

traffic incidents, human consumption, pollution, drought, disease, fires, and predation by other animals, which can result in disability or mortality. Here we report on a subadult female *K. zombensis* (170 mm straight-line carapace length) found at 1240 h in the Manguzi Forest Reserve, KwaZulu Natal Province, South Africa (26.99561°S, 32.72512°E; WGS 84), on 12 November 2019. The tortoise was found in a small open patch as we were walking through dense forest. At the time it had already withdrawn into its shell, indicating that it had noticed human presence well before it was spotted. On closer investigation we noted that both the carapace and plastron (Fig. 1A) had visible marks of earlier predation attempts and two limbs were missing. The front left leg (Fig. 1B) and the rear right leg (Fig. 1C) were completely gone and the resulting wounds were well-healed.

We suggest that the missing limbs can be attributed to predation attempts in its early years of development. This is suggested by the fact that the carapace and plastron openings have not grown equally. On the unaffected front right limb, the widest opening point was measured at 16 mm; however, it can be clearly seen that on the affected front left limb, this opening is greatly reduced (Fig. 1B). The same is true for the rear end of the tortoise, where on the unaffected rear left limb, the widest opening point was measured at 10 mm, and a slight reduction can be seen of this opening on the affected rear right limb (Fig. 1C). It is possible that the limbs were lost at different times, as suggested by the growth differences of the limb openings.

It is not possible to determine which species was responsible for the predation attempt. However, the marks on the carapace and plastron, and the overall small size of the tortoise, lead us to believe that it was a small mammal probably belonging to either the order Carnivora or Rodentia. The missing legs could be attributed to the same mammalian predator or may even have been caused by a bird. Remarkably, visual inspection suggested this *K. zombensis* was otherwise in good general health. The fact that the remaining limbs were on opposing sides of the tortoise allowed the animal some limited mobility. This tortoise also had very few visible ectoparasites (e.g., ticks), which often are found on the softer parts of these tortoises.

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KINOSTERNON ABAXILLARE (Central Chiapas Mud Turtle). **ECTOPARASITES.** *Kinosternon abaxillare* is distributed in the central part of Chiapas (Mexico) and a small portion of northern Guatemala. Many aspects of its natural history are unknown and there are few published studies on its biology (Legler and Vogt 2013. *The Turtles of Mexico: Land and Freshwater Forms*. University of California Press, Berkeley, California. 402 pp.).

From March 2018 to February 2019, I made 12 field trips to study *K. abaxillare* in central and southwestern Chiapas. The ponds in which I conducted my field work were located on private land, surrounded by a mosaic of cattle pasture, mango trees, and corn fields. A total of 168 turtles were captured (two yearlings, 50 immatures, 47 adult males, and 69 adult females). Of these turtles, one yearling, 12 immatures, 9 adult males and 19 adult females had attached leeches (*Placobdella ringueleti*). The ectoparasites were mainly concentrated in the inguinal area, the base of the tail, around the neck, and inside the cloaca (Fig. 1). The minimum and maximum number of *P. ringueleti* individuals found on *K. abaxillare* in this work was 3–10 for the immatures,

