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TORTOISES AND TURTLES

African Spurred Tortoise

Centrochelys sulcata

Centrochelys sulcata is the largest tortoise on the African mainland: the shell reaches 50-85 cm, the weight up to 90 kg, and the animal can live for 50-80 years. The young are small but grow fast, and adults require a heated room of more than 20 m² in winter, a large outdoor enclosure in summer and a keeper who can carry the responsibility for decades.

Family: Testudinidae Former name: *Geochelone sulcata; Testudo sulcata*

KEY FACTS

THE ANIMAL

Adult size	**50-85 cm** total length incl. tail
Weight	**30,000-90,000 g**
Lifespan	**50-80 years**
Active	**By day and at dusk**
Lifestyle	**Terrestrial and burrowing**
Habitat	**Semi-desert and savanna**
Difficulty	**Experienced**

CARE

Min. enclosure	**640 × 320 × 120 cm** L × W × H for 1 adult
Temperature, day	**24-32 °C**
Basking spot	**38-41 °C**
Temperature, night	**21-23 °C**
Humidity	**40-80%**
Water	**Water dish**
UVB	**Essential** Ferguson zone 4
Diet	**Plants**
Kept	**Singly or in groups**

BREEDING

Reproduction	**Egg-laying**
Sexually mature	**120-180 months**
Clutch size	**15-40 eggs**
Clutches per year	**2-3**
Incubation	**90-120 days** at 30-31 °C

PROTECTION AND PAPERWORK

CITES	**Appendix II**
EU annex	**Annex B**
IUCN	**Endangered (EN)**

About the species

Centrochelys sulcata is the only species in its genus and the largest tortoise on the African mainland. Only the giant tortoises of the Galápagos and Aldabra grow larger. The shell is thick, domed and light brown to yellow, with distinct growth rings in older animals, and the plastron is ivory-coloured. The forelegs are covered with large, overlapping scales, and the thighs carry strong horny spurs. The marginal scutes are serrated. The species name probably comes from Latin sulcus, furrow, after the grooves between the plates of the shell.

Females have a straight carapace length of about 50-60 cm and weigh up to about 40 kg. Males reach 75-85 cm and typically weigh 80-90 kg, and the largest measured carapace length is 83 cm with a weight of 105 kg. At hatching the young is about 5 cm, but it grows quickly and reaches 15-25 cm within the first years and about 20 kg in under 15 years. Animals from Sudan generally grow larger than animals from other parts of the range.

The species is not suited to an ordinary home. It is very strong, pushes and digs its way through weak walls and fences, can only be outdoors for part of the year in a temperate climate, and lives for 50-80 years. Many young are bought without the buyer having realised what awaits in ten years.

Distribution and habitat

The species lives in the Sahel, the belt along the southern edge of the Sahara, from Senegal and Mauritania in the west to Sudan, South Sudan, Eritrea and Ethiopia in the east. It has also been recorded in Mali, Niger, Chad, the Central African Republic and Cameroon.

Populations have declined sharply. The species is rare today at most known localities, because the animals are caught for trade and depend on the same grazing as cattle. Bush fires and climate change make it worse. The species has been introduced and has formed populations in the US Virgin Islands and the British Virgin Islands, but this is not the original range. Release is never the solution for an animal one can no longer keep.

> **Native range:** Ethiopia, Eritrea, Sudan, South Sudan, Chad, Niger, Mali, Mauritania, Senegal, Central African Republic and Cameroon.

HABITAT

The species lives in semi-arid grassland, savanna and thorn scrub in the Sahel, on hills, stable dunes and flat areas with bushes and tall grass, often by watercourses that flow only part of the year. The climate has a short rainy season, when the animals are most active, and a long dry season. The daytime temperature can reach nearly 49 °C.

To escape the heat the animals dig burrows that can go down about 3 m, where the air is cooler and more humid than at the surface. The animals spend the midday heat in the burrow and graze in the morning and evening. Abandoned burrows are used by many other animals.

Care

THE ENCLOSURE

Space is the first thing to settle. A widely used minimum rule for tortoises is a length of 8 times and a width of 4 times the shell length of the largest animal. Less space is often used successfully, but the general recommendation is 8 × 4 times the shell length. For a female of 60 cm that gives 480 × 240 cm, and for a male of 80 cm 640 × 320 cm, that is, over 20 m². The sizes in the fact box are set for a large male. The walls must be solid and so high that an adult cannot rear up over them, and for a large male that means 120 cm.

