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An Annotated Checklist of the Herpetofauna of Beris Valley, Kedah, Malaysia

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Abstrak: Suatu kajian tentang herpetofauna telah dilakukan secara penilaian pantas di Lembah Beris, Kedah, Malaysia semasa ekspedisi saintifik yang dianjurkan oleh Pusat Pengajian Sains Kajihayat, Universiti Sains Malaysia bermula pada 14–17 Ogos 2009. Selama empat hari, kesemua amfibia dan reptilia telah ditinjau dan ditangkap disekitar parit, jalan raya, kawasan empangan, paya, denai hutan dan sungai. Keputusan menunjukkan sebanyak 14 spesies amfibia daripada 9 genus dan 5 famili mendiami kawasan tersebut. Di samping itu sebanyak tujuh spesies cicak, lima spesies ular dan dua spesies kura-kura air tawar turut mendiami kawasan tersebut. Dua spesies amfibia iaitu *Fejervarya limnocharis* dan *Microhyla butleri* dan dua spesies reptilia iaitu *Hemidactylus frenatus* dan *Varanus salvator* merupakan spesies amfibia dan reptilia yang biasa dan kerap ditemui di kawasan ini. Laporan ini adalah senarai awal dan merupakan laporan pertama tentang kepelbagaian amfibia dan reptilia di Lembah Beris, Kedah. Jumlah spesimen yang diperolehi daripada kajian ini adalah lebih rendah daripada jangkaan kerana tempoh kajian yang amat singkat dan diharapkan lebih banyak spesimen dapat direkodkan pada masa yang akan datang.

Kata kunci: Lembah Beris, Kedah, Semenanjung Malaysia, Amfibia, Reptilia

Abstract: The herpetofauna of Beris Valley, Kedah, Malaysia, was studied using a rapid assessment survey during a scientific expedition organised by the School of Biological Sciences at the Universiti Sains Malaysia, from 14–17 August 2009. All amphibians and reptiles were observed and captured during the four-day survey along the ditches, roads, dam areas, swamps, forest trails and streams. The results showed that 14 species of amphibians from 9 genera and 5 families inhabit the area, and 7 species of lizards, 5 species of snakes and 2 species of freshwater turtles were also present in the area. *Fejervarya limnocharis* and *Microhyla butleri* seemed to be the most common amphibians, while *Hemidactylus frenatus* and *Varanus salvator* were the most common reptiles in the area. This report constitutes a preliminary checklist and first record of amphibians and reptiles in Beris Valley, Kedah. The number of specimens was less than expected because of the very short survey period, but we hope to record more species in future studies.

Keywords: Beris Valley, Kedah, Peninsular Malaysia, Amphibians, Reptiles

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INTRODUCTION

The tropical rainforest of Peninsular Malaysia is home to a variety of amphibian and reptile species. Recent records showed that 103 species of amphibians (Norhayati 2009) and 270 species of reptiles (Ibrahim *et al.* 2008) inhabit Peninsular Malaysia. In Borneo, Sumatera and Sulawesi, there are 147, 85 and 36 species of amphibians, respectively (Inger 2005). Amphibians and reptiles live in various types of environments, including disturbed areas, mangroves, rivers, streams, swamps, waterfalls, lakes, primary forests, plantations, caves and mountains.

Despite the large diversity of amphibians and reptiles, few studies on inventories, checklists, feeding habits, reproduction and other aspects of their biology have been performed. Several scientists such as Norsham *et al*. (2005), Grismer *et al*. (2006), Ibrahim *et al*. (2006), Norhayati *et al*. (2007) and Chan *et al*. (2009) studied the herpetofauna in Peninsular Malaysia, while in Borneo, scientists such as Inger and Stuebing (1989, 1992), Voris and Inger (1995), Inger *et al.* (1995), Das and Hass (2003, 2005) and Matsui and Ibrahim (2006) performed similar studies.

Both in Peninsular Malaysia and Borneo, new species of amphibians are discovered yearly, which indicates that many unknown and undescribed species of anura inhabit these shores. For example, several new species of amphibians such as *Kalophrynus eok* (Das & Hass 2003), *Rhacophorus chlorophtalmus* (Das & Hass 2005), *Odorrana monjerai* (Matsui & Ibrahim 2006), *Ansonia endauensis* (Grismer *et al.* 2006), *Ansonia latiffi* (Wood *et al.* 2008), *Leptolalax kecil* (Matsui *et al.* 2009), *Gastrophrynoides immaculatus* (Chan *et al*. 2009) and *Pelophryne saravacensis* (Inger & Stuebing 2009) were recently discovered and described. The main purpose of this study was to record the amphibians and reptiles that exist in the Beris Valley area. This is a preliminary list, and we hope to record more species in future studies.

