

**KEY TO THE**  
**LIZARDS**  
**of the**  
**MARIANAS**

## A CHECKLIST AND KEY TO THE AMPHIBIANS AND REPTILES OF THE MARIANAS.

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Notes on Using the Key.--Our aim has been to reduce the number of technical characteristics and subtle distinctions that must be made in order to identify individual species whenever possible. However, in some cases and especially when distinguishing species which are superficially similar, the most definitive characteristics involve counting or noting the relative size of the scales on specific parts of the body. The user of these keys should not be intimidated by this feature; often an identification can be made using other characteristics but additional definitive characters should be used whenever any doubt exists about the identification suggested. The undersides of the digits (toes or fingers) of all lizards are covered by scales called subdigital lamellae. The toes of geckos are usually but not always widened to increase the surface area of the toe in contact with the substrate. The subdigital lamellae of geckos are typically in one of three basic patterns: undivided with the individual lamellae extending uninterrupted from one side of the digit to the other; divided with a medial groove or suture dividing the subdigital lamellae into pairs of scales; and distally divided where the lamellae near the tip of the digit are divided, but not divided basally. Lamellae are usually counted on the longest digit (4th digit when 5 are present), and from the tip of the digit to the base but only along one side of the digit when the scales are paired. Thus the characteristic is the number of lamellae or pairs of lamellae extending along the undersurface of the digit. Some lizards have only 4 fingers or only 4 toes, instead of the usual condition of 5 digits on the hands and feet. This characteristic should be checked carefully.

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1. A. Lacks a tail; lacks scales on the body; typically moves by hopping rather than running.---Frogs and toads (2).  
B. Has a tail; has scales on head and body; moves by running or crawling.---Reptiles (3).
2. A. Has conspicuous tubercles, warts, and glands on surface of skin; head and body up to 250 mm in length; capable of secreting milky poison when roughly handled; calls with a loud rolling rattle-like trill from flooded areas.---Marine Toad, Bufo marinus.  
B. Has smooth skin; head and body to 40 mm in length; tips of toes expanded into rounded disks; calls with a high pitched insect-like trill from shrubs and grasses near swampy areas or flooded areas.---Southern Tree Frog, Litoria fallax.
3. A. Has a shell covering from which head, limbs and tail protrude; usually found in association with water or coast.---Turtles (4).  
B. Lacks a shell; body covered with scales.---Snakes and Lizards (6).
4. A. A sea turtle with seven prominent ridges along the length of the shell; surface of shell covered with rubbery skin, lacking hard plates, tip of upper jaw with prominent hook defined by notch in cutting surface of upper jaw; head lacking conspicuous scales; coloration of body and shell dark with light rounded spots.---Leatherback Turtle, Dermochelys coriacea.  
B. A sea turtle without prominent ridges on shell; with hard scutes on shell and distinct scales on head; coloration of head and limbs often consisting of dark scales with bright outlines; shell with radiating light markings which are often elongated and joined.---Hardbacked Sea Turtles, Family Cheloniidae (5).



5. A. Head relatively large; with serrated (toothlike) biting surfaces on lower jaw; two pairs of large scales on snout in front area between the eyes; posterior edge of shell relatively smooth without prominent notches between adjacent scutes; belly of hatchlings light in color.---Green Sea Turtle, Chelonia mydas.
- B. Head relatively narrow; snout and upper jaw relatively elongated forming birdlike beak; without serrated biting surfaces on lower jaw; single pair of scales on snout in front of eyes; posterior margin of shell relatively jagged due to notches between adjacent scutes; belly of hatchling dark in color.---Hawksbill Turtle, Eretmochelys imbricata.
6. A. Lacks legs, body elongate and covered with scales; tail not easily broken.---Snakes (7).
- B. Has legs, body and tail short or moderately elongate; tail usually easily broken.---Lizards (8).
7. A. Has eyes clearly visible, size .4-2.6 m, body and head light to dark brown with yellow undersides; head wider than neck and adjacent body; readily bites.---Brown Tree Snake, Boiga irregularis.
- B. Has tiny eyes visible only as black dots beneath skin; small size to 150 mm; body and head purplish brown to black; head not markedly wider than neck and rest of body; does not bite even when handled roughly.---Blind or Worm Snake, Rhamphotyphlops braminus.
8. A. Large body size, up to 600 mm excluding tail which is nearly as long; neck long and flexible; head sharply tapering anteriorly with elongate snout; tongue long, protrusible, forked on tip; coloration black sometimes with greenish tint, and numerous yellow or cream spots; tail not easily broken.---Monitor Lizard or Guana, Varanus indicus.



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- B. Small body size, less than 120 mm excluding tail; neck not nearly as long or flexible as in Monitor Lizard; tongue may be protrusile, but not as long or as distinctly forked; tail easily broken.---Other lizards (9).
9. A. Lizards normally active only during daylight; eyes normally with eyelids; round pupils visible as black dots in center of eye; coloration often unicolor or striped with brightly colored tail; most with scales on head large and platelike; scales on body usually smooth, hard, large enough to overlap each other.---American Chameleon and Skinks (10).
- B. Lizards normally active only during twilight and night; lack eyelids; pupil of eye elongate vertically, scales on head granular, or with irregular border or scalloped border, not larger than scales on body; skin soft, velvety.---Geckos (18).
10. A. Has wide scales on undersides of toes and fingers; scales small, dull, soft; can change color from green to brownish black; males have enlarged reddish retractible fan located on midline of throat; scales on body small.---American Anole or Chameleon, Anolis carolinensis.
- B. Lacks wide scales on toes and fingers; scales shiney, smooth, relatively hard and platelike; lacks fan on throat; can not change color rapidly, coloration often unicolor or striped.---Skinks (11).
11. A. A large skink (to 120 mm body length) with bright green scales edged with black as adult; young are lighter green; extremely sharp claws.---Green Tree Skink, Lamprolepis smaragdina.
- B. Smaller skink; coloration brown, tannish bronze, often striped, sometimes with a bright blue tail.---Other skinks (12).
12. A. Has only 4 fingers on hand; coloration brown often with slight greenish tint

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dorsally but lacking prominent markings; undersides grey-white often with slight orangish tint; medium size (up to 70 mm); no stripes on head or body.---Curious Brown Skink, Carlia sp. fusca group.

