

## FIRST REPORT ON THE HERPETOFAUNA OF PULAU PANGKOR, PERAK, MALAYSIA

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Pulau Pangkor is an important island off the west coast of Perak, Peninsular Malaysia which contains three forest reserves and a permanent source of freshwater. Despite that, the herpetofauna of the island has never been studied before. This paper represents the first report on the herpetofauna of Pulau Pangkor with the documentation of 13 species of amphibians and 44 reptiles. These numbers are by no means exhaustive and future studies are expected to uncover new records.

**Keywords:** Peninsular Malaysia, amphibians, reptiles, survey.

### INTRODUCTION

Pulau Pangkor (= Pangkor Island) is the largest among a small archipelago of four west coast islands belonging to the state of Perak which form an offshore extension of the Bintang Mountain Range of northwestern Peninsular Malaysia (Fig. 1). On the west side of Pulau Pangkor lie the small islands of Giam, Mentanggor and Pangkor Laut. The landscape of Pulau Pangkor consists of sandy beaches with mangrove swamps lining parts of

its coasts, while its interior is composed of mountainous terrain covered with large expanses of lowland and hill dipterocarp forests dominated by the palm species *Eugeissona tristis* and rattan species *Calamus castaneus* (Lee et al., 2006), and scattered outcroppings of granite boulders. Three forest reserves are present on the island; Hutan Simpan Utara and Hutan Simpan Selatan on the northern and southern tip of the island, respectively, while Hutan Simpan Sungai Pinang is located at the central region of the island.

Encompassing approximately 32 km<sup>2</sup> in area and only 3.5 km from the coast of Lumut, the island's inte-

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**Fig. 1.** Location of Pulau Pangkor, Perak and map of the island.

**TABLE 1.** Checklist of the herpetofauna of Pulau Pangkor, Perak

Taxa	Location
<b>AMPHIBIANS</b>	
<b>Ichthyophiidae</b>	
<i>Ichthyophis</i> sp.	Teluk Segadas
<b>Bufonidae</b>	
<i>Duttaphrynus melanostictus</i>	Suspension Bridge
<b>Dicroglossidae</b>	
<i>Fejervarya limnocharis</i>	Teluk Nipah
<i>Limnonectes blythii</i> (?)	Teluk Nipah
<i>Limnonectes laticeps</i>	Suspension Bridge; Teluk Nipah
<i>Limnonectes plicatellus</i>	Teluk Segadas
<i>Occidozyga laevis</i>	Teluk Segadas
<i>Occidozyga martensii</i>	Teluk Segadas
<b>Microhylidae</b>	
<i>Kaloula pulchra</i>	Suspension Bridge
<i>Microhyla heymonsi</i>	Teluk Segadas
<i>Microhyla butleri</i> (?)	Teluk Nipah
<b>Ranidae</b>	
<i>Rana glandulosa</i>	Teluk Nipah; Teluk Segadas
<b>Rhacophoridae</b>	
<i>Polypedates leucomystax</i>	Teluk Segadas
<b>REPTILES</b>	
<b>Agamidae</b>	
<i>Aphaniotis fusca</i>	Teluk Nipah; Teluk Segadas; Hutan Simpan Utara
<i>Bronchocela cristatella</i>	Hutan Simpan Utara
<i>Calotes versicolor</i>	Pantai Bogak; Pangkor Beach Resort
<i>Draco formosus</i>	Teluk Nipah; Teluk Segadas
<i>Gonocephalus bellii</i>	Suspension Bridge
<b>Gekkonidae</b>	
<i>Cnemaspis</i> sp.	Hutan Simpan Utara
<i>Cyrtodactylus consobrinus</i>	Suspension Bridge; Hutan Simpan Utara
<i>Cyrtodactylus quadrivirgatus</i>	Teluk Nipah; Hutan Simpan Utara
<i>Gehyra mutilata</i>	Hutan Simpan Utara
<i>Gekko monarchus</i>	Suspension Bridge; Hutan Simpan Utara
<i>Gekko smithii</i>	Suspension Bridge
<i>Hemidactylus brookii</i>	Puteri Bayu Resort
<i>Hemidactylus craspedotus</i>	Teluk Segadas
<i>Hemidactylus frenatus</i>	Teluk Segadas; Pangkor Beach Resort
<i>Hemidactylus platyurus</i>	Puteri Bayu Resort; Pangkor Beach Resort
<i>Ptychozoon kuhli</i>	Teluk Nipah; Hutan Simpan Utara
<b>Scincidae</b>	
<i>Dasia grisea</i> (?)	Hutan Simpan Utara
<i>Dasia olivacea</i>	Hutan Simpan Utara
<i>Eutropis multifasciata</i>	Teluk Nipah; Hutan Simpan Utara

