

A NEW RECORD OF THE COLUBRID SNAKE, *PLAGIOPHOLIS STYANI* BOULENGER, 1899 (SQUAMATA: REPTILIA), FROM TAIWAN

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ABSTRACT - *Plagiopholis styani* Boulenger, 1899 is recorded from Taiwan for the first time of the genus for this island. Five specimens, all from Yangmingshan National Park, Taiwan, were examined and identified as this species based on external characteristics, such as 6 supralabials, 2+2 temporals, and no loreals. *Plagiopholis styani* has hitherto been known to occur in the central, southern and southeastern parts of mainland China. This is the first record of this species outside the Asian continent.

KEY WORDS: *Plagiopholis styani*, Colubridae, Taiwan, Yangmingshan.

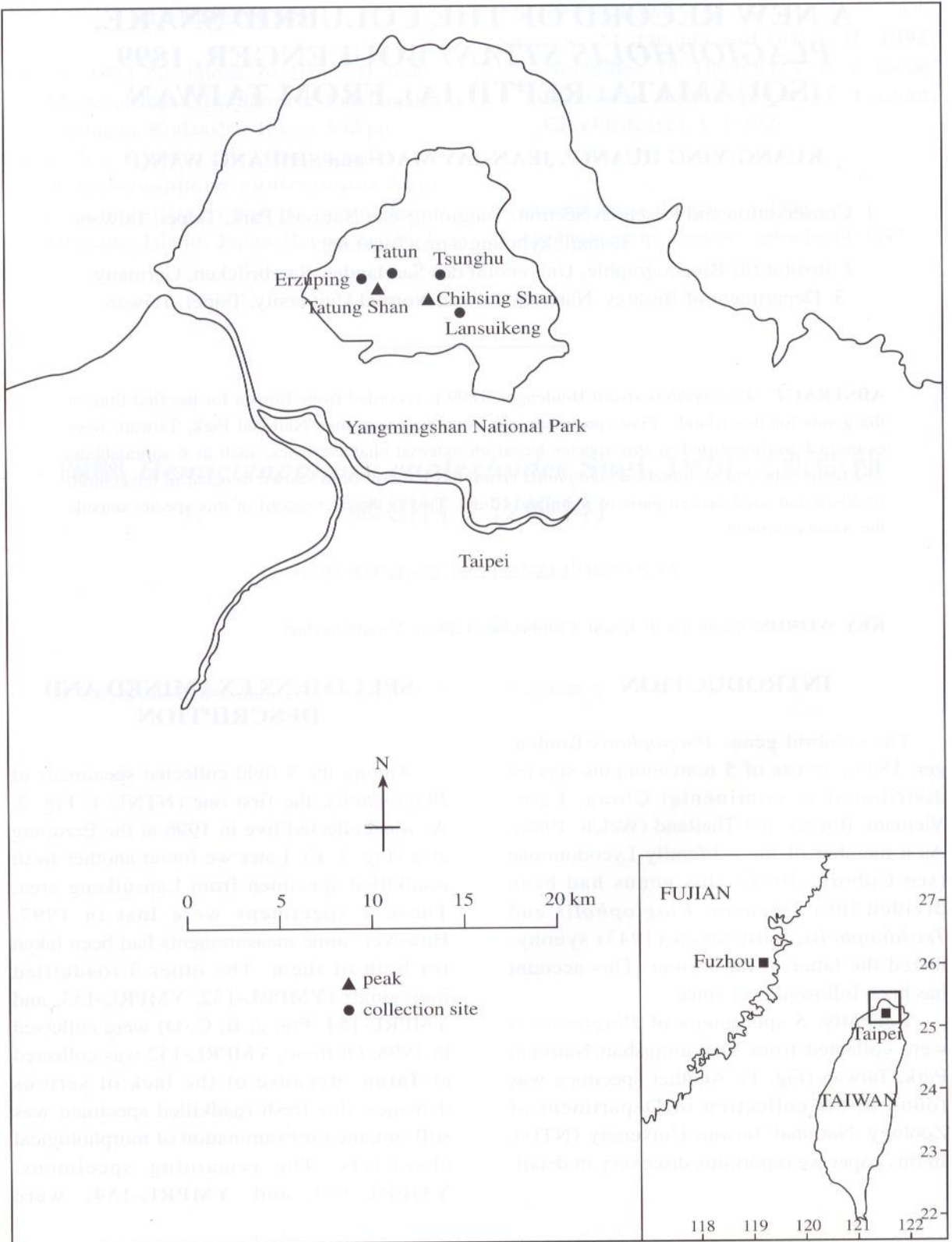
INTRODUCTION

The colubrid genus *Plagiopholis* Boulenger, 1893 consists of 5 nonvenomous species distributed in continental China, Laos, Vietnam, Burma, and Thailand (Welch, 1988). As a member of the subfamily Lycodontinae (see Coborn, 1991), this genus had been divided into 2 genera, *Plagiopholis* and *Trirhinopholis*, until Smith (1943) synonymized the latter to the former. This account has been followed ever since.

Recently, 5 specimens of *Plagiopholis* were collected from Yangmingshan National Park, Taiwan (Fig. 1). Another specimen was found in the collection of Department of Zoology, National Taiwan University (NTU). In this paper we report this discovery in detail.

SPECIMENS EXAMINED AND DESCRIPTION

Among the 5 field collected specimens of *Plagiopholis*, the first one (NTNU-1: Fig. 2, A) was collected live in 1996 at the Erzuping area (Fig. 2, F). Later we found another fresh roadkilled specimen from Lansuikeng area. These 2 specimens were lost in 1997. However, some measurements had been taken for both of them. The other 3 roadkilled individuals (YMPRL-152, YMPRL-153, and YMPRL-154: Fig. 2, B, C, D) were collected in 1998. Of these, YMPRL-152 was collected at Tatun. Because of the lack of serious damages, this fresh roadkilled specimen was still suitable for examination of morphological characters. The remaining specimens, YMPRL-153 and YMPRL-154, were



