MAMMALIAN SPECIES No. 89, pp. 1–3, 3 figs.

Trichechus senegalensis.

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Published 6 January 1978 by The American Society of Mammalogists

Trichechus senegalensis Link, 1795

African Manatee

Trichechus senegalensis Link, 1795:109. Type locality Senegal.
Trichechus Australis Shaw, 1800:244. Type locality Senegal.
Manatus stroggylonurus Bechstein, 1800:733. Type locality unknown.
Manatus nasutus Wyman, 1848:199. Type locality Ivory Coast.
Manatus Vogelii Owen, 1856:346. Type locality Benue River, Nigeria.
Manatus Oweni Du Chaillu, 1861:367. Type locality the mouth of the Gabon River, Gabon.

CONTEXT AND CONTENT. Order Sirenia, Family Trichechidae. The single genus *Trichechus* includes three species: *T. senegalensis*, *T. inunguis*, and *T. manatus*.

DIAGNOSIS. Externally indistinguishable from *T. manatus*. Distinguishing cranial characters are taken from Hatt (1934); however, even these provide little basis for separating *T. senegalensis* and *T. manatus*. Cranial bone is smooth and dense; general skull shape is broad and compact; the snout is short; medial zygomatic arches are directed approximately 35° to 40° laterally from the longitudinal axis of the skull and are extremely thick and deeper than those of *T. manatus*; vomer is short, extending only to the level of the middle of the orbit; nasal process of the premaxilla partly covers the anterior surface (along nasal cavity) of the orbital process; incisive foramen simple; foramen magnum roundish; symphyseal suture of mandibles without a deep furrow along the anterior margin. The sternum is without a deep median notch in the anterior border. The first phalanx is approximately 25% of humerus length.

GENERAL CHARACTERS. African manatees are heavy and fusiform in shape. Adults are 3 to 4 m in length and weigh less than 500 kg. The horizontally flattened tail is spatulate and the forelimbs are paddlelike with nails on the dorsal surface. The skin is finely wrinkled throughout and grayish-brown in color. Fine, colorless hairs are sparsely distributed over the body and stout

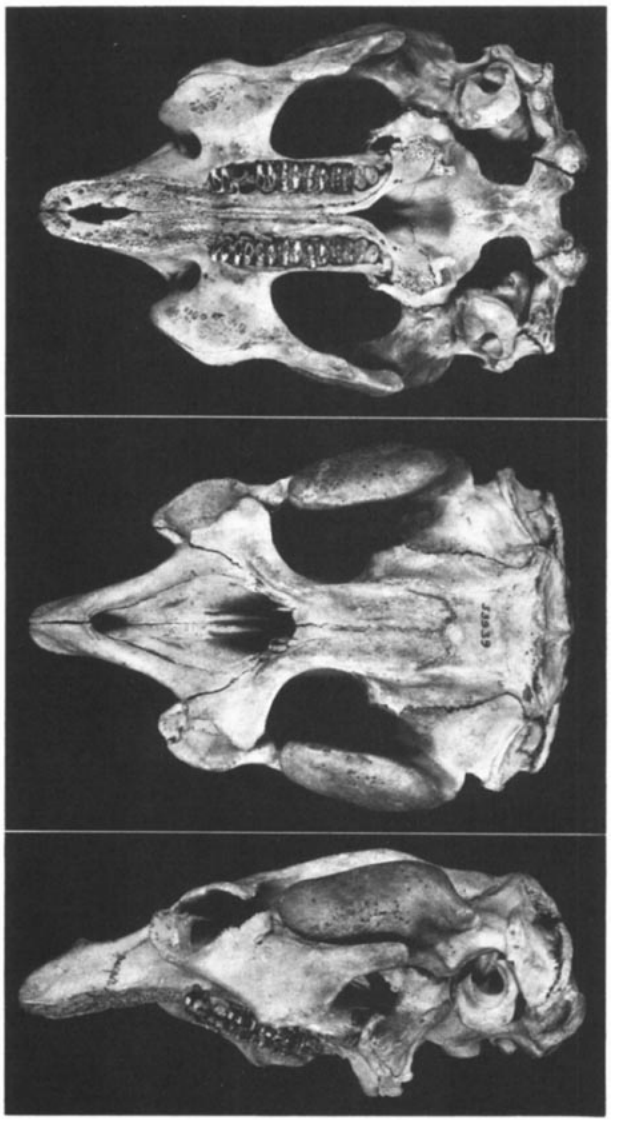

FIGURE 1. Skull of *Trichechus senegalensis* in ventral, dorsal, and lateral views (from the top down). Photographs by James Coxe, Department of Photography, American Museum of Natural History, of AMNH 53939. The greatest zygomatic breadth of this skull is 189 mm.

