size and shape) to the genera *Hyperoodon* or *Mesoplodon* (see Carwardine 2000).

Cetacea indet.

NMP 90717: thoracic vertebra. O: unknown; OD: absent. AVH = 101; AVW = 150; PVH = 101; PVW = 151; VTPL = 190 (L) / 198 (R); VSPL = 170; VL = 117.

NMP 90993: three *bullae ossae*. O: unknown; OD: absent. Length = 35–40 mm. N: due to their sizes and shapes as well as to location in the depository room, these bullae are most probably associable with skulls of *Delphinus delphis* (NMP 90989 and 90990).

NMP 90994: skeleton without skull and mandibles. O: unknown; OD: “Delphin – forelimbs and backbone. OM 154”.

NMP 90995: set of several postcranials (backbones, particular vertebrae, scapulae, forelimbs, one sternum). O: unknown; OD: absent. N: the scapulae number (three left ones, one right) indicates at minimum three individuals, the forelimbs number implicates for four individuals. A description is presented on one scapula: “n. 67, *Delphinus delphis*,



Fig. 8. Skull of the Ganges river dolphin (*Platanista gangetica*; NMP 9865). Lateral view.



Fig. 9. Skull of the Amazon river dolphin (*Inia geoffrensis*; NMP 91007). Dorsal view.

right scapula” (but it is actually left scapula). These bones are perhaps associable with the skulls and/or skeletons NMP 90987–90990.

NMP 90997: right scapula. O: unknown; OD: “spare scapula of a dolphin”. N: in perfect condition.

NMP 91001: right forelimb with scapula. O: unknown; OD: “n. 41”. N: some fingers broken.

NMP 91008: two *bullae ossae*. O: unknown; OD: “AN 14/60 3548. Length = 30 mm”. N: their size and shape perhaps correspond to *Phocoena* sp.

NMP 91017: vertebrae (seven cervical and nine caudal), two scapulae. O: unknown; OD: “dolphin, scapulae, vertebrae”.

NMP 91028: dry penis. O: unknown; OD: absent. PL = 1440; ICL = 1470; DB = 105; CB = 310; DM = 34; CM = 100; DA = 14; CA = 50. N: based on its size it could belong to the following genera: *Balaena*, *Balaenoptera*, *Berardius*, *Eschrichtius*, *Eubalaena*, *Hyperoodon*, *Megaptera*, *Physeter*. *Corpora cavernosa penis* are readable at the base.

NMP 91030: lumbar vertebra. O: unknown; OD: absent. AVH = 280; AVW = 235; PVH = 273; PVW = 230; VTPL = 270; VSPL = 460; VL = 160.

NMP 91031: lumbar vertebra. O: unknown; OD: “obsc. 121/60, vertebra of whale 1959, given by the Department of Geology”. AVH = 210; AVW = 305; PVH = 215; PVW = 310; VTPL = 340; VSPL = 480; VL = 198.

NMP 91032: cf. caudal vertebra. O: unknown; OD: absent. AVH = 248; AVW = 320; PVH = 240; PVW = 320; VL = 236. N: transverse processes and the spinal process partly cutted.

NMP 91033: cf. caudal vertebra. O: unknown; OD: absent. AVH = 245; AVW = 318; PVH = 245; PVW = 320; VL = 240. N: transverse processes and the spinal process partly cutted.

NMP 91034: caudal vertebra. O: unknown; OD: absent. AVH = 280; AVW = 360; PVH = 277; PVW = 353; VTPL = ca. 40 (L) / 60 (R); VSPL = ca. 50; VL = 290.

NMP 91038: dry penis. O: unknown; OD: absent. PL = 1410; DB = 144; CB = 400; DM = 50; CM = 135; DA = 22; CA = 80. N: based on its size it could belong to the following genera: *Balaena*, *Balaenoptera*, *Berardius*, *Eschrichtius*, *Eubalaena*, *Hyperoodon*, *Megaptera*, *Physeter*. *Corpora cavernosa penis* are readable at the base.

