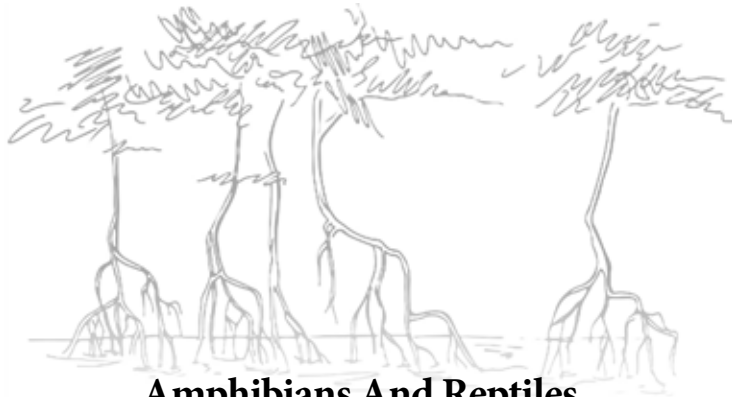


SADONG JAYA

A WILDERNESS UNVEILED

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Amphibians And Reptiles

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Introduction

This report describes the results of a rapid (five-day) biodiversity assessment to collect data on occurrence and abundance of amphibians and reptiles of the proposed Sadong Jaya Nature Reserve and adjacent areas of western Sarawak, through field sampling. The primary objectives are to evaluate habitat and microhabitat use by the local fauna, as well as to evaluate species richness and diversity of reptiles at the study site. There are no published data on the herpetofauna of the area, despite its proximity to urban areas of Sarawak.

The distributional and ecological data generated are expected to be of value for activities such as land-use planning, conservation of particular taxa and for the use of species in understanding ecological processes. It will also be useful for basing regional Red Lists and for understanding the conservation and management requirements of individual species, and important under the context, for the development of a nature reserve.

The primary objectives of the research project were to prepare an inventory of the herpetofauna occurring at the site and to determine herpetofaunal species and habitat associations.

Data were gathered during field work conducted between 22–26 July 2019. We made observations along transects as well as via boat and road cruising. For all individual frogs and reptiles encountered, the following data were collected from the mangrove forests of the proposed Nature Reserve and adjacent regions, including oil plantations, grassy verges, and rural, built-up areas, with tarred roads: location (including a GPS fix), species, behaviour, habitat association, and any other detail. Field technique included standard methods employed for herpetofaunal studies worldwide for similar rapid-techniques (as



mentioned in McDiarmid *et al.*, 2012): observations along transects (= ‘visual encounter surveys, involving 2–3 people covering trails at all times of the day, and particularly during dusk, after evening showers), as well as boat and road cruising.

Observations

A total of 10 reptile species and two amphibian species were recorded from the site (Table 1). An overall impression of the fauna is that it represents the coastal south-east Asian herpetofauna, including a few mangrove species, the rest comprising human commensals that have invaded areas of disturbance in the proximity.

Apart from two species (*Gekko monarchus* and *Hemidactylus platyurus*) in the ‘Not Evaluated’ category of the IUCN Red List, the herpetofaunal species recorded are classified as ‘Least Concern’.

Additional species predicted (based on availability of habitat) is the Mangrove Skink, *Emoia atrocostata*, Beaked Sea Snake, *Hydrophis schistosa* and the Wart Snake, *Acrochordus granulatus*. Long-term sampling is recommended to prepare more comprehensive list of herpetofauna of the site, including the employment of sampling techniques such as pit-fall traps with drift fences and adhesive trapping within the mangrove forests, as well as the use of nets for sea snakes and other aquatic snakes.

Several species were found accidentally, such as Banded Krait, *Bungarus fasciatus* during road cruising on a wet night, and a near-adult Water Monitor Lizard, *Varanus salvator*, otherwise a commonly-encountered species, was sighted on a tree, approximately 5 meters from ground, next to a Bornean Striped Tree Skink, *Dasia vitatta*. Also observed was an unidentifiable species of Flying Lizard, *Draco* sp.



Figure 1. The Mangrove or Crab-eating Frog, *Fejervarya cancrivora*.



Figure 2. Tadpole of the Mangrove Frog, *Fejervarya cancrivora*.



Figure 3. The Common Asian Toad, *Duttaphrynus melanostictus*. Photo: Jye Wen Wong.



Figure 4. Saltwater Crocodile, *Crocodylus porosus*. Photo: Jye Wen Wong.



Figure 5. *Cerberus rynchops* on mangrove edge.



Table 1: Checklist of reptiles and amphibians of the proposed Sadong Jaya Nature Reserve, Sarawak (current 25 August 2019), as recorded during a rapid assessment of the fauna in 22–26 July 2019. The list is necessarily preliminary, and additional species are expected when long-term sampling of the herpetofauna is conducted. Abbreviations for IUCN Red List (version 2020-1) include: LC = Least Concern; and NE = Not Evaluated.

