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TORTOISES AND TURTLES

Chinese Softshell Turtle

Pelodiscus sinensis

Pelodiscus sinensis is an almost entirely aquatic softshell turtle from central and southern China and Taiwan with a leathery shell and a long, snorkel-like snout. The shell grows to 25-33 cm long, and the animal can live over 25 years. The species is vulnerable in the wild and needs a large, filtered aquarium with a soft sand bottom, clean, warm water and full escape-proofing.

Family: Trionychidae Former name: *Trionyx sinensis*

KEY FACTS

THE ANIMAL

Adult size	**25-33 cm** total length incl. tail
Lifespan	**25-30 years**
Active	**By day**
Lifestyle	**Aquatic**
Habitat	**Wetland**
Difficulty	**Intermediate**

CARE

Min. enclosure	**180 × 80 × 60 cm** L × W × H for 1 adult
Temperature, day	**25-30 °C**
Temperature, night	**22-26 °C**
Humidity	**50-80%**
Water	**Aquaterrarium** depth 30-40 cm
Water temperature	**25-28 °C**
UVB	**Recommended** Ferguson zone 2
Diet	**Insects, complete diet, vertebrates and worms/snails**
Kept	**Singly**

BREEDING

Reproduction	**Egg-laying**
Sexually mature	**48-72 months**
Clutch size	**8-30 eggs**
Clutches per year	**2-5**
Incubation	**50-65 days** at 28-30 °C

PROTECTION AND PAPERWORK

CITES	**Not listed**
EU annex	**Not listed**
IUCN	**Vulnerable (VU)**

About the species

Pelodiscus sinensis is a medium-sized softshell turtle in the family Trionychidae. The shell (carapace) lacks horny scutes and is leathery and flexible, especially at the sides; in the middle there is a layer of bone under the skin, but at the edges there is no bone. The shell is round, flat and olive-coloured, often with dark spots. The plastron is orange to reddish and may have large dark spots. The head and legs are olive above, with dark spots on the head and dark stripes running from the eyes. The snout is long with tubular nostrils, so the animal can poke it above the surface and breathe while the body lies hidden in sand or mud. The feet are webbed and have three claws. All measurements in the text are shell length.

Females grow largest and reach up to 33 cm, while males are smaller, up to about 27 cm. Males have a longer tail than females. Sexual maturity is reached at about 18-19 cm shell length and typically after 4-6 years. Newly hatched juveniles are about 25 mm. The animal can live over 25 years.

The species is the most widely farmed turtle in the world, because it is used for food and in traditional medicine, and several hundred million animals are traded every year. Animals in the trade are therefore almost always farm-bred on a large scale. The species delimitation has changed: populations from north-eastern China, Russia, Korea and Japan are now regarded as a separate species, *P. maackii*, and local forms in Vietnam, Hainan and other parts of China as species in their own right. Farming and releases have mixed the populations, so animals in the trade may be of mixed origin, and the identification is not always certain. The species is vulnerable in the wild because of harvesting for food, habitat loss and disease.

The species is fast and strong and bites painfully when provoked. It is not an animal to handle.

Distribution and habitat

Pelodiscus sinensis is native to China and Taiwan. In China the species occurs from Inner Mongolia in the north to Guangxi in the south, including the provinces of Anhui, Fujian, Gansu, Guangdong, Guizhou, Hebei, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Shaanxi, Shandong, Shanxi, Sichuan, Yunnan and Zhejiang as well as Hong Kong. The original range is difficult to delimit, because the species has been farmed and moved by people for centuries.

Released and escaped animals have established populations in a number of countries outside China, including South Korea, Thailand, Malaysia and the Philippines and in Hawaii, and the species has been found in Spain, several other European countries and possibly Brazil. The map shows only the native range.

> **Native range:** China and Taiwan.

HABITAT

P. sinensis lives in slow-flowing fresh water: rivers, lakes, ponds, canals and streams with a soft bottom of mud or sand, and the species is also found in brackish water. In Hawaii it is seen in marshes and drainage ditches. The animal lies buried in the bottom for most of the day with only its eyes and snout free and snaps at prey that pass by.

The species can excrete a large part of its urea through the mouth instead of through the cloaca, and it dips its head in water to rinse the mouth. This adaptation means it tolerates brackish water and poor water quality better than many other turtles. In the wild it feeds on fish, crustaceans, molluscs and insects as well as seeds from marsh plants. It basks less than most other freshwater turtles.