MATERIALS AND METHODS

The diversity of amphibians and reptiles of Beris Valley, Kedah, Malaysia ($5^0$96'N,$100^0$76'E, ca. 200 m asl) (Fig. 1), was investigated during a scientific expedition for a period of 4 days from 14–17 August 2009. The Beris Valley area is located in the district of Sik in the state of Kedah, and it is 55 and 77 km from Kulim and Sungai Petani, respectively. The main watercourse, the Beris River, along with its tributaries, drains this area and joins the Muda River and finally empties into Straits of Malacca. A dam was built in June 2000 across the Beris River and was completed in December 2003, supplying water to the people of Kedah and Pulau Pinang. This is the fourth dam in Kedah; the others are in Pedu, Ahning and Muda. Lowland dipterocarp forest dominates this area, with valuable timber species such as *Shorea leprosula* (meranti tembaga), *Koompasia malaccensis* (kempas), *Dryobalanops aromatica* (kapur), *Dipterocarpus sp.* (Keruing) and *Alstonia angustiloba* (Pulai). Meanwhile, the understory are dominated by *Bambusia sp*. (buluh), *Calamus sp.* (rotan) and *Eugesonnia trista*

(bertam). Besides the forest, there are rubber plantations, orchards and human settlements around the area.

The frogs, lizards and snakes were collected around the staff quarters, along the roadside ditches, culverts and swampy grounds in the vicinity of the dam area and also along forest trails, old rubber plantations and a stream at Kampung Charok Tok Tir. All specimens were observed and captured during day and night by search parties comprising four individuals using hand or sweep nets. In the Charok Tok Tir stream, collections were performed along the banks for a distance of 200 m. For night observations, we used battery powered torches and head lamps to locate the specimens. The collection of amphibian tadpoles, snake carcasses and a few lizards were performed during the daytime. All voucher specimens were fixed in 10% formalin, preserved in 70% ethanol and later deposited at the Amphibians and Reptiles Collection, Universiti Sains Malaysia, for future reference. To photograph the specimens, we used an Olympus digital camera model C-750 with 10X optical zoom. The main references used to identify the specimens were Berry (1975), Inger and Stuebing (1997), Ibrahim *et al*. (2008), Cox *et al*. (1998), Auliya (2007) and Norhayati (2009).

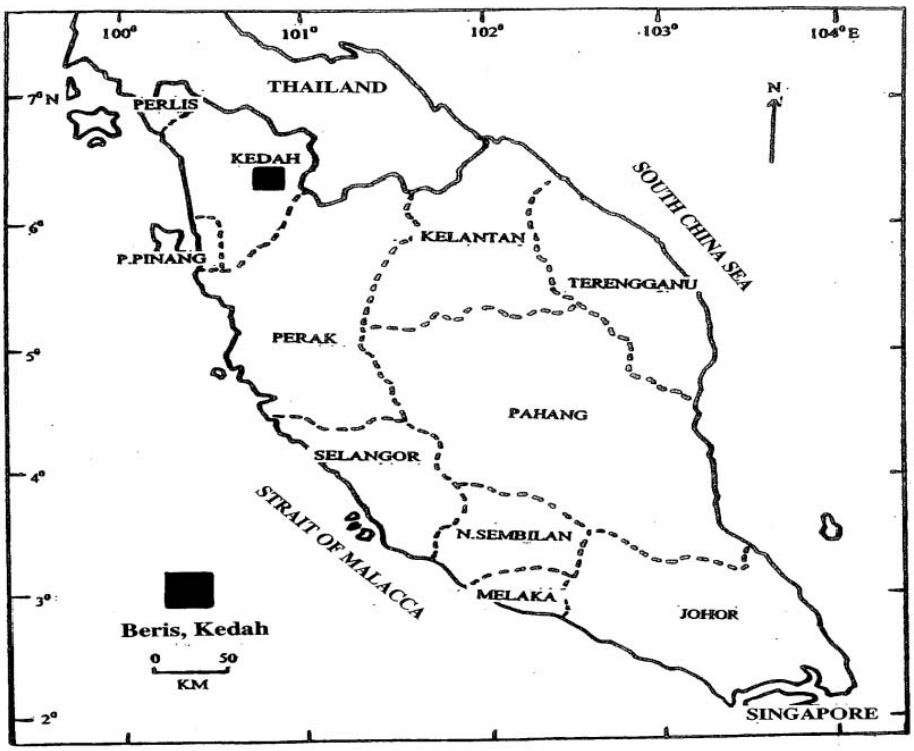

Figure 1: Location of Beris, Kedah.

