

Catalogue of American Amphibians and Reptiles.

IVERSON, JOHN B. 1977. *Sternotherus minor*.

***Sternotherus minor* (Agassiz)
Loggerhead musk turtle**

Goniocchelys minor Agassiz, 1857:424. Type-localities, "neighborhood of Mobile [Mobile County, Alabama]," "Columbus [Muscogee County], Georgia" and "New Orleans [New Orleans Parish, Louisiana]"; restricted to Columbus, Georgia, by Schmidt (1953). Syntypes: Alabama, Mus. Comp. Zool. 1570, subadult male, collected by Dr. Nott, Georgia, Mus. Comp. Zool. 1571 (2 specimens), adult female and male, collected by Dr. Genner, Louisiana, U. S. Nat. Mus. 71111 (formerly Mus. Comp. Zool. 1572), adult female collected by N. B. Benedict; Univ. Michigan Mus. Zool. 63520, adult female collected by Dr. Benedict; Mus. Comp. Zool. 1572-73, an adult male and a juvenile collected by Dr. Benedict (reidentified by Tinkle (1958a) as *S. odoratus*). All syntypes but UMMZ 63520 seen by author.

Aromochelys minor: Strauch, 1862:39.

Sternotherus minor: Stejneger, 1923:2.

Sternotherus peltifer: Smith and Glass, 1947:22. See subspecies synonymy.

Sternotherus minor: Tinkle, 1958a:4.

• CONTENT. Two subspecies are recognized: *Sternotherus minor minor* and *S. m. peltifer*.

• DEFINITION. Adults are 80-135 mm in carapace length with females larger than males. The juvenile carapace has an ovate outline with a median keel and occasionally a pair of lateral keels (see subspecies). Adults possess a smooth, strongly vaulted carapace. The carapace angle formed by the mid-dorsal line at the juncture of second and third vertebral scutes and the second pleural scutes is less than eight times carapace height; carapace width is less than 2.2 times carapace height. The first vertebral scute never touches the second marginal, and at least three vertebral scutes are wider than long. The axillary is in contact with the inguinal. The inguinal contacts the seventh marginal but not the eighth. The tenth and eleventh marginal scutes are elevated above the preceding marginals. Gular scute is single and small. Interpectoral seam length is more than 40% of median plastral forelobe length. Interabdominal seam length less than 30% of plastron length. The nuchal bone often contacts the first neural bone. A poorly developed plastral hinge lies between the pectoral and the abdominal scutes. The nasal scale is furcate behind in adults. The carapace is brown with dark seams. The imbricated carapacial scutes are usually flecked or streaked with dark brown or black. The usually immaculate plastron is pink in post hatchlings and then becomes yellow. The skin is gray-brown with dark brown or black markings. Barbels are present on the chin only. Adult females possess short stubby tails, whereas males possess long, thickened tails with terminal spines and a patch of tuberculate scales on the posterior surface of the crus and thigh of each hind leg.

• DESCRIPTIONS. General descriptions are in Smith and Glass (1947), Tinkle (1958a), Ernst and Barbour (1972), and Conant (1975). Hatchlings are described in Ernst and Barbour (1972) and Conant (1975). More detailed descriptions include cervical vertebrae (Williams, 1950), plastral hinges (Shah, 1960), skull (Tinkle, 1958a), carapacial seam arrangements (Tinkle, 1962), rostral pores (Winokur and Legler, 1974), and penial morphology (Zug, 1966).

• ILLUSTRATIONS. Color photographs of adults appear in: Ernst and Barbour (1972); those of young, in Conant (1975). Carr (1952), Tinkle and Webb (1955), Tinkle (1958a), Estridge (1970), Ernst and Barbour (1972), Conant (1975), and Mount (1975) provide black and white photographs of the adult; Ernst and Barbour (1972), the skull; and Tinkle and Webb (1955), the holotype of *peltifer*. Drawings of the adult are in Wermuth and Mertens (1961) and of the penis in Zug (1966).

