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TORTOISES AND TURTLES

Chinese Stripe-necked Turtle

Mauremys sinensis

Mauremys sinensis is a diurnal, semi-aquatic turtle from southern China, Taiwan, Laos and northern Vietnam with yellow stripes on the head and neck. The shell grows to 20-30 cm, and the animal can live about 30 years. The species is critically endangered in the wild and needs a large, filtered aquarium with a dry land section, a warm basking spot and UVB.

Family: Geoemydidae Former name: *Ocadia sinensis; Emys sinensis*

KEY FACTS

THE ANIMAL

Adult size	**20-30 cm** total length incl. tail
Lifespan	**20-30 years**
Active	**By day**
Lifestyle	**Semi-aquatic**
Habitat	**Wetland**
Difficulty	**Intermediate**

CARE

Min. enclosure	**150 × 75 × 70 cm** L × W × H for 1 adult
Temperature, day	**26-30 °C**
Basking spot	**30-35 °C**
Temperature, night	**20-24 °C**
Humidity	**50-80%**
Water	**Aquaterrarium** depth 30-40 cm
Water temperature	**22-27 °C**
UVB	**Essential** Ferguson zone 3
Diet	**Insects, complete diet, plants, vertebrates and worms/snails**
Kept	**Singly or in groups**

BREEDING

Reproduction	**Egg-laying**
Clutch size	**5-20 eggs**
Incubation	**60-75 days** at 26-29 °C

PROTECTION AND PAPERWORK

CITES	**Appendix III**
EU annex	**Annex C**
IUCN	**Critically Endangered (CR)**

About the species

Mauremys sinensis is a medium-sized freshwater turtle. The shell (carapace) is greyish green with three distinct keels in young animals, while in adults it becomes brown and the keels gradually disappear. The plastron is ivory to yellowish with small black spots. The top of the head is dark green to black, and the head, neck and legs have fine, pale yellow stripes. The eyes are golden with a dark, horizontal line through the iris. All measurements in the text are shell length.

Females grow larger than males. Males reach about 20 cm, females typically about 26 cm and some up to 30 cm. The male has a longer and thicker tail and a slightly concave plastron. Newly hatched young measure 3-4 cm and have a conspicuously long tail, which other young like to nip, so many animals lose part of the tail tip. The damage rarely matters, and it can partly grow back.

The species hybridises readily with other species in the family, for example *Mauremys reevesii*, and several "species" described from the trade turned out to be hybrids with *M. sinensis* as one parent. The animals should therefore be kept separate from other species of the genus, so that no crosses arise, and animals of known origin are preferable.

Lifespan is up to about 30 years. The species is inquisitive and quickly learns to come forward at feeding, but it is not a pet to pick up. It is critically endangered in the wild because of habitat loss and collection for the food and pet trades, and captive-bred animals are therefore preferable.

Read more: Buying animals: captive-bred, wild-caught and transport

Distribution and habitat

Mauremys sinensis lives in southern China (including Guangdong, Guangxi, Fujian, Zhejiang and Hainan), on Taiwan, in Laos and in northern and central Vietnam. There are also records from Hong Kong and the low-lying parts of eastern China.

Outside its native range the species occurs as an introduction, for example in South Korea, and in Europe breeding animals have been found in wetlands, where released animals have laid eggs and had young hatch. The map shows only the native range.

> **Native range:** China, Taiwan, Vietnam and Laos.

HABITAT

M. sinensis is found in low-lying fresh water: ponds, canals, marshes, streams and slow rivers. The species tolerates a wide temperature range and lives in tropical, subtropical and temperate regions, and with strong, webbed legs it also copes with rivers with moderate current.

The animals spend much of the day at basking spots by the water's edge. In the wild the diet is largely plants, but the species also takes carrion and the small animals it can catch.

Care

THE ENCLOSURE

Keep the animal in an aquarium, a large tub or a secure indoor pond, not in an ordinary terrarium. The tank must be at least five times as long as the shell and half as wide as it is long, with the land area counted as part of the floor area. The water must be at least twice as deep as the shell is wide. An adult female of 30 cm thus needs at least 150 × 75 cm. The dimensions in the data box, 150 × 75 × 70 cm, give a water section of 110 × 75 cm with 40 cm of water (about 330 litres), a land section of 40 × 75 cm and a 30 cm rim above the water. Juveniles can initially be kept in a small aquarium or a box, but quickly set up an enclosure for an adult animal.

