

## A CHECKLIST OF THE HERPETOFAUNA OF THE BANJARAN BINTANG, PENINSULAR MALAYSIA

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The three major mountain ranges of Peninsular Malaysia comprise areas of extreme environmental diversity, yet they remain relatively unexplored. Although herpetofaunal records from these upland systems are scattered throughout a wide body of literature, only two major studies have focused on the largest mountain system, the Banjaran Titiwangsa and only one major survey was published for a locality in the easternmost range, the Banjaran Timur. The smallest range of mountains in northwestern Peninsular Malaysia, the Banjaran Bintang, has had no major studies focusing specifically on the composition of its herpetofauna. This is despite the fact that it harbors the type localities of seven species of frogs, one caecilian, 10 species of lizards, and four species of snakes, the vast majority of which come from one locality at Bukit Larut, Perak. This study compiles all the herpetofaunal records from the literature and museum collections from the Banjaran Bintang as well as presents new locality records for seven species of frogs, one species of lizard, and five species of snakes. This brings the total number of species known from the Banjaran Bintang to 107 (41 frogs, two caecilians, three turtles, 31 lizards, and 30 snakes). In this regard, the much smaller Banjaran Bintang has significantly more species of amphibians and reptiles than any other upland system in Peninsular Malaysia. We regard this as a collecting artifact that underscores the unexplored nature of the other mountain ranges.

**Keywords:** Malaysia, Banjaran Bintang, Banjaran Titiwangsa, Banjaran Timur, herpetofauna, Bukit Larut.

### INTRODUCTION

Peninsular Malaysia (= West Malaysia) composes the southern one-third of the 1600 km long Malay Peninsula. Its complex, rugged topography is sculpted by a series of three, north to south tending, somewhat imbricating, mountain ranges whose upland ecosystems not only add a significant component to the environmental

diversity of Peninsular Malaysia but have long been known as regions of high herpetofaunal diversity and endemism (e.g., Boulenger, 1900, 1903, 1908; Chan et al., 2009; Das et al., 2004; Das and Norsham, 2003; Dring, 1979; Flower, 1896, 1899; Grandison, 1972; Grismer, 2006, 2007, 2008; Grismer and Pan, 2008; Grismer et al., 2006b, 2008a, 2009a, 2009b; Hallerman and McGuire, 2001; Laidlaw, 1900, 1901a, 1901b; Leong and Lim, 2003; Lim et al., 2002; Matsui and Ibrahim, 2006; McLeod and Norhyati, 2007; Norsham and Lim, 2002; Sanders et al., 2004; Sly, 1976; Smedley, 1931; Smith, 1922, 1935; Vogel et al., 2004; Wood et al., 2008, 2009). The easternmost series of these ranges in Peninsular Malaysia comprises an array of jagged corridors collectively referred to as the Banjaran Timur and occupy significant portions of the states of Kelantan, Terengganu, and northern Pahang (Fig. 1). Their complex physiography is an amalgam of semi-isolated, peaks, plateaus, ranges and associated foothills that encompass the highest (Gunung Tahan, 2187 m a.s.l.) and some of the most rugged terrain in Peninsular Malaysia. The central and most extensive mountain range in Pen-

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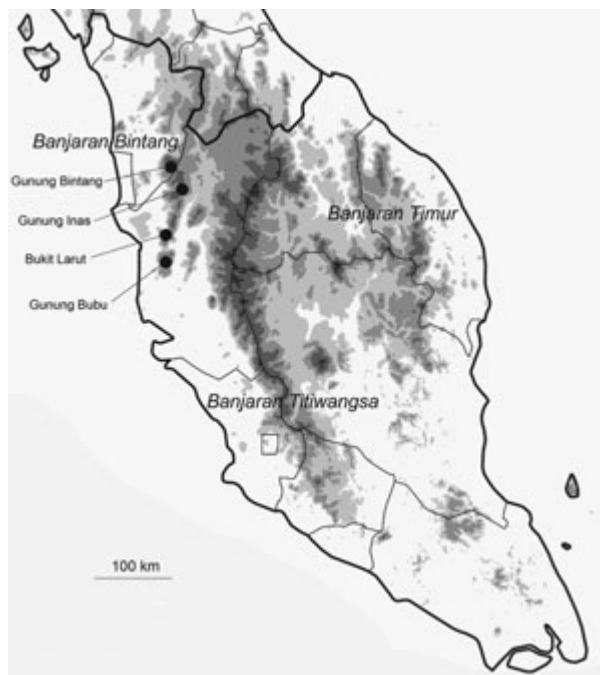


Fig. 1. Map of Peninsular Malaysia.

insular Malaysia is the Banjaran Titiwangsa. This long, single, arcing, upland system forms the spine of Peninsular Malaysia and extends well north of the Thai-Malaysian border southward approximately 480 km for nearly the entire length of the country. This uplifted massif reaches just over 2180 m in elevation, never dips below 1000 m, and essentially divides Peninsular Malaysia into eastern and western halves. In contrast, the shorter Banjaran Bintang in the west extends approximately 140 km from central Perak, northward to the Thai border and slightly beyond, terminating near Jalor at Bukit Besar, Yala Province, Thailand. Despite its shorter length, it dominates the landscape of northwestern Peninsular Malaysia and offers a significant amount of montane environments.

Although there is a scattered body of literature on varying components of the herpetofauna of these upland systems, there have been only five substantial publications focusing exclusively on them (Dring, 1979; Grandison, 1972; Leong and Lim, 2003; Lim et al., 2002; Smith, 1922). Two of these (Dring, 1979; Smith, 1922) were fieldwork-based, systematic surveys that addressed only two localities (Gunung Lawit, Terengganu and Gunung Tahan, Pahang, respectively) within the extensive the Banjaran Timur and neither locality has been seriously treated since, or in the case of Gunung Lawit,

has even been revisited. Although the environmentally rich Banjaran Titiwangsa is the major physiographic element of Peninsular Malaysia, only checklists for just two areas along its crest, Cameron Highlands (2031 m) and Bukit Fraser (1510 m), Pahang have ever been presented (Leong and Lim, 2003; Lim et al., 2002, respectively) and only anecdotal reports from other areas have ever been published (e.g., Sly, 1976). One semi-isolated peak, Gunung Benom, Pahang (2107 m), along the eastern flank of the central section of the Banjaran Titiwangsa, was field-surveyed for its herpetofauna by Grandison (1972) but like Gunung Lawit, was never revisited.

Surprisingly, the only report focusing exclusively on the herpetofauna of any portion of the Banjaran Bintang, was that of Boulenger (1900), well over a century ago, where he described 11 new species from Bukit Larut, Perak of which 10 are still valid. The literature on the herpetofauna of this mountain range consists of scattered reports from only two localities (Bukit Larut [= Maxwell's Hill; Perak Hills] and Gunung Inas [= Gunung Hijau]) and begins as early as Flower (1896) and is as recent as Grismer et al. (2009) and Wood et al. (2009). Yet no composite checklist of the herpetofauna of this mountain range has ever been presented. This is despite the fact that Bukit Larut is the type locality for seven species of frogs, one caecilian, nine species of lizards, and three species of snakes and Gunung Inas is the type locality for an additional species of lizard and snake (Table 1). This clearly underscores the prominence of this short mountain range to the herpetological biodiversity of Peninsular Malaysia as well as its scientific legacy.