• DISTRIBUTION. *Sternotherus minor* is restricted to the southeastern United States. *S. m. minor* ranges from the St. John's river basin and Rainbow River of the Withlacoochee basin in north Florida, northward to and including the Ogeechee-Canoochee River system in Georgia, and westward to and including the Apalachicola River system in Florida, Georgia and Alabama. Within this range it is absent from the Wacasa

River system in north Florida. *Sternotherus m. peltifer* occurs throughout the Pearl River drainage of eastern Louisiana and Mississippi and the Mobile Bay drainage in Georgia, Tennessee, Alabama, and Mississippi. It also occurs in portions of the Tennessee River system in Tennessee, Alabama, and Virginia. It is apparently absent from the Pascagoula River drainage in Mississippi and Alabama. It occurs at least to 1500' above mean sea level (Johnson, 1958). Intergrade populations are found in the Gulf drainages of the Perdido River to the Choctawhatchee River (Iverson, 1977). *Sternotherus minor* is not found at New Orleans, Louisiana, one of the original type localities.

• FOSSIL RECORD. There is a single Pleistocene record from Vero, Indian River County, Florida (Weigel, 1962).

• PERTINENT LITERATURE. General accounts of the biology are given in Carr (1940, 1952), Tinkle (1958a), Ernst and Barbour (1972), and Conant (1975). Other important references are: taxonomy (Siebenrock, 1907; Stejneger, 1923; Tinkle and Webb, 1955; Tinkle, 1958a; Wermuth and Mertens, 1961; Iverson, 1977); reproduction (Carr, 1940, 1952; Tinkle, 1958a); ecology (Carr, 1952; Johnson, 1958; Tinkle, 1958a, 1958b; Berry, 1975); hybridization (Folkerts, 1967; Estridge, 1970); food and feeding (Tinkle, 1958a; Folkerts, 1968; Snyder and Snyder, 1971; Berry, 1975); agonistic behavior (Jackson, 1969); musk (Neill, 1948); biogeography (Tinkle, 1958a; Iverson, 1977); radioactive exoskeleton burdens (Jackson *et al.*, 1974); algal relationships (Ernst and Barbour, 1972); parasites (Johnson, 1967; Ernst and Barbour, 1972); carapace erosion (Jackson, 1965); serology (Crenshaw, 1962; Frair, 1972); hematology (Seal, 1964; Goin and Jackson, 1965); physiology (Belkin, 1964, 1965, 1968; Hutchison *et al.*, 1966; Jackson *et al.*, 1975).

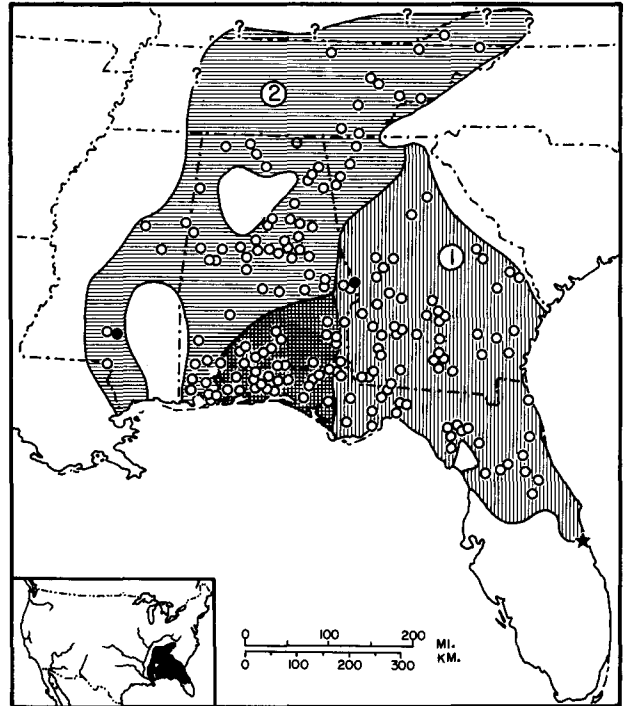
• ETYMOLOGY. The name *minor* (Latin) refers to its smaller size than its congener *S. carinatus*. The name *peltifer* is from the Latin *pelta*, a small shield, and *fer*, to bear, in reference to the small scutes on the bridge.

**1. *Sternotherus minor minor* (Agassiz)
Loggerhead musk turtle**

Goniocchelys minor Agassiz, 1857:424. See species account.

Sternotherus carinatus minor: Carr, 1952:77.

Sternotherus minor minor: Tinkle and Webb, 1955:64.



MAP. Solid circles mark type-localities, open circles indicate other selected localities. Shading patterns overlap in area of intergradation. The star indicates the fossil locality.

