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Herpetology 2024: Which Lizard?

Borneo




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This is the fourth part of a series of articles describing herpetological species and field excursions possible for participants of the 10th World Congress of Herpetology, to be held in Kuching, Sarawak, Borneo in 2024. In this instalment, we describe the lizard species.

An incredible 124 species of lizards are now known from Borneo, and new species are being described annually. The genera of agamids (*Draco* – nine species), geckos (*Cyrtodactylus* – 12 species) and skinks (*Sphenomorphus* – 10 species) particularly have seen multiple new species being recognized in the recent past, and the past two decades have also seen substantial changes in generic placement, an inevitable fact when intense work is conducted, in this case, by several research groups, using multiple lines of evidence.

Being based in Kuching, the capital of Sarawak State, during the World Congress in 2024, participants will be spoiled for choice regarding field sites for watching saurian reptiles, be it a short trip between sessions, at night, after the end of the day at the Borneo Convention Centre, or longish trips before or after the Congress. We shall describe some options, based on proximity to our town.

Within the city limits are a few options for nature and wilderness, the most famous being the Sama Jaya Nature Reserve, in the southwestern suburbs of Kuching, requiring a commute of under 30 minutes. Protected as an urban recreation spot, it has well-maintained tracks for joggers and nature watchers, across a Bornean heath ('Kerangas') forest, a specialized vegetation that grows on nutrient-poor soil. For herpe-



Fig. 1. *Draco quinquefasciatus*

tologists, it is famous for the eponymous Sama Jaya Litter Skink (*Subdoluseps samajaya*), described from here, although a successful peek at one is a challenge (the holotype was found when a pitfall trap was being established). However, visitors are likely to see a variety of other lizard species at the Reserve, including the Common Flying Lizard (*Draco sumatranus*), Red-throated Skink (*Eutropis rugifera*) and Blue-eyed Angle-headed Lizard (*Gonocephalus liogaster*), apart from several other skinks, geckos and monitors. Several species of Pitcher Plants (*Nepenthes*) are commonly encountered at the site, which is also home to interesting mammals such as tarsiers and the colugo or flying lemur.

Even within the urban landscape are a variety of lizard species, eking a livelihood amongst a landscape of concrete and wood, including at least five species of house geckos, besides the Common Flying Lizard (*D. sumatranus*), the Crested Green Lizard (*Bronchocela cristatella*) and Bowring's Supple Skink (*Subdoluseps bowringii*). Keeping your eyes peeled as you drive through Kampung (villages) is always a great idea- maybe what zipped across the path is a Long-tailed Lizard (*Takydromus sexlineatus*) or is that a Water Monitor Lizard (*Varanus salvator*), unhurriedly looking for a road-killed meal?

For those who can slip out of town in the evenings, we can recommend Kubah National Park, located about 45 minutes to the north of the city (and the source of our drinking water supply). Highlights of the Park are four species of Angle-headed Lizards (*Gonocephalus*), whose ecology was studied by one of us, Sandra (Wong Jye Wen).



Fig. 2. *Gonocephalus grandis*



Fig. 3. *Harpesaurus borneensis*



Fig. 4. *Cyrtodactylus consobrinus*



Fig. 5. *Cyrtodactylus pubisulcus*



Fig. 6. *Cnemaspis matahari*



Fig. 7. *Cnemaspis paripari*



Fig. 8. *Cyrtodactylus muluensis*



Fig. 9. *Cnemaspis nigridia*



Fig. 10. *Gekko* cf. *albofasciatus*



Fig. 11. *Aeluroscalabotes felinus*



Fig. 12. *Gekko kuhlii*

These large forest dwelling lizards are commonly sighted throughout the Park, often perching on tree trunks and branches in shaded parts of the forest. Around the many streams flowing through the Park, a glance through the trees may lead you to the Great Angle-headed Lizard (*G. grandis*). Amongst the four species found here, the Bornean Angle-headed Lizard (*G. bornensis*) and Doria's Angle-headed Lizard (*G. doriae*) may be worth looking for, as they are endemic to Borneo. Species of this genus tend to restrict their movement within their respective home range that often overlap, and their homing ability is astonishing. Like many other agamids, they



Fig. 13. *Cekko rhacophorus*

exhibit striking sexual dimorphism, whereby males are generally more vibrant compared to females. They are able to drastically change their colors from dull to bright or vice versa for social interaction and thermoregulation. During the day, many of these sedentary lizards appear darker to passively thermoregulate from exposure to indirect solar radiation. With energy gained from the sun, they may even play rounds of 'hide-and-seek' with you around the tree trunk, attempting to evade your sight, while some lurk in the shadows of saplings on the forest floor ambushing a meal. These opportunists feed on a wide variety of prey, including insects, earthworms, and snails.



