

A NEW TURTLE SPECIES OF THE GENUS *MACROCLEMYS* (CHELYDRIDAE) FROM THE FLORIDA PLIOCENE

JAMES L. DOBIE

Department of Zoology-Entomology
Auburn University, Auburn, Alabama 36830

ABSTRACT

Remains of specimens which appear to represent a new species of *Macrolemys* were excavated recently from a mid-Pliocene deposit at McGehee's Farm in Alachua County, Florida. The new species named ***Macrolemys auffenbergi*** was compared with *M. schmidti*, Miocene of Nebraska, and with the Pliocene-to-Recent species, *M. temmincki*.

Macrolemys schmidti is presumably the progenitor of *M. temmincki*. This presumption is based on distributional data and on the ages of the known fossils. Presumably, *M. temmincki* gave rise to *M. auffenbergi*.

The causative factor in the extinction of *M. auffenbergi* was perhaps the lowering of the water table during the mid-Pliocene.

INTRODUCTION

Pliocene remains of *Macrolemys* were excavated recently from a deposit at McGehee's Farm near Newberry, Alachua County, Florida, by staff members of the Florida State Museum. This is the first record for the genus from a Pliocene deposit in the southeastern United States although Pliocene representatives have been recorded by Zangerl (1945) and Hibbard (1963) from South Dakota and Kansas, respectively.

The assemblage of material from the McGehee site was compared with Pleistocene remains held by the University of Florida (UF) and with recent specimens deposited at Tulane University (TU), at the University of Michigan Museum of Zoology (UMMZ), and in the author's personal collection (JLD). Measurements by Zangerl (op. cit.) for the Miocene species, *M. schmidti*, Chicago Natural History Museum, (CNHM, P26014) and for the South Dakota *M. temmincki* (CNHM, P15823) were compared with the fossil remains from McGehee's Farm. In addition, two skull measurements from each of these two turtles

were kindly supplied by Dr. Zangerl (personal communication). Hibbard's data (op. cit.) on the shell of the Kansas Pliocene *M. temmincki*, University of Michigan Museum of Paleontology (UMMP, 47109) were compared with the McGehee material.

The Pliocene remains from Florida appear to represent an undescribed fossil species of *Macrolemys*. I propose that it be named ***Macrolemys auffenbergi*** in honor of Dr. Walter Auffenberg for his contributions to our knowledge of fossil and recent turtles.

Holotype: University of Florida (UF) 10992. A nearly complete specimen (Fig. 1A-C) collected by Robert Allen in December, 1963. The carapace of the holotype lacks peripherals 8-11 on the right side, costals 3, 4, 5, and 8 on the left side, and parts of costals 6, 7, and 8 on the right side. The carapace is similar to the recent species in that three supramarginals are present on the left and right sides of the carapace and because scute sulci are the same. The carapace is approximately 455 mm long, straight line measurement. The skull lacks all bones except for the two parietals, the right quadratojugal, the left squamosal, a piece of the supraoccipital and a fragment which appears to be part of the quadrate. The right side of the mandibular ramus lacks all bones except the dentary, the left ramus is entire. The rest of the holotype is entire except for caudal vertebrae and various elements of the fore and hind feet (Fig. 1A).

Paratypes: The paratypes consist of 16 humeri (UF 9224-9228, UF 13051-13061), a basal phalanx of the third finger from a fore foot (UF 13062), two basal phalanges of the third fingers from the hind feet (UF 13063, UF 13064), an incomplete carapace

EDITORIAL COMMITTEE FOR THIS PAPER:

DR. RAINER ZANGERL, Chief Curator, Department of Geology, Field Museum of Natural History, Chicago, Illinois 60605

DR. WILLIAM W. MILSTEAD, Professor of Biology, University of Missouri, Kansas City, Missouri 64110



Figure 1A. Holotype remains of *M. auffenbergi*, UF10992.

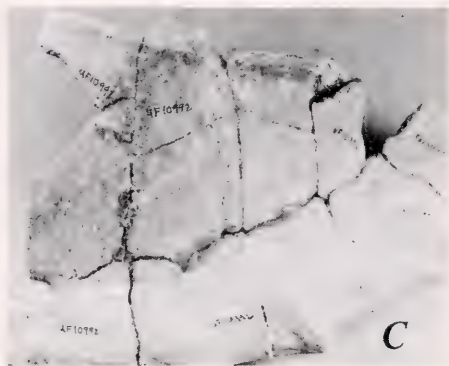


Figure 1C. View of the fifth through eighth costal bones of *M. auffenbergi* (holotype, UF10992).