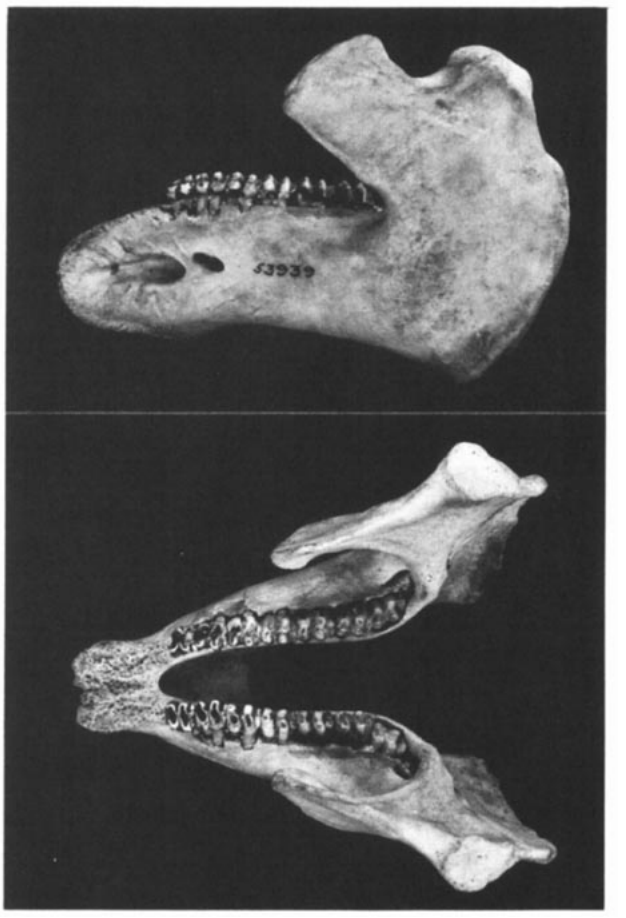

FIGURE 2. Lower jaw of *T. senegalensis* (same specimen shown in figure 1) in lateral and dorsal views. The greatest breadth across the mandibles is 149 mm. (the reduction is not, therefore, as great as in figure 1). Note the greater wear on the more anterior teeth (at left).

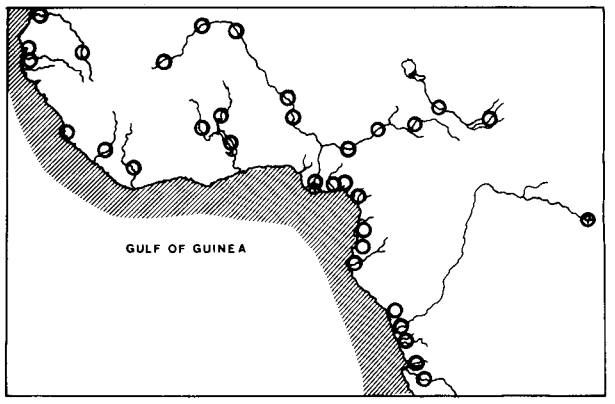

FIGURE 3. Map of part of western Africa with specimen localities indicated by open circles. The circle with the question mark indicates an unconfirmed report from the Uele River.

bristles are located on the upper and lower lip pads. There are two axillary mammae. Eyes are small, closing with sphincter action and eyelashes are absent. The ears are minute, with no external pinnae. Detailed descriptions and measurements may be found in Gijzen (1963) and Cadenat (1957). Black and white photographs are in Mohr (1957) and Hatt (1934). An African manatee grazing in the wild was pictured in Sikes (1974).