In a temperate climate this means in practice two set-ups. In summer, when the daytime temperature is steadily above about 20 °C and nights do not fall below 10 °C, the animal needs a large outdoor enclosure in a sunny spot, preferably 25-30 m² for two medium-sized adults, with a heated house, shade and grass to graze. The rest of the year, typically from September to May, it must live indoors in a heated room, a conservatory or an insulated animal house with heat and UVB, with at least the dimensions the minimum rule gives. The species cannot overwinter outdoors, and it must be possible to move it between the two places, even when it weighs over 50 kg.

Young animals under 25 cm can live indoors for a time in an enclosure of at least 210 × 105 cm. A closed box makes it easier to keep the heat and humidity, but it must be well ventilated, and an open enclosure requires a humid hide and a warm room. The young grow fast and soon need to move on.

Outdoors the wall must be of concrete blocks or similar and go at least 30 cm into the ground, because wood and thin boards do not hold. All furnishings must be fixed in place. The substrate is a mixture of topsoil and sand, for example 60 % topsoil and 40 % sand, 15 cm deep for young animals and up to 60 cm for adults, so that the animal can dig. Remove droppings daily.

Read more: Lighting and UVB Read more: Humidity, misting and ventilation

TEMPERATURE

The air temperature should be 24-32 °C by day, with a basking spot of 38-41 °C for young animals, and 21-23 °C at night. Use powerful heat spots over the basking spot and, in a large room, a radiant panel with a thermostat, so that the whole room is warm. Measure with digital thermometers at both ends. The species does not tolerate cold combined with damp.

Adults are more robust and tolerate a wider temperature range when they can retreat into a burrow or shade. Outdoors in a temperate climate there must be a house with non-light heat (ceramic heater or radiant panel) set to about 21-24 °C when the night becomes colder than about 10 °C. The animal must go indoors as soon as the daytime temperature is no longer steadily above about 20 °C.

The species must never hibernate. It needs warmth and light all year.

Read more: Heat and temperature

HUMIDITY AND WATER

Although the species comes from a dry area, young animals must not be kept completely dry: in the wild the young hatch in the rainy season and spend a lot of time in humid burrows. Young animals need high humidity, about 80 % and preferably more at night, and there must always be a humid hide. Adults are kept drier, about 40-50 %, because cold, damp air over a longer period causes respiratory infections and shell rot. Chronic dehydration during growth causes deformed scutes (pyramiding).

Young animals should have a lukewarm bath at 29-35 °C for 20-30 minutes daily, in water that reaches no higher than the elbows. Moisten the substrate with a pressure sprayer or watering can, and keep a humid hide in the cool end.

WATER AND WATER QUALITY

There must always be a large, low and stable bowl of fresh water, dug in so that the animal can get in and out. The water must reach no higher than the animal's knees. The tortoise fouls the water quickly, so change it daily and scrub the bowl with an animal-safe disinfectant once a week.

Read more: Quarantine and hygiene

LIGHTING AND UVB

The species is diurnal and needs both strong light and UVB (Ferguson zone 4) all year indoors, with a UV index of about 4-6 at the basking spot. Use a reflective T5 HO tube with 10-14 % UVB, about half the length of the enclosure, mounted on the warm side close to the heat bulb and preferably inside the enclosure, because mesh attenuates UVB. The distance depends on tube and reflector, so measure the UV index with a UVI meter.

UVB is not strong enough to serve as daylight, so supplement with several powerful LED lamps of about 6500 K covering most of the enclosure. Indoors keep the light on for 13 hours in summer and 11 hours in winter. Outdoors artificial light is unnecessary, and the sun is the best UVB source.

FEEDING

C. sulcata is a herbivore and needs a high-fibre, low-protein diet. The bulk is grass and hay (timothy, cocksfoot hay, grass from a lawn free of pesticides), supplemented with dandelion, clover, plantain, mallow, hibiscus leaves, opuntia pads and flowers. Lettuce such as romaine and endive can be used as filler. Variety is the key. Spinach, kale and parsley are given only in small amounts, and are best left out, because they contain a lot of oxalate, which binds calcium. Fruit is not given, because it causes diarrhoea, parasite problems and colic. Too much protein causes overly fast growth, deformed shells and bone disease.

