



*Photo Credit: Roger Birkhead

Mud and Musk Turtles (Family Kinosternidae)

Small and Usually Drab, but full of Personality

Mud and musk turtles are fairly small, largely aquatic to semi aquatic turtles with a highly domed, nondescript grayish, brown, or blackish gray carapace and reduced plastron. Some species have a dorsal keel, and most have two pairs of yellowish to pale stripes on the head and neck. Most are fairly poor swimmers, often walking along the bottom instead. Commonly kept species include the common musk turtle or stinkpot (*Sternotherus odoratus*), razorback musk turtle (*Sternotherus carinatus*), loggerhead musk turtle (*Sternotherus minor*), Sonora mud turtle (*Kinosternon sonoriense*), Arizona mud turtle (*Kinosternon arizonense*), striped mud turtle (*Kinosternon baurii*), scorpion mud turtle (*Kinosternon scorpiodes*), and the eastern mud turtle (*Kinosternon subrubrum*). This family also includes the monotypic Narrow Bridged Musk Turtle (*Claudius angustatus*) and the Mexican Giant Musk Turtles (*Staurotypus spp.*), which are also occasionally kept within the reptile hobby, and for which, other than the much larger sizes and suitably larger enclosures that *Staurotypus* species require, are for the most part similar in their care, husbandry, and natural history.

These generally small but surly turtles may initially be pugnacious, but with regular interaction and captive breeding, can become very tame and handleable. These turtles also earn the common name of musk turtle due to several species having musk glands that they will use to secrete a noxious smelling musk when handled. For novice pet owners interested in acquiring an aquatic to semi aquatic turtle, mud and musk turtles are a suitable choice.

Taxonomy

Life: All living, physical, and animate entities

Domain: Eukaryota

Kingdom: Animalia

Phylum/Sub Phylum: Chordata/Vertebrata

Class: Reptilia

Order: Testudines

Suborder: Cryptodira

Superfamily: Kinosternoidea

Family: Kinosternidae

Subfamily: Kinosterninae

Genus: Kinosternon and Sternotherus

Species: *Kinosternon spp.** and *Sternotherus spp.**

**Taxonomy subject to change and revision.*

Lifespan and Longevity

If provided the proper care and conditions, mud and musk turtles can attain longevity of 20 to 30 years or more.

Distribution and Habitat

Depending upon the genus and species, mud and musk turtles are a very broadly distributed genera of turtles found over much of North America, and into Central America and northern South America. More specifically, species of these turtles can generally occur from southern to southeastern Canada, throughout much of the Midwestern, eastern, southern, southwestern to southeastern United States, and into Mexico, and through Belize, Costa Rica, Guatemala, Honduras, Nicaragua, and Panama, to Colombia, Ecuador, and Peru. Within this wide range, mud and musk turtles are largely aquatic to semi-aquatic turtles, occupying relatively clear inlets of lakes, oxbow ponds and other river backwaters, marshes and swamplands, rivers, streams, and their basins, ditches, and other similar bodies of water.

Origin/History

Kinosternon spp. Spix, 1824; Sternotherus Bell in Gray, 1825. Species and subspecies would have other authors first attributed to them at other years.

It is difficult to pinpoint when exactly the mud and musk turtles specifically were first were kept as pets, although these turtles most likely became available during the same time period the aquatic turtle trade came into existence, in general, around the 1950's or 1960's along with other aquatic turtles. In the mid-1970's the USDA would prohibit the sale of hatchling turtles under 4 inches, citing salmonellosis public health concerns, although there would be a loophole allowing them to still be sold for bona-fide educational, scientific, or research purposes.

By the later 1990's or 2000's, mud and musk turtles became more widely seen as popular alternatives to larger aquatic turtles such as sliders, map turtles, and cooters, as they are smaller and relatively easier to care for.

Experience Level Required

Novice/Beginner to Intermediate/Moderate.

Size

Mud and musk turtles are fairly small turtles. Most of these species seldom exceed an upper shell, or carapace length of about 2 ½ to 5 ½ inches depending on the species. The Mexican Giant Musk Turtles, however, can attain significantly larger carapace lengths than other mud and musk turtles, and may reach as much as 14 to 16 inches.

