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On the occurrence of *Amphiesma khasiense* (Serpentes: Natricidae) in Thailand

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(with four text-figures)

ABSTRACT.– We update the knowledge on the distribution of the rare mountain stream dweller snake *Amphiesma khasiense* in Thailand, including the first records from Northern Thailand, in Chiang Mai and Chiang Rai provinces. Morphological data are provided for these specimens. Our biological observations confirm the species' riparian and nocturnal habits.

KEY WORDS.– Natricidae, *Amphiesma khasiense*, Chiang Mai, Chiang Rai, riparian habitat, Thailand.

Introduction

Originally described from the Khasi Hills in north-eastern India, *Amphiesma khasiense* (Boulenger, 1890) was subsequently found in northern Myanmar, south-western China (Yunnan and Xizang provinces; Zhao and Adler, 1993: 226) and northern Laos (Xiengkhuang and Phongsaly provinces; examined specimens). More recently, this species was discovered in north-eastern Thailand, where so far, a single specimen from Phu Luang, Loei Province, was recorded (Chanhome et al., 2001). It is a rarely encountered and poorly known snake, associated with mountain stream environments. Its discovery in two localities in northern Thailand leads us to give an update on the knowledge of its distribution and morphological variation in the country.

Materials and methods

The identifications are based on external morphological and colouration characters. Body measurements were made to the nearest millimeter. Paired meristic characters are given in the left/right order. Ventral scales were counted following Dowling's (1951) method, and are preceded by the number of preventrals (scales anterior to the ventrals, wider than long, but not in contact on each side with the first dorsal scale row). The terminal tail scute is not included in the subcaudal count. Sex was determined by dissection of the base of the tail.

Abbreviations: Morphological characters: AN: anal scale; D: divided; DSR: dorsal scale rows, counted, respectively, at one head length behind head, at midbody (above the ventral corresponding to half of the total number of ven-

trals), and at one head length before vent; Lor: loreal scale; SC: subcaudal scales; SRR: scale row reduction; SVL: snout-vent length; TaL: tail length; TL: total length; VEN: ventral scales. Institutions: BMNH: British Museum of Natural History, London; CTNRC: Center for Thai National Reference Collections, Bangkok; KZM: Korat Zoo Museum, Korat; MNHN: Muséum National d'Histoire Naturelle, Paris; QSMI: Queen Saovabha Memorial Institute, Thai Red Cross, Bangkok.

Results

In April 2008, one of us (KK) collected two adult *Amphiesma khasiense* (see Fig. 1–2), QSMI 542 and KZM 001, near Ban Pa Miang Mae Hang (X: 534000, Y: 2124300, UTM Zone 47), Moo. 7, Tambon (= Subdistrict) Pagnew, Wieng Pa Pao District, Chiang Rai Province, northern Thailand. The locality is situated at ca. 1,200 m asl. They were actively foraging at 0200 h on leaf litter, along a fast-flowing stream in a secondary forest. They were slow to escape and did not make any attempt to bite when handled. Their main meristic characters are presented in Table 1.

QSMI 542 has a SVL of 339 mm, a TaL of 170 mm (thus, a TL of 509 mm), 1+2 / 1+2 temporals, and has a SRR resulting from the fusion of rows 3 and 4 into row 3 at the level of ventral number 101 on both sides. KZM 001 has a SVL of 311 mm, a TaL of 142 mm (TL of 453 mm), and shows 1+1+2 / 1+2 temporals, and a SRR through fusion of rows 3 and 4 into 3 at the level of ventrals 95 and 96 respectively. Both have keeled dorsal scales, apart from the first row except posteriorly, where there is a weak keel.

They also share 2/2 internasals, 2/2 prefrontals and 1/1 Lor. Their dorsum ground colour is dark brown, with a lighter stripe on row 5, with the stripe comprising whitish spots at 1–3 scale lengths from each other, becoming indistinct posteriorly. Their ventral colour is white, except that the lateral parts of the ventrals are of the same colour as the dorsum. The infralabials are white, each with a small black spot; the throat is white. The tail underside is white anteriorly, darkening towards the tail tip. The pupil is round and black, the iris is dark red. Each supralabials have a large white spot surrounded by black colour.

On 18 May 2008, one of us (SW) encountered a single, adult specimen (Fig. 3) in Doi Inthanon National Park, Chiang Mai Province, northern Thailand. The exact coordinates of the locality are X: 449319, Y: 2050066 (UTM Zone 47); the altitude was ca. 1,300 m asl. This individual was actively foraging at 2030 h, immediately after a rain shower, along a man-made pool where *Tyrolotriton verrucosus* Anderson, 1871 (Urodela: Salamandridae) were also observed. Along the pool, which is surrounded by agricultural fields, *Polypedates leucomystax* (Gravenhorst, 1829) and *Rhacophorus bipunctatus* Ahl, 1927 (Rhacophoridae) were also found. The snake was gentle and did not try to bite when handled. Figure 3 shows its typical lateral head and body patterns, as well as several meristic characters (a.o., 10 SL, whose 4–6 in contact with the eye, 1 Lor, 1 PreO, 3 PoO, 1 anterior temporal).

