

***Opisthotropis spenceri* SMITH, 1918 (SERPENTES: NATRICIDAE):
THE THIRD AND FOURTH SPECIMENS**

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ABSTRACT

Opisthotropis spenceri Smith, 1918 is known from only two specimens, both from the type locality: “Muang Ngo, N. Siam” (=Lampang Province, Thailand). In this work, additional specimens are reported from Nan Province (northern Thailand). This discovery is approximately 85 years after the snake was described and the specimens document the third and fourth known specimens. Locality of these additional specimens represented the second known locality of the species. Variation among those four specimens is reported. Its recent distribution map is present.

Key words: Thailand, distribution, specimens, morphology.

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INTRODUCTION

The snake genus *Opisthotropis* Günther, 1872 presently contains 19 species which are distributed across southern China and mainland Southeast Asia extending southward to Sumatra (Indonesia), eastward to the Philippines and northward to the Ryukyu Archipelago of Japan (Zhao and Adler, 1993; Orlovet *et al.*, 2000; Stuart, 2006; Stuart and Chuaynkern, 2007; Murphy *et al.*, 2008; Ziegler *et al.*, 2008). In particularly Thailand, three species are known (Chuaynkern and Chuaynkern, 2012): *O. boonsongi* (Taylor and Elbel, 1958) (type locality: “PhuLuang, Loei Province, Thailand”), *O. maculosa* Stuart and Chuaynkern, 2007 (type locality: “Thailand, NongKhai Province [now Buengkarn Province], BoongKlar District, PhuWua Wildlife Sanctuary”) and *O. spenceri* Smith, 1918 (type locality: “MuangNgow, N. Siam [=Lampang Province, northern Thailand]). Unfortunately, knowledge of the members of this genus is scarce.

The Spencer's stream snake *Opisthotropis spenceri* is such a case of a little known snake. Until now, we know of only two specimens and these represent the entire knowledge of the species. The first specimen is the type specimen (M.A.S. 1178) which is a female snake with a total length of 600 mm and tail (imperfect) 72 mm (Smith, 1918). In subsequent work of Smith (1943), an additional second specimen (a female with total length 560 mm and tail 150 mm) was added which was collected from the type locality. Until the present day, no more additional specimen of the species have been reported and the subsequent works on the species (*e.g.*, Deuve, 1970; Nabhitabhata *et al.*, 2004; Nabhitabhata and Chandard, 2005; Das, 2010) only refer its type locality or type specimens attributed to Smith (1918, 1943).

On 5 July 2011, a single specimen of *Opisthotropis spenceri* was collected from the mountains of Nan Province. Furthermore, one more specimen was collected from the same locality as the previous one and sent to us on 6 April 2013. These two new specimens represent the third and fourth known specimens of the species. Their locality also represents the second known locality and documents the first provincial record for Nan Province. Below, the third and fourth specimens are described and variation among the four specimens is presented.

MATERIALS AND METHODS

The third specimen was caught in the field by hand, preserved in 10% buffered formalin, and later transferred to 70% ethanol. The fourth specimen was sent from Nan Province to the second author (PD) on 6 April 2013 at Bangkok and the snake escaped from their box. Overnight, the snake was found dead on 8 April 2013. It was fixed in 10% buffered formalin, and transferred to 70% ethanol. A tissue sample was taken from the third specimen by preserving a piece of liver in 99% ethanol before the specimen was fixed in formalin. Both specimens were catalogued and deposited in the Khon Kaen University Vertebrate Collection (KKUC), Khon Kaen University (KKU), Khon Kaen Province, northeastern Thailand.