NMP 91039: dry penis. O: unknown; OD: “AN 170/70”. PL = 1430; DB = 104; CB = 310; DM = 51; CM = 110; DA = 23; CA = 70. N: based on its size it could belong to the following genera: *Balaena*, *Balaenoptera*, *Berardius*, *Eschrichtius*, *Eubalaena*, *Hyperoodon*, *Megaptera*, *Physeter*. *Corpora cavernosa penis* are readable at the base. Old museum collection.

NMP 91040: thoracic vertebra. O: unknown; OD: “AN 3488”. AVH = 220; AVW = 295; PVH = 225; PVW = 320; VTPL = 270 (L) / 240 (R); VSPL = 490; VL = 180.

NMP 91041: lumbar vertebra. O: unknown; OD: “AN 150/55”. AVH = 260; AVW = 315; PVH = 265; PVW = 315; VTPL = 180; VSPL = 420; VL = 310.

NMP 91042: scapula. O: unknown; OD: “AN 3489”. Scapula length = 1230; height = 680–690. N: this scapula probably belongs to the genus *Balaenoptera* (but certainly not to *Megaptera*, *Balaena* and *Eubalaena*), perhaps to the species *B. bonaerensis* or *B. acutorostrata* (based on Turner 1913, Arnold et al. 1987, Cabrera 1998).

ISZ, unnumbered: dry penis. O: unknown; OD: absent. PL = 1510; DB = 95; CB = 270; DM = 37; CM = 100; DA = 16–23; CA = 50–80. N: based on its size, it could belong to the following genera: *Balaena*, *Balaenoptera*, *Berardius*, *Eschrichtius*, *Eubalaena*, *Hyperoodon*, *Megaptera*, *Physeter*. *Corpora cavernosa penis* are not readable at the base.

IAMF D16/40: forelimb. O: unknown; OD: “D16/40, *Delphinus delphis*, C1930, n. 28”. N: size similar to that in the genus *Tursiops*; by Seichert et al. (2006) designed as *Delphinus* sp.

IAMF D16/41: caudal segment with a fluke. O: unknown; OD: absent. N: length of particular fluke halves = 95; direct width of the fluke = 190; length of the fleshy part = ca. 90. The fluke shape is similar to *Lagenorhynchus* sp., but its size is smaller than in normal individual of *Lagenorhynchus* sp.

IAMF D24/6: forelimb, scapula, sternum with 5 pairs of incomplete ribs. O: unknown; OD: “D24/6, C 668”. N: proportionally cf. *Phocoena phocoena*.

IAMF D24/12 and D24/13: two stylohyal bones. O: unknown; OD: “D24/12, D24/13, *Balaena* sp.”. Stylohyal length = 275; DA = 40; DM = 60; DB = 40. N: the bones were anatomically determined (as stylohyal) according to Arnold et al. (1987). According to their size, the bones are probably associable with the skeleton of *Balaenoptera acutorostrata* (IAMF 1089) – its hyoid bones are present, but without stylohyal parts.

IAMF D24/17: intervertebral disc. O: unknown; OD: absent. VH = 75 (measured in the middle portion); VW = 88.5; VL = 5–6. N: larger than in *Tursiops*.

IAMF D24/18: intervertebral disc. O: unknown; OD: absent. VH = 83 (measured in the middle portion); VW = 86; VL = 5–6. N: larger than in *Tursiops*.

IAMF, unnumbered: forelimb. O: unknown; OD: absent. N: the size is similar to that in *Tursiops truncatus*, but the antebrachium are markedly longer (in comparison with that in IAMF D24/2)

COMMENTS

In summary, the four collections (National Museum; Department of Zoology, Faculty of Science; Institute of Anatomy, First Faculty of Medicine; Institute of Histology and Embryology, Faculty of Medicine in Plzeň) contain 234 collection items of cetaceans, which represent at least 24 species from nine families (sensu Mead & Brownell 2005); see Table 1. In addition, two specimens of another species, *Balaena mysticetus*, have been reported from two other collections (Mazák 1988).

