

First Records of the Pipe Snake (*Cylindrophis*) in China

KRAIG ADLER¹, ERMI ZHAO² AND ILYA S. DAREVSKY³

¹Cornell University, Neurobiology and Behavior, Seeley G. Mudd Hall, Ithaca, New York 14853, USA

²Chengdu Institute of Biology, P.O. Box 416, Chengdu, Sichuan, China

³Zoological Institute, Russian Academy of Sciences, St. Petersburg 199034, Russia

Abstract. -*Cylindrophis ruffus* (Laurenti, 1768), the red-tail pipe snake, previously known from Burma through Indochina and the East Indies, is reported from three localities in southern China (Hainan, Hong Kong, and Xiamen). These are the first Chinese records for this snake family (Aniliidae or Uropeltidae, according to different classifications). Justification is given for spelling the specific epithet *ruffus* and not *rufus*.

Key words: Reptilia, Serpentes, snakes, Aniliidae, Uropeltidae, *Cylindrophis*, China, Indochina.

Introduction

The genus *Cylindrophis* is comprised of eight species of snakes distributed in Sri Lanka and from Burma through Indochina and the East Indies. Until now, there were no records for China. Historically, this genus has been placed in the primitive family Aniliidae (e.g., Goin et al., 1978; Rieppel, 1979; Underwood, 1967), which also includes *Anomochilus* of western Malaysia and Sumatra, and *Anilius* of South America; *Loxocemus* of Mexico and Central America is sometimes also included in this family. McDowell (1975, 1987), however, separated the two Asian genera from the Aniliidae, and placed them in the subfamily Cylindropheinae of the family Uropeltidae, which includes the shield-tailed snakes (subfamily Uropeltinae), a group of seven genera of burrowing snakes restricted to Sri Lanka and peninsular India.

Chinese Records

We wish to report the first specimens of this genus (and family) from China. All appear to be referable to the most widely distributed species in the genus, *Cylindrophis ruffus* (Laurenti, 1768), which ranges from Burma to Vietnam, south through peninsular Malaysia and Indonesia (Fig. 1). The published records nearest to China are for Bhamo, Burma (Boulenger, 1888) and Myitkyina, Burma (Wall, 1926), both of which localities are

about 50 km from the western border of China's Yunnan Province. The species is also known from northern Thailand: Chiang Mai in the northwest and Sakon Nakhon in the northeast (Cox, pers. comm.). Deuve (1970) reported *C. ruffus* from several localities in western Laos as far north as Vientiane. Bourret (1935) described four specimens in the collection of the University of Hanoi, but none of these has precise locality data; there are no recent records from northern Vietnam (Tran et al., 1981).

Our new records are from three widely-separated localities in southern China (see Fig. 1), as follows:

Fujian Province: Xiamen (Amoy Island); Department of Biology, Xiamen University, two unnumbered specimens, collected at Xiamen by a farmer who dug them out of the soil, date unknown but prior to 1969.

Hainan Province: Hainan, no further locality data; Zoological Institute, St. Petersburg (Leningrad), (ZIN 7509), collected in 1888 by Alfred Otto Herz.

Hong Kong: No further locality data; Museum of Comparative Zoology (MCZ), Harvard University, (MCZ 5489), collected by a "Capt. Muller," and received in exchange with Peabody Museum, Salem, in 1886.



FIG. 1. Distribution of *Cylindrophis ruffus* in Indochina and southern China. The range extends through Indonesia (including Sumatra, Java, and Borneo) as far east as the Celebes and nearby Batjan and Sangihe islands. The new localities in China are Hainan, Hong Kong, and Xiamen (arrows). There are no known authentic records from northern Vietnam. The dashed line indicates the northernmost limit of the South China Biogeographic Region. (Base map adapted from New York Times Atlas of the World, 1985).

All of these localities are in that part of China designated, on biogeographic grounds, as the "South China Region" (China Natural Geography Editorial Board, 1979), an area in southern China that extends from western Yunnan eastward to Fujian Province and includes Hainan and Taiwan (Fig. 1). These records are all the more surprising since this part of China has been collected by herpetologists for many decades. Clifford H. Pope and Malcolm A. Smith failed to find *Cylindrophis* during their extensive field work in Hainan in the 1920s, and Rudolf Mell, who resided in Canton (=Guangzhou) from 1908 to 1921 and made comprehensive collections from southern China, never found it. It is unreported in Fujian by Ting and Zheng

(1974) in their survey of the snakes of that province and also from Hong Kong (Karsen et al., 1986; Romer, 1979). It is possible, of course, that our specimens from Hainan and Hong Kong, being old records and without precise locality data, merely were shipped from these places and the specimens actually originated elsewhere, but the newer records from Fujian, even further north along the Chinese coast and more distant from the main range of the species, are undoubtedly authentic.

On geographic grounds, the Chinese specimens are referable to the nominate subspecies, *C. r. ruffus*. For the record, we provide some meristic data for the

TABLE 1. Meristic data for the Hainan Island and Hong Kong *Calamaria*.

