四川两栖类原色图鉴

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中国林业出版社

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序

野生动物是国家的宝贵自然财富，是大自然的重要组成部分。保护好野生动物资源，对维护自然生态平衡，发展国民经济，丰富人民的物质、文化生活，促进国际交流和各国人民之间的友谊，都具有重要意义。

四川地处青藏高原与长江中下游平原之间，地势高差悬殊，地貌和气候类型复杂多样，植物种类繁多，自然条件十分优越，分布有极其丰富的野生动物资源。仅陆生野生脊椎动物就有1 038种，占全国陆生野生脊椎动物种数的45%。其中两栖类有111种(亚种)，占全国两栖类种数的36.8%，其模式标本产地在四川的有56种，仅产于四川的特有种有33种，可见四川两栖类在全国两栖类中的重要位置。

1988年11月国家公布了《中华人民共和国野生动物保护法》，1990年1月四川省公布了《四川省〈中华人民共和国野生动物保护法〉实施办法》。根据上述法律法规，国家和省野生动物行政主管部门制定了相应的配套法规。1988年12月经国务院批准，由林业部、农业部联合公布了《国家重点保护野生动物名录》。《名录》中，在四川有分布的国家重点保护陆生野生脊椎动物Ⅰ级28种，Ⅱ级107种，共135种。1990年3月四川省人民政府公布了《四川省重点保护野生动物名录》77种，其中陆生野生脊椎动物63种。1995年3月13日，四川省林业厅根据国家授予的权力，将《四川省有益的或有重要经济、科研价值的陆生野生动物名录》修改为818种。至此，在四川省受到严格保护的国家和地方重点保护野生动物，以及有益动物共1 016种。能够识别如此之多的种类，确非易事，即使有一定专业知识的人，也会有一定的难度。近十年来，四川省各地，在贯彻实施《中华人民共和国野生动物保护法》、《四川省实施办法》过程中，因对许多野生动物难于识别，给保护管理工作带来许多困难，特别是对违法行为不能及时处理，影响了管理工作的正常开展。

为更好地贯彻执行《中华人民共和国野生动物保护法》、《四川省实施办法》，加强野生动物的保护管理和宣传教育工作，对违法行为能及时准确处理，提高工作效率，提高人们对野生动物的保护意识，四川省林业厅、四川省野生动物保护协会组织中国科学院动物研究所、中国科学院成都生物研究所、四川省自然资源研究所、四川大学、四川农业大学、四川师范学院、四川省卫生防疫站、四川省金堂中学和金堂文化馆等单位的有关专家、教授，将四川省分布的1 038种陆生野生脊椎动物，编绘成一套原色图鉴，让广大读者和广大执法者，能够明明白白看

到四川省分布的现有陆生野生脊椎动物的形象。

这套原色图鉴分为《四川兽类原色图鉴》、《四川鸟类原色图鉴》、《四川爬行类原色图鉴》、《四川两栖类原色图鉴》四卷，是一部图文并茂的工具书。能使广大读者在实际工作中，像查字典一样，通过实物和彩图与文字对照，即可查出该种动物的中名、拉丁学名，同时知道该物种的栖息环境，一般生活习性、产地，以及保护级别等知识。这是开展野生动物保护管理、驯养繁殖、开发利用、科研教学等工作必不可少的参考书。

这套原色图鉴中，《四川鸟类原色图鉴》、《四川兽类原色图鉴》已经出版，《四川爬行类原色图鉴》稍后也即将出版。《四川两栖类原色图鉴》的出版，将进一步推动四川省野生动物保护管理工作。两栖类动物全是食害虫的有益动物。加强对两栖类动物的保护，必将更有益于农林牧业生产，更有益于人类生存环境质量的提高。

中国科学院副院长、院士、教授

1997 年 10 月 18 日

Preface

Wildlife is a precious treasure for the nation and a signficant part of the nature. Effective protection of wildlife resources is essential to optimize ecological and economic interests, to enrich people's physical and cultural lives and to promote international friendship and exchanges.