Measurements were taken after preservation with a digital slide-caliper to the nearest 0.1 mm. SVL was taken with a soft measuring tape to nearest mm. The number of ventral scales was counted according to Dowling (1951). The number of dorsal scale rows was counted (following David *et al.*, 2011) at one head length behind the neck, at mid-body and at one head length before vent respectively. Values for symmetric head characters are given in left/right order. Abbreviations are following: SVL, snout-vent length (measured from rostral to posterior edge of anal scales); HL, head length (measured from rostral to posterior edge of parietal); HW, head width (measured at the widest position); SL, snout length (measured from rostral to anterior eye); EL, eye length (horizontal measured from anterior to posterior eye); SN, snout-nostril (measured from rostral to anterior nostril); EN, eye-nostril (measured from anterior nostril to

anterior eye); PFL, prefrontal length (measured at longest position of prefrontal); PFW, prefrontal width (measured at widest position of prefrontal); FL, frontal length (measured at longest position of frontal); FW, frontal width (measured at widest position of frontal); PL, parietal length (measured at longest position of parietal); PW, parietal width (measured at widest position of parietals); PS, parietal suture (measured the contacted distant of parietals); SL, supralabials; IL, infralabials; TaiL, tail length (measured from posterior edge of anal scales to tail tip); TL, total length (SVL plus TaiL plus); DSR, dorsal scale rows. Names for province and district of Thailand present in this work followed Anonymous (1990).

The photographs of specimens were taken using digital camera and modified by using Photoshop CS2 programs. The drawing of head characteristics was made by Yodchaiy Chuaynkern and Pechrkawin Nurngsomsri using a Leica MS5 stereomicroscope with a camera lucida attachment at the Department of Biology, Faculty of Science, Khon Kaen University.

In the present work, the type specimens were not available for comparison. Therefore, the third and fourth specimens of *Opisthotropis spenceri* were compared with their original description provided by previous taxonomic works (Smith, 1918, 1943; Taylor, 1965; Cox, 1991; Ziegler *et al.*, 2008; Das, 2010; David *et al.*, 2011; Yang *et al.*, 2011; Cox *et al.*, 2012). We also compared our specimens with the photographs of the type specimen of the species (BMNH 1946.1.15.31) with the assistance of Patrick Campbell from the Natural History Museum (London, UK).



Figure 1 Preserved syntype of *Opisthotropis spenceri* (BMNH 1946.1.15.31). Photography: Patrick Campbell

RESULTS

Opisthotropis spenceri Smith, 1918 (Figs. 1-4)

Opisthotropis spenceri Smith, 1918: 13. Syntype: BMNH 1946.1.15.31. Type locality: “Muang Ngow, N. Siam”, Thailand.

Material examined.—KKUC 00600-601, unsexed; a specimen was collected on small stream in hilly evergreen forest, Tha Wang Pha Subdistrict, Tha Wang Pha District, Nan Province; KKUC 00600 was collected on 5 July 2011 and KKUC 00601 on 8 April 2013.

Description of the third and fourth specimens.—Snake of small size (SVL 304.72-348 mm), body stout, cylindrical. Head of small size, wider than long (HW 59.6-7.87 mm; HL 9.82-9.98 mm), depressed, dorsally cover with large shields; snout blunted in dorsal view, rounded in lateral view, its length (SL 3.32-7.71 mm) 3.9-6.4 times longer than horizontal diameter of eye (EL 0.85-1.21 mm); nostril in dorsal position and oblique, crescentic and very narrow, piercing the middle of divided nasal, closer to tip of snout (SN 0.99-1.00 mm) than to eye (EN 1.96-2.24 mm); eye small; pupil rounded; tail pointed, 0.45 time shorter than snout-vent (Tail 30.2 mm [regenerated tail for the KKUC 00600], 132.98 mm).

Dentition. Not examine.

Body scalation. DSR: 17—17—17, entirely smooth, rather large. Ventral scales 178-185. Anal scales divided, subcaudal scales 49 [incomplete tail]-192 mm, all paired.

