

Distribution and Natural History Notes on Some Poorly Known Frogs and Snakes from Peninsular Malaysia

CHAN KIN ONN

Institute for Environment and Development (LESTARI)
Universiti Kebangsaan Malaysia, 43600 Bangi
Selangor Darul Ehsan, Malaysia
e-mail: kin_onn@yahoo.com

and

NORHAYATI AHMAD

School of Environment and Natural Resource Sciences
Faculty of Science and Technology, Universiti Kebangsaan Malaysia
43600 Bangi, Selangor Darul Ehsan, Malaysia
e-mail: yati_68@yahoo.co.uk

Despite having been studied for many years, the status and knowledge of the herpetofauna of Peninsular Malaysia is far from being complete or fully understood. Although relatively recent new species discoveries have added significantly to the overall biodiversity of the region (Chan and Grismer 2008; Chan et al. 2009; Das et al. 2007; Das and Lim 2001; Grismer and Chan 2008; Grismer et al. 2006 and references therein; Grismer et al. 2008a, b, c; Grismer et al. 2009; Grismer and Norhayati 2009; Leong and Lim 2003; Matsui and Jaafar 2006; McLeod and Norhayati 2007; Van Rooijen and Vogel 2008; Vogel and Van Rooijen 2007; Wood et al. 2008, 2009), information on existing species are still inadequate or lacking altogether. Alongside these new findings, intensive and systematic field work has also uncovered a number of rare species (e.g., *Cyrtodactylus sworderi*, Grismer et al. 2007; *Enhydris pahangensis*, Chan, *in press*) which have not been recorded since their discoveries in the early 1900s. Many of these species lack complete descriptions and/or proper color illustrations and next to nothing is known about their life history as they have rarely been observed in the wild. This paper addresses some of these issues by providing expanded descriptions, color photographs, life history observations, and new locality records of the more poorly known frogs and snakes of Peninsular Malaysia.

MATERIALS AND METHODS

Color photographs were taken for vouchers and color pattern comparisons. Measurements were taken with Mitutoyo digimatic caliper to the nearest 0.1 mm. Measurements taken for frogs are as follows: snout–vent length (SVL); tibia length (TiL), measured from the center of the knee to the centre of the ankle. For snakes: snout–vent length (SVL); tail length (TaL), from cloaca to tail tip; number of dorsal scale rows (DoS), counted at one head length posterior to head, at midbody, and one head length anterior to vent; number of ventral scale rows (Ven); number of supralabials (SupL), with the number of SupL in contact with the orbit in brackets; number of infralabials (InfL). Voucher specimens or photographs are provided to support new locality records. All specimens have been deposited at the museum of the Department of Wildlife and National Parks Peninsular Malaysia (DWNP) and the herpetological collection at Universiti Kebangsaan Malaysia (UKM). HC refers to the Herpetological Collection of Universiti Kebangsaan Malaysia

(UKM), Bangi, Selangor, Peninsular Malaysia; UKMDPC refers to Universiti Kebangsaan Malaysia Digital Photograph Collection; LSUDPC refers to the La Sierra University Digital Photograph Collection. Institutional abbreviations follow Leviton et al. (1985), except we retain ZRC for USDZ, following conventional usage. Measurements taken on voucher specimens are presented in Table 1.

RESULTS

Species accounts

Rhacophorus robinsoni Boulenger 1903

Robinson's Treefrog

Fig. 1

Rhacophorus robinsonii Boulenger 1903 in Annandale and Robinson (eds.), *Fasciculi Malayenses*, 2(1):136. Type locality: "Bukit Besar. 2500 feet", Pattani, Thailand.

Rhacophorus (Rhacophorus) robinsonii Ahl 1931:157

Rhacophorus pardalis robinsoni Wolf 1936:208

Rhacophorus robinsoni Inger 1954:372; Berry 1975:109; Manthey & Grossman 1997:138; Das & Norsham 2007:70

Description. SVL male 59 mm; female 82 mm; Vomerine teeth in two long oblique series touching the inner edge of the choanae; snout obtusely pointed; canthus rostralis sharp; tympanum distinct, as high as wide; supratympanic fold distinct, outlined with black, extends horizontally posterior to the orbit, slants, and ends abruptly posterior to the tympanum.

Finger tips expanded into large disks bearing circum-marginal and transverse ventral grooves; width of three outer fingers equal to tympanum diameter; broad webbing reaches base of disks of outer three fingers but only halfway to disk of first finger; nuptial pad present in males. Toe disks smaller than those of fingers, bearing circum-marginal and transverse ventral grooves; completely webbed to disks on all toes; a small inner metatarsal tubercle; no outer metatarsal tubercle.

