

(Palmer and Braswell 1995. Reptiles of North Carolina. University of North Carolina Press, Chapel Hill. 412 pp.; Kornilev et al., *op. cit.*), to our knowledge this is the first report of a *G. muhlenbergii* death associated with railroad tracks. Henceforth, we recommend that railroads traversing potential habitat be regarded as a potential threat to *G. muhlenbergii* populations, particularly where road crossings provide easy access to tracks (Kornilev et al., *op. cit.*). We thank Lewis Medlock for field assistance.

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**GOPHERUS POLYPHEMUS** (Gopher Tortoise), **CTENOSAURA SIMILIS** (Gray's Spiny-tailed Iguana). **PREDATION.** *Gopherus polyphemus* is currently listed as a threatened and protected species in the state of Florida (Mushinsky et al. 2006. In Meylan [ed.], Biology and Conservation of Florida Turtles, pp. 350–375. Chelonian Research Monographs 3). Documented natural predators of *Gopherus polyphemus* include the Raccoon (*Procyon lotor*), Gray Fox (*Urocyon cinereoargenteus*), Striped Skunk (*Mephitis mephitis*), Opossum (*Didelphis virginianus*), Armadillo (*Dasypus novemcinctus*), and crows (*Corvus* sp.) (Mushinsky et al., *op. cit.*), and the introduced Savannah Monitor (*Varanus exanthematicus*) (Owens et al. 2005. Herpetol. Rev. 36:57–58). Herein, we augment this list to include the nonindigenous Gray's Spiny-tailed Iguana (*Ctenosaura similis*).

In its native range of central and southern Mexico, the Yucatán Peninsula, and Central America, *C. similis* is known to consume a variety of plants and animals, including leaves, flowers, fruits, insects, spiders, crabs, fishes, rodents, hatchling sea turtles, lizards and their eggs, birds and their eggs, bats, as well as its own eggs and hatchlings (Montanucci 1968. Herpetologica 24:305–315; Fitch and Henderson 1978. Univ. Kansas Sci. Bull. 51:483–500; Alvarez del Toro 1982. Los Reptiles de Chiapas. Instituto de Historia Natural, Tuxtla Guiterrez. 248 pp.; Van Devender 1982. In Burghardt and Rand [eds.], Iguanas of the World, pp. 162–183. Noyes Publications, Park Ridge, New Jersey; Krysko et al. 2003. Florida Sci. 66:74–79). In its introduced range in Florida, *C. similis* has been documented consuming at least 24 native plants and 13 invertebrates, and 14 nonindigenous plants and 2 vertebrates (Krysko et al. 2009. Florida Sci. 72:48–58).

On 28 May 2008, in a residential area on northern Gasparilla Island, Charlotte Co., Florida (26.8094°N, 82.2815°W, datum WGS84, elev. < 1 m), we observed an adult (37.5 cm SVL, 1.54 kg) male *Ctenosaura similis* enter a *Gopherus polyphemus* burrow. Later that morning, as part of an ongoing iguana removal program on Gasparilla Island, this lizard was trapped and transferred to USDA's National Wildlife Research Center Florida Field Station. Stomach contents revealed various stems, leaves, and seeds, as well as several small bones and scutes from the plastron and carapace of a juvenile *G. polyphemus* (Fig. 1).

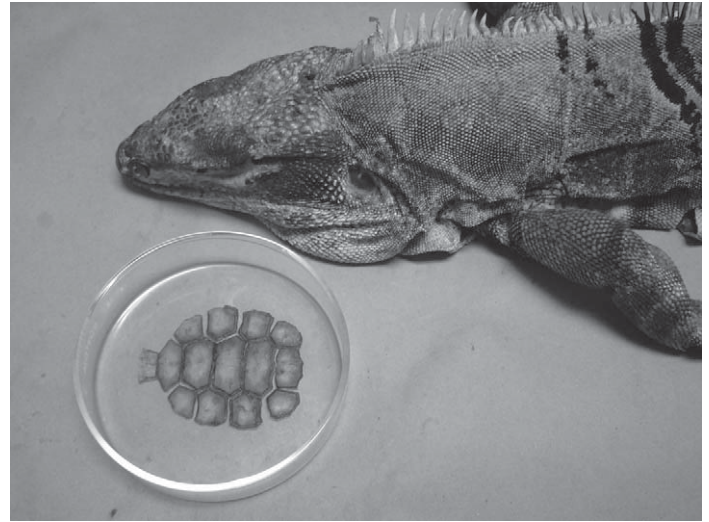


FIG. 1. Adult male *Ctenosaura similis* and scutes of the carapace of a juvenile *Gopherus polyphemus* recovered from its stomach.

Given the close proximity of *Ctenosaura similis* to *Gopherus polyphemus* burrows, ctenosaurs on Gasparilla Island undoubtedly encounter tortoises regularly. Although previous studies have noted the potential negative effects of ctenosaurs on Gopher Tortoises through burrow usurpation (Engeman et al. 2009. Herpetol. Rev. 40:84) and competition for food (Krysko et al. 2009, *op. cit.*), direct predation has not been previously documented. Invasive carnivorous reptiles represent potentially serious impacts to tortoise populations already imperiled by habitat degradation and native predators.

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**HYDROMEDUSA MAXIMILIANI** (Brazilian Snake-necked Turtle). **GROOMING BEHAVIOR.** Grooming behavior in chelid turtles of Australia and Asia is thought to facilitate removal of dead skin from the axilar and inguinal pockets and the tail and neck (Legler 1978. Can. J. Zool. 56:2449–2453; Legler and Georges 1993. In Glasby et al. [eds.], Fauna of Australia Series, pp. 1–27. Australian Government Publishing Service; Green 1996. Herpetofauna 26:46–47). Grooming behavior in Brazilian chelid turtles has apparently not been reported to date.

