

A New Species of *Rhabdophis* (Serpentes: Colubridae) from Hainan Island, China

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Abstract.— After detailed examination of a population of colubrine snakes previously identified as *Natrix* (sensu lato) *chrysarga* (Schlegel), from Hainan Island, China, it is now considered an undescribed species. This paper describes this new species and names it as *Rhabdophis adleri*.

Key words: Serpentes, Colubridae, *Rhabdophis adleri* sp. nov., China.

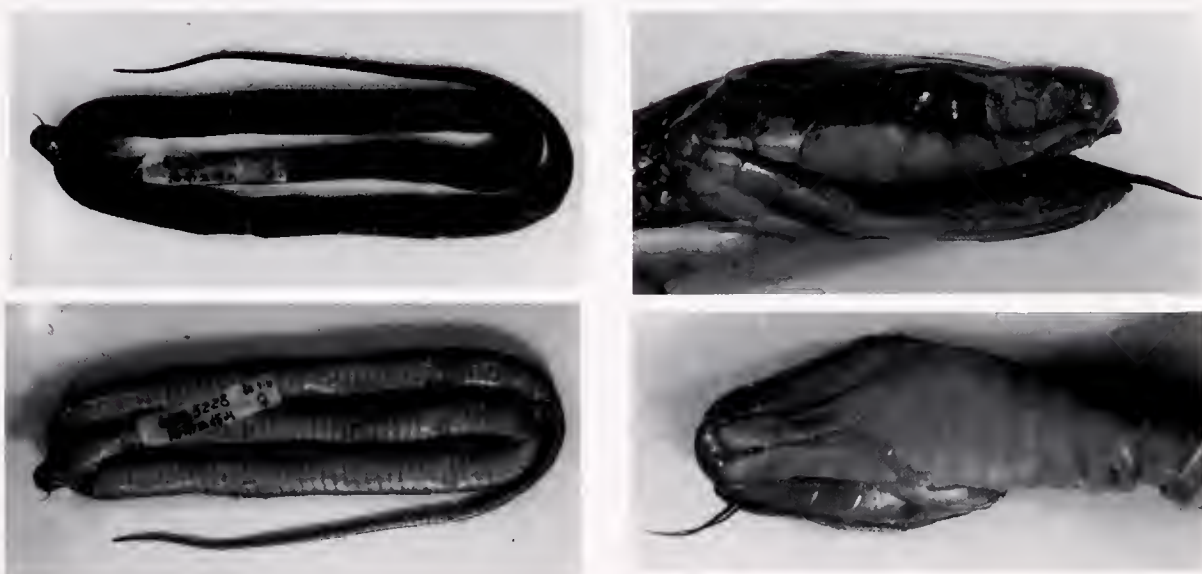


Figure 1. Allotype of *Rhabdophis adleri*.

Introduction

G. A. Boulenger ("1899," 1900) reported *Tropidonotus chrysargus* Schlegel from Wuchih Mts. (= Mt. Wuzhi), Hainan. M. A. Smith (1923) reported one specimen of *Natrix chrysarga* (Schlegel) from Kaphao (near Mt. Wuzhi), Hainan Island, which had 154 ventrals and 83 pairs of subcaudals, 8 supralabials, 4th and 5th touching the eyes. C. H. Pope (1935) reported two specimens from Hainan and two from Hong Kong as *Natrix chrysarga* (Schlegel). His description is abstracted from De Rooij (1917:89), but he noted that "Hainan examples seem to lack the dark spots usually present laterally on the ventrals" (loc. cit., p. 102). R. Bourret (1934) described *Natrix chrysarga callichroma* from Ba-vi, Tong King, Vietnam. M. A. Smith (1938) described *Natrix auchenia* based on specimens from Five Finger Mountain (Mt.

Wuzhi), Hainan Island. M. A. Smith (1943) indicated under *Natrix chrysarga* that "the Himalayan and Hainan records of this snake are not correct," and considered his *Natrix auchenia* to be a synonym of *Natrix callichroma* Bourret, 1934. Thus, the Hainan specimens were referred to the latter. Recently, M. Toriba (1994), following M. A. Smith, also stated that the Hainan records of *Rhabdophis chrysargus* "should be replaced by *R. callichromus*." Z. X. Li (1962) recorded *Natrix himalayanus* as new to Hainan Island. I have examined one of his specimens (FDUA162), and actually it belongs to the new species described in this paper. A herpetological survey was carried out on Hainan Island in 1964 by a combined team of Sichuan Medical College (now West China University of Medical Sciences) and Southwest Institute of Biology (now Chengdu Institute of Biology), Academia Sinica. Nine specimens of *Natrix* (sensu lato) were

Table 1. Dimensions and scale counts of *Rhabdophis adleri* sp. nov.

