

Kinosternon scorpioides (Scorpion Mud Turtle)

Family: Kinosternidae (Mud Turtles)

Order: Testudines (Tortoises and Turtles)

Class: Reptilia (Reptiles)



Fig. 1. Scorpion mud turtle, *Kinosternon scorpioides*.

[<http://foro.elacuaria.com/index.php?topic=1991.0>, downloaded 1 December 2014]

TRAITS. *Kinosternon scorpioides* (Fig.1) has many variations in body size of the various subspecies due to geographic locations, but the ratio mean male size to mean female size remains to be that the males have a larger carapace length (outer shell) (exceeding 20cm in some populations) than the females (average of 15cm) (Iverson, 2010). Carapace length is the length of the fused dorsal plates of a turtle (The Free Dictionary, 2014). The carapace of many individuals can have three ridges/keels (Ernst and Barbour, 1989) that can be reduced in size with age. Males of this species have a large grasping/prehensile tail, which has a larger spine at the end (also called a terminal spine) compared to the females of this species (Pritchard and Trebbau, 1984) (Fig. 2). The shell colouration is varied within and among the populations and can vary from tan to black (also having olive and brown). The plastron has a lighter colour, which varies from yellow to

brown in adults. Skin colour also has variations in some populations from gray to brown to nearly black and often have vermiculations (dense coverage but irregular line patterns) of yellow, orange or red either on the head or the neck of adults. The head is moderately large in size with the snout slightly projected and a hooked upper jaw. The chin has two large anterior barbels (a whisker-like organ near the mouth) and two or three smaller pairs follow (Ernst and Barbour, 1989).

ECOLOGY. *Kinosternon scorpioides* subspecies have been recorded in Northeast and Eastern Mexico, Central America South America to northern Argentina (Berry and Iverson, 2011), including Trinidad (but absent from Tobago). *K. scorpioides* tend to prefer calm, fresh-water backwaters and isolated ponds. These aquatic environments can be varied between permanent, semi-permanent and temporary. *K. scorpioides* has been shown to be a very adaptable species of turtle since they tend to burrow into drying mud or underneath leaves during times of drought. In these times of drought they remain in a “semi-dormant” state (Ernst and Barbour, 1989).

ACTIVITY. *K. scorpioides* activity is crepuscular (both at dawn and dusk) (Cabrera, 1998). Basking in this species is rare and the body temperature correlates to the temperature of the waters it was observed in (Lacher et al, 1986). On the very few occasions basking was observed was when captive females basked a few weeks prior to nesting (Hofer, 1999). It is also noted that during dry seasons some individuals have been recorded hiding/burrowing beneath drying mud or fallen leaves (when on land) and remain in a “semi-dormant” state. *K. scorpioides* primarily feeds on insects and their young, shrimps, fishes, all stages of a frogs’ life cycle, spiders, snail, worms, crabs and carrion (e.g. bird eggshells). It also feeds on plant materials such as algae, fruits, nuts, seeds and aquatic plants. However, when given the opportunity they choose to feed on the carnivorous material. They have been recorded to feed both terrestrially and aquatically (Forero-Medina and Castano-Mora, 2006). Captive *K. scorpioides* have been observed to be aggressive towards some members of its species at feeding time (Pritchard and Trebbau, 1984).

SEXUAL BEHAVIOUR. Copulation in the field has not been recorded but many authors have described mating behaviour of captive *K. scorpioides*. The male *K. scorpioides* approach the female at the rear end. He then proceeds to bite her hind limbs, tail or carapace. The female may remain in the same position and the male will often circle her and continue biting. If the female still does not respond the male positions himself on the back of the female and clasps the edges of her carapace with his forelimbs and hind limbs to hold her in position. He then proceeds to wave his head rapidly in a lateral position sometimes biting the female’s shell and head, which would cause her expose her cloaca (a common cavity into which the urinary, intestinal and generative canals open in reptiles), as a result of her head being forced in by the males’ action. Once the cloaca is exposed the male aggressively inserts his grasping/prehensile tail beneath her carapace and attempts intercourse. *K. scorpioides* is referred to as a species that partakes in unwilling insemination by the males on the females as a mating strategy. The larger prehensile tail and larger terminal spine allows this strategy to be effective.

NESTING BEHAVIOUR. *K. scorpioides* build small body pits in which the eggs are laid into a shallow nest. The depths of the pits vary with the body size of the female. Some eggs are deposited just below the leaf litter depending the season. Nests can be found between 5m to 191 m from the body of water it may have originated from and usually occur to the north of the closest water source (Castillo-Centeno, 1986). Clutch size is varied across the species and can range from 1-8 eggs

(Iverson, 2010). Larger clutch size has been correlated with an increase in female body size (Goode 1994; Iverson 2010). Average egg size is 34 mm in length, 18 mm in width and weighs about 6.7g. These averages have been shown to increase from north to south (Iverson 2010). *K. scorpioides* have a low investment cost per clutch since they produce very few, relatively small eggs. However, they make up for this by producing many clutches per year (Iverson, 2010). *K. scorpioides* embryos experience diapause - a duration in which growth or development of the embryo is decreased, as well as, physiological activity in response to changes in environmental conditions. Development of the embryo is delayed until this duration is interrupted by environmental factors, such as, warming after a cold period. Besides diapause they also seem to exhibit estivation. Embryos that have reached hatching stage are only triggered to hatch when the conditions are suitable and for this to occur their metabolism is reduced to prevent them from depleting their food resources inside the shell until the time is appropriate (similar properties to hibernation). The purpose of these mechanisms aid in synchronizing hatching to start at the beginning of the summer rainy season (Castillo-Centeno 1986; Iverson 2010). The sex of the *K. scorpioides* is dependent on the temperature where in some populations experience temperature-dependent sex determination pattern II, where changes in temperatures (either high or low) produce the females and temperatures in between give rise to male production (Ewert et al., 2004).

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Fig. 2. *Kinosternon scorpioides*, under-side views of male (left) and female (right).

[<http://nas.er.usgs.gov/queries/factsheet.aspx?SpeciesID=1266>, downloaded 13 November, 2014]

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