Lying between the Qinghai-Tibetan Plateau and the Plains along the Middle and Lower Reaches of the Yangtze River, Sichuan Province holds complex land forms and climatic types, which provide excellent habitats for numerous species of fauna and flora. All told, Sichuan shelters 1,038 wild vertebrate species, 45% of the total species recorded in China. Among the total, amphibians amount to 111 species (sub-species), claiming 36.8% of the total in China. Further, Sichuan is native to 56 type amphibian specimens and 33 endemic species, illustrating its important position in China.

In November 1988, " The Wildlife Protection Law of the People's Republic of China" was publicized, and in January 1990, Sichuan Province publicized "The Sichuan Implementation Act for the Wildlife Protection Law of PRC ". Based on this Law and Act, the National and Provincial Wildlife Administrations have prepared corresponding regulations. In December 1988, approved by the State Council, the Ministry of Forestry and the Ministry of Agriculture jointly announced " The List of Wildlife of National Importance". Sichuan Province records 28 first-priority land species and 107 second-priority land species. In March 1990, Sichuan Province announced " The List of Wildlife of Provincial Importance", adding 77 species with 63 land-dwellers. On March 13, 1995, this number was revised to a total of 818 species by the Sichuan Forestry Department. All told, the three Lists cover 1,016 vertebrate species of national and local importance. Obviously it is difficult for people concerned to identify so many species, even for trained specialists. In the process of implementing " The Wildlife Protection Law of the People's Republic of China" and the corresponding " Sichuan Implementation Act ", over the past ten years, people have been unable to identifly the species correctly, causing many problems for wildlife conservation and management, in particular, some law-breaking cases could not be havdled properly or on time, hindering the sound development of wildlife conservation and management.

In an attempt to secure better implementation of " The Wildlife Protection Law"and

"The Sichuan Implementation Act", to enhance wildlife protection, management, public awareness and education, to secure proper and time legal actions against law violations, and to improve public nconsciousness for wildlife conservation, the Sichuan Forestry Department and Sichuan Wildlife Conservation Association organized specialists from the Zoological Institute of the Chinese Academy of Sciences, Chengdu Institute of Biology of the Chinese Academy of Sciences, Sichuan Research Institute of Natural Resources, Sichuan University, Sichuan Agriculture University, Sichuan Normal College, Sichuan Provincial Hygiene and Quarantine Station, Jintang Middle School and Jintang County Culture Museum to edit a series of pictorial handbooks covering all 1 038 land vertebrate species recorded in Sichuan, for the readers and law executors to better identify all the species recorded in this province.

The series of pictorial handbooks consist of " The Colour Handbook of the Mammals of Sichuan", " The Colour Handbook of the Birds of Sichuan", " The Colour Handbook of the Amphibians of Sichuan", and "The Colour Handbook of the Reptiles of Sichuan". These handbooks, with detailed descriptions and color pictures, may be used as special dictionaries for readers to check its Chinese names, Latin names, habitat conditions, common biological behavior, distribution and protection priorties. They are fundamental reference handbooks for wildlife conservation and management, captive taming and breeding, development and utilization, scientific research and conservation education.

" The Colour Handbook of the Birds of Sichuan"and " The Colour Handbook of the Mammals of Sichuan" were published, and " The Colour Handbook of the Reptiles of Sichuan" will be soon published. Now, the publication of " The Colour Handbook of the Amphibians of Sichuan" will certainly advance wildlife conservation and management in Sichuan. As all amphibians are healthy insect killers, their strengthened protection will contribute greatly to agriculture, forestry, husbandry and improve the environment quality for human beings.