Sl	Species	Common Name	IUCN Listing	Habitat	Remarks
REPTILIA					
Crocodylidae					
1	<i>Crocodylus porosus</i> Schneider, 1801	Saltwater Crocodile	LC	Creeks, river mouth	Abundant; numerous juveniles sighted
Agamidae					
2	<i>Draco cf. cornutus</i> Günther, 1864	Horned Flying Lizard	LC	Mangrove tree	Identification await confirmation
Gekkonidae					
3	<i>Gekko monarchus</i> (Duméril & Bibron, 1836)	Warty Gecko	NE	Human settlements	Edge species
4	<i>Hemidactylus frenatus</i> Duméril & Bibron, 1836	Asian House Gecko	LC	Human settlements	Human commensal
5	<i>Hemidactylus platyurus</i> (Schneider, 1792)	Flat-tailed Gecko	NE	Human settlements	Human commensal
Scincidae					
6	<i>Dasia vittata</i> (Edeling, 1864)	Bornean Striped Tree Skink	LC	Mangrove tree	Bornean endemic
7	<i>Eutropis multifasciata</i> (Kuhl, 1820)	Common Garden Skink	LC	Edge of plantation	Edge species
Varanidae					
8	<i>Varanus salvator</i> (Laurenti, 1768)	Water Monitor Lizard	LC	Creeks, human settlements	



Homalopsidae

- | | | | | |
|---|---|--------------------------|----|--------|
| 9 | <i>Cerberus rynchops</i>
(Schneider, 1799) | Dog-faced
Water Snake | LC | Creeks |
|---|---|--------------------------|----|--------|

Elapidae

- | | | | | |
|----|--|--------------|----|----------------------|
| 10 | <i>Bungarus fasciatus</i>
(Schneider, 1801) | Banded Krait | LC | Human
settlements |
|----|--|--------------|----|----------------------|

AMPHIBIA

Bufonidae

- | | | | | | |
|----|--|----------------------|----|----------------------|--------------------|
| 11 | <i>Duttaphrynus melanostictus</i>
(Schneider, 1799) | Common Asian
Toad | LC | Human
settlements | Human
commensal |
|----|--|----------------------|----|----------------------|--------------------|

Dicroglossidae

- | | | | | |
|----|---|---------------------------------------|----|---------------------------------|
| 12 | <i>Fejervarya cancrivora</i>
(Gravenhorst, 1829) | Mangrove Frog;
Crab-eating
Frog | LC | Creeks,
human
settlements |
|----|---|---------------------------------------|----|---------------------------------|

Discussion And Recommendations

The herpetofauna at the site is those typically encountered in mangrove and other coastal sites of south-east Asia. Disturbance, at the edges have added to the biodiversity, with the arrival of human commensal species of geckos, such as the Asian House Gecko, *Hemidactylus frenatus* and the Flat-tailed Gecko, *H. platyurus*, and the Common Asian Toad, *Duttaphrynus melanostictus*. The Mangrove or Crab-eating Frog, *Fejervarya cancrivora* was found both at the edge of the forests and within the oil palm plantation areas.

An interesting observation was the encounter of a large number of Dog-faced Water Snake, *Cerberus rynchops*, on mudflats, at the edge of the water. Mudskippers were also found in syntopy in abundance, and although mass predation (as reported by Giesen, 1993) was not noticed, the area may be a good site for further research on the behaviour of this common, yet poorly-understood species. A tangle of the Dog-faced Water Snake, was also observed swimming towards the sea mouth, during rising tide. The significance of this is currently not understood. This species is referred by some recent authors as *C. schneideri*, and more taxonomic work is required for clarification.



The Saltwater Crocodile, *Crocodylus porosus* population of the site appears healthy, with a large number of individuals observed (Table 1), representing those near hatchling size, > 1 year old juveniles, and subadults, including at least a few adults. Although there are no attacks on humans at the site, the presence of a large adult at Sungei Jemukan has been a deterrence to night-fishing activities, according to local fishermen.

The Water Monitor Lizard, *Varanus salvator*, was abundant at the site, and often seen all day up to the evenings, around habitations, as well as forest and river edges. It is presumed to be a reflection of the large amount of garbage present at the site, that offers nourishment for rodents, that, in turn, sustain the lizard population (see a similar observation in Ueda, 2009). Additionally, the dominant ethnic composition of the adjacent village is Malay Muslims, who refrain from hunting them.

Of interest to biologists is the abundance of the Mangrove or Crab-eating Frog, *Fejervarya cancrivora*. This species has been recorded to survive immersion in sea water for brief periods or brackish water for extended periods, which it does by increasing urea production and retention, and by remaining slightly hyperosmotic within urea and sodium flux (Dicker and Elliott, 1970; Schmidt-Nielsen and Lee, 1962; Tatsunori et al., 1995). The adults of this frog can survive with salinity up to 2.8%, and its larval stages can withstand salinity as high as 3.9% (Gordon et al., 1961). The second species of amphibian recorded, the Common Asian Toad, *Duttaphrynus melanostictus*, is a human-commensal. It may be an invasive on Borneo, and certainly, its range has increased in the past 20 years, corresponding with the clearing of forests and expansion of human settlements.

It was thought that the excessive activities along waterways are disruptive to the activities of the local herpetofauna, such as the use of river for fishing, and particularly, the use of boats with loud outboard engine. We observed a basking crocodile falling off a log, at the sound of an approaching boat!

Finally, we have a few recommendations based on this rapid assessment. Longer field studies need to be conducted, utilising specialised sampling methods (such as pitfall traps, drift fences and adhesive traps), camera trapping and the use of nets, which will doubtless add to the species inventory. A public education programme is required, that will engage the local population regarding the value of the biodiversity of the proposed Nature Reserve, vis-à-vis, ecotourism. The ease with which crocodiles and large monitors can be viewed here can be considered advantageous, and we noticed many motorists stopping to view large basking crocodiles during low tide, especially at the Sampun Bridge. Finally, locals need to be sensitized on the effects of poor garbage disposal behaviour, and encouraged to be part of clean-up programmes in the area, to attract tourists and naturalists.



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