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First report of the herpetofauna of Pulau Tinggi, Johor, West Malaysia

Pulau Tinggi is a small island (17 km²), located 32 km south-east of the coastal town of Mersing, in Johor, West Malaysia, and forms part of the southern section of the Seribu Archipelago in the South China Sea. Of the 13 islands in the state of Johor, Pulau Tinggi has the highest peak at 625 m above sea level. This mountainous and largely uninhabited island is dissected by many small streams, and its coastline is characterised by white sandy beaches and many caves. With the exception of minor logging on the lower periphery of the west coast, the interior of the island consists of primary forest with closed canopy but lacks large granitic boulders found on the outer islands of the Seribu Archipelago Pulau Tioman (Day, 1990; Grismer et al., 2002; Hendrickson, 1966a,b; Lim & Lim, 1999), its neighboring island Pulau Tulai (Hendrickson 1966a; Grismer et al., 2001b; Pulau Aur (Grismer et al., 2001a), and Pulau Pemanggil (Youmans et al., 2003).

Although the herpetofauna of the outer islands has been thoroughly examined, (Pulau Tioman: Day, 1990; Grismer et al., 2002; Hendrickson, 1966a,b; Lim and Lim, 1999; Pulau Tulai: Hendrickson 1966a; Grismer et al., 2001b; Pulau Aur: Grismer et al., 2001a; Escobar et al., 2003; and Pulau Pemanggil: Youmans et

al., 2003), this is the first published report of the herpetofauna of Pulau Tinggi. A total of 15 species were confirmed: two species of ranids, one rhacophorid, four species of gekkonids, two species of scincids, five species of agamids, and one colubrid. An additional species of snake and one gecko were observed but were not collected or photographed and therefore remain unconfirmed sightings.

Collecting was conducted with the intention of obtaining a preliminary list of the species present, and to obtain tissue samples of representative specimens. Collections were made by hand and blowpipe during the afternoon (1300-1700 h) and evening (1900-2300 h) of 23 July 2002 on the southeast side of the island, in the village of Pasir Panjang, the Pasir Panjang jungle trail, and Pasir Panjang waterfall trail and stream (02° 17'N; 109° 06'E). Tissue samples of liver were taken and stored in 100% ethanol. Specimens were preserved in 10% formalin and stored in 70% ethanol. Museum acronyms are ZRC = Zoological Reference Collection, at the Raffles Museum of Biodiversity Research, National University of Singapore, Singapore; LSUPC = La Sierra University Photographic Collection at the Department of Biology, La Sierra University, Riverside, California, 92515-8247.

Anura

Limnonectes blythii (Boulenger, 1920) (ZRC.1.10036).- Individuals were observed during the day along a moderately-flowing rocky stream with small waterfalls that ran through primary forest. One was collected at night on rocks next to the stream.

Polypedates leucomystax (Gravenhorst, 1829) (ZRC.1.10038).- Several individuals were observed at night on vegetation next to an overflowing reservoir behind the village. One specimen was collected.

Rana hosii Boulenger 1891, (ZRC.1.10037).- Several individuals were observed during the day along a moderately-flowing stream with small waterfalls that ran through primary forest. One individual was observed diving from a 4 m high perch into the stream to escape. One specimen was collected at night from this stream, and

others were observed burrowing into the leaf litter at the bottom of streams to escape.

Squamata (Lizards)

Aphaniotis fusca (Peters, 1864) (ZRC.2.5496).- Several individuals were observed during the day on trees 2-4 m above ground level. At night they were observed sleeping on the lower foliage of trees. One specimen was collected.

Bronchocela cristatella (Kuhl, 1820) (ZRC.2.5497).- A single individual was observed along the jungle trail, 3 m above ground level on the side of a large tree (2 m diameter) next to dense shrubs.

Cnemaspis kendallii (Gray, 1845) (ZRC.2.5526).- Several individuals were observed during the day on rocks and in small caves in the vicinity of the stream bed. During the night they were observed on vegetation. One was collected.

Cosymbotus craspedotus (Mocquard, 1890)(LSUPC-L6091).- One individual was observed 2.5 m up a tree at the beginning of the Pasir Panjang jungle trail. The specimen avoided capture by crawling high into a crevice at the top of the tree.

Dasia olivacea Gray 1839, (ZRC.2.5500).- Several individuals were observed during the day on salt cedar trees (*Tamarisk* sp.) along the beach. Many avoided capture by crawling to the top of the tree or by hiding on the upper sides of branches. One specimen was collected.

Draco formosus Boulenger 1900, (ZRC.2.5502).- Several individuals were observed during the day approximately 4-10 m above ground level on large trees in primary forest.