DISTRIBUTION. The range of *T. senegalensis* includes rivers, estuaries, and coastal regions of West Africa from Senegal to Angola (figure 3). African manatees are not uncommon in the lower reaches of the Senegal River (Cadenat, 1957), although they were reported as rare in the Faleme (Cligny, 1900), a tributary branching from the Senegal approximately 500 km inland. Specimens have been taken from the Gambia River (Hatt, 1934; Brown, 1878; Baikie, 1857) and Christopher Columbus noted manatees off the coast of Guinea (True, 1884). They also occur in the Sierra Leone River, where the animals are still common enough to be trapped for food (Robinson, 1971). Manatees have been reported from the coasts of Liberia (Beal, 1939), and records exist from Piso Lake, the Missunado River, the Cavalla River (Hatt, 1934), and along the entire Ivory Coast (Blancou, 1960; Beal, 1939). In Ghana, *Trichechus* seems to be restricted to the coasts and the Volta River system, but it is believed to be absent from the river below the dam (Cansdale, 1964). Forming the northern border of Dahomey are the Niger and Mekrou rivers, where manatee populations were once substantial; however, they have been extirpated as a result of uncontrolled local hunting (Poche, 1973). Throughout the Niger River system, weedy swamp areas are favored habitat (Sikes, 1974; Howell, 1968), and manatees have penetrated the Niger as far upstream as Segou, Mali, a distance of about 2000 km (Hatt, 1934; Gratiolet, 1901). They occur up the Benue River to Numan, where earlier they were reported as common (Hatt, 1934). African manatees do not occur in Lake Chad (S. Sikes, personal communication), although they have been reported in the principal tributaries of the Chad region—the Baningi, the Bahr Keeta, and the River Chari (Bouveignes, 1952; Derscheid, 1926; N. Scott, personal communication). In Cameroon, *T. senegalensis* is rare (Allen, 1942). Records exist from several coastal rivers from Cameroon to the Congo Brazzaville, including the Mungo, Wouri and Muni (Hatt, 1934), the Gabon (Blancou, 1960), the Ogooue (Allen, 1942), the Loeme and Chiloango rivers (Hatt, 1934), but no estimates of abundance along this coastal area are available. Manatees were present in considerable numbers in the lower reaches of the Congo River and they have been reported from the Uele and Mbomu rivers, although specimens have not been collected from the latter localities (Hatt, 1934). In general, the population within Zaire appears diminished (Allen, 1942). Further south, manatees have been reported from the Loge, Dande, Bengo and Cuanza rivers, but abundance remains unknown (Ellerman, *et al.*, 1953; Hatt, 1934).

FOSSIL RECORD. The earliest manatee fossils are from South America (Couto, 1967; Reinhart, 1951) and date back to the lower Miocene. Fossil specimens from the Pliocene are unknown. Pleistocene *Trichechus* has been discovered from the eastern United States, the Caribbean (Romer, 1966), and Argentina (Reinhart, 1959). *Trichechus* is known only from Recent times in West Africa (Romer, 1966).

FORM. Skull and skeleton are of dense (pachyostotic) bone. The skull is generally broad and has a shortened, slightly deflected snout. Nasal bones are variable, ranging from platelike to peglike in form, and they even may be wholly undeveloped (Hatt, 1934). Two vestigial incisors are present in each jaw at birth, but are resorbed later in life (Harrison and King, 1965). Cheekteeth are brachyodont and without cement. Five to seven functional teeth are present at one time in each jaw, and each has two cuspidate crosscrests. Roots are closed and divided. Teeth are replaced from the rear by newly erupting teeth, and up to 20 teeth per jaw have been estimated (Thomas and Lydekker, 1897).

Ear ossicles of *T. senegalensis* are especially large and bulky (Robineau, 1965). The anterior process of the malleus is ankylosed to the tympanal and the *processus brevis incudis* is joined to the *tegmen tympani*. This unusual anchoring may relate to the reported exceptional hearing ability of manatees.

Skeletal characters are similar to those of the other manatees and were discussed by Hatt (1934). The soft anatomy of the African manatee has not been thoroughly studied. Lemire (1968) examined a *T. senegalensis* stomach and found no significant differences between this species and the other manatees.

FUNCTION. The only physiological data available are a series of rectal temperatures taken while a captive was exposed to variable air and water temperatures (Dekeyser, 1952). These data indicate that body temperature of *T. senegalensis* varies more in response to changes in air temperature than to fluctuations in water temperature. Van den Bergh (1968) recorded a single submergence interval of 7 minutes for a captive, but African manatees probably are capable of diving for longer periods.