Head scalation. Rostral wider than high, well visible from above. Nasal large, longer than high, obliquely divided just behind nostril by a distinct furrow, surrounded by rostral, first two supralabials, loreal, and internasals. 2 internasals, triangular, wider than long, in contact with rostral, nasals, loreals, and prefrontal. A single, broad, subrectangular prefrontal, 1.3 times broader (PFW 3.87 mm) than long (PFL 1.37 mm), in contact with internasals anteriorly, not contact with nasals except for the third specimen that contact on the right side but not in contact on the left one, contact with loreal and preocular laterally, contact with frontal and supraoculars posteriorly. Subtriangular frontal, about as long as wide (FL 3.05 mm, FW 2.77 mm), apex directed posteriorly, 2.2times longer than prefrontal. Parietals 2 times longer than wide (PL 5.15 mm, PW 2.63 mm), in contact (PS 2.68 mm) equally to length of frontal. 1/1 supraocular, longer than wide. 1/1 subrectangular loreal, in contact with nasal, internasal on left (but not in the right), prefrontal, preocular, and the second to third supralabials. 1/1 large preocular, higher than long, in contact with loreal anteriorly, prefrontal, frontal and supraocular dorsally, and the third and fourth supralabials ventrally. 2/2 postoculars, upper largest. 7/7 supralabials, SL 1-5 distinctly higher than long, SL 6-7 as long as high, SL, SL 1-2 contact nasal, SL 2-3 contact loreal, SL 4 entering orbit on both sides, SL 4-5 largest. 2+2+3 temporals, anteriorone largest on upper, lower in contact with SL 5-6 and parietals;

7/7 infralabials, first pair in contact behind small mental, IL 1-4 in contact with anterior chin shields, IL 5 largest. Posterior chin shields much shorter than anterior ones, separated from each other by 2+5 scals.



Figure 2 Live specimens of *Opisthotropis spenceri* (KKUC 00600). Photograph: Prateep Duengkae.



Figure 3 Preserved *Opisthotropis spenceri* (KKUC 00600). Photography: Yodchaiy Chuaynkern.

Coloration. In life, olive brown above, yellowish white below, subcaudals mottled with gray. In preservative, the head is uniformly olive brown above and its sides, slightly paler than the body. The upper body surface is uniformly dark brown above, paler on the lower part of the sides. The tail is entirely uniformly dark brown above. The venter is uniformly yellowish-grey, strongly speckled with dark grayish-brown on chin, throat, infralabials. The under surface of the tail is finely mottled with grayish-brown.