Sternotherus minor minor: Tinkle, 1958a:4.
Sternotherus minor minor: Wharton and Howard 1971:73.

• DEFINITION. The juvenile carapace has three distinct keels which are lost with age. The head is patterned with dark spots or blotches on lighter background; there is no striping on head or neck.

2. *Sternotherus minor peltifer* Smith and Glass Stripe-necked musk turtle

Sternotherus peltifer Smith and Glass, 1947:22. Type-locality, "Bassfield, Jefferson Davis County, 30 miles west of Hattiesburg, Mississippi." Holotype: Texas Coop. Wildlife Coll. 1205, an adult male collected by Helmut K. Buechner, 4 June 1946 (not seen by author).

Sternotherus carinatus peltifer: Carr, 1952:81.

Sternotherus minor peltifer: Tinkle and Webb, 1955:64.

Sternotherus minor peltifer: Tinkle, 1958a:4.

• DEFINITION. Juveniles have only one distinct keel which disappears with age. The head exhibits irregular dark markings which coalesce on the back of the head and neck to form longitudinal stripes on a light background.

LITERATURE CITED

- Agassiz, Louis. 1857. Contributions to the natural history of the United States of America. Vol. 1. Little, Brown and Co., Boston. li + 452 p.
- Belkin, D. A. 1964. Variations in heart rate during voluntary diving in the turtle *Pseudemys concinna*. *Copeia* 1964(2): 321-330.
- 1965. Reduction of metabolic rate in response to starvation in the turtle *Sternotherus minor*. *Copeia* 1965(3):367-368.
- 1968. Aquatic respiration and underwater survival of two freshwater turtle species. *Resp. Physiol.* 4:1-14.
- Berry, James F. 1975. The population effects of ecological sympatry on musk turtles in northern Florida. *Copeia* 1975 (4):692-700.
- Carr, Archie F. 1940. A contribution to the herpetology of Florida. Univ. Florida Publ., Biol. Sci. Ser. 3(1):1-118.
- 1952. Handbook of turtles. The turtles of the United States, Canada, and Baja California. Cornell Univ. Press, Ithaca, N. Y. xv + 542 p.
- Conant, Roger. 1975. A field guide to reptiles and amphibians of eastern and central North America. Second edition. Houghton Mifflin Co., Boston. xviii + 429 p.
- Crenshaw, J. W. 1962. Variation in the serum albumins and other blood proteins of turtles of the Kinosternidae. *Physiol. Zool.* 35:157-165.
- Ernst, Carl H., and Roger W. Barbour. 1972. Turtles of the United States. Univ. Press Kentucky, Lexington. x + 347 p.
- Estridge, Ronald E. 1970. The taxonomic status of *Sternotherus depressus* (Testudinata: Kinosternidae) with observations on its ecology. M.S. Thesis, Auburn Univ. 49 p.
- Folkerts, George W. 1967. Notes on a hybrid musk turtle. *Copeia* 1967(2):479-480.
- 1968. Food habits of the stripe-necked musk turtle, *Sternotherus minor peltifer* Smith and Glass. *J. Herpetol.* 2(3/4): 171-173.
- Frair, Wayne. 1972. Taxonomic relations among chelydrid and kinosternid turtles elucidated by serological tests. *Copeia* 1972(1):97-108.
- Goin, Coleman J., and Crawford G. Jackson. 1965. Hemoglobin value of some amphibians and reptiles from Florida. *Herpetologica* 21(2):145-146.
- Hutchison, V. H., A. Vinegar, and R. J. Kosh. 1966. Critical thermal maxima in turtles. *Herpetologica* 22(1):32-41.
- Iverson, John B. 1977. Geographic variation in the musk turtle *Sternotherus minor*. *Copeia*, in press.
- Jackson, Crawford G. 1965. Carapace erosion in the loggerhead musk turtle *Sternotherus minor minor* Agassiz. *Herpetologica* 20(4):279-281.
- 1969. Agonistic behavior in *Sternotherus minor minor* Agassiz. *Herpetologica* 25(1):53-54.