Draco melanopogon Boulenger 1887, (ZRC.2.5494).- Several individuals were observed 2-6 m above ground level on trees.

Draco sumatranus Schlegel 1844, (ZRC.2.5495).- Several specimens were observed during the day, 4-8 m above ground level on coconut palms and dipterocarp trees along the periphery of the forest near water sources. None were observed within the primary forest.

Gekko monarchus (Duméril & Bibron, 1836) (ZRC.2.5501).- One individual was observed

during the day in rock caves near the waterfall. Several specimens were observed at night along the trail on trees, and in the caves near the waterfall. One specimen observed at night fell from a tree and landed on a student's shoulder.

Hemidactylus frenatus Duméril & Bibron 1836, (ZRC.2.5498).- Specimens were observed and collected during the day while turning boards and rocks along the beach in Pasir Panjang village. Several individuals were also observed at night on walls in the village.

Mabuaya multifasciata (Kuhl, 1820) (ZRC.2.5499).- One specimen was collected within the waterfall stream. It first avoided capture by submerging itself in the stream, but was caught when it came up approximately 1.5 m upstream from where it originally submerged itself. Other specimens were observed foraging in the vicinity of human habitation.

Ptychozoon kuhlii (Stejneger, 1902).- One individual was observed basking 6 m high along the trunk of a large dipterocarp tree. The individual was not collected or photographed and remains an unconfirmed sighting.

Squamata (Snakes)

Ahaetulla prasina (Boie, 1827) (LSUPC-S3610).- A single individual was observed during the day on the forest floor while it crossed the Pasir Panjang jungle trail.

Dendrelaphis sp. (Gray, 1834).- A pair was observed 2 m above ground level on a small tree that was 2 m from the jungle trail. As they were approached, they launched themselves onto the forest floor and escaped downhill in the direction of the stream before being identified.

This report on the herpetofauna of Pulau Tinggi is preliminary, being that only a small portion of the island was sampled (Pasir Panjang village, jungle trail, and waterfall trail and stream) for a single afternoon and evening. Therefore, the species mentioned are considered only a subset of the total island diversity. All species reported from Pulau Tinggi occur on the much larger Pulau Tioman with the exception of *Draco formosus*. Although only three species of *Draco* have been found on Pulau Tinggi, *D. formosus*, *D. melanopogon* and *D. sumatranus*, we suspect that due to the rich forest habitat, ad-

ditional species such as *D. fimbriatus* will be found. The absence of the common saxicolous skink *Sphenomorphus scotophilus* may be due to a lack of large granitic boulders in the forest habitat. This may also account for the absence of a large endemic species of *Cnemaspis* such as occurs on Pulau Tulai and Pulau Tioman (*Cnemaspis* sp. Das and Grismer in press.), Pulau Aur (*Cnemaspis* sp. Das and Grismer in press), and Pulau Pemanggil (*Cnemaspis* sp. Grismer et al., in prep). Future sampling of the herpetofauna of this island is being planned.

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A reinterpretation of the agamid genus *Mantheyus* Ananjeva and Stuart, 2001, as a junior synonym of *Ptyctolaemus* Peters, 1864, with comments on the problem of monotypic genera

Recently, Ananjeva and Stuart (2001) erected a new monotypic genus to accommodate the south-east Asian agamid lizard *Ptyctolaemus phuwuanensis* Manthey and Nabhitabhata, 1991, and to separate it from its original congener *P. gularis* Peters, 1864. The arguments for this generic partition were based on a reexamination of the scarce material of these two species which are both extremely rare in collections.

The problem that led us to submit the present note was that Ananjeva and Stuart (2001) interpreted the undoubtedly existing morphological differences between the two rare agamid species in a purely phenetic manner, and that they did not deal with the conceptual background of the notion of the genus in zoology. In spite of the existence of a diversity of species concepts, a widely accepted definition of what a genus is, is largely lacking, and only few trials have been made to put the notion of the genus concept on a less arbitrary basis (e.g., Dubois, 1988). In order to promote such a discussion, we want to make the following points:

1. The monophyly of all species accommodated in one genus is an indispensable prerequisite.

2. In a Hennigian sense (see Hennig, 1950, 1966), the morphological characters by which a genus is defined must be synapomorphies and not plesiomorphic character states.

3. But if apomorphic characters are used to define genera, they should not be obvious, environment-correlated adaptations, because in this case, morphological divergence may lead to an overestimation of the (phylo)genetic distance (see below).

4. It must be borne in mind that the conceptual purpose of the genus as a hierarchical category in our binary nomenclatural system is primarily to link related species together, so that a monotypic