Housing and Enclosure

Enclosure System: Primarily Aquatic to Somewhat Semi-Aquatic. Mud and musk turtles are semi aquatic turtle species. Provide a sturdy, escape proof aquarium or commercially available plastic or galvanized stock tank or turtle tub of sufficient size with an elevated dock or basking area/access to dry land using a substrate dam. The latter are perhaps preferred for maintaining aquatic to semi-aquatic turtles in, as they are easier to clean, move/transport, and maintain than aquariums. Provide a minimum of 10 gallons of space per inch of shell, or about 20 to 40 gallons, or accordingly larger, for most adult turtles depending on the species. A general rule of thumb to follow for most aquatic to semi-aquatic turtles is to provide water that is at least 1 ½ to 2 times the turtle's height in depth to allow for complete submersion, and at least two to three times the carapace length for adequate swimming and movement. A powerful water filter rated at least twice that of the amount of water in the enclosure is highly recommended for aquatic turtles, as they are messy and require frequent cleaning and regular water changes. Use a

submersible water heater with a guard to maintain water temperatures of 75 to 85 degrees F. Substrate is optional, and foregoing it makes for easier cleaning and maintenance, but small to medium sized gravel can be used. Additional rocks, logs, live or artificial foliage can also be provided for additional foraging, basking, and hiding opportunities.

Temperature, Lighting, and Humidity

Providing the correct amounts of UVA/UVB overhead incandescent and florescent lighting, and calcium-to-phosphorus ratios is essential for ensuring the health and overall well-being of mud and musk turtles in captivity. Without UVA/UVB, or adequate amounts of it, they can be susceptible to the abnormal bone and shell growth and development known as Metabolic Bone Disease (MBD), and other health and development maladies. Pyramiding of the scutes and shell can also occur due to poor or improper diet, lighting, or heating. Always be sure to spot clean the enclosure for urates, feces, or uneaten food at least twice per week. Be sure to periodically replace the substrate, clean, and disinfect the enclosure and its furnishings at minimum every 2 to 3 months. Mud and musk turtles require a thermal gradient using a ceramic or radiant heat emitter, UTH (or under tank heating pad), submersible water heater, and UVA/UVB overhead lighting. Ambient and cool end temperatures should be within 70 to 80 degrees F and the basking area from 85 to 95 degrees F. Also be sure to maintain a light cycle of 12 to 14 hours per day, and monitor temperatures with a quality thermometer. Although these turtles are largely aquatic, and infrequently bask out of the water, be sure to provide a basking area or platform for your mud or musk turtle to emerge completely from the water as well. More specific lighting, heating, and humidity product suggestions and recommendations that can best suit one's needs, as well as those of one's animals can be given as well. While humidity is somewhat less important for most aquatic to semi-aquatic turtles, a general humidity level should be at, or around about 60 to 75%.

Feeding, Diet, and Nutrition

Primarily Carnivorous; In the wild, mud and musk turtles are primarily carnivorous, feeding on aquatic to semi-aquatic insects, crustaceans, mollusks, and other invertebrates, as well as smaller vertebrates including small fish, amphibians, and carrion, or dead and decaying plant and animal material.

In captivity, variety is important with most aquatic to semi-aquatic turtle's diets. Mud and musk turtles can be given feeder insects of appropriate size including crickets, roaches, mealworms, waxworms, superworms, or other invertebrates. They can also eat small, frozen-thawed rodents of appropriate size, but offer these sparingly, if at all. Other food items that will be accepted by these turtles can include many of the commercially available aquatic to semi-aquatic turtle or omnivore mix diets, small feeder fish of appropriate nutritional value, earthworms, redworms, freeze dried shrimp or krill, or some other meats. Dog and cat foods can also be used, but use these sparingly, if at all as well. Commercially available canned or pelleted turtle diets are not good staples for feeding aquatic to semi-aquatic turtles, and should not exceed roughly 25% of their diets; Variety is always best.

Gutloading any feeder insects and providing additional calcium and vitamin D3 is essential for these turtle's optimal health and well-being. Without proper supplementation, they are susceptible to Metabolic Bone Disease, pyramiding of the shell, and other abnormal bone, growth, and health maladies. Feeding frequency will depend on the age, size, and overall health of your turtle, but typically in most cases should be twice to three times weekly. Do not overfeed them, though as obesity and other health related issues can become a concern. More specific dietary and supplementary product suggestions and recommendations that can best suit one's needs, as well as those of one's animals can be given as well.

Handling

Mud and musk turtles may use their long necks to occasionally nip when handled. Maintain handle of these turtles towards the rear of the shell to prevent this. Most small to mid-sized turtle and tortoise species that are not aggressive or prone to biting can be picked up and handled either by placing both hands along both sides of the shell, or from the rear of the carapace with the thumb on the carapace and index through pinky fingers on the plastron to reduce the chances of being kicked, scratched, or nipped when they are threatened. Although most species of chelonians are not outwardly aggressive, defensive, or dangerous, they can become stressed as a result of over-handling, however, and some species, and even individual animals can be shyer than others. These are some considerations to keep in mind when handling any chelonian species.

****Also be sure to practice basic cleanliness and hygiene associated with proper husbandry after touching or handling any animals or animal enclosures to prevent the possibility of contracting salmonellosis or any other zoonotic pathogens****

Contact

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