It is clear that the mountain systems of Peninsular Malaysia are in great need of field-based, systematic research and this report is the first of a series of extensive reports we are preparing on the herpetofauna of these upland corridors. We report here the results of our first set of surveys of the Banjaran Bintang and present a composite checklist of the herpetofauna from every locality within this range for which records exist. In so doing, we provide the first report of the herpetofauna from the southernmost extent of this system, Gunung Bubu, Perak, as well as new records from Bukit Larut, Perak and Gunung Bintang, Kedah. There are scattered, published accounts for species along the western foothills (and to a lesser extent the eastern foothills) of the Banjaran Bintang but this report focuses exclusively on the species ranging from approximately 300 m in elevation and upwards.

TABLE 1. List of the Herpetofauna from the Three Major Surveyed Localities along the Banjaran Bintang

| Species                             | Bukit Larut | Gunung Bubu | Gunung Inas |
|-------------------------------------|-------------|-------------|-------------|
| <b>FROGS</b>                        |             |             |             |
| <b>Bufonidae</b>                    |             |             |             |
| <i>Ansonia malayana</i>             | TL          | ×           | ×           |
| <i>Bufo asper</i>                   | ×           | ×           |             |
| <i>Bufo melanostictus*</i>          | ×           |             |             |
| <i>Ingerophrynus parvus*</i>        |             | ×           |             |
| <i>Ingerophrynus quadriporcatus</i> | ×           |             |             |
| <i>Leptophryne borbonica</i>        |             | ×           | ×           |
| <b>Megophryidae</b>                 |             |             |             |
| <i>Leptobranchium hendricksoni</i>  |             | ×           |             |
| <i>Leptotalax heteropus</i>         | ×           | ×           |             |
| <i>Leptotalax pelodytoides</i>      | ×           |             |             |
| <i>Megophrys nasuta</i>             |             | ×           | ×           |
| <i>Xenophrys aceras</i>             | ×           |             |             |
| <i>Xenophrys longipes</i>           | TL          |             |             |
| <b>Microhylidae</b>                 |             |             |             |
| <i>Chaperina fusca</i>              | ×           |             |             |
| <i>Metaphrynella pollicaris</i>     | ×           |             |             |
| <i>Microhyla annectens</i>          | TL          |             |             |
| <i>Microhyla butleri</i>            | TL, E       |             |             |
| <i>Phrynella pulchra</i>            | ×           |             |             |
| <b>Ranidae</b>                      |             |             |             |
| <i>Amolops larutensis</i>           | TL          | ×           |             |
| <i>Fejervarya limnocharis*</i>      | ×           | ×           |             |
| <i>Limnonectes blythii</i>          | ×           | ×           |             |
| <i>Limnonectes kuhlii</i>           | ×           | ×           |             |
| <i>Limnonectes laticeps</i>         | ×           | ×           |             |
| <i>Limnonectes malesianus</i>       |             | ×           |             |
| <i>Limnonectes plicatellus</i>      | ×           |             | ×           |
| <i>Occidozyga laevis*</i>           |             | ×           |             |
| <i>Odorrana hosii</i>               | ×           | ×           |             |
| <i>Rana banjarana</i>               | ×           | ×           | ?           |
| <i>Rana erythraea*</i>              | ×           | ×           |             |
| <i>Rana labialis</i>                |             | ×           | ×           |
| <i>Rana luctuosa</i>                | ×           |             |             |
| <i>Rana miopus</i>                  | ×           |             | ×           |
| <i>Rana nigrovittata</i>            | ×           | ×           |             |
| <i>Taylorana hascheana</i>          | ×           |             | ×           |
| <b>Rhacophoridae</b>                |             |             |             |
| <i>Nyctixalus pictus</i>            | ×           |             |             |
| <i>Philautus petersi</i>            | ×           | ×           |             |
| <i>Philautus vermiculatus</i>       | TL          |             |             |
| <i>Rhacophorus bipunctatus*</i>     | ×           |             |             |
| <i>Rhacophorus prominanus*</i>      | ×           |             |             |
| <i>Rhacophorus cynaopunctatus</i>   | ×           |             |             |
| <i>Theloderma asperum</i>           | TL          |             |             |
| <i>Theloderma leprosa</i>           | ×           |             |             |
| <b>CAECILIANS</b>                   |             |             |             |
| <b>Ichthyophiidae</b>               |             |             |             |
| <i>Caudacaecilia larutensis</i>     | TL, E       |             |             |
| <i>Ichthyophis</i> sp.              | ×           |             |             |

TABLE 1 (continued)

| Species                             | Bukit Larut | Gunung Bubu | Gunung Inas |
|-------------------------------------|-------------|-------------|-------------|
| <b>TURTLES</b>                      |             |             |             |
| <b>Testudinidae</b>                 |             |             |             |
| <i>Heosemys spinosa</i>             | ×           |             |             |
| <i>Manouria emys</i>                | ×           |             |             |
| <i>Manouria impressa</i>            | ×           |             |             |
| <b>LIZARDS</b>                      |             |             |             |
| <b>Agamidae</b>                     |             |             |             |
| <i>Acanthosaura bintangensis</i>    | TL, E       |             |             |
| <i>Bronchocela cristatella</i>      | ×           |             |             |
| <i>Calotes emma</i>                 |             | ×           |             |
| <i>Draco abbreviatus</i>            | ×           | ×           |             |
| <i>Draco blanfordii</i>             | ×           |             |             |
| <i>Draco fimbriatus</i>             | ×           |             |             |
| <i>Draco formosus</i>               | TL          | ×           |             |
| <i>Draco haematopogon</i>           | ×           |             |             |
| <i>Draco melanopogon</i>            | ×           | ×           | ×           |
| <i>Gonocephalus abbotti</i>         |             | ×           |             |
| <i>Gonocephalus belli</i>           | ×           |             |             |
| <i>Gonocephalus grandis</i>         |             | ×           |             |
| <i>Pseudocalotes larutensis</i>     | TL, E       |             |             |
| <b>Eublepharidae</b>                |             |             |             |
| <i>Aeluroscalabotes felinus</i>     | ×           |             |             |
| <b>Gekkonidae</b>                   |             |             |             |
| <i>Cnemaspis mcguirei</i>           | TL, E       | ×           | ×           |
| <i>Cnemaspis pseudomcguirei</i>     | TL, E       |             | ×           |
| <i>Cyrtodactylus pulchellus</i>     | ×           | ×           |             |
| <i>Cyrtodactylus quadrivirgatus</i> | ×           | ×           | ×           |
| <i>Gehyra mutilata</i>              | ×           |             |             |
| <i>Gekko monarchus</i>              | ×           | ×           |             |
| <i>Hemiphyllodactylus harterti</i>  | TL, E       |             |             |
| <i>Hemiphyllodactylus typus</i>     | ×           |             |             |
| <b>Scincidae</b>                    |             |             |             |
| <i>Dasia grisea*</i>                | ×           |             |             |
| <i>Eutropis multifasciatus</i>      | ×           |             |             |
| <i>Larutia larutensis</i>           | TL, E       |             |             |
| <i>Lygosoma bampfylidii</i>         | ×           |             |             |
| <i>Lygosoma stellatum</i>           | TL          |             |             |
| <i>Sphenomorphus butleri</i>        | TL, E       |             |             |
| <i>Sphenomorphus cyanolaemus</i>    | ×           |             |             |
| <i>Sphenomorphus praesignus</i>     | TL          |             |             |
| <b>Varanidae</b>                    |             |             |             |
| <i>Varanus rudicollis</i>           | ×           |             |             |
| <b>SNAKES</b>                       |             |             |             |
| <b>Typhlopidae</b>                  |             |             |             |
| <i>Typhlops albiceps</i>            | ×           |             |             |
| <b>Pythonidae</b>                   |             |             |             |
| <i>Python reticulatus*</i>          |             | ×           |             |
| <b>Colubridae</b>                   |             |             |             |
| <i>Ahaetulla prasina*</i>           | ×           |             |             |
| <i>Amphiesma inas</i>               |             |             | TL          |
| <i>Aplopeltura boa</i>              | ×           |             |             |
| <i>Asthenodipsas vertebralis</i>    | TL          |             |             |
| <i>Calamaria albiventer</i>         | ×           |             |             |