Number	Locality (All Hainan Is.)	Sex	SVL	TL	Supra- labials	Infra- labials	Oculars	Ocu/ temp	V	Sc	Bars
CIB64III5245	Mt. Wuzhi	M	505	205	2-3-3	10(5)	2-3	2+2+3/2	153	82	57+29
CIB64III5112	Mt. Wuzhi	F	445	125	2-3-3	10(5)	2-3	2+2+3	164	40+	69+18
CIB64III5114	Mt. Wuzhi	F	573	138	2-3-3	10(5)	1-3	2+2+3	157	52+	45+?
CIB64III5115	Mt. Wuzhi	F	600	200	2-3-3	10(5)	2/1-3	2+1/ 2+2/3	157	81	66+18
CIB64III5228	Mt. Wuzhi	F	687	240	2-3-3	10(5)	1-3/4	2+2+3	154	83	56+26
CIB64III5883	Mt. Diaoluo	M	515	180	2-3-3	10(5)	2/1-3	2+2	152	85	62+9
CIB64III5917	Mt. Diaoluo	M	595	195	2-3-3	10(5)	2-3	2+2+3/2	151	82	59+15
BIZ742	Mt. Diaoluo	M	—	—	2-3-3	10(5)	2-3	2+2	152	85	46+14
BIZ789	Mt. Diaoluo	M	—	—	2-3-3	10(5)	2/1-3	2+2	150	—	55+23
FDU-A162	Mt. Diaoluo	F	530	185	2-3-3	10(5)	2-3	2+2/3	155	82	—
BIZ757	Mt. Diaoluo	F	—	—	2-3-3	10(5)	2-3	2+3	153	76	64+30
BIZ787	Mt. Diaoluo	F	—	—	2-3-3	10(5)	1-3	2+2	157	65+	57+27 +
BIZ792	Mt. Diaoluo	F	—	—	2-3-3	10(5)	1-3	2+3/2	156	79	49+7
BIZ801	Mt. Diaoluo	J	—	—	2-3-3	10(5)	2-3	2+2	151	83	39+3
BIZ1021	Mt. Jianfengling	M	—	—	2-3-3	10(5)	1-3	2+3	155	88	55+21
BIZ641	Mt. Jianfengling	F	—	—	2-3-3	—	1/2-3	1+2	156	87	61+32
BIZ646	Mt. Jianfengling	F	—	—	2-3-3	10(5)	1-3	2+2	157	79	56+30
BIZ655	Mt. Jianfengling	F	—	—	3-2-3	—	2/1-3	2+2	154	60+	51+6+
BIZ659	Mt. Jianfengling	F	—	—	3-2-3	10(5)	1-3	2+3/2	155	63+	65+19
BIZ1013	Mt. Jianfengling	F	—	—	2-3-3	10(5)	1-3	2+2	156	81	62+18
—	Hainan Is.	F	—	—	2-3-3	10(5)	1-3	2+2	153	84	59+29

BIZ: Institute of Zoology, Academia Sinica (Beijing)

CIB: Chengdu Institute of Biology, Academia Sinica

FDU: Fudan University (Shanghai)

caught that are referable to the new species. I also examined specimens belonging to the same species from Hainan Island collected by Institute of Zoology, Academia Sinica. All the specimens examined by me were originally identified as *Natrix chrysarga* (as in B. Q. Hu et al., 1980:67) or *Rhabdophis chrysargus* (as in Zhao and Adler, 1993:256). After detailed examination, I now believe that it should be a new species which has never been described before.

***Rhabdophis adleri* sp. nov.**

Tropidonotus chrysargus: Boulenger, "1899" (1900): 957.

Natrix chrysarga: Smith, 1923: 201; Pope, 1935: 101 (part); Hu et al., 1980: 67.

Natrix himalayamus: Li, 1962: 432.

Rhabdophis chrysargus: Zhao and Adler, 1993: 256.

Holotype: CIB 64III5917, adult male, 10 June 1964, Dali Village in Mt. Diaoluo, Lingshui Co., Hainan Prov., China, 225 meters.

Allotype: CIB 64III5228, adult female, 10 May 1964, Mt. Wuzhi, Qiongzong Co., Hainan Prov., China, 500 meters (Fig. 1).

Paratypes: CIB 64III5112, 5114-5, females, 24-25 April 1964, CIB 64III5245, male, 11 May 1964, Mt. Wuzhi, Qiongzong Co., Hainan Prov., China, 500-610 meters; CIB 64III5883, male, CIB 64III5441, juvenile, 1-9 June 1964, Mt. Diaoluo, Lingshui Co., Hainan Prov., China, 82-217 meters; CIB 64III6612, juvenile, 25 August 1964, Mt. Yinggeling, Baisha Co., Hainan Prov., China, 670 meters.

All the type series, but one (CIB 64III5245) which was presented to Fujian Medical College, are preserved in Chengdu Institute of Biology, Academia Sinica.

Diagnosis: A *Rhabdophis* with a nuchal groove and the last two maxillary teeth abruptly enlarged, but without a nuchal gland. Upper labials 8, the third to fifth (rarely fourth and fifth) touching the eye; 19 dorsal scale rows at midbody, all strongly keeled; olive green above with short dorso-lateral, yellowish transverse bars 39-69 + 3-32 pairs.