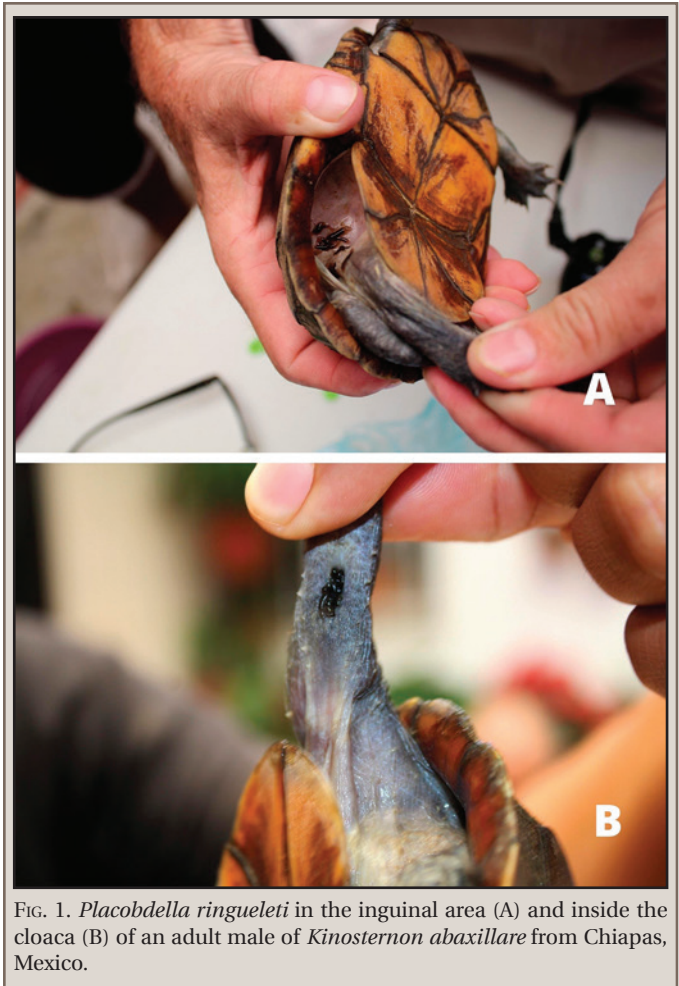


FIG. 1. *Placobdella ringueleti* in the inguinal area (A) and inside the cloaca (B) of an adult male of *Kinosternon abaxillare* from Chiapas, Mexico.

8–15 for adult males, and 6–24 for adult females. The higher number of leeches on adult females may have been due to the latter's larger size (Reyes-Grajales 2019. B.S. Thesis, Instituto de Ciencias Biológicas, Universidad de Ciencias y Artes de Chiapas, Chiapas, Mexico. 96 pp.).

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LEPIDOCHELYS KEMPPII (Kemp's Ridley Sea Turtle). **COLD-STUNNED NESTING FEMALES.** *Lepidochelys kempii* are present in the Gulf of Mexico (GoM) and North Atlantic Ocean, and primarily nest along the western GoM coast in Mexico and Texas (National Marine Fisheries Service et al. 2011. Bi-national Recovery Plan for the Kemp's Ridley Sea Turtle, Second Revision. Silver Spring, Maryland. 177 pp.). *Lepidochelys kempii* are primarily diurnal nesters, preferring to nest on windy days when evidence of nesting activity is quickly erased, and winds help keep them cooler on the typically hot daytime beach (Jimenez-Quiroz et al. 2005. *Chelon. Conserv. Biol.* 4:774–780). *Lepidochelys kempii*



FIG. 1. Biologists warming a cold-stunned nesting *Lepidochelys kempii* on 3 May 2013 at Padre Island National Seashore, Texas, USA by covering the carapace with a warm towel, placing their hands on the neck and flippers to transfer body heat (A) and kneeling down to shield the female from cold north-northwest winds while she completed the nesting process (B).

typically complete the nesting process in under 50 min, with oviposition lasting around 12 min (Pritchard and Marquez 1973. IUCN Monograph No. 2: Marine Turtle Series. 30 pp.). The established nesting season for *L. kempii* in Texas is from April to mid-July (Shaver et al. 2016. Gulf Mex. Sci. 33:158–178). Though Texas experiences large cold stunning events of *Chelonia mydas*, during which hundreds to thousands of *C. mydas* are found washed ashore or floating in a hypothermic state, only six *L. kempii* have stranded cold stunned in Texas since 1980 (Shaver et al. 2017. PLoS ONE 12:e0173920). Herein, we detail three records of nesting *L. kempii* appearing to become cold stunned during oviposition on the Texas GoM coast.