Member and Vice-President of the Chinese Academy of Sciences
18 October 1997

前　言

四川省位于中国西南部的长江上游，幅员辽阔，属于青藏高原与长江中、下游平原之间的过渡地带，地跨古北和东洋两界。境内地势起伏甚大，高差悬殊，气候复杂，水域和植被类型多样，区域差异明显，为多种两栖动物生存和繁衍提供了得天独厚的良好环境。特别是四川西部的横断山地区，由于在第四纪冰期未受到大面积冰盖，因而在该地区保存了许多较为原始的属种、以及特有和珍稀类群，其中以小鲵科和锄足蟾科动物尤为丰富，前者在四川有9种，约占国内该科物种的45%，后者在四川有35种，约占国内该科物种的50%。四川的两栖类物种之多略次于云南，位居国内各省(区)的第二位。四川两栖动物种类繁多、资源丰富，历来为国内外学者所关注。

近代研究四川两栖动物始于1868年，至今已有130多年的历史。据不完全统计先后发表与四川两栖动物有关的重要论著约180篇(部)，为发掘四川两栖动物资源和研究其物种多样性等作出了重大贡献。1930年以前国外学者在四川境内零星收集少数标本，曾发表新种12种。1930～1950年中国学者对四川部分地区进行考察，采集较多标本，先后出版张孟闻、徐锡藩的《Study of some Amphibians from Szechuan》(四川两栖动物略记，1932年)和刘承钊的《Amphibians of Western China》(华西两栖类，1950年)两部专著，前者记载四川两栖动物14种，分隶6属5科2目；后者记载中国西部两栖动物74种，其中四川有56种，并首次附有彩绘图47幅(成体33幅，蝌蚪13幅，卵群1幅)；此期中国学者在四川发现新种20种。1950年以后中国学者在四川境内进行了广泛的调查工作，又发现大量新纪录。据刘承钊和胡淑琴《中国无尾两栖类》(1961年)一书记载四川有无尾两栖类67种，该书并附有四川物种的彩绘图成体55幅，蝌蚪33幅；此后，四川生物研究所(费梁等)《四川两栖动物区系》(1978年)一文报道四川两栖动物已增加到78种，分隶于19属10科2目；据费梁等《中国两栖动物检索》(1990年)和叶昌媛等《中国珍稀及经济两栖动物》(1993年)先后记载四川两栖类已知92种(亚种)，分隶30属(亚属)10科(亚科)2目；又据1999年出版由费梁主编的《中国两栖动物图鉴》(该书于1996年2月完成编写)一书记载四川两栖动物为98种(亚种)。目前，虽然已有一些记述中国两栖动物的著作，但尚无一本专门描述又能鉴别四川两栖动物的彩绘图鉴。因此，本图鉴受四川省林业厅野生动植物保护处的委托，在中国科学院成都生物研究所领导的大力支持下编著了这部图鉴。本图鉴不仅可用于鉴别四川省两栖动物的已知种，而且是对现阶段四川两栖动物研究成果的全面系统的总结；也有助于进一步查清四川两栖动物资源，促进省内，仍至国内两栖动物分类区系和系统发育的深入研究；对确定珍稀、濒危物种以及保护级别、制定保护措施、发展经济物种的养殖和合理利用均有重要意义。

两栖动物是人类熟知的有益动物，早在两千多年以前的《山海经》、《尔雅》等古籍

中就有记述。它们在农田及其它自然环境中大量捕食害虫，被人们称为“护谷虫”。两栖动物广布于各种生态环境中能有效防治虫害，它们在保证农、林、牧业丰产和维护生态平衡中起着重要作用，因此应当遵照国家的有关法律法规加强保护。

《四川两栖类原色图鉴》于1991年由四川省林业厅野生动植物保护处约请中国科学院成都生物研究所费梁任主编，当时重庆市及其所属各区县还隶属于四川省。鉴于本书所有的资料都是1997年前的，而这些资料是在原四川省的范围内研究获得的；本书成稿也在1997年前。1997年重庆市从原四川省划出，当时再修改书稿已非易事。同时考虑到本书包括重庆市的资料，对重庆市的野生动物保护管理工作，亦有所裨益。因此，本书提及的“四川省”系指1997年以前的“四川省”，即包括现四川省和现重庆市。