Fig. 14. *Lanthanotus borneensis*



Fig. 15. *Dasia vittata*



Fig. 16. *Eutropis rudis*

It is here that we found the incredible Horned Lizard (*Harpesaurus borneensis*), whose males have an extraordinary ‘horn’ like structure (smaller in females) and is associated with tree buttresses, where it picks up small ants- apparently the main component of its diet. Another interesting aspect of its biology is that it is Borneo’s only ovoviviparous agamid. If you are sheltering in one of the wooden gazebos (‘Pondok’ in the Malay vernacular) at the Park during a thunderstorm, don’t forget to scan the rafters and high beams, as these are where the Gliding Geckos (*Gekko kuhlii* and *G. horsfieldii*, formerly in the genus *Ptychozoon*) prefer to conceal themselves. A giveaway to their presence is egg scars and ‘live’ eggs.

On dry, hot days, Kubah National Park (and the adjacent Matang Wildlife Centre) are great sites for observing Flying Lizards (*Draco*), and as many as six species have been recorded here. They are most often seen on trunks of trees with smooth bark, and apart for one or two, most are members of the forest interiors, some of the larger species, even of the higher branches, making identification a challenge. However, at least two of these species, the Common Flying Lizard (*D. sumatranus*) and Obscure Flying Lizard (*D. obscurus*) are found in edge-habitats, and more commonly encountered on the walk along the Summit Trail, and are also abundant in the Park Headquarters area of Kubah. Visitors to the Wildlife Centre at Matang may wish to also visit the rehabilitation centre, where representative species of the more ‘famous’ wildlife of Borneo are housed, including Orangutans, hornbills, gibbons and the *Tomistoma* or False Gharial.



Fig. 17. *Sphenomorphus multisquamatus*



Fig. 18. *Subdoluseps samajaya*



Fig. 19. *Tropidophorus micropus*

If you head towards the beach (but check local advisory at the time for tides and presence of jellyfish), we can recommend the Santubong region, including the National Park of the same name, which was one of the more famous bases of collection for Alfred Russel Wallace (1893–1913) in the year 1855. Here, struck down with malaria, Wallace famously thought up the idea of evolution through natural selection, a theory he was to jointly publish with Charles Darwin (1809–1882) much later.

Saurian diversity on the coast dips compared to the forests, and one or two species to be encountered here are the Mangrove Skink (*Emoia atrocostata*) and the Water Monitor Lizard (*V. salvator*), the former recorded as a prey of the latter on beach habitats. The Striped Bornean Tree Skink (*Dasia vittata*) is relatively common in the beach forests. Also, look out for the gigantic Jurassic oyster fossils, exposed on the rocks along the beach!

Another interesting area for searching for unusual lizards is karst and other areas of limestone. Kuching's eastern and southeastern borders abut areas of extensive limestone formations, and part of the Sarawak Delta Geopark. This vast area comprises often isolated massifs, sometimes with its own flora and fauna. Among the protected areas are the Wild and Fairy Caves, home to the endemic Fairy Cave Day Gecko (*Cnemaspis paripari*), a gorgeous, saxicolous gecko that is crepuscular, with some diurnal activity. These rock formations, reaching up to the border with Kalimantan, Indonesia, are home to a number of recently-described rock geckos of the genera *Cnemaspis* and *Cyrtodactylus*.

Other species we can highlight from areas close to Kuching include the Black-lipped Shrub Lizard (*Pelturagonia nigrilabris*) and the Penrissen Limbless Skink (*Larutia kecil*) from Gunung Penrissen, the Gading Day Gecko (*Cnemaspis nigridia*) and Cat Gecko (*Aeluroscalabotes felinus*) at Gunung Gading National Park and the Crested Flying Lizard (*Draco cristatellus*) at Gunung Santubong National Park.



