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TORTOISES AND TURTLES

Yellow-Footed Tortoise

Chelonoidis denticulatus

Chelonoidis denticulatus is a large, dark forest tortoise from the Amazon and the adjoining forests with yellow to orange scales on the head and legs. The shell is typically 35-45 cm long, and in some populations the animals reach 60-70 cm. The species can live for more than 50 years, requires even warmth and high humidity all year and eats leaves, fruit and a little animal food.

Family: Testudinidae Former name: *Chelonoidis denticulata; Geochelone denticulata; Testudo denticulata; Testudo tabulata*

KEY FACTS

THE ANIMAL

Adult size	**35-70 cm** total length incl. tail
Lifespan	**50-60 years**
Active	**By day**
Lifestyle	**Terrestrial**
Habitat	**Dry forest and rainforest**
Difficulty	**Experienced**

CARE

Min. enclosure	**320 × 160 × 60 cm** L × W × H for 1 adult
Temperature, day	**26-29 °C**
Basking spot	**29-32 °C**
Temperature, night	**20-23 °C**
Humidity	**70-90%**
Water	**Water dish**
UVB	**Essential** Ferguson zone 2
Diet	**Insects, fruit, plants and worms/snails**
Kept	**Singly or in groups**

BREEDING

Reproduction	**Egg-laying**
Sexually mature	**96-120 months**
Clutch size	**2-7 eggs**
Incubation	**120-190 days** at 29-31 °C

PROTECTION AND PAPERWORK

CITES	**Appendix II**
EU annex	**Annex B**
IUCN	**Vulnerable (VU)**

About the species

Chelonoidis denticulatus is the largest tortoise on the South American mainland. The carapace is long, oval and highly domed with almost parallel sides, a flat row of vertebral scutes and a slight peak towards the rear. It is yellowish brown to dark brown, often almost black along the edges of the scutes, with a pale yellow, orange or light brown patch in the middle of each scute. The plastron is yellowish brown and darkens towards the seams. The head and legs are black with yellow to orange scales, and the hind legs are powerful and elephantine. Young animals have slightly serrated shell edges at the front and rear and a serrated first marginal scute.

All measurements in the text are shell length. Adults are typically 35-45 cm, in some populations 60-70 cm, and the largest known animal is a female of 94 cm. Males are on average slightly larger, but the largest animals are females. The male has a deeply concave plastron, a distinct waist and a longer, thicker tail, which is carried laid to the side. The female has a short,

cone-shaped tail. The species can be confused with *Chelonoidis carbonarius*: *C. denticulatus* has a broader and more rounded shell, yellow rather than red scales and a serrated first marginal scute in young animals. As adult size varies greatly, it is an advantage to know the size and origin of the parent animals.

The species name *denticulatus* means "finely toothed" and alludes to the serrated shell edges in young animals. The species was described by Carl von Linné in 1766 as *Testudo denticulata*. The name long stood as *denticulata*, and the species has also been placed in the genus *Geochelone*.

Distribution and habitat

Chelonoidis denticulatus occurs in large parts of northern South America east of the Andes: south-eastern Venezuela, Guyana, Suriname and French Guiana, the Amazon region of Brazil and eastern Ecuador, Colombia, north-eastern Peru and northern and eastern Bolivia. An isolated population lives in eastern Brazil, and the species also occurs on Trinidad. It is also known from Guadeloupe in the Lesser Antilles, but that population is not shown on the map, because it is unclear whether it is native.

The species is most closely tied to continuous forest. Populations are under pressure from hunting for food, the collection of eggs and adults and the destruction of habitats, and the species is assessed as Vulnerable (VU) on the IUCN Red List.

> **Native range:** Venezuela, Guyana, Suriname, French Guiana, Brazil, Ecuador, Colombia, Peru, Bolivia and Trinidad & Tobago.