Besides this latter specimen, we examined another one from Doi Inthanon National Park, CTNRC 980504. It has a SVL of 352 mm, a TaL of 183 mm (TL 535 mm), 1+2 / 1+2 temporals,

Table 1. Main meristic characters of Thai and syntypal *Amphiesma khasiense*.

Collection number	Sex	DSR	VEN	AN	SC	SL	IL	PreO	PoO
CTNRC 980504	M	19–19–17	1+142	D	107, D	9(4–6) / 9(4–6)	10(5) / 10(5)	1/1	3/3
QSMI 273	F	19–19–17	0+143	D	97, D	9(4–6) / 9(4–6)	10(5) / 10(5)	1/1	3/3
QSMI 542	F	19–19–17	2+145	D	99, D	9(4–6) / 9(4–6)	10(5) / 10(5)	1/1	3/3
KZM 001	F	19–19–17	2+145	D	89, D	10(4–6) / 9(4–6)	10(5) / 10(5)	1/1	3/2
BMNH 1946.1.12.80	F	19–19–17	2+148	D	95, D	9(4–6) / 9(4–6)	10(5) / 10(5)	1/1	3/3
BMNH 1946.1.12.81	M	19–19–17	2+148	D	> 48	9(4–6) / 8(3–5)	10(5) / 11(5)	2/1	3/3
BMNH 1946.1.12.82	M	19–19–17	2+150	D	> 79	9(4–6) / 9(4–6)	10(5) / 11(5)	1/1	3/3
BMNH 1946.1.13.45	F	19–19–17	1+152	D	99, D	9(4–6) / 9(4–6)	10(5) / 10(5)	1/1	3/3

(*plus an additional half ventral on the right side just before the anal scale)



Figure 1. Detail of the head of an adult *Amphiesma khasiense* from near Ban Pa Miang Mae Hang, Chiang Rai Province, Thailand. Photo: K. Kunya.



Figure 2. Adult *Amphiesma khasiense* from near Ban Pa Miang Mae Hang, Chiang Rai Province, Thailand. Photo: K. Kunya.

and a SRR through fusion of rows 3 and 4 into 3 at the level of ventrals 91 and 96, respectively. Other main characters are shown in Table 1. All dorsal scale rows are keeled, with the first row having only a weak keel. It is the only confirmed male known so far from Thailand.

Discussion

The colour and meristic data of the newly collected Thai *Amphiesma khasiense* concur with those of the syntypes of the species (see Table 1 and Boulenger, 1890:344) and with the single previously known Thai specimen, from Phu Luang in north-eastern Thailand (QSMI 273, see Table 1 and Chanhom et al., 2001). The use of the identification key to Indochinese *Amphiesma* provided by David et al. (2007) also leads to *A. khasiense*. The key indicates a keeled first dorsal row in *A. khasiense*; this keel is actually weak or not visible anteriorly in the Thai specimens. The keeling seems in fact related to age, the longest specimens being more strongly keeled, especially posteriorly.

Amphiesma khasiense was largely confused in the literature with *A. modestum*, *A. Boulengeri*



Figure 3. Adult *Amphiesma khasiense* from Doi Inthanon National Park, Chiang Mai Province, Thailand. Photo: S. Waengsothorn.

eri and *A. inas*. An adult *Amphiesma* specimen illustrated by Chan-ard et al. (1999:153) from a primary forest at 950 m asl on Phu Luang was erroneously identified as *A. inas*. However, if the dorsal colouration and pattern of this specimen are similar with those of *A. khasiense*, the colour pattern of its supralabials are much closer to those of specimens occurring in Vietnam and Cambodia. In these eastern populations, the white, round blotches in the middle of the supralabials are replaced by elongate streaks or even a continuous stripe. We examined 6 (3 ♂, 3 ♀) specimens from Cardamom Mountains (Cambodia), referred to *Amphiesma* cf. *khasiense* by Grismer et al. (2007). In all of them, the labial pattern comprises elongate streaks, more or less contiguous. The same was observed in about 75 specimens from Vietnam. In contrast, one specimen from Phongsaly Province, North Laos (MNHN 2004.0248), shows the typical pattern observed in *A. khasiense* specimens from India, Myanmar and northern Thailand. A revision of this group is in progress. There might be two species under the specific nomen *khasiense* in the Indochinese Peninsula. Pending the results of this revision, and in agreement with our statement in Chanhom et al. (2001), this specimen from Phu Luang is best identified as *Amphiesma* cf. *khasiense*, inasmuch we confirmed above the occurrence of the genuine *A. khasiense* on the basis of a preserved specimen.

