



A new species of the genus *Lycodon* (Boie, 1826) from the southwestern mountains of China (Squamata: Colubridae)

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Abstract

A new species of the genus *Lycodon* from the Gaoligong Mountains, Yunnan, China is described, *Lycodon gongshan* sp. nov. This species is similar to *L. fasciatus*, but differs in its longer tail, especially in males, and larger number of subcaudals, especially in females. The number of ventrals and maximum body size is greater in both sexes of the new species. From the *Lycodon ruhstrati* group, the new species differs in the colour of the belly and the dorsal bands. This new species seems to be endemic to Yunnan Province, People's Republic of China. The holotype of *Ophites fasciatus* Anderson, 1879 appears to have been lost, so a neotype is designated in order to address the status of this taxon.

Key words: *Lycodon fasciatus*, *Lycodon gongshan* spec. nov., neotype, Oriental Region, taxonomy

Introduction

Snakes of the *Lycodon fasciatus* (Anderson, 1879) and *Lycodon ruhstrati* (Fischer, 1886) groups have drawn some attention in recent years. While these two taxa were often confused in the past, the *Lycodon ruhstrati* complex was recently reviewed (Vogel & Brachtel 2008; Vogel *et al.* 2009) and it has been shown to be a composite of species. Two of these, *Lycodon ruhstrati abditus* Vogel *et al.*, 2009 and *Lycodon futsingensis* (Pope, 1928), occur in China, in particular in Yunnan Province. Another new species, similar to these groups, was recently described as *Lycodon synaptor* Vogel & David, 2010 from Dongchuan District in Yunnan Province, China. While gathering more data on the *Lycodon fasciatus* group, we came upon four individuals that obviously belonged to another new Chinese species, which we describe herein.

For a long time, *L. fasciatus* has been considered to be a wide ranging, and variable species. John Anderson (1879) described *Ophites fasciatus* from a specimen he received during his two expeditions to Western Yunnan in 1866 and 1875. The specimen was collected at Ponsee (today Bangxi in Yingjiang County, Yunnan). The description was quite detailed for that time, but he did not mention the sex of the specimen. Since 1865, Anderson had worked as a curator of the Indian Museum in Calcutta and he held this position until 1886 (Alcock 1902), so many of the specimens, including many type specimens, collected during these two expeditions are still in the collection of the ZSI in Kolkata (Das *et al.* 1992). However, neither the senior author, who visited this collection in 2008, nor I. Das who examined all type specimens there (Das 1998), could locate the holotype of *Ophites fasciatus* in the collection of the ZSI. This specimen was most likely lost during the flooding of the Ganga during World War II (Das *in litt.* July, 2010). Given that "*Lycodon fasciatus*" auctorum has been shown to be a composite of closely related species, we herein designate a neotype for *Ophites fasciatus* Anderson, 1879.

Material and methods

This revision is based on a total of 73 preserved specimens, as well as several photographed specimens, of *Lycodon fasciatus* auctorum examined for their external morphological characters. The examined specimens are listed in the Appendix. Comparative material of the *L. ruhstrati* complex is listed in Vogel *et al.* (2009). A total of 53 morphological characters were recorded for each specimen. The characters and their abbreviations are listed in Table 1.

TABLE 1. The list of morphological characters used in this study, and their abbreviation.

Number	Abbreviation	Characters
Morphometry		
1	SVL	Snout-vent length (mm)
2	TaL	Tail length (mm)
3	TL	Total length (mm)
4	Rel TL	Relative tail length TaL/TL
Anatomy		
5	TEETH	Number of upper maxillary teeth (on one side)
Scalation		
6	DSR	Dorsal scale rows
7	ASR	Dorsal scale rows at neck
8	MSR	Dorsal scale rows at midbody
9	PSR	Dorsal scale rows before vent
10	Keel	Number of keeled dorsal rows
11	VEN	Ventral plates
12	PreVEN	Number of preventrals
13	VEN not	Ventrals notched or not
14	VEN keel	Ventrals keeled
15	SC	Subcaudal plates
16	ANA	Anal plate. 1: single, 2: divided
17	Lor-l	Number of loreal scales (0 or 1) at left
18	Lor-r	Number of loreal scales (0 or 1) at right
19	Lo touch-l	Loreal scale touches eye at left
20	Lo touch-r	Loreal scale touches eye at right
21	SL-l	Number of supralabials at left
22	SL-r	Number of supralabials at right
23	SL/Eye-l	Numbers of the SL entering orbit at left
24	SL/Eye-r	Numbers of the SL entering orbit at right
25	Larg SL-l	Largest SL left
26	Larg SLr	Largest SL right
27	IL-l	Number of infralabials at left
28	IL-r	Number of infralabials at right
29	IL-tot	Total number of infralabials
30	IL/1st child	Number of IL in contact with anterior chin shield
31	PreOc-l	Number of preoculars at left
32	PreOc-r	Number of preoculars at right
33	PostOc-l	Number of postoculars at left

continued next page

TABLE 1. (continued)

