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FIG. 1. Adult female *Gopherus morafkai* drinking small catchment at the base of a rocky waterfall (~ 100 ml) at 0930–0940 h on 22 September 2015.



FIG. 2. Adult female *Gopherus morafkai* using nares to drink from depression on a rock (~ 25 ml) at 1000–1002 h on 4 October 2015.

waterfall, with her head at the base of the waterfall, her nose submerged in a small catchment which held approximately 100 ml of water (Fig. 1). We approached and observed the SDT extract virtually all of the water that collected there from the brief runoff in less than 5 minutes. A second observation of another adult female two weeks later, on the morning of 4 October 2015 following a rainfall event of 3 mm, occurred along a dirt track, just out of the small wash. This female approached a flat rock with a small, centrally located depression that held only 25 ml of water, and successfully “sucked” this water up by positioning her nares in the small puddle while pulsing her throat (Fig. 2).

A final, less natural observation revealed the efficiency of this drinking mode: after an adult female voided her bladder contents during attachment of a radio tag, we placed her in a large plastic container (~ 1 x 0.5 x 0.6 m), tipped so that about 300 ml of water was available at one end of the container. The female drank all of the water in less than 5 min, leaving the plastic container virtually dry; by constantly re-positioning her head and nares, she successfully sucked up all the water, even when it was a small puddle less than 25 x 25 mm and barely a few mm in height.

Our observations suggest that SDTs, and perhaps other arid-land tortoises, benefit by drinking through their nares because it allows for relatively rapid and efficient extraction of the surface water they encounter under natural conditions. The ability to obtain water from very small depressions maximizes their opportunity for hydration in an otherwise extremely arid environment. Our hypothesis could be evaluated by examining other tortoises from mesic environments to determine if they drink in a similar fashion or if the mouth is used by submersion of the entire head. It may be that this behavior is a simple consequence of the absence of pliable soft tissue (rather, a hardened beak) surrounding the mouth, and that this merely pre-adapts desert tortoises to obtain water in this fashion as a result of their shared ancestry.

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MACROCHELYS TEMMINCKII (Alligator Snapping Turtle). PREDATION. *Macrochelys temminckii* is the largest freshwater turtle in North America, a species whose large size and highly aquatic behavior is thought to limit exposure to natural predators (Pritchard 1989. *The Alligator Snapping Turtle: Biology and Conservation*. Milwaukee Public Museum, Milwaukee, Wisconsin. 104 pp.). To date, *M. temminckii* has few known predators, other than humans, which have exploited the species for decades to harvest its meat (Sloan and Lovich 1995. *Chelon. Conserv. Biol.* 1:221–222). Nest depredation is a significant source of embryonic mortality, with *Procyon lotor* (Raccoon) being the major nest predator (Ewert et al. 2006. *Chelon. Res. Monogr.* 3:58–71). Also, Holcomb and Carr (2011. *Southwest. Nat.* 56:427–429) reported an infestation of a single *M. temminckii* nest, where *Megaselia scalaris* (phorid fly) larvae killed developing embryos and hatchlings. Predators of post-embryonic *M. temminckii* are less known and include two circumstantial observations of predation of juveniles by *Lontra canadensis* (Northern River Otter; Ligon and Reasor 2007. *Southwest. Nat.* 52:608–610) and two reported occurrences of cannibalism of immatures by adult male *M. temminckii* (Sloan et al. 1996. *Chelon. Conserv. Biol.* 2:96–99). Humans are the only known predators of mature *M. temminckii*.

Macrochelys temminckii is a sit-and-wait predator that prefers to occupy microhabitats with submerged structures and relatively dense canopy cover; use of such microhabitat features may be related to increased food availability and protection from predators (Howey and Dinkelacker 2009. *J. Herpetol.* 43:589–596). Specifically, *M. temminckii* co-occurs with a large predator, *Alligator mississippiensis* (American Alligator), throughout much of its range, and many authors have speculated that *A. mississippiensis* may predate young or small *M. temminckii*

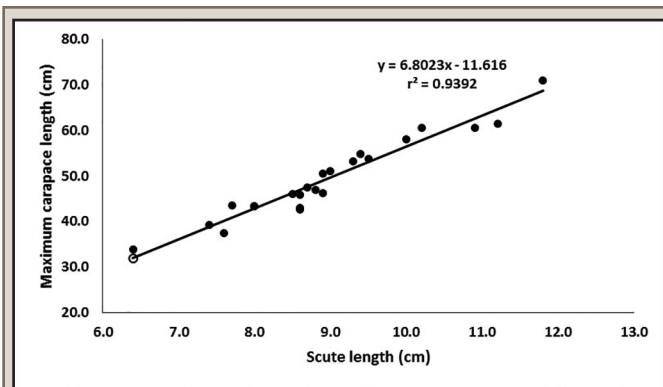


FIG. 1. Relationship between third left costal scute length and maximum carapace length for *Macrochelys temminckii*. Dots are from Auburn University Museum of Natural History specimens, and open circle is from the depredated *M. temminckii*.

(Ernst and Lovich. 2009. *Turtles of the United States and Canada*, 2nd ed. Johns Hopkins University Press, Baltimore, Maryland. 827 pp.; Henry et al. 2009. *In* Howey and Dinkelacker 2009, *op. cit.*). Here, we report on the first verified observation of *M. temminckii* predation by *A. mississippiensis*.