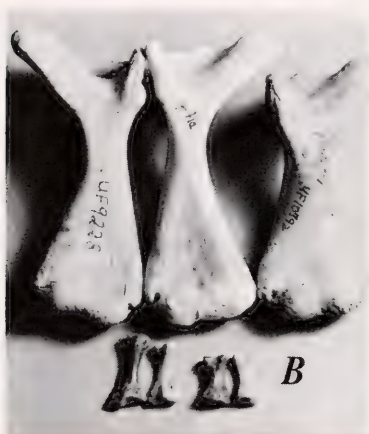


Figure 1B. A photograph showing that humeri (holotype, UF10992; paratype, UF9228) and phalanges (holotype, UF10992) of *M. auffenbergi* are wider than the same skeletal elements in *M. temmincki* (JLD 4 Florida).

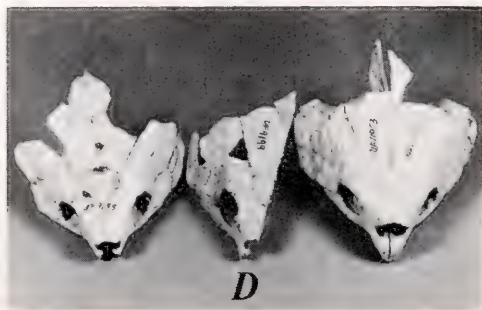


Figure 1D. Dorsal view of skulls of Paratypes UF9198-9199 and UF11053 of *M. auffenbergi*.

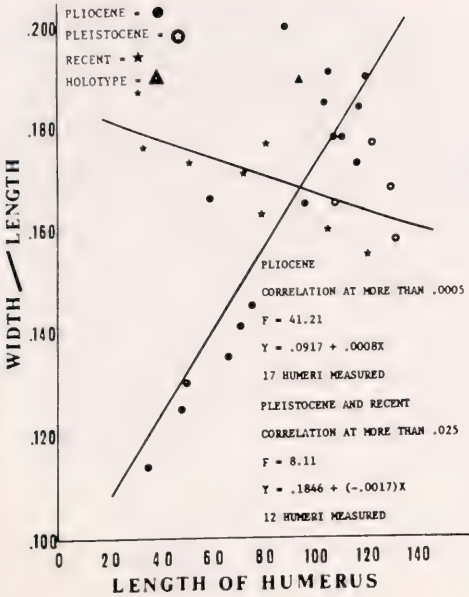
and plastron (UF 9242), a nearly complete skull, with an entire mandible (UF 11053), and two partial skulls (UF 9198, UF 9199; Fig. 1D).

Type locality and horizon: McGehee site; McGehee Farm, T9S, R17E, S1½ of NW¼, Sec. 22, located approximately 120 yards east of State Hwy. 45 and 3 miles north of Newberry, Alachua County, Florida. The locality is a mid-Pliocene deposit of Hemphillian age (Webb, 1964).

Diagnosis and description: As the humerus of the new species increases in length (width measured at a point halfway down the length of the humerus), the width/length ratio also increases, i.e., width in-

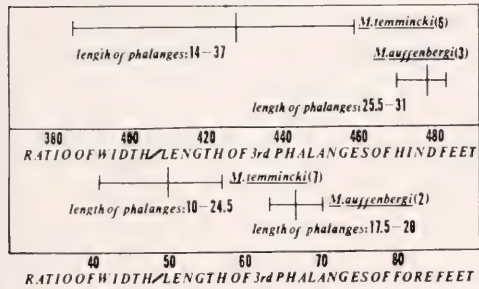
creases more rapidly than length. This ratio decreases for *M. temmincki*, i.e., length increases more rapidly than width. The former is positive allometry, the latter is negative. The largest ratios are found in the larger animals for *M. auffenbergi* and in the smaller animals for *M. temmincki* (Fig. 2A). There is no overlapping of ranges in width/length ratios for phalanges of digits of the fore and hind feet (Fig. 2B).