TABLE 1 (continued)

| Species                              | Bukit Larut | Gunung Bubu | Gunung Inas |
|--------------------------------------|-------------|-------------|-------------|
| <i>Calamaria lumbricoidea</i>        | ×           |             |             |
| <i>Calamaria pavimentata</i>         | ×           |             |             |
| <i>Calamaria schlegeli</i>           | ×           |             |             |
| <i>Collorhabdium williamsoni</i>     | ×           |             |             |
| <i>Chrysopelea pelias</i>            |             | ×           |             |
| <i>Gonyosoma oxycephala</i>          | ×           | ×           |             |
| <i>Lycodon butleri</i>               | TL          |             |             |
| <i>Lycodon subcinctus</i>            | ×           |             |             |
| <i>Macrocalamus chanardi</i>         | TL, E       |             |             |
| <i>Psammodynastes pulverulentus*</i> | ×           |             |             |
| <i>Pseudorabdion longiceps*</i>      | ×           |             |             |
| <i>Rhabdophis chrysargos</i>         | ×           | ×           |             |
| <i>Rhabdophis conspiciatus*</i>      | ×           |             |             |
| <i>Xenelaphis ellipsifer</i>         | ×           |             |             |
| <i>Xenochrophis cerasogaster</i>     | ×           |             |             |
| <b>Elapidae</b>                      |             |             |             |
| <i>Bungarus flaviceps</i>            | ×           |             |             |
| <i>Calliophis bivirgata</i>          |             | ×           | ×           |
| <i>Calliophis intestinalis</i>       | ×           |             |             |
| <i>Calliophis maculiceps</i>         |             |             | ×           |
| <i>Ophiophagus hannah</i>            | ×           |             |             |
| <b>Viperidae</b>                     |             |             |             |
| <i>Ovophis monticola</i>             | ×           |             |             |
| <i>Popeia fucata</i>                 | ×           |             | ?           |
| <i>Trimeresurus wiroti</i>           | ×           |             |             |

**Note.** TL, type locality; E, endemic to the Banjaran Bintang; ?, record considered tentative; \*new records reported here.

## DESCRIPTION OF THE BANJARAN BINTANG

The Banjaran Bintang is a prominent physiographic feature of northwestern Peninsular Malaysia that lies almost exclusively in the state of Perak. With an upper elevation of 1862 m at Gunung Bintang, it offers a wide range of habitats along an altitudinal transect. The vegetative structure along its flanks begin with lowland dipterocarp forests up to an elevation of 300 m. Hill dipterocarp forest dominates its flanks from 300 to 1200 m, lower montane forest extends from 1200 to 1800 m, and upper montane forest occurs above 1800 m (Kiew, 1998; Manokaran, 1998). Its southernmost extent terminates somewhat abruptly with the semi-isolated Gunung Bubu near the coast in central Perak. This mountain is located within the Bintang Hijau Forest Reserve (4°42' N 100°49' E) and ranges from ~210 to 1657 m in elevation. The upper regions compose a granite pinnacle (Wong, 1966) surrounded by isolated outcroppings bely-

ing its granite basement. Various rocky, fast and slow flowing streams course throughout the habitat, adding a significant component to the microhabitat diversity.

A low elevation gap (351 m) through which Highway E1 passes, separates Gunung Bubu from the more northern portion of the Banjaran Bintang. Located on the northern margin of this gap above the city of Taiping and approximately 25 km north of Gunung Bubu is Bukit Larut (04°51'43" N 100°47'59" E), historically and still often referred to as Maxwell's Hill or the Perak Hills. This is the oldest hill station in Peninsular Malaysia and was established as a tea plantation by the British in 1884 and has been the premiere collecting locality along the entire Banjaran Bintang for the last 112 years. Bukit Larut reaches 1448 m at Gunung Hijau Liman Kati and receives more rainfall than any other area in Peninsular Malaysia, averaging over 3800 mm per year (Subramanian, 1998). Above 1000 m at this locality, the granite base of the Banjaran Bintang manifests itself as rocky outcroppings along the road cuts and trails which course through the hill dipterocarp forest and into the lower montane forest along the flanks of Gunung Hijau Liman Kati.

From Bukit Larut, the Banjaran Bintang extends another 125 km northward beyond the Thai border with a somewhat saw-toothed crest, highlighting prominent peaks (from south to north) such as Gunung Biong (1218 m), Ulu Jerneh (1577 m), Gunung Inas (1801 m), Gunung Bintang (1862 m), Gunung Baubak (1199 m), and Gunung Damarli. With the exception of Gunung Bintang, all these peaks occur within the state of Perak and from only Gunung Inas are there published herpetofaunal records (Laidlaw, 1900, 1901a, 1901b; Werner, 1901). Gunung Bintang is located just west of the border of Perak in the state of Kedah at a point where the Banjaran Bintang arcs slightly to the west. Future expeditions are planned for Gunung Bintang and Gunung Inas.

## MATERIAL AND METHODS

Surveys were conducted at Bukit Larut from 10 – 11 December 1996, 17 – 19 and 24 – 26 October 1997, 24 – 26 March, 16 – 19 June, 14 – 17 October 2008, and 16 – 18 September 2009. Collections were focused along road cuts between 800 and 1300 m in elevation and in the lower montane forest along the Gunung Hijau Trail between 1200 and 1448 m in elevation. The lowland forest of Ulu Kenas Recreational Forest (RF) was surveyed from 16 – 21 December 2006 along forest trails surrounding the foothills of Gunung Bubu and ending at the peak of the mountain. Specimens were col-



lected by hand or with a blow pipe during the day and night. Representative samples of each species collected were photographed prior to preservation. Following euthanization, tissue samples of liver were taken and stored in 100% ethanol. Specimens were then preserved with 10% formalin and later transferred into 70% ethanol. Voucher material is deposited in the collection of the Department of Wildlife and National Parks (DWNP); the collection of the University Kebangsaan Malaysia (UKMHC and HC); and the La Sierra University Herpetological Collection (LSUHC), Riverside, California, USA. Tissue samples are deposited at UKM, HC, and LSUHC. Voucher photographs are cataloged in the La Sierra University Digital Photo Collection (LSUDPC) and the La Sierra University Photo Collection (LSUPC).

## CHECKLIST

Reported below are species previously unknown from the Banjaran Bintang or previously unknown from particular regions of the Banjaran Bintang. Provided also are synonyms for all species where they apply to Banjaran Bintang populations only. Table 1 provides a locality list of every species from every place it has been reported within the Banjaran Bintang.

## FROGS

### Bufonidae

#### *Ansonia malayana* Inger, 1960

*Bufo jerboa*. Laidlaw, 1900; Gunung Bintang.

*Bufo penangensis*. Boulenger, 1912; Bukit Larut.

*Ansonia malayana*. Inger, 1960; Berry, 1975; Manthey and Grossmann, 1997; Bukit Larut.