Fig. 20. *Tropidophorus sebi*



Fig. 21. *Tytthoscincus batupanggah*

Talk about the lizards of Borneo, and the name that comes up on top is always the Bornean Earless Monitor (*Lanthanotus borneensis*). This secretive species inhabits rocky streams and their verges within pristine forests, currently restricted to Sarawak's (and Kalimantan's) interiors. Described as the 'Holy Grail' of herpetology, a long-term study of its spatial and thermal biology is currently being undertaken by our lab, using radio-telemetry in central Sarawak. Needless to say, its cryptic behavior, occupancy of remote areas and rarity make the possibility of sightings by casual tourists uncertain. The Earless Monitor forages in water and on the banks of streams, catching crabs and earthworms at night. It has sometimes even been accidentally trapped in mist nets set for a study of ground-dwelling birds, suggestive of some terrestrial activity.

For those with more time in hand, a visit to Gunung Mulu National Park is highly recommended. A total of 40 species of lizards are known from this vast protected area of nearly 530 square kilometres. Saurian highlights of Mulu include the Bornean Glass Lizard (*Dopasia buettikoferi*), the Lagang Cave Day Gecko (*Cnemaspis lagang*) and the Mulu Bent-toed Gecko (*Cyrtodactylus muluensis*). Apart from the saurofauna, visitors to the Park will enjoy the spectacular vistas offered. These include its limestone peaks, tall trees, a canopy walkway, and the sandstone ridge of the Mulu Summit itself, a week-long return journey from the Park Headquarters, led by a trusty Penan guide.

Visitors will agree that Borneo's lizard fauna is diverse, active year-round, show interesting natural histories and many can be seen with relatively little effort.



Fig. 22. *Varanus rudicollis*

We welcome visitors to the Congress, and will be at hand to advise our guests on local travel to see its amazing herpetofauna and much more that the State of Sarawak has to offer.

