Ashy Geckos (*Sphaerodactylus elegans elegans*), native to Cuba and Hispaniola, have been introduced in the Florida Keys.

HUSBANDRY

The Reef Geckos of Florida

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Photographs by Phillip Frank except where indicated.

Formerly considered a subfamily, Sphaerodactylinae, of the cosmopolitan lizard family Gekkonidae, these small and unique geckos, confined to the Western Hemisphere, have recently been elevated to familial level as the Sphaerodactylidae, a clade distinct from all other geckos. In addition to *Sphaerodactylus*, other genera in the family include *Aristelliger*, *Coleodactylus*, *Gonatodes*, *Lepidoblepharis*, and *Pseudogonatodes*.

Four species have been recorded as part of the fauna of the United States. However, three and possibly all four of these are thought to have been introduced. Little is known of the status of one species, the Yellow-headed Gecko (*Gonatodes albogularis*), beyond the fact that populations were in apparent decline. Further consideration of this possibly extirpated species is beyond the scope of this paper.

The remaining three species are known collectively as "Reef Geckos," and all are in the genus *Sphaerodactylus*, the Ashy Reef Gecko (*S. elegans*), the Ocellated Reef Gecko (*S. argus argus*), and the Florida Reef Gecko (*S. notatus notatus*), which is considered by some to be the only gecko native to Florida.

The beautiful coloration of the Reef Geckos is often cryptic and their behavior is both bizarre and fascinating. Based on observations in the field, supplemented with information on captive maintenance gleaned from our own experience, we describe the husbandry of the three species known to occur in the Florida Keys.

When compared with most lizards, those in the genus *Sphaerodactylus* are true dwarves. The world's smallest known land vertebrate is *S. ariasae*, found on Beata Island off the coast of Hispaniola. Adults of this species average only 16 mm in snout-vent length (SVL). However, the majority of species are larger, with the "giant" of the genus, *S, torrei* from Cuba and the Bahamas, reaching a SVL of 39 mm. However, their diminutive size should not discourage husbandry of these hardy and engaging geckos. They are easy to accommodate and are surprisingly robust. Also, unlike many other geckos, many sphaerodactyls are

Ashy Geckos prefer moist areas, and can be found in leaf litter and other detritus, wood and rock piles, and under bark.

Reef Geckos (*Sphaerodactylus notatus notatus*) range from extreme southwestern mainland Florida, through the Florida Keys, the Dry Tortugas, Cuba, and the Bahamas. They may be the only geckos native to the United States.

S. BLAIR HEDGES

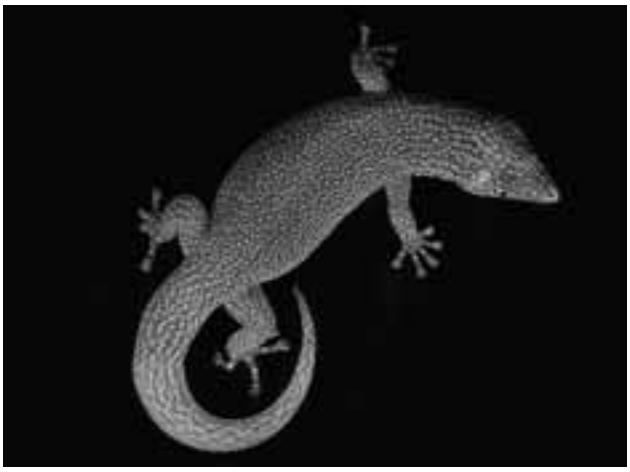
Sphaerodactylus ariasae, from Beata Island off the southern tip of Hispaniola, is the world's smallest amniote (which includes reptiles, birds, and mammals, vertebrates with embryos surrounded by fluid-filled membranes). Adults of this species average only 16 mm in snout-vent length.

active during the day. One major concern in keeping these species in captivity is aggressive behavior among individuals of the same sex. For the potential *Sphaerodactylus* owner, we suggest that only groups of two should be kept together, as even females can become overtly aggressive toward each other, often resulting in the death of the subordinate animal.

