

## H U S B A N D R Y

# Captive Husbandry of the Chuckwalla (*Sauromalus ater*)

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Chuckwallas (*Sauromalus* spp.) are iguanid lizards inhabiting the southwestern portion of North America. Approximately seven species have been described and generally accepted, and additional subspecies or full species can be added to the count, depending on how one defines those terms. The common Chuckwalla (*Sauromalus ater* Duméril 1856) is the most widely distributed species, occurring from southwestern Utah and south-

ern Nevada, south through the eastern portion of southern California and western Arizona, down into the Baja Peninsula and the Sonoran Desert of México. Until recently, U.S. populations often were referred to as *S. obesus* (see article on p. 78). One of the largest native lizards in the United States, Chuckwallas range in size from 13 to over 20 cm in snout-vent length (SVL) (Stebbins 1985). Adult males are larger than adult females. The head is distinct from the body and the heads of males are much broader than those of females. Scales at the back of the head form small spikes, which are most prominent in adult males. These lizards have stout bodies and, when relaxed, have multiple folds of skin along their sides.

Coloration varies considerably over the range of *S. ater*. Some animals have 3–5 dark dorsal bands on a light background. Others have solid black heads and bodies with either white, bright orange, or red tails. Numerous variations on these patterns occur. Juveniles tend to have the dorsal bands with black freckling in the interspaces. Most young animals also have bands on the tail, and these may be retained into adulthood in some populations. The transition to adult coloration generally occurs within the first two years of life.

These lizards inhabit arid regions with moderate shrub cover and usually are found on or near rocky outcrops with plenty of crevices in which they take refuge from predators and at night. Primarily diurnal, they actively forage for plant material and can regularly be found climbing low foliage to retrieve leaves from overhead branches. When threatened, they retreat into rocky crevices and fill their lungs with air, expanding the torso and compressing their body into the crack, preventing extraction by potential predators and even most collectors (a pry-bar is standard collecting gear when hunting Chuckwallas). Although they look somewhat cumbersome with their relatively short legs and stout bodies, they are agile runners and can move with surprising speed when threatened.

### Chuckwallas in Captivity

Because they are diurnally active and tend to have calm dispositions, Chuckwallas can make excellent pets. They can be housed in small groups, if enough cage space is provided. Their moderate size (compared to most other iguanids) also means that an enclosure does not need to fill an entire room to house a breeding group. Taking into consideration their requirements in captivity, they are an easy and rewarding species with which to work.



Adult male *Sauromalus ater*, Joshua Tree National Monument, Porcupine Wash, California. Photograph by Brad Hollingsworth.



A Chuckwalla habitat should be well-structured to provide climbing space, basking areas, and crevices into which the lizard can wedge itself. The crevices in the habitat have been created by stacking various types of cinder blocks to provide spaces of varying size. *Photograph by Carole Saucier.*

### Enclosure

The type of enclosure one should select for Chuckwallas depends on the number of animals to be housed and how natural and aesthetically pleasing the display is to be. At a minimum, for adult animals, a 40-gallon breeder-size tank can suitably house an adult pair. This setup provides approximately 4.5 ft<sup>2</sup> of floor space. In general, another 2–2.5 ft<sup>2</sup> of floor space is necessary for each additional animal in order to provide adequate individual space for each lizard. Cages can be built out of wood or other materials (as long as they are constructed in a fashion that permits thorough cleaning), but floor space should be a primary consideration. Vertical height is much less important. Also, any cage, whether purchased or constructed, should have good ventilation. Chuckwallas like hot basking spots and these must be provided. If ventilation is inadequate, temperatures in the enclosure can quickly rise to dangerous levels.

Props and substrate for the cage should be selected based on functionality as well as aesthetics; more elaborate designs often require considerably more maintenance. An effective substrate can be made up of playground sand and dirt in approximately a 2:1 ratio. Gravel should not be used as it can be inadvertently ingested and cause intestinal impaction. Wood shavings or other substrates, such as ground coconut shells, are not recommended because they retain moisture that can lead to bacterial or fungal growth, which can adversely affect the health of the animals. The substrate should be at least 2–3 in deep to allow for digging. Individual fecal pellets should be removed frequently, and the entire substrate should be replaced at least twice each year to ensure adequate cleanliness.