Number	Abbreviation	Characters
34	PostOc-r	Number of postoculars at right
35	ATem-l	Number of anterior temporals at left
36	ATem-r	Number of anterior temporals at right
37	PTem-l	Number of posterior temporals at left
38	PTem-r	Number of posterior temporals at right
39	ParaR	Temporal row containing the paraparietals
40	Paras	Plates surrounding the paraparietals, see Inger & Marx (1965)
41	Parab	Scales between the paraparietals
Pattern		
42	BODCOL	Body colour. 1: grey; 2: brown or ochre
43	Bands	Number of bands on body
44	Tail bands	Number of bands on tail
45	Tail venter	Colouration of tail venter
46	Bellycol	Colouration of belly
47	Bellyspeck	Speckling of belly
48	First band	Number of VEN before the first band starts, counted left side
49	Broad base	Number of VEN that are covered at the base of the first band
50	Broad vert	Numbers of vertebral scales that are covered by the first band
51	Edged	Dorsal bands with light margins
52	Coul throat	Colour of the throat
53	Ve throat	Dark VEN on the throat before the first band

Measurements, except for body and tail lengths, were taken with a slide-caliper to the nearest 0.1 mm; all body measurements were made to the nearest millimetre. The number of ventral scales was counted according to Dowling (1951). Half ventrals were not counted, except if they were present on both sides (divided ventrals). The terminal scute is not included in the number of subcaudals. The dorsal scale row counts are given at one head length behind the head, at midbody (i.e., at the level of the ventral plate corresponding to a half of the total number of ventrals), and at one head length before the vent. We considered sublabials as those shields that were with more than half their length below a supralabial. The values for paired head characters are given in a left / right order.

The whitish bands on the body and tail were counted on one side. Indiscernible or incomplete bands were counted as single, and bands that were partly fused were counted as two. The collar was not counted and bands covering the anal shield were added to the bands of the body.

Museum abbreviations. BMNH: The Natural History Museum, London, UK; BNHS: Bombay Natural History Society, Mumbai, India; CAS: California Academy of Sciences, San Francisco, USA; CIB: Chengdu Institute of Biology, Chinese Academy of Sciences, Chengdu, People's Republic of China; FMNH: Field Museum of Natural History, Chicago, USA; KIZ: Kunming Institute of Zoology, Chinese Academy of Sciences, Kunming, People's Republic of China; MNHN: Muséum national d'Histoire naturelle, Paris, France; MS: Montri Sumotha private collection, Thailand; NMW: Naturhistorisches Museum Wien, Austria; HNU: Hunan Normal University, Changsha, People's Republic of China; ZFMK: Zoologisches Forschungsmuseum Alexander Koenig, Bonn, Germany; ZMB: Zoologisches Museum für Naturkunde der Humboldt-Universität zu Berlin, Berlin, Germany; ZSM: Zoologische Staatssammlung, München, Germany; ZSI: Zoological Survey of India, Kolkata, India.

Results

The missing holotype of *Ophites fasciatus* is problematic because the specimen was collected in or close to the Hengduan Mountains, which is within the distribution area of the new species described herein. In the description of the holotype of *Ophites fasciatus*, Anderson (1879) recorded 90 subcaudals, an extreme value. The values for the 26 male specimens of *Lycodon fasciatus* we examined range from 74–88, and the for 30 female specimens 65–88, while the values for the new species were 95–96 for the two males and 92 for the single female we had at hand. The relative tail length of the holotype of *Ophites fasciatus* is typical for *Lycodon fasciatus*, but too short for a male of our new species. Thus, it is possible that the holotype of *Ophites fasciatus* was in fact equivalent to females of the new species described herein, which would require a new name to be applied to *Lycodon fasciatus* outside the Hengduan Mountains in its major range, and a restriction of the name *Lycodon fasciatus* to the species (described as new here) endemic to the Hengduan Mountains. However, the values provided by Anderson for the holotype of *Ophites fasciatus* make it possible that this specimen indeed belongs to *Lycodon fasciatus* as defined herein. The scale counts for the holotype of *Ophites fasciatus*, as given by Anderson, are compared to *Lycodon fasciatus* sensu lato and the population of the Hengduan mountains investigated here in Table 2.

TABLE 2. The comparison of distinguishing characters of the holotype of *Ophites fasciatus* with the new species and *Lycodon fasciatus* as defined herein. 1= Without the here described species and the holotype; 2=value from Anderson 1879.

	<i>Lycodon fasciatus</i> males ¹	<i>Lycodon fasciatus</i> females ¹	<i>Lycodon fasciatus</i> holotype ²	<i>Lycodon spec. nov.</i> males	<i>Lycodon spec. nov.</i> females
n	26	30	1	2	1
Subcaudals	74–88	65–88	90	95–96	92
Relative tail length	0.198–0.225 \bar{x} =0.207	0.190–0.219 \bar{x} =0.205	0.206	0.231–0.232 \bar{x} =0.232	0.215

Designation of a neotype for *Ophites fasciatus* Anderson, 1879. To fix the status of *Ophites fasciatus* Anderson, 1879, we here designate a neotype for this species according to Art. 75.3 of the Code of Zoological Nomenclature (I.C.Z.N., 1999). For reasons of nomenclatorial stability, we decided to choose a specimen that belongs to that taxon that is well known as *Lycodon fasciatus* till now, distributed from India and China in the North, to Myanmar, Thailand, Laos, and Vietnam in the South instead of the species described here as new, with a very restricted area in southwestern Yunnan.