Care

THE ENCLOSURE

Keep the animal in a large aquarium or a closed tub, not in an ordinary terrarium. The species is almost entirely aquatic, fast and active and grows large. A tank of 180 × 80 × 60 cm holds up to 40 cm of water (about 570 litres) above the sand and leaves room for the lid. Width matters more than height, because the animal must be able to turn and swim freely. Plan for the adult size from the start: juveniles grow quickly, and a small starter aquarium soon becomes too small.

The bottom should be 5-10 cm of fine, washed sand (play sand or filter sand), because the animal buries itself, and because sharp or coarse gravel scrapes the shell and causes inflammation. The animal must be able to reach the surface with its snout while buried, so make a raised sand area so close under the water surface that it can, and keep the rest deeper so the animal can swim freely. Fine sand can clog the filter, so place the filter intake high or protect it.

Provide an underwater hide of smooth stones or driftwood that cannot shift or collapse. Everything in the tank must be smooth: rough stones and sharp edges cause injuries and infections in the carapace and plastron. Keep the layout simple, because the animal knocks over and pulls at loose items. Also provide a smooth, sloping surface or a ramp where the animal can get fully out of the water, even though the species rarely basks. A smooth slab laid across two smooth stones gives both a hide under the water and a basking spot on top.

The tank must be completely escape-proof, and the lid must be fixed so the animal cannot push it off. The species is fast and can use its long neck as a lever to pull itself up over the edge. It must never be released into the wild. Water is heavy: 570 litres weigh 570 kg, so place the setup on a floor that can carry it. Keep one animal per tank.

Read more: Heat and temperature

TEMPERATURE

The water should be 25-28 °C all year round. If the water is too cold, the metabolism slows and the animal digests poorly; if it is too warm, the animal can overheat. Use a water heater with a thermostat, and shield it and the cable, or place it in a sump, because the animal will otherwise bite it or burn its feet on it. A digital thermometer with a probe in the water shows the temperature.

The air above the water should be 25-30 °C. There is no fixed hotspot: the species basks little and rarely, so a heat lamp is optional. If there is a basking spot, its surface should be able to reach 30-35 °C (borrowed from other freshwater turtles).

Night temperature is not documented; 22-26 °C in the air is an estimate, while the water holds its temperature. Brumation is not documented as necessary, and the water is kept warm all year round.

Read more: Brumation and the seasons

HUMIDITY AND WATER

Humidity is not documented for the species and matters little for an animal that lives in water; 50-80 % is an estimate. Ensure good air circulation under the lid, so the animal does not breathe stagnant, humid air when it puts its snout up.

The skin and shell are soft and without horny scutes, so poor water quickly causes sores and infections. Water quality is the most important factor in care. Use a powerful filter, check ammonia and nitrite (should be 0) and nitrate with a water test, and remove food remains.

Read more: Humidity, misting and ventilation

WATER AND WATER QUALITY

The water should be deep, clean and warm. The depth is 30-40 cm for adults, so they can swim freely and reach the surface with their snout. Juveniles are started in water only 10-15 cm deep, and the depth is increased as they grow and swim confidently. The temperature is 25-28 °C (see Temperature).

The species is a carnivore and fouls the water quickly. Choose a powerful external filter that filters both mechanically and biologically; better too strong than too weak. Let the filter run in for a few weeks before the animal moves in. Replace 25-30 % of the water every week, and use a water conditioner against chlorine. The new water must be at the same temperature as the tank. Rinse the filter media in water from the tank, not from the tap. Feed in a small separate tub if you can, so the main tank stays clean. Connect all electrical equipment near the water to a residual-current device (RCD). Keep the water pH at 6.0-7.0.

LIGHTING AND UVB

UVB is recommended, not strictly required. The species is diurnal, but it basks rarely, so many animals spend only a little time under the lamp. Even so, UVB provides vitamin D3, which the animal needs to absorb calcium. Use a T5 HO tube with a reflector over the basking spot at the water's edge. The Ferguson zone is not documented for the species; zone 2 is an estimate, based on the fact that the species basks less than most freshwater turtles.

Plastic and glass block UVB, and dense mesh blocks a large part of it. UVB tubes lose strength and must be replaced regularly. The light should be on for 11-13 hours a day and switched off in the evening. On very warm, sunny days the animal can have a few hours outdoors in an escape-proof, shaded pond.

