

Catalogue of American Amphibians and Reptiles.

ERNST, CARL H. 1974. *Kinosternon baurii* (Garman).

***Kinosternon baurii* (Garman)**
Striped mud turtle

Cinosternum baurii Garman, 1891:141. Type-locality: "Key West" (Monroe County, Florida). Syntypes: Mus. Comp. Zool. 282-87 (six juveniles) collected by S. Garman in 1878. MCZ 1558 (adult female) collected by J. E. Miller, MCZ 1563 (adult female) collected by J. E. Miller, MCZ 4380 (juvenile) collected by S. Garman in 1878; Univ. Michigan Mus. Zool. 53038 (adult female, formerly MCZ 4718) collected by S. Garman in 1878; Field Mus. Nat. Hist. 73481 (adult female, formerly MCZ 4050 from "Cuba") collected by F. Poey. Syntypes examined by the author.

Kinosternon baurii: Loennberg, 1894:319. First use of this combination.

• CONTENT. Two subspecies are recognized: *Kinosternon baurii baurii* and *K. b. palmarum*.

• DEFINITION. Adults are 75-120 mm in carapace length; females average larger than males. The adult carapace is smooth, unkeeled, unserrated and usually widest and highest behind the middle. It is tan to black with three longitudinal yellow stripes. The vertebrals may be depressed, forming a broad, shallow middorsal groove. Hatchlings and juveniles have keeled carapaces. The broad plastron has two movable transverse hinges bordering the abdominal scutes; it is olive to yellow and either plain or with dark seam borders in adults or a dark central blotch in hatchlings. There are only eleven plastral scutes since the gular is single. The skin is tan to black, and the neck and head may show dark mottling. The small, conical head has two yellow or white stripes extending posteriorly from the orbit; one above and one below the tympanum. All four feet are webbed. Females have short, stubby tails. Males have long, thick, spine-tipped tails and a patch of tuberculate scales on the inner surface of each thigh and crus.

• DESCRIPTIONS. General descriptions are given by Siebenrock (1907), Pope (1939), Carr (1952), Conant (1958), Duellman and Schwartz (1958), Pritchard (1967) and Ernst and Barbour (1972). Juveniles and hatchlings are described by Pope (1939), Carr (1952), Einem (1956), Conant (1958) and Ernst and Barbour (1972). The eggs are described by Einem (1956) and Ernst and Barbour (1972). Detailed anatomical descriptions have been published on the cervical vertebrae (Williams, 1950), plastral hinges (Shah, 1960), carapacial seam arrangements (Tinkle, 1962), penis (Zug, 1966), nasal passages and choanae (Parsons and Stephens, 1968; Parsons, 1968) and pelvic girdle and hind limbs (Zug, 1971).