Neotype of *Lycodon fasciatus* (Figs. 1–2): BMHN 1901.4.26.1 (adult male), from “Mogok”, Mandalay Division, Myanmar. Collected by H. Hampton. *Morphology.* Body elongated but robust; head distinct from neck, rather flattened; snout projecting beyond lower jaw; pupil white and elliptical vertically; tail opened with a ventral slit at its base. SVL 641 mm, TaL 174 mm; ratio TaL/TL 0.213. *Body scalation.* DSR: 17–17–15 rows, scales weakly keeled, except for unkeeled three outermost rows (at midbody). VEN: 203 (+ 2 preventrals); SC 83, paired; ventrals and subcaudals angulate laterally; anal entire. *Head scalation.* Rostral large, triangular, just visible from above, internasals slightly broader than long, half as long as prefrontals; nasal divided, its anterior portion smaller than posterior one; prefrontals, distinctly wider than long, touching loreal; frontal subhexagonal, about as long as wide; a large supraocular on each side, longer than wide; two large, subtriangular parietals, much longer than frontal, in broad midline contact; 1/1 long, nearly rectangular loreal scale, about 3 times as long as high, in contact with the eye; 8/8 SL, 1st SL small, 2nd and 3rd in contact with loreal, 3rd, 4th and 5th entering orbit, 6th and 7th largest; 1/1 nearly subrectangular preocular above loreal; 2/2 postoculars; temporals 2+2/2+2; 1/1 large paraparietal behind posterior temporals, surrounded by 7/8 scales with 4 scales in between; 9/9 infralabials, first pair in contact, IL 1–5 in contact with anterior chin shields. *Colour.* Upper body surface dark brown; 35 cream bands on trunk, 14 bands on tail; first band starting at ventral 8 and extending over 7 ventrals on the first dorsal row, 2 dorsals wide middorsally. Bands wider and more irregular posteriorly. Bands 8 and 9 on left confluent middorsally, forming band 8 on right, band 12 and 13 on the right side confluent middorsally, forming band 13 on left. Bands uniformly cream anteriorly, more mottled posteriorly. Bands on posterior third of body and on tail heavily speckled with small brownish spots, concentrated in centres of bands, margins remaining more or less uniformly cream. Head a little paler than body; supralabials paler centrally; chin and throat uniformly creamish-yellow, anterior sublabials

slightly darker and with darker margins. Venter creamish-yellow with dark bands; first band from 6th to 9th ventral only very slightly darkened. Other anterior bands very clear, 2nd to 4th bands 6 ventrals broad, 5th to 6th bands 4 ventrals broad, other bands 2-3.5 ventrals broad. Ventral bands less clear posteriorly, pale parts speckled; several ventrals half dark and half cream. Underside of tail pale/dark banded with pale parts heavily speckled. Ventral tail bands less contrasted towards posterior end.

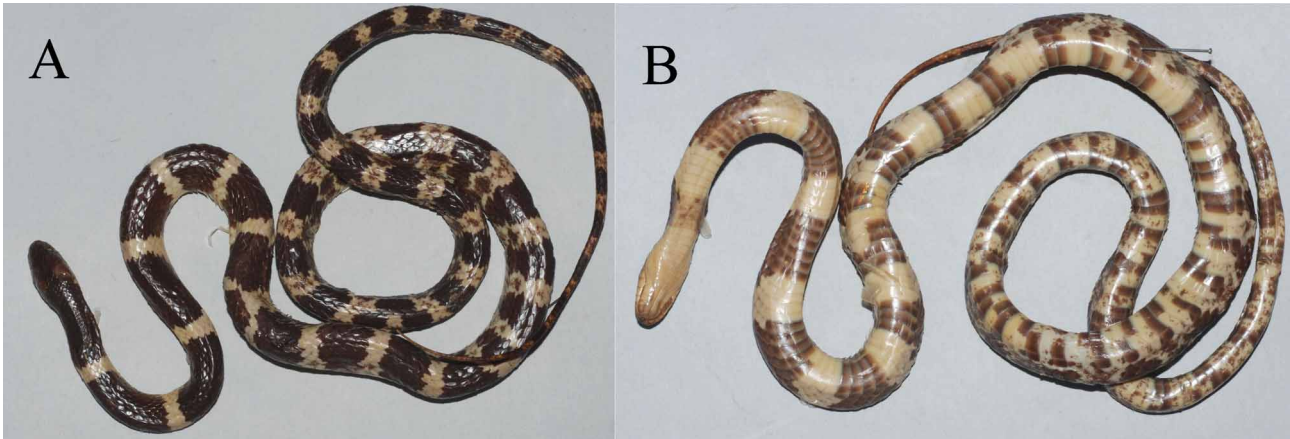


FIGURE 1. Neotype of *Ophites fasciatus*. BMHN 1901.4.26.1, TL 815 mm. A) Dorsal view, B) ventral view. Photographs by Gernot Vogel.



FIGURE 2. A lateral view of the right side of the head of the neotype of *Ophites fasciatus*. BMHN 1901.4.26.1. Photograph by Gernot Vogel.

