Tropical Life Sciences Research, 20(1), 81–87, 2009

Preliminary Checklist of The Herpetofauna of Pulau Besar, Melaka, Malaysia

[1]Chan Kin Onn[*], [1,2]L Lee Grismer, [3]Perry Lee Wood Jr., [3]Jesse Leland Grismer and [1,4]Norhayati Ahmad

[1]Institute for Environment and Development (LESTARI), Universiti Kebangsaan Malaysia, 43600 Bangi, Selangor, Malaysia
[2] Department of Biology, La Sierra University, 4500 Riverwalk Parkway, Riverside, California, 92515-8247 USA
[3]Department of Biology, Villanova University, 800 Lancaster Ave, Villanova, Pennsylvania, 19085 USA
[4]Faculty of Science and Technology, Universiti Kebangsaan Malaysia, 43600 Bangi, Selangor, Malaysia

Abstrak: Satu tinjauan herpetofauna telah dijalankan di Pulau Besar, Melaka dari 10 hingga 12 Jun 2008. Hasil daripada tinjauan itu, lima spesies amfibia, sembilan spesies cicak (termasuk satu spesies baru gekkonid daripada genus *Cyrtodactylus*) dan satu spesies ular telah dijumpai. Ini merupakan laporan dan senarai spesies pertama mengenai herpetofauna di Pulau Besar dan Kepulauan Air.

Kata kunci: Amfibia, Kepulauan Air, Reptilia, Senarai Spesies

Abstract: A herpetological survey was conducted at Pulau Besar, Melaka from 10 to 12 June 2008, resulting in the discovery of five species of amphibians, nine species of lizards (including one new species of the gekkonid *Cyrtodactylus*) and one snake species. This report constitutes the first checklist of the herpetofauna of Pulau Besar and the Water Islands Archipelago.

Keywords: Amphibians, Water Islands Archipelago, Reptiles, Checklist

INTRODUCTION

Pulau Besar is located in the Melaka Straits, approximately 5 km off the coast of Umbai, 10 km south of the town of Melaka. It is the largest (1.33 km²) of eight islands that form the Water Islands Archipelago, off the west coast of Peninsular Malaysia. Much of the island's natural vegetation has been destroyed and converted into a golf course and several large resorts. A small pocket of natural habitat remains on the northwestern coast of the island, consisting of a small mangrove swamp and rocky granite outcrops which are disjointed in their distribution across the island.

Previously, a snake survey was conducted on mainland Melaka (Batchelor 1958) but little has been done to uncover the diversity of its offshore islands. The only report ever produced from its offshore islands was of a single species, *Leiolepis belliana*, reported by Boulenger (1912). The other seven, smaller satellite islands in the Water Islands Archipelago have large boulders lining the coast and interiors covered by undisturbed forest. Such habitats are

[*]Corresponding author: kin_onn@yahoo.com

expected to harbor additional species which future surveys are likely to uncover. We present here the first report on the herpetofauna of Pulau Besar, Melaka.

MATERIALS AND METHODS

Field surveys were conducted from 10 to 12 June 2008 during the day and night, and covered the entire island. Specimens were captured by hand or with blowpipes. Liver tissues were taken and stored in 100% ethanol prior to specimen fixation in 10% formalin and storage in 70% ethanol. Photographs or voucher specimens are provided for each species unless stated otherwise. All specimens have been deposited at the La Sierra University Herpetological Collection (LSUHC) at La Sierra University, Riverside, California, USA.

RESULTS

A preliminary checklist of the herpetofauna of Pulau Besar, Melaka is presented in Table 1. In this survey, we discovered five species of amphibians, nine species of lizards (including one new species of the gekkonid *Cyrtodactylus*) and one snake species. A discussion of each species observation is given. *Hemidactylus* taxonomy follows Carranza and Arnold (2006). Amphibian taxonomy follows Frost *et al.* (2006).

ANURA

Microhylidae

Microhyla heymonsi Vogt 1911
Several males were heard calling from 2030–2400 h in grassy areas along the periphery of the golf course. One specimen (LSUHC 8959) was collected.

Kaloula pulchra Gray 1831
One adult female (LSUHC 8958) was observed near a fountain on the grounds of the Putera Panti Resort at 2100 h.

Bufonidae

Duttaphrynus melanostictus (Schneider 1799)
A pair was observed at the base of a fountain on the grounds of the Putera Panti Resort at 2100 h. Another adult male (LSUHC 8957) was found at the base of a granitic outcropping near the beach.

Ranidae

Hylarana erythraea (Schlegel 1837)
One adult female (LSUHC 8956) was found near an ephemeral pond at the edge of the golf course.

Rhacophoridae

Polypedates leucomystax Gravenhorst 1829
A single male (LSUHC 8932) was observed in a well near the edge of the golf course. Several others (males and females) were observed in a fountain on the grounds of the Putera Panti Resort at 2100 h.