Props in the cage should consist minimally of piled rocks, leaving crevices and openings into which the animals can retreat for security. This mimics their natural habitat and is much more suited behaviorally than a hide-box. When piling rocks, be sure that they are stable; if they shift they could injure or kill the lizards. Artificial rock outcroppings may be constructed (see arti-



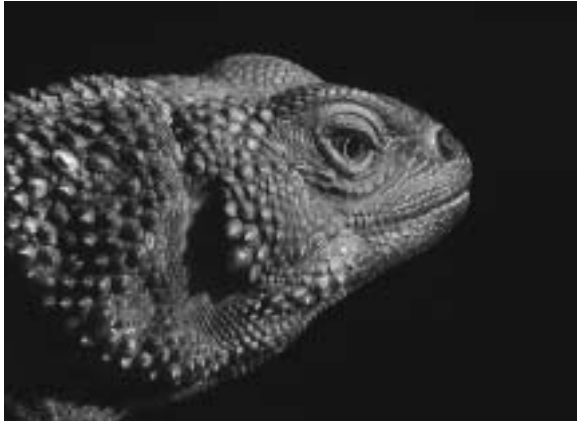
This captive *Sauromalus ater* prefers to bask atop the cinder block structure and sleep in the tightest crevices in the lower block. *Photograph by Carole Saucier.*

cle in IGUANA 11:39–51). These often are more stable and easier to clean than piles of real rocks, and are readily accepted by Chuckwallas. Regardless of whether natural or artificial rocks are used, if multiple specimens are being housed, retreats should be sufficiently abundant so that each lizard has access to a separate area. In addition to rocks, props such as branches or plants can be added to the enclosure. When using live plants, however, keep in mind that Chuckwallas are herbivorous and any plants selected should be resistant to consumption (such as cacti) and non-toxic. Artificial plants with large leaves may be preferable; avoid those with small leaves, which may be ingested and result in intestinal impaction. The effective use of props in a cage will not only improve the appearance of the enclosure, but may well enhance the psychological well-being of its inhabitants, and produce behavior much like that which they exhibit in the wild.

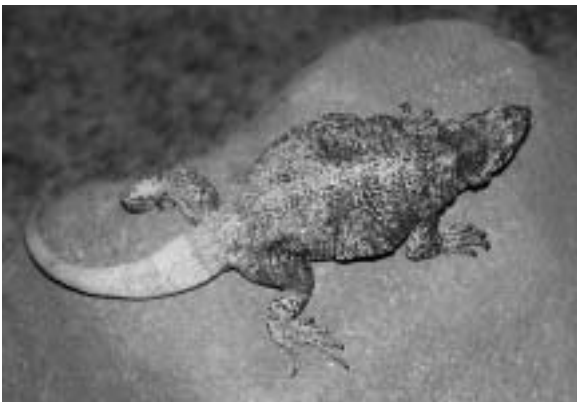
### Selecting an Animal

Although *Sauromalus ater* can be collected with permits across most of its range, this species is of special concern in many areas, and I do not recommend obtaining wild-caught specimens. Fortunately, these lizards are commonly bred in captivity. Captive-bred individuals are ideal, because wild populations are not adversely affected and captive-bred animals should be relatively free of diseases and parasites.

When selecting specimens, choose animals that appear healthy. The base of the tail should be full and rounded. A drawn appearance is indicative of deficient fat stores or improper nutrition. Legs should be solid and muscular. Individuals should be bright-eyed, alert, and attentive to activity around them. When handled, they should not be placid, but rather wiggling around.



A healthy male captive *Sauromalus hispidus*. Note the broad head and the scales at the back of the head that form small spikes, which are most prominent in adult males. Photograph by John Binns.



This female *Sauromalus ater* was recently received by a rescuer in Michigan. Its age and history are unknown. Although this individual is thin, the folds of skin along its sides are normal. Also note the relatively narrow head and that the "spikes" at the back of the head are barely noticeable. Photograph by Carole Saucier.