Skin above smooth; slightly granular on flanks and throat; belly covered with large, smooth, rounded granules; arms and tarsus without flaps of skin; no anal flap.

Color in life. Pale brown or dark chocolate brown to light green above; two thin, black bars on the head, one crossing the snout, and another longer bar between the orbits; dorsum scattered with dark blotches; with or without a white spot below the tympanum; sides of head a darker shade of brown; flanks, inner and outer sides of limbs yellowish with black and whitish-blue reticulations; limbs bearing dark cross-bars; interdigital webbing black with fine brown veins; throat whitish, mottled with brown; belly white with dark reticulations. Juveniles: yellow to orange interdigital webbing; underside of the body yellowish.

Life history. *Rhacophorus robinsoni* inhabits primary or old, undisturbed secondary forests and has been found on tree tops as high as 10 m above the forest floor (Grismer et al. 2004) and on leaves as low as 1 m above the ground. Like many of its other congeners, frogs descend lower to the ground following heavy rainfall to breed along stagnant puddles or ponds. However, one specimen from Ulu Gombak was found sitting on a leaf during an extremely dry night when no other frogs were abroad and Grismer et al. (2004) recorded a gravid female during the day, crouched in

the interstices of truck tracks on a logging road far from any body of water.

Distribution in Peninsular Malaysia. Kuala Teku, Pahang (Berry 1975); Gombak, Selangor (Yong 1977); Temenggor, Perak (Grismer et al. 2004); Cameron Highlands, Pahang; Kampung Chennah, Negeri Sembilan (this report).

Notes. In Peninsular Malaysia, *Rhacophorus robinsoni* has only been recorded three times, the first being from Kuala Teku, Pahang in the early 1900's (Boulenger 1912) and the second from Gombak, Selangor (Yong 1977). A third specimen was reported by Grismer et al. (2004) from Temenggor Forest Reserve, Perak, but was left unidentified (*Rhacophorus* sp.). This species has since been found at Cameron Highlands, Pahang (UKMDPC 1.0002) and Kampung Chennah, Negeri Sembilan (HC 191,192; Fig. 1). Given the current distribution pattern of *R. robinsoni* which ranges from southern Thailand to its southernmost record in Negeri Sembilan, it is likely that this species has a wider distribution range and probably occurs throughout Peninsular Malaysia.

Theloderma leprosa Tschudi 1838

Fig. 2

Theloderma leprosa Tschudi 1838, Classification der Batrachier, 32: 73. Type locality: "Sumatra", Indonesia.

Hyla leprosa Schlegel 1858:55

Theloderma leprosum Boulenger 1884:21

Polypedates leprosus Günther 1887:315

Rhacophorus leprosus Boulenger 1890:324; Berry 1975:100

Theloderma leprosa Das & Norsham 2007: 71

Description. SVL 65 mm; Vomerine teeth in two short series touching the inner front edge of the choanae; head broader than long; canthus rostralis visible, angular; lores distinctly concave; nares protruding from snout with an internarial sulcus; tympanum distinct, $\frac{3}{4}$ eye diameter, ellipsoidal, covered with small, rounded warts not bearing asperities; supratympanic fold absent. Finger tips expanded into disks bearing circum marginal grooves; fingers free of web; outer metacarpal tubercle present; nuptial pad present in males. Disks of toes smaller than those of fingers, bearing circum marginal grooves; toes nearly entirely webbed, reaching disks of third and fifth, third phalanx of fourth; subarticular tubercles well developed; inner metatarsal tubercle present.

Entire upper surface covered with prominent warts of varying sizes, all bearing granular asperities; a series of large, ridge-like warts on back and hind limbs; throat with raised granules bearing apical asperities; chest and belly covered with large, smooth, rounded granules.

Chocolate to grayish brown above; asperities on warts whitish which gives it a speckled appearance; underside of body, lower side of flanks and inner side of limbs black with whitish and pale blue reticulations; interdigital webbing and disks orange.

Life history. *Theloderma leprosa* has been observed in tree-holes as high as 3 m above ground (pers. obs.) The size of these large thelodermids (Max. SVL 65 mm) may play a role in habitat stratification within this group, with smaller congeners (*T. asperum*, *T. horridum*, and *T. licin*) and other tree-hole dwellers (*Metaphrynella pollicaris* and *Phrynella pulchra*) occupying smaller tree holes and cavities closer to the ground. Thus far, frogs have only been found in primary and old secondary forests where bigger trees are presumably able to provide the specific microhabitat require-

ments for these large tree-hole breeders. Berry (1975) noted that a specimen was found in a hole made by cicadas in the ground while Dring (1979) found a specimen on a palm leaf 1.5 m above ground at 790 m in elevation. *Theloderma leprosa* appears to be a high altitude species, occurring at elevations of approximately 800 m and above sea level.