**Comment.** Seven specimens (DWNP 1252, 1257, 1264, 1269, 1272, 1273, 1274) were collected from Ulu Kenas RF at 1200 m elevation on 19–20 December. All were collected in lower montane forest on leaves of low lying vegetation growing around large boulders by a moderately flowing stream. They closely resemble Inger's (1960) description of *Ansonia malayana* a series of specimens collected from the type locality at Bukit Larut (LSUHC 8865–66, 8873–77, 9018–22).

#### *Bufo asper* Gravenhorst, 1829

*Bufo asper*. Boulenger, 1903; Bukit Larut.

**Comment.** An adult female (UKMHC 394) was collected from Ulu Kenas RF on 16 December in shallow waters of the Kenas River under a boulder overhang. It closely matches Berry's (1975) description of *Bufo asper* from Peninsular Malaysia and to specimens photographed at Bukit Larut (LSUDPC 4403).

#### *Bufo melanostictus* Schneider, 1799

**Comment.** A single juvenile (LSUDPC 4811) was photographed along the edge of the road at Bukit Larut on 17 October 1997 in hill dipterocarp forest. It matched a series of specimens

from Pulau Langkawi, Kedah (LSUHC 6803–04, 7110, 7140). This is the first report of this species from the Banjaran Bintang.

#### *Ingerophrynus parvus* Boulenger, 1887

**Comment.** Five specimens (UKMHC 362, 376–78, 429) were collected from Ulu Kenas RF on 18 and 21 December on the ground along a forest trail by the Kenas River. They are in accord with Berry's (1975) description of this species from Peninsular Malaysia. This is the first report of this species from the Banjaran Bintang.

#### *Ingerophrynus quadriporcatus* Boulenger, 1887

*Bufo quadriporcatus* Boulenger, 1912; Berry, 1975: Bukit Larut.

#### *Leptophryne borbonica* (Tschudi, 1839)

*Bufo jerboa*. Laidlaw, 1900: Gunung Inas.

**Comment.** An adult male (UKM 443) was collected from Ulu Kenas RF on 21 December perched on a leaf of a small plant 0.5 m above the ground. It is in accord with Laidlaw's (1900) description of material from Gunung Inas and Berry's (1975) description of specimens from Peninsular Malaysia.

### Megophryidae

#### *Leptobrachium hendricksoni* Taylor, 1962

**Comment.** Two specimens (UKMHC 379, 381) were collected from Ulu Kenas RF on 18 December among leaf litter. They are in accord with Taylor's (1962) description of *L. hendricksoni* from Peninsular Malaysia.

#### *Leptotalax heteropus* Boulenger, 1900

*Leptotalax heteropus*. Boulenger, 1900a; Berry, 1975; Manthey and Grossmann 1997: Bukit Larut.

**Comment.** Nine specimens (UKMHC 400–01, 403, 406–07, 414, 417, 419, 421) were collected from Ulu Kenas RF on 19–20 December on low vegetation. They agree with Berry's (1975) description of this species from Peninsular Malaysia. A single adult found on 25 January 2009 from Gunung Bintang (LSUDPC 5027–29) also matches the above descriptions.

#### *Leptotalax pelodytoides* (Boulenger, 1893)

*Leptobrachium pelodytoides*. Boulenger, 1912: Bukit Larut.

#### *Megophrys nasuta* (Schlegel, 1858)

*Megophrys montana*. Laidlaw, 1900: Gunung Inas.

**Comment.** Three specimens (UKMHC 364, 384–85) were collected from Ulu Kenas RF on 18 December among leaf litter. They are in accord with Berry's (1975) description of *M. nasuta* from Peninsular Malaysia.

#### *Xenophrys aceras* (Boulenger, 1903)

**Comment.** An adult female (DWNP 1926) was collected along side the road at Bukit Larut during a rainy evening on 15 November 1997. A juvenile (LSUDPC 5030) was photographed from the summit of Gunung Bintang on 25 January 2009. These specimens are in accord with Berry's (1975) description of this species from Peninsular Malaysia and represent the first records of this species from the Banjaran Bintang. Boulenger (1903) reports the type locality of *Xenophrys aceras* (= *Megalophrys montana* var. *aceras*) as "Bukit Besar" which Frost (2009) indicates is at "2500 feet elevation, Perak, Malay Peninsula, Malaysia." However, this is in error. There are two "Bukit Besar," one in Malaysia that is currently referred to as Bukit Larut and another in Thailand in the Namtok Sai Khao National Park, Pattani Province.

Boulenger (1903) was not explicit from which Bukit Besar Annandale and Robinson made their collections, however, it is clear from reading other accounts in Boulenger (1903; 141), Laidlaw (1901b:302), and Boulenger (1912:36), that this expedition made their collections from the Bukit Besar in Thailand. In fact, the type locality for *Theloderma horridum* collected on the same expedition (see Boulenger 1903:139) is reported by Frost (2009) as “near our camp on Bukit Besar”, Pattani, Thailand.”

### ***Xenophrys longipes* (Boulenger, 1886)**

*Megalophrys longipes*. Boulenger, 1886; 1912: Bukit Larut.

*Megophrys longipes*. Berry, 1975; Chan-ard et al., 1999: Bukit Larut.

### **Microhylidae**

#### ***Chaperina fusca* Mocquard, 1892**

*Microhyla lecostigma*. Flower, 1896: Bukit Larut.

*Chaperina fusca*. Berry, 1975: Bukit Larut.

#### ***Microhyla annectens* Boulenger, 1900**

*Microhyla annectens*. Boulenger, 1900a; Berry 1975: Bukit Larut.

#### ***Microhyla butleri* Boulenger, 1900**

*Microhyla butleri*. Boulenger, 1900a; Berry, 1975; Manthey and Grossmann, 1997; Bukit Larut.

#### ***Metaphrynella pollicaris* (Boulenger, 1890)**

*Phrynella pollicaris*. Butler, 1904: Bukit Larut.

*Metaphrynella pollicaris*. Berry, 1975: Bukit Larut.

#### ***Phrynella pulchra* Boulenger, 1887**

*Phrynella pulchra*. Wray, 1890: Bukit Larut.

### **Ranidae**

#### ***Amolops larutensis* (Boulenger, 1899)**

*Ixalus larutensis*. Boulenger, 1899: Bukit Larut.

*Amolops larutensis*. Berry, 1975, Manthey and Grossmann, 1997: Bukit Larut.

**Comment.** Seven specimens (UKMHC 366, 387, 390, 393, 402, 405, 435) were collected from Ulu Kenas RF on 18–20 December on boulders by the Kenas River. They are in accord with Boulenger’s (1899) description of this species from the type locality at Bukit Larut.

#### ***Fejervarya limnocharis* (Gravenhorst, 1829)**

**Comment.** An adult female (UKMHC 375) was collected from Ulu Kenas RF on 18 December on the ground among park buildings. It is in accord with Berry’s (1975) description of this species from Peninsular Malaysia. This is the first report of this species from the Banjaran Bintang.

#### ***Limnonectes blythii* (Boulenger, 1920)**

*Rana macrodon*. Boulenger, 1903, 1912: Bukit Larut.

**Comment.** A juvenile female (UKMHC 427) was collected from Ulu Kenas RF on 20 December along a forest trail by the Kenas River. It is in accord with Berry’s (1975) description and discussion of this species’ taxonomy.

#### ***Limnonectes kuhlii* (Tschudi, 1838)**

*Rana kuhlii*. Boulenger, 1912; Berry 1975: Bukit Larut.

*Limnonectes kuhlii*. Chan-ard et al., 1999: Bukit Larut.

