

Radiated Tortoises (*Geochelone radiata*) - Chris Tabaka DVM and Darrell Senneke
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This care sheet is intended only to cover the general care of this species. Further research to best develop a maintenance/reproduction plan for whichever species/subspecies you are caring for is essential.

Say the word “radiata” to any tortoise lover and almost invariably their jaw will drop, their eyes will glaze over and a far-away look will appear on their on their face. Such is the power of *Geochelone radiata*, the Radiated Tortoise of Madagascar.

There are many reasons accounting for this reaction. To be certain, a large part of this mystique is the fact that they are designated CITES I and are also on the US Endangered Species list. This makes them one of the most protected tortoise species in the world, giving them a “forbidden fruit” appeal. Yet for those willing to put forward the time, effort, funds, and sacrifice, captive bred wildlife permits and captive bred specimens can be obtained. Their point of origin on the exotic island of Madagascar, a land of mystery to most herpetoculturists, known for its unique species, adds to the overall mystique. Throw in the incredible beauty of this species and the result is an animal that for many is their “dream tortoise”. Stunningly attractive, their black shell contrasts sharply with their yellow patterns. Having evolved in a similar environment to the Indian Star tortoise (*Geochelone elegans*) they bear a similar starred pattern, but a starred pattern of greater complexity and on a much larger tortoise. This same pattern that makes them stand out so in a collection or a photo makes them nearly invisible in their natural habitat of thorny brush and tall grasses. *Geochelone radiata* are one of the larger species of tortoise, reaching 40 cm (16 inches) and nearly 16 Kilograms (35 pounds). An adult Radiated tortoise is a truly impressive animal.

In many ways, Radiated tortoises are like a combination of many other tortoises in terms of their care. While they do periodically experience very dry climates such as the Leopard tortoise (*Geochelone pardalis*) they are also in a monsoon region and experience heavy rains and generally very wet weather. One behavior that has developed with Radiated tortoises is that they will literally dance in the rain almost as if they are trying to shake off debris. They will

Radiated Tortoise - *Geochelone radiata*

- **Location** - Madagascar
- **Habitat** - Thorny brush and tall grasses, monsoon - normally dry with seasonal heavy rain
- **Size** - 40cm (16 inches)
- **Diet** - Leafy greens (dandelions, clover, endive etc.), fruits (10 - 20 %), grasses and occasional supplementation with Mazuri Tortoise Diet
- **Conservation Status** - CITES I
- **Threats** - habitat loss, traditional medicines and pet trade

also drink heavily from the ground during such “monsoons”. If supplied with a dry hutch, they can be maintained in fairly humid areas similar to the Redfoot tortoise (*Geochelone carbonaria*).

HOUSING RADIATEDS INDOORS - The most common form of indoor accommodation for small or medium sized Radiated Tortoises consists of a “turtle table”. To all appearances this

looks like a bookshelf unit flipped onto its back. A reasonable size for a hatchling is 2 feet by 3 feet (60 cm by 90 cm). As the animal grows, the size of this habitat should be increased. For an adult Radiated tortoise, the indoor accommodation should be at least 8 feet by 4 feet (240 cm by 120 cm) Into the bottom of this "turtle table" holes can be cut to allow for the sinking of food, water, and eventually nesting containers flush with the surface for easier animal access.

The water area of the habitat should be large enough to allow the tortoise to completely soak in it if it wishes - it must also be shallow enough to protect it from drowning. Cypress mulch is the indoor substrate of choice for this species due to its humidity retention characteristics which in turn leads to good scute and skin health.

In one corner of the environment a 100W spot lamp should be positioned to provide artificial basking facilities. This should be positioned to provide a basking spot of 95 degrees F or so in that section of the habitat. The habitat should also be equipped with a full spectrum fluorescent light to provide for UVB. A UVB source is necessary for Vitamin D3 syntheses (needed in calcium metabolism) If preferred to this lighting arrangement a Mercury vapor bulb may be used that fulfills both heat and UVB requirements. There should be a hide box located in the corner away from the basking spot to allow the animal a cool dim retreat.

OUTDOOR HOUSING - Predator proof outdoor habitats offer many advantages over indoor accommodations and should be seriously considered as an option during warmer weather. Some areas of the habitat should be heavily planted to allow the Radiated a cool dim retreat. While this species doesn't seek out grassy tussocks as actively as the Star tortoise, they will still receive frequent use. Provision of a wet, muddy area for wallowing will also be appreciated by your tortoise. Radiated tortoises take readily to using a hutch or doghouse-like artificial retreat. In areas with cool nights a thermostatically controlled ceramic heater in such a retreat will provide the tortoise with an area that remains above 55 degrees F (16 C). This is a moderately cold hardy species as adults.

DIET - Radiateds are primarily herbivorous animals. Excessive protein as well as all animal protein should be avoided as they are highly prone to pyramiding. *G. radiata* are also extremely attracted to any foodstuff that are red in color.

The diet offered should consist of:

- Leafy greens (dandelions, clover, endive etc.)
- Fruits (10 - 20 %)
- Grasses
- Occasional supplementation with Mazuri Tortoise Diet

Because of their large adult size, additional calcium supplementation is absolutely essential. For proper growth as well as egg production, powdered calcium can be sprinkled on all foods once a week to help meet these requirements. It is suggested that one use calcium supplemented with vitamin D3 if the animal is being maintained indoors and calcium without D3 if it is outdoors. Provision of a cuttlefish bone, which can be gnawed for its calcium content as well as for a healthy beak, is also recommended. The substrate of choice is cypress mulch or something possessing the same humidity holding properties in order to keep their shells/skin from drying out in captive conditions. In outdoor pens in areas of high sand content, food should not be placed directly on sandy soil. Sand can build up in the tortoises GI tract leading to possible impaction and even death. One author has witnessed this firsthand in a necropsy of a radiated tortoise that died of twisted bowels due to a sand impaction. A completely separate sand-free area in the habitat must be utilized to feed.

MEDICAL COMMENTS – In general this is a very, very hardy species. Medical problems seen by one of the authors includes such situations as sand impaction leading to intestinal strangulation and death, an iodine deficiency in the diet which led to the formation of goiter (reddened swollen areas on the side of the neck which resolved with supplemental iodine in the diet), and an unidentified viral encephalopathy in an animal (possibly herpes in origin- NEVER mix species and especially a species such as this with any others).

Due to the extreme pressures on native populations of *Geochelone radiata* as can be seen in John Behler's Letter To CITES Animal Committee and Concerned Parties, in which he details the Killing fields of Anandriana, (9 January 2002) *. It is important that if possible every effort is made to reproduce the animals in your care. While some animals are too severely affected by poor diet leading to such maladies as flattening/collapse (see picture) or extreme pyramiding (see picture), all healthy specimens of this species carry the added burden of attempted reproduction. Feel free to contact the authors for technical expertise contacts in this area.

Dietary Based Deformities Seen in *G. radiata*



G. radiata with "flattened" shell due to improper diet



G. radiata with "pyramiding" due to improper diet

This species does not hibernate in nature. Facilities must be provided for the continued health and well being of the tortoise indoors in cooler (non tropical) climates.

It should be noted that turtle and tortoise care research is ongoing. As new information becomes available we share this on the World Chelonian Trust web site at www.chelonia.org. Serious keepers find it to be a benefit to have the support of others who keep these species. Care is discussed in our free online email community, which may be joined from the web address above. Please contact us about the many benefits of becoming a member of the World Chelonian Trust.

* *Turtle and Tortoise Newsletter*, 2000, 5:18-19 © 2000 by Chelonian Research Foundation

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