B. Has 5 fingers on hand; coloration often with trace of stripes on head or head and body.---Other skinks (13).

13. A. Has relatively narrow, flattened body; lacks movable eyelids (eyelids are clear and fused over eye so eye always appears open); body brownish with wide bronze stripe in middle of back; lateral body black with numerous grey markings and spots; two rows of scales along middle of back wider than adjacent scales; a black spot in the middle of the head behind the eyes.---Snake-eyed Skink, Cryptoblepharus poecilopleurus.

B. Has movable eyelids; body less flattened; scales on midline of back not markedly wider than adjacent scales.---Other skinks (14).

14. A. Has a yellow spot on top of head behind eyes; may have a narrower yellow stripe extending from spot onto body; 17-25 lamellae under the 4th toe; vertical markings on the lip (labial) scales; chin and underside of tail bluish green.---Moth Skink, Lipinia noctua.

B. No yellow spot visible on top of head; if yellow stripe present on midbody, stripe not widened on head to form spot; 30 or more lamellae under 4th toe.---Other skinks belonging to genus Emoia (15).

15. A. Small in size, head and body to 55 mm in length; body brown or black, usually with 3 cream or yellow narrow strips extending from snout onto body where they fade; stripes may be absent in large adults; females and juveniles with bright blue tail; 36 or fewer scales around midbody.---Striped Emoia (16).

B. Larger, head and body to 95 mm; lacks 3 narrow stripes on head and body; lacks blue tail; 34 or more scales around midbody.---Other Emoia (17).

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16. A. Scales on underside of toes tiny and difficult to discern or count without magnification; more than 50 lamellae on 4th toe; stripes not fading in adults; stripes may be slightly whiter and slightly wider than in following species.---Azure-tailed Skink, Emoia cyanura.
- B. Scales on underside of toes larger, discernible without magnification; 31-34 lamellae under 4th toe; stripes often faded in adults producing unicolor brown head and body with trace of stripes occasionally still visible on head.---Blue-tailed Skink, Emoia caeruleocauda.
17. A. Dorsal body metallic gray, green, or black with tan or brown flecks that tend to form transverse markings; underside of body white or greenish white; sides of body black with light flecks; 38 or more scales around the midbody; length of the interparietal (small unpaired scale between the largest scales on the posterior half of the head) is 1.5 - 2.0 times the basal width.---Tidepool Skink, Emoia atrocostata.
- B. Body plain brown or tan with black sides ornamented with tiny white squares along the dorsolateral and ventrolateral margins of the black coloration on the sides; largest individuals tend to appear unicolor but can retain traces of black and white flecks in dorsolateral region; the underside of the body may be bright orange; length of interparietal scale less than 1.5 times the basal width of the scale.---Slevin's Skink, Emoia slevini.
18. A. No enlarged toe pads (widest part of toe at base, not toward tip); about 18-20 transverse rows of raised enlarged tubercular scales running along sides and back; coloration consisting of blotches of dark brown, light brown, and tan often highlighted with white that would match leaf litter.---Rock Gecko, Nactus pelagicus.
- B. Enlarged toe pads; lacking enlarged and raised scales in transverse rows on back.---Other Geckos (19).



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19. A. Small gecko, tan or pinkish brown with 5-8 darker brown or black wavy transverse markings (chevrons) on back between fore- and hindlimbs; a pair of black spots at base of tail; usually with pair of white bodies visible in neck region; small, maximum size 45 mm.---Mourning Gecko, Lepidodactylus lugubris.  
B. Geckos lacking chevrons on back and tail.---Other Geckos (20).
20. A. Large gecko (to 70 mm) with innermost digits reduced on hands and feet in size so that only 4 toes are conspicuous; inner finger tiny, lacking a claw; tail flattened with angular fringed edge of scales running along sides of tail; bases of toes with webbing; the widened lamellae under toes are divided (=paired) near the tip of the toe but entire closer to palms of hands and feet; belly may have few to many black flecks.--Micronesian gecko, Perochirus ateles.  
B. Geckos with five well developed digits on all limbs; belly uniform in color.---Other Geckos (21)
21. A. Medium gecko (to 60 mm) with 7-10 large scales along each side of the undersides of toes and fingers; individual scales under toes visible without magnification, in part due to dark borders on each scale; coloration uniform light beige or grey or if darker markings present they are longitudinally arranged along the body axis; tail covered with two sizes of scales, the largest arranged in rings of weak spines.---House Gecko, Hemidactylus frenatus.  
B. Geckos with lamellae on underside of toepad that are difficult to discern from one another or count without magnification; tails without rings of enlarged spine-like scales; predominant color pattern not consisting of blotches arranged in lines along body.---Genus Gehyra (22).
22. A. Medium gecko (to 55 mm?) with the scales on the undersides of the toepad paired (ie. two scales span the width of the toe); 8-10 enlarged scales under longest toe; color

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uniform or more often light grey with rounded charcoal grey spots over entire head and body; skin exceedingly fragile, often torn when captured or handled; enlarged scales on the underside of an unregenerated tail.---Mutilating gecko, Gehyra mutilata.