Young growing animals can have as much as they will eat, every day. As the animal approaches adult size, the amount is limited to a daily portion the size of the shell. The older the animal gets, the more hay it can tolerate. Adults eat large amounts. Offer the food on a flat stone or tray, so that the animal does not swallow substrate.

The species grows fast and has a great need for calcium and minerals: sprinkle a calcium supplement with D3 over the food every day for young growing animals, and leave a cuttlebone available as a calcium source and for wearing down the beak. Grass-pellet complete food can be used for variety, but not as the staple.

Read more: Calcium, vitamins and supplements

BEHAVIOUR AND HANDLING

The species is calm and sluggish, but not a pet for handling. The animal is stressed by being lifted, and an adult of 50-90 kg cannot be lifted by one person. Many take food from the hand and enjoy having the shell scratched. The animal can withdraw into its shell and hiss. It is inquisitive and can become stuck on its back if it tips over, so an enclosure must be free of traps and slopes, and you must be able to turn the animal over.

The animals are solitary and do well alone. In very large enclosures several can live together without major conflict, but males are territorial and fight and shove each other, especially in the breeding season, and a male and a female together produce eggs. Do not keep two males together.

Great strength and digging behaviour are part of the species: it undermines fences and can open gates. The animal requires daily care for decades, even when you are away, and a stand-in must be able to handle a tortoise weighing many tens of kilos.

Breeding

SEXUAL MATURITY AND SEXING

The males are markedly larger than the females: 75-85 cm against about 50-60 cm in carapace length. The male has a concave plastron and a longer tail. The animals become sexually mature after 10-15 years, and so only after several years at full adult size. The timing depends on growth and feeding.

MATING

In the wild mating is triggered especially after the rainy season in the period September-November, but it can take place from June to March. The males are very territorial and fight over the females by ramming and overturning each other. During mating they are noisy, with grunting, croaking and whistling. Larger males usually win.

The species is bred on a very large scale, and more young are rarely needed. Do not breed unless all the young have a home ready for an animal that will grow beyond 60 cm and live for decades.

EGG-LAYING AND CLUTCHES

About 60 days after mating the female begins to walk around looking for a nest site. Over 5-15 days she often digs four or five nest holes before choosing one. She typically lays 15-30 eggs per clutch, occasional clutches up to about 40, and normally 2-3 clutches in the season. The nest is dug when the air is at least about 26 °C, and the eggs are laid a few minutes apart. She then fills the hole and covers the eggs, which can take over an hour.

Provide the female with a large, sunny and well-drained area with loose, deep soil, and a warm place to dig indoors if she is to lay outside the summer.

INCUBATION

The eggs are moved carefully, without being turned, to an incubator with moist vermiculite. At about 30-31 °C they hatch after 90-120 days. Sex depends on the temperature during incubation, so the temperature must be kept stable. In the wild the eggs lie in the soil for about eight months.

Read more: Incubating eggs

REARING THE YOUNG

The young are 4-5 cm and about 40 g at hatching. Keep them in a warm, humid box with a humidity above 80 %, a humid hide, UVB and a basking spot, and bathe them every day in lukewarm water. Feed them every day with grass and soft leaves. The animals grow quickly and soon pass the size at which they can live in a box. Plan space for all the young before eggs are laid.

Health and common mistakes

Most problems are caused by too little space, cold, dehydration and wrong food:

- Pyramiding and shell deformities with chronic dehydration, too much protein and too little UVB.
- Brittle bones (metabolic bone disease) with a lack of UVB, vitamin D3 and calcium: soft shell, weak legs and growth defects.
- Respiratory infections and shell rot with cold, cold damp and stagnant, humid air. Young are most vulnerable.
- Dehydration in small animals, shown by sunken eyes and dry, rough scales.
- Overheating, if the animal cannot get down into a burrow or into shade, or if it lies on its back in the sun.
- Overgrown beak and claws when there is nothing hard and rough to gnaw on.
- Internal parasites, which can be detected with a faecal sample.
- Bladder stones, which are known in the species and can require surgery.

A healthy animal has clear eyes, a dry nose, a firm shell and a good appetite. The species must not hibernate. Adults of 50 kg or more are hard to transport, and the vet must have the right facilities. Expect high costs for vet, heat and light all year, and for food in large amounts. Heating a room through a northern winter is a major expense. Seek a vet experienced with reptiles if the animal loses weight, does not eat for several days or has discharge from the nose and breathing difficulty.

Read more: Common diseases and signs of illness

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.