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

FEEDING

P. sinensis is mainly carnivorous. Give whole prey: small fish, shrimp, krill, earthworms, water snails, crayfish and feeder insects such as crickets and grasshoppers, which are snapped up eagerly when they land on the water. Whole fish, molluscs and shrimp have the right balance of vitamins and calcium. Commercial aquatic turtle food can supplement the diet, but many animals of the species do not eat it.

Add calcium and vitamins to the feeding, and gut-load the insects with calcium and vitamins for the day before they are offered. A lack of calcium and D3 causes soft bones and a deformed shell. A lack of vitamin A causes swollen, closed eyes, so keep the diet varied. Juveniles are fed daily or every other day with amounts they eat in a few minutes, while adults are fed 2-3 times a week. Overfeeding causes growth that is too rapid, fatty liver and poor water.

The animal eats in the water and is fast and eager. Offer food with long tongs, not with your fingers.

Read more: Feeder animals: keeping and breeding

BEHAVIOUR AND HANDLING

P. sinensis is shy, but fast and strong. The neck is long and flexible, and the head can reach astonishingly far back along the shell towards the hand holding the animal. Handle the animal only when necessary: grasp the rear part of the shell with both hands, and hold the animal away from your body. The shell is soft and is damaged if the animal is dropped or knocked.

The animal lies very still, buried, and is most active during the day. It is territorial and can injure conspecifics and other animals, so keep one animal per tank. Males chase and bite the female on the head, neck and legs during mating. Fish that are small enough are eaten.

Animals from some populations can release a foul-smelling fluid from pores along the front edge of the shell when threatened. Wash your hands before and after contact with the animal and the water, and do not let children under 5 touch it.

Breeding

SEXUAL MATURITY AND SEXING

Sex can be difficult to determine in young animals. The male is smaller than the female and has a longer tail. The animals are sexually mature at about 18-19 cm shell length, typically after 4-6 years (48-72 months). Sex is determined by the genes, not by the incubation temperature.

Read more: Incubating eggs

MATING

Mating takes place in the water or at the surface. The male holds on to the female's shell with his forelimbs and bites at her head, neck and legs, so the female may be seriously wounded. She must have room to get away, and the animals are separated if she is chased continuously. The female can store sperm for almost a year after mating.

EGG-LAYING AND CLUTCHES

A female lays 8-30 eggs per clutch and can lay 2-5 clutches a year. The eggs are spherical and about 20 mm. In the wild the nest is dug in sand or mud on the bank, and the nest hole is about 8-10 cm wide at the opening. Give the female a box or a land section with warm, moist sand, otherwise she lays the eggs in the water, and they perish.

INCUBATION

The eggs hatch after 50-65 days, faster at higher temperature. 28 °C is regarded as the most suitable constant incubation temperature, and at that temperature the eggs hatch after about 54 days; 28-30 °C is a good range. Constant temperatures of 24-34 °C are used, but the extremes stress the embryos and can cause deformities. Place the eggs in moist vermiculite, about equal parts water and vermiculite by weight, and keep the moisture even, so the eggs neither drown nor dry out. The eggs are not turned.

REARING THE YOUNG

Hatchlings are about 25 mm and weigh about 3 g at hatching. They live off the yolk sac for up to two weeks and need clean, warm water (25-28 °C), a soft sand bottom and hides from the start. Start them in shallow water, 10-15 cm, and increase the depth as they grow. Feed daily or every other day with small shrimp, worms, mosquito larvae and commercial food for young turtles, supplemented with calcium. The hatchlings grow quickly and need more space and deeper water every few weeks. Hatchlings are particularly prone to shell infections, so water quality is crucial.

Health and common mistakes

Softshell turtles hide illness, and the skin and shell are vulnerable because they have no hard plates. Weigh and measure the animal once a month, and keep a log of weight, appetite and behaviour.

Typical problems and husbandry errors: - Poor water: causes skin, shell and eye inflammation and bacterial infections, to which the species is particularly susceptible in intensive farming. - Injuries from a rough bottom or sharp objects: cause wounds that become infected. Use only fine, washed sand and smooth stones. - Burns from the water heater: always shield the heater. - Lack of calcium and vitamin D3: causes a soft, deformed shell and bone disease. - Lack of vitamin A: causes swollen, closed eyes, often because of a one-sided diet. - Overfeeding: causes growth that is too rapid and liver problems.

All reptiles can be symptom-free carriers of Salmonella and infect humans. Wash your hands before and after contact with the animal, the water and the 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 or inflamed wounds.

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