B. Largest gecko in the Marianas Islands (to 95 mm) with scales on the undersides of the toepad unpaired (ie. each scale spans the width of the toepad), 11-18 scales along each side of longest toe; lacking enlarged scales on the underside of unregenerated tail, although such scales may be present on regenerated tails; tail relatively round, no angular edge on side of tail.---Island gecko, Gehyra oceanica.

GECKOS

Family Gekkonidae

The geckos comprise a widespread and successful group of lizards especially numerous in tropical regions of the world. They differ from all other lizards in the Marianas in having a relatively fine skin with a velvety texture covering the body and lacking enlarged platelike scales on the head and body. They have well developed eyes with vertically elongated pupils; all species in the Marianas are nocturnal or predominantly active at twilight; they may be active in the daytime but primarily inside buildings, in dense shade, or other subdued lighting. Several of the geckos in the Marianas are widespread species dispersed on islands over a wide area of the Pacific Ocean. Geckos typically lay two eggs with hard calcareous shells; the durability of the eggs and their resistance to dessication may be an important factor in allowing geckos to colonize new islands when the eggs are hidden in logs and in vegetation that may be transported by ocean currents, winds, etc. Such eggs probably facilitate dispersal by ocean currents and incidental transport by both early and modern movements of humans. Some question exists as to which of the geckos may have arrived with human traffic to the Marianas region, but all species known at present show signs of having been present for long periods of time (centuries if not thousands of years). The Micronesian Gecko is a member of a group of lizards confined to the Western Pacific region (Micronesia, Marianas, and Palau), but all of the other geckos belong to genera with much wider geographic distributions.



Gehyra mutilata - Mutilating Gecko

This gecko is one of the most adaptable of the geckos as evidenced by its occurrence in a wide variety of habitats, including in and on buildings. It is commonly found in forested areas in rotten trunks, under bark, and in termite nests. The eggs of this species may be found in any nook or cavity but are especially obvious in cavities under the bark of standing dead tree trunks where many females may nest in the same site and shells from previously hatched eggs also accumulate. The typical clutch consists of 2 eggs, but unlike most geckos, this species sometimes deposits 3 eggs. Its stocky, more rotund body form, slightly flattened tail, and spotted coloration help to distinguish it from other geckos, but in its unicolor coloration it is easily confused with the House Gecko and the Island Gecko. It differs from the latter in lacking the rings of enlarged scales on the tail; and from the latter in having paired scales on the undersides of the toes and fingers. Males have 32-39 enlarged pores anterior to their vents. The Mutilating Gecko is known from Cocos, Guam, Rota, Tinian, Saipan, Srigan, Guguan, Alamagan, Pagan, and Agrihan. It is now uncommon in many areas of Guam, but may be locally abundant elsewhere on the island.

Gehyra oceanica - Island Gecko

This gecko can be locally quite abundant, especially on concrete structures, limestone cliffs, and in Pandanus, palms, and cicads. It is often found in association with the Mutilating Gecko, but may prey on House Geckos and Mourning Geckos sufficiently often to exclude them from living in close proximity to the Island Gecko. Adults of this species are conspicuous and only likely to be confused with the Micronesian Gecko (Perochirus) which differs in having a markedly flattened tail (most evident if the tail is not regenerated), a shorter and less flattened head, and the innermost digit reduced in size resulting in the appearance of only four digits on the hand. The Island Gecko has elongated scales behind the scale on the tip of the chin which differ markedly from the rounded ones of the Micronesian

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Gecko. The Island Gecko differs from the House Gecko (Hemidactylus) in having smaller, more numerous scales on the underside of the digits that are not highlighted with dark coloration, and in lacking the rings of spines on the tail. Males have 26-42 enlarged pores anterior to the vent. On Guam this gecko is now rare and virtually extinct, even though it was locally abundant as recently as 1985. It is usually common wherever it occurs: Cocos, Guam, Rota, Tinian, Saipan, Guguan, Alamagan, and Asuncion.

### Hemidactylus frenatus - House Gecko

This gecko is extremely successful around man and is a common inhabitant of houses and urban areas in general. It is tolerant of sunlight as evidenced by its occurrence on wooden fence posts in open pasture situations and its occasional discovery in shade during daylight hours. Although primarily feeding on insects and other arthropods, House Geckos probably include the Mourning Gecko in their diet when ever possible. Both occur in similar situations, but the distribution of the Mourning Gecko may be influenced by the presence of the House Gecko. This is the only gecko with enlarged spine-like scales arranged in rings on the tail although these scales are difficult to see in juveniles. This species is often heard, each call lasting 2-3 seconds and usually consisting of 7-8 chirps. It may also give a short, soft trill. It frequently carries tiny red parasitic mites on the toes near the claws. Males have 20-40 pores anterior to the vent. On Guam it is now common in forested areas, where it has replaced the native gecko species. The House Gecko is known from Cocos, Guam, Rota, Tinian, Saipan, Alamagan, Pagan, and Agrihan.