The revised Czech collections contain 28.6% of cetacean species, and 82% of cetacean families (sensu Mead & Brownell 2005). Only Eschrichtiidae and Neobalaenidae, each of which is represented by a single recent species, are absent from the collections.

Although some specimens in the collections belong to the most endangered cetacean species, e.g. those of the genera *Balaena*, *Eubalaena*, *Platanista* and *Inia*, all cetaceans are more or less rare animals (see e.g. Reeves et al. 2003). This increases the scientific value of the collections, and forms a basis for the advancement of public knowledge.

None of the revised collections was created systematically as a representative collection of cetaceans. Large proportion of the cetacean material in NMP was originally property of the famous Prague nature products trading company of Václav Frič, and was bequeathed to the National Museum by Frič's nephew Jaroslav (Štěpánek 1975). This selection was not primarily created as a scientific collection and the specimens lacked most data concerning their origin and taxonomic affiliation. The remaining specimens, few percent of the collection, were obtained occasionally, e.g. skeleton of the Fin whale *Balaenoptera physalus*, preparations of river dolphins (*Platanista gangetica*, *Inia geoffrensis*), bones of the Sperm whale *Physeter catodon* or bones of the Beluga *Delphinapterus leucas* (see Frič 1861, Štěpánek 1975).

The cetacean collection of ISZ has also a composite character. It arose only occasionally and over a long time. However, some of the specimens were obtained when Ludwig Freund (1878–1953) worked a professor at the Prague University (for details on his personality see Robovský et al. 2004).

The history of the collection of IAMF was summarised by Seichert et al. (2006). In general, it originated by a fusion of the collections of two Institutes of Anatomy of the Czech and German Faculties of Medicine, Charles University, in 1940. The collections arose as sets of comparative preparations without zoological documentation in both institutions,

and the collection was partly damaged by war incidents in 1945, closer information about the items deposited in IAMF collection is absent (Seichert et al. 2006). This applies also to the most significant specimen of this collection, the complete skeleton of the Common minke whale (*Balaenoptera acutorostrata*).

The collection of IHMF in Plzeň contains a small number of prenatal stages of cetaceans, which were obtained from the Morphology Center of the Johann Wolfgang Goethe University, Frankfurt am Main, Germany. Tonar & Voller (2006) published small part of this material. The above-mentioned collections of cetaceans are most probably the largest ones that exist in the Czech Republic. Further cetacean material can be present in other institutions (universities, schools, museums, castles) or in some private collections. For example, a complete mounted skeleton of the Harbour porpoise (*Phocoena phocoena*) is deposited in the Pedagogical Faculty of the University of South Bohemia in České Budějovice. In addition, the first author (JR) saw a skull of the Franciscana, *Pontoporia blainvillei* (Gervais et d'Orbigny, 1844) in a private collection. The narwhal tusks as well as remains of large whales (baleen, ribs, jaws) have attracted a human attention since the Middle Age, and sometimes such specimens are presented in public exhibitions (or in depositories) in castles or regional museums. Thus, further search could increase the number of the cetacean specimens in Czech collection.

Penial bones or penes?

Dry penes of whales are present in many collections (NMP and ISZ of the collections treated in this paper). In some specimens, *corpora cavernosa* are visible at base, but they are not detectable in others. The compact character of several specimens (without detectable *corpora cavernosa* at their base) led some people to hypothesize that these preparations actually represent penial bones or even some plant material (dry fruits).

However, several revised specimens of 'penes' are certainly not plant structures for their detectable *corpora cavernosa*. According to the histological investigation of a specimen from ISZ that was drier and without any trace of *corpora cavernosa*, such material certainly does represent a bone (F. Jelínek, pers. comm.), what was also apparent from its size.