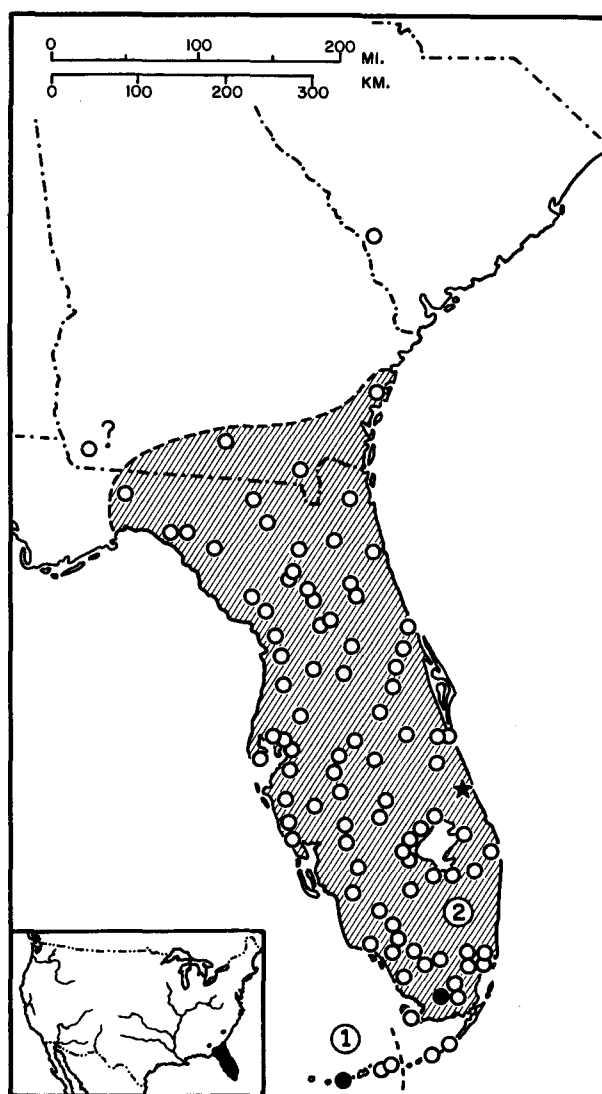
• ILLUSTRATIONS. For color photographs of adult, see Ernst and Barbour (1972); for black and white photographs and drawings of adults see Siebenrock (1907), Pope (1939), Carr (1952), Conant (1958), Wermuth and Mertens (1961), and Ernst and Barbour (1972). The bony structure of the plastron is pictured in Siebenrock (1907) and the skull in Ernst and Barbour (1972). Parsons and Stephens (1968) present drawings of transverse sections through the nasal cavity, and Zug (1971) presents lateral view drawings of the hind limbs during bottom-walking. A photograph of a cross section of the cochlear partition is shown in Schmidt (1964).

• DISTRIBUTION. *Kinosternon baurii* is restricted to the extreme southeastern United States; it ranges from southeastern South Carolina (Duever, 1972; specimens, Univ. Georgia 2404-7, examined and confirmed by author) along the Atlantic Coastal Plain of Georgia (Wharton and Howard, 1971) and south through peninsular Florida and the Keys. There is a questionable record from southwestern Georgia (Univ. Michigan Mus. Zool. 67707), and the northern distribution of *K. baurii* is poorly delineated in southern South Carolina. *Kinosternon b. baurii* is restricted to the lower Florida Keys, from Big Pine Key to Key West. *Kinosternon b. palmarum* occupies the rest of the range. Uzzell and Schwartz (1955) did much to clarify the distribution of the subspecies.

• FOSSIL RECORD. Fossil *Kinosternon baurii* have been found in Beds 2 and 3, Late Pleistocene (Wisconsin) of Vero Beach, St. Lucie County, Florida (Weigel, 1962).

• PERTINENT LITERATURE. General accounts of the biology are given by Pope (1939), Carr (1940, 1952), Einem (1956), Duellman and Schwartz (1958), and Ernst and Barbour (1972). Other important references are listed below by topics. Taxonomy: Siebenrock (1907), Uzzell and Schwartz (1955), and Frair (1964, 1972). Serology: Crenshaw (1962) and Frair (1964, 1972). Longevity: DeSola (1935). Carapacial skeletal elements: Holman (1963). Temperature relationships: Hutchinson, *et al.* (1966). Habitat: Ernst, *et al.* (1972). Relationship with mammals: Lee (1968). Algal relationships: Loennberg (1894) and Neill and Allen (1954). Parasites: Hughes, *et al.* (1941). DDT-poisoning: Herald (1949). Rearing in terraria: Bustard (1961). Movements: Zug (1971, 1973), Ernst, *et al.* (1972). Occurrence in marine or estuarine habitats: Duellman and Schwartz (1958) and Neill (1958).

• ETYMOLOGY. The specific name *baurii* is in honor of George Baur, noted osteologist and testudinologist. The subspecific name *palmarum* means of the palms and refers to the type locality at Royal Palm State Park (now Paradise Key of Everglades National Park).



MAP. The solid circles mark the type-localities; open circles indicate other selected localities. The star indicates the fossil locality.

1. *Kinosternon baurii baurii* (Garman)

Cinosternum baurii Garman: 1891:141. See species account.
Kinosternon baurii baurii: Stejneger and Barbour, 1939:155.
Kinosternon bauri bauri: Uzzell and Schwartz, 1955:33. Emendation of ending.

