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First Record of *Lygosoma angeli* (Smith, 1937) (Reptilia: Squamata: Scincidae) in Thailand with Notes on Other Specimens from Laos

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ABSTRACT: The lygosomine skink, *Lygosoma angeli*, is added to the herpetofauna of Thailand based on material from the collection of the Natural History Museum. New geographical and morphological data on Lao specimens of *L. angeli* are also provided.

KEY WORDS: *Lygosoma angeli*, Scincidae, geographic distribution, new record, Thailand.

INTRODUCTION

Lygosoma angeli was first described from Vietnam by Malcolm Smith (1937). It was only known from this country until recently in the past decade. More recent discoveries show that this species also occurs in Laos. So far in total, only nine specimens were known to science (Teynié *et al.*, 2004; Geissler *et al.*, 2011).

Early in 2011, a request came in for specimen pictures of *Lygosoma isodactylum* from the Zoologisches Forschungsmuseum Alexander Koenig, Bonn, Germany. At the time, there were four lygosomine skinks in the Natural History Museum, National Science Museum, Thailand (THNHM) collection classified as *Lygosoma isodactylum*. One was confirmed as belonging to that species, while the other three appeared morphologically distinct from *L. isodactylum*.

MATERIALS AND METHODS

One specimen was from Khao Soi Dao Wildlife Sanctuary Chantaburi Province, Eastern Thailand: THNHM 07070. This specimen was collected by Tanya Chan-ard in 1988. Two specimens were collected from Xe Paine, Champasak, Laos: THNHM 11298 and THNHM 11299. Specimens were collected by Tanya Chan-ard on 10 Feburary 1997. Morphological data were taken from THNHM 11298 and THNHM 07070, but not from THNHM 11299. Because of the damaged state of specimen THNHM 11299, it was feared that close

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examination and taking of all the measurements and others morphological data would have resulted in further damage or destruction of the specimen. It was clear from physical appearance, colour and pattern of the specimen that it was the same species as THNHM 11298.

Comparative morphological data between *Lygosoma angeli* and *Lygosoma isodactylum* (Geissler *et al.*, 2011) are shown in Table 1. Measurements were made with a dial caliper and are given in millimetres. Scale counts were made under an Olympus stereo microscope and from pictures made from an Olympus C7070WZ with an Olympus stereo microscope.

RESULTS

Based on comparisons of the morphological data (Table 1; Figures 1-4), THNHM 11298 and THNHM 07070 were classified as *Lygosoma angeli*. The data could be taken from THNHM 11299 also fit into the morphological variation known for *Lygosoma angeli*; however, since data was incomplete, it is not included in Table 1. All three specimens showed the characteristic colour pattern, each light brown body scale bearing a basal black blotch; however, THNHM 07070 shows a significantly darker ground colouration, probably due to its preservation state. These new specimens extend the morphological variation known for this species, as could be expected from examination of new specimens, especially from a population found so far from the previously known range.

In particular, the forelimb length, measured from axilla to palm was significantly shorter in THNHM 07070 than values for the other specimens previously collected, even though its snout-vent length is large.

The head widths of THNHM 11298 and THNHM 07070 were wider than the values previously measured for the species. This could possibly be due to flattening compression in THNHM 07070, but not in THNHM 11298.

The tympanum in THNHM 07070 is partly covered with scales, but still visible (Figure 3). It is possible that this is due to flattening compression of the specimen during preservation.

Up to the time of this publication, all *Lygosoma angeli* specimens examined had 30 mid-body scale rows. THNHM 11298, from Champasak, Laos, has only 28 mid-body scale rows. This same specimen only had 5 infralabials and 6 supralabials. THNHM 11299, which was not included in the table, showed values within those expected for *Lygosoma angeli.*

Figure 1. *Lygosoma angeli* (THNHM 07070 Khao Soi Dao Wildlife Sanctuary, Chantaburi Province, Thailand): dorsal view of head.

Figure 2. *Lygosoma angeli* (THNHM 11298 Xe Paine, Champasak, Laos): dorsal view of head. There was some staining done for scale counts.

