


Short Communication

Herpetofauna Diversity in Palayo Waterfall, Cipta Karya Village, Bengkayang Regency, West Kalimantan, Indonesia

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Abstract

Reports on herpetofauna diversity in Kalimantan are often based on surveys within national parks. This survey aims to determine the list of herpetofauna species outside the conservation areas. The survey was conducted at the Palayo Waterfall area, Cipta Karya Village, Sungai Betung District, Bengkayang Regency, West Kalimantan, Indonesia. The survey activities were carried out on November 12-13, 2022, using the Visual Encounter Survey (VES) method with a time-constrained search along the stream of Palayo Waterfall. The result showed that 19 herpetofauna species were found, consisting of 8 amphibian species from 4 families and 11 reptile species from 6 families. Generally, the IUCN conservation status of herpetofauna species found is of the Least Concern. Only one species was categorized as Vulnerable (*Meristogenys jerboa*), one as Endangered (*Leptolalax marmoratus*) and one as Data Deficient (*Limnonectes conspicillatus*).

INTRODUCTION

Kalimantan as one of the islands in Indonesia has high biodiversity, especially the herpetofauna community which has been found as many as 374 species (Widjaja *et al.* 2014). Herpetofauna have an important role in the ecosystem as environmental bioindicators and top predators in the food chain so that some herpetofauna have narrow and limited ecological niches and even only found in specific habitats. Unfortunately, reports on herpetofauna surveys in Kalimantan are often conducted within conservation areas such as national parks (Mediyansyah, 2008; Purbatrapila, 2009; Sardi *et*

al. 2014; Veith *et al.* 2014). There are still few herpetofauna surveys outside conservation areas in West Kalimantan like a survey conducted by Maulidi *et al.* (2019) in Munggu Village found 24 herpetofauna. Thus explaining that herpetofauna surveys conducted outside conservation areas are relatively diverse. For this reason, carrying out an inventory of herpetofauna diversity outside conservation area is necessary, especially in Palayo Waterfall, Cipta Karya Village, Bengkayang Regency, West Kalimantan as one of the disturbed areas by anthropogenic activities. This survey aims to obtain a species list of herpetofauna and describe

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some threatened herpetofauna species. The data is expected to be used for future studies or management actions in the Palayo Waterfall area.

MATERIALS AND METHODS

The survey was conducted at the Palayo Waterfall, Cipta Karya Village, Sungai Betung District, Bengkayang Regency, West Kalimantan, Indonesia (109°25'11.864"E; 0°50'58.722"N) (Figure 1). The survey site consists of an environmental hue in the form of rocks on the banks of the river and is supported by vegetation in the form of bamboo trees, and rubber trees, there are also rice plants and large trees and topography on sloping soil (hills). The survey activities were carried out on November 12-13, 2022 using the Visual Encounter Survey (VES) method with a time-constrained search along Palayo

Waterfall stream (observation length: 1.000 m) (Kusrini, 2019). Data was retrieved twice during the day (08.00-11.00 WIB) to find diurnal herpetofauna and at night (19.00-21.00 WIB) to obtain nocturnal herpetofauna. Herpetofauna found were only documented and not taken for specimens. Herpetofauna found were recorded the number of species and individuals and documented for identification purposes. Identification of herpetofauna was carried out by matching the morphological characteristics possessed by using literature such as Das (2010), Das et al. (2022), Inger et al. (2017), and Malkmus et al. (2002) and their conservation status based on IUCN Red List. Herpetofauna that have been identified are then recorded and analyzed descriptively based on the survey location.