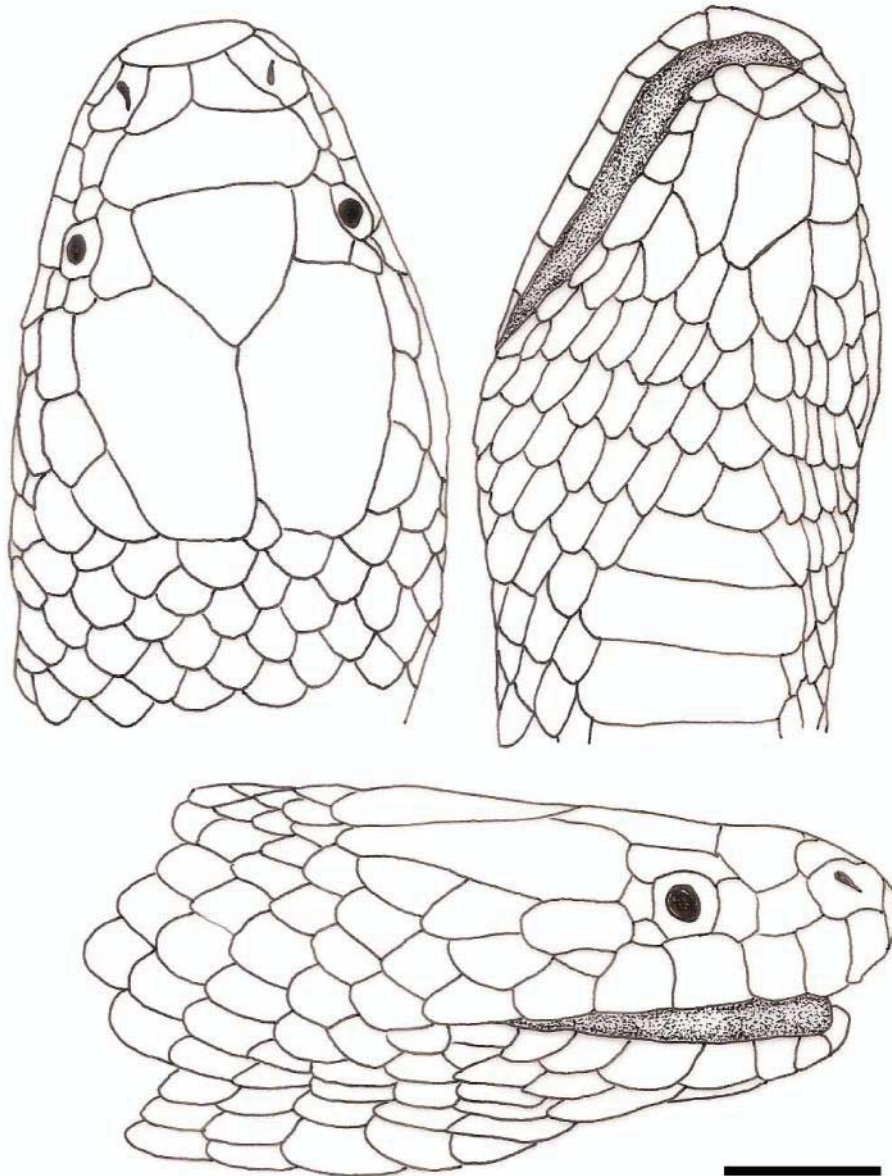


Figure 4 Head scalation of *Opisthotropis spenceri* (KKUC 00600). Drawn by Yodchaiy Chuaynkern and Pechrkawin Nurngsomsri. Scale bar equals 3 mm.

Variation. – Differences between syntype, the second, third and fourth specimens of *Opisthotropis spenceri* in measurements and scalation are listed as in Table 1. The type specimen is larger than the third specimen. Ventral scales in the type specimen are fewer in number than the third specimen. The paired subcaudal scales in the type specimen are fewer in number than the third specimen, which implies that the number of subcaudal scales must be over 49 scales. The fourth and fifth supralabials touches the eye in the type specimen but only the fourth touches the eye in the third specimen. Smith (1943) noted that the second specimen has 8 supralabials but the syntype, the third and fourth specimens have 7. Anterior temporals in the type specimen are equal in size but the upper is larger in the third specimen. Anterior chin shields in the type specimen are touching by the first five infralabials but first four in the third specimen. Posterior chin shields in the type specimen are separated by 1+3 scales but 2+5 scales in the third specimen.

Distribution, ecology and behavior. – *Opisthotropis spenceri* is currently known from two localities (Fig. 5): the type locality “Muang Ngow, N. Siam” (=Lampang Province, northern Thailand) and Nan Province. The third specimen was collected from small streams running through the Dry evergreen forest.

DISCUSSION

Morphologically, the additional third and fourth specimens of *Opisthotropis spenceri* are most similar to the description of the species presented by Smith (1918, 1943) and other authors (e.g., Smith, 1918, 1943; Taylor, 1965; Cox, 1991; Ziegler *et al.*, 2008; Das, 2010; David *et al.*, 2011; Yang *et al.*, 2011; Cox *et al.*, 2012). Identification of the third and fourth specimens places them well within the taxonomic keys of the genus provided by several authors (e.g., Ziegler *et al.*, 2008; David *et al.*, 2011; Yang *et al.*, 2011; Cox *et al.*, 2012). However, differences between the four specimens are few as presented above. The snout-vent length and tail length differ according to specimens' age and the longest snout-vent length is the syntype BMNH 1914.1.15.31 (528 mm). The ventral scales differentiate in counted numbers with average 182 ± 3.61 (178-185 scales). We consider these differences to represent variation within the species rather than being of taxonomic significance. When field efforts were enhanced and additional specimens of the rare *Opisthotropis* are discovered, the variation within species can be documented more thoroughly (e.g., *O. maculosa*: Yang *et al.*, 2011).