HABITAT

The species lives in humid rainforest and drier forest and in belts of forest up to savanna and grassland. It is more tied to dense, shady forest than *Chelonoidis carbonarius*. Where the two species live side by side, *C. carbonarius* has moved out into open country, while *C. denticulatus* has stayed in the forest. The climate is warm and humid with small variations in temperature all year, and activity rises when the rainy season begins. The species does not hibernate.

The animals spend a lot of time in leaf litter and undergrowth and near water. They eat many kinds of leaves, grass, flowers, fallen fruit, fungi, carrion and slow small animals such as snails and worms. They roam without fixed territories, and the males fight by trying to overturn each other.

Care

THE ENCLOSURE

Chelonoidis denticulatus is kept broadly like its close relative *Chelonoidis carbonarius*, but is a more distinctly forest species that requires more shade, more stable warmth and an evenly high humidity. It is harder to keep well than *C. carbonarius*, and the large adult size requires a great deal of space.

In a cool northern European climate the indoor facility is the animal's home for most of the year. The minimum size for an adult is 8 times the shell length in length and 4 times in width. Less space is often used successfully, but the general recommendation is 8 × 4 times the shell length. For an animal of 40 cm this gives 320 × 160 cm, and the sides must be at least 60 cm high. An animal of 50 cm needs at least 400 × 200 cm. Use a closed vivarium or a table with a lid, so that humidity can be kept up. Put an opaque strip of 10-15 cm along the front glass, so that the animal does not pace and stress against the glass. Young can live in a large plastic box or a closed tortoise table of at least 90 × 60 cm with the same furnishings.

Time outdoors is only a supplement on warm summer days, and the animal must come in when the day is below about 18 °C. The pen must be densely planted with non-toxic plants and have ample shade, an opaque wall of at least 40 cm and netting against predators and crows. If the night falls below 18 °C, the animal needs a closed, heated shelter or must be brought in.

The substrate must hold moisture: a mixture of topsoil, coconut fibre, bark and long-fibre sphagnum at least 10 cm deep. Put leaf litter on top. Furnish with several hides, hollow logs and a mud puddle. At least one hide must be humid, and there must be a dark, quiet hide at the cool end.

Read more: Humidity, misting and ventilation

TEMPERATURE

The air temperature is 26-29 °C by day, and the basking spot under the heat lamp is 29-32 °C, measured on the surface itself. The cooler end is 24-26 °C. At night the temperature may fall to 20-23 °C, but never below 18 °C. Use several halogen lamps or a mix of heat lamps and radiant heat with a thermostat, so that the heat is spread over a large basking area. The lamp should sit at least 30 cm above the shell.

The species tolerates fluctuations and cold less well than *C. carbonarius* and must not hibernate. Above 32 °C there must be ample shade and a cooler place to retreat to. Do not take the animal out of the warmth into a cold room for any length of time.

Read more: Heat and temperature

HUMIDITY AND WATER

Humidity must be 70-90 %, which suits a humid forest species. The substrate must be evenly moist without standing in water. Moisten the soil layer and surfaces daily with a pressure sprayer or a misting system, and cover part of the lid so that the humidity stays while there is still ventilation. A humid hide with moistened moss or leaf litter is always necessary.

The species loves to lie in water. Provide a large, shallow water bowl or a tub that the animal can easily get in and out of; the water must be 2-3 cm deep for young and no more than 7 cm for adults. Bowl and water are changed daily. Young dry out quickly, and swollen, closed eyes are an early sign. They get a lumpy shell if the air is too dry and are therefore bathed in lukewarm water several times a week.

LIGHTING AND UVB

C. denticulatus is diurnal, but a shade-loving forest species that does not bask in bright light like desert species. UVB is necessary all the same: measure a UV index of 2.0-3.0 at the basking spot (Ferguson zone 2). This is achieved, for example, with a T5 HO UVB tube of 6 % at a distance of 30-35 cm. Replace the tube according to the manufacturer's instructions, because output falls long before the tube fails.