**TABLE 1** (continued)

Taxa	Location
<i>Eutropis rugifera</i> (?)	Hutan Simpan Utara
<i>Sphenomorphus scotophilus</i> (?)	Suspension Bridge
<i>Lipinia vittigera</i> (?)	Hutan Simpan Utara
<i>Lygosoma bowringii</i>	Pantai Bogak; Pangkor Beach Resort
<b>Varanidae</b>	
<i>Varanus salvator</i>	Pangkor town; Pangkor Beach Resort; Hutan Simpan Utara
<b>Colubridae</b>	
<i>Ahaetulla fasciolata</i>	Suspension Bridge
<i>Ahaetulla prasina</i>	Hutan Simpan Utara
<i>Boiga drapiezii</i>	Hutan Simpan Utara
<i>Chrysopelea paradisi</i>	Pangkor town (Road kill)
<i>Coelognathus flavolineatus</i>	Pantai Bogak – Teluk Nipah road (Road kill)
<i>Dendrelaphis caudolineatus</i>	Pantai Bogak – Teluk Nipah road (Road kill); Hutan Simpan Utara
<i>Dendrelaphis pictus</i>	Pangkor Beach Resort; Kampung Tk. Dalam
<i>Dendrelaphis</i> sp. (?)	Hutan Simpan Utara
<i>Dryocalamus subannulatus</i>	Hutan Simpan Utara
<i>Dryophiops rubescens</i>	Hutan Simpan Utara
<i>Enhydris plumbea</i>	Teluk Segadas
<i>Oligodon purpurascens</i>	Teluk Nipah
<i>Ptyas korros</i>	Batu Keramat
<b>Elapidae</b>	
<i>Naja sumatrana</i>	Hutan Simpan Utara
<b>Pythonidae</b>	
<i>Python reticulatus</i>	Pangkor Beach Resort; Teluk Dalam
<b>Typhlopidae</b>	
<i>Ramphotyphlops braminus</i>	Pangkor Beach Resort
<b>Viperidae</b>	
<i>Tropidolaemus wagleri</i>	Teluk Ketapang (Road kill); Suspension Bridge; Hutan Simpan Utara
<i>Cryptelytrops purpureomaculatus</i> (?)	
<b>Geoemydidae</b>	
<i>Cuora amboinensis</i>	Hutan Simpan Utara
<i>Heosemys spinosa</i>	Hutan Simpan Utara

(?), Unconfirmed record.

rior remains heavily forested and maintains a river system, Sungai Pinang, which supplies a significant source of permanent fresh water in the form of multiple streams. Despite such promising conditions and its relative proximity to the mainland, the herpetofauna of Pulau Pangkor has never been surveyed and this report represents the first study of its herpetofauna.

## MATERIAL AND METHODS

Surveys were conducted in the periods March 15 – 17, May 4 – 8, June 13 to July 8, 2009, and February 22 to March 8, 2010, at the following locations: the Suspension Bridge trail (SB) at Pantai Bogak, the Waterfall trail at Teluk Nipah (TN), Teluk Segadas trail (TS) at Kampung Gedong, and Hutan Simpan Utara (HSU). Collections were carried out by active searching and chance observations (road kills). Liver tissues were taken from specimens and stored in 100% ethanol prior to fixation in 10% formalin. Fixed specimens were subsequently transferred to 70% ethanol for storage. Photographs or voucher specimens are provided for every species unless stated otherwise. Accounts without vouchers are considered unconfirmed. All specimens were deposited in the La Sierra University Herpetological Collection (LSUHC) at La Sierra University, Riverside, California, and the Universiti Kebangsaan Malaysia Herpetological Collection (UKMHC, HC) at Universiti Kebangsaan Malaysia, Bangi, Malaysia. Voucher photographs were deposited at the Universiti Kebangsaan Malaysia Digital Photograph Collection (UKMDPC) and La Sierra University Digital Photograph Collection (LSUDPC). *Hemidactylus* taxonomy follows Carranza and Arnold (2006); *Draco* taxonomy follows Manthey (2008); amphibian taxonomy follows Frost (2009). The results of this study are presented in Table 1.

