Lipotes Miller, 1918

Lipotes Miller, 1918:2. Type species Lipotes vexillifer Miller, 1918, by original designation.

CONTEXT AND CONTENT. Order Cetacea, Family Phatanistidae, Subfamily Inianae. The genus Lipotes now includes one species Lipotes vexillifer as treated below. No subspecies are recognized.

Lipotes vexillifer Miller, 1918

White-flag Dolphin

Lipotes vexillifer Miller, 1918:2. Type locality "Tung Ting Lake, China."

DIAGNOSIS. Because Lipotes is monotypic, the following diagnosis applies to genus and species: general structure of skull as in Inia (Amazon River Dolphin) but rostrum curved upward (see Figure 1); proximal extremity of premaxillary thin and plate-like, not forming raised anterior border to narial aperture; mandibular symphysis barely equal to free portion of ramus. Dentition (three specimens) ranges from 32 to 34 above and 31 to 34 below, essentially uniform throughout, with form of crown and character of enamel wrinkling (Figure 2) much as in median teeth of Inia, but root not thickened; entire tooth resembles one of Miocon North American Schizodelphus (modified from Miller, 1918). General external morphology also similar to Inia, but differs as follows: rostrum curved upward, pectorals relatively smaller and rounded rather than pointed, blowhole longitudinal and somewhat rectangular, and dorsal fin larger and triangular in shape.

GENERAL CHARACTERS. Longer descriptions that compare the skull and skeleton of Lipotes with those of Inia and the other two river dolphins, Platanista and Pontoporia, may be found in Miller (1918 and 1923), Slipher (1936), and Wimo (1942). The "rugose enamel seems to characterize all known fossil and Recent "inid" dolphins (Kellogg, 1942).

Photographs of the holotype (skull and cervical vertebrae) and measurements appear in Miller (1918); for external black-and-white photographs, see Miller (1918), Pope (1940), and Figure 3 for skeleton presentation of skull and skeleton, see Slipher (1936). The left tympanic bulla and periodic complex of Lipotes are shown in Figure 4. The color of the holotype was pale blue-gray above, white below (Miller, 1918).

External measurements were taken from the American Museum and British Museum carcasses before being prepared as skeletons. The measurements of the British Museum (Natural History) specimen are in parentheses and were converted from inches. All measurements of more than 100 mm were rounded to the nearest 5 mm. These have not been published previously and are given below: total length (tip of upper jaw to fluke notch) 2020 (2080); tip upper jaw to apex of melon (305); angle of gape 375; to center of eye 440; to blowhole 495 (455); to posterior base of flipper 880; to anterior base of dorsal fin 1065; notch of fluke to anus 520; and to posterior base of dorsal fin 670; projection of lower jaw beyond upper 7; eye to angle of apex (direct) 65; and to center of blowhole (direct) 115; girth at head at eyes 750, girth of body just behind flipper 1010, maximum girth (1220), and girth just behind dorsal fin 820; length of eye 10; axilla of flipper to tip 210; maximum width of flipper 185; height of dorsal fin 100; width of flukes tip to tip 315, width right lobe 180; length of anal-genital slit 150; length between umbilicus and anterior margin of genital slit (485).

DISTRIBUTION. Found in Tung Lake, China, and around the mouths of, and up into, the various streams that flow into the lake (Hoy, 1923).

FOSSIL RECORD. No fossils are known for Lipotes. Rensberger (1969) described Kamphophos serculus, a new genus and species of Inian dolphin, from the Miocene "Monterey" Formation (California) (Alameda Creek, 8 mi. SE Sunol, Alameda County). Rensberger concluded that Kamphophos is as closely related to Lipotes as to Inia from the Amazon and Orinoco rivers of South America. "In terms of the relative number of common characters" Considerable additional study is needed to clarify the relationships of these three genera.

FORM. Blubber thickness in the type specimen was approximately 38 mm over all of the body (Hoy, 1923). Relationships of tympanoperiotic bones to skull and air sinuses are given by Fraser and Purves (1960). A pair of large float-like bones are found, one on each side of the head just behind the anterior edge. These bones are thought to function with blowhole movements as each has a double retractor and protractor muscle (Hinton and Pycraft, 1922; Hinton, 1936). The vertebral count is relatively low: 7 cervical, 10 thoracic, 7–8 lumbar, and 19–20 caudal vertebrae with 12 chevron bones. The first six ribs have capillarit and tubercular attachments. The blowhole air sacs were described by Hinton and Pycraft (1922) as the ventriculus of the stomach, which is widely confluent with the second compartment, thus less completely segmented proximally than in most other genera. The asymmetry of body is excessive, with the right side overdeveloped (Hinton, 1936). Other organ systems have not been studied. Hinton (1936) reported that a study on the coarse anatomy of the British Museum Lipotes was under way and that a "complete photographic record of the work was made as it proceeded, and many preparations were preserved."

E. C. Fraser (in litt., 10 January 1969) reported that he was not aware of any preserved preparations from the specimen in the British Museum. Pope's unpublished field notes of 1921 stated: "All viscera as well as vaginal-anal opening and surrounding parts including teats saved. Also, pelvic rudiments; blowholes with surrounding flesh and underlying bones; and organs of throat.