本图鉴记述了目前四川省两栖动物已知的111种(亚种)，其中包括3个新种和牛蛙等3个引进种，分隶31属(亚属)10科2目，其模式标本产地在四川的有56种。全书分为绪论和各论两部分：绪论包括四川自然概况、两栖动物研究简况、区系特征、物种生态类型、资源和保护、两栖动物概述、分类学述语和量度，以及四川两栖动物的目、科、属的特征及其成体、蝌蚪、卵群检索；各论每一个种均有文字叙述，即中文名、拉丁学名、英文名、形态简述、生物学资料、地理分布、保护级别以及彩绘图、彩色照片及墨线图。全书共有各类图片651幅，其中彩绘图254幅(成体194幅，蝌蚪和卵群60幅)，彩色照片261幅(成体202幅，蝌蚪与卵群23幅，生境36幅)、墨线图136幅(成体特征图61幅，蝌蚪和卵群75幅)；书后附有四川两栖动物地理分布表和四川省两栖动物名录，中文名索引，拉丁学名索引，此处还有国家和省级保护两栖动物物种名录，有关异名见附录。本图鉴以彩色图片和简要形态描述相对照，配合特征图和检索表有助于鉴别物种。

本图鉴文字部分由费梁和叶昌媛撰写；原色图由李健和王宜生根据模式、地模或四川的实物标本绘制，有少数种如魏氏齿蟾因无标本则依据文献的附图仿绘；花齿突蟾无成体标本，则借用西藏江达标本绘图。序和前言的英语由钟盛先、袁世军译校。本图鉴在编著过程中还得到重庆自然博物馆黄永昭、四川师范学院胡锦矗、邓其祥等大力支持，惠赠和惠借标本和文献资料；中国科学院成都生物研究所谢锋、江建平、李胜全、钟盛先提供部分生态照片，并在工作中给予支持；四川省林业厅邓祥遂、胡铁卿、蒲涛和中国林业出版社陈利认真审阅书稿和图片，并提出宝贵的修改意见；费翔在电脑制作图表方面给予帮助，谨此一并致以衷心的感谢。

《四川两栖类原色图鉴》一书虽然是在作者多年野外考察和室内研究的基础上编著完成的，但由于两栖动物色彩十分复杂，保存的标本极易退色，因此需要实物标本和活体时的颜色才能绘制原色图，其难度甚大。两栖类的颜色在许多物种中存在个体变异，为了较全面地显示同一物种不同个体的颜色变异，本图鉴除彩绘图外还采用了部分彩色照片。由于编绘本图鉴难度较大，要求质量高，加之编绘人员经验不足，水平有限，漏误之处实难避免，恳请读者提出批评和建议，以便今后补充和修正。

此外，还附有本书名录与国家和省保护的两栖动物名录的对照表，便于同物异名物种的检索。

费 梁

1997年8月28日

Introduction

Sichuan Province, covering an extensive area, is located in the upper reaches of the Yangtze River in southwestern China, in the transitional region between the Qinghai-Tibetan Plateau and the middle and lower reaches of the Yangtze River. It connects the Palaeoarctic realm and Oriental realm. In Sichuan, elevation difference is great with towering mountains and deep valleys. The climate is complicated and varied in different areas and elevations. The water areas and vegetation types are greatly diversified, and the landscapes are quite different throughout. All provide unique favorable conditions for the existence and evolution of many amphibians in this region. Particularly, the Hengduan Mountains in western Sichuan, not seriously affected by the Quaternary Glacier, still preserve many primary genera and species, as well as many endemic and rare animals. Among them, the animals of Hynobiidae and Pelobatidae are extremely rich. As for the former, there are 9 species in Sichuan accounting for about 45 % of the total in China. There are 35 species of the latter accounting for about 50 % of China's total. The amphibians in Sichuan rank second in number of species, just after Yunnan in China. Because of its rich resources and great diversity of amphibians, many scholars in China and abroad have long been interested in Sichuan.