Distribution in Peninsular Malaysia. Bukit Larut, Perak; Gunung Angsi, Negeri Sembilan; Gunung Tapis, Pahang (Berry 1975); Gunung Lawit, Terengganu (Dring 1979); Cameron Highlands, Pahang; Gunung Besar Hantu, Negeri Sembilan (this report).

Notes. *Theloderma leprosa* was first discovered in the Malay Peninsula by Mr. L. Wray from Larut Hills [Bukit Larut], Perak at 4000 feet elevation (Boulenger 1912). Subsequent locality records were from Gunung Angsi, Negeri Sembilan (at 2600 feet) and Gunung Tapis, Pahang (Berry 1975). Dring (1979) reports this species from Gunung Lawit, Terengganu. Since then, this species has also been discovered in Cameron Highlands, Pahang and Gunung Besar Hantu, Negeri Sembilan (HC 281; Fig. 2). Thus far, *T. leprosa* has been shown only to occur at high elevations in all three of Peninsular Malaysia's main mountain ranges, Bukit Larut on Banjaran Bintang; Cameron Highlands, Gunung Besar Hantu and Gunung Angsi on Banjaran Titiwangsa; Gunung Lawit and Gunung Tapis on Banjaran Timur. Following such trends, this species is likely to occur on other mountain tops throughout those mountain ranges.

Hylarana siberu (Dring, McCarthy & Whitten 1990)

Fig. 3

Rana siberu Dring, McCarthy & Whitten 1990. *Indo-Malayan Zoology*, 6(1989): 119-132. Type locality: "Teitei Bulak, Sabeuleleu, Siberut [Island], 1° 21'S, 98° 59'E", Mentawai Islands, Indonesia.

Rana (Pulchrana) siberu Dubois 1992:326

Pulchrana siberu Frost et al. 2006:369

Hylarana siberu Che et al. 2007:1

Description. SVL male 39.5 mm; female 44.9 mm; Skin above smooth, slightly rugose on back, flanks and underside of body. Tympanum visible, slightly higher than wide, about $\frac{1}{2}$ eye diameter; supratympanic fold absent. Nuptial pads absent in males; humeral glands enlarged. Fingers with rudimentary web; outer metatarsal tubercle round, inner one oval. Web reaching one half phalanx of first toe and first phalange of second toe, one half phalanx between second and third toes, base of disk of third toe and second phalanx of fourth toe, two half phalanges between fourth and fifth toes; inner metatarsal tubercle oval. Dorsum completely black without markings; complete or nearly complete reddish/orange dorsolateral stripe from rostrum, along the canthal region, lateral margin of upper eyelid, along body and terminating at sacral region; series of small, white spots on upper labial; flanks and upper side of limbs with round, creamy yellow spots, sometimes connected together forming short, roundish streaks; throat and underside of limbs whitish, heavily stippled with dark brown; belly whitish with dark brown reticulations

Life history. *Hylarana siberu* inhabits lowland primary forest and has been found along the edge of a temporary pool in a swampy area away from streams. Another specimen was caught in a pit-fall trap away from streams as well which may indicate that this species is not a riparian as is its putatively close relative

Hylarana picturata which it most closely resembles.

Distribution in Peninsular Malaysia. Lakum Forest Reserve, Pahang (Leong and Lim 2004); Kuala Gandah, Pahang (this report).

Notes. *Hylarana siberu* was previously known from the Indonesian Island of Siberut (west Sumatra) and Sumatra only (Dring et al. 1990). The first record of this species in Peninsular Malaysia was of a single adult male from the Lakum Forest Reserve, Pahang (Leong and Lim 2004). This paper reports the second known specimen of an adult female (DWNP 1189; Fig. 3) from Kuala Gandah, Pahang, approximately 25 km from Lakum Forest Reserve. In Peninsular Malaysia, *H. siberu* most closely resembles *H. picturata* but differs by having an immaculate dorsum vs. a spotted dorsum; continuous, unbroken dorsolateral stripe vs. discontinuous dorsolateral stripe formed by closely linked spots; and reduction in webbing on toes vs. nearly full webbed.

Reptilia

Calliophis gracilis Gray 1835

Spotted Coral Snake

Fig. 4

Calliophis gracilis Gray 1835. Illustrations of Indian Zoology, chiefly selected from the collection of Major - General Hardwicke. Vol. 2. London (1833–1834): 263 pp.