Nabhitabhata (1987) listed, without comments nor voucher material, *Amphiesma modestum* from Doi Suthep-Pui National Park, Chiang Mai Province, northern Thailand. That record might refer to *Amphiesma khasiense*, or even more likely, to *A. deschauenseei*. This taxon is related to *A. modestum*, although quite dis-

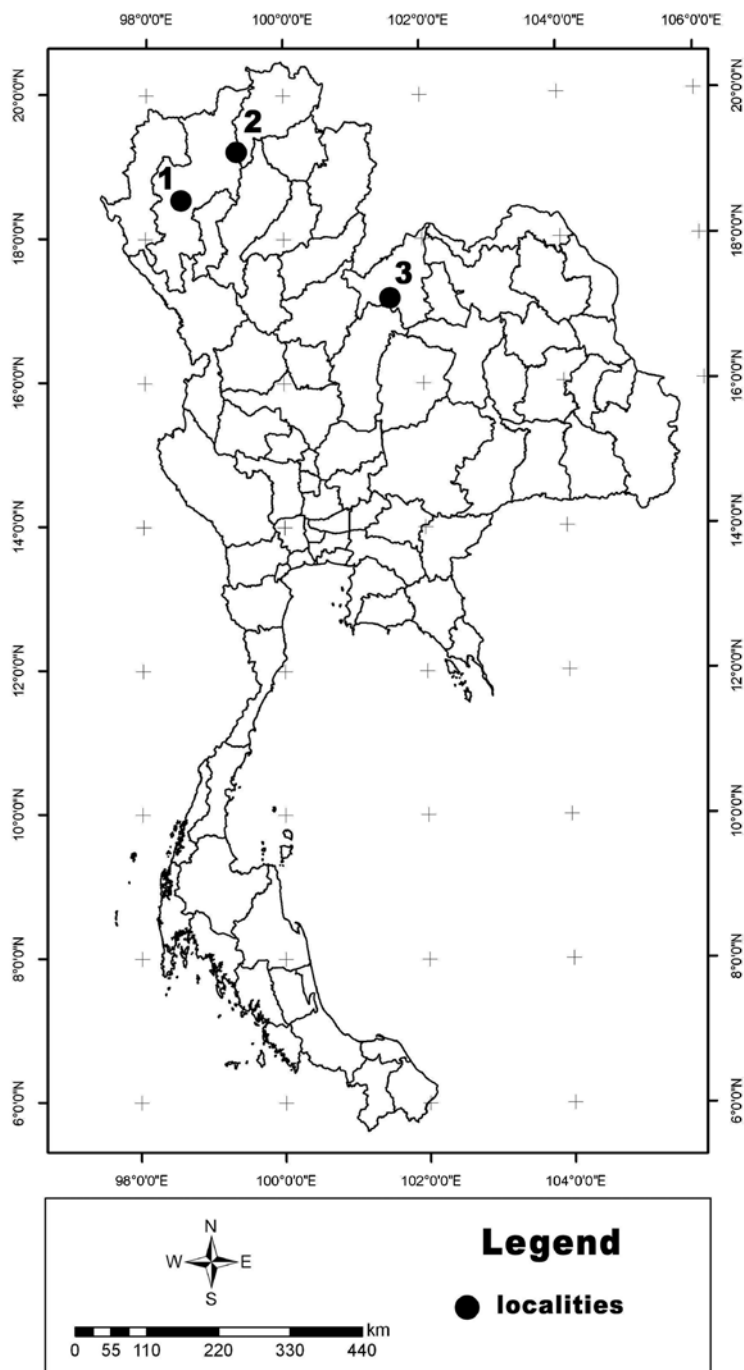


Figure 4. Map of Thailand showing the known localities for *Amphiesma khasiense* in Thailand. 1 = Doi Inthanon National Park, Chiang Mai Prov.; 2 = Ban Pa Miang Mae Hang, Chiang Rai Prov.; 3 = Phu Luang, Loei Prov. Map by S. Waengsothorn.

tinct from *A. khasiense* and cannot be excluded, since it is also known from Chiang Mai Province. Diagnostic differences between *Amphiesma khasiense*, *A. boulengeri* and *A. inas* were

presented in Chanhom et al. (2001) and David et al. (2007). *Amphiesma boulengeri* has never been recorded from Thailand and *A. modestum* has been cited but not vouchered (unless one considers *A. deschauenseei* to be a synonym of *A. modestum*, a position accepted by Smith [1943] but we refute this on the basis of our unpublished data), and *A. inas* is so far confirmed only from southern peninsular Thailand.

The current confirmed data on the distribution of *Amphiesma khasiense* in Thailand (see Fig. 4), i.e., its presence above 900 m asl in three parallel mountain ranges, from West to East, Thanon Thongchai Range (Doi Inthanon), Khun Tan Range (Ban Pa Miang Mae Hang) and Phetchabun Range (Phu Luang), seems to indicate a penetration southwards through high elevation stations. According to this zoogeographical pattern, the occurrence of this species can be expected in Phi Phan Nam Range and Louang Prabang Range, parallel to and between Thanon Thongchai Range and Phetchabun Range. The status of the numerous specimens of "*A. khasiense*" recorded

from northern Vietnam is under revision. Along Thanon Thongchai Range, the species might even be expected as far south as Kanchanaburi Province. The above data reveal the capacity of

the species to inhabit degraded environments. Its conservation does not seem to currently represent an issue, being known from two national parks- Phu Luang and Doi Inthanon.

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