***Lycodon gongshan* spec. nov.**

(Figs 3–4)

Holotype. KIZ 730034 adult male (tail dissected), from “Bapo, Gongshan, China”, today Dulongjiang Township, Gongshan County, Yunnan Province, People’s Republic of China (Figs 3–4). Collector unknown.

Paratypes (n = 3). KIZ 730008, juvenile male (tail dissected), from “Bapo, Gongshan, China”, today Dulongjiang Township, Gongshan County, Yunnan Province, People’s Republic of China; collector unknown. HNU 200609001, adult male, from Dulongjiang Township, Gongshan County, Yunnan Province, People’s Repub-

lic of China; collected by Qingbai Hou. HNU 200505002, adult female, from Xiaoheishan, Longjiang Township, Longling County, Yunnan Province, People's Republic of China; collected by Yan Hengmei, Liang Hongbin and Guo Keji.

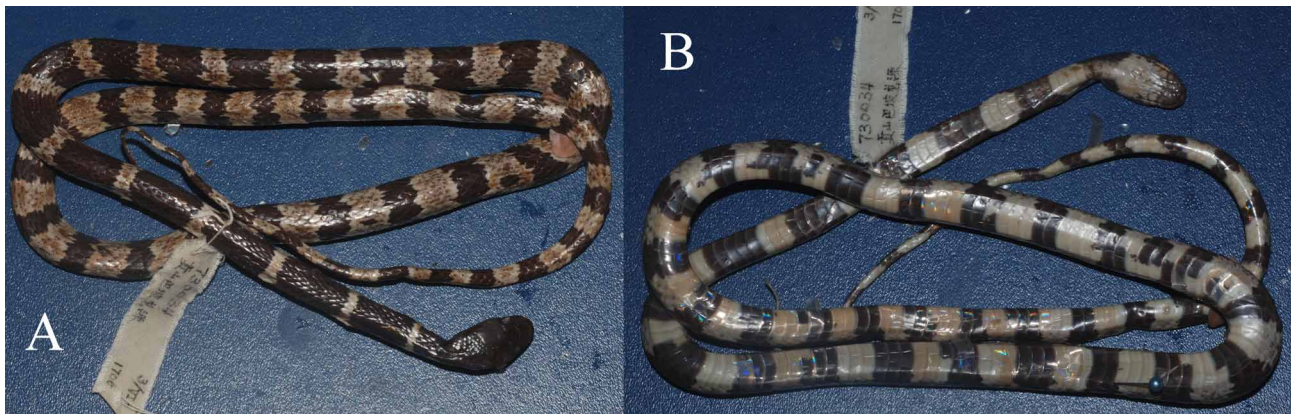


FIGURE 3. Dorsal view of the preserved Holotype of *Lycodon gongshan* **spec. nov.**, KIZ 730034, TL 963 mm. A) Dorsal view, B) ventral view. Photographs by Gernot Vogel.



FIGURE 4 Lateral view of right side of the head of the preserved holotype of *Lycodon gongshan* **spec. nov.**, KIZ 730034. Photograph by Gernot Vogel.

Diagnosis. A species of the genus *Lycodon* characterized by: (1) a loreal scale entering the orbit; (2) 17 dorsal scale rows anteriorly and at midbody; (3) upper and vertebral dorsal rows (6–12) are keeled; (4) 210–216 ventrals in males, and 215 ventrals in the single female known; (5) 95–96 subcaudals in males, and 92 subcaudals in the single female; (6) relative tail length ca. 0.231–0.232 in males, and 0.215 in the female; (7) 8 supralabials with SL 4–6 touching the orbit; (7) 32–40 pale bands on a dark body; (8) breadth of the anteriormost band 1 dorsal scale middorsally, 3–4 ventrals, midventrally; (9) belly with discreet bands throughout, and (10) dark ventrals on the throat.

This species can be recognized by its long tail (tail length/total length 0.231–0.232 in males, 0.215 in females, vs. 0.198–0.225 in males, 0.193–0.219 in females of *L. fasciatus*), and the high number of subcaudals (95–96 in males, and 92 in females). Also, its anteriormost pale band is very narrow, being 1 dorsal scale broad middorsally

in all 4 known specimens, vs. 1–5 dorsals ($\bar{x} = 2.5$ in 62 specimens) in the *L. fasciatus* group, with the anteriormost band starting at ventral 4–7 (vs. usually ventral 10–16 in *L. fasciatus* and in species of the *L. ruhstrati* group). Furthermore, the new species has a dark throat, whereas in *L. fasciatus* usually the throat is white (except in some individuals from parts of Yunnan. Vogel *et al.* unpublished data). Detailed comparisons with other species of the genus *Lycodon* appear below in the Discussion.

Comparison. Superficially, *Lycodon gongshan spec. nov.* resembles other species of the *Lycodon fasciatus* group. It differs from *L. fasciatus* by its much longer tail, more ventrals in males (210–216 vs. 190–211), more subcaudals in males (94–96 vs. 74–90) and females (92 vs. 67–88). In *L. gongshan* in all eight occurrences only four lower labials touch the anterior chin shields, whereas in *L. fasciatus* this is usually five, and only rarely four (on both sides only in five of 64 specimens). The anteriormost band lies closer to the head in *L. gongshan* (first band starts at ventral 4–7 vs. usually 8–18 in *L. fasciatus*, rarely 5–8 in five of 67 specimens), and is very narrow, only one dorsal scale broad in the four available specimens, vs. usually 1.5–6 in *L. fasciatus* (rarely one dorsal scale broad, 5 of 67 specimens). The number of subcaudals and tail length are sexually dimorphic in the new species, but not in *L. fasciatus* (Table 2). Lastly, *L. gongshan spec. nov.* reaches a larger size than *L. fasciatus*: two of the three available males of the new species are considerably larger than the largest of the 32 males of *L. fasciatus* at hand; the single female of the new species is larger than the 36 examined females of *L. fasciatus*.

