A new species of the genus Rhabdophis Fitzinger, 1843 (Squamata: Colubridae) from Guangdong Province, southern China

GUANG-XIANG ZHU1,2, YING-YONG WANG3,6, HIROHIKO TAKEUCHI4 & ER-MI ZHAO1,5,6
1Life Science College of Sichuan University, Key Laboratory of Bio-resources and Eco-environment (Ministry of Education), Sichuan Chengdu 610064, P.R. China
2College of Life and Basic Sciences, Sichuan Agricultural University, Sichuan Ya’an 625014, P.R. China
3State Key Laboratory of Biocontrol/The Museum of Biology, School of Life Sciences, Sun Yat-sen University, Guangdong Guangzhou 510275, P.R. China
4Department of Zoology, Graduate School of Science, Kyoto University, Sakyo, Kyoto, 606-8502, Japan
5Chengdu Institute of Biology, Chinese Academy of Sciences, Sichuan Chengdu 610041, P.R. China
6Corresponding author. E-mail: wangyy@mail.sysu.edu.cn; zem006@163.com

Abstract

A new species, Rhabdophis guangdongensis sp. nov., is described from the Guangdong Province, China. It can be easily distinguished from other known congeners by cyt b and c-mos sequences, and by the following combination of morphological characters: body size small; head distinct from the neck; 20 maxillary teeth, the three most posterior teeth strongly enlarged, and not separated by diastema from other teeth; six supralabials, the third and fourth touching the eye; seven infralabials, the first four in contact with anterior chin shields; dorsal scales in 15 rows throughout the body, weakly keeled, the outer row smooth; 126 ventrals; 39 paired subcaudals; anal scale divided; 44 pairs of narrow dorsolateral black cross-bars on body and 15 pairs on tail; body and tail with two dorsolateral longitudinal brownish-red lines, respectively with a series of white spots in cross-bars. The description of this new species brings the total number of described species of this genus to 21 and represents the tenth known Rhabdophis species in China.

Key words: Colubridae, morphology, mitochondrial and nuclear DNA, taxonomy

Introduction

The genus Rhabdophis Fitzinger (1843) was previously referred to the genus Natrix sensu lato. In the middle of the 20th century, the genus Rhabdophis was revised and diagnosed primarily based on the combination of the following characters: hemipenes and sulcus spermaticus divided; last two maxillary teeth strongly enlarged, recurved and usually preceded by a diastema; terrestrial; internasals broad anteriorly, nostrils lateral; apical pits present or absent; vertebral glands present in several species (Malnate 1960).

Currently, the genus Rhabdophis, containing 20 species, is distributed across Eastern and South Asia ( Günther 1858, 1864; Boulenger 1893, 1900; Wall 1923; Bourret 1935; Smith 1943; Malnate 1960; Taylor 1966; Jiang & Zhao 1983; Malnate & Underwood 1988; Zhao & Adler 1993; Zhao 1997; Stuebing & Tan 2002; de Lang & Vogel 2006; Takeuchi 2013). Nine of these species occur in China, i.e., R. tigrinus (Boie, 1826); R. subminiatus (Schlegel, 1837); R. nigrivinctus (Blyth, 1855); R. himalayanus ( Günther, 1864); R. swinhonis ( Günther, 1868); R. nuchalis (Boulenger, 1891); R. leonardi (Wall, 1923); R. pentasupralabialis (Jiang & Zhao, 1983) and R. adleri (Zhao, 1997).

During our field surveys in Southern China from 2008 to 2012, we collected an unidentified species of the genus Rhabdophis that can be externally distinguished from all known congeners based on morphological characters. In addition, phylogenetic relationship based on the mitochondrial cytochrome b (cyt b) and nuclear oocyte maturation factor (c-mos) gene sequences revealed that this taxon is differentiated from other congeners in China. Therefore, we refer this specimen to be a new species which is described in this study.
Remark. The species is considered to be locally rare. Since May 2008 to date, only the holotype of *R. guangdongensis* sp. nov. was found during our extensive field surveys in southern China, including the areas from the type locality to Shenzhen City. Only three individuals of this species were found by others. The lowland and submontane forests are threatened by deforestation, changing land use, alien invasive plants, and ecological degradation. Therefore, the species should be classified as a rare and endangered species in the relevant legal provisions.

Acknowledgments

We would like to thank Peng Guo, Ding-qi Rao, Song Huang, Ke Jiang, Ji-Chao Wang and Xiao-he Wang who offered tissue samples to Guang-Xiang Zhu. We thank the California Academy of Science, San Francisco for kindly providing samples. We sincerely thank Dr. Gernot Vogel who provided us with morphological characters of *R. callichroma*. We are very grateful to Assistant Professor Si-Min Lin for his warm help and for providing two specimens of *R. swinhonis*. We also express our thanks to Yang Liu who helped us check the specimens in USA.

We extend our thanks to Xiao-he Wang, Hong-tao Cao, Zan Guo and Guo-bin Zhou et al. for their help with fieldwork and Ping-jing Yu for help with the literature survey. We acknowledge Shi-Shi Lin for his support and for providing us with photographs of the new species. In addition, we are much indebted to the following institutes, Museums and their staff for their help and permission to examine preserved specimens under their care: BM, CIB, DLNM, HNMN, IOZ, KIZ, KUZR, NXU, SCNU, SCUM, SICAU, SYS, USNM, YBU, and ZJU.

References


A NEW SPECIES OF RHABDOPHIS FROM CHINA


APPENDIX 1. Specimens examined.

*Rhabdophis adleri* (6): CIB10494–10495 and CIB95495, Mount Diaoluoshan, Lingshui County, Hainan Province, China; CIB10496–10497 and CIB78032, Mount Wuzhishan, Qiongzhou County, Hainan Province, China; MNHN 1938-122 (Holotype), Mount Bavi, Tonkin.

*Rhabdophis callichroma* (2): BM1946.1.8.98/99.11.30.4), Mount Wuzhishan, Qiongzhou County, Hainan Province, China; MNHN 1938–122 (Holotype), Mount Bavi, Tonkin.


*Rhabdophis guangdongensis* sp. nov. (1): SYS r000018, Aizhai Village, Renhua County, Guangdong Province, China.

*Rhabdophis himalayanus* (2): CIB10498, Maniweng, Medog County, Xizang Autonomous Region, China; CIB10499, Xigong lake, Medog County, Xizang Autonomous Region, China.

*Rhabdophis leonardi* (6): CIB10500-04, Luding County, Sichuan Province, China, 1980; CIB14343, Pianma Town, Lushui County, Yunnan, China.