None of these materials could be found at the American Museum in December 1966.

REPRODUCTION. A lactating female, 2020 mm in total length, was captured on 21 December 1921. The type specimen, a male 2285 mm in total length, was said to be an adult by Miller (1918). The British Museum specimen, a female, was 2080 mm in total length and was probably mature. Females are said to "breedled" in the various streams that flow into the lake during the summer high water (Hoy, 1923).

ECOLOGY. No predators are known except possibly man. No ectoparasites or endoparasites are recorded (Dailly and Brownell, 1972). In summer, the water level in the lake rises and the dolphins are said to go up various streams that flow into the lake (Hoy, 1923). Pope's field notes revealed that two large scaled fish ("Lu-yu") were found in the stomach of his specimen; these had been recently eaten and measured 450 and 380 mm in length. The stomach of the type specimen contained 1.9 liters of a single species of a "long, eel-like catfish that inhabits the mud in the bottom of this lake" (Miller, 1918). Mud was stirred up and the water discolored with schools of Lipotes fed (Hoy, 1923). Dolphins are not seen in the clear part of the lake so far below its mouth (Hoy, 1923). The current status of the population of this species is unknown, but Pope (1940) stated that after getting the local fishermen to collect a specimen no others could be collected, and "one explanation of the failure of the fishermen to help further was that they hold the dolphin in awe, believing that ill fortune descends on those who molest it. The individual that they brought me may have been merely a compromise with fate; or perhaps they had been threatened by their guild."
Figure 1. Photographs of skull and lower jaw of *Lipotes vexillifer*, AMNH 57333. From top to bottom, dorsal view, ventral view, lateral view of cranium and jaw (with area enlarged in Figure 2 marked).
Figure 2. Lateral view of teeth 15 through 19 (counting from front to back) of left lower jaw of *Lipotes vexillifer* (see Figure 1).

**BEHAVIOR.** Group size is usually three or four, "but occasionally they may school in groups of 10 or 12 individuals" (Hoy, in Miller, 1918). Feeding is probably done around the bottom and perhaps in the mud. "The Chinese say that a peculiar roaring noise, that is often heard at night on the lake, is due to these dolphins, and judging from the noise that the one I secured made, this would probably seem to be the case" (Hoy, 1923). Hoy's specimen "when shot gave a cry like that of a water-buffalo call."

**REMARKS.** A total of only five specimens (one complete skeleton) appear to be extant in museums. The holotype (USNM 21883, skull and cervical vertebrae) was collected on 18 February 1916 by Charles M. Hoy (Hoy, 1923), stated that this specimen was collected in the winter of 1914, but a hand-written letter in the files of the U.S. National Museum from Hoy to Miller, dated 23 October 1917, stated that it was shot on 18 February 1916. AMNH 57333 (also catalogued under 63975), a complete skeleton, was collected on 21 December 1921 by Clifford H. Pope. BM(NH) 226-6-22-1, a once complete skeleton (all the ribs and all parts of the pectoral limbs, and pelvis are missing—P. E. Purves in litt., 15 October 1970), was collected on 19 January 1922 by G. F. C. Corfield. The editor of the China Journal of Arts and Sciences reported at the end of Hoy's 1923 paper: "It is interesting to note that two specimens of this interesting dolphin lie in the Shanghai Museum (R. A. S.) and have apparently been there for some considerable time. One is a complete skull of an immature animal, the other the lower jaw of an adult. There is no data to be found in connection with these interesting specimens, which is regrettable." It was also noted that since Hoy secured the type specimen, "three specimens are reported to have been taken for the Third American [Museum] Expedition;" this was the expedition with which Andrews and Pope worked. Clifford Pope collected three dolphins in Tung Ting Lake, but two were black finless porpoise (*Neophocaena phocaenoides*). The third dolphin was the complete skeleton of *Lipotes* reported above.

*Lipotes* is from the Greek word *lipos* for fat and *tes* suffix for action and agency. The specific name *vexillifer* is from the Latin words *vexillum* for flag and the suffix *-fer* for carry or bear.

Nothing is known about the genetics or physiology of *Lipotes*.

Miller (1918) placed *Lipotes* in the family Iniidae, which also contains *Inia*. The Platanistidae (monotypic with *Platanista*) and Iniidae were recognized by Miller (1923) and Kellogg (1928). These authors transferred Stenodelphininae (monotypic with *Pontoporia*) from the Platanistidae to the family Delphinidae. Recent authors (Slipper, 1936; Simpson, 1945; Fraser and Purves, 1960) have placed *Inia, Lipotes, Platanista,* and *Pontoporia* together in the family Platanistidae. Simpson and the last two authors have recognized three distinct subfamilies. Slipper (1936) recognized no subfamilies. Publications dealing with fossil inuids (Kellogg, 1944 and...
1955: Rensberger, 1969) have continued to recognize the iniids as a distinct family.

**LITERATURE CITED**


The editor for this account was S. Anderson. Photographs are by the Department of Photography, The American Museum of Natural History, except Figure 3.

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