RESULTS

A total of 14 species of frogs from 5 families, 7 species of lizards from 5 families, 5 species of snakes from 3 families and 2 species of freshwater turtles from 1 family were found to inhabit the Beris Valley area (Appendices 1 and 2). The 14 species of frogs included *Duttaphrynus melanostictus, Ingerophrynus parvus* and *Phrynoidis aspera* from the family Bufonidae, *Fejervarya limnocharis, Limnonectes blythii, Occidozyga laevis* and *Occidozyga martensii* from the family Discoglossidae, *Hylarana erythraea, Hylarana glandulosa, Hylarana laterimaculata* and *Hylarana labialis* from the family Ranidae, *Microhyla butleri* and *Microhyla heymonsi* from the family Microhylidae and finally *Polypedates leucomystax* from the family Rhacophoridae.

The seven species of lizards were *Hemidactylus frenatus* and *Gehyra mutilata* from the family Gekkonidae, *Calotes versicolor* from the family Agamidae, *Leiolepis triploidy* from the family Leiolepididae, *Eutropis multifasciata* and *Eutropis macularia* from the family Scincidae and *Varanus salvator* from the family Varanidae. The five species of snakes included *Ahaetulla prasina, Homalopsis buccata* and *Enhydris enhydris* from the family Colubridae, *Ramphotyphlops braminus* from the family Typhlopidae and *Calloselasma rhodostoma* from the family Viperidae. Two species of freshwater turtles, *Cuora amboinensis* and *Cyclemys dentata* from the family Geoemydidae, were also found here.

Species Account

Amphibians

Bufonidae

Three bufonids species, *D. melanostictus, I. parvus* and *P. aspera,* represented this family.

Duttaphrynus melanostictus

This commensal species is widespread and is known to adapt to a variety of environmental conditions. In the Beris Valley area, eight adult individuals were observed around the staff quarters after heavy rains. We also found four specimens in a ditch, three at a car porch and one on a road.

Ingerophrynus parvus

Only four specimens were collected during the survey, two at an old rubber plantation at Kampung Charok Tok Tir and another two on the ground along the forest trail at the saddle dam.

Phrynoidis aspera

Two adult specimens were found resting on a large rock in mid-stream at Kampung Charok Tok Tir in the daytime.

Dicroglossidae
We collected four species of frogs from this family: *F. limnocharis*, *L. blythii, O. laevis* and *O. martensii*.

Fejervarya limnocharis
This is another commensal species found in the Beris Valley, and from our observations, more than 30 individuals were found around the staff quarters and roadside to the main dam. We only captured 10 specimens for our collection.

Limnonectes blythii
Only one adult specimen was found in the early evening (18:30 hours) resting under dead wood near the stream at Kampung Charok Tok Tir.

Occidozyga laevis
We collected two specimens from the puddles near the roadside (off of the road) at Kampung Charok Tok Tir after heavy rains. The puddles were about 1 x 1 m with ankle-deep and muddy water.

Occidozyga martensii
Two individuals (one adult and one juvenile) were found hiding under dead leaves near puddles in an old rubber plantation at Kampung Charok Tok Tir.

Ranidae
This is the largest family of Malaysian frogs, and in Peninsular Malaysia, about 30 species of frogs belong to this family. In the Beris Valley, we found only four species of ranids: *H. erythraea, H. glandulosa, H. laterimaculata* and *H. labialis.*

Hylarana erythraea
Two adults were found perching on dead wood in the swampy area near the staff quarters. Another two were found in the cement ditch along the road to the saddle dam. This is a very common frog and can be easily found in disturbed areas.

