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TORTOISES AND TURTLES

Caspian Terrapin

Mauremys caspica

Mauremys caspica is a medium-sized, diurnal freshwater turtle from the Middle East and the Caucasus with distinct yellow stripes on the neck and forelegs. Shell length reaches up to 25 cm, and females are the largest. The species is hardy and tolerates both cold and polluted water, but needs a large, filtered aquaterrarium with a warm basking spot and UVB. In summer it can be kept outdoors in an enclosed pond.

Family: Geoemydidae Former name: *Testudo caspica; Clemmys caspica; Mauremys caspica caspica*

KEY FACTS

THE ANIMAL

Adult size	**15-25 cm** total length incl. tail
Weight	**450-650 g**
Lifespan	**15-25 years**
Active	**By day**
Lifestyle	**Semi-aquatic**
Habitat	**Wetland**
Difficulty	**Intermediate**

CARE

Min. enclosure	**130 × 65 × 65 cm** L × W × H for 1 adult
Temperature, day	**24-29 °C**
Basking spot	**30-35 °C**
Temperature, night	**18-24 °C**
Humidity	**50-70%**
Water	**Aquaterrarium** depth 25-40 cm
Water temperature	**21-27 °C**
UVB	**Essential** Ferguson zone 3
Diet	**Insects, complete diet, plants, vertebrates and worms/snails**
Kept	**Singly or in pairs**

BREEDING

Reproduction	**Egg-laying**
Sexually mature	**48-60 months**
Clutch size	**4-11 eggs**
Clutches per year	**1-3**
Incubation	**65-100 days** at 27-30 °C

PROTECTION AND PAPERWORK

CITES	**Not listed**
EU annex	**Not listed**
IUCN	**Not Evaluated (NE)**

About the species

Mauremys caspica is a medium-sized freshwater turtle that spends most of its life in the water, but readily basks in groups on banks and floating objects. All measurements in the text are shell length (carapace). The shell can reach 25 cm, but most adults in the wild are 12-16 cm; females are on average slightly larger and heavier than males, and males have the longest and thickest tail.

The carapace is strongly flattened and olive green to brown, with yellowish or greyish line markings in the form of figures of eight on each side. The pattern is clearest in young animals and fades with age, so old animals are often uniformly coloured and dull. A low keel along the middle never disappears completely. The plastron is yellow with a large dark blotch on each

scute, and the bridge between carapace and plastron is always yellow. In old animals from the north the plastron can be entirely dark. The head is olive with yellow stripes along the snout, under the eye and on the neck, and the neck and legs are striped and marbled on a yellow ground. The forelegs have five claws, the hind legs four, and the toes have distinct webbing. In the male the plastron is slightly concave, in the female flat or slightly convex.

The delimitation of the species has changed. Two western forms were formerly regarded as subspecies, but are today separate species: *Mauremys rivulata* (the Balkans and the eastern Mediterranean) and *Mauremys leprosa* (Iberia and North Africa). The three other subspecies described within *M. caspica* are no longer recognised. To the west the species meets *M. rivulata* and can interbreed with it. It is told apart from *M. rivulata* by the broad yellow stripes on the forelegs, a yellow bridge and the large, yellow-edged blotches on the plastron.

The species is shy and an excellent swimmer, and it quickly learns to associate the person who feeds it with food. It survives long periods in very dirty or brackish water and is therefore robust against poor water quality. Lifespan in captivity is poorly documented: the greatest known age is just under 18 years, and 15-25 years is an estimate for animals with good care.

Distribution and habitat

Mauremys caspica is found in a number of partly separate populations from central and south-eastern Turkey to north-eastern Syria, eastern Iraq, Iran, eastern Saudi Arabia and Bahrain. To the north and east the range continues to Armenia, Azerbaijan, Georgia, southern Turkmenistan and Dagestan in southern Russia, where the species reaches the city of Makhachkala along the western shore of the Caspian Sea. To the west it is replaced by *M. rivulata* in western Turkey.

Older records from Greece, the Balkans and the western Middle East now belong to *M. rivulata* and are not on the map. On the Arabian Peninsula the species is found only on Bahrain and in the oases of Al Qatif, Al Hufuf and Al Uqayr in Saudi Arabia. The populations are genetically distinct and thus not introduced by humans.

> **Native range:** Armenia, Azerbaijan, Bahrain, Georgia, Iran, Iraq, Russia, Saudi Arabia, Syria, Turkey and Turkmenistan.

HABITAT

Mauremys caspica lives in almost every kind of freshwater: fast-flowing mountain streams, rivers, ponds, lakes, reed and rush fringes, irrigation canals and drainage ditches, brackish lagoons on the Caspian Sea and tidal marsh in southern Iraq. It is also found in oases in very dry regions, where large groups of animals can lie in small watercourses and man-made ponds. In Turkey, subadult and adult animals prefer cold, fast-flowing watercourses, while old, algae-covered animals are more often seen in warm, muddy and still ponds. In Dagestan the animals choose deep waterholes with steep banks.