Description of Holotype: Preocular 2, postocular 3; anterior temporal 2, posterior temporal 2; supralabial 8, the third to fifth touching the eye; infralabials 10, the first pair in contact with each other behind the mental, first five pairs in contact with the anterior chin-shields. Dorsal scales in 19 rows at neck and midbody, 17 rows before vent, the anterior dozen scales just behind parietals of two median rows small and arranged in parallel rows in formation of a nuchal

groove, all the dorsal scales strongly keeled, the outer most ones slightly keeled; ventrals 151; anal divided; subcaudals in 82 pairs.

Total length 790 mm, tail length 195 mm, tail 0.25 of the total length.

Olive green above, with short yellow transverse bars on D₅ and D₆ at an interval of 1.5-2.5 scales, the dorso-lateral yellow transverse bars 59 pairs on body and 15 pairs on tail. Lower parts light yellow. Top of head olive green, a reverse "V"-shaped mark in light color upon the nape, upper lip light yellow with partial sutures grayish brown; ventral surface of head yellowish white.

The hemipenis is forked at 9th subcaudal plate and extends to the 13th subcaudal plate, bi-lobed type. It is spinous throughout and has a single very large basal spine or hook. The spines are small and relatively uniform in size but more dense on the tip of the organ and become larger on the base. The skin of the base forms cup-like depressions. The sulcus spermaticus is prominent and forked at the forked point of the organ (Zhang et al., 1984, based on holotype and 64III5883).

Variation of Allotype: The allotype (Fig. 1), an adult female, 1 preocular, 3 postoculars on left and 4 on right; ventrals 154; subcaudals in 83 pairs; yellow transverse bars 56+26 pairs; total length 927 mm, tail 240 mm, tail 0.26 of the total length.

Variation: I examined, excepting the type series, two males, four females, and one juvenile from Mt. Diaoluo, one male and five females from Mt. Jianfengling, Luodong Co., Hainan Island, and another female from Hainan Island, totally six males, fourteen females, and one juvenile (see Table 1). The variation is as follows: 2 preoculars (rarely 1), 3 postoculars (1 to 4); 2 anterior temporals (rarely 1), 2 posterior temporals (rarely 3); 8 supralabials, 3rd to 5th touching the eye, only two females from Mt. Jianfengling with only 4th and 5th touching the eye; 10 infralabials, 5 in contact with anterior chin-shield. Ventrals in males (n=6) 150-155 (mean 152.2), in females (n=14) 153-164 (mean 156); anal divided; subcaudals in males (n=5) 82-88 (mean 84.4), in females (n=9) 76-87 (mean 81.3). The yellow transverse bars are 39-69 + 3-32 pairs.

All the specimens examined have a nuchal groove. All specimens in the type series were dissected and no type of nuchal gland either sacculated or non-sacculated or naked area of skin could be found.

Comparisons: This new species differs from *Natrix callichroma* Bourret, 1934 and *Natrix auchenia* Smith, 1938 and in the latter "the scales of the neck

are not altered in shape or size, but on stretching the skin of that part, two parallel longitudinal areas of naked skin are exposed," and "beneath the naked areas lies the gland (sacculated type); the coloration is "grayish-olive above, with indistinct narrow black, transverse bars, intersected on the dorso-lateral line by short whitish bars" (M. A. Smith, 1943:309). The scales of the neck of the new form are altered in shape and size in formation of a nuchal groove, but lack a nuchal gland; and the coloration is much different because black transverse bars intersected on the dorso-lateral line by short, whitish bars is never found (as in *auchenia*). This new species differs from *Tropidonotus chrysargos* Schlegel, 1937 by the latter having "1 preocular;...9 supralabials, 3rd to 5th touching the eye; usually six infralabials touching the anterior genials," and "hemipenis to the 8th caudal plate, forked near the tip" (loc. cit., p. 308). This new form has 2 (vary rarely 1) preoculars; 8 supralabials, 3rd to 5th touching the eye; only five infralabials touching the anterior chin-shield; and hemipenis to the 13th subcaudal plate and forked at 8th subcaudal plate. This new species differs also from *Tropidonotus himalayanus* Günther, 1864 by the latter having "1 preocular; 8 supralabials, 4th and 5th touching the eye" and "hemipenis extending to the 7th caudal plate, not forked" (loc. cit., p. 300), and the coloration is different.

Biological Data: Widely distributed over entire island at an altitude from 82 to 670 meters. It was found in the plains, hills, and low mountains. It is often found on the ridges between rice fields, among grass along small paths in hilly regions, and also is found at the border of forests. Our specimens were collected during the end of April and the middle of June. Most of them were collected around ten o'clock in the morning on fine days. It feeds on small frogs and fishes. No dates are available on its reproduction.

Etymology: I take great pleasure in naming this new species for Prof. Kraig Adler of Cornell University in Ithaca, New York, USA, in honor of his devotion to the study of Chinese amphibians and reptiles. He collaborated with me to prepare the book entitled "Herpetology of China."

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