**Comment.** Five specimens (UKMHC 391, 413, 431, 433, 438) were collected from Ulu Kenas RF on 19–20 December from within a moderately flowing forest stream. They are in accord with Berry’s (1975) description of specimens from Peninsular Malaysia and with a specimen from Bukit Larut (LSUHC 8868).

#### ***Limnonectes laticeps* (Boulenger, 1882)**

*Rana laticeps*. Berry, 1975: Bukit Larut.

*Limnonectes laticeps*. Chan-ard et al., 1999: Bukit Larut.

**Comment.** Two specimens (UKMHC 418, 439) were collected from Ulu Kenas RF on 20 December along a forest stream. They are in accord with Berry’s (1975) description of specimens from Peninsular Malaysia.

#### ***Limnonectes malesianus* (Kiew, 1984)**

**Comment.** Three specimens (UKMHC 363, 428, 432) were collected from Ulu Kenas RF on 18–19 December on the ground by a shallow swamp. They are in accord with Kiew’s (1984) description of specimens from Peninsular Malaysia and Singapore.

#### ***Limnonectes plicatellus* (Stoliczka, 1873)**

*Rana plicatella*. Laidlaw, 1900: Gunung Inas.

*Rana doriae*. Butler, 1902; Berry 1975: Bukit Larut.

#### ***Occidozyga laevis* (Günther, 1858)**

**Comment.** A single specimen (UKMHC 382) was collected from Ulu Kenas RF on 18 December in a shallow swamp. It is in accord with Berry’s (1975) description of this species from Peninsular Malaysia. This is the first record of this species from the Banjaran Bintang.

#### ***Odorrana hosii* (Boulenger, 1891)**

*Rana livida*. Butler, 1902: Bukit Larut.

**Comment.** Ten specimens (UKMHC 36771, 373–74, 395–97) were collected from Ulu Kenas RF on 17–18 December by the banks of the Kenas River. They are in accord with Berry’s (1975) description of this species from Peninsular Malaysia.

#### ***Rana banjarana* Leong et Lim, 2003**

*Rana signata*. Laidlaw, 1900: Gunung Inas.

**Comment.** Five specimens (UKMHC 408, 415, 422, 426, 434) were collected from Gunung Bubu on 18–20 December along a mountain stream at approximately 1000 m elevation. They are in accord with Leong and Lims’ (2003) description of specimens from Bukit Larut. Leong and Lim (2003) demonstrated that upland populations of the *Rana signata* complex in Peninsular Malaysia belonged to the species *R. banjarana*. Given this, we suspect Laidlaw’s (1900) record at foot Gunung Inas at the headwaters of Sungai Selama tentatively represents this species as well.

#### ***Rana erythraea* (Schlegel, 1837)**

**Comment.** A single specimen (UKMHC 361) was collected from Ulu Kenas RF on 18 December within the park grounds. It is in accord with Berry’s (1975) description of this species from Peninsular Malaysia. Another specimen (LSUDPC 3506) was photographed along the side of the road during a rainy evening on 25 October 1997. These represents the first records of this species from the Banjaran Bintang.

#### ***Rana miopus* Boulenger, 1918**

*Rana larutensis*. Laidlaw, 1900: Gunung Inas.

**Comment.** One specimen (LSUHC 9139) was found during a rainy evening on 14 October 2008 sitting on the ground along side the road in hill dipterocarp forest at Bukit Larut. It is in accord with Berry's (1975) description of this species from Peninsular Malaysia.

***Rana nigrovittata* (Blyth, 1856)**

**Comment.** An adult female (UKMHC 386) was collected from Ulu Kenas RF on 18 December on the ground along a forest stream. It is in accord with Berry's (1975) description of this species from Peninsular Malaysia.

***Rana labialis* Boulenger, 1887**

**Comment.** A single juvenile (UKMHC 383) was collected from Ulu Kenas RF on 18 December on low vegetation 0.5 m above the ground along a forest stream. It is in accord with Berry's (1975) description of this species from Peninsular Malaysia.

***Taylorana hascheana* (Stoliczka, 1870)**

*Rana hascheana*. Laidlaw, 1900: Gunung Inas. Berry, 1975: Bukit Larut.

**Rhacophoridae**

***Nyctixalus pictus* (Peters, 1871)**

*Ixalus pictus*. Butler, 1902: Bukit Larut.  
*Philautus pictus*. Berry, 1975: Bukit Larut.

***Philautus petersi* (Boulenger, 1900)**

*Ixalus larutensis*. Boulenger, 1900a: Bukit Larut.

**Comment.** A single specimen (UKMHC 444) was collected from Ulu Kenas RF on 19 December perched on a leaf of a small plant 0.2 m from the ground at approximately 1000 m elevation. It is in accord with Berry's (1975) description of this species from Peninsular Malaysia and specimens from Bukit Larut (LSUHC 8864, 8872, 9025 – 26).

***Philautus vermiculatus* (Boulenger, 1900)**

*Ixalus vermiculatus*. Boulenger, 1900a: Bukit Larut.  
*Philautus aurfasciatus*. Berry, 1975: Bukit Larut.  
*Philautus vermiculatus*. Berry, 1975: Bukit Larut.

***Rhacophorus bipunctatus* Ahl, 1927**

**Comment.** Several males were heard calling on 16 October 2008 near the system station at Bukit Larut. One specimen was collected (LSUHC 9149) that matches a series of specimens from Pulau Langkawi (Grismer et al., 2006a) and the description of this species by Berry (1975). This is the first record of this *Rhacophorus bipunctatus* from the Banjaran Bintang.

***Rhacophorus cyanopunctatus* Manthey et Steioff, 1998**

*Rhacophorus bimaculatus*. Butler, 1902; Berry, 1975: Bukit Larut.

***Rhacophorus prominanus* Smith, 1924**

**Comment.** A single female (LSUHC 9424) was found in a drain crossing the road at 23:00 on a rainy night at Bukit Larut on 16 September 2009 near the system station. This specimen matches the description of this species by Berry (1975) and is the first record of *R. prominanus* from the Banjaran Bintang.

***Theloderma asperum* (Boulenger, 1896)**

*Ixalus asper*. Butler, 1902: Bukit Larut.  
*Philautus asper*. Berry, 1975: Buki Larut.

***Theloderma leprosum* (Tschudi, 1838)**

*Polypedates leprosus*. Wray, 1890: Bukit Larut.  
*Rhacophorus leprosus*. Flower, 1896; Berry, 1975: Bukit Larut.

**CAECILIANS**

**Ichthyophiidae**

***Caudacaecilia larutensis* (Taylor, 1962)**

*Ichthyophis monochorus*. Boulenger, 1912; Smith, 1930; Berry, 1975: Bukit Larut.  
*Ichthyophis larutensis*. Taylor, 1962: Bukit Larut.

***Ichthyophis* sp.**

*Ichthyophis glutinosus*. Boulenger, 1912: Bukit Larut.  
**Comment.** There are several striped putative species of *Ichthyophis* known from the Malay Peninsula (Berry, 1975; Manthey and Grossmann, 1997; Lim and Lim, 1996; Taylor, 1968) and all have an extremely conserved morphology, making it difficult to distinguish one species from another, resulting in a confusing and unstable taxonomy (Gower et al., 2002). Until the completion of ongoing molecular analyses (D. Gower, personal communication, 2006), no assignment of any population to any species can be done with confidence.

**TURTLES**

**Testudinidae**

***Heosemys spinosa* (Gray, 1831)**

*Geomyda spinosa*. Boulenger 1912: Bukit Larut.

***Manouria emys* (Schlegel et Müller in Temminck, 1844)**

*Testudo emys*. Boulenger, 1899; Flower, 1899: Bukit Larut.