### Lepidodactylus lugubris - Mourning Gecko

This gecko is widespread in natural habitats and in close association with humans. It is an all female species. The black bar running along each side of the head from the snout through the eye and onto the neck are distinctive for this species. The wavy chevron



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markings vary in intensity, but the pair of black spots or blotches on the base of the tail persist in nearly all color phases. The tail is slightly flattened and has a distinct angular edge along the side of the tail. Only 2 other geckos have flattened tails. The Mourning Gecko differs from the Micronesian Gecko in having 5 digits on all limbs and from the Mutilating Gecko in having chevrons instead of rounded spots. The Mourning Gecko often calls with sharp "chiks" that may be given singly or in a series of up to ten notes. The species is common in all habitats that furnish cover from direct sunlight, but is often active during the day in reduced light inside houses and at twilight. Its small size allows it to occur on leaves, small plants, and the tips of twigs. Females are capable of reproducing even though no males occur. Any adult female can establish a population, an attribute that make this species a good colonizer of small patches of habitat. This lizard may have benefitted from the disturbances of Guam's ecology by the Brown Tree Snake; by reducing the birds and largest lizards most likely to prey on the Mourning Gecko, the snake may have contributed to the dispersal and success of the gecko in habitats previously unavailable to it.

It has been reported from Cocos, Guam, Rota, Tinian, Saipan, Guguan, Alamagan, Pagan, Agrihan, and Asuncion.

### Nactus pelagicus - Rock Gecko

This attractively patterned gecko may be the least tolerant of man. It is alert and actively runs on the ground when closely approached at night. It frequently will stop and depend upon its coloration being cryptic against a background of ground litter, but if further threatened rapidly takes refuge in rock crevices and holes. It is occasionally found hiding under objects on the ground during the day, but at night it found out foraging on the ground and on rough rock substrates. This species is distinguished from all other geckos by its lacking widened digital pads on the hands and feet, its slender tail, rounded in cross-section, and its conspicuous coloration of dark transverse markings often highlighted with





