

Review of the genus *Neophocaena* especially in the Far east Asia.

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Introduction

As is known very well the distribution range of the finless porpoise (*Neophocaena* spp.) spreads from the Persian Gulf to the northern Japan. Taxonomic considerations on the species were made by many authors, but the analyses seem to be insufficient especially when taking geographically different local populations in Japanese waters into consideration.

DISCOVERY AND RECOGNITION

The finless porpoise was originally described by Cuvier (1829) as *Delphinus phocaenoides*. The type locality, ie the Cape of Good Hope, described by Cuvier was based on the information given by Jean Jaques Dussumier (Cuvier, 1830; Robineau, 1990). As a result of the later discussions it is accepted that the type locality could have been Malabar, the south-western shore line of India.

A few years after the Cuvier's description, Schlegel described another species of a small porpoise which was sent from Nagasaki Japan to Leiden by Heinrich Bürger, with provisional name *Delphinoptera Namenoiiwo* in the shipping list. The specimen was obtained through the help of Toiosuke (Keiga) Kawahara, a Japanese helper to the group of biologists such as Philipp Franz Balthasar von Siebold sent to Japan by the Vereenigde Oostindische Compagnie (VOC). People sent by the VOC were confined within a small man-made island called Deshima in Nagasaki bay. Toiosuke was also a scientific illustrator trained by the scientists of the VOC. The specimen was brought to Toiosuke by a fisherman of Nagasaki. Detailed description of this specimen was made by Schlegel in Fauna Japonica. Schlegel probably intended to describe the species in Fauna Japonica as *Delphinus melas*, and gave detailed description. However, some technical conditions made Fauna Japonica published later probably in 1844 (Holthuis and Sakai, 1970). Schlegel (1841) referred to the species briefly suggesting he though Fauna Japonica should appear earlier.

[Specimens described for recognizing the finless porpoise are:](#)

Delphinus phocaenoides (G. Cuvier 1829)

Type specimen: Museum National d'Histoire Naturelle, Paris, No. 3086; collected by Jean Jaques Dussumier (Locality: Cape of Good Hope, South Africa)

[Neophocaena phocaenoides \(G. Cuvier, 1829\) Holotype](#)

Delphinus melas (Schlegel 1841)

Type specimen: s' Rijks Museum van Natuurlijke Historie te Leiden, RMNH23709; collected by H. Bürger with a help of Toiosuke Kawahara, (locality: Water near Nagasaki, Japan).

[Neophocaena sunameri \(Pilleri and Gühr, 1975\) Holotype](#)

Neomeris asiaeorientalis Pilleri and Gihl 1972 Jefferson and Wang 2011

Type specimen: Museum of Comparative Zoology, at Harvard College, Cambridge, Mass., Specimen no. 19998(WULSIN collection) (locality: Yangtze, Prov. Kiangsu, Shanghai, China).

[*Neophocaena asiaeorientalis* \(Pilleri and Gihl, 1972\) Holotype](#)

Jefferson and Wang (2011) proposed a scheme where there are two species in the genus *Neophocaena*, namely *N. phocaenoides* and *N. asiaeorientalis*, the latter of which is composed of two subspecies *N. a. asiaeorientalis* and *N. a. sunmeri*. As is summarized well in several publications the idea that the finless porpoises with wide dorsal ridge and those with narrow ridge should be separated into different species or subspecies was introduced by Pilleri and Gihl (1972).

The scientific name *N. a. sunmeri* suggests its relationships with the finless porpoises of Japan, because “sunameri” is one of the Japanese vernacular names used for the species. Because the specimen preserved in Leiden originally defined as *Delphinus melas* was collected in Nagasaki [we need further considerations on which local population the specimen represents for.](#)

COMPLEXITY OF LOCAL POPULATION OF THE FINLESS PORPOISES IN JAPANESE WATERS

In order to make clear description or interpretation of the finless porpoise we need clearer definitions for the species and subspecies.

Yoshida et al (1995) pointed out the existences of at least five different geographical populations of the finless porpoise in the waters around Japan. This result was reinforced by Yoshida et al (2001) where sequence analyses on the control region of mtDNA. Aizu et al (2013) analysed more and confirmed this condition using nuclear genes and microsatellite. As was mentioned by Jefferson (2002) morphology of the dorsal ridge and other soft tissue characters are also significant in recognizing geographical populations.

What is necessary to establish a practical and useful definition for these species, subspecies or even geographical populations are well described observations on the following characters:

1. osteological characters especially of the skull
2. external body proportions
3. morphological characters including soft tissue
 - 2-1. dorsal ridge
 - 2-2. density and number of tubercles
 - 2-3. cross section shape of the body at several levels
4. molecular diversity

Considering fairly large differences of the above characters, although some of them are extremely difficult to quantify, conclusions given by Jefferson and Wang (2011) are still premature and we need further detailed examinations on at least recognized local populations of the finless porpoise of the seas around Japan.