We discovered the remains of a *M. temminckii* in the stomach of a mature male *A. mississippiensis* while we were conducting research on the diet of *A. mississippiensis* (CRS and CMM, unpubl. data). The *A. mississippiensis* (total length = 320 cm) was harvested in September 2012 on Walter F. George Lake, Georgia, USA, as part of the annual state-regulated harvest. The carcass was donated to us by Mike Gifford after tagging and processing. The remains of the *M. temminckii* (AUM 4910) included the beak, claws, and numerous partially chewed scutes with presumed teeth punctures that ranged from 4–15 mm in diameter. Other ingested items included remains identifiable as *Didelphis virginiana* (Virginia Opossum), *Dasyurus novemcinctus* (Nine-banded Armadillo), *Sus scrofa* (Feral Pig), unidentified fishes, wood fragments, plastic storage bags, fishing lures/tackle, and numerous gastroliths.

Of the stomach contents identifiable as *M. temminckii*, we used a partial third left costal scute to estimate the age and size of the predated *M. temminckii*. A count of the scute annuli estimated the individual's age to be ca. 15 yr; this was performed by James Godwin (Auburn University Museum of Natural History). Dobie (1971. *Copeia* 1971:645–658) reported that *M. temminckii* generally reaches sexual maturity at 11–13 years of age. However, Tucker and Sloan (1997. *Chelon. Conserv. Biol.* 2:587–592) found males to attain maturity between 11–21 years and females between 13–21 years. To estimate the individual's size, we measured 23 specimens from the Auburn University Museum of Natural History. The third left costal scute length, centered over the ridge of the scute, and maximum carapace length (MCL) were measured for all specimens to the nearest 0.1 cm. MCL ranged from 33.9 to 71.0 cm and third left costal scute length ranged from 6.4 to 11.8 cm. Regression analysis indicated that scute length was strongly correlated with MCL, such that for every 1.0 cm increase in scute length we observed a 6.8 (\pm 0.79; 95% C.I.) cm increase in MCL ($P \leq 0.001$; $r^2 = 0.94$; Fig. 1). Using this regression model and the observed 6.4 cm length from the partial costal scute, we estimated the minimum size of the predated *M. temminckii* as 31.9 cm MCL. The smallest reported carapace length for a mature *M. temminckii* is 33 cm (Dobie 1971, *op. cit.*). The turtle most likely had more than 15 annuli and

was longer than the estimated MCL as the scute used for these estimates was missing the majority of the perimeter. Given the predicted MCL, the predated *M. temminckii* was most likely a large juvenile that had not yet reached maturity, although it could have been a small adult.

This observation represents the first verified published occurrence of *A. mississippiensis* preying upon any life stage of *M. temminckii*. Although this record is evidence of a single occurrence of *M. temminckii* predation by *A. mississippiensis*, the frequency of this interaction is unknown. However, lack of evidence in the literature suggests that the interaction is uncommon in nature.

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NILSSONIA FORMOSA (Burmese Peacock Softshell Turtle). MORPHOMETRICS, COLORATION, AND PHOTOGRAPH OF NEONATE. *Nilssonina formosa* is a medium-sized (carapace length [CL] to 400 mm) trionychid endemic to the Ayeyarwady (formerly Irrawaddy), Sittaung (formerly Sittang), and Thanlwin (formerly Salween) rivers in Myanmar (Ernst and Barbour 1989. *Turtles of the World*. Smithsonian Institution Press, Washington, D.C. 313 pp.). Despite being heavily, albeit illegally, exploited for sale in Chinese wildlife markets (Platt et al. 2000. *Chelon. Res. Monogr.* 2:95–100), *N. formosa* remains one of the least-studied and most enigmatic of Asian trionychids (Kuchling et al. 2004. *Salamandra* 40:281–296). In particular, very little is known about the early life stages of *N. formosa*, including the physical characteristics of neonates and small juveniles. Gray (1869. *Proc. Zool. Soc. London* 1869:165–225) described *N. formosa* from a “young” turtle preserved in “spirits” (BMNH 68.4.143, re-registered as BMNH 1946.1.22.11), and other reports of juveniles (Smith 1931. *The Fauna of British India, including Ceylon and Burma*. Vol. 1. *Loricata and Testudines*. Taylor and Francis, London. 185 pp.) appear to be largely based on this account. Moreover, excepting the black-and-white illustration of the type specimen in Gray (*op. cit.*), drawings or photographs of small *N. formosa* are unavailable.

We recently examined 14 neonate *N. formosa* at the Yadanabon Zoological Gardens in Mandalay, Myanmar. Herein we report morphometric measurements and describe the coloration of these turtles, compare our observations with previously published accounts, and provide the first published photograph of a neonate *N. formosa*. Such information is useful for species identification (Platt et al. 2014. *Photographic Guide to the Freshwater Turtles and Tortoises of Myanmar*. Privately printed, Yangon. 53 pp.), calculating growth rates (Iverson et al. 1991. *J. Herpetol.* 25:64–72; Melancon et al. 2011. *Southeast. Nat.* 10:399–408), and understanding the adaptive significance of coloration and morphology (Britson 1998. *Copeia* 1998:383–390; Guilford and Dawkins 1993. *Evolution* 47:400–416).

The neonates were captured shortly after hatching on about 15 May 2015 (daily records are not maintained by zoo staff) in a drift-fence and pitfall array encircling an artificial sandbank beside a pond (ca. 0.5 ha) housing 23 Burmese Roofed Turtles (*Batagur trivittata*) and two *N. formosa*; the latter were reportedly