Hoplodactylus  
oceanica  
Island gecko



Gmutilata  
Mutilating gecko



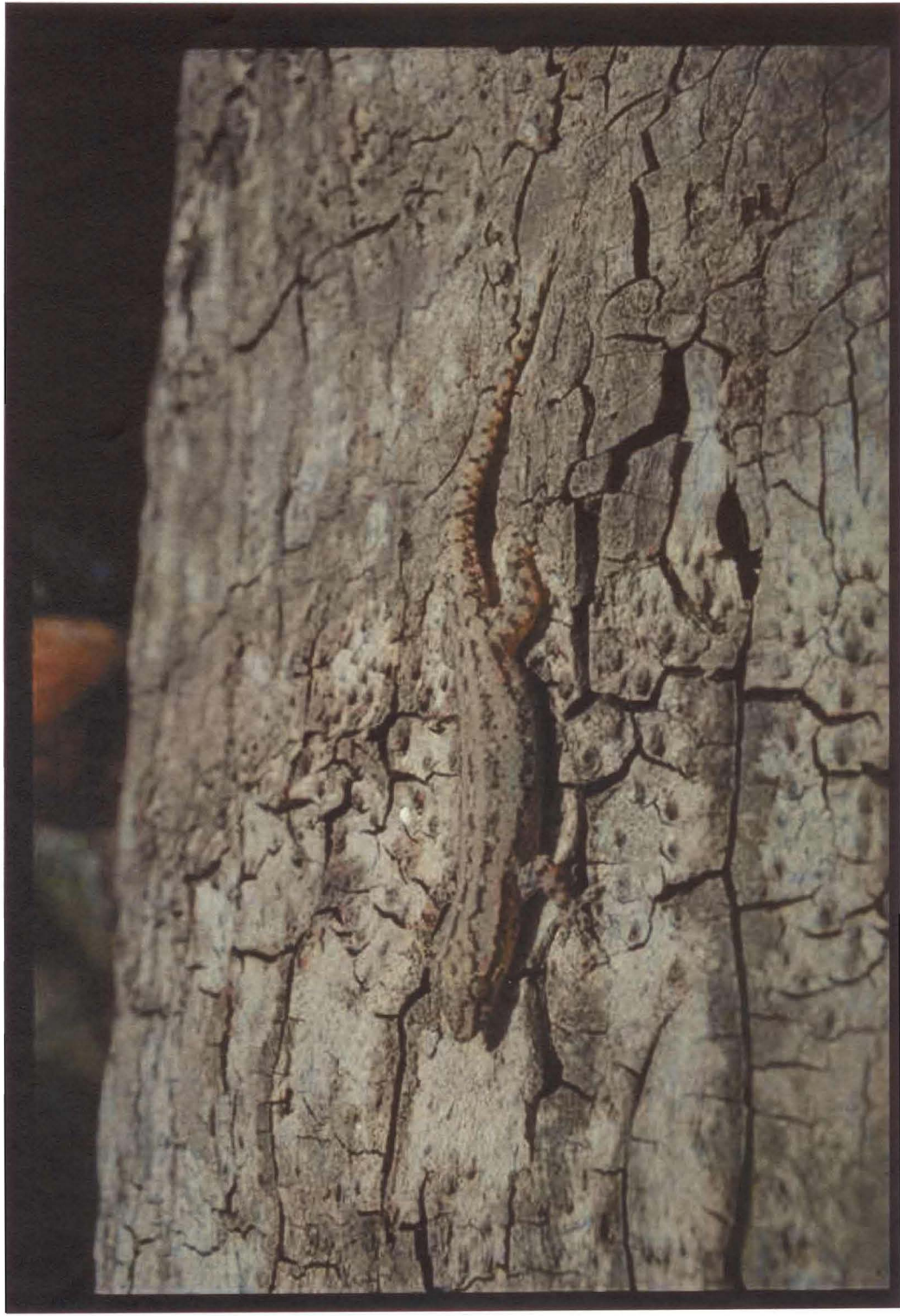


Pateles  
Micronesian Gecko





Npelagicus  
Rock gecko



Hfrenatus  
House gecko





Hfrenatus  
House gecko





Llugubris  
Morning gecko

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light countershading. This is an all female species; no males are known from the Marianas. It has been reported from Guam, Rota, and Tinian, but probably has gone undetected on other islands due to its unusual habitat and habits. It is now rare or absent from Guam, perhaps due to predation by the introduced Brown Tree Snake and the Musk Shrew (Suncus murinus).

### Perochirus ateles - Micronesian Gecko

This relatively large gecko may be primarily associated with large trees. One specimen was observed on a primary branch of a large Barringtonia (Fish Poison tree) in shade during daylight hours. It is the only gecko in the Marianas that has a conspicuously reduced toe and finger; the innermost lacks a claw and is partially fused with the adjacent finger. The toes have webbing and the scales on the toepads are paired only toward the tips of the digits. The flattened tail with only slightly enlarged scales on its lower surface is distinctive, once compared carefully with other species. The underside of the chin has 3-4 rows of enlarged, relatively rounded scales behind the scale on the tip of the lower jaw. There are 2-5 enlarged pores in front of the vent of males. This lizard have been reported from Cocos, Guam, Tinian, and Saipan. It has not been seen on Guam in recent years.

## SKINKS

### Family Scincidae

The skinks belong to an even more diverse and successful family of lizards than the geckos. They are characterized by large scales covering the head and body that are actually boney plates covered with skin. Such armament of the skin is a useful defense against predation. Skinks are often difficult to hold in the hand because the hard smooth scales slip under all but the tightest grasp. A considerable amount of variation exists in body form with some species having short bodies and normally proportioned limbs whereas others have elongated bodies and tails and have reduced the relative size of the fore- and



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hindlimbs. The lizards with elongated bodies often move using lateral undulation similar to the swimming movements of fishes, snakes, and other elongate animals. Most skinks have movable eyelids, but it is always the lower eyelid that is best developed for closing over the eye, and many have a clear window in the eyelid allowing vision even when the eyelid is closed. However one species, the Snake-eyed Skink, in the Marianas has the eyelid permanently fused as a spectacle over the eye; thus the eye appears to be always open. Most skinks are active only during the daytime, but some may be active at night or only be seen at night when they are disturbed from the grass or cover where they are sleeping. Skinks lay eggs, but in contrast to geckos the number of eggs is variable between and within species. The eggs have leathery parchment-like shells unlike the hard calcareous shells of geckos. Some skinks retain the eggs in the body of the female and give birth to active young. Most of the skinks in the Marianas are widespread species occurring on many islands in the western and southern Pacific region, but others are more restricted. Slevin's Skink is known only from the Marianas Chain. The Curious Skink is a recent arrival to the area with the first specimens in Guam appearing in the 1960s, but as a species extremely tolerant of disturbed habitats including urban lawns, it has become abundant and conspicuous throughout Guam and the other islands to which it has arrived.

### Carlia sp. (C. fusca sensu lato) - Curious Skink

The taxonomy of this genus of lizards is extremely complex and the exact identification of the introduced populations of this lizard group present in the Marianas can not be determined at the present time. All of the known populations in the Marianas are similar in appearance, but specimens of Carlia from Palau differ in having small beige spots scattered on the dark brown ground color of the body. Specimens from the Marianas are medium to dark brown above and have grey venters with a variable rose or bronze suffusion especially evident in adult males. The species is most readily distinguished from other skinks in the region by having only four digits on the hands. Adult Blue-tailed Skinks and Slevin's Skinks are



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similar in having a predominantly brown body coloration, but have five digits on the hands, and have white or other ventral colorations instead of grey. It actively forages on the ground especially in grassy areas. It will climb onto low vegetation but is not normally seen above 0.5 m above the substrate. It is most active on sunny days and may depend on patches of sunlight even in forested areas. It is frequently seen at night presumably when it is disturbed from sleeping refugia in grass, but the possibility exists that this species has some nocturnal activity. It is an extremely alert lizard and quickly investigates any movement on the substrate that might represent food. It will readily grab and devour other small lizards that it encounters, including Blue-tailed Skinks and House Geckos. The Curious Skink is extremely common in many localities on Cocos, Guam, Saipan, and Tinian. It may have reached Cocos Island relatively recently where it was quite inconspicuous on Cocos Island until 1990 when individuals were found in abundance throughout the island. Its abundance in urban areas makes it a likely candidate for being carried to other islands as a passive stowaway in cargo moved by air and ship traffic from Guam and other source populations.