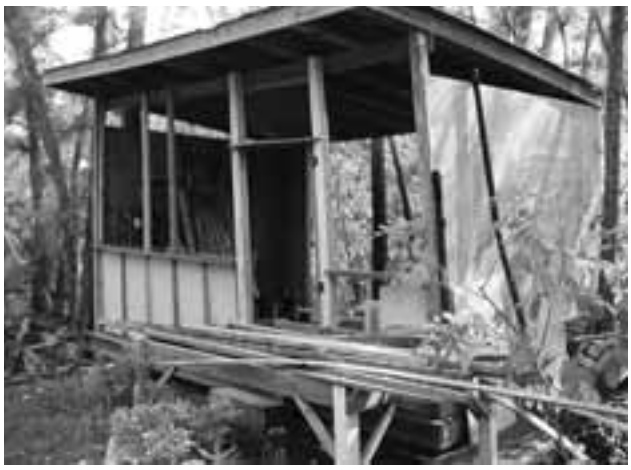
In their native habitats, sphaerodactyls are secretive. They typically are found in leaf litter, under old boards and trash piles, inside walls, and under rocks and logs, in fact, anywhere offering suitable cover, food, and security from predators. They can occur communally in high population densities, and communal egg laying has been observed. On some of the Florida Keys, all three species occur in sympatry.

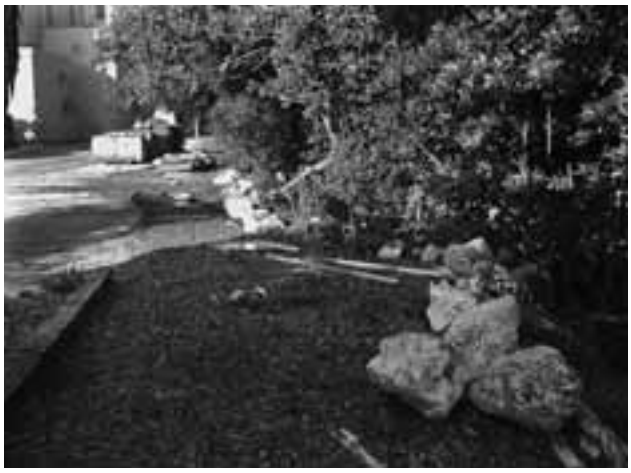
Ashy Geckos
(*Sphaerodactylus elegans elegans*)

The Ashy Reef Gecko was introduced into Florida. The species is native to Cuba and Hispaniola, with the nominate subspecies (that in Florida) endemic to Cuba. This is the largest of the three species, with a maximum SVL to 39 mm. Ground color varies from golden tan to dark rusty brown in adults. The entire dorsum is covered by tiny whitish-cream to yellow spots, conjoining on the head and tail to form a worm-like pattern. Males and females both exhibit similar patterns, but sexing can be accomplished by visual inspection of adults. Males generally have well-developed preanal pores and hemipenial bulges. Also, as with most sphaerodactyls, males exhibit a shiny, reflective patch of scales ("escutcheon patch") just anterior to the vent where the two rows of preanal pores meet. By holding an animal in a clear glass container and examining the ventral area, individuals can be sexed without being harmed (or the eyes of the keeper being unduly strained).



Ground color on the Ashy Gecko varies from golden tan to dark rusty brown in adults. The entire dorsum is covered by tiny whitish-cream to yellow spots.





Sphaerodactyls are secretive. They typically are found in leaf litter, under old boards and trash piles, inside walls, and under rocks and logs, in fact, anywhere offering suitable cover, food, and security from predators. In the Florida Keys, they often are associated with humans and their debris.

Hatchlings and juveniles are strikingly colored. Interspersed black and yellowish-tan bands on a purplish-gray head and a green body with a crimson tail and red legs make them one of the most beautiful geckos. As they grow, the colors diminish, with the banding fading into the adult pattern in just a few short months.