	Hainan	Hong Kong
	ZIN	MCZ
	7509	5489
Sex	female	female
Snout-vent length (in mm)	430	350
Tail length (in mm)	10	8.5
Dorsal scale rows (midbody)	21	21
Ventrals	195	187
Subcaudals	7	7
Upper/lower labials	5/6	6/6
Preoculars/postoculars	0/1	0/1
Anterior/posterior temporals	1/2	1/2

Hainan and Hong Kong specimens (Table 1); unfortunately, we have been unable to reexamine the Fujian specimens to obtain comparable data.

Further descriptive details are given elsewhere (Zhao and Adler, 1989; Zhao and Darevsky, 1990).

Natural History

Insofar as is known, all species of pipe snakes, as they are commonly called, are live bearing, inoffensive, and secretive in nature, often being collected beneath fallen vegetation or dug up by farmers from their subterranean burrows. In Thailand, *C. ruffus* is locally common and has been collected in rice fields (it takes readily to water) and in gardens near houses, where it easily burrows in soft earth (Smith, 1943). Schmidt (1928) reported a specimen found in a salt water lagoon.

This is a distinctive snake, both morphologically and behaviorally, and should be easily recognized by collectors. Members of the genus *Cylindrophis* are heavy-bodied snakes, with no neck constriction and a very short tail (Fig. 2A). They reach a total length of nearly one meter. The body of *C. ruffus* is banded and boldly so on the venter. Males have pelvic vestiges with tiny hind limbs terminating in a claw-like spur on each side of the vent. According to literature reports, these snakes make little attempt to escape



FIG. 2. *Cylindrophis ruffus*. A: Hong Kong specimen (MCZ 5489); note absence of neck constriction and the very short tail (arrow marks location of vent). B-C: Adult specimens, probably from Thailand, in defensive posture. When threatened, the head typically is hidden beneath the body (B) or in debris (C) and the posterior end of the body and tail are flattened, held over the body, and sometimes aimed at the intruder, as shown in B.

when exposed, but flatten the entire body and curl the posterior end of the body and the tail over the body, thus exposing the bright red bands on their ventral surface (Fig. 2B-C). Persons collecting in southern China, including Taiwan, should make a special effort to look for this snake.

Correct Spelling of *ruffus*

Laurenti (1768, p. 71) originally named this taxon *Anguis ruffa* (two fs). His original description is brief: "CXXXVIII. *Anguis ruffa*. DIAGN. Corpore æquali, ruffo, lineis transversalibus albis interruptis; abdomine vario. *Habitat Surinami; hospitatur in Museo Gronoviano*," or in translation, "[Species] 138. *Anguis ruffa*. Diagnosis. Body uniform, red, broken white transverse bands; abdomen various. Lives in Surinam; housed in Gronovius's Museum." The description apparently is based on *Anguis* species number 6 in Gronovius (1756, p. 54), where fuller details are given. Gmelin (1789) apparently was the first to cite Laurenti's new species, which he called *Anguis rufus* (one f). Wagler (1828) associated this species with his new genus *Cylindrophis*, although he called his new species *C. resplendens*, now regarded as a synonym of *ruffus*. There can be little question that Laurenti intended the spelling with two fs and not as emended by Gmelin. Laurenti used the two-f spelling twice in his description (in both printings of the book; for details of these editions, see Adler, 1989, pp. 12-13) and this spelling was not corrected on his errata page. In classical Latin, *rufus* is invariably spelled with a single *f*, which probably led to Gmelin's emendation. However, in late Latin inscriptions and manuscripts, doubling of consonants was often used to preserve the length of the preceding vowel, here a long *u*, for purposes of pronunciation (Grandgent, 1907); thus, the alternate spelling *ruffus* is a perfectly acceptable form. Laurenti, in fact, routinely doubled consonants before and after vowels in the names of species throughout his book. The International Code (1985, article 32) states that an author's original spelling must be

preserved unless it contravenes provisions of Articles 27-31 (*ruffus* does not) or there is evidence in the original publication of an inadvertent error (there is none). Thus, "*Anguis ruffa*" is the correct original spelling in the sense of the Code. The Code makes no explicit statement about doubling of consonants, but *in passim* there are several instances of such names used as examples in that book.

Acknowledgments

We thank Pere Alberch and José Rosado (Museum of Comparative Zoology, Harvard University) for loaning us the Hong Kong specimen and some comparative material. The USA National Academy of Sciences has supported Adler's and Zhao's research on the Chinese herpetofauna, through its Committee on Scientific Communication with the People's Republic of China. Peter K. Knoefel and Frederick M. Ahl provided advice concerning classical Latin and Merel J. Cox helped to delineate the range of *C. ruffus* in Thailand. David M. Dennis kindly supplied the photographs of living pipe snakes.