Hylarana glandulosa
We heard about 15 males calling around the swampy area near the staff quarters and along the roadside to the saddle dam. They start their calling activities in early evening (18:00 hours) and continue until early night (20:00 hours). Although we heard many calling males, unfortunately only one single adult was captured along the forest trail to the saddle dam.

Hylarana laterimaculata
Two males were heard calling from the forest trail at the saddle dam, but no specimen was captured. This small specimen is usually found on the forest floor near swampy areas.

Hylarana labialis
This is a very common forest frog and can be found easily along rivers and streams in lowland dipterocarp forests. This species inhabits various habitats ranging from swampy areas to rocky streams. We found three adults perching on small branches of a tree adjacent to a stream at Kampung Charok Tok Tir.

Microhylidae
Two common species of microhylids, *M. butleri* and *M. heymonsi,* were found in the Beris Valley. These two commensal species are widely distributed in disturbed areas and around human settlements.

Microhyla butleri
Over 50 males of this species were heard calling in the bushes and undergrowth near the swampy area at the base of the saddle dam and along the roadside to the saddle dam after heavy rains. We also found two amplectant pairs in the cement ditch along the road to the main dam. Only four adult specimens were collected during the survey period.

Microhyla heymonsi
We only captured 2 specimens around the staff quarters after rainfall, although about 15 males were heard calling in the bushes and grasses along the road to the main dam.

Rhacophoridae
Polypedates leucomystax
This common tree frog has adapted to a wide variety of environmental conditions except the primary forest. In the Beris Valley, we captured two specimens perching on a tree branch along the road to the saddle dam. We also heard four adult males calling around the water tank near the staff quarters.

Reptilia (Lizards)

Gekkonidae
Hemidactylus frenatus
About 50 individuals were counted on the ceilings, car porch, walls and inside the buildings around the staff quarters, but no specimens were collected.

Gehyra mutilata
Four specimens were observed on the ceilings of buildings at the staff quarters, but no specimens were collected.

Agamidae
Calotes versicolor
One adult and one juvenile were captured while perching on the branch of tree along the roadside to the main dam.

Leiolepididae
Leiolepis triploidy
Two adults were observed emerging from their burrows in the afternoon (15:00 hours) along the roadside to the main dam, but no specimens were captured. We also found another two burrows in the same area, which we presume belonged to this species.

Varanidae
Varanus salvator
We found two large adults swimming at the swampy area near the staff quarters. Another three carcasses of juveniles were found on the road to Kampung Charok Tok Tir.

Scincidae
Eutropis multifasciata
One specimen was captured while hiding under dead leaves at an old rubber plantation at Kampung Charok Tok Tir.

Eutropis macularia
A single juvenile was captured while hiding under the shoes at the staff quarters.

Reptilia (Snakes)

Typhlopidae
Ramphotyphlops braminus
Two adult specimens were found dead in the cement ditch along the roadside to the saddle dam.

Viperidae
Calloselasma rhodostoma
A single juvenile was found dead in the cement ditch along the roadside to the main dam.

Colubridae
Ahaetulla prasina
A single juvenile was observed perching on the branches of tree at Kampung Charok Tok Tir.

Homalopsis buccata
An adult about 30 cm long was found trapped in a fish net at Beris Lake.

Enhydris enhydris
A single juvenile was found dead a few metres away from the carcass of *C. rhodostoma*.

Reptilia (Freshwater turtles)

Geoemydidae
Cuora amboinensis
Road kill of an adult was found along the road to Kampung Charok Tok Tir.

Cyclemys dentata
A single juvenile was captured on the ground along the forest trail at the saddle dam.

DISCUSSION

For the four-day excursion to the Beris Valley area, Sik, Kedah, we recorded 14 species of amphibians and 14 species of reptiles. These are new records of the herpetofauna of Beris Valley. The number of species is less than expected because of the short observation period and climatic factors. Due to the limited survey period, we could not explore and record all the amphibians and reptiles present in the area. Our main survey area was around the Beris Dam and a forest stream at Kampung Charok Tok Tir, which did not cover all amphibian and reptile habitats such as forests swamps, forest floor and tree canopies. We also could not go out for observations on the second day because of the heavy rainfall from the evening until midnight, and this affected our sampling schedule.