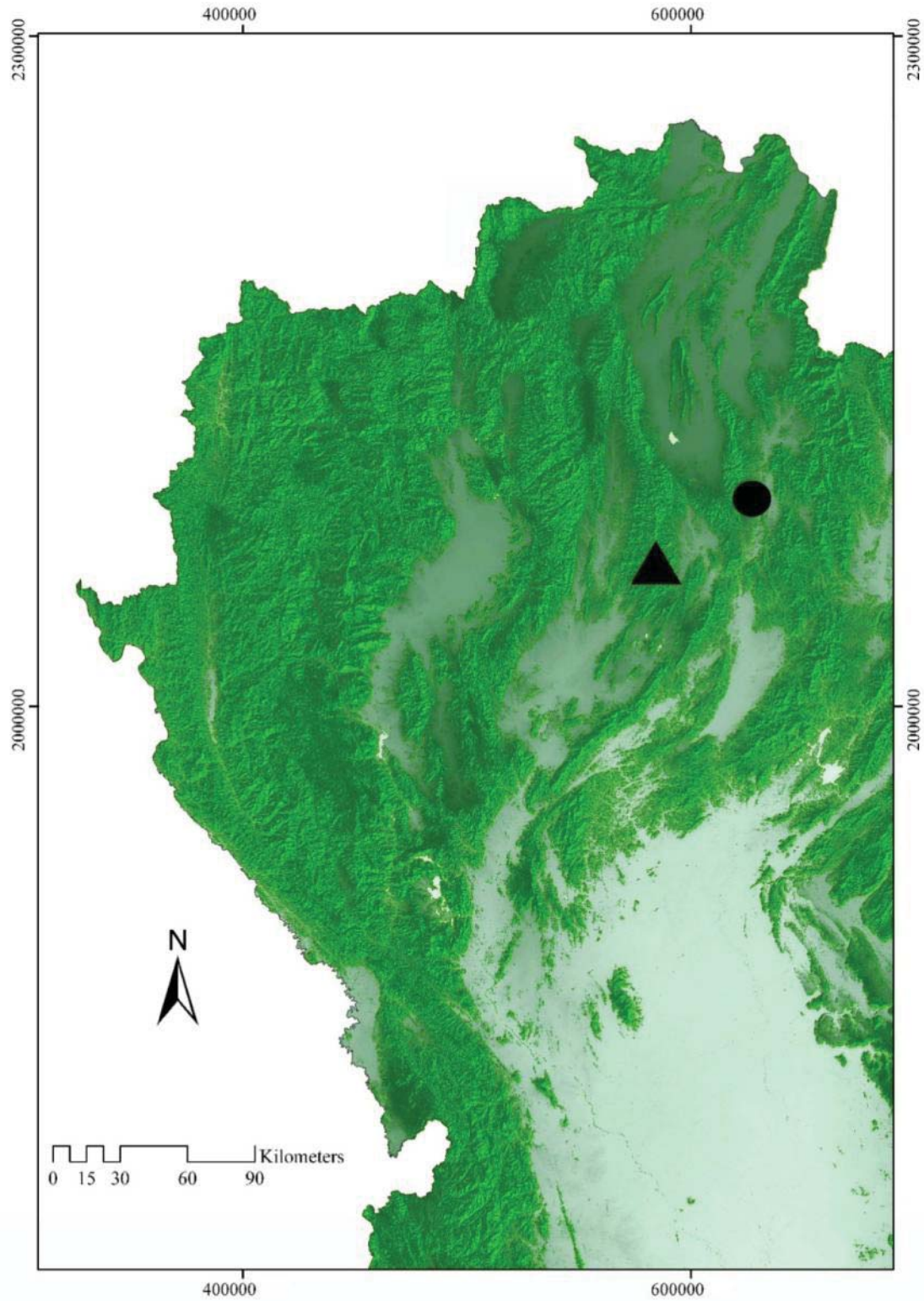


Figure 5 Map of northern Thailand showing the recent known distribution of *Opisthotropis spenceri*: solid triangle, the type locality “Muang Ngao, N. Siam (=Lampang Province); solid circle, Tha Wang Pha District, Nan Province.

