On the Occurrence of *Oligodon joynsoni* (Smith, 1917) in China (Squamata: Colubridae)

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Abstract On the basis of a different dorsal pattern, and a low number of maxillary teeth, the specimens of *Oligodon joynsoni* (Smith, 1917) from the Nonggang National Nature Reserve, Guangxi, China formerly identified as *O. joynsoni* by several authors should be referred to the recently described species *O. nagao* David, Nguyen, Nguyen, Jiang, Chen, Teynié, and Ziegler, 2012. Here, we provide the first genuine record of *O. joynsoni* (Smith, 1917) in China based on a male specimen collected from Xishuangbanna, Yunnan, China.

Keywords taxonomy, revision, record, *Oligodon joynsoni*, Colubridae, Squamata

1. Introduction

*Simotes longicauda joynsoni* Smith, 1917 (holotype: BMNH 1946.1.4.23; type locality: “Valley of the Maa Yome, Muang Ngow, N. Siam”, now Muang Ngao or Muang Ngau, 18°45'27” N, 99°58'42” E, in Lampang, Thailand), currently known as *Oligodon joynsoni* (Smith, 1917), is a valid, but still poorly known species. Pope (1935) placed *Simotes longicauda* Boulenger 1903 in the synonymy of *Simotes chinensis* Günther, 1888 (now *Oligodon chinensis*, a valid species), but he supported the validity of Smith’s subspecies “joynsoni” and suggested its specific status. On the one hand, Bourret (1936) recognized the validity of *S. longicauda*, but as a subspecies of *Coronella violacea* Cantor, 1839 (a junior synonym of *Coronella cyclura* Cantor, 1839, now *Oligodon cyclurus*; Smith, 1943), and on the other hand, he considered *joynsoni* to be a color variety of *Holarchus violaceus longicauda*. Smith (1943) placed *S. longicauda* in the junior synonymy of *O. chinensis* (Günther, 1888) and formally elevated *S. longicauda joynsoni* to specific status in the genus *Oligodon* Fitzinger, 1826, as *O. joynsoni* (Smith, 1917). This position was followed by Taylor (1965) and subsequent authors (Wagner, 1975). More recently, the specimens from Thailand identified by Taylor (1965) as *Oligodon cinereus swinhonis* (Günther, 1864) and *O. cinereus multifasciatus* (Jan and Sordelli, 1865) were referred to *O. joynsoni* (David et al., 2011). Smith (1943), Wagner (1975), Green et al. (2010) and David et al. (2011) recognized *O. joynsoni* into the “*O. cinereus* group”, which is mainly characterized by 1) short, not forked hemipenes with papillae, without spines; 2) 15–21 dorsal scale rows; 3) 8–12 maxillary teeth; and 4) cloacal plate usually entire. Some species are separated from other members of the group by a combination of subtle differences, making the systematics of this group,
especially the complex of *O. cinereus* (Günther, 1864), still largely unresolved.

*Oligodon joynsoni* was first recorded from China by Kadoorie Farm and Botanic Garden (2002) on the basis of a male specimen collected in the Nonggang National Nature Reserve, Guangxi in 1998. This record was then mentioned by Zhao (2006), Zhang (2009) and Zhang et al. (2011). It differed from type series by having different dorsal pattern and fewer maxillary teeth. An additional male specimen was collected from the same locality in October 2011. Then, the specimens from the Nonggang National Nature Reserve, Guangxi were referred to a new species *Oligodon nagao* David, Nguyen, Nguyen, Jiang, Chen, Teynié, and Ziegler, 2012. Subsequently, a male specimen collected from extremely southern Yunnan was identified as *O. joynsoni*. The occurrence of *O. joynsoni* (Smith, 1917) in China is discussed here.