Callophis gracilis Günther 1864

Elaps nigromaculatus Cantor 1847:1029

Callophis gracilis Boulenger 1912:203

Calliophis gracilis Tweedie 1983:110

Calliophis gracilis Welch 1994:39; Slowinski, Boundy & Lawson 2001

Description. Body slender, relatively long, up to 740 mm total length; tail very short, terminating in a blunt point; dorsal scales arranged in 13/13/13 rows; ventrals 303–324; subcaudals 21–28; six supralabials, 3rd and 4th touching the orbit; five infralabials.

Body gray above with a thin, black, vertebral stripe connected to a series of small black spots. Similar lateral stripe connects a series of larger, black spots which alternate with smaller, vertebral spots. Top of head with dark, symmetrical markings. Underside of body with alternating black and yellow bands. Underside of tail banded black and orange.

Life history. A specimen from Cameron Highlands was found by Orang Asli collectors above 700 m elevation. At Bukit Lagong, Selangor, a subadult specimen was observed in the afternoon, swimming across a dammed-up portion of stream at 350 m elevation.

Distribution in Peninsular Malaysia. Penang, southern Perak, Selangor (Boulenger 1912); Fraser's Hill, Pahang (Leong and Lim 2003); Cameron Highlands, Pahang (this report)

Notes. According to Cantor (1847), *Calliophis gracilis* is common in the hills of Penang but no reports of this species have been made from that island since his early observations. In Selangor, this snake is known from Gombak and Bukit Lagong, Kepong.

Xenelaphis ellipsifer Boulenger 1900

Ocellated Brown Snake

Fig. 5

Xenelaphis ellipsifer Boulenger 1900. Description of new reptiles and batrachians from Borneo. Proc. Zool. Soc. London:

182–187. Type locality: Sarawak river.

Xenelaphis ellipsifer Tweedie 1983:48; Manthey & Grossmann 1997: 396; Malkmus et al. 2002:369

Description. Maximum recorded length 2320 mm; 1–2 preoculars, one subocular, two postoculars; one loreal; 8–9 supralabials; 2+2 or 1+2 temporals; dorsal scales arranged in 17/17/15 rows; 186–203 ventrals; anal plate divided; 129–134 subcaudals. Brown above, paler on the sides with a series 18–20 black, circular or ellipsoidal markings, each crossing the back and touching the ventrals on either side; the circles are bordered externally with paler brown or white and in between each circle, lower on the sides is an irregularly shaped black spot; top of head and neck rusty brown with longitudinal black markings on side of neck; sides of head and neck yellow; belly creamy white.

Life history. *Xenelaphis ellipsifer* inhabits primary and old secondary forests from lowlands to 1100 m in elevation. Adults probably feed on fish and rodents while juveniles prefer fish, frogs and lizards (Malkmus et al. 2002). According to the Orang Asli collectors who found this species in Kampung Chennah, Negeri Sembilan, the snake was abroad at night, foraging in and along a moderately flowing stream and was quick to escape when approached. The same snake was observed along the same stream a number of instances which might suggest a narrow home range.

Distribution in Peninsular Malaysia. Bukit Larut, Perak; Cameron Highlands, Pahang (Tweedie 1983); Gombak, Selangor (pers. comm.); Kampung Chennah, Negeri Sembilan (this report).

Notes. *Xenelaphis ellipsifer* was not known from Peninsular Malaysia until 1954 when a specimen was found in a collection from Bukit Larut, Perak. It was then the fifth specimen of *X. ellipsifer* known to science, with previous records being from Borneo and Sumatra (Tweedie 1983). Lim (1958) reported a skin obtained from Cameron Highlands in 1957. Since then, *X. ellipsifer* has not been seen until Sheperd and Auliya (pers. comm.) reported a sighting of this species at Gombak, Selangor. Following that, another specimen was found by Orang Asli collectors in the lowland forests of Kampung Chennah, Negeri Sembilan which constitutes a new locality record (HC 194; Fig. 5).

Oligodon signatus (Günther 1864)

Barred Kukri Snake

Fig. 6

Simotes signatus Günther 1864. The Reptiles of British India. London (Taylor & Francis), xxvii + 452 pp.

FIGURES 1–8, OPPOSITE PAGE.

FIG. 1. *Rhacophorus robinsoni* from Kampung Chennah, Negeri Sembilan (HC 191).

FIG. 2. *Theioderma leprosa* from Gunung Besar Hantu, Negeri Sembilan (HC 281).