Text-figure 1

Map showing locations of collection sites of *Plagiopholis styani* in Taiwan.

Table 1

Measurements and sampling site information of *Plagiopholis styani* collected from Yangmingshan, Taiwan. Corresponding data for specimens NTU are also given.

	Catalogue Code					
	NTNU-1	NTNU-2	YMPRL-152	YMPRL-153	YMPRL-154	*NTU
Collection date	18 Aug.1996	?/1996	20 May 1998	17 Aug. 1998	15 Sept. 1998	—
Collection site	Erzuping	Lansuikeng	Tatun	Tsunghu	Tsunghu	—
Elevation(m)	820	700	800	730	730	
Sex	—	—	♂	♂	♂	♀
Weight (g)			19.0	—		—
TBL (mm)	335	336	331	—		313
SVL (mm)	287	287	272	—		269
TL (mm)	48	49	59	57		44
Ventrals	—	—	108	106		111
Subcaudals	—	—	33	30		27
Anal plate	—	—	single	single		single
Body scale count	-15-	-15-	15-15-15	?-?-15		15-15-15
Preocular	—	—	1	1		1
Postocular	—	—	2	2		2
Supralabial	—	—	2-2-2	2-2-2		2-2-2
Infralabial	—	—	6	6		6
Temporal	—	—	2+2	2+2		2+2
Loreal	—	—	no	no		no

*NTU specimen bears no sampling information.

collected in the Tsunghu (Fig.2, E) area, of which YMPRL-153 was partly damaged with the hemipenis being everted. All 3 specimens are deposited at the Conservation and Research Section, Yangmingshan National Park.

In addition to these specimens, a female *Plagiopholis*, erroneously labelled as *Rhabdophis swinhonis*, was found in the collection of the Department of Zoology, NTU. Sampling data for this specimen was unknown since there was no tag on it. However, it was also measured for a supplementary comparison (Table 1).

In the 5 field collected specimens, range of the total body length (TBL) varies from 331-336 mm, snout-vent length (SVL) 272-

287 mm, tail length (TL) 48-59 mm, and body weight (BW) 19 g (Table 1). Head small, not distinct from neck; dorsal scales smooth without keel, in 15 rows throughout body; ventrals 106-108; subcaudals 30-33 pairs; anal plate single; 1 preocular; 2 postoculars; supralabials 6, 3rd and 4th entering eye, not touching supraocular; 6 infralabials; 2 anterior temporals; 2 posterior temporals; loreal lacking. All measurements from our specimens are similar to those of the genus from the mainland China (Boulenger, 1914, cited by Zhao *et al.* 1998; Ding and Zheng, 1974).