On 9 April 2003 at 1045 h, a *L. kempii* was discovered emerging from the GoM near the 0.8 km marker at Padre Island National Seashore (PAIS), Kleberg County, Texas, USA. The female began nesting at the base of the foredunes but was observed nesting unusually slowly for the species, seemingly due to the cold environmental conditions. Past climate records indicate that at 1057 h, the air temperature was 14°C with 24 km/h north-northwest winds and at 1158 h, wind gusts were as great as 35 km/h (Corpus Christi International Weather Station, Corpus Christi, Texas, USA). The *L. kempii* measured 60.1 cm straight carapace length (SCL), 62.9 cm straight carapace width (SCW), and was identified as a post head-start turtle imprinted at Rancho Nuevo, Mexico in 1993. The female laid 94 eggs



FIG. 2. Biologist warming a cold-stunned nesting *Lepidochelys kempii* on 14 April 2020 on South Padre Island, Texas, USA by covering the carapace with a warm towel and lying next to the female during oviposition to shield her from cold winds.

and spent more than 1 h on the beach completing the nesting process. After nesting, the lethargic *L. kempii* was placed inside a warm vehicle and monitored for several hours. Around 1920 h, she became active and was released into the GoM at PAIS.

On 3 May 2013 at 0758 h, a *L. kempii* was observed emerging from the GoM near the 4.7 km marker at PAIS. At 0846 h, the female began oviposition, however, eventually ceased moving and depositing eggs into the nest chamber. Past climate records indicate that at 0756 h, the air temperature was 12°C with 52 km/h north-northwest winds and wind gusts of 72 km/h (Corpus Christi International Weather Station, Corpus Christi, Texas, USA). To warm the *L. kempii*, the three PAIS biologists present at the nest site covered her carapace with a warm towel, placed their hands on her flippers and neck to transfer their body heat, and shielded her from the wind by kneeling down on her northern side (Fig. 1). After ca. 1.15 h of no activity, the *L. kempii* resumed oviposition and laid 73 eggs. The *L. kempii* finished the remaining nesting phases normally at approximately 1020 h; spending almost 2.5 h on land. The *L. kempii* measured 59.8 cm SCL, 59.8 cm SCW, and had only one confirmed nest at PAIS in 2013.

On 14 April 2020 at 1523 h, a *L. kempii* was discovered digging a nest chamber on South Padre Island, Cameron County, Texas, USA. The female was positioned at the base of the foredunes and was facing inland, away from the GoM. The *L. kempii* became increasingly lethargic as she finished digging the nest chamber and began oviposition. The *L. kempii* remained in the oviposition phase for more than 1.5 h, breathing shallowly. Biologists covered her carapace with a warm towel and shielded her from the wind by lying down next to her (Fig. 2). While the *L. kempii* was nesting, the air temperature was 19°C with north winds of 40 km/h and wind gusts of 48 km/h (Mariana Devlin, pers. comm.). Despite the lengthy oviposition phase, only 22 eggs were documented in the clutch, indicating that the female had ceased laying due to the cool environmental conditions. However, it cannot be confirmed that she only laid a partial clutch then since the next time that she was documented nesting on 8 May 2020, 24 days inter-nesting interval, she laid 103 eggs. The *L. kempii* measured 62.7 cm SCL and 56.3 cm SCW, eventually regained movement, and returned to the GoM after 1800 h.

These three records indicate that small adult *L. kempii* (SCL < 63 cm) are susceptible to cold environmental conditions while nesting. Smaller females may require assistance with maintaining body temperature and completing the nesting process during early season (March–May) nesting activity in Texas.

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MAUREMYS MUTICA (Yellow Pond Turtle). PREDATION. Turtles face different predation pressures in different life stages. Many aquatic and terrestrial animals have been reported as predators on turtle nests, hatchlings, or adults, but small to medium-sized omnivorous mesopredators, such as the Northern Raccoon (Geller 2020. *Herpetol. Rev.* 51:314–315) can be particularly important predators on turtle eggs and young. Although known predators of turtles are numerous, direct observations of predation events are still scarce in some areas and worthwhile to document.

Mauremys mutica is distributed across southern China, Vietnam, Taiwan, and Japan. In recent decades, wild populations of this turtle have seriously declined owing to illegal trade and habitat loss. Nevertheless, Taiwan is among the few places where stable populations of this turtle can still be found, particularly in protected areas such as the Fushan Botanical Garden in northern Taiwan. This nature reserve supports a considerable number of these turtles in its wetland habitat. In northern Taiwan, the breeding season of *Mauremys mutica* starts in spring, and the egg-laying period lasts from May to July (Chen et al. 2000. *Chelon. Res. Monogr.* 2:45–51).

