KEEPING AND BREEDING OF PHRYNOCEPHALUS MYSTACEUS IN CAPTIVITY

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Introduction

Phrynocephalus mystaceus, or Secret toad-headed agamas, are a wide ranging desert species comprised of multiple subspecies. The species can be found from Southern Russia to Northern China and west into Afghanistan and other neighboring countries. Adults are typically between 16-20 cm (6-8 in) including the tail. They are a sand specialist species with multiple adaptations for surviving in a sandy and arid environment. Their coloration is primarily tan but may also contain some soft pink and yellow mottling. The tail tips are often black and their ventral region may contain bright orange. Males typically display a more pronounced black spot on their chest as well as pronounced hemipenal bulges when mature. Their feet are elongated and lined with fringe-like scales that make running on and burying in sand fast and efficient. When threatened or ready to rest they are capable of vibrating their body in such a way that they can quickly submerge their bodies in sand. They will often leave their nostrils and eyes above the surface to breathe and ambush prey. Tail flagging is a common behavioral adaptation that terrestrial lizards employ to communicate with conspecifics. Phrynocephalus regularly flag or wave their tail when excited, ready to mate, or to establish territory. It is a striking behavior that makes for an engaging terrarium display. When threatened they can also employ a dramatic defensive display where they open their mouths wide and specialized skin flaps in the corners of the mouth extend creating an impressive gaping posture. While wild *Phrynocephalus mystaceus* are shy, captive bred individuals are extremely bold and have little to no fear of humans and therefore rarely employ this behavior.

The author has found this species to be extremely enjoyable and rewarding to keep and breed. They are very active and bold in the terrarium exhibiting many interesting behaviors throughout the day. While this species is currently rare in herpetoculture they are fairly easy to keep and breed and the author hopes their popularity will increase as more people learn about them.

Keeping

The author keeps his agamas in a fairly simple desert terraria. This is a sand specialist species that is well adapted for running across and burying into sand. They are not prone to climbing. As such, the author employs a simple substrate of “play sand” with only one or two cork bark or fake rock hides in the enclosure. The agamas are never observed climbing on the hides but they do occasionally hide under them. Since the agamas need to completely bury themselves in sand to feel secure a substrate depth of

7-10 cm is provided. No other enclosure furnishings are needed or are utilized by the agamas in the author’s experience.

Phrynocephalus mystaceus are active lizards and should be provided with as much floor area as possible. The author uses 122 cm by 61 cm (48 in x 24 in) terraria. Height is not as important. Larger enclosures would be even better. When smaller enclosures are utilized the agamas may be stressed and damage their noses running into enclosure sides.

The author prefers to keep the adult agamas in male-female pairs. While the author has kept adults in larger groups before there often seems to be a subdominant animal that does not fare as well as the dominant pair. Aggression is not overt in this species so the effects may not be instantly apparent. In the author's experience, no issues present when a single male and single female are kept together long term.

High heat and UV light are important for this species to thrive. For most of the year a hot spot of 38-43 C (100-110 F) is provided using a halogen flood bulb on one side of the enclosure. The ambient temperature of the enclosure can range from 27-32 C (80-90 F) for much of the year. Ultraviolet light is provided using a T5HO fluorescent fixture with a Zoo Med Reptisun 10.0 bulb. Daylight is simulated via a high output LED full spectrum fixture in the 6500 K range. During the Summer months the lights are on for fourteen hours, during the Spring and Autumn twelve hours, and during Winter eight hours.

The enclosure is misted in the morning or evening once or twice a week. The agamas will occasionally lick the water droplets from their mouths or enclosure walls. A water bowl does not seem to be recognized by the animals and the author does not provide one. One side of the enclosure is heavily dampened with water once a week in the Spring and Summer seasons. This is necessary for breeding and likely has a hydrating effect on the lizards.

Phrynocephalus mystaceus are voracious insectivores. Adults are fed live insects three days a week (Monday, Wednesday, and Friday). The author uses as much variety as possible and feeder insects include crickets, mealworms, superworms, roaches, silkworms, bean beetles, and hydei fruit flies. Care must be taken when feeding as this species is prone to obesity. Every feeder insect is dusted in Repashy Calcium Plus supplement. Like with all insectivores, the insect prey should be properly gut loaded with fresh greens, fruits, and vegetables.

Breeding

For consistent breeding success a strong seasonal temperature variation must be provided. In November the author gradually decreases the temperature of the enclosures for several weeks. After several weeks of gradual cooling the author will stop feeding the agamas while leaving the heat bulb on

for one more week. This will allow the lizards to fully digest their last meal of the year. Then, the heat bulb is turned off and the agamas are left in their enclosure at ambient temperatures for another week. Next, the lizards are removed to a hibernaculum for winter brumation/hibernation. The author utilizes an unheated garage that maintains a 10 C (50 F) during the Winter months. A wine cooler or other refrigerator can also be used. The lizards are kept in small well ventilated bins with enough sand to completely bury in. The agamas are left to sleep through the winter for the next eight to twelve weeks. In the Spring, the lizards are returned to their normal terraria. Temperature is gradually increased over the next week and normal feeding and care resumes. Usually the agamas will start to exhibit breeding behavior several weeks after emerging from their winter sleep with the male chasing the female around the enclosure in an attempt to mate. If the female is receptive she will allow him to catch her and mate. If she is not receptive she will run away repeatedly and/or flip over on her back making mating impossible.