- , Charlie M. Holcomb, Skaidrite Kleinbergs-Krisans, and Marguerite M. Jackson. 1974. Variation in Strontium-90 exoskeletal burdens of turtles (Reptilia: Testudines) in south-eastern United States. *Herpetologica* 30(4):406-409.
- , and Marguerite M. Jackson. 1975. Serum levels of urea and inorganic phosphorus in the loggerhead musk turtle, *Sternotherus minor minor*. *Comp. Biochem. Physiol.* 51A:963-964.
- Johnson, Charles A. 1967. *Sternotherus minor peltifer* (Chelonia), a new host record for *Heronimus chelydrae* MacCallum, 1902 (Trematoda: Digenea). *J. Parasitol.* 53:617.
- Johnson, Richard M. 1958. A biogeographic study of the herpetofauna of eastern Tennessee. Ph.D. Dissertation, Univ. Florida. 220 p.
- Mount, Robert H. 1975. The reptiles and amphibians of Alabama. Auburn Univ. Agric. Ex. Stat. vii + 347 p.
- Neill, Wilfred T. 1948. Use of scent glands by prenatal *Sternotherus minor*. *Herpetologica* 4(4):148.
- Schmidt, Karl P. 1953. A check list of North American amphibians and reptiles. Sixth edition. Amer. Soc. Ichthyol. Herpetol., Univ. Chicago Press, Chicago, viii + 280 p.
- Seal, U. S. 1964. Vertebrate distribution of serum ceruloplasmin and sialic acid and the effects of pregnancy. *Comp. Biochem. Physiol.* 13:143-159.
- Shah, R. V. 1960. The mechanisms of carapacial and plastral hinges in chelonians. *Breviora* (130):1-15.
- Siebenrock, Friedrich. 1907. Die Schildkrötenfamilie Cinsternidae. *Sitzungb. Akad. Wiss. Wien.* 116(1):527-599.
- Smith, Hobart M., and Bryan P. Glass. 1947. A new musk turtle from the southeastern United States. *J. Washington Acad. Sci.* 37(1):22-24.
- Snyder, Noel F. R., and Helen A. Snyder. 1971. Defenses of the Florida apple snail *Pomacea paludosa*. *Behaviour* 40: 176-214.
- Stejneger, Leonard. 1923. Rehabilitation of a hitherto overlooked species of musk turtle of the southern states. *Proc. U. S. Nat. Mus.* 62(6):1-3.
- Strauch, Alexander. 1862. Chelonische Studien mit besonderer beziehung auf die Schildkrötensammlung der Kaiserlichen Akademie der Wissenschaften zu St. Petersburg. *Mem. Acad. Imp. Sci. St. Petersburg* 5(7):1-196.
- Tinkle, Donald W. 1958a. The systematics and ecology of the *Sternotherus carinatus* complex (Testudinata: Chelydridae). *Tulane Stud. Zool.* 6(1):1-56.
- 1958b. Experiments with censusing of southern turtle populations. *Herpetologica* 14(3):172-175.
- 1962. Variation in shell morphology of North American turtles. I. The carapacial seam arrangements. *Tulane Stud. Zool.* 9(5):331-349.
- , and R. G. Webb. 1955. A new species of *Sternotherus* with a discussion of the *Sternotherus carinatus* complex (Chelonia, Kinosternidae). *Tulane Stud. Zool.* 3(3):53-67.
- Weigel, Robert D. 1962. Fossil vertebrates of Vero, Florida. *Florida Geol. Surv. Spec. Publ.* (10):1-59.
- Wermuth, H., and R. Mertens. 1961. Schildkröten, Krokodile, Bruckenechsen. G. Fischer, Jena. xxvi + 422 p.
- Wharton, Charles H., and J. Donald Howard. 1971. Range extensions for Georgia amphibians and reptiles. *Herpetol. Rev.* 3(4):73-74.
- Williams, Ernest Edward. 1950. Variation and selection in the cervical central articulations of living turtles. *Bull. Amer. Mus. Natur. Hist.* 94(9):509-561.
- Winokur, Robert Michael, and John M. Legler. 1974. Rostral pores in turtles. *J. Morphol.* 143:107-120.
- Zug, George R. 1966. The penial morphology and the relationships of cryptodiran turtles. *Occas. Pap. Mus. Zool. Univ. Michigan* (647):1-24.

JOHN B. IVERSON, FLORIDA STATE MUSEUM, GAINESVILLE, FLORIDA 32611.

Primary editor for this account, George Zug.

Published 21 March 1977 by the SOCIETY FOR THE STUDY OF AMPHIBIANS AND REPTILES.