At 1930 h on 11 September 2020, we set up a light trap to collect insects in the Fushan Botanical Garden (24.75969°N, 121.58510°E; WGS 84). A foraging Chinese Ferret Badger (*Melogale moschata*) appeared, scraping and digging in the grass. A few minutes later, the badger caught a prey item and brought it to a nearby pavilion. We approached the badger and realized that it had captured a hatchling *M. mutica* (ca. 4 cm carapace length). Attempting to circumvent the turtle's shell, the badger spent about 20 min manipulating the prey (Fig. 1). Later

in the predation event, the hatchling was obviously dead, but the badger was unable to totally swallow it. The badger finally moved into the forest with its prey, thus we were not able to observe subsequent behavior or confirm consumption of the hatchling turtle.

The Chinese Ferret Badger is an omnivorous mustelid mammal which feeds mostly on arthropods, earthworms, amphibians, and plants (Chuang et al. 1997. *J. Zool.* 243:71–79; Wu H.-Y. 1999. *Zool. Stud.* 38:443–451). This observation provides the first report of *M. mutica* being predated by a Chinese Ferret Badger in Taiwan. With the relative abundance of this turtle species in this nature reserve, we can speculate that the turtles may occasionally be predated by other local mesopredators in addition to the Chinese Ferret Badger, such as the Small Indian Civet (*Viverricula indica*) and the Crab-eating Mongoose (*Herpestes urvu*). These mammalian predators may have a significant impact on the population of *M. mutica* within the reserve.

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NILSSONIA HURUM (Indian Peacock Softshell Turtle). MELANISM. *Nilssonina hurum* (Indian Peacock Softshell Turtle) is a large riverine freshwater turtle belonging to the family Trionychidae. The species is widespread across the northern and central Indian subcontinent in the Indus, Gangetic, Brahmaputra, and Subarnarekha River basins of Pakistan, India, Nepal, and Bangladesh (Das et al. 2010. *Chelon. Res. Monogr.* No. 5, pp. 048.1–048.6). This species is primarily found in inland rivers but is also encountered in other isolated wetlands such as reservoirs, lakes, and village ponds.

The carapace of adults is oval and flat, up to 60 cm in length, and displays color variations ranging from a medium to dark olive green to dark grey, sometimes accompanied by a yellow ring, with an olive green speckled pattern observed across this colour range. The plastron is pale grayish white. Eye color is generally olive green with darker olive green to dark gray outer ring on the iris and gray to grayish black cornea, with clearly discernible black pupils. No sexual dimorphism is recorded for the species with regards to pigmentation. Juveniles are olive green with four orange and black ringed, dark-centered ocelli symmetrically positioned on the olive-green carapace with dark reticulations (Das et al. 2010, *op. cit.*); the plastron is dark gray. As adults, the carapacial ocelli fade and the plastron turns light gray. Head and limbs of both adults and juveniles are olive green; where the head has a distinctive reticulation of dark olive to dark grey and large yellow or orange patches on the snout and behind the eyes (Das et al. 2010, *op. cit.*; Hanfee 1999. A WWF Field Guide to Freshwater Turtles and Tortoises of India. TRAFFIC-India/WWF-India). These characteristic patches on the head, are heart-shaped on the snout and oblong to circular behind the eyes corresponding with the tympanic region, are the primary characteristic to differentiate *N. hurum* from other sympatric species of the genus *Nilssonina*, such as *N. gangetica*, *N. leithii*, and *N. nigricans*. Similar patches are present in the sister species *N. nigricans*, though they are not as distinctive as in *N. hurum*.

On 19 May 2018, at 1300h, during trapping for freshwater turtles on the Lower Sarju River (nearest town: Colonelganj) we captured a melanistic softshell turtle. The Lower Sarju River is



FIG. 1. *Melogale moschata* capturing a hatchling *Mauremys mutica* in Fushan Botanical Garden, Taiwan.