The species tolerates very polluted water: in Turkey it is found in watercourses where sewage from towns and hospitals runs out. In polluted water it can live more on refuse and become a kind of scavenger.

In the northern part of the range the animals hibernate on the bottom of the water. They bury themselves in the mud in October and November, when the air temperature is around 6-8 °C, and emerge again at the beginning of March, when the air is 15-17 °C and the water 9-11 °C. In warmer regions, such as Georgia, the animals can be active in February, and in Turkmenistan hibernation is very short or absent in mild winters. Mating takes place from March to May, but has been seen both in April and late in October depending on the region, and egg-laying takes place from May to the end of July.

Read more: Brumation and the seasons

Care

THE ENCLOSURE

Keep the animal in a large aquaterrarium, a tub or an enclosed pond, not in an ordinary terrarium. The care of *Mauremys caspica* is only sparsely described, so the figures for temperature and light are borrowed from the closely related *Mauremys rivulata* and *Mauremys leprosa*.

The tank must be at least five times as long as the shell of the largest animal 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. A female of 25 cm therefore needs at least 130 × 65 cm and a male of 15 cm 80 × 40 cm. An aquaterrarium of 130 × 65 × 65 cm gives a water section of 90 × 65 cm with 40 cm of water (about 230 litres), a land area of 40 × 65 cm and a 25 cm rim above the water. Each additional adult requires more space and more basking spots. Larger is always better.

Water is heavy: 230 litres weighs 230 kg, so place the set-up on a floor that can bear it. The land area must be large enough for the whole animal to haul out of the water completely and dry off. Build it as a shelf or a shoreline with a rough ramp, so that the animal can crawl up instead of swimming up to the surface. Natural stone, roots and ready-made floating platforms are suitable. Young animals swim less well than adults and need shallower water and easy ways up.

The water is cleaned by a powerful external filter that filters both mechanically and biologically. In large tubs and ponds, a koi-type filter with layers of foam and a pump works well, preferably with a UV-C unit to keep algae growth down. A substrate layer of mud or gravel is not necessary. In summer an outdoor pond is best, if it is secured against escape and predators with fencing down into the ground and netting over the top. In central Europe the species is active outdoors from March-April to October. Never release the animal into the wild.

TEMPERATURE

The water must be 21-27 °C. The air above the water must be 24-29 °C, and the surface of the basking spot must reach 30-35 °C, measured with an infrared thermometer. At night the air may fall to 18-24 °C. Warm the basking spot with a halogen lamp in a deep dome with a ceramic socket. The water heater must sit behind a plastic guard so that the animal cannot burn itself, and have a thermostat.

In the wild the species is active in water down to about 9-11 °C in spring, and in outdoor set-ups it is active from March to October, so it tolerates cooler water than many other turtles. Above about 30 °C in the water and air temperatures above 36 °C, however, it risks overheating. There must therefore be both warm and cool places, and an outdoor pond must have shade.

Hibernation is natural in the northern part of the range. For animals kept indoors all year, an artificial hibernation is not necessary: let the water and air fall a couple of degrees and let the day length follow the seasons. Temperature and duration of a hibernation in captivity are not documented for the species. Talk to a vet with experience of reptiles before letting an animal hibernate.

Read more: Heat and temperature

HUMIDITY AND WATER

For an aquatic turtle, air humidity matters little; 50-70 % in the room is an estimate. What is decisive is the cleanliness of the water: the animal passes droppings and food remains in the water, so it quickly becomes dirty.

Use a powerful filter, remove food remains with a net after feeding, and change part of the water regularly. Use water without chlorine, for example treated with a water conditioner. The species tolerates polluted water in the wild, but in captivity dirty water causes skin infections and shell rot.

Read more: Humidity, misting and ventilation

WATER AND WATER QUALITY

The water is the animal's home, so it must be deep, clean and relatively warm. The water must be at least twice as deep as the shell is wide, and 25-40 cm suits adults; young animals need shallower water. The temperature is 21-27 °C (see Temperature). The depth must leave room to swim freely and turn, but the animal must always have an easy way up to the surface.

The filter must filter both mechanically and biologically. The mechanical part removes food remains and droppings; the biological part, with foam or ceramic rings, houses bacteria that break down toxic nitrogenous waste. Choose an external canister filter rated for at least 2-3 times the water volume, or in a pond a koi-type filter. Clean the filter regularly, and rinse the filter media in water from the tub, not from the tap, so that the bacteria are preserved. Connect all electrical equipment near the water to a residual-current device (RCD), and unplug with dry hands before touching the filter.

LIGHTING AND UVB

UVB is a necessity: it allows the animal to produce vitamin D3, absorb calcium and develop a healthy shell. Zone 3 is suitable, because the species basks a lot and lives in open, sunny waters. Use a T5 HO tube with a reflector over the basking spot. The distance from the tube to the animal's back follows the tube's instructions; there must be no glass or plastic between tube and animal, and UVB tubes lose strength and must be replaced regularly.