These shy animals often are found near human habitation. They are diurnal and crepuscular. They prefer moist areas, and can be found in leaf litter and other detritus, wood and rock piles, and under bark. Although predominately terrestrial, they are the most arboreal of the group and can be observed in search of food on fences, and high in trees under bark or on walls near lights at night.

This is a hardy and adaptable species. A standard 2.5-gallon aquarium is suitable for a pair of these animals. Keeping this species in larger groups is not recommended. The cage should be furnished with a 2-inch substrate composed of equal parts topsoil and sand. Cover in the form of overturned plant crocks, bark, and rocks should be provided. Loose, dry leaves offer additional security. Live plants are useful for cover and to help maintain proper humidity levels. Branches for climbing may be beneficial, and, if the back wall of the terrarium is covered with pieces of bark or similar material, this will increase the surface area of the terrarium and provide additional hiding places by more accurately simulating natural habitat.

A water dish will rarely be used. The animals get plenty of water from daily sprayings of half of the terrarium, which should keep half of the terrarium substrate moist — but not wet. Temperatures in the terrarium should range from 24–30 °C

These shy animals (*Sphaerodactylus elegans*) often are found near or on human habitation.

Female Ashy Geckos usually deposit eggs in a concealed area directly on the substrate, in crevices, or under other objects.

(75–85 °F). A small, slightly warmer area should be provided to allow for proper thermoregulation, which helps encourage reproduction. Lighting for the enclosure is not necessary; enough indirect light to allow the animals to differentiate the photoperiod is sufficient. If lighting is desirable, fluorescents and low-wattage spots should be considered. Be careful to avoid overheating a small enclosure.

As insectivores, geckos are best fed appropriately sized prey items such as small crickets, roaches, wax worms, fruit flies, isopods, house flies, and field sweepings. Prey items should be dusted with calcium and/or vitamin supplements at every feeding. Feed every other day, although breeding and gravid females may require daily feedings to maintain proper body weight.

Breeding this species is not problematic. Instead of spraying once a day, regularly spray twice a day for a period of up to several weeks to ensure that at least half of the substrate stays moist. This is an important factor in initiating breeding activity. Raising the average temperature in the terrarium also may help, as this further increases the lizards' activity levels.

After fertilization, a female will lay within 18–30 days. She can produce a single hard-shelled oblong egg every two weeks for over two months after the initial pairing. Gravid females carry one very large egg easily seen through the ventral skin. Eggs are usually deposited in a concealed area directly on the substrate, in crevices, or under other objects. They frequently deposit their eggs in the transition zone between the wet and dry areas in the terrarium. *In situ* incubation is possible, and young can be reared with the parents until sexual maturity. At that time the males will begin engaging in aggressive behavior toward one another. We prefer to remove the eggs for incubation on a dry substrate in a bottle cap or similar container placed in a cup filled with saturated perlite or vermiculite. The ambient humidity will provide all the moisture the eggs require, but direct contact with moisture can be fatal to the embryo. Fruit-fly mesh lids are applied to prevent the tiny hatchlings from escaping while allowing proper ventilation. Suitable temperatures for incubation are in the 25–30 °C (78–85 °F) range. The brightly colored young hatch in 50–85 days.

Young can be reared in jars, small terraria, or our preferred method, in 32-ounce deli cups outfitted with a fruit fly mesh lid. An inch or so of soil is placed in the bottom of the cup, with egg cartons torn and crumpled and set into stacks inside the cup to provide cover and access to both moist and dry areas. Provide similar care as for the adults; however, young animals should be fed every day, with supplements used at every feeding. By 5–8 months of age, the young have lost their striking juvenile colors, and the males are now sexually identifiable. We suggest holding animals back from breeding until at least one year of age.

At 5–8 months of age, young Ashy Geckos lose their striking juvenile colors (left), but bands may remain apparent for a little longer.