Juveniles and most adults will usually inflate their torso to some degree when handled, as wild animals would in rock crevices. If these behaviors are not observed, something is probably wrong, and another animal should be selected.

When considering the acquisition of more than one specimen to be housed in a single enclosure, purchase only one male. Males are territorial and will defend their territories to the detriment of other males in the enclosure. Several females can be housed with a single male, as long as the caging provides adequate space for the number of animals. Sexing individuals, however, can be difficult when purchasing very young specimens. Although adult *S. ater* are sexually dimorphic, with males much larger than females, this doesn't help when dealing with hatchlings of the same size. Unfortunately, at this age, no effective way exists for determining the differences between the sexes, and probing is not recommended for hatchlings due to the likelihood of injury. Once lizards reach 6–12 months of age, an accurate

determination of sex is possible. The base of the head in males is wider than that of females. Also, as males mature, the femoral pores, located on the undersides of the thighs, become prominent and can be used to reliably ascertain sex. If animals are too young to use these features and comparing multiple specimens to one another does not help identify the subtle differences, the buyer inevitably will be unsure of establishing the proper sex ratio. If the purchase cannot be delayed until the animals are older, extra males will need to be removed to a separate enclosure before they reach sexual maturity.

### Lighting

Ultraviolet radiation, specifically ultraviolet B (UVB), must be provided via either natural sunlight or UVB-emitting bulbs. Reptiles use UVB to produce vitamin D<sub>3</sub> that, in turn, is used to metabolize calcium (Aucone et al. 2003, Ferguson et al. 2003, Laing and Fraser 1999, Lian et al. 1999). Without vitamin D<sub>3</sub>, bone density can be compromised and this potentially can lead to metabolic bone disease. Vitamin D<sub>3</sub> supplements can be added to the food, but the amount required is not known, so animals can easily be over- or undersupplemented. Adequate lighting is always preferable.

Short of natural sunlight, artificial lights that produce wavelengths in the UVB spectrum are the best means for providing adequate UVB for Chuckwallas in captivity. Chuckwallas can bask naturally to regulate their vitamin D<sub>3</sub> blood levels and body temperatures. Two bulbs in particular have been shown to provide enough UVB for proper growth and maintenance: the Westron Active UV Heat Lamp (Oceanside, New York; Aucone et al. 2003) and the Zoo-Med Repti-Sun 5.0 fluorescent bulb (San Luis Obispo, California; W.H. Gehrmann, pers. comm.). The Active UV Heat Lamp is an incandescent bulb that emits heat as well as UVB. The UVB will penetrate to 36 in, which is ideal in larger enclosures. The Repti-Sun 5.0 is a fluorescent bulb, meaning that additional heat sources will be required. Also, if the Repti-Sun 5.0 is used, lizards must be able to bask within 8 in of the bulb in order to assure adequate UVB exposure. Finally, fluorescent bulbs should be replaced every six months, as UVB emission declines dramatically beyond that time. Regardless of the type of UVB source used, an artificial light cycle should be set to vary seasonally. In the summer, a 16D:8N (day:night) cycle is ideal; in the winter, the cycle should be adjusted to 12D:12N, with appropriate incremental adjustments during fall and spring.

### Temperature and Humidity

Chuckwallas are native to desert regions. In captivity, temperatures should mimic those that they would encounter in their natural habitat. Daytime temperatures should average 80–82 °F throughout the cage. In addition, a heat lamp should provide a basking spot of 110–120 °F during the day. This can be either an Active UV Heat Lamp or an incandescent spot lamp. If an incandescent spot lamp is used, also be sure to provide a fluorescent UVB-emitting bulb (Repti-Sun 5.0). In a large enclosure and if multiple animals are housed together, more than one basking site must be provided. Otherwise, dominant individuals will prevent cagemates from adequately thermoregulating. Temperatures should drop at night. To follow a reasonably natural cycle during



Adult male *Sauromalus ater*, Cataviña, Baja California. Photograph by Brad Hollingsworth.

the summer, nighttime lows should be in the low to mid-70s (°F); in the winter, temperatures can drop to the low to mid-60s (°F). Chuckwallas will “hibernate” during the winter if temperatures are allowed to drop to the low to mid 60s (°F) with daytime temperatures increasing into the 80s (°F) and basking spot(s) removed.