### Cryptoblepharis poecilocephalus - Snake-eyed Skink

This extremely slender skink has relatively small limbs for the size of its body and tail. It squirms and twists the body when grasped and is extremely difficult to hold in the hand. The eyelid is permanently fused over the eye and thus the eye always appears to be open. The body is brownish black with 3 golden dorsal stripes fusing into two stripes on the tail. The bottom edges of the stripes are jagged but the top edges are boldly defined. The area along the middle has a more intense copper color than the bronze dorsolateral stripes. The scales making up the two rows along the middle of the back are wider than adjacent scales. This species climbs readily on rocks and tree trunks but is usually in close proximity to salt water. It has been collected under the rough bark of Australian Pines (Cassurina). On islands where other terrestrial skinks are lacking it may expand its niche to include a broader variety of terrestrial habitats. It is often found in areas of loose

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sandy soil. It has been reported from Cocos, Guam, Rota, Aguijan, Tinian, Saipan, Anatahan, Sarigan, Guguan, Alamagan, Agrihan, Asuncion and Maug. Few specimens have been found on Guam in recent years and the status of the species on this island is unknown.

### Green Tree Skink - Lamprolepis smaragdina

This widely distributed skink was introduced into the Mariana Islands and remains conspicuous on large trees on Saipan and Tinian. The large size (to 120 mm), bright metallic green coloration of the dorsal body, and yellowish green coloration of the belly make this an easy species to identify. There may be black flecks marking the edges of the scales on the limbs and tail. The juveniles are less brightly colored but are the only green or greenish brown lizards with large, smooth, shiny scales. This lizards sleeps on the tips of branches at night, but when disturbed will run down the trunk, or less frequently jump, to take refuge on the ground. The claws of this proficient climber are particularly sharp relative to any other lizard in the Marianas.

An introduction of several individuals of the Green Tree Skink at the Marine Laboratory of the University of Guam in the 1960s failed to result in a reproductive population on Guam (L. Whatshisname, pers. comm.).

### Blue-tailed Skink - Emoia caeruleocauda

Despite its common name, this skink has a conspicuous blue tail only in juveniles and females. Juveniles and young adults also have three prominent yellow stripes separated by a brown or black ground color, but the stripes fade in adults making it difficult to distinguish this species from the unicolor brown Curious Skink without counting the fingers. Many adults that appear to lack stripes retain a trace of the vertebral or dorsolateral stripes on the head and neck. The Blue-tailed Skink is most difficult to distinguish from the Azure-tailed Skink which does not loose its bright stripes. The scales on the underside



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lighter brown flecks. The belly is white to greenish white. The black lateral field make be somewhat broken by light flecks. There are 38 or more scales around the middle of the body in contrast to the Blue-tailed and Azure-tailed skinks which have 36 or fewer scales around the middle of the body. The posterior edge of the rostral scale on the tip of the snout is blunt (truncate) instead of rounded as in Slevin's Skink (?). The length of the interparietal is 1.5 to 2 times the greatest width. This skink is known only from areas immediately adjacent to salt water, where it climbs among the rocks and dense beach scrub vegetation. It sometimes seeks refuge in tidepools. It has been reported from Cocos and Rota. Its absence from Guam is inexplicable. It is an extremely wary lizard occupying a relatively specialized habitat, and may have been overlooked on other islands.

### Slevin's Skink - Emoia slevini

This relatively large (to 95 mm) skink may be uniform brown or have a tan body with black sides outlined above and below with small white square blotches that highlight the lateral coloration. The posterior two thirds of the belly may be bright orange in large specimens. There are 38 or fewer scales around the middle of the body and the length of the interparietal is less than 1.5 times the width. Small individuals resemble the Snake-eyed Skink. Slightly larger Slevin's Skinks resemble brown individuals of the Blue-tailed Skink, but usually show traces of the black lateral field and an interparietal scale between the parietal scales. Careful study is needed to distinguish this species from the Tide-pool Skink using the shape of the interparietal scale, the color pattern, and the number of dorsal scales. This species is found on the forest floor, in old fields, and low on tree trunks. It is known from Cocos, Guam, Rota, Tinian, Guguan, Alamagan, Asuncion, and Maug, although it does not seem to be common on any of the southern islands. Recent fieldwork on Guam, Rota, and Tinian has failed to document this species. The ecology of this poorly known skink deserves further study.



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of the fourth toe number 31-43 in the Blue-tailed Skink and are much smaller and numerous in the Azure-tailed Skink with more than 50 (usually 65-70) scales under the fourth toe. The vertebral stripe of the latter species tends to be somewhat wider on the head, the stripes are slightly whiter, and there is a visible pineal eye spot in the middle of the head behind the eyes. This species actively forages noisily on the ground and on vegetation during daylight hours. It apparently depends on its rapid movements in and out of vegetation to protect it from predation by birds and other predators. In most areas where it occurs, it is the most conspicuous lizard on the forest floor, but is increasingly supplanted by the Curious Skink on Guam and Cocos. It is also known from Rota, Aguijan, Tinian, Saipan, Alamagan, Agrihan, and Asuncion.

### Azure-tailed Skink - Emoia cyanura

This small, striped skink is presently known only from Cocos Islands. It is most likely to be confused with the Blue-tailed Skink (see comments in previous species account) and a single report of the species from southern Guam can not be confirmed due to the lack of voucher specimens (Kami and ??). However the presence of the species on Cocos without evidence of its former or present occurrence Guam is inexplicable without presuming that it formerly occurred on Guam and disappeared without documentation. In other areas of the Pacific where Azure-tailed and Blue-tailed Skinks occur together, they are characterized as occurring in forest edge and forest interiors respectively. We have confirmed that the population on Cocos Island represent E. cyanura rather than a recently described species E. empar which was confused with it until relatively recently.