Ocellated Geckos
(*Sphaerodactylus argus argus*)

This species has been introduced into the Florida Keys and is native to Cuba and Jamaica. Ocellated Geckos are a rare find in the Florida Keys, found only on two islands and just recently rediscovered after a 26-year hiatus between sightings! These diminutive geckos have a SVL to 33 mm. Ground color ranges from all shades of brown to olive, and, as the name suggests, tiny white ocelli occur above the shoulders and nape and on the head, collectively forming four broken stripes that start at the nose and fade about mid-body. The body has many single-scaled white spots. Juveniles have a pattern similar to that of adults, but with an orange wash, which may persist into adulthood, predominately on the tail. Adult patterning appears at about four months of age. Mature males exhibit clearly defined preanal pores and hemipenial bulges.

This is easily the most cryptic of our resident sphaerodactyls. These geckos are found in leaf litter and debris around buildings. They are more moisture-dependant than the other Florida Reef Geckos, and prefer habitat with ready access to freshwater, such as gardens and mulched areas near buildings.

A terrarium designed for these animals should incorporate all of the aspects listed for *S. elegans elegans*, but particular attention to adequate cover must be addressed. A thick substrate consisting of a 50–70% sand and black topsoil mixture is a preferred choice. Leaf litter cover is a must. Use dry, sanitized maple or oak leaves, and cover a majority of the cage floor, piling the leaves against the cage walls and objects to increase the number of hiding places. Provision of a background of rock when dealing with these species seems beneficial, although they are primarily terrestrial. A structural focal point, such as a cork flat or overturned plant crock, is a necessity as well. The terrarium should be sprayed daily, enough to keep half of the floor substrate moist — but not wet. Suitable temperature values are 27–30 °C (80–85 °F), with a small "hot spot" for thermoregulation. A temperature drop at night can be tolerated if it is less than 6 °C (~10 °F).

These insectivorous lizards should be fed appropriately sized crickets, roaches, isopods, fire brats, wax worms, and fruit flies every other day. Breeding or laying females should be offered food daily, as should hatchlings. Dust prey items at every feeding with vitamin and/or mineral supplement.

Slightly raising ambient temperatures and increasing sprayings to twice a day is the tried-and-true method for inducing breeding. Be careful not to over-saturate the terrarium substrate. The second spraying of the day is needed only to spike the relative humidity.

Eggs are incubated at temperatures of 25–30 °C (78–85 °F), with humidity levels of 60–90% appearing adequate. Young will hatch in 40–70 days and thrive under similar conditions as the parents. House them in small terraria, jars, or large deli cups. Feed daily with supplement-dusted prey items.

Reef Geckos
(*Sphaerodactylus notatus notatus*)

Reef Geckos range from extreme southwestern mainland Florida, through the Florida Keys, north along the southeastern Florida coast to Fort Lauderdale, and across the Dry Tortugas, Cuba, and the Bahamas. These small geckos attain a maximum SVL of 34 mm. Their most striking feature is the strongly keeled, overlapping scales, which are reminiscent of fish scales. The colors are deep earth tones, with the ground color generally a rich shade of brown. Body and tail are covered in dark spots. This species exhibits sexual dimorphism, with females having three broad

Upward-directed eyes, clearly evident in this Ocellated Gecko (*Sphaerodactylus argus argus*), facilitate detection of predators from within leaf litter. Ocellated Geckos are native to Cuba and Jamaica but have become established in the Florida Keys.

Leaf-litter cover is a must for housing sphaerodactyls such as this Ocellated Gecko. Use dry, sanitized maple or oak leaves to cover a majority of the cage floor.

Like most sphaerodactyls, Ocellated Geckos produce a single oblong egg.

stripes on the head and a pair of white "eye" spots on the shoulders. Males are essentially spotted all over, including the head. They possess hemipenial bulges and preanal pores.