FIG. 3. *Hylarana siberu* from Kuala Gandah, Pahang (DWNP 1189).

FIG. 4. *Calliophis gracilis* from Cameron Highlands (HC 193).

FIG. 5. *Xenelaphis ellipsifer* from Kampung Chennah, Negeri Sembilan (HC 194).

FIG. 6. *Oligodon signatus* from Kampung Chennah, Negeri Sembilan (HC 196).

FIG. 7. *Asthenodipsas malaccanus* from Gunung Besar Hantu, Negeri Sembilan (HC 195).

FIG. 8. *Enhydryis pahangensis* from Nenasi Forest Reserve, Pahang (HC 198).



Oligodon signatus Wall 1923; Tweedie 1985:53; Hendrickson 1966:67; Manthey & Grossman 1997:373

Description. Maximum length 600 mm; seven supralabials, third and fourth contact orbit; loreal usually present, rarely absent on one side of the head; dorsal scales arranged in 17/15/15 rows; 141–157 ventrals; 47–60 subcaudals. Chocolate brown above with a series of reddish, chevron-like markings mid-dorsally that begin just posterior to the nape until the tip of tail. Markings are spaced approximately 8–10 scales apart at midbody. These markings are larger and more elongate at the anterior portion of the body and decrease in size towards the tail. Underside of body pinkish red.

Life history. This semi-fossorial snake inhabits lowland to upper hill forests.

Distribution in Peninsular Malaysia. Selangor; Malacca (Batchelor 1958); Gunung Pantu Forest Reserve, Johor (Yong 2006); Cameron Highlands, Pahang; Kampung Chennah, Negeri Sembilan (This report).

Notes. In Peninsular Malaysia, Batchelor (1958) reports *Oligodon signatus* from Selangor and Malacca. Yong (2006) reports a specimen from Gunung Pantu Forest Reserve, Johor, which was positively identified from a roadkill. Two additional localities reported here are Kampung Chennah, Negeri Sembilan (HC 196; Fig. 6) and Cameron Highlands, Pahang (UKMDPC 1.0077). The latter represents the northern most record for this species.

Asthenodipsas malaccanus

Malayan Slug Snake

Fig. 7

Asthenodipsas malaccana Peters 1864. Über neue Amphibien (*Typhloscincus*, *Typhlops*, *Asthenodipsas*, *Ogmodon*). Mber. k. preuss. Akad. Wiss., Berlin: 271–276.

Amblycephalus malaccanus Boulenger 1892; De Rooij 1917

Pareas malaccanus Robinson & Kloss 1920; Grandison 1972, 1978

Internatus malaccanus Rao & Yang 1992

Asthenodipsas malaccanus Iskandar & Colijn 2002; Grossman & Tillack 2004

Description. Body cylindrical with a very weak vertebral ridge; 6–8 supralabials, 3rd and 4th, rarely only 3rd touching orbit; 5–7 infralabials; dorsal scales arranged in 15/15/15 rows; 154–180 ventrals; 26–56 subcaudals. Ground color of dorsal surface of body and tail greyish brown; top and sides of head and supralabials dusky white smudged with irregularly shaped, gray to brown markings; iris red; dull, white, vertebral line extending posteriorly approximately 14 scale rows connects white head markings with first white, dorsal body band; dorsum overlain with approximately 28 irregularly shaped to squarish, white vertebral blotches; some blotches occur only on one or the other side of the vertebral region, covering 3–5 scale rows; others straddle the vertebral region covering 5–7 scale rows; series of broken to continuous white markings on vertebral scales connect dorsal blotches; brown stippling on centralmost scales of blotches give blotches a smudged appearance; sides of body and tail immaculate; infralabials, gular region and throat white with dark grey-brown mottling; ventral scales grayish brown, slightly lighter than color of dorsum; white midventral line extends from throat to tip of tail.

Life history. A gravid female carrying three eggs was found above 800 m elevation on Gunung Besar Hantu, Negeri Sembilan during the month of September (HC 195; Fig. 7).

Distribution in Peninsular Malaysia. Asahan Estate, Malacca; Gunung Benom, Pahang; Perak; Selangor (Tweedie 1983); Endau-Rompin National Park, Johor (LSUDPC 4860); Gunung Besar Hantu, Negeri Sembilan (this report).

Notes. *Asthenodipsas malaccanus* ranges from Thailand, through Peninsular Malaysia to Indonesia (Sumatra and the Mentawai Islands). Stuebing and Inger (1999) reported this species from Borneo, however, we have examined a series of eight specimens of *A. malaccanus* from Thailand, Indonesia, and Peninsular Malaysia, including the holotype (see appendix) and found them to differ notably from the Bornean population by having a weak vertebral ridge vs. a strong ridge; and a blackish dorsum with white, squarish, paravertebral blotches vs. a tan dorsum with dark, vertical bars. Therefore, we consider the *A. malaccanus* of Borneo to be a potentially new species.