Dinodon yunnanensis Werner, 1922 was described from Yunnanfu, now Kunming, Yunnan Province, China. It is currently regarded as a synonym of *Lycodon fasciatus* (Pope, 1935; Zhao & Adler, 1993). As with *Lycodon fasciatus*, the holotype of *Dinodon yunnanensis* differs from *L. gongshan spec. nov.* in the number of ventrals and subcaudals, in the relative tail length, and in having fewer bands on the body + tail (23+7 vs. 32–40 + 12–16 in *L. gongshan spec. nov.*). A comparison of *L. gongshan spec. nov.* with species of the *L. fasciatus* and *L. ruhstrati* groups is given in Table 4.

Etymology. The specific name refers to the area of origin of this species, Gongshan County. We suggest the following common names: Gongshan Baihuanshe (Chinese), Gongshan Wolf Snake (English), Gongshan Wolfszahnatter (German).

Description of the holotype. *Habitus.* Body elongate, somewhat laterally compressed; head flattened anteriorly, well distinct from neck; snout depressed and elongated; nostril oval, large. Eye moderate, pupil vertically elliptic. SVL 740 mm; TaL 223 mm; TL 963 mm. *Body scalation.* 212 ventrals (+ 1 preventral), 96 subcaudals, all paired. Anal entire. Dorsal scales in 17–17–15 rows, the 6 upper rows feebly keeled. Vertebral row not enlarged. No apical pit detected. *Head scalation.* Rostral triangular, hardly visible from above; nasal vertically divided by furrow below and above nostril; two small internasals, widely in contact with each other and prefrontals; two large prefrontals, longer and wider than internasals; rather small, more or less triangular frontal; 2 large parietals, each bordered by three large scales, 2 upper temporals and larger paraparietal posteriorly; 1/1 supraocular; 1/1 preocular, above posterior part of loreal; 2/2 subequal postoculars; 1/1 loreal, rather elongate and narrow, entering orbit, in contact with SL 2 and 3, preocular, prefrontal and posterior part of nasal; 8/8 SL, SL 1–2 in contact with nasal, SL 3–5 entering orbit, 6th SL largest; 2+2/2+3 temporals, lower anterior temporal slightly broader than upper; 8/8 infralabials, IL 1–4 in contact with first pair of chin shields anterior and posterior chin shields about same length on right, on left anterior larger than posterior, anterior pair wider. *Coloration in preservative.* Body and tail dark brown, with 37 crossbands on body and 15 on tail, anteriorly narrow, becoming wider posteriorly; crossbands about 1 dorsal scale broad middorsally, widening ventrolaterally to about 3–4 dorsals broad; first crossband beginning at level of ventral 5; second crossband 4 scales behind first; crossbands on body darker centered with dark brown speckles; crossbands on tail also darkly speckled. Head uniformly blackish-brown; no collar. Underside of head dark on anterior third, otherwise cream; throat cream with dark, cloudy speckles on first four ventrals. Venter dark with clear, rather irregular cream bands, 2–3 ventrals broad, with 2–4 ventrals between each band. Within bands some ventrals dark on one half and cream on other, especially on posterior of body. Under surface of tail banded as body venter, clear cream bands about 3 subcaudals broad.

Variation. The paratypes, agree in most respects with the description of the holotype. A comparison of the most important morphological characters is summarized in Table 3.

Distribution. China. *Lycodon gongshan* is presently only known from the Gongshan County and Longling County areas, in Yunnan Province, People's Republic of China. Both localities are situated in the Hengduan Mountains (Fig 5).

Biology. There is no information available on the biology of this species.

TABLE 3. Scalation of the four type specimens of *Lycodon gongshan spec. nov.* * = holotype. 1: small part of the tail tip missing.

Characters	KIZ 730034*	KIZ 730008	HNU 200609001	HNU 200505002
Sex	adult male	juvenile male	adult male	adult female
SVL	740	236	691	598
TaL	223	71	237	164
Rel TL	0.232	0.231	- ¹	0.215
ASR	17	17	17	17
MSR	17	17	17	17
VEN	212	216	210	215
SC	96	95	94 ¹	92
Lo enters eye	yes	yes	yes	yes
Dorsal bands	37	40	38	32
Tail bands	15	16	16	13
First band at VEN no	5	4	6	7
Broad base [VEN]	4	3.5	3	4
Broad vertebral [Dorsals]	1	1	1	1

Discussion

There are four specimens of *Lycodon fasciatus* available, collected in the Hengduan Mountains. All stem from Yunnan Province. These are KIZ 74 II 0263 from Tuantian, Tengchong County, KIZ 74 I 0145 from Husa, Longchuan County, KIZ 74 I 0035 from Gongwa, Longchuan County, and KIZ 74 II 0262 from Tengchong County. Longchuan, Tengchong and Yingjiang are located in the southwest of Gaoligong Mountain, in the Hengduan Mountains. The first three specimens are females, the last is male. All of them are typical *L. fasciatus* and the morphology is well within the range of this species. Thus, *L. fasciatus* is sympatric (but perhaps not syntopic) with *L. gongshan spec. nov.* in at least some areas.