Reef Geckos are leaf-litter dwellers by preference, but also can be found in rock piles and under debris around human habitation. For captive maintenance, a 2.5-gallon terrarium is adequate for a pair of this species. A thick substrate should consist of black topsoil and sand in a 1:1 ratio. The terrarium should be planted with live plants, such as Pothos, Philodendron, or any other good ground cover. An overturned, broken crock or piece of cork bark should be provided for cover. Scatter dried, sanitized maple or oak leaves over a majority of the terrarium floor. Indirect lighting is sufficient, if proper temperatures can be maintained. The gradient inside the terrarium should be 24–30 °C (75–85 °F) during the day, with a drop of 2–3 °C (~5–6 °F) at night. Animals should be misted at least once a day, with more than 50% of the terrarium floor kept moist — but not wet. A water dish is unnecessary as sphaerodactyls are strictly droplet drinkers, although it might serve to maintain proper humidity.

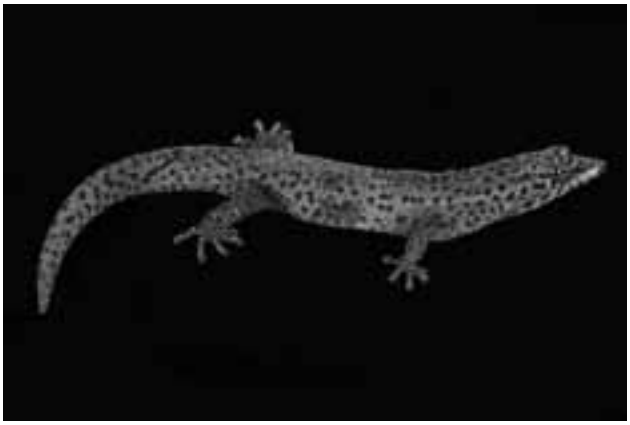
Reef Geckos are insectivorous. Feed appropriately sized fruit flies, crickets, roaches, wax worms, fire brats, and isopods every other day. Breeding or laying females and hatchlings should be offered food daily. Dust with a vitamin and/or mineral supplement at every feeding.

As with the other sphaerodactyls, reproduction can be initiated with a slight temperature increase and by increasing the number of sprayings per day. Be careful not to soak the substrate too much; if moisture levels are adequate, spray only enough to raise the relative humidity.

A female will produce a single oblong egg about 14–21 days after impregnation, and will continue to produce 2–4 more every 14–28 days. Eggs are generally laid directly on the surface, in a crack or fissure, or in curled leaves. Be extremely careful when searching for them. Eggs can be incubated *in situ*, but we recommend removal for incubation. Incubation is the same as for *S. elegans*, except the young hatch in 45–60 days.

Newly hatched *S. notatus* are extremely large, often 25 mm in total length. House them separately in deli cups or small terraria under conditions like those of the adults. They begin to lose juvenile coloration at 3–4 months of age, with males beginning to develop noticeable preanal pores and hemipenial bulges at 5 months. They are sexually mature by 8–10 months under captive conditions, but we suggest holding animals back until 12 months of age for breeding purposes.

Reef Geckos (*Sphaerodactylus notatus notatus*) exhibit sexual dimorphism, with females (right) having three broad stripes on the head and a pair of white "eye" spots on the shoulders. Males (left) are essentially spotted all over, including the head.



Reef Geckos are leaf-litter dwellers by preference, and dried, sanitized maple or oak leaves should cover the majority of the terrarium floor.

Summary

The small size and undemanding nature of these animals, coupled with an inherent hardiness, wide array of behaviors, and attractive appearance make them worthy of attention. Whether you're a serious herpetoculturist or an inexperienced hobbyist, they are well suited for those with limited time and space availability, and are very economical as well. They require very little lighting or heating. The only regular investment for keeping these animals healthy is a reliable supply of small insects. Additionally, they are prolific under captive conditions, making them a fun and educational terrarium subject.

Furthermore, the frustration of acquiring these animals is coming to an end. Groups of dedicated hobbyists and researchers are working to ensure a solid understanding of husbandry needs and an ability to provide a captive-bred supply of these animals. As more hobbyists learn about their husbandry and ease of care, Reef Geckos will soon become commonly available species.

Acknowledgments

Special thanks to Yuri Huta and Jay Sommers for breeding information and photographs.

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