Karoo dwarf tortoise (*Chersobius boulengeri*)

Husbandry guidelines, version 5

The following information is based on experience gathered within the studbook coordinated by Dwarf Tortoise Conservation, based on wild-caught adult individuals and captive-bred juveniles.

Enclosure

Adult Karoo dwarf tortoises show intra- en intersexual aggression, so individuals may need to be kept solitarily for most of the time. Due to their relatively high activity levels in captivity, males and females require at least 0.75–1.00 and 1.00–1.50 m^2 per individual, respectively, and couples require at least 1.50–1.75 m^2. The minimum sizes in these ranges are for very space-efficient enclosures with opaque sides, sight barriers, and limited unavailable surface area (e.g., no large rocks or logs that tortoises can only walk around, but rather hollow structures that simultaneously act as side barrier and retreat). Inexperienced keepers should use relatively large enclosures. Mid-September, male Karoo dwarf tortoises may be introduced in female enclosures. From the moment of introduction, couples can be kept together for as long males are not frequently following, biting or mounting females, or disturbing nesting. Males should be removed in the end of April latest. When mating activity is observed, females should be inspected weekly for skin damage due to male bites.

Enclosures should have a firm soil (e.g., sand and loam mixed in a 1:1 ratio and compacted) to avoid sand being ingested, except at egg-laying sites (see below). Ingestion of sand may be further avoided by offering food at a site with a hard bottom (e.g., concrete slab, rubber mat; photo right). Multiple retreats should be provided for each individual. Retreats should be constructed in such a way that tortoises cannot climb on them and drop down. Retreats constructed from concrete bricks (photos right) are particularly useful, forming >11 cm high vertical sides. Furthermore, concrete bricks enable integration of a heat mat in the structure, using a tempered glass pane to separate the heat mat from the tortoises, simulating radiant heat from rocks that wild tortoises use to thermoregulate. The usable surface of retreats should be 400–600 cm^2 and their internal height should be 5–7 cm. Enclosure decoration may be completed with wood stumps and (live or artificial) plants.

For adult females, egg-laying sites with a stable soil layer (e.g., sand and loam mixed in a 10:1 ratio, not compacted) of at least 6–8 cm deep should be provided to allow nesting. Nesting sites should provide cover by an overhanging plant, rock, wood, or other structure, because Karoo dwarf tortoises will not nest in an open space. Heated retreats (see above) are typically preferred as egg-laying sites.

Enclosures may be lightly sprayed, especially in summer (for instance once every 1–3 weeks). The top layer of the soil (including in retreats) should dry within 24 hours after spraying. Karoo dwarf tortoises do not tolerate permanently damp soils or retreats.

Juveniles are successfully kept in simple enclosures, starting at approximately 0.14 m^2 for 1–3 hatchlings. These enclosures are decorated with the same soil substrate as the adult enclosures and a (natural or artificial) hiding place for each tortoise. Hatchlings can be kept on newspaper substrate for the first week. Small and simple enclosures allow better observation and therefore increase the chance of survival of the tortoises.

Juvenile Karoo dwarf tortoises are sensitive to dehydration, but do not tolerate permanently damp conditions. In order to avoid dehydration, they require weekly 10-min soaks during the first year. In addition, enclosures should be heavily sprayed twice weekly, drying up within 36 hours. To achieve this, a thin soil layer and proper ventilation are key. Open-top enclosures in a heated room are ideal.

The habitat requirements of *Chersobius boulengeri* are incompatible with outdoor husbandry in Europe, even in summer.

Illumination and temperature
Because the light intensity in the natural distribution range is extremely high, bright illumination should be provided by means of daylight, tube lights, CDM/HQI, HID or led light bulbs. It is not yet known if UV radiation (natural UV Index 10–15) is essential. If it is not provided, sufficient vitamin D has to be added to the diet. One basking spot should be available for each adult tortoise, separated by a visual barrier (e.g., retreat). Photoperiod needs to be adjusted to the natural distribution range. This means 14 hours in summer and 10 hours in winter, with a gradual shift between these two extremes. Climatic cycle can be adjusted to northern or southern hemisphere.

Appropriate ambient enclosure temperature should be provided by means of heating lamps, infrared panels, central heating systems, soil heating or a combination. Ambient day temperatures need to fluctuate with the season, for instance 30–33°C in summer and 15–20°C in winter. Night temperature should be lower than day temperature. There is no minimum night temperature, as long as the temperature remains above 0°C. The day temperature under spot lights or in sun needs to be higher, for instance 45°C or higher, to allow basking.

Diet
Adult Karoo dwarf tortoises may be finicky about their diet. Excellent results have been obtained using a basis of coarsely cut chicory, mixed with a 1:1 (weight-based) blend of calcium lactate and Calcicare (3% of chicory weight) and a fibrous (Agrobs Prealpine Senior) supplement (5% of chicory volume). This basis was then supplemented (30% of chicory volume) with finely cut green leaves (e.g., *Taraxacum*, *Plantago*, *Trifolium*, *Vicia*, endive, etc.). Once every two weeks, chicory may be substituted by been sprouts. Occasionally, succulents (e.g., *Crassula*, *Echeveria*, *Haworthia*) that have not been subjected to biocides may be offered. Food should be provided at least four times weekly, but rather daily in the active summer season. Hatchlings should be fed daily during the first months.

Clean drinking water should be provided for all life stages at least once every two days, as the tortoises drink infrequently.

Parasites
Wild and captive Karoo dwarf tortoises may carry significant loads of nematodes in the intestines. Faecal examinations can help monitor nematode infestations and fenbendazole (e.g., Panacur) can be used to suppress nematode populations upon diagnosed infestations or in routine administrations (e.g., annually at the end of summer).

Incubation of eggs
The sex of hatchling *C. boulengeri* likely depends on incubation temperature, but the threshold temperature is not known. Speckled dwarf tortoises required high incubation temperatures (i.e., 33°C) to develop females. Until more information is available, the following incubation regime can be used, based on incubation period for Karoo dwarf tortoise eggs and general chelonian embryology:

- Incubation day 0–22: Diurnal temperature cycle of 31°C and 26°C

- Incubation day 23–43: Constant temperature of 33°C (for females) or 30°C (for males)
- Incubation day 44–end of incubation: Diurnal temperature cycle of 31°C and 26°C

Since female incubation temperatures are close to detrimental temperatures, they should be carefully monitored with a calibrated thermometer. Furthermore, incubation substrate humidity should be low to avoid eggs taking up too much moisture and cracking. Substrate-less incubation at a high relative humidity (80–90%) of the air circumvents such problems.

Status in the wild and in captivity
Karoo dwarf tortoises are endangered in the wild. The only legal Karoo dwarf tortoises in captivity are included in formal scientific studies.

Literature
A detailed bibliography can be found at the website of the Dwarf Tortoise Conservation. There is virtually no published literature available on husbandry or ecology of Karoo dwarf tortoises.

Additional information
These husbandry guidelines were drawn up in June 2024. Husbandry methods are dynamic and therefore it is recommended to check for updates.