### Tide-pool Skink - Emoia atrocostata

This skink lacks definite stripes, but usually has a prominent black lateral field that contrasts with the metallic gray, green, or brown dorsal coloration marked with tan or



Blue Taild Skink  
*Emoia caeruleocauda*





Curious Skink  
Carli Fusca





Carolina Anole  
*Anolis Carolinesis*





Vinducus  
Island Monitor





Slevin's Skink  
*Emonia Slevini*

Moth Skink - Lipinia noctua

This small skink (to 55 mm) is poorly documented in the Marianas by only a few specimens from Guam. It is characterized by a yellow spot on the top of the head which may be contiguous with a narrower yellow middorsal stripe continuing onto the body but fading before reaching the base of the tail. It also has an interparietal scale and lacks supranasal scales, small scales between the scale containing the nostril and the internasals on the top of the snout. Overall the coloration is brown or tan flecked with lighter and darker marks. A thick black line runs from the snout through the eye and onto the lateral body but breaking up before reaching the base of the hindlimb. The lips are marked with alternating black and white bars. The belly is yellow to orange under the body and legs and fading to a pale bluish green under the tail and chin. This lizard will break its toes as well as its tail to escape the grasp of potential predator. Unlike the other lizards of the Marianas this species gives birth to live young. It is found on the ground or low in trees. Its status on Guam is unknown.

MONITORS

Family Varanidae

The monitors are medium to large-sized lizards that are easily recognized by their well developed limbs, long necks, and long tails. They are distributed in Africa, Asia, Australia and intervening island areas, but reach their maximal diversity in Australia. They have a snake-like bifurcate tongue that is protrude to chemically sample the air which makes them efficient predators and scavengers. They are active diurnal and which elevate their body temperatures by basking.

Island Monitor - Varanus indicus



## Amphibians and Reptiles of the Marianas Islands

This monitor has a wide distribution from the Solomon Islands and Australia to the Mariana Islands far to the north. Some evidence exists to suggest that the species has been present on Guam since the arrival of the island's original inhabitants, but a more recent introduction to Guam or other islands can not be excluded. The large size of this lizard made it a source of meat for early Pacific islanders. Some introductions of this lizard by Japanese may have resulted from the desire to develop biological controls for rats that damaged rice and other agricultural crops. In recent times, many islanders view the monitor as a pest species because it frequently invades populated areas where it preys on poultry and eggs. It is also known to feed on native birds and their eggs although the extent of this predation is unknown. It is known to kill and consume the Brown Tree Snake on Guam. Its diet also includes a broad range of invertebrates including insects, crabs, and snails. It responds to odors and readily consumes garbage and carrion as well as living prey. Its tail, which is higher than wide, does not break off as easily as the tails of most lizards. It is a proficient climber and frequently seeks refuge in tree tops when threatened by man or other predators. The monitor is black to greenish black with small cream or yellow spots. It may have orangish lips and an off-white belly. The monitor is known from Guam, Rota, Aguijan, Saipan, Anatahan, Sarigan, Pagan, and probably occurs on Alamagan and Agrihan. Monitors may have declined in abundance on Guam in the last two decades, but whether this due to predation of the Brown Tree Snake on eggs and young or a consequence of mortality due to the automobile traffic on Guam is unclear. As a large predator capable of killing Brown Tree Snakes up to 2.3 m in length, the monitor may be an effective deterrent to the snake colonizing other islands where the Monitor occurs.

BLIND SNAKES

Family Typhlopidae

Braminus Blind Snake - Ramphotyphlops braminus

This diminutive (to 30 cm) worm-like snake is a highly specialized for its secretive habits of burrowing in soil for termites and other insects on which it feeds. The eyes are extremely reduced and visible only a small dots on top of the blunt head. The tail is relatively blunt except for a tiny harmless spur-like scale which the animal pushes against the substrate when moving. The coloration varies from pinkish brown to charcoal black. The small size and inoffensive disposition of the snake prevents it from biting. This species is most frequently encountered under boards and other materials lying on top of the ground. Whether it arrived to the Marianas within floating debris or in soil and the roots of plants transported by man is not known. It is an all-female species and thus any adult female is a potential colonist. The blind snake can be distinguished from other snakes and especially the Brown Tree Snake by its diminutive eyes, its head that is not wider than the neck, its small size, and the blunt tail. In contrast to most snakes the scales on the belly are not wider than adjacent scales on the sides or back. It is known from Guam, Rota, Tinian, Saipan, Anatahan, Arigan, Alamagan, Pagan, and Agrihan. It probably occurs undetected on other islands.

TYPICAL SNAKES

Family Colubridae

This most diverse of the snake families occurs on all continents except Antarctica. Its absence from many oceanic islands probably stems from snakes being poorly adapted for overwater dispersal, and more recently an aversion of man to transport snakes. Colubrid snakes span a wide range of ecological and dietary specializations ranging from estuaries to



## Amphibians and Reptiles of the Marianas Islands

deserts and insects to vertebrates. Members of this family are usually considered to be harmless to man because they lack the highly advanced venom glands and injection apparatus typically found in the venomous snake families Viperidae and Elapidae. However some colubrids are mildly venomous to man and can cause death in humans by injection of secretions from Duvernoy's gland using grooved teeth at the rear of the mouth. Tropical faunas on all continents include colubrid snakes with special adaptations for life in trees. Arboreal colubrids usually have relatively slender bodies with long tails, good eye sight and ridges on the side of the ventral scales to aid in climbing. Some are diurnal whereas others are nocturnal. A few are dietary specialists restricted to insects, snails, or lizards whereas others are opportunists capable of exploiting a wide range of vertebrate prey including amphibians, reptiles, birds, and mammals.