• DEFINITION. This race has opaque carapacial scutes with the sutures between the bony plates beneath not showing through. The carapacial and head stripes are sometimes obliterated and the lower jaw weakly streaked with dark pigment, if at all.

2. *Kinosternon baurii palmarum* Stejneger

Kinosternon bauri palmarum Stejneger, 1925: 463. Type-locality, "Royal Palm State Park, Dade County, Florida" (now Paradise Key of Everglades National Park). Holotype, U. S. Natl. Mus. 61065 (adult female) collected by C. A. Mosier (examined by author).

Kinosternon baurii palmarum: Carr, 1940:98.

• DEFINITION. The adult carapacial scutes are thin and transparent allowing the underlying sutures to show through. Carapacial stripes usually well-developed, but may be obscure in old individuals. Head stripes well-developed; lower jaw heavily streaked with dark pigment.

COMMENT

Garman (1891) reported one of the syntypes of *Kinosternon baurii* to be from Cuba. I suspect this specimen has the wrong collection data associated with it.

In his description of *Kinosternon b. palmarum*, Stejneger (1925) mentioned three specimens in addition to the holotype. Only two paratypes are listed in the United States National Museum catalogue: USNM 60597 (shell, juvenile male), collected by C. A. Mosier, 6 April 1918, and USNM 69559 (adult female), collected by Mosier, 30 October 1918 (both examined by author). A careful search has failed to reveal the third paratype.

The relationship of *K. baurii* with sympatric *K. subrubrum* needs further study, especially since some Florida individuals appear to be hybrids between the two. Also, the relationship of the South Carolina population of *K. baurii* needs study. An examination of the few available specimens revealed slight differences from Florida specimens, however more individuals are needed to determine the extent of variation.