SQUAMATA (LIZARDS)

Gekkonidae

Cyrtodactylus batucolus Grismer, Chan, Grismer, Wood, Belabut 2008
Several lizards were observed between 2030 and 0200 h, mostly on boulders that had cracks or exfoliations into which they could escape. Occasionally, lizards were found on the sides of large trees, in small rocky areas at the mangrove's edge, or on the sides of cement buildings. This species is ubiquitously distributed across the island so long as rocks with cracks and exfoliations are present, regardless of the condition of the forest. Seven specimens (LSUHC 8933, 8935–36, 8939, 8941–43) were collected to form the type series (Grismer *et al.* 2008c)

Gekko monarchus (Duméril & Bibron 1836)
Three specimens (LSUHC 8952, adult male; LSUHC 8951, gravid female; LSUHC 8950 juvenile) were collected as vouchers. Several other specimens were observed on rocks, trees, sides of buildings, and on grass along open fields.

Gehyra mutilata (Wiegmann 1834)
A single gravid female (LSUHC 8963) was collected 2.5 m above the ground on the trunk of a large tree near the beach. Several other specimens were seen, but only on trees.

Hemidactylus frenatus Duméril & Bibron 1836
This species was ubiquitous throughout the island. Two adult males (LSUHC 8953–54) were collected as vouchers.

Hemidactylus platyurus (Schneider 1792)
Multiple individuals were observed on buildings during the night. No specimens or photographs were taken, and this record remains unconfirmed.

Scincidae

Eutropis multifasciata (Kuhl 1820)
E. multifasciata were commonly seen during the day across the entire island in all terrestrial habitats. Lizards were surprisingly abundant in an open grassy field with loamy soil following a brief rain: we observed 40–50 individuals in an area of less than 30 m^2. One adult female (LSUHC 8962) was collected as a voucher.

Lygosoma bowringii (Günther 1864)
An adult male (LSUHC 8960) and female (LSUHC 8961) were found during the day beneath a log in sandy soil along the beach.

Leiolepididae

Leiolepis belliana (Hardwicke & Gray 1827)
An adult male (LSUHC 8964) was collected from the golf course and two other individuals were also seen. This species had previously been reported on the island (Boulenger 1912) but long before a golf course was present.

Varanidae

Varanus salvator (Laurenti 1768)
Several large individuals were seen in a pond near the center of the island. No specimens or photographs were taken and this record remains unconfirmed.

SQUAMATA (SNAKES)

Typhlopidae

Ramphotyphlops braminus (Daudin 1803)
A single specimen (LSUHC 8977) was found crawling above ground at 2300 h at the base of a large granite rock in soft soil.

DISCUSSION

The discovery of another new species of lizard from an offshore island in Peninsular Malaysia once again underscores the need for more studies to be carried out in these insular strongholds of overlooked biodiversity, with more discoveries expected as the remaining islands in the archipelago are explored. As ongoing research continues to demonstrate, isolated ecosystems such as offshore islands, mountaintops, granite outcrops, caves and karst formations harbor a disproportionately large number of endemic species (Chan *et al*. 2009; Chan & Grismer 2008; Das 2005; Das & Grismer 2003; Grismer & Chan 2008; Grismer & Das 2006; Grismer & Ngo 2007; Grismer 2005, 2008; Grismer & Norhayati 2008; Grismer *et al*. 2006b, 2008a, b, c, d, forthcoming a; Leong &

Grismer 2004). Intensive and long term surveys conducted in the Seribuat Archipelago since 2001 uncovered at least 13 new species and 186 new insular species records (see Grismer *et al.* 2006a and references therein) and preliminary surveys on the Perhentian Islands resulted in the discovery of at least three species of lizards new to science (Grismer & Chan 2008; Grismer *et al.* forthcoming b). The Water Islands Archipelago offers the same potential for discovery. Here, we briefly surveyed only one island, the most disturbed of the seven, and we expect that future surveys will discover more species, especially snakes. Similar habitats and undisturbed forests occur on the other, smaller islands and thus, we expect additional discoveries to be made there as well.

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Appendix

Table 1: Checklist of the herpetofauna of Pulau Besar, Melaka.

Taxa	Location
ANURA	
Microhylidae	
Microhyla heymonsi	Mangrove
Kaloula pulchra	Resort grounds
Bufonidae	
Duttaphrynus melanostictus	Resort grounds
Ranidae	
Hylarana erythraea	Mangrove
Rhacophoridae	
Polypedates leucomystax	Mangrove
SQUAMATA (Lizards)	
Gekkonidae	
Cyrtodactylus batucolus	Granite outcrops, abandoned buildings
Gekko monarchus	Granite outcrops
Gehyra mutilata	Resort grounds
Hemidactylus frenatus	Resort grounds
Hemidactylus platyurus (unconfirmed)	Resort grounds
Scincidae	
Eutropis multifasciata	Beach
Lygosoma bowringii	Beach
Leiolepidae	
Leiolepis belliana	Golf course
Varanidae	
Varanus salvator (unconfirmed)	Pond near golf course (sighting)
SQUAMATA (Snakes)	
Typhlopidae	
Ramphotyphlops braminus	Granite outcrop