## RESULTS

### AMPHIBIANS

#### Family Ichthyophiidae

*Ichthyophis* sp. (HC 231, 232; Fig. 2) collected 6 May 2009 at night under leaf debris in a clear, shallow, stagnant pool at TS.

#### Bufonidae

*Duttaphrynus melanostictus* (UKMHC 468) collected 5 May 2009 at night on dry ground at TS. Also found in abundance among chalets along Pantai Bogak.

#### Dicroglossidae

*Fejervarya limnocharis* (UKMHC 432, 439) collected 5 May 2009 during the day in a muddy ditch at TN.

*Limnonectes blythii* (No Voucher) observed 5 May 2009 at night on the ground by a forest trail at TN but eluded capture.

*Limnonectes laticeps* (UKMHC 523, 524; Fig. 3) collected 4 May 2009 at night in a shallow, slow flowing



Fig. 2. *Ichthyophis* sp. from Teluk Segadas.



Fig. 3. *Limnonectes laticeps* from the Suspension Bridge trail.

stream at SB. Also found in abundance on rocks and in streams at TN.

*Limnonectes plicatellus* (LSUHC 9199) male collected 16 March 2009 at night while it was calling in a shallow swamp at TS.

*Occidozyga laevis* (UKMHC 460, 530; Fig. 4) collected 5 May 2009 at night in a swamp at TS.

*Occidozyga martensii* (LSUHC 9201; Fig. 5) collected 16 March on the edge of a small swamp at TS.

#### Microhylidae

*Kaloula pulchra* (UKMHC 449) collected 4 May 2009 at night on the ground at SB.

*Microhyla heymonsi* (UKMHC 454) collected 5 May 2009 at night in a swamp at TS.

*Microhyla butleri* (No voucher) observed 5 May 2009 during the day on a leaf near ground level at TN but eluded capture.





Fig. 4. *Occidozyga laevis* from Teluk Segadas.



Fig. 5. *Occidozyga martensii* from Teluk Segadas.

## Ranidae

*Hylarana glandulosa* (UKMHC 451) collected 5 May 2009 at night from a swamp at TS. Also observed at TN under a boulder by a slow flowing stream.

## Rhacophoridae

*Polypedates leucomystax* (UKMHC 542) collected 5 May 2009 at night in a swamp at TS.

## REPTILES

### Agamidae

*Aphaniotis fusca* (UKMHC 465, 494) collected 6 May 2009 at SB and TN. Adults, juveniles and hatchlings were observed at night sleeping on leaves 0.5 m from ground at those locations. Several adults were observed at HSU.

*Bronchocela cristatella* (UKMDPC 1.0097). Several adults were found on trees at HSU.



Fig. 6. *Gonocephalus bellii* from the Suspension Bridge trail.

*Calotes versicolor* (UKMDPC 1.0089-92) observed 15 March 2009 during the day on trees and around human habitations along Pantai Bogak. Also commonly observed near Pangkor Beach Resort.

*Draco formosus* (LSUDPC 4966) observed 15 March 2009 during the day on tree trunks 5 m above ground at TN and TS.

*Gonocephalus bellii* (LSUHC 9196; Fig. 6) adult male, collected 15 March 2009 at SB. It was found during the day on the ground beneath a boulder overhang with dirt in its nostrils, presumably foraging for food. Juveniles and an adult female (LSUDPC 4956) were observed at night sleeping on horizontal branches 0.5 m above ground at the same location.

## Gekkonidae

*Cnemaspis* sp. (UKMDPC 1.0099) adult was found on 16 June 2009 on the underside of a dead leaf (still attached to its branch) 1 m above the ground next to a large tree at HSU.

*Cyrtodactylus consobrinus* (UKMHC 492) collected 4 May 2009 at night on a large boulder at SB. Both juveniles and adults were observed at the same location. One adult was seen on a large boulder at HSU.

*Cyrtodactylus quadrivirgatus* (LSUHC 9191) observed 15 March 2009 at night on a leaf 0.5 m from ground at TN. Two more adults were found on fallen, decaying trees at HSU.

*Gehyra mutilata* (UKMDPC 1.0098) observed 20 June 2009 on buildings along the coast.

*Gekko monarchus* (UKMHC 446) collected 4 May 2009 at night on a boulder at SB where it occurs in syntopy with *Cyrtodactylus consobrinus*. Specimens were also frequently observed at HSU.