Lycodon gongshan spec. nov. seems to be endemic to the Hengduan Mountains, a range of about 500 km in length, reaching 6,740 m a.s.l. This range is already known as a centre of endemism and high biodiversity (Venell 2006; Fu *et al.* 2007), but still seems to be relatively underexplored for reptiles and amphibians (Stotz *et al.* 2003). In 2003, UNESCO included the area “Three Parallel Rivers of Yunnan” in the World Heritage List. One reason was explained as follows: “Northwest Yunnan is the area of richest biodiversity in China and may be the most biologically diverse temperate region on Earth. The property encompasses most of the natural habitats in the Hengduan Mountains, one of the world's most important remaining areas for the conservation of the Earth's biodiversity” (UNESCO 2003).

Previously, 23 reptile species were regarded as endemic to the Hengduan Mountains (Zhao & Yang 1997), and there are ten endemic snake species here, namely: *Gloydus monticola* (Werner, 1922) (Yunnan Province), *Ovophis zayuensis* (Jiang, 1977) (Tibet Autonomous Region), *Protobothrops xiangchengensis* (Zhao, Jiang, & Huang, 1978) (Sichuan and Yunnan provinces), *Achalinus meiguensis* Hu & Zhao, 1966 (Sichuan, Guizhou and Yunnan provinces), *Calamaria yunnanensis* Chernov, 1962 (Yunnan Province), *Euprepiophis perlaceus* (Stejneger, 1929) (Sichuan Province), *Oligodon multizonatus* Zhao & Jiang, 1981 (Sichuan, Shaanxi and Gansu provinces), *Pareas nigriceps* Guo & Deng, 2009 (Yunnan Province), *Rhabdophis pentasupralabialis* Jiang & Zhao, 1983 (Sichuan and Yunnan provinces), and *Thermophis zhaermii* Guo, Liu, Feng & He, 2008 (Sichuan Province) (Luo *et al.* 2010). Several endemic subspecies of snakes have also been described from this area, and the following are sometimes regarded as valid but should be checked for their status: *Sibynophis chinensis miyiensis* Zhao & Kou, 1987 (Sichuan and Yunnan provinces), *Elaphe carinata deqinensis* Yang & Su, 1984 (Yunnan Province), *Macropisthodon rudis multiprefrontalis* Zhao & Jiang, 1981 (Sichuan Province), and *Ovophis monticola zhaokentangi* Zhao, 1995 (Yunnan Province) (Luo *et al.* 2010). Having in mind that several subspecies of Oriental snakes proved to be valid

species in recent years (e.g., Wüster & Thorpe, 1992; Vogel & David, 2007, Vogel & Rooijen, (2011 in print), it is expected that some of these may eventually receive full species status.