Figure 3. *Lygosoma angeli* (THNHM 07070, Khao Soi Dao Wildlife Sanctuary, Chantaburi Province, Thailand): lateral view of head, stained for scale counts. Fibers are from an attempt to clean the specimen.

Figure 4. *Lygosoma angeli* (THNHM 11298, Xe Paine, Champasak, Laos): lateral view of head.

Table 1. Morphological comparison between *Lygosoma angeli* and *L. isodactylum* (data from Geissler *et al.*, 2011 and our new specimens).

	Lygosoma angeli	***Lygosoma isodactylum***	**THNHM 11298**	**THNHM 07070**
Sample size	n = 6	*		
Snout-vent-length	77.5-112.3 (97.3 ± 12.6)	82.5-117.0	95.5	101.0
Tail length (* generated)	55.4-86.3 (67.9 ± 14.0, n=4)	66.0-93	57.8	80.0
Trunk length (from Axilla to groin)	55.8-85.4 (71.7 ± 10.7)	58.0	76.6	73.9
Headlength	9.4-12.1 (10.5 ± 1.0)	11.7-14.0	10.2	9.0
Headwidth	4.8-6.2 (5.6 ± 0.5)	7.7-9.0	6.5	6.5
Snout to forelimb	15.9-21.4 (18.5 ± 2.2)	20.0	18.4	20.0
Snout length (snout to posterior angle of mouth)	3.2-3.7 (3.5 ± 0.2		4.3	4.6
Snout to tympanum	8.3-10.2 (9.4 ± 0.8)	10.3	10.2	Not Visible
Forelimb length (axilla to palm)	4.3-5.5 (4.9 ± 0.4)	11.5	5.5	4.0
Hindlimb length (groin to palm)	6.4-8.4 (7.4 ± 0.7)	12.4-15.5	7.6	7.9
Prefrontals in contact	no	no	no	no
Supraoculars	4	4	4	4
Frontoparietal(s)	1	1	1	1
Parietals in contact posteriorly	yes	yes	yes	yes
Scales bordering parietals posteriorly	9-10		10	9
Nuchals	0	0	0	0
Supranasals in contact	yes	no	yes	yes
Supranasals fused with nasals	no	Anterior	no	no
Loreals	2	1	2	2

Table 1. Morphological comparison between *Lygosoma angeli* and *L. isodactylum* (data from Geissler *et al.*, 2011 and our new specimens) (continued).

	Lygosoma angeli	***Lygosoma isodactylum***	**THNHM 11298**	**THNHM 07070**
Sample size	n = 6	*		
Preocular	2	2	2	2
Supraciliaries	5-6	7	5	5
Supralabials	7	7	6	7
Lower eyelid	scaly	scaly	scaly	scaly
Infralabials	6-7		6	7
Pairs of chin shields	2	3	2	4
First pair of chin shields in contact medially	yes	yes	yes	yes
Second pair seperated by n scales	1	1	1	0
Third pair seperated by n scales		3	3	0
Chin shields in contact with infralabials	yes	no	yes	yes
Midbody scale rows	30	30-34	28	30
Paravertebral scales	107-115	88-98	109	108
Ventrals in transerve rows	112-123		113	121
Enlarged precloacals	6	6	6	6
Subdigital lamellae on fourth finger	5		5	5
Subdigital lamellae on fourth toe	6-7	7-10	5	7