### 2. Material and Methods

In total, 110 preserved specimens of the “*O. cinereus* group” were examined (Appendix), including the specimen from the Nonggang National Nature Reserve, Guangxi in 1998, which is the basis of the first record of *O. joynsoni* in China (CIB 95292), a second specimen recently collected in the same locality (KIZ 014591, one of the paratypes of *O. nagao*) in October 2011, and the specimen collected from Mengla County of Xishuangbanna, southern Yunnan in September 2009, which we here refer to *O. joynsoni* (KIZ 09128).

Recently collected specimens were fixed in 5% formalin solution, and transferred to 70% ethanol, and the left hemipenis was everted by injection of 5% formalin solution. Measurements were taken with slide-caliper to the nearest 0.1 mm except snout-vent length (SVL) and tail length (TaL), which were made to the nearest 1 mm with a flexible ruler. The hemipenal morphology is described according to the methods and terminology of Dowling and Savage (1960). The numbers of dorsal scale rows, counted according to Dowling (1951), are given at one head length behind head, at mid-body, and at one head length before vent, respectively. The data of other species which we cannot examine are given mainly based on literature (Pope, 1935; Smith, 1917, 1943; Taylor, 1965; Wagner, 1975; Zhao, 2006; David et al., 2011).

Morphometric characters include: HL: head length (from the tip of rostral to posterior end of the jaw); HW: head width; MT: maxillary teeth; SVL (from the snout to the posterior edge of vent); TaL (from the posterior edge of vent to the end of tail); TL: total length; and TaL/TL: ratio of tail length/total length. Pholidosis measurements include: DSR: number of dorsal scale rows (at three positions as described above); ATem: anterior temporal scale; PosOc: postocular scale; PreOc: precocular scale; PreSubOc: presubocular scale (minute scale below the precocular); SC: subcaudal scales; SL: supralabials; and VEN: ventral scales. Values for paired head characters are given in left / right order.

Museums where the related specimens are deposited include: BMNH: Natural History Museum, London, UK; BNHS: Bombay Natural History Society, Mumbai, India; CIB: Chengdu Institute of Biology, Chinese Academy of Sciences (CAS), Chengdu, Sichuan, China; KIZ: Kungming Institute of Zoology, CAS, Kunming, Yunnan, China; MNHN: Muséum National d’Histoire Naturelle, Paris, France; NMW: Naturhistorisches Museum Wien, Vienna, Austria; NHMB: Naturhistorisches Museum Basel, Basel, Switzerland; PSGV: Gernot Vogel’s private collection, Heidelberg, Germany; USNM: National Museum of Natural History, Smithsonian Institution, Washington, USA; ZFMK: Zoologisches Forschungsmuseum Alexander Koenig, Bonn, Germany; ZMA: Zoölogisch Museum Amsterdam, Amsterdam, The Netherlands; and ZSI: Zoological Survey of India, Kolkata, India.

### 3. Results and Discussion

#### 3.1 Note on the record of *Oligodon joynsoni* (Smith 1917) from Guangxi, China

The first specimen (CIB 95292) was collected from the Nonggang National Nature Reserve, Guangxi (Figure 1) in 1998 and was the basis of the first record of *O. joynsoni* from China by Kadoorie Farm and Botanic Garden (2002). The presence of *O. joynsoni* in China was mentioned by Zhao (2006), Zhang (2009) and Zhang et al. (2011). The second specimen (KIZ 014591) was collected from the same locality in October 2011 (Figures 2, 3).

These two specimens are similar to *O. joynsoni* in their scalation, especially the large numbers of VEN and SC (Table 1), but differed from *O. joynsoni* mainly by 1) a different dorsal pattern, the specimens with a series of retangular, black-edged brown blotches on back of body and tail, whereas *O. joynsoni* without dorsal blotches but reticulations forming more or less distinct cross-bars on the upper surfaces of body and tail; and 2) 9 maxillary teeth vs. 11–12 in *O. joynsoni*. Additional investigations suggested that the two specimens from Guangxi could not be identified as *O. joynsoni*, and referred to a new species which is described recently, *Oligodon nagao* David,
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Nguyen, Nguyen, Jiang, Chen, Teynié, and Ziegler, 2012. The new species based on a type series including the holotype and four paratypes from northern Vietnam, one paratype from Guangxi, China (KIZ 09128) and central Laos, respectively. According to its hemipenal morphology mainly, this species should be placed in the “Oligodon cinereus group”.

