

New Faces from Ancient Places: Uncovering Peninsular Malaysia's Hidden Lizard Diversity Part II: Skinks

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All photographs by the author.

How many times have you walked along a shady forest trail and quickly turned to see what was rustling in the leaf litter — only to catch a glimpse of something dark and shiny, a split second before it darted behind a log or under a bush? Later, down that same trail, you could swear you caught a glint of something in the sunlight just before it circled around to the backside of a tree. Well, don't despair, it happens to all of us.

If you were in Peninsular Malaysia, more than likely what you saw was one of the region's 36 species of actively foraging, constantly moving skinks. This is really no surprise, given that the family Scincidae is the most diverse group of reptiles in the world. Upwards of 1,300 species are currently recognized, comprising nearly one-third of the world's known species of lizards. Also, as you might have guessed, skinks are most diverse in the tropics. They

really are quite an amazing lot as well. Although they vary remarkably in anatomy and lifestyle, nearly all skinks have relatively long, shiny bodies and tails and, in many groups, exhibit an independent evolution of limb reduction and loss.

Most skinks are terrestrial and show an amazing array of anatomical and behavioral adaptations for living in restrictive microhabitats. In Peninsular Malaysia, the majority of skinks are forest-floor or climbing species, and a few are limbless or nearly limbless fossorial forms. All are covered with shiny scales, and each scale is underlain by a thin plate of bone called an osteoderm. This smooth, hard exterior makes skinks extremely durable and difficult to grab. In fact, many species of snakes that feed on skinks (such as the Oriental Whip Snake, *Ahaetulla prasina*) have independently evolved specialized mechanisms for grasping and holding them.



The striped pattern of *Larutia seribuatensis* might serve a protective function by creating a visual illusion that can confuse potential predators.



Unlike the newly described *Larutia seribuatensis*, which occurs at sea level and appears to be active on the surface, the new species' closest relative (*L. trifasciata*, illustrated here) is an upland fossorial cloudforest denizen.

These features include hinged maxillary teeth and gaps in tooth rows in which the skink's body is trapped.

I find researching skinks to be the ultimate test of my patience. Eight species in Peninsular Malaysia are known from three or fewer individuals. Countless are the times when I have crossed the Pacific Ocean to go to the places where they are supposed to occur, only to miss them. However, this is not to say I struck out. One of the great things about skinks is that they are good at partitioning environmental resources. Consequently, you can find a high number of species in one place. Even if that place has not been visited frequently, some of those species are likely to be new to science.

During my quests over the last five years to find rare species such as *Sphenomorphus cameronicus* in the Banjaran Titiwangsa or *Lipinia surda* in the Seribuat Archipelago, my team has been fortunate enough to discover and describe six new species of skinks, all of which are endemic to Peninsular Malaysia or its associated Archipelagos. One of the most interesting new skinks is a nearly limbless species of the genus *Larutia*. The Larut Skinks are named after Bukit Larut, the locality of the type species, *Larutia larutensis*. While surveying the satellite island of Tulai off the coast of Pulau Tioman in the Seribuat Archipelago, we found three specimens of a strange, snake-like skink beneath some surface debris and leaf litter. We quickly determined it to be a new member of the genus. What is most perplexing about this new species is that the five other species of *Larutia*, including the new species' closest relative, *L. trifasciata*

from the Banjaran Titiwangsa, are all upland fossorial cloudforest lizards from Peninsular Malaysia, Sumatra, or Borneo — whereas this new species, which was named *L. seribuatensis*, was found at sea level in relatively arid conditions. Additionally, it had a complete striping pattern that suggests it spends a significant amount of time above ground moving through the leaf litter. As in striped snakes,



Some Peninsular Malaysian forest skinks, such as the Blotched Forest Skink (*Sphenomorphus praesignus*), are large, long-limbed, colorful, and diurnally active.



Other Malaysian species, such as the Bukit Larut Forest Skink (*Sphenomorphus butleri*), are small, brownish, nondescript, and secretive leaf-litter specialists with short limbs and elongate bodies and tails.