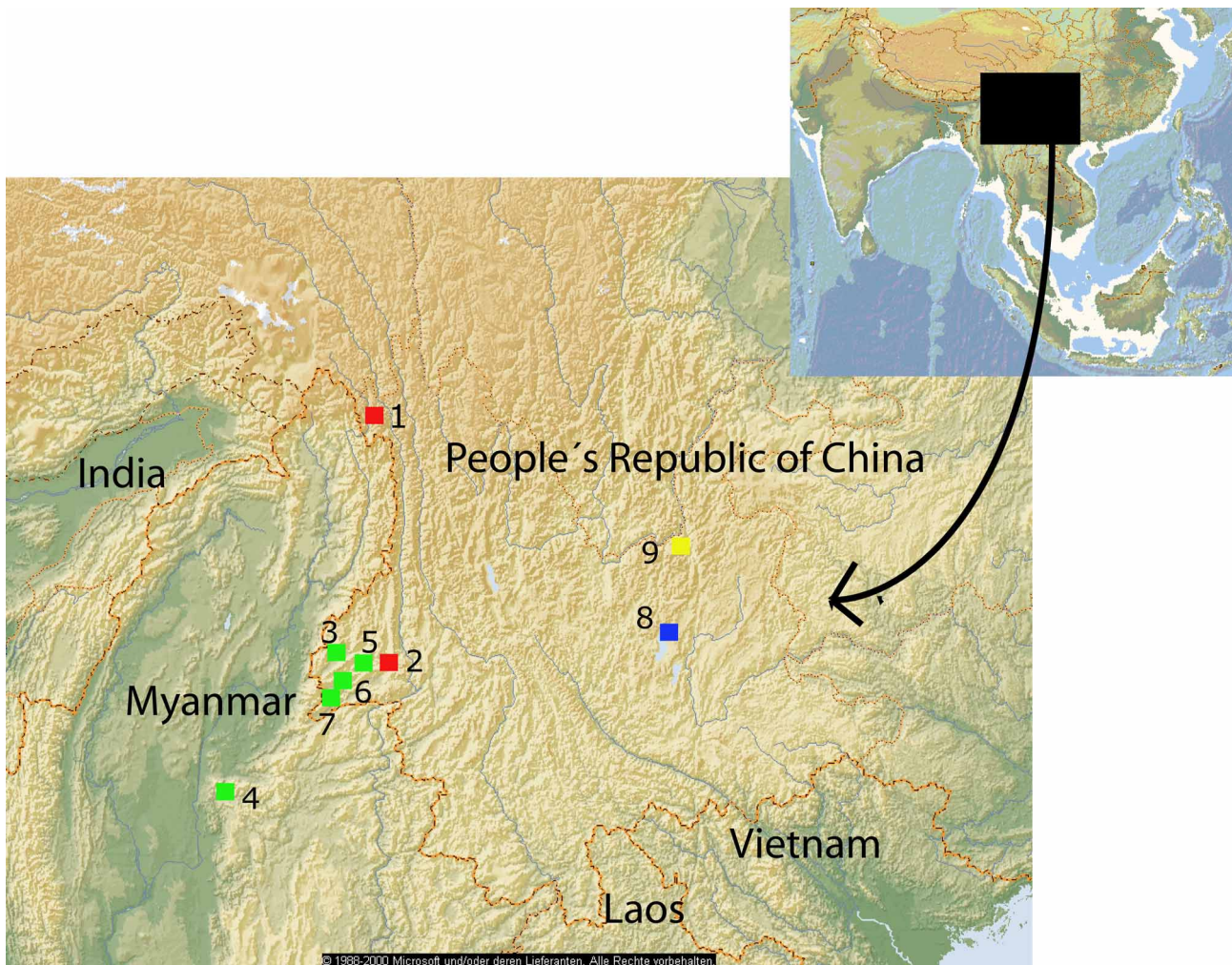


FIGURE 5. Map showing the distribution of *Lycodon gongshan spec. nov.* (red squares 1-2), *Lycodon fasciatus* (green squares 3-7), “*Dinodon yunnanensis*” (blue square 8), and *Lycodon synaptor* (yellow square 9). 1. “Bapo”, now Dulongjiang Township, Gongshan County, Yunnan Province, People’s Republic of China [Type locality of *Lycodon gongshan spec. nov.*]; 2. Xiaoheishan, Longjiang Township, Longling County, Yunnan Province, People’s Republic of China; 3. “Ponsee”, now Bangxi, Yingjiang County, Yunnan Province, People’s Republic of China [former type locality of *Ophites fasciatus*]; 4. “Mogok”, Mandalay Division, Myanmar [New type locality of *Lycodon fasciatus*]; 5. Tuantian, Tengchong County, Yunnan Province, People’s Republic of China; 6. Husa, Longchuan County, Yunnan Province, People’s Republic of China; 7. Ruili City, Yunnan Province, People’s Republic of China; 8. “Yunnanfu”, now Kunming City, Yunnan Province, People’s Republic of China [Type locality of *Dinodon yunnanensis*]; 9. “Tongchuan”, now Dongchuan District, Yunnan Province, People’s Republic of China [Type locality of *Lycodon synaptor*]. “For *Lycodon fasciatus* only specimens from the Gongshan area are shown in the map.”

As already mentioned (Vogel & David, 2010), there are still several lineages combined under the name *Lycodon fasciatus*. This fact explains the large ranges of some characters in *Lycodon fasciatus sensu lato*. Thus, some characters of *Lycodon gongshan spec. nov.* might currently appear less diagnostic than they actually are. More material, especially from remote Chinese areas, is needed for a better understanding of the *L. fasciatus* complex. This is another example of a supposedly widespread species that, upon closer examination, proves to be a species complex. A similar situation in other taxa would represent a greater underestimation of diversity in the ophidian fauna of the Oriental region than currently appreciated, a topic that requires further investigation. Centers of endemism can be overlooked by inaccurate and/or imprecise taxonomies, which may lead to dire consequences in nature conservation, especially for taxa less well studied than vertebrates.

TABLE 4. A comparison of the main morphological characters in the *Lycodon fasciatus* / *ruhstrati* groups. For an explanation of abbreviations see Material and Methods and Table 1. Values in brackets are exceptional values with an observed frequency of less than 20%. Notes. – 1: There are still several lineages combined under this name. 2: Data from Pauwels et al. (2005). 3: In Pauwels et al. (2005) these values are erroneous