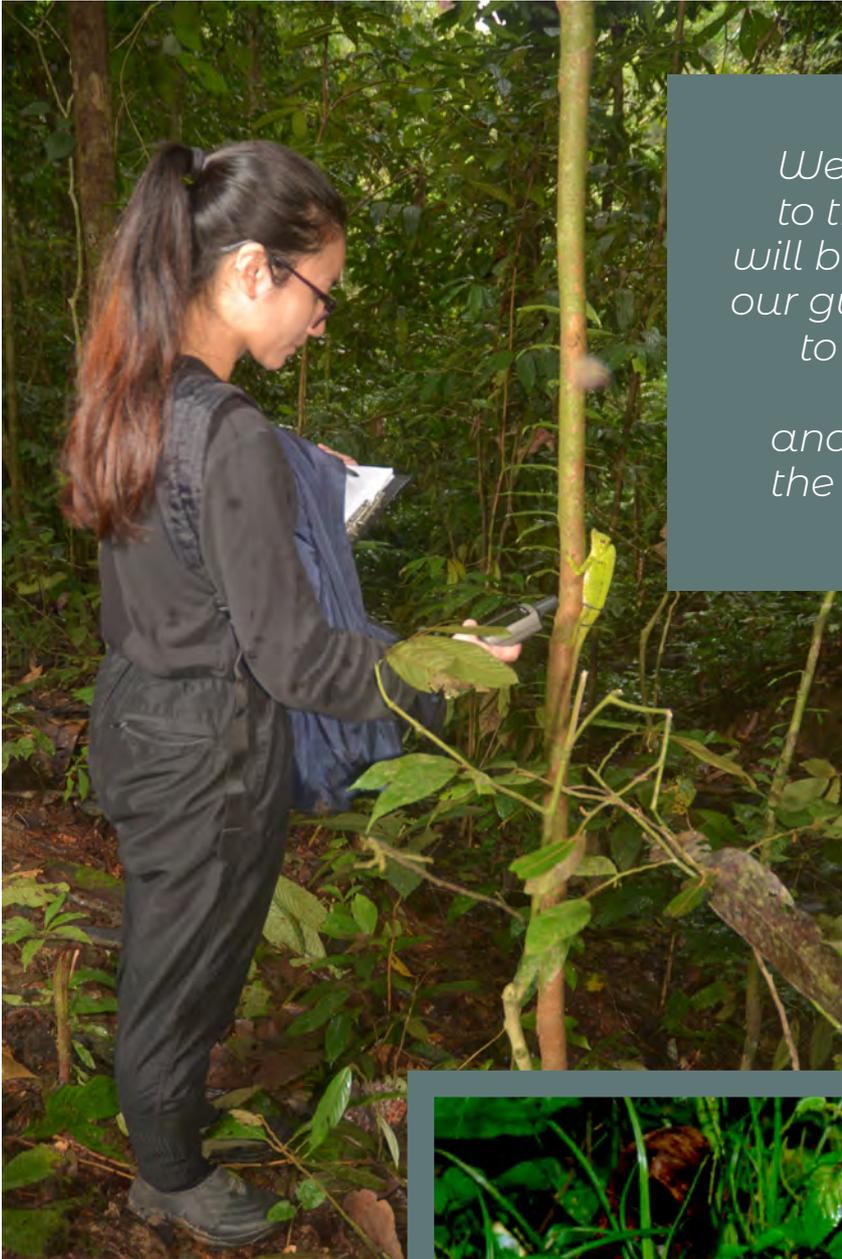
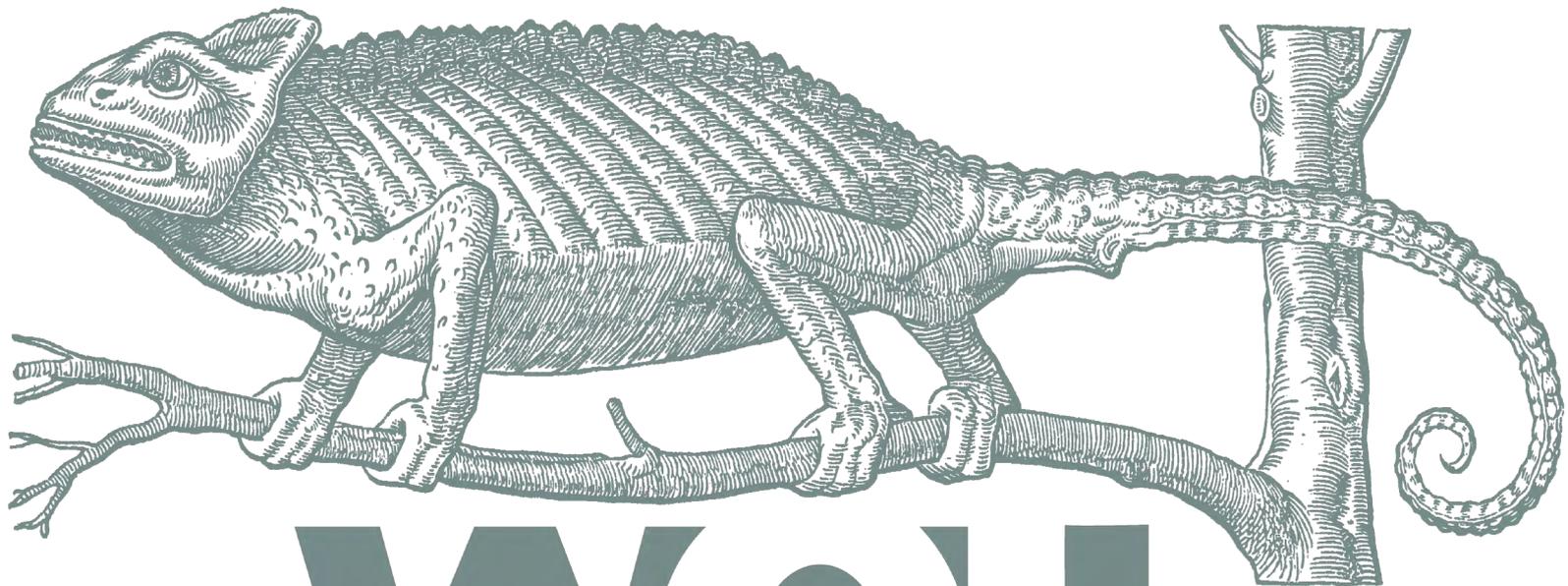


Fig. 23. Sandra Wong Jye Wen radio-tracking and georeferencing a *Gonocephalus doriae*.



Fig. 24. *Varanus salvator*



WCH

World Congress of Herpetology

The World Congress of Herpetology (WCH) is an International Scientific Nonprofit Organization that is also a Scientific Member of the International Union of Biological Sciences (IUBS). The mission of the World Congress of Herpetology is to promote herpetological research, education, and conservation, by facilitating communication between individuals, societies, and other organisations engaged in the study of amphibians and reptiles.

The aim of the WCH newsletter is to provide a means of communication during the period between WCH congresses that are typically held every three to five years. We want it to be a means of communication between the WCH Executive Committee (EC), the International Herpetological Committee (IHC), and the global herpetological community, and a place to feature ongoing actions being taken to study amphibians and reptiles by individuals and herpetological societies globally. It will be published bi-annually in June and December.

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