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The five other new species of skinks that my team and I discovered and described are all in the genus *Sphenomorphus*, the forest skinks. In Peninsular Malaysia, forest skinks fall into two broad categories. Some species, such as the Blotched Forest Skink (*S. praesignus*),



Sphenomorphus ishaki, the Pulau Tioman Forest Skink, is unique in that it is known only from higher elevations and is active only during cool, cloudy days.

are large, long-limbed, colorful, and diurnal terrestrial or climbing species whose foraging and basking behaviors make them conspicuous components of the ecosystems they inhabit. Others, however, such as the Bukit Larut Forest Skink (*S. butleri*), are small, brownish, nondescript, and secretive leaf-litter specialists with short limbs and elongate bodies and tails whose lifestyles leave them poorly understood and rarely seen. Most of these are upland or insular endemics, and our five new species all fall within this latter group of small skinks.

Now, I admit that these skinks are not nearly as “cool” looking as some of our newly discovered geckos that have flaming yellow heads, electric white tails, and colorful banding patterns. However, these little skinks are equally exciting in a different way, mainly because they provide us with clues as to how evolution works. The fact that these geographically isolated species stuck on islands and mountaintops scattered all over Peninsular Malaysia look very similar to one another makes a bold statement about how natural selection operates on a common genotype shared between multiple species. In essence it says: “If you have the common genetic blueprint of *Sphenomorphus* and you are terrestrial, less than 50 mm in snout-vent length, and live in leaf litter, then you’ll survive best if you look and behave like this.” In fact, discerning one species from another is very difficult without a close, microscopic examination. So, for an evolutionary biologist, this is an exciting example of how evolution “edits” basic genetic material to produce a body plan and a lifestyle best suited to widely separated but similar environments.



Sphenomorphus bukitensis, the Titiwangsa Forest Skink, is so small and so secretive that it likely has a much more extensive distribution than that indicated by the few known individuals.



The only known example of *Sphenomorphus perhentianensis*, the Perhentian Forest Skink, was found foraging on the forest floor immediately following a heavy afternoon rain shower.

Four of the five new species of *Sphenomorphus* are insular endemics. *Sphenomorphus ishaki*, the Pulau Tioman Forest Skink, is unique in that it is known only from the upper elevations of Gunung Kajang and is abroad only during cool, cloudy days. This is a significant behavioral departure from most skinks, which are commonly active on hot, sunny days. Another, *S. sibuensis*, the Pulau Sibul Forest Skink, occurs at sea level in coastal vegetation that fringes the mangrove swamps on Pulau Sibul. It is known from only two specimens that were collected almost exactly one year apart under the exact same small log! This may indicate something about the extreme microhabitat specificity of this new species. The third insular endemic comes from Pulau Perhentian Besar

of the Perhentian Archipelago. This species, *S. perhentianensis*, the Perhentian Forest Skink, is known from only a single specimen, but was sufficiently distinctive to warrant its own specific recognition. It was found foraging on the forest floor immediately following a heavy afternoon rain shower. It also is the only member of this group of skinks known from northeastern Malaysia. The remaining insular species comes from the Langkawi Archipelago, where it is known from Pulau Langkawi and the smaller, adjacent Pulau Singa Besar. Curiously, the Pulau Langkawi individual was found near the summit of Machinchang at an elevation of >750 m, whereas the lizard from Pulau Singa Besar, was found near sea level. Clearly this species' degree of microhabitat specificity is not nearly as restrictive as that of *S. sibuensis*. The last endemic species, *Sphenomorphus bukitensis*, comes from the Banjaran Titiwangsa. We found this species one night while turning logs at Fraser's Hill, and subsequently found it again farther north in the Cameron Highlands. This species is so small and so secretive that it likely occurs over the entire length of the mountain range. We just haven't looked hard enough yet to find it elsewhere.

So, what do all these new species described during the past five years indicate? Just like the geckos you may have read about in the last issue of *Reptiles & Amphibians*, it means that we have a long way to go before we really know just how many different species of skinks occur in Peninsular Malaysia. The fact that we have discovered and described many more new species of geckos than species of skinks merely reflects the reality that geckos are much easier to find and don't run nearly as fast. So, the next time you are walking along a forest trail and you hear something in the leaves and you just can't get a good look at it, it is probably a skink. It could even be a species we have never seen, although we may have heard it any number of times!