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The Amphibian Diversity of Bukit Jana, Taiping, Perak

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Abstrak: Kajian terhadap fauna amfibia di Bukit Jana, Taiping, Perak telah dijalankan dari Januari 2009 sehingga Disember 2010; pemerhatian dilakukan pada 12 malam. Dua puluh empat spesies katak dari 14 genera dan 6 famili telah direkodkan menghuni kawasan Bukit Jana. Tujuh spesies komensal telah dijumpai sekeliling habitat manusia, berdekatan dengan kaki bukit manakala katak hutan biasa kebanyakannya dijumpai berdekatan dengan sungai, anak sungai dan lantai hutan. Ini merupakan senarai semak pertama untuk amfibia Bukit Jana, Perak dan didapati menyumbang sebanyak 22% daripada 107 spesies katak yang telah direkodkan berhabitat di Semenanjung Malaysia.

Kata kunci: Bukit Jana, Taiping, Perak, Sungai, Amfibia

Abstract: The study on the amphibian fauna of Bukit Jana, Taiping, Perak was carried out from January 2009 until December 2010 with a total of 12 nights of observation. Twenty four species of frogs from 14 genera and 6 families were recorded to inhabit the Bukit Jana areas. Seven commensal species were found around human habitations near the foothill whereas the others are typical forest frogs found mostly near the rivers, streams and forest floor. This is the first amphibian checklist of Bukit Jana, Perak and it contributed 22% out of 107 species of frogs that are recorded to inhabit Peninsular Malaysia.

Keywords: Bukit Jana, Taiping, Perak, River, Amphibian

INTRODUCTION

Perak (21005 km^2) is the second largest state in Peninsular Malaysia after the state of Pahang (35965 km^2). In Perak there are many forest areas, rivers, streams, waterfalls and lakes that are still unexplored and very rich with various types of flora and fauna including amphibians and reptiles. The mountain ranges, Banjaran Bintang located in the middle of Perak extends from the border of Thailand to central Perak near Ipoh.

In Perak, study on amphibians and reptiles were done by several local and foreign scientists at various locations. For example Kiew *et al*. (1995) studied the herpetofauna at Temenggor forest, Norsham *et al.* (2000) at Belum forest, Grismer *et al*. (2006) at Temenggor forest, Grismer *et al*. (2010) at Bukit Larut and Gunung Bubu and, Chan *et al*. (2010b) at Pangkor Island. Apart from these areas, the other places in Perak seem to be poorly studied with regards to herpetofauna. Thus, the main purpose of this study is to observe and record the amphibian species that inhabit the forest areas around Bukit Jana, Perak.

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Kampung Bukit Jana (4°53'N/100°45'E, <200 m asl) (Fig. 1) is located near Kamunting town in the district of Larut Matang and Selama and it is 13 km from Taiping and 75 km from Ipoh. Located within the Banjaran Bintang ranges, Bukit Jana peak (app. 600 m asl) is much lower compared to Bukit Larut (1036 m asl). The main drainage system, Sungai Jana arises from Banjaran Bintang, flowing into Sungai Sepetang and empties into Straits of Malacca through a small town, Kuala Sepetang. This area is surrounded by dipterocarp forest and fruit orchards. At the foothill, most of the area has been developed into housing estates, villages and golf resort.

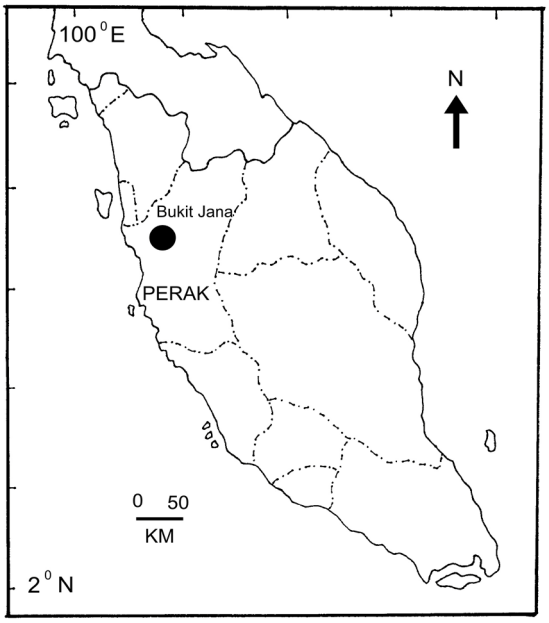

Figure 1: Location of Bukit Jana, Perak.