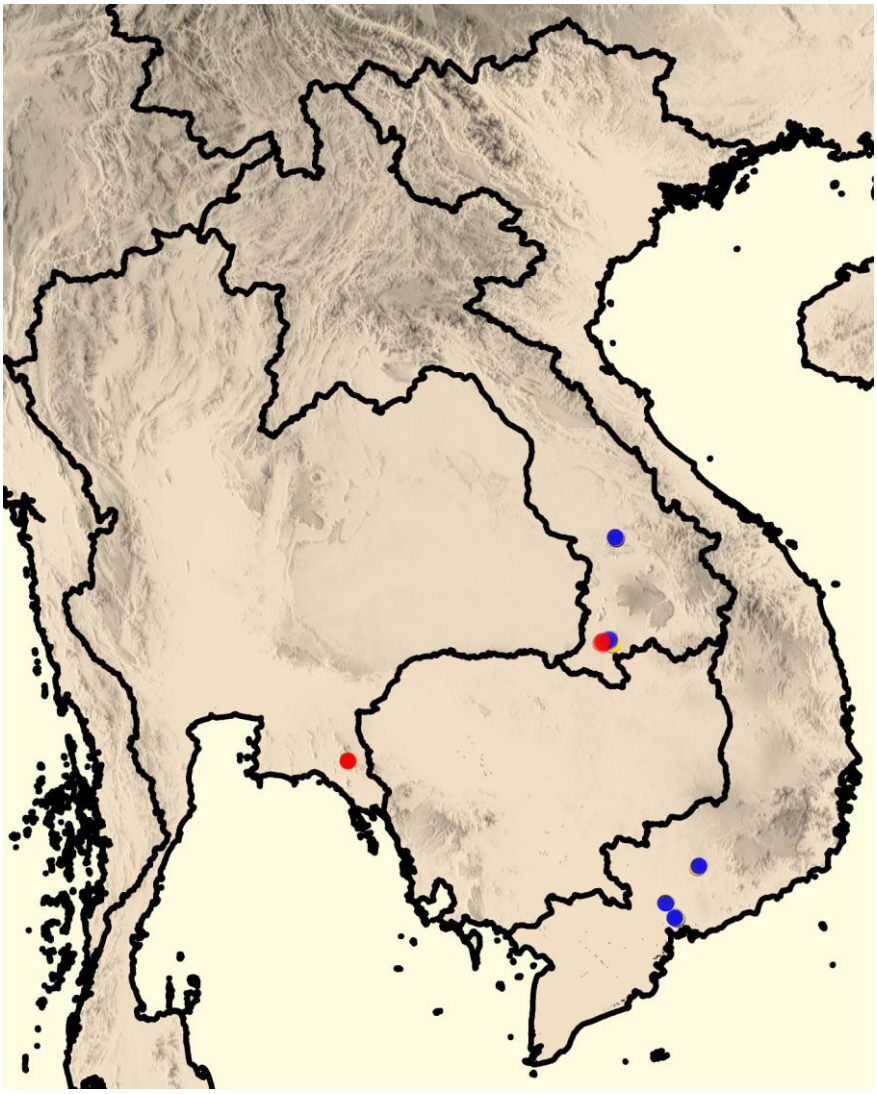

Figure 5. Map of all known *Lygosoma angeli* localities taken from Geissler *et al.* (2011) (in blue) and this study (in red).

DISCUSSION

The recent finding of these three specimens of *Lygosoma angeli* in the herpetological collection of the THNHM shows that the knowledge about the real distribution pattern of these secretive skinks in Southeast Asia is still preliminary. Including *L. angeli*, currently nine species of *Lygosoma* Hardwicke & Gray, 1827 (*L. angeli*, *L. anguinum*, *L. bowringii*, *L. corpulentum*, *L. haroldyoungi*, *L. herbeti*, *L. isodactylum*, *L. koratense* and *L. quadrupes*) are known to occur in Thailand (Nabhitabhata *et al.*, 2004; Nabhitabhata & Chan-ard, 2005). Like the record of *Lygosoma corpulentum* Smith, 1921 from the same locality in Eastern Thailand (Nabhitabhata & Chan-ard, 2005), the presence of *L. angeli* underscores

that many taxa, thought to be endemic to Indochina, may also be present in Eastern Thailand. This supports the hypothesis that the Mekong, in fact, does not form a biogeographical border for the lowland herpetofauna in mainland Southeast Asia (Bain & Hurley, 2011). The short distance between the new locality and the Cambodian border reinforces the hypothesis that the species must also be distributed in Cambodia, as it was supposed by Geissler *et al.* (2011).

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