The land section must be large enough for the whole animal to get completely out of the water and dry off completely. Build it as a beach or shelf with a rough ramp and a large, flat stone as a basking spot. The lamp and UVB sit directly over the basking spot. The rim around the land section must be at least 25 cm high, so that the animal cannot climb out. Give a female a box of soil or sand as a nesting site.

Give the animal a hide under water made of roots or stones that cannot shift or trap the animal. Stones and driftwood must sit stably: turtles can topple loose stacks, and they can break glass. Water is heavy: 330 litres weighs 330 kg, so place the set-up on a floor that can bear it.

If several animals are kept together, they must be roughly the same size, and the tub must be at least 50 % larger for each additional animal, with several basking spots. Preferably keep only one animal, and keep the species separate from other species of the genus, because they hybridise.

The set-up must be completely escape-proof. The species has been seen breeding in European wetlands after release, so an animal must never be released into the wild. An outdoor pond in summer is acceptable only if it is secured with fencing that goes at least 30 cm into the ground and netting over the top, and only in warm periods.

Read more: Lighting and UVB Read more: Heat and temperature

TEMPERATURE

The surface of the basking spot should be 30-35 °C, measured with an infrared thermometer a couple of hours after the lamps are switched on, and the air above it 27-30 °C. Heat with a powerful spot or halogen lamp, and place the heat lamp at the same distance from the basking spot as the UVB tube.

The water should be 22-27 °C, and most animals do best in the middle of the range. Set the water heater to a reasonably low temperature, so that a gradient arises between the cool water and the warm basking spot. The heater must have a plastic guard, so that the animal does not burn itself, and an automatic shut-off, and a digital thermometer with a probe in the water shows the temperature.

At night the lamps are switched off. The night temperature is not documented; 20-24 °C suits the tropical and subtropical habitats. Hibernation is not documented as necessary for the species, so the temperature is maintained year-round. If the animal is lethargic or does not eat, the temperature may be too low, and the animal should be checked.

Read more: Brumation and the seasons

HUMIDITY AND WATER

The turtle's humidity is the water itself, so the relative humidity of the air is not documented in detail for the species; 50-80 % in the room is plenty. What matters is that the land section can dry completely and that the water is clean.

The animal passes its droppings in the water, so the water quickly becomes dirty. Use a powerful filter, change part of the water regularly, and remove food remains with a net after feeding. Water quality is important, because poor water causes skin, shell and ear infections.

Read more: Humidity, misting and ventilation

WATER AND WATER QUALITY

The water is the animal's living space, so it must be deep, clean and warm. The water must be at least twice as deep as the shell is wide, and 30-40 cm suits adults. The temperature is 22-27 °C (see Temperature).

Turtles produce far more waste than fish. Choose an external filter rated for at least twice the water volume, because the animal cannot move it and make it stop. A filter rated for fish is often too weak. The filter must filter both mechanically and biologically. Rinse the filter media in water from the tub, not from the tap, so that the bacteria are preserved, and never use soap or chemicals. Connect all electrical equipment near the water to a residual-current device (RCD).

LIGHTING AND UVB

UVB is a necessity. The species is diurnal and sits for a long time at the basking spot. Use a T5 HO tube with a reflector over the basking spot, so that the animal gets UVB when it dries off. The Ferguson zone is not documented in detail for the species; zone 3 is borrowed from comparable sun-loving aquatic turtles, and the UV index at the basking spot should be 3.0-4.0, while elsewhere in the set-up it should be lower, so that the animal can choose. Follow the tube manufacturer's recommendation for the distance to the animal's back.

Plastic and glass block UVB completely, and dense mesh blocks a large part, so nothing may be between the tube and the animal. UVB tubes lose strength and must be replaced regularly. UVB gives the animal vitamin D3, which the turtle needs to absorb calcium. Without it, it develops bone disease (MBD) with a soft shell and lethargy.

The light must be on 11-13 hours a day. Do not use coloured light at night.

Read more: Calcium, vitamins and supplements Read more: Common diseases and signs of illness

FEEDING

M. sinensis is omnivorous. In the wild adults eat many plants, but also carrion and small animals such as shrimp, small fish, water snails and mosquito larvae. The turtle eats only in the water, so throw the food into the tub.

The food should contain 30-40 % protein, plenty of calcium and little phosphorus. Juveniles need more protein and calcium than adults, and with age the diet should consist of more plant matter. Juveniles are fed every other day, adults about twice a week. Too much food causes too rapid growth, liver problems, shell deformities and a shorter lifespan and burdens the water.