MATERIALS AND METHODS

The amphibian fauna of Bukit Jana, Perak was investigated for a 2 year period starting from January 2009 until December 2010 with a total of 12 nights of observation. Collections of amphibian species were done along the river banks, small forest streams, swampy areas, puddles, ditches, forest trails, forest floor and around human habitations. The sampling team comprised of four persons, who searched and captured the frogs at night (20:00 to 22:00 hours) by hand and using sweep nets. All the frog specimens were identified using Berry (1975) and Inger and Stuebing (1997) as references. For the scientific name of each taxon, Frost (2010) was followed. Life specimens of frogs were photographed using Olympus digital camera with 10X optical zoom. Later, all the specimens were fixed with 10% formalin and stored in 70% ethanol and deposited at School of

Pharmaceutical Sciences, Universiti Sains Malaysia (USM) for future reference (Appendix 1).

RESULTS

Twenty four species of amphibians from 14 genera and 6 families were recorded to inhabit Bukit Jana areas. Some photographed specimens are shown in Figure 2 until Figure 11. The amphibian habitats, species checklist and the number of individual frog observed every month are shown in Tables 1 and 2. Majority of the frogs are from the family Ranidae (34.42%) followed by Dicroglossidae (19.42%), Bufonidae (18.65%), Microhylidae (18.07%), Rhacophoridae (5.19%) and Megophryidae (4.23%). The most frequently encountered species during the survey was *Phrynoidis aspera* (14%), followed by *Amolops laruensis* (13%) and *Hylarana glandulosa* (9%).

Table 1: The habitats of amphibian from Bukit Jana, Taiping, Perak.

Taxa	Habitat
Bufonidae	
Duttaphrynus melanostictus	cement ditch, on the road
Ingerophrynus parvus	on dead leaves in forest floor
Phrynoidis aspera	on the rock near the river, small forest stream, river bank
Dicroglossidae	
Fejervarya cancrivora	small pool near the river
Fejervarya limnocharis	on the road, open area
Limnonectes blythii	under big rock, pool near the river
Limnonectes laticeps	near small forest stream
Limnonectes malesianus	puddles in forest floor
Occidozyga laevis	puddles in forest floor
Limnonectes plicatellus	river bank, near small forest stream
Megophryidae	
Leptobrachium hendricksoni	swampy area, under dead leaves
Megophrys nasuta	under dead wood, small forest stream
Microhylidae	
Kaluola pulchra	in the drain near human habitation
Microhyla butleri	small bushes near the river
Microhyla fissipes	under tall grass
Microhyla heymonsi	under dead leaves, tall grass

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Table 1: (*continued*)

Taxa	Habitat
Ranidae	
Amolops larutensis	on wet rock, rock crevice in cascade area
Hylarana erythraea	ditch near human habitation
Hylarana glandulosa	swampy area, puddles near the river
Odorrana hosii	on the rock, river bank, swampy area
Hylarana picturata	on dead wood, river bank
Hylarana labialis	on big rock, perch on tree branch (<1 m)
Rhacophoridae	
Polypedates leucomystax	cement drain near human habitation
Polypedates macrotis	perch on tree branches near swampy area

DISCUSSION

Bukit Jana is located northwestern from Bukit Larut and both areas are within the Banjaran Bintang ranges. The amphibian fauna of Bukit Larut has been documented by Boulenger (1900) and recently by Grismer *et al*. (2010) but at Bukit Jana the amphibian fauna has not been surveyed and documented yet. In this study, 24 species of amphibians were recorded to inhabit the forest areas in Bukit Jana and this number constitutes 22% out of 107 amphibians (Chan *et al*. 2010a) species that are recorded in Peninsular Malaysia. According to this data, Bukit Jana also contributes a high number of amphibian species. It shows that the area provided suitable environment such as forest streams, rivers and swamps for the frogs to live and breed.

All the frogs captured and observed in this survey were typical forest frogs found mostly in the forest except for the seven human commensal species. The seven commensal species were found around human habitations and forest edge at the foothill of Bukit Jana. The presence of forest frogs and commensal species indicated that the areas have been disturbed by human but in a minimal or moderate level. Majority of the frogs recorded were riparian species because the sampling areas were more focused around the streams and rivers. These types of species live along the river banks and do not enter into the deeper parts of the forest. They usually breed in puddles, rock pools, swampy areas and small forest streams near the river.