3.2 Note on Oligodon joynsoni (Smith, 1917) in Yunnan, China

An adult male specimen (KIZ 09128) of the “Oligodon cinereus group” was collected from Xishuangbanna, Mengla County, in extremely southern Yunnan (Figure 1) in September 2009. The specimen agrees in all morphological characters of the body, maxillary teeth and hemipenis with those of O. joynsoni (Wagner, 1975; David et al., 2011). The only difference is that its tail is slightly shorter than that of the specimens from Thailand and Laos (Tal/TL 0.122 vs. 0.124–0.156). Therefore, the specimen should be identified as O. joynsoni (Smith, 1917). It represents the first authentic record of this species in China. Moreover, its locality, Mengla County, Yunnan is only about 410 km from the type locality of O. joynsoni in Thailand (Figure 1).

**Description:** Adult male of O. joynsoni, body elongate, cylindrical and robust; head short (HL/SVL ratio 0.026), ovoid, barely distinct from thick neck; snout long, narrowing anteriorly, slightly rounded, extending well beyond lower jaw; large, oval nostril piercing laterally the central part of nasal; eye rather small (ED/HL ratio 0.190), with round pupil; tail average, robust at its base, tapering progressively to a point.

**Measurements:** SVL 568 mm, TaL 79 mm, TL 647 mm, Tal/TL 0.122, HL 14.7 mm, and HW 10.9 mm.

**Dentition:** Maxillary teeth 11, with the first 9 being small, and the last 2 strongly enlarged, largest, blade-like, without diastema (the 10th tooth lost, identified by its socket).

**Hemipenis (in situ):** The organ is unforked and reaching the 14th SC; origin of musculus retractor penis magnus at the 34th SC; a simple sulcus; structured by membranous tissues mainly; no spines; one third of the hemipenis covered with calyces and longitudinal flounces; two long papilla from the tip of the organ, unsymmetrical, the largest one about half of hemipenal length.

**Body scalation:** DSR 17–17–15, all scales smooth; 194 VEN, strongly angulated; 43 SC, all paired; and cloacal entire. The dorsal scale row reductions are as follows:

<table>
<thead>
<tr>
<th>Species</th>
<th>TaL/TL</th>
<th>DSR</th>
<th>VEN</th>
<th>SC</th>
<th>SL</th>
<th>ATem</th>
<th>MT</th>
<th>Dorsal pattern</th>
</tr>
</thead>
<tbody>
<tr>
<td>O. joynsoni</td>
<td>0.124–0.156</td>
<td>17–17–15</td>
<td>186–198</td>
<td>32–50</td>
<td>7–8</td>
<td>1–2</td>
<td>11–12</td>
<td>Reticulations</td>
</tr>
<tr>
<td>O. joynsoni, KIZ 09128</td>
<td>0.111–0.133</td>
<td>17–17–15</td>
<td>193–200</td>
<td>38–42</td>
<td></td>
<td></td>
<td></td>
<td>Reticulations</td>
</tr>
<tr>
<td>O. nagao, (2♂), Guangxi</td>
<td>0.130–0.143</td>
<td>17–17–15</td>
<td>190–193</td>
<td>47</td>
<td>7–8</td>
<td>1</td>
<td>9</td>
<td>Large blotches</td>
</tr>
</tbody>
</table>

* The characters according to Smith (1917, 1943), Wagner (1975), David et al. (2011) and from the specimens listed in Appendix.