The hemipenis observed for YMPRL-153 is forked and extends to the posterior edge of the 8th subcaudal plate. The sulcus spermaticus

is bifurcate, centrifugal and symmetrical. Surface of the hemipenis apex has some reticulate structure. In addition, the basal portion of hemipenis is covered with spines of various sizes. In the proximal area of the basal portion there is a large single hook on each lateral side of the hemipenis (Fig. 2, C).

The specimens are brown above, with many small irregular spots or short stripes; the belly whitish. There is a broad dark brown crossbar on the nape. The labial is white with a black edge. The coloration of these specimens collected in Taiwan is also similar to that of continental specimens described in Ding and Zheng (1974) and Zhao (1998).

TAXONOMIC ACCOUNTS

Colubridae, the largest family in the Suborder Serpentes, consists of approximately 300 extant genera in the world. Nevertheless, the phylogenetic affinity in these genera is yet to be clarified (Zhao et al., 1998).

Plagiopholis is morphologically similar to *Pseudoxenodon* (Zhao and Adler, 1993) and *Oligodon* (Ding and Zheng, 1974) among other extant genera in Taiwan (Chen and Yu, 1984; Lue et al., 1989). However, because the dorsal scales, rostral scales and nostril position of *Plagiopholis* are different from those of *Pseudoxenodon* and *Oligodon*, respectively (Ding and Zheng, 1974; Zhao and Adler, 1993), it is not difficult to discriminate the former from the latter two genera. *Plagiopholis* is characterized by hypapophyses developed throughout the vertebral column; maxillary teeth 8-22, small, equal, not grooved; having head so small as to be indistinct from neck; nostril lateral, not in the nasal, but located between two nasals, or between them and first upper labial; eye moderate, with vertically subelliptic pupil; loreal present or absent; body short, stout, cylindrical; scales smooth, more or less oblique without pits; ventrals rounded; tail

short; subcaudals paired or single; and mental in contact with the anterior genials. Moreover, a distinct broad dark anteriorly pointing chevron or crossbar usually found on the nape and dorsal scales invariably in 15 rows throughout the body can assist the discrimination of *Plagiopholis* from other genera (Smith, 1943; Zhao et al., 1998).

The 5 recognized species of *Plagiopholis* are similar to each other in morphology there is no published taxonomic key applicable to all of them simultaneously. The generic key of Smith (1943) included 3 species and that of Zhao et al. (1998) was or four species only. We thus incorporated information regarding the diagnostic characters of the five species from these two publications as below: *P. unipostocularis*, with 1 postocular, 4th supralabial touching supraocular, no loreal; *P. nuchalis*, with 2 postoculars, 6 supralabials, 4th supralabial not touching supraocular, 1 loreal, temporals 1+2; *P. blakewayi*, 5 supralabials, no loreal, temporals 1+1; *P. delacouri*, 6 supralabials, no loreal, temporals 1+2; *P. styani*, 6 supralabials, no loreal, temporals 2+2.

External characters in our specimens agree with diagnostic characters of *P. styani*. Furthermore, close investigation of the description of the species in Zhao et al. (1988) yielded no contradiction with features of our specimens except specimen YMPRL-152 has 33 subcaudals that exceeds the record range, 25-30, of the species. We thus identify the Taiwanese population found as *P. styani*.

HABITAT AND ECOLOGICAL NOTES

The annual precipitation of this area is over 4500 mm; winters are cool and wet with seasonal northeast wind lasting for 6 months, while summers are hot and dry with an occasional visit of typhoon. The average temperature is 16.6 °C (Chen and Tsai, 1983).