Humidity in natural Chuckwalla habitat is very low. These lizards, however, do not seem to be adversely affected by higher humidity levels. No humidity control should be necessary, even in naturally humid areas. Residents of arid regions obviously need not worry about humidity levels.

#### Diet

Chuckwallas are primarily herbivorous, but may consume live prey at times. A varied diet consisting primarily of dark greens should be provided to captive animals on a daily basis (see also the sidebar on p. 43). Escarole, chicory, dandelions, collards, and turnip and mustard greens can provide an adequate level of nutrition. This diet can be supplemented sparingly with other leafy greens, such as romaine lettuce, as well as fruits like apples, pears, or bananas. When dandelions (or other, but especially yellow flowers) are blooming, Chuckwallas will happily munch on as many of them as you can gather. Just be cautious and make sure that they are collected from areas where pesticides and herbicides have not been applied. Occasional individuals may take crickets, wax worms, mealworms, and even pinkie mice, but these should constitute a very minimal part of the overall diet. Calcium car-

bonate ( $\text{CaCO}_3$ ) should be supplemented to the diet once each week. This is readily available in powdered form and should be sprinkled over the food to help ensure that enough calcium is being provided in the diet. Even with adequate UVB lighting, sufficient dietary calcium is necessary for proper bone growth and maintenance.

A stable water bowl that cannot be overturned should be provided. Water should be replaced daily. As a rule, Chuckwallas get the majority of their water from food, but they will drink occasionally from a bowl. Adequate water is critical, and a bowl will provide assurance that an animal can supplement its water intake as needed.

#### Reproduction

In captivity, reproduction should coincide with natural seasonal variations in temperature. A cooling period (or “hibernation”) during the winter is usually necessary to induce reproductive activity. After emergence in the spring, males will undertake a courtship display consisting of a variety of head bobs and pushups in an effort to induce the females to breed. Following successful mating, females will deposit eggs approximately 30 days later. In the wild, Chuckwallas lay 5–16 eggs per clutch (Stebbins 1985). A nest box containing vermiculite, moist sphagnum, or perlite can be provided, but females also may choose to lay their eggs under a rock in the enclosure. Any digging activity should be closely monitored. Eggs can be artificially incubated in a sealed container of vermiculite mixed with water at a ratio of



*Sauromalus ater*, Isla Tiburón, Sonora. When threatened, Chuckwallas retreat into rocky crevices and fill their lungs with air, expanding the torso and compressing their body into the crack, preventing extraction by potential predators. Photograph by Brad Hollingsworth.

0.75:1. The container should be opened twice each week to allow fresh air to circulate. Eggs should be incubated at 80–82 °F and will hatch about 90 days after laying.

Juveniles can be housed and fed similarly to the adults. Multiple males can usually be maintained together until they are 6–12 months of age. At that point, males must be separated, as aggressive behavior inevitably will increase. If keeping groups of juveniles together, individuals should be weighed weekly to ensure that all animals are gaining weight normally. If an individual is found to be significantly smaller than companions of equal age, too many animals may be in the enclosure, resulting in competition for food and ideal basking spots. Smaller groupings may be necessary and undersized individuals must be maintained separately.

### Conclusion

Chuckwallas are a fascinating species and they can be very rewarding captives. Private collectors appreciate their relatively large size and docile personalities. Parameters for keeping this species are straightforward and, if followed, Chuckwallas can thrive for many years in a captive environment. With captive breeding becoming increasingly more commonplace, healthy individuals are readily available for the home terrarium. However,

as for all reptiles, prospective owners should prepare thoroughly before acquiring animals. Thought must be given to adequate housing, because certain conditions must be met before one can properly care for these unique lizards.

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In addition, the following webpage is quite informative: <http://www.reptilesfaz.com/>