***Manouria impressa* (Günther, 1882)**

*Testudo latinuchalis*. Boulenger, 1912: Bukit Larut.

**LIZARDS**

**Agamidae**

***Acanthosaura bintangensis* Wood, Grismer, Grismer, Norhayati, Chan and Bauer, 2009**

*Acanthosaura crucigera*. Boulenger, 1912; Manthey, 2008: Bukit Larut.

***Bronchocela cristatella* (Kuhl, 1820)**

*Bronchocela cristatella*. Diong and Lim, 1998: Bukit Larut.

***Calotes emma* Gray, 1845**

**Comment.** An adult male (UKMHC 446) was collected from the foothill of Gunung Bubu on 19 December sunning on a pile of dried branches on the ground. It is in accord with Manthey and Grossmann's (1997) description of this species from Peninsular Malaysia.

***Draco abbreviatus* Hardwicke and Gray, 1827**

*Draco punctatus*. Boulenger, 1900a, 1912: Bukit Larut.  
*Draco fimbriatus*. McGuire and Kiew 2001: Bukit Larut.  
**Comment.** An adult male (UKMHC 357) was collected from the foothill of Gunung Bubu on 18 December on a tree trunk 4 m



from the ground. It is in accord with Manthey's (2008) description of this species from Peninsular Malaysia.

***Draco blanfordii* Boulenger, 1885**

*Draco blanfordii*. Boulenger, 1900a, 1912; Laidlaw, 1901b: Bukit Larut.

***Draco fimbriatus* Kuhl, 1820**

*Draco punctatus*. Boulenger, 1912: Bukit Larut.

***Draco formosus* Boulenger, 1900**

*Draco formosus*. Boulenger, 1900a, 1912: Bukit Larut.

**Comment.** A hatchling (UKMHC 412) was collected from Ulu Kenas RF on 19 December in hill dipterocarp forest on a tree trunk 2.5 m from the ground. It is in accord with Muster's (1982) description of this species from Peninsular Malaysia.

***Draco haematopogon* Boie in Gray, 1831**

*Draco microlepis*. Butler, 1902; Boulenger, 1912: Bukit Larut.

*Draco melanopogon*. Laidlaw, 1901b: Gunung Inas.

*Draco haematopogon*. McGuire and Kiew, 2001: Bukit Larut.

**Comment.** Laidlaw (1900) reports finding *Draco melanopogon* at 1000 feet in elevation on Gunung Inas and says "At a height of some 3500 ft. above sea level on Gunung Inas, I saw two or three Flying Lizards belonging to another, smaller species, but could not capture any." We tentatively assign these specimens to *D. haematopogon* being that they are the only "smaller" species of *Draco* in Peninsular Malaysia found above 1000 m and they are common at Bukit Larut.

***Draco melanopogon* Boulenger, 1887**

*Draco microlepis*. Butler, 1902; Boulenger, 1912: Bukit Larut.

*Draco melanopogon*. Laidlaw, 1901b: Gunung Inas.

**Comment.** An adult pair (UKMHC 358 – 59) was collected from Ulu Kenas RF on 18 December on a tree trunk 3 m from ground around the park. They are in accord with Grismer et al.'s (2006b) description of this species from the Temengor Forest Reserve.

***Gonocephalus abbotti* Cochran, 1922**

**Comment.** One specimen (LSUDPC 4427) was collected from Gunung Bubu on 20 December perched on a branch 2 m from ground at 1000 m elevation. It is in accord with the Grismer et al. (2006b) description of this species from the Temengor Forest Reserve.

***Gonocephalus bellii* (Duméril et Bibron, 1837)**

*Gonocephalus borneensis*. Haniitsch, 1900; Boulenger, 1912: Bukit Larut.

***Gonocephalus grandis* (Gray, 1845)**

**Comment.** An adult pair (UKMHC 372, 389) was collected from Ulu Kenas Recreational Forest on 17 – 18 December in vegetation by the Kenas River. They are in accord with Manthey and Grossmann's (1977) description of this species from the Malay Peninsula.

***Pseudocalotes larutensis* Hallerman et McGuire, 2001**

*Pseudocalotes larutensis*. Hallerman and McGuire 2001; Chan-ard et al., 1999: Bukit Larut.

**Eublepharidae**

***Aeluroscalabotes felinus* Günther, 1864**

*Aeluroscalabotes felinus*. Boulenger, 1912; Smedley, 1932: Bukit Larut.

**Gekkonidae**

***Cnemaspis mcguirei* Grismer, Grismer, Wood and Chan, 2008**

*Gonatodes affinis*. Laidlaw, 1901b: Gunung Inas. Smith, 1930: Bukit Larut.

*Gonatodes kendallii*. Boulenger, 1912: Gunung Inas.

*Cnemaspis kendallii*. Das and Bauer, 1998: Bukit Larut.

***Cnemaspis pseudomcguirei* Grismer, Norhayati, Chan, Belabut, Muin, Wood, and Grismer, 2009**

*Gonatodes affinis*. Laidlaw, 1901a: Gunung Inas.

*Cnemaspis pseudomcguirei*. Grismer et al., 2009a: Bukit Larut.

**Comment.** Laidlaw (1901b) reports collecting and seeing several individuals of "small size" between 3000 and 4000 feet in elevation on Gunung Inas. One specimen measured 41 mm in snout-vent length and according to Laidlaw (1901b) all the others were of similar size. This falls within the size range of *Cnemaspis pseudomcguirei* (SVL = 36.0 – 42.5 mm; Grismer et al., 2009a) and is far below that of the sympatric *C. mcguirei* (SVL = 51.9 – 65.0 mm; Grismer et al., 2008a). Being that these are the only two species of *Cnemaspis* known from these elevations in the Bajaran Bintang (Grismer et al., 2008a, 2009a) we consider Laidlaw's (1901b) specimens to be *C. pseudomcguirei*.

***Cyrtodactylus pulchellus* Gray, 1827**

*Cyrtodactylus pulchellus*. Flower, 1899; Boulenger, 1912; Smith, 1930: Bukit Larut.

**Comment.** Two adult females (UKMHC 445, 447) were collected from Gunung Bubu on 19 December on branch 2 m from the ground at 1000 m elevation. They are in accord with Grismer and Norhayati's (2008) description of this species from the Peninsular Malaysia.

***Cyrtodactylus quadrivirgatus* Taylor, 1962**

*Gymnodactylus marmoratus*. Flower, 1899: Bukit Larut. Laidlaw, 1901b: Gunung Inas.

**Comment.** Six specimens (UKMHC 404, 411, 416, 424 – 25, 437) were collected from Ulu Kenas Recreational Forest on 19 – 20 December on low vegetation in forest surrounding the park. They are in accord with the Grismer et al. (2008b) description of this species from Peninsular Malaysia.

***Gehyra mutilata* (Wiegmann, 1834)**

*Gehyra mutilata*. Flower, 1899: Bukit Larut.

***Gekko monarchus* (Duméril and Bibron, 1836)**

*Gekko monarchus*. Manthey and Grossmann, 1997; Chan-ard et al., 1999: Bukit Larut.

**Comment.** An adult female (UKMHC 380) was collected from Ulu Kenas on 18 December on park buildings. They are in accord with Manthey and Grossmann's (1977) description of this species from the Malay Peninsula.

***Hemiphyllodactylus harterti* (Werner, 1900)**

*Lepidodactylus harterti*. Werner, 1900: Gunung Inas.

*Gehyra larutensis*. Boulenger, 1900a: 1912: Bukit Larut.