LITERATURE CITED

- Bustard, Robert. 1961. American terrapins. *Aquarist and Pondkpr.* 26:88-89.
- Carr, Archie F. 1940. A contribution to the herpetology of Florida. *Univ. Florida Biol. Ser.* 3:1-118.
- 1952. Handbook of turtles. The turtles of the United States, Canada, and Baja California. Cornell Univ. Press, Ithaca, N. Y. 542 p.
- Conant, Roger. 1958. A field guide to reptiles and amphibians of the United States and Canada East of the 100th meridian. Houghton Mifflin Co., Boston. 366 p.
- Crenshaw, John W., Jr. 1962. Variation in the serum albumins and other blood proteins of turtles of the Kinosternidae. *Physiol. Zool.* 35:157-165.
- DeSola, C. Ralph. 1935. Herpetological notes from southeastern Florida. *Copeia* 1935:44-45.
- Duellman, William E., and Albert Schwartz. 1958. Amphibians and reptiles of southern Florida. *Bull. Florida State Mus.* 3(5):181-324.
- Duever, Michael. 1972. The striped mud turtle (*Kinosternon bauri* Garman) in South Carolina. *Herpetol. Rev.* 4:131.
- Einem, Gerald E. 1956. Certain aspects of the natural history of the mudturtle, *Kinosternon bauri*. *Copeia* 1956: 186-188.
- Ernst, Carl H., and Roger W. Barbour. 1972. Turtles of the United States. Univ. Press Kentucky, Lexington, Kentucky. 347 p.
- , Roger W. Barbour, and James R. Butler. 1972. Habitat preferences of two Florida turtles, genus *Kinosternon*. *Trans. Kentucky Acad. Sci.* 33:41-42.
- Frair, Wayne. 1964. Turtle family relationships as determined by serological tests, pp. 535-544. In Leone, C. A. (ed.): Taxonomic biochemistry and serology. Ronald Press, New York.
- 1972. Taxonomic relations among chelydrid and kinosternid turtles elucidated by serological tests. *Copeia* 1972: 97-108.
- Garman, Samuel. 1891. On a tortoise found in Florida and Cuba, *Cinosternum baurii*. *Bull. Essex Instit.* 23:141-144.
- Herald, Earl S. 1949. Effects of DDT-oil solutions upon amphibians and reptiles. *Herpetologica* 5:117-120.
- Holman, J. Alan. 1963. Late Pleistocene amphibians and reptiles of the Clear Creek and Ben Franklin Local Faunas of Texas. *J. Grad. Res. Cent.* 31:152-167.
- Hughes, R. Chester, Joe W. Higginbotham, and Jasper W. Clary. 1941. The trematodes of reptiles, Part II, host catalogue. *Proc. Oklahoma Acad. Sci.* 21:35-43.
- Hutchison, Victor H., Allen Vinegar, and Richard J. Kosh. 1966. Critical thermal maxima in turtles. *Herpetologica* 22:32-41.
- Lee, David S. 1968. Herpetofauna associated with central Florida mammals. *Herpetologica* 24:83-84.
- Loennberg, Einar. 1894. Notes on reptiles and batrachians collected in Florida in 1892 and 1893. *Proc. U. S. Natl. Mus.* 17:317-339.
- Neill, Wilfred T. 1958. The occurrence of amphibians and reptiles in saltwater areas, and a bibliography. *Bull. Marine Sci. Gulf Caribbean* 8(1):1-97.
- , and E. Ross Allen. 1954. Algae on turtles: some additional considerations. *Ecology* 35:581-584.
- Parsons, Thomas S. 1968. Variations in the choanal structure of Recent turtles. *Canadian J. Zool.* 46:1235-1263.
- , and Sharon M. Stephens. 1968. The nasal anatomy of *Kinosternon* and *Sternotherus* (Testudines: Kinosternidae). *Canadian J. Zool.* 46:399-404.
- Pope, Clifford H. 1939. Turtles of the United States and Canada. Alfred A. Knopf, New York. 343 p.
- Pritchard, Peter C. H. 1967. *Living Turtles of the World*. T. F. H. Publ., Inc., Jersey City, N. J. 288 p.
- Schmidt, Robert S. 1964. Phylogenetic significance of lizard cochlea. *Copeia* 1964:542-549.
- Shah, R. V. 1960. The mechanisms of carapacial and plastral hinges in chelonians. *Breviora* (130):1-15.
- Siebenrock, F. 1907. Die Schildkrötenfamilie Cinosternidae m. Acad. Wissenschaften Wien 116:527-599.
- Stejneger, Leonhard. 1925. New species and subspecies of American turtles. *J. Washington Acad. Sci.* 15:462-463.
- , and Thomas Barbour. 1939. A check list of North American amphibians and reptiles, 4th ed. Harvard Univ. Press, Cambridge, Mass. 207 p.
- Tinkle, Donald W. 1962. Variation in shell morphology of North American turtles I. The carapacial seam arrangements. *Tulane Stud. Zool.* 9:331-349.
- Uzzell, Thomas M., and Albert Schwartz. 1955. The status of the turtle *Kinosternon bauri palmarum* Stejneger with notes on variation in the species. *J. Elisha Mitchell Soc.* 71:28-35.
- Weigel, R. D. 1962. Fossil vertebrates of Vero, Florida. *Florida Geol. Surv. Spec. Publ.* (10):1-59.
- Wermuth, Heinz, and Robert Mertens. 1961. Schildkröten, Krokodile, Bruckenechsen. Veb. Gustav Fischer Verlag, Jena. 422 p.
- Wharton, Charles W., and J. Donald Howard. 1971. Range extensions for Georgia amphibians and reptiles. *Herpetol. Rev.* 3:73-74.
- Williams, Ernest E. 1950. Variation and selection in the cervical central articulations of living turtles. *Bull. Amer. Mus. Nat. Hist.* 94:505-562.
- Zug, George R. 1966. The penial morphology and the relationships of cryptodiran turtles. *Occ. Pap. Mus. Zool. Univ. Michigan* (647):1-24.
- 1971. Buoyancy, locomotion, morphology of the pelvic girdle and hindlimb, and systematics of cryptodiran turtles. *Misc. Publ. Mus. Zool. Univ. Michigan* (142):1-98.
- 1973. Walk pattern analysis of cryptodiran turtle gaits. *Anim. Behav.* 20:439-443.

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