Enhydris pahangensis

Pahang Water Snake

Fig. 8

Enhydris pahangensis Tweedie 1946. Tweedie, M.W. F. 1946. A new snake from the Malay Peninsula. Ann. Mag. nat. Hist. (11) 13 (98):142–144.

Description. Males up to 300 mm SVL; females up to 392 mm SVL; dorsal scales arranged in 25/25/21 rows; 129–132 ventrals; 47–55 subcaudals; eight supralabials, 4th touching the orbit; 11 infralabials. Grayish or yellowish brown above with a series of paired, dark spots beginning from the nape to the base of tail. Spots are usually half a scale wide and may not always be parallel to each other. Anterior portion of the head darkly stippled, slightly darker than ground body color. Labials white, heavily stippled with black. A cream-colored lateral stripe on each side of the body extends from the side of the head to the tail tip. On the body, this stripe covers four of the lowest dorsal scale rows, reduced to three towards the vent. The stripe is bordered above and below by a black zig-zag line, the line bordering the ventral scales is thicker and more pronounced. Ventrals white, edged with black, with an antero-medial dark blotch on each ventral scale. Chin scales white, mottled with black.

Life history. This species inhabits primary or undisturbed secondary forests and has been found among decaying leaves in a stagnant portion of a small and slow moving stream.

Distribution in Peninsular Malaysia. Kuala Tahan, Pahang (Tweedie 1983); Sungai Kura, Hulu Terengganu (Chan, *in press*); Nenasi Forest Reserve, Pahang (this report).

Notes. In Peninsular Malaysia, *Enhydris pahangensis* most resembles *E. plumbea* but differs by having 25 dorsal scale rows vs. 19; a creamy lateral stripe distinctly bordered above and below by a black zig-zag line vs. a creamy lateral stripe lacking distinct zig-zag borders; labials, chin scales, and anterior portion of snout mottled with dark gray vs. no mottling; ventral and subcaudal scales white, edged with black and an antero-medial dark blotch on each ventral scale vs. immaculate white. Previously, *E. pahangensis* was only known from the type specimen from Kuala Tahan, Pahang. Subsequently, a second specimen was collected from Hulu Terengganu (Chan, *in press*), thereby expanding its

TABLE 1. Measurements taken for examined specimens. See methods and materials for abbreviations. Blank = not applicable.

Species	Locality	Mus. No.	Sex	SVL	TiL	TaL	DoS	Ven	SubC	SupL	IntL
<i>Rhacophorus robinsoni</i>	"Kampung Chemah, Negeri Sembilan"	HC 191	Adult Male	59.2	25.7						
<i>Rhacophorus robinsoni</i>	"Kampung Chemah, Negeri Sembilan"	HC 192	Juvenile	30.4	13.9						
<i>Theloderma leprosa</i>	"Kampung Chemah, Negeri Sembilan"	HC 281	Adult Male	61.1	33.1						
<i>Hylarana siberu</i>	"Kuala Gandah, Pahang"	DWNP 1189	Adult Female	37.7	16.9						
<i>Calliophis gracilis</i>	"Cameron Highlands, Pahang"	HC 193	Adult Male	55.0		30	13/13/13	311	25	6 (3+4)	5
<i>Xenelaphis ellipsifer</i>	"Kampung Chemah, Negeri Sembilan"	HC 194	Adult Female	85.0		351	17/17/15	191	130	8 (4)	10
<i>Oligodon signatus</i>	"Kampung Chemah, Negeri Sembilan"	HC 196	Adult Female (gravid)	315		88	17/15/15	156	54	7 (3+4)	8
<i>Ashenodipsas malaccensis</i>	"Gunung Besar Hantu, Negeri Sembilan"	HC 195	Adult Female (gravid)	384		39	15/15/15	170	28	7 (3+4)	5
<i>Enhydris pahangensis</i>	"Nenasi Forest Reserve, Pahang"	HC 197	Adult Male	300		69	25/25/21	132	55	8 (4)	11
<i>Enhydris pahangensis</i>	"Nenasi Forest Reserve, Pahang"	HC 198	Adult Female	392		68.5	25/25/21	131	47	8 (4)	11

distribution to the neighboring state. We report of a third locality from Nenasi Forest Reserve, Pahang (HC197, HC198; Fig. 8). Due to its close resemblance to *E. plumbea* whose identity it has probably been masquerading under most of the time, this species is likely to encompass a wider distribution which might be revealed upon closer examination of existing museum specimens.