Text-figure 2

Plagiopholis styani (Scale bar= 1.0 cm) and habitat. A: Live *P. styani* (NTNU-1); B: Horizontal view of the head of *P. styani* (YMPRL-152) with supralabial 6, 3rd and 4th touching the eye, preocular 1, no loreal, postocular 2, temporal 2+2; C: Hemipenis of *P. styani* (YMPRL- 153), bearing spines and bifurcate centrifugal and symmetrical sulcus; D: Dorsal view of a roadkilled *P. styani* head (YMPRL-153); E: Microenvironment of a collecting site (Tsunghu) with arrow bamboo under broadleaf evergreen forest; F: Landscape of a collecting site (Erzuping), a basin and forest patch dominated by silvergrass (*Miscanthus floridulus*) and surrounded by dense broadleaf forest.

The vegetation around sites where these snakes were collected is a broadleaf evergreen forest dominated by members of the Lauraceae and Moraceae, accompanied by *Trochodendron aralioides*, *Eurya japonica*, and *Prunus phaeosticta* (Chuang, 1960; Huang et al. 1983). The ground is mainly covered by silvergrass, *Miscanthus floridulus*, and arrow bamboo, *Yushania usawai* (Lee, 1988). The Tatun site is not far from open ground recreation area. The Tsunghu site (Fig. 2, E) is near pure arrow bamboo bush edge. The Erzuping site (Fig. 2, F) is a forest patch dominated by silvergrass and surrounded by dense broadleaf forest. The Lansuikeng site, which is also forest vegetation, is the only site on the southern slope.

The 1st author has conducted a survey of roadkilled vertebrate remains since August 1994 from elevations of 200 to 1080m in above sea level in the Yangmingshan area. Over 2000 dead snakes were recorded among which only 3 (YMPRL-152, YMPRL-153, YMPRL-154) were identified as *P. styani*. The collection site elevations of *P. styani* fall between 730 and 820m. Dates of collections of those specimens suggest that *P. styani* in this region is active from May to September.

DISCUSSION

A hundred years after Boulenger's original description in 1899, *Plagiopholis styani* is recorded from Taiwan for the first time. One may suspect it to be an exotic artificially introduced species, since many snakes are imported legally or illegally to Taiwan as materials of traditional medicine or as pets. *Plagiopholis styani* is not a colorful species and chiefly preys on worms, earthworms and arthropods (Smith, 1943; Obst, 1984; Coborn, 1991). Such characters of the species make it an unattractive and unsuitable subject for a pet trading. On the other hand, its small body size much reduces its dietary value. It is thus

unlikely that this species is imported for commercial purposes. We consider the above listed general features of *P. styani*, as well as its nocturnal secretive habits, hiding itself under rocks and logs during the day (Obst et al., 1984; Coborn, 1991), as the main reason why it has not been discovered for such a long period.

Unfortunately, little effort has been conducted for the snake inventory in Taiwan. The present discovery lends an additional support to the paleogeographical hypothesis which assumes the recent landbridge between Taiwan and Asian continent (e.g. Ota, 1991). More efforts are needed for a thorough study of snake fauna of Taiwan.

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台灣新記錄種之黃頷蛇科福建頸斑蛇

Plagiopholis styani (Boulenger, 1899)

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摘要

根據外部形態特徵比對五隻採自台灣的陽明山國家公園的黃頷蛇科標本，鑑定為福建頸斑蛇 *Plagiopholis styani* (Boulenger, 1899)，為台灣首次發現之新記錄屬及新記錄種。此種以往從未在其他亞洲大陸以外的島嶼發現過，僅曾紀錄於中國中部、南部及東南部。本文除提供此蛇之形態特徵與度量，並描述發現棲地之生態環境。

關鍵詞：福建頸斑蛇，黃頷蛇科，台灣、陽明山。

DISCUSSION

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The genus *Plagiopholis* was first described by Boulenger (1899) and is currently recognized as a monogeneric genus. It is distributed in southern China, southeastern Asia, and the Philippines. The genus is characterized by the presence of a large, prominent, yellowish-brown patch on the head, which is the origin of its name. The patch is usually located on the side of the head, just behind the eye. The color of the patch can vary from yellowish-brown to black. The patch is usually present in both sexes, but it is sometimes absent in some individuals. The patch is usually present in both sexes, but it is sometimes absent in some individuals. The patch is usually present in both sexes, but it is sometimes absent in some individuals.

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