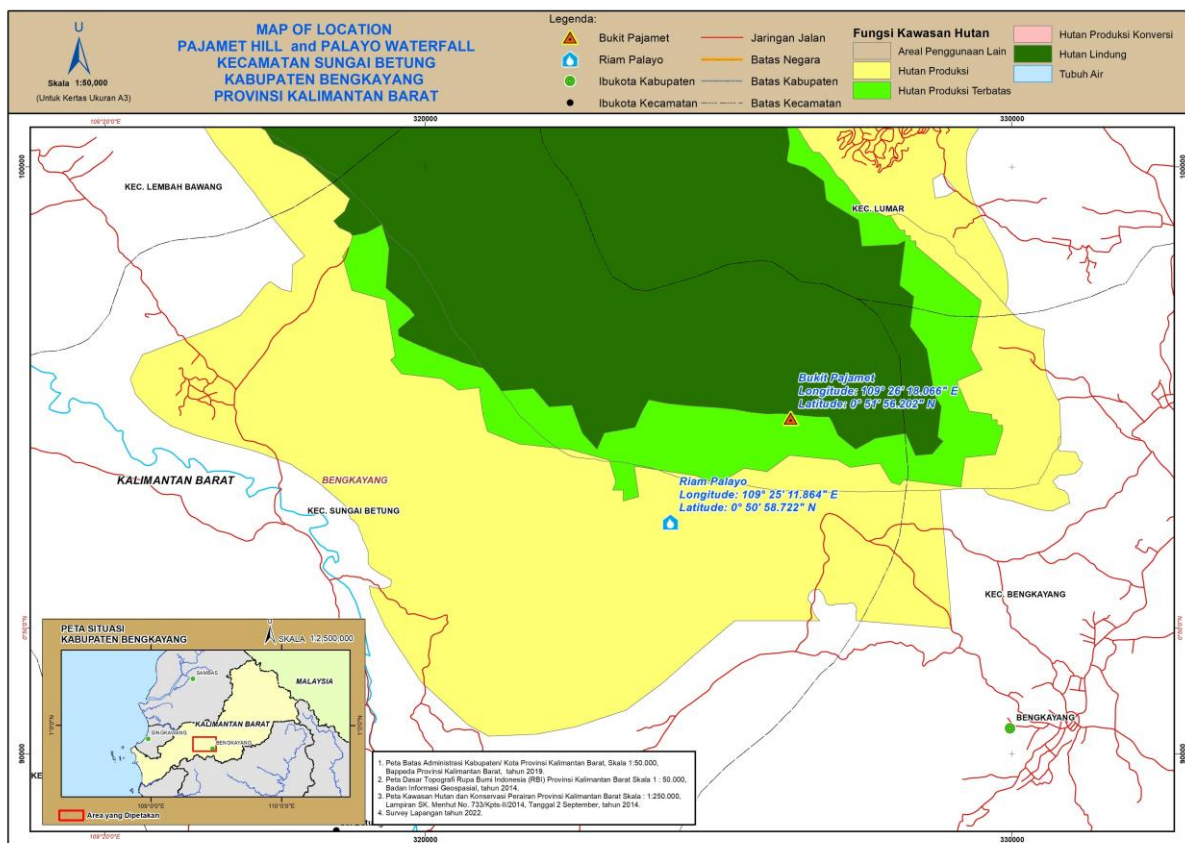


Figure 1. Map of herpetofauna survey in Bengkayang Regency West Kalimantan

RESULTS AND DISCUSSION

During the survey in Palayo waterfall, 19 herpetofauna species were found, consisting of 8 amphibian species from 4 families and 11 reptile species from 6 families. Generally, the IUCN conservation status of herpetofauna species found is of the Least Concern. Only one species

was categorized as Vulnerable (*Meristogenys jerboa*), one as Endangered (*Leptotalax marmoratus*), and one as Data Deficient (*Limnnectes conspicillatus*) (Table 1). Photographs of a selection of these herpetofauna species are shown in Figure 2.

Among ten herpetofauna species consisting of six amphibians (*Ansonia spinulifer*, *Limnonectes conspicillatus*, *Leptolalax gracilis*, *Leptolalax marmoratus*, *Meristogenys jerboa* and *Staurois guttatus*) and four reptiles (*Dasia vittata*, *Sphenomorphus multisquamatus*, *Tropidophorus brookei* and *Calamaria borneensis*) species are endemic to Borneo. According to Dehling & Dehling (2017) only *Limnonectes conspicillatus* has an unknown distribution that is currently only concentrated in the Sarawak region of Malaysia based on its locality, so that the encounter with this amphibian can add information about its distribution which is not limited to the Sarawak region.

Based on IUCN Red List conservation status, most of the herpetofauna are in the Least Concern category, meaning the population is safe. Two of the herpetofauna species were found to have a high risk

of extinction, *Meristogenys jerboa* was categorized as Vulnerable and *Leptolalax marmoratus* was categorized as Endangered species. Only one herpetofauna species have the category as Data Deficient (*Limnonectes conspicillatus*). Contrary to its status, all herpetofauna species found are not protected under wildlife laws in Indonesia so the potential for large-scale exploitation will continue without legal protection in Indonesia.