DISCUSSION

Herpetofaunal surveys generally result in skewed observation frequencies with some species observed much more frequently than others (e.g., Das 1996; Murphy et al. 1994; Ziegler 2002) and several factors can contribute to the perceived rarity of a particular species. First, some species are rarely seen simply because of their association with specific, isolated, habitats like forest canopies, karst formations, mountain tops or islands (e.g., Chan and Grismer 2008; Chan et al. 2009; Grismer and Chan 2008; Grismer 2007, 2008; Grismer et al. 2008a, b, c; Stuebing and Tan 2002). Surveys to these locations are usually more infrequent resulting in fewer reports. Other factors include elusive lifestyles or morphology (nocturnal or fossorial habits and camouflage) and the fact that some species do actually occur in low densities. These factors are difficult to disentangle in practice unless very strict survey methodologies are applied. However, species abundance patterns in many taxa are known to correspond roughly to a log-normal distribution with some species being abundant and many occurring in low densities (e.g., Limpert et al. 2001; Longino et al. 2002; Loreau 1992). Not surprisingly, such uneven species abundance patterns also appear to hold true for reptiles and amphibians. For instance, Lloyd et al. (1968) carried out a very thorough herpetological survey in a lowland rainforest in Sarawak and concluded that the herpetofaunal species abundance is fairly uneven, with other workers coming to similar conclusions (e.g., Dash and Mahanta 1993; Inger and Colwell 1977; Karns et al. 2005).

Knowledge on the herpetofauna of Peninsular Malaysia has seen great progress in recent years with new locality records and new species growing at an unprecedented rate (Chan and Grismer 2008; Chan et al. 2009; Grismer 2008; Grismer and Chan 2008; Grismer and Pan, 2008; Grismer et al. 2004, 2006; Wood et al. 2008, 2009). Such reports are crucial for biogeographic studies and focus on the importance and utilization of regional checklists which are not to be underestimated. Grismer and Pan (2008) highlighted regions of Peninsular Malaysia most understudied and suggested areas where focused research efforts should continue and Grismer et al. (2009) stressed the importance of looking more closely at species that have already been collected. This two-pronged approach to studying the diversity of this region's herpetofauna has already proved invaluable (see the review by Grismer et al. 2009) and will only generate more discoveries as time passes.

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APPENDIX

Specimens examined

Asthenodipsas malaccanus: ZMB 5041, Malacca; BMNH 1924.10.23.7, Labong Tendai, Sumatra, Indonesia; BMNH 1967.2276, Gunung Benom, Malaysia; SMF 32580, Perak, Malaysia; ZMH R06836, Lebong-Tandai, Benkoelen, Sumatra, Indonesia; ZFMK 45131, Satun, Thailand; ZMB 50673, Thung Song, Thailand; ZRC 2.2746, Asahan Estate, Melaka.

Calliophis gracilis: HC 193, Cameron Highlands, Pahang, Peninsular Malaysia.

Enhydris pahangensis: HC 197,198, Nenasi Forest Reserve, Pahang, Peninsular Malaysia.

Hylarana siberu: DWNP 1189, Kuala Gandah, Pahang, Peninsular Malaysia.

Oligodon signatus: HC 196, Kampung Chennah, Negeri Sembilan, Peninsular Malaysia.

Rhacophorus robinsoni: HC 191, 192, Kampung Chennah, Negeri Sembilan, Peninsular Malaysia.

Theloderma leprosa: HC 281, Gunung Besar Hantu, Negeri Sembilan, Peninsular Malaysia.

Xenelaphis ellipsifer: HC 194, Kampung Chennah, Negeri Sembilan, Peninsular Malaysia.

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On the Distribution and Status of *Plectrohyla hazelae* (Taylor, 1940) (Amphibia: Hylidae) from Oaxaca, Mexico

JOSEPH R. MENDELSON III*

and

EDWARD H. KABAY

Department of Herpetology, Zoo Atlanta
800 Cherokee Ave SE, Atlanta, Georgia 30315-1440, USA