*Peropus larutensis*. Smedley, 1932: Bukit Larut.



*Hemiphyllodactylus larutensis*. Manthey and Grossmann, 1997: Bukit Larut.

***Hemiphyllodactylus typus* Bleeker, 1860**

*Hemiphyllodactylus typus*. Chan-ard et al., 1999: Bukit Larut.

**Scincidae**

***Dasia grisea* (Gray, 1845)**

Comment. A specimen was located in the collection of the Department of Wildlife and Natural Parks, Malaysia (DWNP 1772) that was collected from Bukit Larut. No other collecting data were associated with the specimen. An additional specimen was observed by LLG and CKO at Bukit Larut on the morning of 16 October sunning on the branch of a tree 4 m above the ground. This is the first record of this species from the Banjaran Bintang.

***Eutropis multifasciatus* (Kuhl, 1820)**

*Mabuya multifasciata*. Flower, 1899: Bukit Larut.

***Larutia larutensis* (Boulenger, 1900)**

*Lygosoma larutense*. Boulenger, 1900b, 1903, 1912; Smith, 1922; Smedley, 1931; Tweedie, 1940: Bukit Larut.

*Larutia larutensis*. Manthey and Grossmann, 1997; Chan-ard et al., 1999; J. Grismer et al., 2003: Bukit Larut.

***Sphenomorphus butleri* (Boulenger, 1912)**

*Lygosoma malayanum*. Butler, 1902: Bukit Larut.

***Sphenomorphus cyanolaemus* Inger et Hosmer, 1965**

*Lygosoma maculatum*. Flower, 1899; Boulenger, 1912: Bukit Larut.

***Sphenomorphus praesignus* (Boulenger, 1900)**

*Lygosoma praesignae*. Boulenger, 1900a: Bukit Larut.

*Sphenomorphus praesignus*. Manthey and Grossmann, 1997: Bukit Larut.

**Varanidae**

***Varanus rudicollis* Gray, 1845**

*Varanus rudicollis*. Bennet and Lim, 1995: Bukit Larut.

**SNAKES**

**Typhlopidae**

***Rhamphotyphlops albiceps* (Boulenger, 1898)**

*Typhlops albiceps*. Boulenger, 1903; 1912: Bukit Larut.

**Pythonidae**

***Python reticulatus* (Schneider, 1801)**

Comment. A large specimen was encountered on the trail to the summit of Gunung Bubu on 17 December in hill dipterocarp forest. This is the first record of this species from the Banjaran Bintang.

**Colubridae**

***Ahaetulla prasina* (Boie, 1827)**

Comment. A yellow adult specimen was photographed along the side of the road (LSUDPC 3018) during the day at Bukit Larut on 19 October 1997. This represents the first record of this species reported from the Banjaran Bintang.

***Amphiesma inas* (Laidlaw, 1901)**

*Tropidonotus inas*. Laidlaw, 1901a: Gunung Inas.

*Amphiesma inas*. Tweedie, 1983; Manthey and Grossmann, 1997: Gunung Inas.

***Aplopeltura boa* (Boie, 1828)**

*Haplopetula boa*. Boulenger, 1912: Bukit Larut.

***Asthenodipsas vertebralis* (Boulenger, 1900)**

*Amblycephalus vertebralis*. Boulenger, 1912: Bukit Larut.

*Pareas vertebralis*. Tweedie, 1983; Manthey and Grossmann, 1997: Bukit Larut.

***Calamaria albiventer* (Gray, 1835)**

*Calamaria albiventer*. Smedley, 1932; Inger and Marx, 1965: Bukit Larut.

***Calamaria lumbricoidea* Boie, 1827**

*Calamaria vermiformis*. Boulenger, 1901b: Bukit Larut.

***Calamaria pavementata* Duméril, Bibron and Duméril, 1854**

*Calamaria pavementata*. Inger and Marx, 1965: Bukit Larut.

***Calamaria schlegeli* Duméril, Bibron et Duméril, 1854**

*Calamaria schlegeli*. Inger and Marx, 1965: Bukit Larut.

***Collorhabdium williamsoni* Smedley, 1931**

*Collorhabdium williamsoni*. Lim, 1964; Tweedie 1983; Manthey and Grossmann, 1997: Bukit Larut.

***Chrysopelea pelias* (Linnaeus, 1758)**

Comment. An adult female (UKMHC 448) was collected from Ulu Kenas Recreational Forest on 18 December in the roof of a hut. It is in accord with Tweedie's (1983) description of this species from Peninsular Malaysia.

***Gonyosoma oxycephala* (Boie, 1827)**

*Gonyosoma oxycephala*. Flower, 1899: Bukit Larut.

Comment. An adult female (UKMHC 360) was collected from Ulu Kenas Recreational Forest on 18 December on a tree 1.5 m above ground. It is in accord with Tweedie's (1983) description of this species from Peninsular Malaysia.

***Lycodon butleri* Boulenger, 1900**

*Lycodon butleri*. Boulenger, 1900a; Lim, 1964; Tweedie, 1983: Bukit Larut.

***Lycodon subcinctus* Boie, 1827**

*Lycodon subcinctus*. Flower, 1899; Boulenger, 1912: Bukit Larut.

***Macrocalamus chanardi* David and Pauwels, 2004**

*Macrocalamus lateralis*. Flower, 1899; Boulenger, 1912; Manthey and Grossmann, 1997: Bukit Larut.

***Psammodynastes pulverulentus* (Boie, 1827)**

Comment. A juvenile specimen (LSUPC 10 – 16, 1022) was found in a drainage ditch during the early morning of 26 October 1997 at Bukit Larut. This represents the first record of this species reported from the Banjaran Bintang.

***Pseudorabdion longiceps* (Cantor, 1847)**

**Comment.** An adult specimen (LSUDPC 0090) was found crossing the road during the evening of 25 October 1997 at Bukit Larut. This represents the first record of this species reported from the Banjaran Bintang.

***Rhabdophis chrysargos* (Schlegel, 1837)**

*Tropidonotus chrysargos*. Flower, 1896; Boulenger, 1912: Bukit Larut.

*Natrix chrysargos*. Smedley, 1932: Bukit Larut.

**Comment.** An adult female (UKMHC 388) was collected from Ulu Kenas Forest Reserve on 18 December by the side of a forest stream. It is in accord with Tweedie's (1983) description of this species from Peninsular Malaysia.

***Rhabdophis conspicillatus* (Günther, 1872)**

**Comment.** A juvenile (LSUHC 9433) was collected at 800 m along side the road below the Gunung Hijau rest house. This specimen matches the description of this species in Tweedie (1983) and is the first record of *R. conspicillatus* for the Banjaran Bintang.

***Xenelaphis ellipsifer* Boulenger, 1900**

*Xenelaphis ellipsifer*. Tweedie, 1983: Bukit Larut.

***Xenochrophis cerasogaster* (Cantor, 1839)**

*Xenochrophis cerasogaster*. Boulenger, 1912: Bukit Larut.