The difference among the three species in the relative length of the alveolar surface of the upper jaw is apparent in Figure 2C. However, Dr. Zangerl (personal communication) stated the following for *M. schmidtii*, "the estimate of the total length: posterior



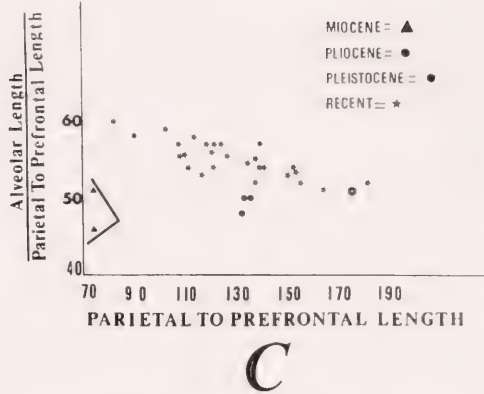
A

Figure 2A. Regression analyses of ratios of width/length for humeri of *M. auffenbergi* and *M. temmincki*.



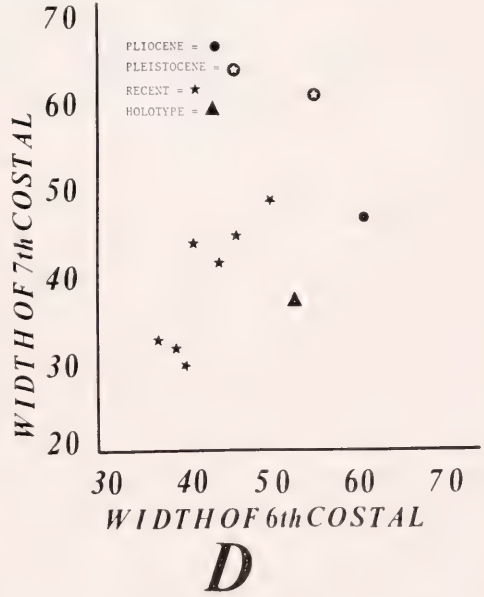
B

Figure 2B. Ratios of width/length for the basal phalanges of the third fingers for the fore and hind feet of *M. auffenbergi* and *M. temmincki*.



C

Figure 2C. Ratio of alveolar length (posterior end of alveolar shelf to anterior attachment with the premaxilla) divided by length from the posterior end of the parietal to the anterior end of the prefrontal for skulls of *M. schmidtii*, *M. auffenbergi* and *M. temmincki*.



D

Figure 2D. Widths of the sixth costal bones of the carapace for *M. auffenbergi* and *M. temmincki*.

end of the parietal to front end of prefrontal is, of course, a wild guess based on the position of the occipital condyle." The two points for the *M. schmidtii* were calculated using the two "estimated" lengths supplied by Dr. Zangerl. This datum is unavailable for the Pliocene skull from South

Dakota (Zangerl, personal communication). The new species is separable from *M. temmincki* on the basis of one character of the carapace: in the former, the sixth costal is wider than the seventh (Fig. 2D). The eighth costal bones of the holotype and paratype UF 9242 are broken. Comparison