DIFFICULTY OF SPECIFYING THE TYPE SPECIMEN OF *N. A. SUNAMERI*

As was mentioned by Yoshida et al (1995; 2001) and others five geographically discrete populations in; Sendai Bay to Tokyo Bay, Ise-Mikawa Bay, Inland Sea to Genkai Nada, Omura Bay, and Ariake Sound and Tachibana Bay were recognized and they are different in several ways including soft tissue morphology. The specimen in Leiden museum was collected in the city of Nagasaki, but in Nagasaki is in close geographical position from either Omura bay and Ariake sound. The first priority for us is to clarify the origin of Leiden specimen whether it was collected in Omura bay or Ariake sound. It would be possible to examine either by morphology of the skeleton or molecular biology or both. This will make the position of Leiden specimen clear.

Within the limited experience of the present author finless porpoises from the Yellow sea, which was probably classified as *N. a. sunameri* following the definition given by Jefferson and Wang (2011), had significantly different external appearances especially of dorsal ridge. We need further confirmation by molecular biology at least the Yellow sea population appears significantly different from the finless porpoise from Japanese waters. If the subspecies *N. a. sunameri* is to be defined by RMNH23709 in Leiden the finless porpoises from the Yellow sea is different in external morphology. Further studies on the Yellow sea population, five geographical populations in Japan will be necessary for us to get proper recognition of the species.

REFERENCES

- Aizu, M., et al. 2013. Genetic population structure of finless porpoise in Japanese coastal waters. Document submitted to International Whaling Committee SC/65a/SM24
- Chen, L., M. W. Bruford, S. Xu, K. Zhou and G. Yang. 2010. Microsatellite variation and significant population genetic structure of endangered finless porpoises (*Neophocaena phocaenoides*) in Chinese coastal waters and the Yangtze River., *Marine Biology* 157:1453-62.
- Cuvier, G. 1829. Le règne animal distribué d'après son organisation, pour servir de base à l'histoire naturelle des animaux et d'introduction à l'anatomie comparée. Vol. 1. Dèterville, Paris.
- Cuvier, G. 1830. Rapport fait à l'Académie royale des Sciences, sur les Collections rapportées récemment de la mer des Indes par M. Dussumier, de Bordeaux, *Annales des Sciences Naturelles* 21:458-68.
- Holthuis, L. B. and T. Sakai. 1970. Ph. *F. von Siebold and Fauna Japonica – A history of early Japanese zoology*. Academic Press of Japan, Tokyo, 1970. 323 pp.
- Jefferson, T. A. 2002. Preliminary analyses of geographic variation in cranial morphometrics of the finless porpoise (*Neophocena phocaenoides*). *Raffles Bulletin of Zoology* Supplement No.10:3-14.
- Jefferson, T. A. and J. Y. Wang. 2011. Revision of the taxonomy of finless porpoises (genus *Neophocaena*): The existence of two species. *Journal of Marine Animals and Their Ecology* 4:3-16.
- Pilleri, G. and H. Gühr. 1972. Contribution to the knowledge of the cetaceans of Pakistan with particular reference to the Genera *Neomeris*, *Sousa*, *Delphinus* and *Tursiops* and description of a new Chinese Porpoise (*Neomeris asiaorientalis*). *Investigations on Cetacea* 4:107-59.

- Pilleri, G. and M. Gahr. 1973. Contribution to the Knowledge of the Cetaceans of Southwest and Monsoon Asia (Persian Gulf, Indus Delta, Malabar, Andaman Sea and Gulf of Siam). *Investigations on cetacea* 5:95-149.
- Pilleri, G., and M. Gahr. 1975. On the taxonomy and ecology of the finless black porpoise, *Neophocaena* (Cetacea, Delphinidae). *Mammalia* 39:657-73.
- Robineau, D. 1990. Les types de cétacés actuels de Muséum national d'Histoire naturelle. II. Delphinidae, Phocoenidae., *Bul.Mus.natn.Hist.nat.*, Paris, 4^e ser. 12:197-238.
- Schlegel, H. 1841. Beiträge zur Charakteristik der Cetaceen., *Abhandlungen aus den Gebiete der Zoologie und Vergleichenden Anatomie* 1:1-44, 6 pls.
- Temminck, C. J., and H. Schlegel. 1844. Les mammifères marins., Pp. 1-26, 10 pIs in *Aperçu général et spécifique sur les Mammifères qui habitent le Japon et les Iles qui en dépendent* (==Fauna Japonica - Mammifères) (Temminck.C.J., ed.). A. Arnz & Comp., Leiden. 1-26, 10 pIs
- Van Bree, P. J. H. 1973. *Neophocaena phocaenoides asiaeorientalis* (Pilleri & Gahr, 1973), a synonym of the preoccupied name *Delphinus melas* Schlegel, 1841. (Notes on Cetacea, Delphinoidea VII.), *Beaufortia* 21:17-24.
- Yoshida, H., K. Shirakihara, M. Shirakihara, and A. Takemura. 1995. Geographic variation in the skull morphology of the finless porpoise *Neophocaena phocaenoides*, in Japanese waters., *Fisheries Science* 61:555-58.
- YOSHIDA, H., M. YOSHIOKA, M. SHIRAKIHARA, AND S. CHOW. 2001. Population structure of finless porpoises (*Neophocaena phocaenoides*) in coastal waters of Japan based on mitochondrial DNA sequences., *Journal of Mammalogy* 82:123-30.