**Comment.** Cantor (1847) provided a description of a specimen of *Xenochrophis cerasogaster* from "Province Wellesley" in Peninsular Malaysia. Boulenger (1912) reported that an additional specimen was taken from "Larut, Perak [Bukit Larut]" by L. Wray, Jr., curator of the Perak Museum. Wall (1923), without evidence, anecdotally dismisses Cantor's (1847) record as being doubtful but did not comment on the record provided by Boulenger (1912). Smith (1930) continued to follow Cantor (1847) and Boulenger (1912) in recognizing *X. cerasogaster* as part of the herpetofauna of Peninsular Malaysia. Smedley (1932) raised serious doubts as to the provenance of a number of Cantor's (1847) Malaysian records but did not list *X. cerasogaster* among them, likely recognizing the fact that an additional specimen had been collected from Bukit Larut (Boulenger, 1912). Nonetheless, Smith (1943), without comment, did not list this species from Peninsular Malaysia and Tweedie (1953:126), with no supporting evidence or reason, noted that *X. cerasogaster* had "since been deleted" from the Malayan herpetofauna, presumably basing his assertion on Smith's (1943) omission of this species. Neither of these authors provided any evidence for their exclusion of *X. cerasogaster* despite the fact that two specimens from specific localities in Penin-

sular Malaysia had been collected (Boulenger, 1912; Cantor, 1847). Malnate and Minton (1965) extensively reviewed the anatomy of *X. cerasogaster* and examined Cantor's (1847) specimen (BMNH 60.3.19.12223), stating that it "is unquestionably *Xenochrophis cerasogaster*." Yet, based solely on distributional data (*X. cerasogaster* putatively being restricted to the Ganges and lower Indus valleys of Pakistan, India, and Nepal; Malnate and Minton, 1965:117), they elected to follow Tweedie (1953) and not include it as part of the Malaysian herpetofauna. They stated that Tweedie's (1953) action was the "correct interpretation" even though Tweedie (1953) provided absolutely no justification whatsoever for his decision. The disjunct distribution among Indomalayan lineages across South Asia is a well known biogeographical pattern occurring in many taxa (e.g., Dicroglossidae, *sensu* Frost, 2009; *Draco*, Manthey, 2008; the *Cnemaspis kandiana* group, Bauer et al., 2007; Cyndrophiiidae, Vitt and Caldwell, 2009.) which we believe has no bearing on the provenance of Cantor's (1847) and Boulenger's (1912) specimens. Additionally, other species on which Cantor (1847) reported as being from Malaysia that were specifically delisted by Smedley (1932) have since proven to be valid records based on the collection of additional material over a hundred years later (e.g., *Lygosoma albopunctata*, Lim, 1998). Therefore, we find more scientific justification in recognizing Cantor's (1847) and Boulenger's (1912) records for this species than not recognizing them. Additionally we note that Malnate and Minton's (1965) recounting of the chronological events which they believe transpired to Tweedie's delisting of *X. cerasogaster* and clearly influenced their decision to follow him is flawed due to their erroneous citing of Tweedie's book as being published in 1935 (Malnate and Minton, 1965:31) instead of 1953.

**Elapidae*****Bungarus flaviceps* Reinhardt, 1843**

*Bungarus flaviceps*. Flower, 1899: Bukit Larut.

***Calliophis bivirgata* (Boie, 1827)**

*Dolophis bivirgatus*. Laidlaw, 1901a: Gunung Inas.

**Comment.** An adult female (UKMHC 436) was collected from Ulu Kenas Recreational Forest on 20 December in a swampy area among leaf litter. It is in accord with Tweedie's (1983) description of this species from Peninsular Malaysia.

**Viperidae*****Ovophis monticola* (Günther, 1864)**

*Lachesis monticola*. Boulenger, 1912: Bukit Larut.

**TABLE 2.** Numbers of Species from Selected Montane Regions

| Region                        | Frogs | Caecilians | Turtles | Lizards | Snakes |
|-------------------------------|-------|------------|---------|---------|--------|
| Banjaran Bintang              | 41    | 2          | 3       | 31      | 30     |
| Bajaran Titiwangsa            | 24    | 1          | 2       | 25      | 44     |
| Belum-Temengor forest complex | 39    | 1          | 7       | 27      | 26     |
| Gunung Lawit                  | 46    | 0          | 2       | 20      | 8      |
| Gunung Tahan                  | 37    | 0          | 2       | 24      | 20     |
| Gunung Benom                  | 39    | 1          | 0       | 20      | 19     |

**Note.** Data for the Banjaran Titiwangsa come from Lim et al. (2003), Leong and Lim (2002), Sly (1974), Grismer (2007, 2008), and Chan et al. (2009). Data for the Belum-Temengor forest complex come from Grismer et al. (2006b). Data for Gunung Lawit come from Dring (1979). Data for Gunung Tahan come from Boulenger (1908) and Smith (1922). Data for Gunung Benom come from Grandison (1972).

***Popeia fucata* (Vogel, David and Pauwels, 2004)**

*Lachesis gramineus*. Laidlaw, 1901a: Gunung Inas.

*Trimeresurus fucatus*. Vogel, David et Pauwels, 2004: Bukit Larut.

**Comment.** Laidlaw (1901a) lists *Lachesis gramineus* (= *Cryptelytrops albolabrus*) from Gunung Inas but provides no description of that specimen to separate it from the very similar *Popeia fucata* known from Bukit Larut. Wüster (in David and Ineich, 1999) provides compelling evidence that all Malaysian and Indonesia records of *C. albolabrus* are highly suspect and that no actual specimens exist. Therefore, we tentatively consider Laidlaw's (1901a) report to be that of *P. fucata*.

***Trimeresurus wiroti* Trutnau, 1981**

*Lachesis borneensis*. Boulenger, 1912: Bukit Larut.

**DISCUSSION**

This report indicates there are at least 107 species of amphibians (41 frogs and two caecilians) and reptiles (three turtles, 31 lizards, and 30 snakes) inhabiting the Banjaran Bintang (Table 1). This is comparable to the Banjaran Titiwangsa that has at least 96 species (24 frogs, one caecilian, two turtles, 25 lizards, and 44 snakes) totaled from Cameron Highlands (Leong and Lim, 2003; Grismer, 2007; Wood et al., 2008, 2009), Fraser's Hill (Lim et al., 2002; Grismer, 2007; Wood et al., 2008, 2009), and the vicinity of Genting Highlands (Chan et al., 2009; Grismer, 2007; Sly, 1976). The well-studied herpetofauna of the Belum-Temengor forest complex at the northern end of the Banjaran Titiwangsa has near 100 species (39 frogs, 1 caecilian, 7 turtles, 27 lizards, and 26 snakes; see Grismer et al., 2006b and references therein) and is nearly equal to the herpetofaunal composition of the Banjaran Bintang in all categories (Table 2). This is in contrast to the Banjaran Titiwangsa that has far more species of snakes (Table 2). These data clearly indicate that the relatively small, poorly studied Banjaran Bintang is comparable in biodiversity to the much larger Banjaran Titiwangsa and future research is desperately needed to ascertain its true biodiversity. Additionally, Bukit Larut and Gunung Inas are the type locality for 19 and two species, respectively, of which nine are endemic to the Banjaran Bintang (Table 1). Comparisons to other regions of the Banjaran Timur are not practical due to the expansive, scattered, and fragmented topography of that system and general lack of research therein, but they are included along with Gunung Benom in Table 2.

It is clear that the Banjaran Bintang harbors a significant portion of the herpetofauna of Peninsular Malaysia, nearly 10% of which is endemic to that region. As posited by Pan and Grismer (2008) data such as these should be a clear indication that unexplored upland sys-

tems will harbor a high diversity of species, a significant portion of which will most likely be endemic, and much more field work is needed before their true diversity is realized.

Unfortunately a cable car system to transport visitors from the city of Taiping to the upland habitats of the Bukit Larut region has been approved. It is likely, this will have a severe negative impact on the pristine nature of this environment by opening up the Banjaran Bintang to the illegal commercial animal market which already permeates Peninsular Malaysia (Christy 2008, 2010) and is so prevalent in other upland areas such as Cameron Highlands.

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