Table 1 Comparisons of morphological characters between syntype BMNH 1946.1.15.31 (data from Smith, 1918), second (from Smith, 1943) and the third (KKUC 00600) and fourth specimens (KKUC 00601) of *Opisthotropis spenceri*.

	BMNH 1946.1.15.31	Second Specimen	KKUC 00600	KKUC 00601
Sex	Female	Female	Unsexed	unsexed
SVL	528	410	348	304.72
TaiL	72	150	n/a	137.41
TL	600	560	n/a	442.13
Mid-body scale rows	17-17-17	17-17-17	17-17-17	17-17-17
Pre-ventrals	n/a	n/a	4	4
Ventrals	183	n/a	185	178
Paired subcaudals	33(?)	n/a	49	192
Postoculars	2	2	2/2	2/2
Supralabials at eyes	4-5	4-5	4	4
Supralabials	7	8	7/7	7/7
Infralabials	9	n/a	9/9	9/9
Infralabials touching anterior chin	1-5	n/a	1-4	1-4
Posterior chin shields separated by	1+3	n/a	2+5	2+5

The status of *Opisthotropis spenceri* was previously evaluated as Insufficiently Known and recently the species was assessed as Data Deficient (DD; Pauwels, 2009) as it has only been found in one location and there is no information about the habitat preference, threats and habitat status of this species. Although the present work fulfills a gap of lacking specimens for the species, there is still an inadequate amount of specimens and other information to assess their status. Therefore, further research on this species is needed before a more accurate assessment can be carried out.

As above, only three species of *Opisthotropis* are currently known from Thailand (Chuaynkern and Chuaynkern, 2012): *O. boonsongi*, *O. maculosa* and *O. spenceri*. Surprising, all of them are rare in natural history collections and known only from the type specimens (one holotype for *O. boonsongi*; one holotype for *O. maculosa*; two syntypes for *O. spenceri*). Discovery of the new additional two specimens of *O. spenceri* as in this study took about eighty-five years after the snake was described as new to science. Although the additional discovery of *O. spenceri* in Nan Province as reported in this work brings the total known number of specimens to four and additional known locality of the species to two

(i.e., Lampang and Nan provinces), there are still insufficient voucher specimens for further study. This scarcity of voucher specimens might be due to the members of this group inhabiting hill streams and nearby terrestrial habitats (Smith, 1918; Stuart and Chuaynkern, 2007, Yang *et al.*, 2011). Moreover their natural history is little known and thus, the taxonomists have failed to find this snake in its natural habitat. Furthermore, mountain topology of the North of Thailand is also an important problem in conducting field survey in this part of the country. As in the past, only few studies were conducted in northern Thailand (mainly by Taylor, 1962, 1963, 1965; Taylor and Elbel, 1958) and mostly in the vicinity of Chiang Mai Province, where traveling is more convenient than those of other provinces. We strongly believe that the geographical distribution of *O. spenceri* and possibly its congeners is likely still not fully discovered. Additional undiscovered populations probably exist in the hilly streams of various ranges of mountains over the North of Thailand or maybe extend to the hilly stream of the upper part of Northeast Thailand and also neighboring countries such as Laos and Myanmar. Although the herpetofauna of the Indochinese has been given significant attention during the last decade, with several new species being described and additional records being published by various authors (e.g., Daltry and Wüster, 2002; Teynié *et al.*, 2004; Stuart and Emmett, 2006; Stuart, 2006; Murphy *et al.*, 2008; Chuaynkern *et al.*, 2013). Our knowledge of these animals has been growing rapidly with the species accounts summarizing our knowledge in the form of checklists that are published regularly (Chan-ard *et al.*, 1999; Orlov *et al.*, 2000; Nabhitabhata *et al.*, 2004; Nabhitabhata and Chan-ard, 2005; Teynié and David, 2007; Chuaynkern and Chuaynkern, 2012). However, further field-work efforts should be conducted, which will reveal additional specimens, localities of the species and thus, the result will be to fill the gap of our knowledge on the Spencer's stream snake *Opisthotropis spenceri*.

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