Nguyen, Nguyen, Jiang, Chen, Teynié, and Ziegler, 2012. The new species based on a type series including the holotype and four paratypes from northern Vietnam, one paratype from Guangxi, China (KIZ 09128) and central Laos, respectively. According to its hemipenal morphology mainly, this species should be placed in the “Oligodon cinereus group”.

**Table 1** Comparison of the major morphological characters between Oligodon joynsoni and O. nagao discussed in this paper.

**Figure 1** Map showing the type locality of Oligodon joynsoni (red dot) in Thailand, the locality of O. joynsoni in Yunnan, China (purple dot), and the locality of O. nagao in Guangxi, China (blue dot; former record of O. joynsoni in Guangxi).
parietals moderate, longer than wide, extending on about 30% of HL; no nuchal scale behind parietal; 1/1 small loreal scale, like square; 8/8 SL, the 4th and 5th SL entering orbit; 1/1 narrow preocular, in contact with prefrontal, but not reaching the frontal; 1/1 minute presubocular; 2/2 small, narrow postoculars, the lowest one slightly largest; 1+2 temporals on each side; 8/8 IL, the first five IL in contact with anterior chin shields; mental small; anterior chin shields 1.4 times longer than posterior ones.

**Coloration in life:** Head, dorsum and most part of tail brown; head with a black-edged, dark brown bar across the anterior part of the head, downwards to supralabials under the eye; a black-edged, dark brown oblique bar present from the parietal to the posterior end of the jaw; another black-edged, dark brown streak from frontal to the neck, divided from the end of parietal; body with strong black reticulations forming indistinct cross-bars, rather distinct on posterior part of body and whole tail; posterior part of tail red-brown; venter pink, anterior part with few small black spots, posterior part with large black spots (Figures 4, 5).

### 3.3 Comparison

*Oligodon joynsoni* is quite similar to the reticulate morph of *O. cinereus*, referred to as morph II by Smith (1943). According to Wagner (1975) and our own data, *O. joynsoni* can be distinguished from *O. cinereus* mainly by 1) larger number of ventrals: 186–198 (males) and 193–200 (females) in *O. joynsoni* vs. 155–182 (males) and 162–185 (females) in *O. cinereus*; and 2) greater number of subcaudals: 32–50 (males) and 38–42 (females) in *O. joynsoni* vs. 33–45 (males) and 29–39 (females) in *O. cinereus*.

### 4. Conclusion

The occurrence of *O. joynsoni* (Smith 1917) from Guangxi, China is not supported, as the two known specimens previously identified as such represent a recently described species *Oligodon nagao* David, Nguyen, Nguyen, Jiang, Chen, Teynié, and Ziegler, 2012. According to Zhao (2006) and Zhang (2009), there are six species of *Oligodon* currently known in Guangxi: *O. catenatus* (Blyth, 1854), *O. chinensis* ( Günther, 1888),...
Oligodon (Günther, 1864), O. formosanus (Günther, 1872), O. lungshenensis (Cheng and Huang, 1978), and O. ornatus (Van Denburgh, 1909).

On another hand, O. joynsoni is a new record for the snake fauna of Yunnan, China. Currently, according to Yang and Rao (2008), and modified by Zhang et al. (2011), eight species of Oligodon are known from Yunnan, and they are: O. albocinctus (Cantor, 1839), O. cinereus (Günther, 1864), O. fasciolatus [Günther, 1864; as O. cyclurus in Yang and Rao (2008)], O. formosanus (Günther, 1872), O. joynsoni (Smith, 1917) and O. lacroixi (Angel and Bourret, 1933). The record of O. taeniatus (Günther, 1861) from Yunnan by Yang and Su (1980) was suggested to be erroneous by Zhang et al. (2011), and the three species identified as such are in fact referable to O. cinereus cinereus.

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Appendix: Examined specimens

Oligodon albocinctus (n = 1). China: KIZ 74 I 0026, Longchuan County, Yunnan