### Brown Tree Snake - Boiga irregularis

This species is native to a variety of islands extending from Western Indonesia (Sulawesi) through Papua New Guinea and the Solomon Islands, as well northern and eastern coastal regions of Australia. It is the most southern species of the genus Boiga which includes about 15 species and ranges from Africa through Southeast Asia into the Philippines and Indonesian Island areas. The Brown Tree Snake is characterized by a light to dark brown coloration usually indistinctly marked with narrow shadow-like markings, a light yellow belly which becomes increasingly obscured by grey pigment with age, a narrow elongate body form and markedly wider head with large eyes. Two teeth at the rear of each of the upper jaw bones have grooves which conduct salivary secretions from Duvernoy's gland into the wound made when the snake bites during feeding or defense. In contrast to some more venomous species, the Brown Tree Snake uses its flexible body to hold its prey while the venom is injected and takes effect. The venom acts to immobilize prey, facilitating ingestion and contains digestive enzymes which accelerates digestion once the prey is engulfed. This is a snake only active at night which seeks protection from high temperatures and bright light during

## Amphibians and Reptiles of the Marianas Islands

daylight hours. Although rock crevices, hollow logs, and other natural refugia are most commonly used as daytime retreats, snakes frequently enter houses, sewers, and innumerable artificial situations when in urban and commercial areas. The food habits of this species include a broad range of amphibians, reptiles, birds, and mammals. Except for being a widespread species occasionally reaching 2.3 m and common in disturbed habitats, little is known about the species in its native range.

In Guam the species has reached exceptionally high densities since its initial discovery in the early 1950s. The snake was an effective predator on native forest birds and caused the virtual disappearance of 9 species of birds, several lizards, and possibly even the native bats. In climbing on high voltage wires and electrical equipment the snake frequently interrupted Guam's electrical supply. In 1985, reports of snakes biting people in their homes began to accumulate; in 1990 more than 49 people were treated for snakebite in Guam's emergency rooms with a few bites on small children producing serious symptoms including respiratory seizures, extreme swelling, and temporary neurological problems. No fatalities are known to date, but parents should take precautions to keep snakes away from infants and small children and to closely observe children that have been bitten for symptoms of envenomation.

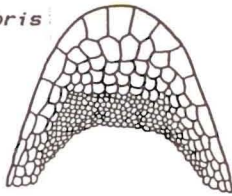
Because the snake frequently seeks daytime refuge in cargo, equipment, and aircraft, several snakes have been unintentionally transported to other islands where the snake could become established and cause similar to those in Guam. To date snakes have arrived to Hawaii, Saipan, Tinian, Pohnpei, Kwajalein and Diego Garcia as a result of civilian and military traffic from Guam. However, no evidence exists to date to suggest that the snake is established (i.e. reproducing) on any of these islands.



# GECKO IDENTIFICATION KEY

## CHIN SHIELDS:

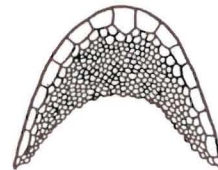
*Lepidodactylus lugubris*



A. Mourning  
Gecko

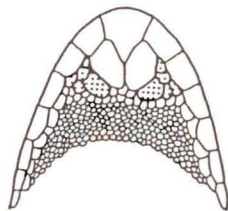


B. Stump-toed  
Gecko

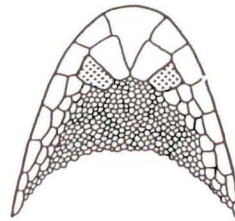


C. Tree Gecko *Hemiphydactylus typus*

*Hemidactylus garnetti*

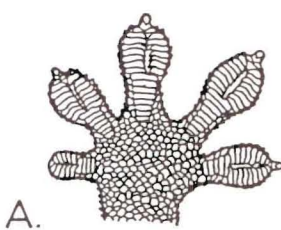


D. Indo-Pacific  
Gecko

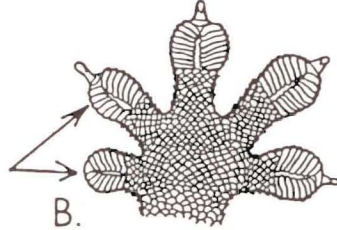


E. House Gecko *Hemidactylus frenatus*

## TOE LAMELLAE (RIGHT FOREFOOT):



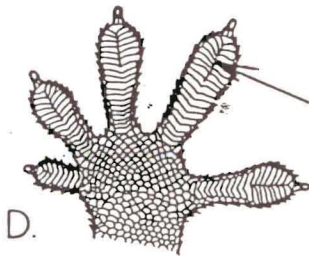
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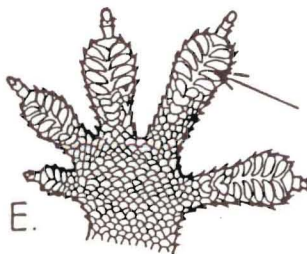
B.



C.



D.

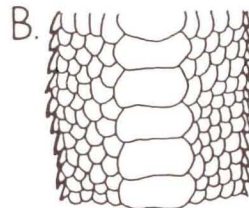


E.

## VENTRAL TAIL SCALES:



A.

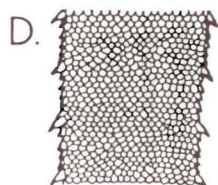


B.

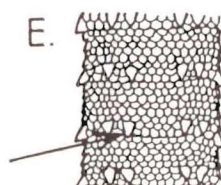


C.

## DORSAL TAIL SCALES:



D.



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