The Beris Dam is characterised as a disturbed area, and we could easily find several commensal species such as *D. melanostictus, F. limnocharis, H. erythraea, M. butleri, M. heymonsi* and *P. leucomystax*. These species are associated with human encroachment and are widely distributed from disturbed areas to forest edges but are absent in the primary forests. Around the dam area there are many puddles, rain pools, temporary ponds and ditches that attract these commensal frogs to live and breed. Several forest frogs such as *I. parvus, H. glandulosa* and *H. laterimaculata* were also found around the area, and these species presumably emerged from the nearby forest to forage or breed.

More forest frog species, such as *I. parvus, P. aspera, L. blythii, O. laevis, O. martensii* and *H. labialis,* were found to inhabit the Kampung Charok Tok Tir settlement. In this area, the level of disturbance is moderate, and the area is surrounded by rubber plantations, orchards and villages that encroach on a lowland dipterocarp forest. We also found forest streams, rain pools and puddles in the area that provided suitable habitats and breeding sites for the frogs. Besides the forests, old rubber plantations also become an important place for amphibians to live and breed because it provides a variety of microhabitats, such as tree buttresses, rotten woods, dead leaves, bushes, undergrowth and rain pools. In the old rubber plantations at Kampung Charok Tok Tir, we found two *I. parvus* under dead wood, two *O. laevis* in the puddles and two *O. martensii* under dead leaves near the puddles.

This checklist is not final, and we expect to find more species during our next excursion. We will use a longer survey period so that we can cover a wide range of habitats such as swampy areas, rocky streams, waterfalls, forest floors and tree canopies.

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REFERENCES

Auliya M. (2007). *An identification guide to the tortoises and freshwater turtles of Brunei Darussalam, Indonesia, Malaysia, Papua New Guinea, Philippines, Singapore and Timor Leste.* Petaling Jaya, Malaysia: TRAFFIC Asia Southeast, 99.

Berry P Y. (1975). *The amphibian fauna of Peninsular Malaysia*. Kuala Lumpur: Tropical Press.

Chan K O, Grismer L L, Norhayati A and Daicus B. (2009). A new species of *Gastrophrynoides* (Anura: Microhylidae): An addition to a previously monotypic genus and a new genus for Peninsular Malaysia. *Zootaxa* 2124: 63–68.

Cox M J, van Dijk P P, Nabhitabatha J and Thirakhupt K. (1998). *A photographic guide to snakes and other reptiles of Thailand, Peninsular Malaysia and Singapore.* London: New Holland Publishers (UK) Ltd.

Das I and Haas A. (2003). A new species of *Kalophrynus* (Anura: Microhylidae) from the Highlands of North-Central Borneo. *The Raffles Bulletin of Zoology* 51(1): 109–113.

_____. (2005). A new species of *Rhacophorus* (Anura: Rhacophoridae) from Gunung Gading, Sarawak. *The Raffles Bulletin of Zoology* 53(2): 257–263.

Grismer L L, Youmans T M, Wood Jr. P L and Grismer J L. (2006). Checklist of the herpetofauna of the Seribuat Archipelago, West Malaysia with comments on biogeography, natural history and adaptive types. *The Raffles Bulletin of Zoology* 54(1): 157–180.

Ibrahim H J, Shahrul Anuar M S, Norhayati A, Shukor M N, Shahriza S, Nurul Ain E, Nor Zalipah, M and Mark Rayan D. (2006). An annotated checklist of herpetofauna of Langkawi Island, Kedah, Malaysia. *Malayan Nature Journal* 57(4): 369–381.

Ibrahim H J, Shahrul Anuar M S, Norhayati A, Chan K O and Muin M A A. (2008). *The common amphibians and reptiles of Penang Island*. Pulau Pinang: Penang State Forestry Department.

Inger R F. (2005). The frog fauna of the Indo-Malayan region as it applies to Wallace's Line. In A A Tuen and I Das (eds.). *Wallace in Sarawak-150 years later. An International Conference on Biogeography and Biodiversity.* Sarawak, Malaysia: Institute of Biodiversity and Environmental Conservation, University Malaysia Sarawak, 82–90.

Inger R F and Stuebing R B. (1989). *Frogs of Sabah.* Kota Kinabalu: Sabah Park Publications.

_____. (1992). The montane amphibian fauna of Northwestern Borneo*. Malayan Nature Journal* 46: 41–51.

_____. (1997). *A field guide to the frogs of Borneo.* Kota Kinabalu: Natural History Publications.

_____. (2009). New species and new records of Bornean frogs (Amphibia: Anura). *The Raffles Bulletin of Zoology* 57(2): 527–535.