Fig. 7. *Ahaetulla fasciolata* from the Suspension Bridge trail.



Fig. 8. *Boiga drapiezii* from Hutan Simpan Utara.

*Gekko smithii* (UKMDPC 1.0093) observed 15 March 2009 at night on a cement hut at SB.

*Hemidactylus brookii* (UKMDPC 1.0094) observed 4 May 2009 at night in a cement drain at Puteri Bayu Resort, Pantai Bogak.

*Hemidactylus craspedotus* (LSUDPC 4970) observed 16 March 2009 at night on a tree trunk 4 m above ground at TS.

*Hemidactylus frenatus* (UKMHC 463) collected 4 May 2009 at night on a wall at Puteri Bayu Resort, Pantai Bogak. Also frequently seen at Pangkor Beach Resort.

*Hemidactylus platyurus* (No voucher) observed 4 May 2009 at night on building walls at Puteri Bayu Resort, Pantai Bogak but eluded capture. Also frequently seen at Pangkor Beach Resort.

*Ptychozoon kuhli* (LSUDPC 4953) observed 15 March 2009 during the day on a tree trunk 3 m above ground at TN. Another specimen was observed on a tree trunk at HSU.

### Scincidae

*Dasia grisea* (No voucher). An adult was seen on 19 June 2009 on a large tree in a dry part of the primary forest. It escaped into a hole in the tree.

*Dasia olivacea* (UKMDPC 1.0100). Several adults were seen on tree trunks along the coast.

*Eutropis multifasciata* (UKMHC 453) juvenile, collected 6 May 2009 during the day on the ground at TN. It is also common at HSU.

*Eutropis rugifera* (No voucher). An adult was found on 30 June 2009 on a dead tree next to a forest stream at HSU but eluded capture.

*Sphenomorphus scotophilus* (No voucher) observed 15 March 2009 during the day on boulders by stream at SB but eluded capture.

*Lipinia vittigera* (No voucher). A juvenile was observed on 13 June 2009 basking on a large boulder overgrown by vegetation next to a forest stream at HSU.

*Lygosoma bowringii* (LSUHC 9193) collected 15 March 2009 under a concrete slab at Vikri Resort, Pantai Bogak. Two more adults were found under logs at Pangkor Beach Resort.

### Varanidae

*Varanus salvator* (LSUDPC 5026) observed 15 March 2009 in Pangkor town. Also found to be common near Pangkor Beach Resort.

### Colubridae

*Ahaetulla prasina* (UKMDPC 1.0101). Several adults were found in trees at HSU.

*Ahaetulla fasciolata* (LSUHC 9207; Fig. 7) collected 15 March 2009 at night sleeping on branches 2 m above ground at SB.

*Boiga drapiezii* (UKMDPC 1.0102; Fig. 8) adult, observed 24 June 2009 at 20:45 on a large leaf 3 m above a forest stream and a subadult was found on 5 July at 21:00 on a leaf along the same stream at HSU. The next day the same specimen was found hiding beneath leaf-debris that had accumulated along the vein of the same leaf.

*Chrysopelea paradisi* (LSUDPC 4967) collected 15 March 2009 as a road-kill in Pangkor town.

*Coelognathus flavolineatus* (LSUDPC 4961) collected 15 March 2009 as a road-kill along the Pantai Bogak – Teluk Nipah road.





Fig. 9. *Dendrelaphis caudolineatus* from Hutan Simpan Utara.



Fig. 11. *Oligodon purpurascens* from Teluk Nipah.



Fig. 10. *Dryocalamus subannulatus* from Hutan Simpan Utara.



Fig. 12. *Naja sumatrana* from Hutan Simpan Utara.

*Dendrelaphis caudolineatus* (LSUDPC 4960; Fig. 9) collected 15 March 2009 as a road-kill along the Pantai Bogak-Teluk Nipah road. Two adults were subsequently found on 16 and 24 June 2009 (UKMDPC 1.0108) at night sleeping on leafs at the edge of the primary forest at HSU.

*Dendrelaphis pictus* (LSUDPC 5458) adult, observed 23 February 2010 at 13:00 in vegetation at Pangkor Beach Resort; a juvenile was found at 20:30 resting in vegetation bordering a pond near Kampung Tk. Dalam.

*Dendrelaphis* sp. (No voucher) An unidentified *Dendrelaphis* was found on 26 June 2009 at night resting in vegetation 5 m above the ground along a stream at HSU.