Taxon	TL [mm]		Rel TL		VEN		SC		MSR	Lo touch	IL
	Males	Females	Males	Females	Males	Females	Males	Females			
<i>Lycodon fasciatus</i> ¹ (n = 67)	894	679	0.198–0.225 (\bar{x} = 0.208) (s = 0.007)	0.190–0.219 (\bar{x} = 0.204) (s = 0.009)	190–211 (\bar{x} = 202.3) (s = 5.3)	182–219 (\bar{x} = 205.3) (s = 8.6)	74–88 (\bar{x} = 81.2) (s = 4.3)	65–88 (\bar{x} = 79.3) (s = 6.1)	17	1	9 (8,10)
<i>Lycodon gongshan</i> spec. nov. (n = 4)	963	762	0.231–0.232 (\bar{x} = 0.232) (s = 0.0002)	0.215 (\bar{x} = 0.212.7) (s = 3.1)	210–216 (\bar{x} = 212.7) (s = 3.1)	215 (\bar{x} = 95.5) (s = 0.7)	95–96 (\bar{x} = 95.5) (s = 0.7)	92	17	1	8
<i>Lycodon synaptor</i> (n = 2)	unknown	487	unknown	0.189–0.192 (\bar{x} = 0.190) (s = 0.002)	unknown	201–203 (\bar{x} = 202) (s = 1.4)	unknown	68–69 (\bar{x} = 68.5) (s = 0.7)	17	0	8
<i>Lycodon ruhstrati</i> (n = 34)	1055	876	0.220–0.248 (\bar{x} = 0.232) (s = 0.010)	0.204–0.239 (\bar{x} = 0.227) (s = 0.009)	211–228 (\bar{x} = 217.6) (s = 5.3)	217–228 (\bar{x} = 220.8) (s = 3.1)	105–114 (\bar{x} = 107.4) (s = 3.3)	97–108 (\bar{x} = 103.1) (s = 3.8)	17	0 (1)	10 (9,11)
<i>Lycodon ruhstrati</i> <i>abditus</i> (n = 34)	964	764	0.202–0.230 (\bar{x} = 0.216) (s = 0.013)	0.204–0.237 (\bar{x} = 0.224) (s = 0.013)	206–224 (\bar{x} = 216.6) (s = 6.5)	221–229 (\bar{x} = 223.5) (s = 3.2)	91–97 (\bar{x} = 94.2) (s = 2.6)	90–103 (\bar{x} = 97.0) (s = 4.9)	17	0 (1)	10 (9,11)
<i>Lycodon futsingensis</i> (n = 22)	773	850	0.194–0.229 (\bar{x} = 0.215) (s = 0.010)	0.203–0.225 (\bar{x} = 0.212) (s = 0.008)	193–203 (\bar{x} = 197.8) (s = 3.3)	197–208 (\bar{x} = 200.9) (s = 4.0)	72–85 (\bar{x} = 79.5) (s = 3.4)	78–85 (\bar{x} = 79.9) (s = 2.7)	17	0	10 (9,11)
<i>Lycodon cardamomensis</i> ² (n = 4)	893	545	0.203–0.206 ³ (\bar{x} = 0.205) (s = 0.002)	0.200 ³	215–222 (\bar{x} = 218.5) (s = 4.9)	223	92–93 (\bar{x} = 92.5) (s = 0.7)	92	17	0	10

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APPENDIX. Comparative material of *Lycodon fasciatus*.

India (9 specimens). Shillong, Assam, BMNH 92.1.25.1, 1908.6.23.6, 1908.6.23.8, 1907.12.16.28–29, 94.10.4.2, BNHS 1219–20, 1229.

Laos (3 specimens). Xieng-Khouang, MNHN 1928.69; Bolovan Highlands MNHN K 3460, 3485.

Myanmar (21 specimens). Maymyo, BMNH 1925.12.22.15–16, BNHS 1222–24; Mogok, BMNH 1900.9.20.5–6, BMNH 1901.4.26.1, BMNH 1904.4.26.7; Toungyi, Shan State, BMNH 91.11.26.31; Bhamo, BMNH 1925.4.2.28; Kachin Hills, BMNH 1925.9.17.10–11; South Shan State, BMNH 1908.6.23.14; Burma-Siam Border, BMNH 1937.2.1.12; Rangoon, BMNH 1940.3.3.3; Thandung Hills, BNHS 1228; "Burma", BMNH 1908.6.23.9–11; BNHS 1218.

People's Republic of China (26 specimens). Western China, CAS 55147; Yunnan, MNHN 1919.148; "Yunnan Fu" (holotype of *Dinodon yunnanensis*), NMW 23417; Kuantun, ZSM 75/1938; Kunming City, Yunnan, BMNH 1930.11.16.4; Ruili City, Yunnan, CIB 9804–9805; Xishuangbanna Prefecture, Yunnan, CIB 9806–9809; Gongwa, Longchuan County, Yunnan, KIZ 74 I 0035; Husa, Longchuan County, Yunnan, KIZ 74 I 0145; Tengchong County, Yunnan, KIZ 74 II 0262; Menglian County, Yunnan, KIZ 75 I 473; Tuantian, Tengchong County, Yunnan, KIZ 74 II 0263; Huahongdong, Kunming City, Yunnan, KIZ 73009, 77004; Kunming City, Yunnan, KIZ 83007; Yunnan, KIZ 83017; FMNH 15148; ZMB 65453; Tibet, MNHN 1921.0465–1921.0466; Yongde County, Yunnan, unnumbered private collection Ke Jiang; "Tonghuan Fu", Western China, NMW 21703:1; "Yunnan Fu", NMW 21703:2.

Thailand (5 specimens). Chiang Mai, FMNH 178369; Doi Suthep National Park, Chiang Mai, CAS 172715; Southern Thailand ?, FMNH 178368; Nan Province, FMNH 270716; Khuntan Mountain, Lampang Province, MS 403.

Vietnam (5 specimens). Phong Nha, ZFMK 86448–50 (GenBank: EU999214–215); ZFMK 80665; Thomas Ziegler collection unregistered.