Table 2: Species checklist and the number of individual amphibia of Bukit Jana, Taiping, Perak.

Taxa (number of species)	Number of individual												
	2009						2010						
	Jan	Mar	May	Jul	Sep	Nov	Feb	Apr	Jun	Aug	Oct	Dec	Total
Bufonidae (3)													
Duttaphrynus melanostictus	0	0	1	2	2	0	3	1	1	0	4	2	16
Ingerophrynus parvus	0	0	0	1	2	0	0	2	1	0	0	3	9
Phrynoidis aspera	4	7	5	8	6	5	7	6	5	8	4	7	72
Dicroglossidae (7)													
Fejervarya cancrivora	1	0	0	2	0	1	2	0	1	0	1	2	10
Fejervarya limnocharis	5	3	1	4	3	5	2	3	5	4	3	5	43
Limnonectes blythii	2	3	0	0	1	2	0	1	0	3	0	1	13
Limnonectes laticeps	3	0	1	0	0	2	0	0	1	0	2	0	9
Limnonectes malesianus	0	0	0	0	1	0	0	1	0	0	1	0	3
Occidozyga laevis	0	0	0	1	1	0	0	0	1	1	0	0	4
Limnonectes plicatellus	1	2	0	3	2	1	1	3	1	2	0	3	19
Megophryidae (2)													
Megophrys nasuta	2	3	1	4	2	0	1	1	3	0	1	1	19
Leptobrachium hendricksoni	0	1	0	0	0	1	0	0	0	1	0	0	3

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Table 2: (*continued*)

Taxa (number of species)	Number of individual												
	2009						2010						
	Jan	Mar	May	Jul	Sep	Nov	Feb	Apr	Jun	Aug	Oct	Dec	Total
Microhylidae (4)													
Kaluola pulchra	2	2	0	0	1	0	2	0	0	2	1	0	10
Microhyla butleri	6	5	3	4	3	0	3	2	2	3	1	5	37
Microhyla heymonsi	0	0	1	0	0	0	0	0	1	0	0	0	2
Microhyla fissipes	8	4	3	4	2	3	4	3	3	5	2	4	45
Ranidae (6)													
Amolops larutensis	5	7	4	6	5	6	4	7	5	8	4	5	66
Hylarana erythraea	1	2	0	1	2	0	2	1	1	0	3	1	14
Hylarana glandulosa	3	4	5	6	5	5	4	3	3	4	2	3	47
Hylarana labialis	2	3	4	3	2	3	3	4	2	5	2	3	36
Odorrana hosii	0	0	0	0	0	1	0	1	0	2	0	1	5
Hylarana picturata	0	0	1	2	2	0	1	0	2	1	2	0	11
Rhacophoridae (2)													
Polypedates macrotis	2	3	0	3	2	0	4	2	3	3	2	1	25
Polypedates leucomystax	0	0	0	0	1	0	0	0	1	0	0	0	2
Number of individual	47	49	30	54	45	35	43	41	42	52	35	47	520
Number of species	15	14	12	16	19	12	15	16	19	15	16	16	24

Some species are difficult to locate due to their behaviors and characteristics. The two leaf litter frogs, *Megophrys nasuta* and *Microhyla fissipes* were difficult to locate because of their camouflage characteristics. Other species such as *Limnonectes malesianus* and *Limnonectes plicatellus* live in the forest and only come to the river for breeding. In this survey, we only encountered three and four individuals of these species respectively. Two species of tree frogs were observed, including the commensal species, *Polypedates leucomystax* and the typical forest species, *Polypedates macrotis*. We did not find other species of rhacophorids presumably because of their arboreal habit. They live on tree canopies and only come down to the forest floor during their breeding season.

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Figure 2: *Phrynoidis aspera.*

Figure 3: *Fejervarya cancrivora.*

Figure 4: *Limnonectes plicatellus.*

Figure 5: *Leptobrachium hendricksoni.*

Figure 6: *Megophrys nasuta.*

Figure 7: *Kaloula pulchra.*

Figure 8: *Hylarana glandulosa.*

Figure 9: *Hylarana picturata.*

Figure 10: *Odorrana hosii.*

Figure 11: *Polypedates macrotis.*

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