Gravid females become obvious as their abdomens swell considerably. It is crucial that the females be provided with an appropriate laying site during this time. This is achieved by heavily wetting the warm side of the terraria. This is done at least once a week when females are obviously gravid. Females will often be waiting for such a “rain” event and usually immediately start digging to deposit their eggs. Care must be taken when digging up eggs for incubation as they are extremely soft shelled and easily damaged. Females can lay between one to five eggs in a clutch with three being the most common clutch size. Three to five clutches can be laid in a season per female. The eggs are removed for incubation to a small container with a perlite substrate. The perlite is mixed with RO (reverse osmosis) water in a 1:1 ratio by weight. Typically 30 grams of perlite and 30 grams of water are used. The eggs are incubated at a constant 29.5 C (85 F). Hatching usually occurs in 40-60 days. The eggs will expand significantly during incubation and babies hatch out quite large relative to adult size.

Neonates can be raised individually or communally under similar conditions as the adults. The only difference is they are fed six days a week as much as they will eat. Growth is relatively slow in the beginning and adult size is typically not achieved for 12-18 months.

Conclusion

Phrynocephalus mystaceus make very enjoyable terrarium subjects due to their bold and active nature. They are hardy animals and can be easily kept by most enthusiasts with some reptile keeping experience. Breeding does require a strong cooling period but if that is provided then breeding is also easily achieved. The author hopes that other herpetoculturists will also attempt to establish this species as they represent an ideal candidate for the home desert terrarium.

Sources

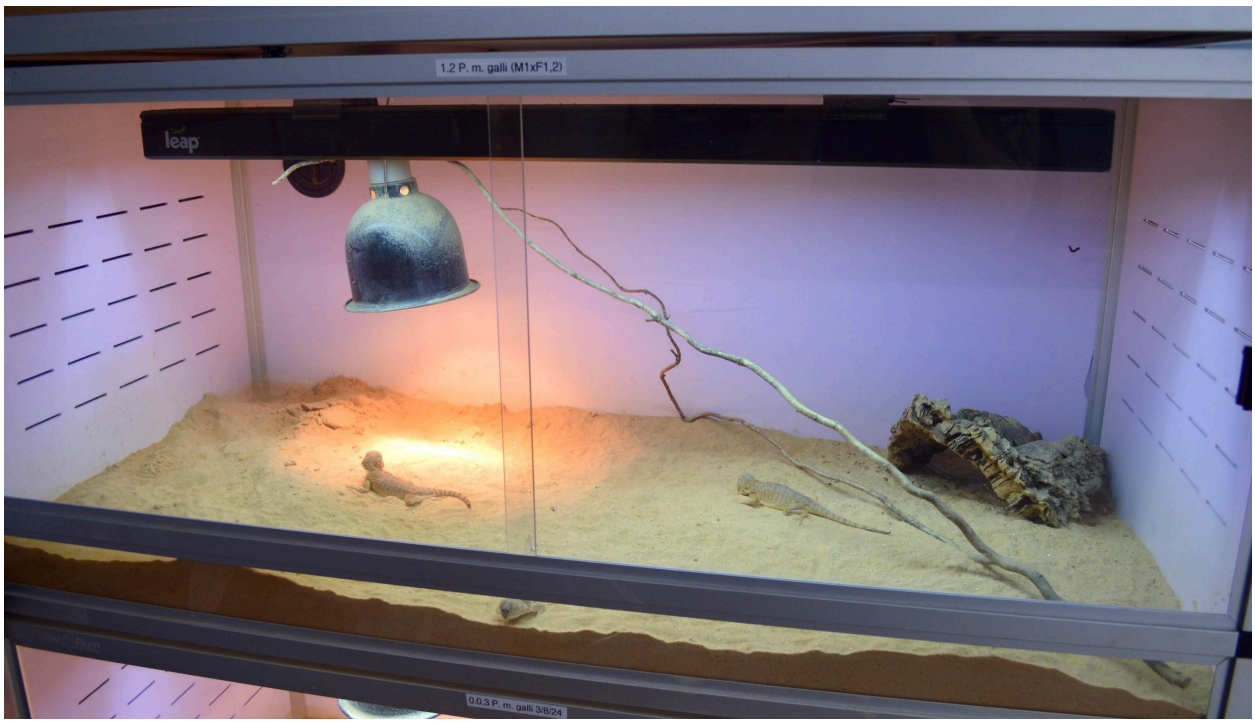
iNaturalist - https://www.inaturalist.org/taxa/31473-Phrynocephalus-mystaceus

Bion - https://bion.com.ua/news_article/toad-headed-agama-care-sheet/

Images

Adult pair - Mail exhibiting tail flagging behavior.

Adult trio - the mouth flaps are visible but not fully extended.


1.2 P. m. galli (M1xF1,2)
leap
0.0.3 P. m. galli 3/8/24


1.1 P. m. galli (M3xF4)
leap
1.2 P. m. galli (M1xF1,2)
0.0.3 P. m. galli 3/8/24

Sand sheltering behavior - eyes and nostrils exposed to breathe and hunt.

Head detail of adult male.

Specialized fringe-scaled back feet for ease of walking on sand.

Intricate and subtly beautiful dorsal coloration perfect for blending into sand.

Recently hatched juveniles

Some of the author's terraria housing breeding pairs.