The number of herpetofauna species found was quite relatively high compared to waterfall areas. At Banyu Nibo Waterfall Yogyakarta, fifteen herpetofauna species from eight families were reported and in Kodok Waterfall Malang found eight species from seven families (Saputro *et al.* 2020; Wanto, 2019). This difference is possible due to differences in habitat, length of observation, and the number of surveyors in the field.

Table 1. Herpetofauna species encountered during this survey

Family	Genus	Species	Common Name	IUCN	Total
Amphibians					
Bufonidae	Ansonia	<i>Ansonia spinulifer</i> *	Spiny Slender Toad	LC	1
	Phrynoidis	<i>Phrynoidis asper</i>	River Toad	LC	1
Dicroglossidae	Fejervarya	<i>Fejervarya cancrivora</i>	Crab-eating Frog	LC	1
	Limnonectes	<i>Limnonectes conspicillatus</i> *	Matang Creek Frog	DD	1
Megophryidae	Leptolalax	<i>Leptolalax gracilis</i> *	Sarawak Slender Litter Frog	LC	2
		<i>Leptolalax marmoratus</i> *	Marmorate Slender Litter Frog	EN	1
Ranidae	Meristogenys	<i>Meristogenys jerboa</i> *	Western Torrent Frog	VU	2
	Staurois	<i>Staurois guttatus</i> *	Black-spotted Rock Skipper	LC	2
Reptiles					
Agamidae	Bronchocela	<i>Bronchocela cristatella</i>	Green Crested Lizard	LC	2
Gekkonidae	Cyrtodactylus	<i>Cyrtodactylus</i> sp.	Bow-fingered Gecko	-	1
Lacertidae	Takydromus	<i>Takydromus sexlineatus</i>	Asian Grass Lizard	LC	2
Scincidae	Dasia	<i>Dasia vittata</i> *	Striped Tree Skink	LC	1
	Eutropis	<i>Eutropis multifasciata</i>	Common Sun Skink	LC	3
	Lipinia	<i>Lipinia vittigera</i>	Common Striped Skink	LC	1
	Sphenomorphus	<i>Sphenomorphus multisquamatus</i> *	Asian Forest Skink	LC	1
Colubridae	Tropidophorus	<i>Tropidophorus brookei</i> *	Brook’s Keeled Skink	LC	2
	Calamaria	<i>Calamaria borneensis</i> *	Bornean Reed Snake	LC	1
	Pseudorabdion	<i>Pseudorabdion longiceps</i>	Dwarf Reed Snake	LC	1
Xenopeltidae	Xenopeltis	<i>Xenopeltis unicolor</i>	Sunbeam Snake	LC	1
Total					27

Notes: [*] Endemic Borneo (Das, 2010), LC: Least Concern, VU: Vulnerable, EN: Endangered, and DD: Data Deficient base on IUCN RedList