The basking spot also dries the skin and shell, so shedding proceeds normally, and it helps against parasites in the skin. If the basking spot is missing, this can cause skin infections, shell rot and ear abscesses. The light should be on for about 12 hours a day, and a slightly shorter day in winter suits the species. Direct sunlight is best, but requires shade so that the animal does

not overheat. It must be dark at night.

Read more: Lighting and UVB Read more: Calcium, vitamins and supplements

FEEDING

Mauremys caspica is omnivorous, but plants make up most of the adult's diet: in the wild they account for 83-100 % of the food, and the rest is fish fry, tadpoles, frogs, crustaceans, aquatic insects and their larvae, earthworms and snails. Grasshoppers are taken in steppe areas. Of plants, it eats algae, horsetail, reeds, legumes and berries from mulberry and bramble. Young animals are more carnivorous than adults. The species eats under water, so the food is given in the tub.

Offer quality pellets for aquatic turtles as a base, with about 30-40 % protein, under 20 % fat and a calcium-to-phosphorus ratio of at least 2:1. Supplement with earthworms, farm-bred snails, insects, pieces of fish and generous amounts of leafy greens such as endive, romaine lettuce and kale, and let aquatic plants float in the tub. Feeding 3 days a week suits adults; more frequent feeding causes too rapid growth and poorer water quality. Growing young animals are fed more often and with a larger share of animal food.

Calcium and vitamin supplements wash off quickly in water. Work them into food that has been soaked in a solution, or dust them on food given outside the tub. Remove food remains after feeding.

Read more: Rearing tadpoles

BEHAVIOUR AND HANDLING

Mauremys caspica is diurnal and shy: it dives in a flash when disturbed. In the wild, groups of animals bask side by side on banks and drifting objects. The species swims well, but even adults need an easy way up out of the water. The animal does not like being handled. Hold it firmly under the shell with both hands, and wash your hands thoroughly afterwards. When picked up, it may release a foul-smelling fluid.

As a rule the animal is kept alone or in pairs. Males can be aggressive towards each other, and females can suffer severe bites to the face and neck during mating, so they must be supervised. There must be enough space and basking spots for all. An animal that keeps swimming along the glass often has too little space.

Breeding

SEXUAL MATURITY AND SEXING

The male is flatter than the female, has a slightly concave plastron and a longer, thicker tail with a wider base. Males can be sexed at a shell length of 7-9 cm, females often already at about 6 cm. The sex ratio in the wild is around 1:1. In the wild in Iran the animals are sexually mature at about 4 years; age and size at sexual maturity in captivity are not documented. The animals must be fully grown before they are put to breeding.

MATING

Mating normally takes place in the water. The female can suffer severe bites to the face and neck, so the pair must be supervised, and there must be room for the female to get away. In the wild the animals mate from late March to May, and the female's eggs mature in March-April. An outdoor pond with a natural seasonal rhythm is the simplest way of getting the animals to breed. Breeding indoors is not described.

EGG-LAYING AND CLUTCHES

The female usually lays 4-11 eggs per clutch. In outdoor set-ups in central Europe she lays up to two clutches between June and the beginning of August; in the wild up to three, of which the first is the largest. The eggs are white, elongated and hard-shelled, about 20-25 × 35-44 mm and 9-10 g. Newly laid eggs are slightly pink and soft and harden afterwards. A female must have a box of moist sand or soil on the land area, at least 20-30 cm deep, so that she can dig a nest. If there is nowhere to lay, she can become egg-bound and needs a vet.

INCUBATION

The eggs are incubated at 27-30 °C and 75-90 % humidity in a moist substrate, for example vermiculite, and hatch after about 65-75 days; the figures are borrowed from the related *Mauremys* species. At lower temperatures and in the wild it takes up to about 100 days. In several *Mauremys* species the incubation temperature determines sex; this is likely, but not confirmed, for *M. caspica*.

Read more: Incubating eggs

REARING THE YOUNG

The hatchlings are about 3 cm at hatching and weigh 5-6 g. They are first and foremost carnivores and live on insect larvae, small worms and other small animals, and they gradually become more herbivorous. Keep them in shallow water with an easy ramp, plants and hiding places. The water temperature for young animals is not documented, but the adults' 21-27 °C suits. They grow quickly and can reach up to 10 cm in a year. Keep young animals apart from adults and make sure all of them get food.

Health and common mistakes

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

Typical problems and care mistakes: - Dirty water: the water quickly becomes a health risk if the filter is too weak or the water is not changed. - Lack of UVB or calcium, which causes a soft, deformed shell and bone disease. - Lack of a basking spot, which causes skin infections, shell rot and ear abscesses. - Too frequent feeding, which causes too rapid growth and poor water quality. - Wrong set-up, where the animal cannot get out of the water.

In the wild the species is often infested with intestinal worms and other parasites, so a faecal sample at a vet is a good idea for newly acquired animals. 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. After a bite, the wound must be rinsed under running water and cleaned with mild soap.

Seek a vet with experience of reptiles if the animal loses weight, does not eat, has an open mouth 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.