*Dryocalamus subannulatus* (UKMDPC 1.0103; Fig. 10) adult, observed 16 June 2009 at 20:00 on low vegetation at HSU. A second specimen was found dead on the forest floor on 13 June with bite-wounds on the

posterior part of the body. A third was found as a road-kill on 28 June at the forest edge at HSU.

*Dryophiops rubescens* (UKMDPC 1.0104) adult, observed 20 June 2009 climbing down a branch in a cultivated area during the day near HSU.

*Enhydryis plumbea* (UKMHC 467) juvenile, collected 6 May 2009 during the day under leaf debris in a stagnant puddle at TS.

*Oligodon purpurascens* (UKMHC 458; Fig. 11) juvenile, collected 6 May 2009 during the day on the ground at TN.

*Ptyas korros* (LSUDPC 5459) adult, observed 3 March 2010 foraging at the forest-edge at 15:00 near Batu Keramat.

## Elapidae

*Naja sumatrana* (UKMDPC 1.0105; Fig. 12) adult, observed 5 July 2009 at 20:30 next to a small stream at HSU.

### Pythonidae

*Python reticulatus* (UKMDPC 1.0106) subadult (2 m) was found on the morning of 2 July 2009 at the restaurant of Pangkor Beach Resort. An adult (~4 m) was found on 21 June 2009 at night lying in ambush at a ditch along a road in Teluk Dalam.

### Typhlopidae

*Ramphotyphlops braminus* (LSUDPC 5460) five adults were observed on 5 March in a cultivated area near Pangkor Beach Resort; three were found beneath tree-logs; one crossing a road at night; one entering an ant-nest at night.

### Viperidae

*Tropidolaemus wagleri* (UKMDPC 1.0095) adult female, observed 6 May 2009 during the day on a tree 2 m above ground at SB. A neonate and several subadults were seen at night in trees in HSU.

*Cryptelytrops purpureomaculatus* (No voucher), reported by local villagers but remains to be confirmed.

### Geomydidae

*Cuora amboinensis* (UKMDPC 1.0109) adult was found on 1 July 2009 at 12:00 on an old garbage site next to a pond near HSU. On 13 June at 24:00 a second adult was found on the bank of a pond in a cultivated area near HSU.

*Heosemys spinosa* (UKMDPC 1.0107) adult was found on 21 June 2009 at 21:15 on the floor of the primary forest next to a forest stream at HSU.

## DISCUSSION

The islands of Peninsular Malaysia have received much attention in recent years beginning with the Seribuat archipelago (J. Grismer et al., 2004; L. Grismer et al., 2006a), Langkawi archipelago (Grismer, 2008, Grismer et al., 2006b, 2009), Pulau Perhentian (Grismer and Chan, 2008), Pulau Jarak (Grismer et al., 2008) and Pulau Besar, Melaka (Chan et al., 2009). As these studies continue to reveal, insular ecosystems harbor a high degree of diversity and endemism (Grismer and Pan, 2008). They continue to be sources for new island records and new species previously unknown to science [see Grismer and Pan (2008) and references therein]. However, despite the presence of a river system giving rise to numerous small, forest streams, the amphibian di-

versity on Pulau Pangkor was surprisingly low. Thus far, 13 species of amphibians from six families (Ichthyophiidae, Bufonidae, Dicroglossidae, Microhylidae, Ranidae, Rhacophoridae) are known from Pulau Pangkor with the families Bufonidae, Ranidae, and Rhacophoridae represented by only one species each. Megophryid frogs, which are generally conspicuous elements of forest floor ecosystems, are absent altogether. Seven out of 13 species of amphibians reported were found in the swampy areas of Teluk Segadas. Forest streams, which usually support a much higher diversity of frogs (see J. Grismer et al., 2004; L. Grismer et al., 2006a for Pulau Tioman and Wood et al., 2008 for Endau-Rompin), were dominated by one single species, *Limnonectes laticeps*. This low amphibian diversity may not be largely attributed to inadequate sampling (seven search days with three to six trained herpetologists) as two of the main streams on the island (TN and SB) were repeatedly sampled. Overall, however, the herpetofaunal diversity is in accord with, if not higher than, the diversity of other similarly-sized islands in the Seribuat Archipelago (L. Grismer et al., 2006a: Table 1). Nonetheless, this first report is by no means exhaustive (13 species of amphibians; 41 reptiles) and additional field work is needed to fully realize the herpetofaunal diversity of Pulau Pangkor.

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