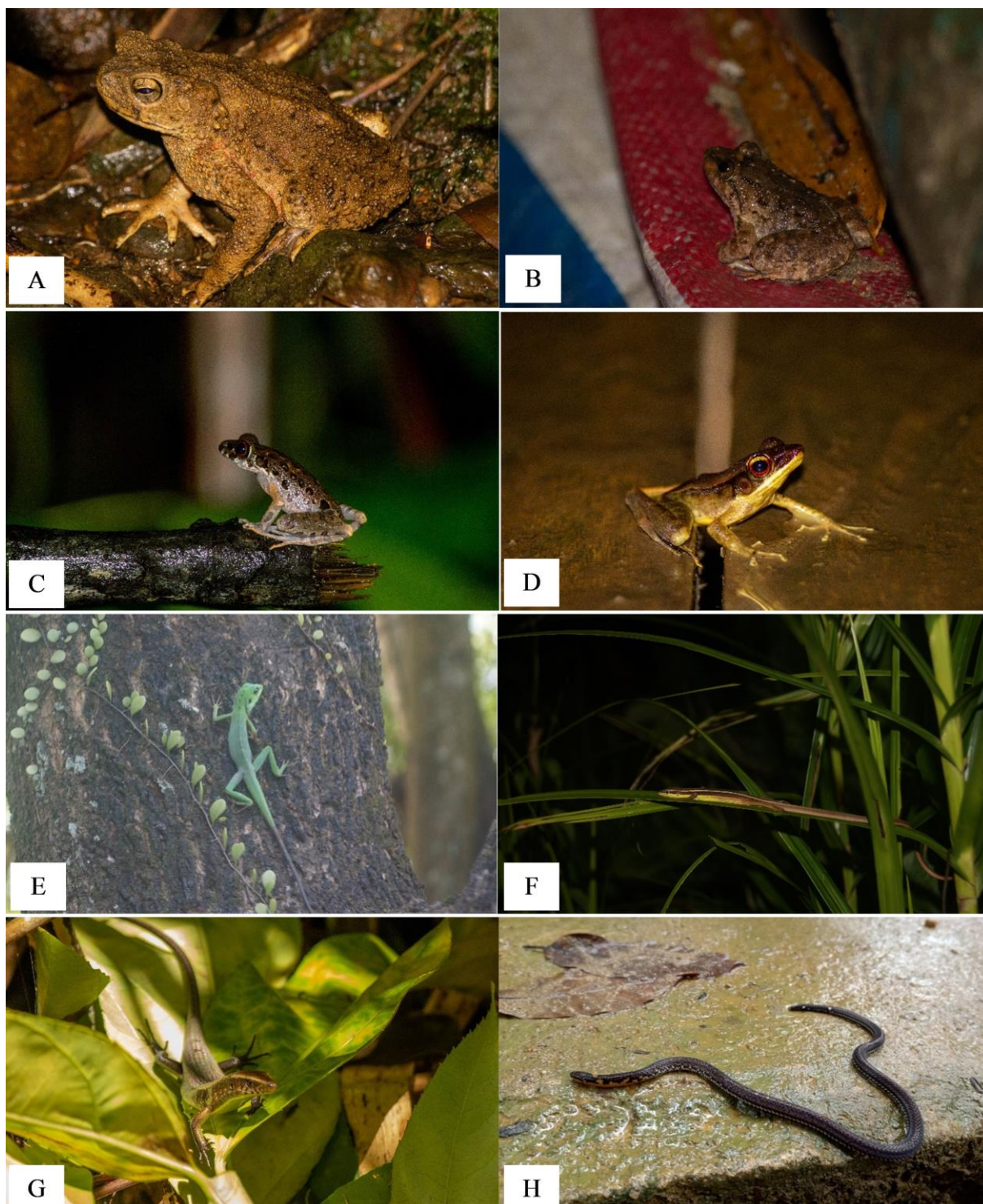


Figure 1 Eight of the 19 species were found in this survey. A. *Phrynoidis asper*, B. *Limnonectes conspicillatus*, C. *Leptolalax marmoratus*, D. *Meristogenys jerboa*, E. *Bronchocela cristatella*, F. *Takydromus sexlineatus*, G. *Eutropis multifasciata*, H. *Calamaria borneensis*

Leptolalax marmoratus was found in the litter layer with closed forest near the stream at night. Based on the IUCN SSC Amphibian Specialist Group (2019) and Matsui *et al.* (2014) until now the distribution of this species has been widely reported in southwestern Sarawak, there was only one encounter in West Kalimantan by Ujang *et al.* (2021)

in Bukit Baka Bukit Raya National Park. So that this encounter can add information on its distribution which also includes the West Kalimantan region. Palayo Waterfall as a tourist destination managed by individuals will undoubtedly modify its natural habitat. Unorganized and attentive modification of habitat can certainly threaten herpetofauna

communities, especially those that are endangered species. This is in line with Janiawarti *et al.* (2016) that herpetofauna relative abundance tends to decrease with an increase in the level of modification and water sources and vegetation cover positively correlated with the herpetofauna community.

CONCLUSION

Based on the results of this study, it could be concluded that 19 herpetofauna species were found, consisting of 8 amphibian species from 4 families and 11 reptile species from 6 families with herpetofauna conservation status found mainly in the Least Concern category and followed by Vulnerable, Endangered and Data Deficient category.

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