Animal food: worms, cockroaches, crickets, shrimp, krill and farmed snails. Give whole animals rather than pieces. Prepared food for aquatic turtles covers part of the diet. Greens: dandelion, clover, chickweed, lettuce, duckweed, water hyacinth and water lettuce. Fruit is an occasional treat. Wash plants from the wild, and use only those that have not been sprayed and are positively identified.

Add calcium and vitamins. Lack of vitamin A causes swollen, red eyes, and the diet must therefore be varied.

Read more: Feeder animals: keeping and breeding

BEHAVIOUR AND HANDLING

M. sinensis is diurnal and inquisitive and quickly learns to associate you with food. Most animals do not like being touched. Feed with tweezers, not with the fingers, because the species has a sharp beak, and a bite hurts and can draw blood.

If the animal has to be lifted, take it from underneath with the palm of your hand and hold the shell with both hands, so that body and legs are supported. Wash your hands before and after, and do not let children under 5 handle the animal.

The animal thrives alone. In the mating season the males are pushy and can bite the female on the head and neck, and hybrids arise easily if several species are kept together, so do not keep the species with other species of the genus. Juveniles nip each other's long tails, so provide plenty of space and hides. If several animals are kept, they must be roughly the same size, and the largest animal should not be more than twice the size of the smallest.

Breeding

SEXUAL MATURITY AND SEXING

The male has a longer and thicker tail and a slightly concave plastron; the female is larger. The sex can usually be determined at about 10 cm shell length. Males are sexually mature at about 13 cm and females at about 18 cm, because sexual maturity follows size, not age, and a rapidly growing turtle matures earlier.

MATING

Mating normally takes place under water. The male courts by following the female and swimming in front of her head, and during this period she can get serious bites to the face and neck, so she must be kept under supervision and have room to get away. Separate the animals if the female is chased continuously.

Hybrids between *M. sinensis* and other species in the family are common, so keep only animals of the same species together if you want to breed.

EGG-LAYING AND CLUTCHES

A female lays about 5-20 eggs per clutch. The number of clutches per year is not documented. She digs a nest in a box of soil or sand on the land section. Always give her such a site, even when she is kept alone, so that she does not retain the eggs.

INCUBATION

The eggs hatch after about 60 days, and the sex is determined by incubation temperature. The incubation temperature and the limits for sex are not documented for the species. In the closely related *Mauremys reevesii* the eggs hatch best at 26-29 °C, after 70-75 days at 29 °C and 80-90 days at 26 °C, while 32 °C and above give poorer hatching and smaller young. The figures are borrowed from there and can be used as a starting point.

The eggs are laid in damp vermiculite, roughly equal parts vermiculite and water by weight, and are not turned after laying. In *M. reevesii* the eggs have a hard shell and are not particularly sensitive to humidity, but they must not lie in water.

Read more: Incubating eggs

REARING THE YOUNG

The young fend for themselves from hatching; the parents care for neither eggs nor young. The young are 3-4 cm and need more protein than adults: feed them every other day with prepared food for young turtles, worms, shrimp and snails, and give them greens. They need water with a depth of at least 1.5 times the shell length, a basking spot they can easily climb onto, and hides.

Juveniles can quickly nip each other's tails, so provide plenty of space and hides, and divide them by size. Growth can be controlled with the food: more food gives faster growth, but growth that is too fast gives a weaker shell.

Health and common mistakes

Turtles hide illness, so watch for changes. Weigh and measure the animal once a month and keep a log of weight, appetite and behaviour. A sudden weight loss is often the first sign of illness.

Typical problems and mistakes in care: - Poor water quality: causes skin, shell and ear infections. Ear infection shows as large swellings behind the eyes and must be treated by a vet. - Shell rot, if the animal cannot get completely out of the water and dry off. - Lack of UVB or calcium: causes bone disease (MBD) with a soft, deformed shell, lethargy and reduced appetite. - Lack of vitamin A: swollen, red eyes, which are often caused by a one-sided diet. - Overfeeding: causes liver problems, shell deformities and a shorter lifespan.

All reptiles can be symptom-free carriers of Salmonella and infect humans. Wash your hands before and after contact with the animal, water and equipment, and do not let children under 5 handle the animal. After a bite, rinse the wound under running water for about five minutes and clean it with mild soap; see a doctor for deep, bleeding or infected wounds.

See a vet with reptile experience if the animal loses weight, does not eat, has its mouth open, swollen eyes or seems lethargic.

Read more: Quarantine and hygiene

Always ask someone who knows

This guide is a good place to start, but it cannot replace experience. Animals differ, and much of what matters most is learned from people who have kept the species for years. Talk to a breeder, an experienced keeper or a vet who knows reptiles and amphibians before you get the animal - and again if anything looks wrong.