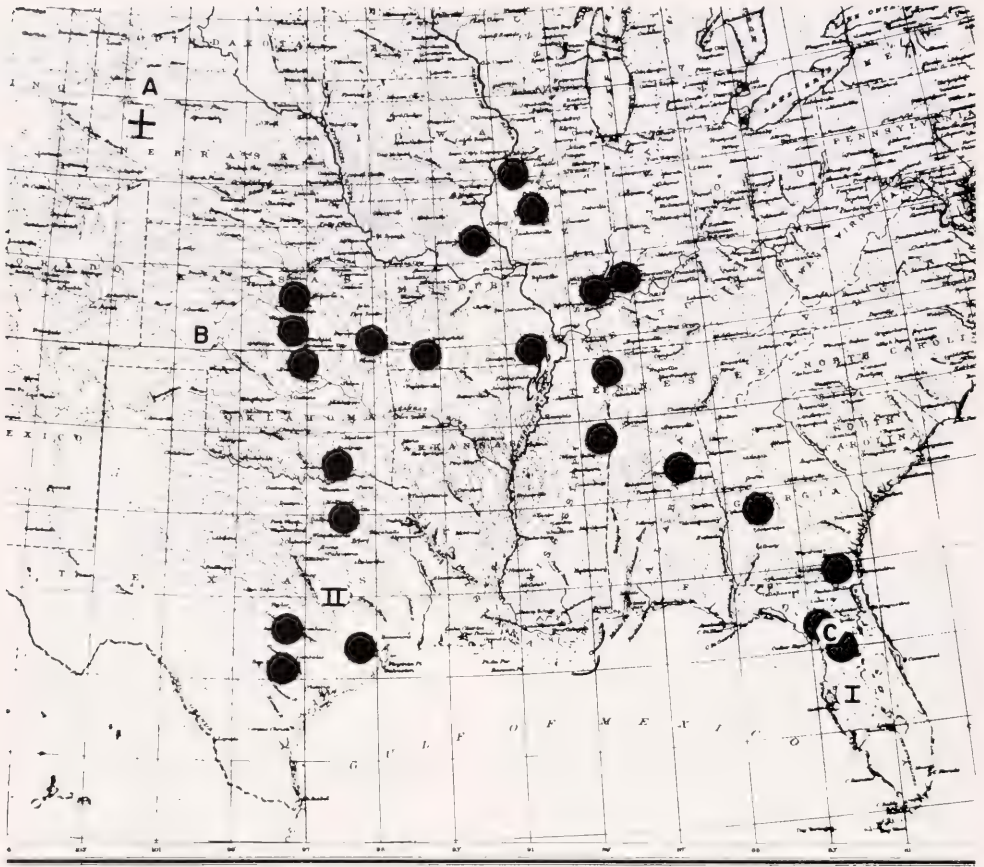


Figure 3. Former and present distribution of the genus *Macroclermys*. The + is the *M. schmidtii* record from the early middle Miocene of Nebraska; A and B are records of the South Dakota (early Pliocene) and Kansas (late Pliocene) *M. temminckii*; C is the Florida (mid-Pliocene) *M. auffenbergi*; I and II are Pleistocene records for *M. temminckii*; solid dark circles are recent *M. temminckii* records.

of *M. auffenbergi* with *M. temminckii* from the upper Pliocene of Kansas (Hibbard, op. cit.) is not possible.

DISCUSSION

Formerly the genus *Macroclermys* was more widely distributed than at present (Fig. 3). I suspect that *M. schmidtii*, from the early middle Miocene of the northwestern corner of Nebraska, was the progenitor of the early Pliocene (Clarendonian)-to-Recent species, *M. temminckii*. I base this on the following facts: (1) the South Dakota deposit is close geographically to the early middle Miocene deposit in Nebraska; (2) the South Dakota deposit is early Plio-

cene; the Florida site (Hemphillian age) is middle Pliocene. *Macroclermys temminckii* is thus older than the new species and presumably gave rise to *M. auffenbergi*.

The Pliocene river(s) inhabited by *M. auffenbergi* was probably a "typical" river with a fauna similar to those that now populate southeastern rivers. The two new fossil species of *Chrysemys* (= *Pseudemys*) (Rose and Weaver, 1966) discovered at the McGehee deposit support this view.

It seems probable, in view of the close structural similarity between these turtles, that habitat requirements for *M. auffenbergi* were similar to those of *M. temminckii*, i.e., thoroughly aquatic, sedentary, omnivor-

ous, and necrophagous (Dobie, 1966; unpublished dissertation).

The question arises as to why *M. temmincki* has persisted, while *M. auffenbergi* has become extinct. Perhaps the extinction of the latter resulted from a lowering of the water table during a period of arid Pliocene climate. *Macrolemys temmincki* survived because its range included the Mississippi River and certain major tributaries, that persisted through this arid period.

Acknowledgments: I appreciate the review of this manuscript by Robert H. Mount of Auburn University and the loan of Pliocene and Pleistocene specimens by Walter Auffenberg of the Florida State Museum at the University of Florida, Gainesville.

LITERATURE CITED

- DOBIE, J. L. 1966. Reproduction and growth in the alligator snapping turtle, *Macrolemys temmincki* (Troost). Unpublished Ph.D. Dissertation, Tulane University.
- HIBBARD, C. W. 1963. The presence of *Macrolemys* and *Chelydra* in the Rexroad Fauna from the upper Pliocene of Kansas. *Copeia*, (4):708-709.
- ROSE, F. L. and W. G. WEAVER, JR. 1966. Two new species of *Chrysemys* (= *Pseudemys*) from the Florida Pliocene. *Tulane Stud. Geol.*, 5(1):41-48.
- WEBB, S. D. 1964. The Alachua Formation. In Guidebook 1964 Field Trip. Soc. Vert. Paleontology in Central Florida. University of Florida, Gainesville.
- ZANGERL, R. 1945. Fossil specimens of *Macrochelys* from the Tertiary of the Plains. *Fieldiana: Geol.*, 10:5-12.

December 23, 1968