*Corresponding author; e-mail: jmendelson@zooatlanta.org

Duellman (2001) reviewed and updated the distributional status of all hylid species in Mesoamerica that were known at the time. We examined the updated distributional map for *P. hazelae* (Duellman 2001:fig. 386, and presented here as Fig. 1a). This same geographic information is also reflected on the map accompanying the account of *P. hazelae* appearing on the online IUCN Red List (<http://www.iucnredlist.org/>), which is the same information compiled by the Global Amphibian Assessment (Stuart et al. 2004). Based on these sources, the prevailing concept of the distribution of this species (Fig. 1a) is that it occurs disjunctly in three montane areas in Guerrero and Oaxaca, Mexico, namely the Sierra Madre del Sur, Sierra Yucuyacua, and Sierra Aloapaneca. The type locality is on Cerro San Felipe, in the Sierra Aloapaneca, and a small number of specimens from various localities on those slopes are deposited

in museums; most of these are listed by Duellman (2001:704). A review of available specimens of *P. hazelae* listed by Duellman (2001:1125), however, revealed several misidentified specimens and other problems. The status of some specimens of *P. hazelae* listed by Duellman (2001:1125) is given in Table 1. The specimens from Puerto de Gallo, Sierra Madre del Sur, Guerrero (CAS 143106–07) are referable to *Plectrohyla mykter*. The two records from the vicinity of Putla, Oaxaca (Sierra Yacuyacua) are more problematic. Duellman (2001:1125, fig. 386) listed and mapped two specimens from “16 kilometers southwest of Cuquila” in the

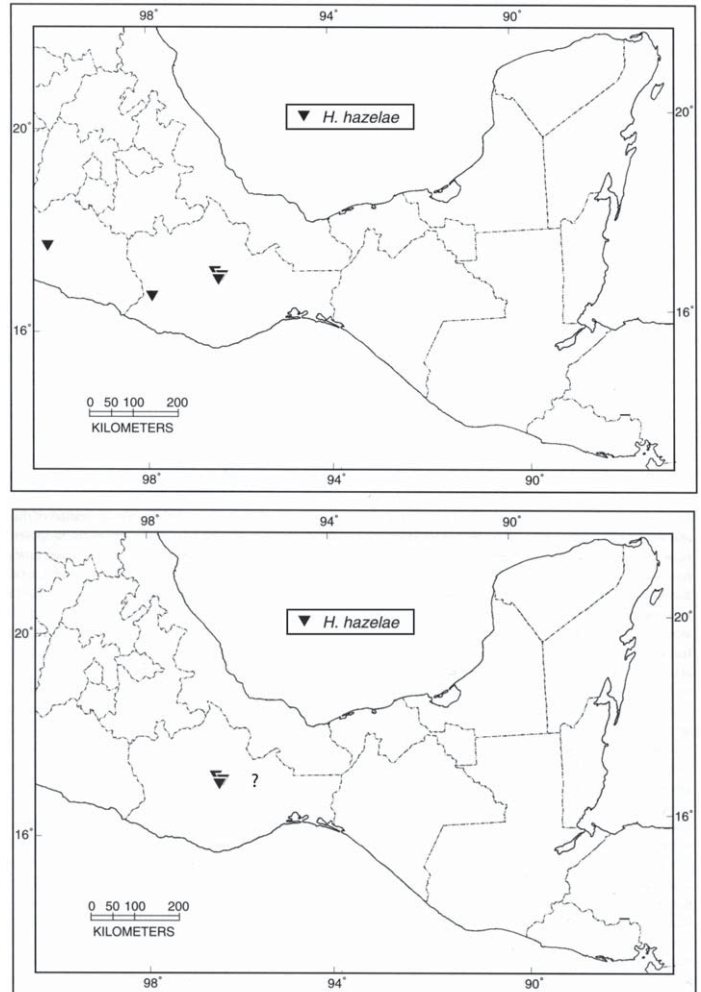


FIG. 1a (top). The distribution of *Plectrohyla hazelae*, as presented by Duellman (2001:fig. 386), showing putative localities for the species in the Sierra Madre del Sur, Sierra Yucuyacua, and the Sierra Aloapaneca or Guerrero and Oaxaca, Mexico. This figure does not indicate the record (KU 13707) from near the town of Tamazulapan, Oaxaca, in the Sierra Mixes; this record was listed by Duellman (2001) but does not appear on this map (see text). This figure has been modified from the original (Duellman, 2001:fig. 386) to exclude locality records of species not relevant to the current paper.

FIG. 1b (bottom). Our current concept of the distribution of *Plectrohyla hazelae*, indicating that it is once known to have existed only on the slopes of Cerro San Felipe, in the Sierra Aloapaneca of Oaxaca, Mexico. The species was last seen alive in 1975 (see text). The question mark indicates the locality for the specimen (KU 137037) from near Tamazulapan, in the Sierra Mixes of Oaxaca, Mexico, that is here referred to *Plectrohyla* sp. indet.