In February and October 2005 we studied four adult specimens of *H. Maximiliani* captured in Reserva Biológica Municipal Santa Cândida (21.6888889°S, 43.3444444°W, 770 m elev.), Juiz de Fora, Minas Gerais state, Brazil, under laboratory conditions. The behavioral observations were made on individual specimens

housed in an aquarium (110 × 39 × 40 cm) containing approximately 64 liters of water, using the focal animal method (Altmann 1974. Behaviour 49:227–267), during 30 min per specimen. All turtles were naturally infested by a turbellarian ectosymbiont *Temnocephala brevicornis* often associated with *H. maximiliani* (Damborenea and Cannon 2001. J. Nat. Hist. 35:1103–1118).

Grooming behavior was observed in all four specimens of *H. maximiliani*. This behavior resulted in removal of the ectosymbiont together with dead skin from the soft parts of the body, facilitated by the tomial edges of the turtle's jaws, in the axillary and inguinal pockets, sites of infestation of *T. brevicornis*.

The behavior most associated with removal of ectoparasites in freshwater turtles is aerial basking (Janzen et al. 1992. J. Herpetol. 26:217–221). Atmospheric or terrestrial basking is a common phenomenon in many species of freshwater turtles, and functions include elevation of body temperature (to enhance the capacity for activity, digestion, reproduction, vitamin D synthesis, and acceleration of egg development in adult females) and drying of the body surface to retard or remove fungi, algae, bacterial and ectoparasites (Cagle 1950. Ecol. Monogr. 20:31–54; Boyer 1965. Ecology 46:99–118; McAuliffe 1977. J. Parasitol. 63:580–581; Crawford et al. 1983. Ecology 64:989–999; Chessman 1987. Herpetologica 43:301–306; Janzen et al., *op. cit.*; Manning and Grigg 1997. Copeia 1997:579–584). However, basking has not been studied or reported in some taxa of freshwater turtles, and particularly, data on this behavior in some species of Pleurodira are scarce, being limited to observations of captive specimens (Miller 1979. Herpetologica 34:39–42). The Australian chelids *Chelodina expansa* and *C. longicollis* reportedly bask only occasionally (Webb 1978. Herpetologica 34:39–42).

*H. maximiliani* seldom leaves the water for basking (Souza 2004. Reptilia 40:47–51), thus grooming behavior could be an alternative strategy for removal of the ectosymbiont *T. brevicornis*. This behavior could aid a non-atmospherical basking turtle in keeping the skin in good condition and may be an adaptation to a highly aquatic mode of life (Legler, *op. cit.*). A relationship may exist between an almost completely aquatic mode of life, the absence of basking, and the occurrence of autogrooming in *C. expansa* and *Rheodytes* sp. (Legler and Georges, *op. cit.*). Grooming is common in captive *Rheodytes* sp. and *C. expansa* and serves to remove the cornified layer of the soft skin, wherever the head can reach (Legler and Georges, *op. cit.*). This report demonstrates the use of this behavior for removal of the ectosymbiont *T. brevicornis* in *H. maximiliani*.

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**PHRYNOPS GEOFFROANUS** (Geoffroy's Side Necked Turtle). **NEST PREDATION.** There are apparently to date no published reports of predation on *Phrynops geoffroanus* nests in nature. Here we report *P. geoffroanus* nest predation by a teiid lizard, *Tupinambis teguixin*, on the Guaporé River on the border of Brazil and Bolivia. In July 2008, during seasonally falling water levels, we sought *P. geoffroanus* nests on the banks of the Guaporé River. From 600 to 1000 h daily we surveyed the river from the border region in Brazil (12.238°S, 64.4637°W; WGS84) to Versalles village in Bolivia (12.4396°S, 63.9271°W). The position of each nest was recorded by GPS and the total number of the eggs (predated and not predated) was also noted. Of the 39 nests found, only three were not predated by *Tupinambis teguixin*. Identification of the nest predator was confirmed by several methods: direct observation of the predation event, by the tracks made around the predated nest or characteristic marks made in the soil when the nest was excavated by the lizards, and/or the tooth marks on the egg shells remaining. *Tupinambis teguixin* was the only large carnivorous lizard seen active in the nesting area; tracks made were too large to be those of an *Ameiva*, another potential lizard nest predator indigenous to the area. This high predation rate may be related to the fact that as seasonal flood waters recede, *P. geoffroanus* is the first species to lay eggs on the emerging river banks. In this part of the Amazon, deforestation has increased recently due to land clearing for cattle ranching and illegal harvest of forest products, particularly lumber. Consequently this lizard is forced to live in the sparse riparian forest habitat, which may in turn affect the availability of its normal prey. Food may be difficult to find during high water; thus as soon as the water levels fall, *P. geoffroanus* eggs may offer the lizards an easily obtained resource.

High population densities and the efficient foraging behavior of *T. teguixin* may have significant consequences for survival of this turtle species on the Guaporé River. Further studies are needed on the effects of deforestation on this lizard's habits and turtle nest predation levels. *P. geoffroanus* is one of the few turtle species that is not widely consumed by humans in this region; consumption of its meat supposedly has caused an allergic reaction in some people, perhaps as a result of its consumption of toxic mushrooms which grow on floating logs and tree trunks in the flooded forest (Vogt 2008. Tartarugas da Amazônia. Grafica Biblos, Lima, Peru. 104 pp.). In addition, the bright orange color of this turtle's plastron suggests to some people that the meat is poisonous. Future studies should assess both the population status of this turtle species and the effects of habitat loss on the lizard species that may be its primary nest predator.

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