Supplement with an LED lamp with daylight at about 6500 K, and keep the light on for about 12 hours a day all year. Time outdoors in warm weather supplements the UVB tube, but glass and acrylic block UVB.

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

FEEDING

C. denticulatus is an omnivore. In the wild it eats leaves, grass, flowers, fallen fruit, fungi, carrion and slow small animals. Fruit makes up slightly more of the diet than in *C. carbonarius*, but the staple is still leaves.

The staple food is dark leafy greens and herbs such as chicory, endive, dandelion, clover and plantain, supplemented with greens such as courgette, bell pepper and green beans. Fruit such as berries, melon, papaya, mango and plums is given in smaller amounts, and edible fungi are readily taken. Animal food such as earthworms and farmed snails is given two to four times a month.

Young are fed daily, adults daily or every other day with as much as they can eat in 15-20 minutes. Feed on a flat dish or stone. Sprinkle a calcium and vitamin supplement over the food a couple of times a week, and leave a cuttlebone available. Overly fast growth from too much protein causes a lumpy shell.

BEHAVIOUR AND HANDLING

The species is calm and inquisitive, but often a little more reserved than *C. carbonarius*, and it prefers to stay close to cover. Many animals do become trusting and come forward when there is food. Always lift the animal from underneath with both hands under the plastron, and hold it low over the substrate.

The animal can be kept alone or in a group, but keeping groups requires a great deal of space and many hides, and the males fight by trying to overturn each other. Do not mix the species with other tortoises, because they can infect each other.

Breeding

SEXUAL MATURITY AND SEXING

The male has a concave plastron, a distinct waist and a longer, thicker tail. The female has a short, cone-shaped tail. In the wild the animals become sexually mature after about 8-10 years. The number and size of eggs increase with the female's size.

MATING

Mating can take place all year, but activity increases with the rainy season. The male jerks his head back and forth towards other animals, and an animal that does not respond is a female. He sniffs her cloaca and mounts her while uttering clucking sounds in a fixed pattern. Rival males fight. Give the female many hides and the chance to get away from the male, and do not keep several males with a few females.

EGG-LAYING AND CLUTCHES

Give the female a box with deep, loose and moist soil where she can dig a nest. Each clutch is 2-7 eggs; the figure is borrowed from *C. carbonarius*, as is the incubation time. A female lays 6-16 eggs a year, more the larger she is, and not all females lay every year. The eggs have a brittle shell, are oblong to round and 3-6 cm in diameter. The number of clutches per year is not documented.

Read more: Incubating eggs

INCUBATION

The eggs are carefully moved without being turned to an incubator with moist vermiculite (1:1 with water by weight) and a humidity of 70-80 %. At 29-31 °C the eggs hatch after 120-190 days, on average about 145 days. The young can stay in the egg for some days after opening it, while the yolk sac is absorbed.

REARING THE YOUNG

The young are independent from hatching and begin to eat calcium-rich plants. Keep them on damp kitchen paper until the navel has healed, and then in a closed box with high humidity (about 75 %), a humid hide, a base of soil, sphagnum and leaf litter and a warm spot of 29-32 °C. Provide UVB, a very shallow water bowl and a lukewarm bath several times a week. Young dry out quickly, and air that is too dry causes a lumpy shell, which cannot be corrected again.

Health and common mistakes

The most frequent problems are caused by husbandry errors:

- Respiratory infection: runny nose, wheezing breathing, open mouth and lethargy. Caused by humidity that is too low, cold or both. A vet is needed.
- Lumpy shell (pyramiding): humidity that is too low during the growing years, too little UVB or calcium and too fast growth. It cannot be corrected afterwards.
- Dehydration: especially in young.
- Parasites: common in newly imported animals. Signs are loose droppings, mucus and weight loss.

Weigh the animal regularly: weight loss is often the first sign, because reptiles hide illness. A new animal must be quarantined before it is put with other tortoises. Contact a vet with reptile experience if the animal does not eat for a couple of weeks, loses weight or has fluid from the nose. Wash hands before and after contact.

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.