ONTOGENY AND REPRODUCTION. Howell (1968) claimed that African manatees breed seasonally in weedy swamps and lagoons during the late dry season. However, documentation is lacking, and captures of a 1.05 m calf in January (Dekeyser, 1952) and a 1.04 m calf in June (Cadenat, 1957) suggest that breeding occurs throughout the year, as is the case for both *T. inunguis* and *T. manatus* (Hartman, 1971; Mohr, 1957). The gestation period is unknown. Usually one calf is produced, and parturition supposedly occurs in shallow lagoons (Beal, 1939). Newborn calves are about one meter long (Cadenat, 1957). Growth rate (lengths only) of a single captive is reported by Gijzen (1963). Longevity of the African manatee is unknown.

ECOLOGY. Man is the only known predator of the African manatee. Sharks and crocodiles occur within manatee habitat, but predation has not been reported (Cadenat, 1957). The only parasite thus far recorded for this manatee is the trematode, *Chiorchis fabaceus*, inhabiting the large intestine (Baylis, 1936). Diseases of free-ranging *T. senegalensis* are unknown; however, a captive held in the Antwerp zoo died of acute enteritis (Derscheid, 1926).

African manatees occur in both shallow coastal waters and in fresh water rivers, but they seem to prefer large, shallow estuaries (Robinson, 1971; Blancou, 1960; Beal, 1939), marigots (Rochebrune, 1883), and weedy swamps (Howell, 1968; Wood, 1937). *T. senegalensis* appears to be limited to regions with water temperatures of 18°C or higher (Allsopp, 1969). In several areas, this species coexists with the hippopotamus (Cansdale, 1964).

Aquatic vascular plants taken by African manatees include *Cymodocea nodosa*, *Polygonum* sp., *Eichornia crassipes*, and *Vossia* sp. (Allsopp, 1969; Dorst and Dandelot, 1969; Beal, 1939). They also have been reported cropping off leaves of mangroves (*Rhizophora* sp.) hanging over the edge of water (Cadenat, 1957). A captive male 1.83 m in length consumed 12 kg of vegetables daily and, upon reaching 2.4 m in length, his intake increased to 17 to 18 kg of vegetables, legumes, and *Elodea* daily (Gijzen, 1963). Therefore, a free-ranging adult might be expected to consume about 8000 kg of aquatic vegetation in one year. Accordingly, *T. senegalensis* has been seriously considered for use in the control of aquatic weeds. The Senegal and Congo rivers are completely weed-choked, and Lake Volta and Kainje Lake have similar problems (W. H. L. Allsopp, personal communication; Cansdale, 1964). Several African nations have expressed interest in stocking manatees for future weed clearance (W. H. L. Allsopp, personal communication), and this species also has been considered for domestication for meat (Beal, 1939).

Local hunting of *T. senegalensis* has been significant, but there has been no large-scale commercial exploitation of this species as there has been for *T. inunguis* in South America. African manatees are hunted with harpoons and guns (Robinson, 1971; Cansdale, 1964; Allen, 1942) for their palatable meat and thick layer of fat. The marked decline in population levels in certain areas has been attributed to hunting (Blancou, 1960; Bouveignes, 1952; Allen, 1942), but the impact of hunting is difficult to ascertain, because the animals are now mostly protected legally and hunting is done secretly.

A further threat to the African manatee is the use of shark nets in coastal waters. Estimates of the total number of manatees killed each year in this manner are not available, but nets placed in a single locality (Ngazobil, Senegal) killed five manatees over a

period of 87 days (Cadenat, 1957). Therefore, the impact of shark netting on manatee populations may be significant.

Legal protection for the African manatee is nearly complete, but enforcement and education problems still remain. *T. senegalensis* occurs within the Doro River Forest Reserve of Nigeria (Howell, 1968), the Djoudj National Park and Basse Casamance National Park of Senegal (Dupuy, 1972, 1973), and the proposed Korup Reserve of Cameroon (Gartlan, 1973). Few African manatees have been kept in captivity, and no successful captive breeding has been reported.

BEHAVIOR. Beal (1939) claimed that *T. senegalensis* is monogamous, associating in groups consisting of an adult pair, a half-grown calf and a young calf. These claims have not been substantiated, and it is more probable that social behavior is similar to that of *T. manatus*, in which the only stable bond exists between a cow and her calf (Hartman, 1971). Cadenat (1957) noted what he believed to be an unusual occurrence, 15 manatees cruising together in a group.

GENETICS. Nothing is known of the genetics of *T. senegalensis*.

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