Inger R F, Stuebing R B and Tan F L. (1995). New species and new records of anurans from Borneo. *The Raffles Bulletin of Zoology* 43(1): 115–131.

Matsui M and Ibrahim J. (2006). A new cascade frog of the subgenus *Odorrana* from Peninsular Malaysia. *Zoological Science* 23(7): 647–651.

Matsui M, Daicus B, Norhayati A and Hoi-Sen Y. (2009). A new species of *Leptolalax* (Amphibia, Anura, Megophryidae) from Peninsular Malaysia. *Zoological Science* 26(3): 243–247.

Norhayati A. (2009). *Amphibia. Amphibians and reptiles of Peninsular Malaysia.* http://amphibia.my (accessed on 15 November 2009).

Norhayati A, Bharathyraja T, Nurolhuda N, Juliana S, Daicus B, Chan K O and Shukor M N. (2007). An annotated checklist of the amphibians at the Endau-Rompin National Park (Selai), Johor. *Journal of Wildlife and Parks* 24: 11–19.

Norsham Y, Norhayati A, Fuad S, Nordin M and Lim B L. (2005). Pre-logging survey on vertebrate species diversity at Sungai Weng sub-catchment, Ulu Muda Forest Reserve, Kedah: Amphibian fauna. *Malayan Nature Journal* 57(1): 47–55.

Voris H K and Inger R F. (1995). Frog abundance along streams in Bornean forests. *Conservation Biology* 9(3): 679–683.

Wood P L, Grismer L L, Norhayati A and Juliana S. (2008). Two new species of torrent dwelling toads *Ansonia* Stoliczka, 1870 (Anura: Bufonidae) from Peninsular Malaysia. *Herpetologica* 64(3): 321–340.

Appendix 1

Amphibians of Beris Valley, Sik, Kedah.

Taxon	Location
Bufonidae	
Duttaphrynus melanostictus	Staff quarters
Ingerophrynus parvus	Forest trail at saddle dam, old rubber plantations at Kampung Charok Tok Tir
Phrynoides aspera	Forest stream at Kampung Charok Tok Tir
Dicroglossidae	
Fejervarya limnocharis	Staff quarters, along roadside to the main dam
Limnonectes blythii	Forest stream at Kampung Charok Tok Tir
Occidozyga laevis	Rain pools at Kampung Charok Tok Tir
Occidozyga martensii	Edge of puddle at Kampung Charok Tok Tir
Ranidae	
Hylarana erythraea	Swampy area near the staff quarters, cement ditch along the roadside to saddle dam
Hylarana glandulosa	Forest trail at saddle dam, swampy area near the staff quarters
Hylarana laterimaculata	Forest trail at saddle dam
Hylarana labialis	Forest stream at Kampung Charok Tok Tir
Microhylidae	
Microhyla butleri	Swampy area, along the roadside to saddle and main dam
Microhyla heymonsi	Staff quarters, along roadside to saddle and main dam
Rhacophoridae	
Polypedates leucomystax	Staff quarters, along roadside to saddle dam

Appendix 2

Reptiles of Beris Valley, Sik, Kedah.

Taxon	Location
Lizards	
Gekkonidae	
Hemidactylus frenatus	Staff quarters
Gehyra mutilata	Staff quarters
Agamidae	
Calotes versicolor	Along the roadside to main dam
Leiolepididae	
Leiolepis triploidy	Emerged from their burrow, along the roadside to main dam
Varanidae	
Varanus salvator	Swampy area near the staff quarters, along the road to Kampung Charok Tok Tir
Scincidae	
Eutropis multifasciata	Old rubber plantation at Kampung Charok Tok Tir
Eutropis macularia	Car porch at staff quarters
Snakes	
Typhlopidae	
Ramphotyphlops braminus	Cement ditch along the roadside to saddle dam
Viperidae	
Calloselasma rhodostoma	Cement ditch along roadside to main dam
Colubridae	
Ahaetulla prasina	Bush at Kampung Charok Tok Tir
Homalopsis buccata	Trapped in fish net at Beris Lake
Enhydris enhydris	Cement ditch along the roadside to main dam
Fresh water turtles	
Geoemydidae	
Cuora amboinensis	Along the road to Kampung Charok Tok Tir Forest trail at saddle dam
Cyclemys dentata	Forest trail at saddle dam