Literature Cited

- ADLER, K. (ed.) 1989. Contributions to the history of herpetology. Society for the Study of Amphibians and Reptiles., Contributions to Herpetology 5:1-202.
- BOULENGER, G. A. 1888. An account of the Reptilia obtained in Burma, north of Tenasserim, by M. L. Fea, of the Genoa Civic Museum. *Annali del Museo Civico di Storia Naturale de Genova*, ser. 2, 6:593-604.
- BOURRET, R. 1934 (1935). Notes herpétologiques sur l'Indochine française. VI. Sur diverses collections de serpents appartenant à l'Université de Hanoi. *Bulletin Général de l'Instruction Publique*, Hanoi 4:73-83.
- CHINA NATURAL GEOGRAPHY EDITORIAL BOARD, ACADEMIA SINICA (K. Zhu, Chief editor). 1979. [Natural geography of China-zoogeography]. Science Press, Beijing. 121 pp. (In Chinese).
- DEUVE, J. 1970. Serpents du Laos. *Mémoires*

- Office de la Recherche Scientifique et Technique
Oure-Mer, Paris 39:1-251.
- GMELIN, J. F. 1788 (1789). *Caroli a Linné systema naturae per regna tria naturae*. Ed. 13. Beer, Leipzig, vol. 1, part 3, pages 1038-1516.
- GOIN, C. J., O. B. GOIN, AND G. R. ZUG. 1978. *Introduction to herpetology*. Third edition. W. H. Freeman, San Francisco, (xiii), 378 pp.
- GRANDGENT, C. H. 1907. *An introduction to vulgar Latin*. D. C. Heath, Boston, xviii, 219 pp.
- GRONOVIVS, L. T. 1756. *Musei ichthyologici tomus secundus sistens piscium . . . et amphibiorum animalium historia zoologica*. For the author by T. Haak, Leiden, (8), 88 pages, 3 plates.
- INTERNATIONAL CODE OF ZOOLOGICAL NOMENCLATURE. 1985. Third edition. Internat. Trust Zool. Nomen. / British Mus. (Nat. Hist.), London. xx, 338 pp.
- KARSEN, S. J., M. W. LAU, AND A. BOGADEK. 1986. *Hong Kong amphibians and reptiles*. Urban Council, Hong Kong. (vii), 136 pp.
- LAURENTI, J. N. 1768. *Specimen medicum, exhibens synopsis reptilium*. J. Thomæ, Vienna, (viii), 214, (3) pp.
- MCDOWELL, S. B. 1975. A catalogue of the snakes of New Guinea and the Solomons, with special reference to those in the Bernice P. Bishop Museum. Part II. Anilioidea and Pythoninae. *Journal of Herpetology* 9:1-80.
- MCDOWELL, S. B. 1987. Systematics, p. 3-50. In Richard A. Seigel, Joseph T. Collins, and Susan S. Novak (eds.), *Snakes: Ecology and evolutionary biology*. Macmillan Publ. Co., New York. (xv), 529 pp.
- RIEPEL, O. 1979. A cladistic classification of primitive snakes based on skull structure. *Zeitschrift der Zoologische Systematik und Evolutionsforschung* 17:140-150.
- ROMER, J. D. 1979. Second revised annotated checklist with keys to the snakes of Hong Kong. *Memoirs of the Hong Kong Natural History Society* 14:1-23.
- SCHMIDT, K. P. 1928. Notes on the herpetology of Indo-China. *Copeia*, old ser. 168:77-80.
- SMITH, M. A. 1943. *The fauna of British India. Reptilia and Amphibia*. Vol. III. *Serpentes*. Taylor and Francis, London, xii, 583 pp.
- TING, H., AND J. ZHANG. 1974. [Snakes of Fujian Province]. Publication of the Department of Biology, Fujian Teachers University, Fuzhou, (vi), 93, (1) pp. (In Chinese).
- TRAN, K., V. S. NGUYÉN, AND T. C. HO. 1981. [Results of systematic studies of amphibians and reptiles in northern Vietnam (1956-1976)], Pp. 365-427. In *Kêt quả biên tra cơ bản động vật miền bắc Việt Nam (1955-1975)*. Hanoi. (In Vietnamese).
- UNDERWOOD, G. 1967. A contribution to the classification of snakes. *British Museum (Nat. Hist.)*, London, publ. 653, x, 179 pp.
- WAGLER, J. G. 1828. *Descriptiones et icones amphibiorum*. Part I. J. G. Cotta, Munich, unnumbered text pages plus 12 plates.
- WALL, F. 1926. Snakes collected in Burma in 1925. *Journal of the Bombay Natural History Society* 31:558-566.
- ZHAO, E., AND K. ADLER. 1989. [Asian pipe snake—A snake family new to China]. *Sichuan Journal of Zoology* 8(2):26. (In Chinese).
- ZHAO, E., AND I. S. DAREVSKY. 1990. [Red-tail pipe snake, first record for Hainan Province, and its description]. *Sichuan Journal of Zoology* 9(1):5. (In Chinese).