Many detailed investigations of cetacean penes have not shown any traces of penial bones throughout the order (e.g. Freund 1912, Meek 1918, Arvy 1978, Bland & Kitchener 2001). Only one evidence of the *os penis* in cetaceans is available – a finding of this bone in the North Atlantic right whale *Eubalaena glacialis* (Müller, 1776) (originally *Balaena biscayensis*), published by Turner (1913). He mentioned: "The Os Penis had been obtained. It was 12^{3/4} inches long, and somewhat cylindrical in shape. The deep end was swollen, 8 inches in girth, and from it the bone tapered to the opposite end, which was 5^{1/4} inches in girth [...]. The presence of a bone in the penis of a Right Whale had not previously attracted attention. It was not quite as long as the corresponding bone in the walrus, and its texture was not so dense". According to the measurements and the shape description of the whale *os penis* published by Turner (1913), it seems to be clear that the penial material in collections might not represent any bones. The available evidence thus indicates that the occurrence of *os penis* in *Eubalaena glacialis* detected by Turner (1913) should be considered an abnormal state, e.g. a secondary calcification of connective tissues (e.g. *corpora cavernosa*). The contiguity of penial / clitoridial bones with the *corpora cavernosa* is evident from many partial investigations (e.g. Gilbert 1892, Kelly 20000, Layne 1952, Murakami & Mizuno 1984). The dry specimens of penes represent thus preparations of the whole organs, in certain cases highly deformed by desiccation.

Table 1. Numbers of the cetacean specimens in studied collections

Taxon	NMP	ISZ	IAMF	IHEMF	Total
<i>Eubalaena</i> sp.	–	1	–	–	1
cf. <i>Balaenidae</i> sp.	–	1	–	–	1
<i>Balaenoptera acutorostrata</i>	–	1	2	–	3
<i>Balaenoptera</i> cf. <i>acutorostrata</i>	3	–	–	–	3
<i>Balaenoptera borealis</i>	1	–	2	–	3
<i>Balaenoptera</i> cf. <i>borealis</i>	–	1	–	–	1
<i>Balaenoptera physalus</i>	3	1	–	–	4
cf. <i>Balaenoptera physalus</i>	–	2	–	–	2
cf. <i>Balaenoptera</i> sp.	–	2	–	–	2
cf. <i>Balaenopteridae</i> sp.	–	–	1	–	1
<i>Delphinus</i> cf. <i>capensis</i>	2	–	–	–	2
<i>Delphinus delphis</i>	21	2	1	–	24
cf. <i>Delphinus delphis</i>	43	3	1	–	47
cf. <i>Delphinus</i> sp.	10	–	1	–	11
<i>Globicephala melas</i>	1	2	1	–	4
<i>Globicephala</i> sp.	–	–	2	–	2
<i>Lagenorhynchus acutus</i>	–	–	1	–	1
<i>Lagenorhynchus albirostris</i>	1	–	–	–	1
<i>Orcinus orca</i>	2	–	–	–	2
cf. <i>Orcinus orca</i>	1	–	–	–	1
<i>Peponocephala electra</i>	1	–	–	–	1
<i>Stenella attenuata</i>	–	–	–	1	1
<i>Stenella clymene</i>	–	–	1	–	1
<i>Stenella longirostris</i>	1	–	–	7	8
<i>Steno bredanensis</i>	1	–	–	–	1
<i>Tursiops aduncus</i>	1	–	–	–	1
<i>Tursiops truncatus</i>	2	–	2	–	4
cf. <i>Tursiops truncatus</i>	2	2	–	–	4
cf. <i>Tursiops</i> sp.	2	–	–	–	2
<i>Delphinapterus leucas</i>	3	–	–	–	3
<i>Monodon monoceros</i>	11	–	1	–	12
<i>Phocoena phocoena</i>	13	3	1	1	18
cf. <i>Phocoena phocoena</i>	21	–	1	–	22
cf. <i>Phocoena</i> sp.	1	–	2	–	3
<i>Physeter catodon</i>	1	–	–	1	2
<i>Platanista gangetica</i>	1	–	–	–	1
<i>Inia geoffrensis</i>	2	–	–	–	2
Ziphiidae sp.	–	–	2	–	2
Cetacea indet.	19	1	8	–	28
Total	170	22	30	10	232

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