The study of amphibians in modern times began in 1868. According to incomplete statistics, about 180 important monographs and books on the amphibians of Sichuan have been published. They have made great contributions to the development of resources and research on biodiversity of the amphibians in Sichuan. Before 1930, foreign scholars collected some specimens from Sichuan and published 12 new species. From 1930 to 1950, Chinese scholars made surveys and studies on amphibians in Sichuan, and many specimens were collected during that time. In 1932, Mangven L. Y. Chang and H. F. Hsu published *Study of Some Amphibians from Szechuan*, and in 1950 Liu Cheng-chao published *Amphibians of Western China*. The former book recorded 14 species of amphibians in Sichuan, belonging to 6 genera, 5 families, and 2 orders, and the latter had 74 species altogether in China with 56 of them in Sichuan. This book was the first to contain color drawings (33 drawings of adults, 13 of tadpoles and 1 of eggs). During this period, Chinese scholars discovered 20 new species in Sichuan. Since 1950, Chinese scholars and scientists have carried out a large number of intensive and extensive investigations in Sichuan, finding many new species and new records. In 1961, Liu Cheng-chao and Hu Shuqing published *Tailless Amphibians of China*. This book described 67 species of tailless amphibians in Sichuan and contained 55 color drawings of adults and 33 of tadpoles. In 1978, Fei Liang *et al.* from the Sichuan Institute of Biology published *Fauna of Amphibians of Sichuan*. The

paper reported an increase of amphibians in Sichuan to 78 species, with 19 genera, 10 families and 2 orders. The 2 books, *Key to Chinese Amphibia* written by Fei Liang *et al.* in 1990 and *Rare and Economic Amphibians of China* by Ye Changyuan *et al.* in 1993 stated that in Sichuan there were 92 known species (subspecies), belonging to 30 genera (subgenera), 10 families (subfamilies), and 2 orders. The book *Atlas of Amphibians of China* (finalized in February, 1996) published in 1999 with major author Fei Liang described that in Sichuan the recorded amphibians were 98 species (subspecies). At present there are some books and monographs published on the amphibians in China, but there is no atlas (illustrated book) with color drawings that cannot only be used to describe, but also to identify the amphibians of Sichuan. Therefore, entrusted by the Animal and Plant Protection and Management Department of Sichuan Forestry Bureau and greatly supported by Chengdu Institute of Biology, the Chinese Academy of Sciences, this atlas was published. Not only can it be used to identify the known species of Sichuan's amphibians, but also to systematically summarize the achievements of research on amphibians in Sichuan. It can help locate the amphibian resources in Sichuan and promote further studies on fauna and phylogeny of the amphibians in Sichuan and also in China. Furthermore, this atlas is important in determining rare and endangered species, confirming their protection grades, implementing protection methods, and reasonably utilizing the resources.

Amphibians are beneficial animals. They catch and eat many kinds of destructive insects in the fields and natural environment, and they have long been called "crop protecting animals". Amphibians occur widely in various ecological environments and they play a very important role in guaranteeing harvests from agriculture, forestry and animal farming, and also maintaining the ecological balance. Therefore, they should be considered with great care and their protection should be enhanced according the related state laws.

In 1991, the Animal and Plant Protection and Management Department of the Sichuan Forestry Bureau entrusted as chief editor of the *Colour Handbook of Amphibians of Sichuan* to Professor Fei Liang of the Chengdu Institute of Biology, the Chinese Academy of Sciences. At that time Chongqing and its regions and counties were still included in Sichuan. In order to make this colour handbook similar to the *Colour Handbook of Birds of Sichuan* and the *Colour Handbook of Mammals of Sichuan*, which have already been published, this book is thus edited based on the original administration division of Sichuan.

This color handbook describes 111 species (subspecies) of amphibians known in Sichuan at present, including 3 new species and 3 introduced species. They are classified into 31 genera (subgenera), 10 families, and 2 orders with 56 species having their type localities in Sichuan. The book is divided into 2 main parts. The first part presents a general introduction outlining the natural conditions, research on amphibians, characteristics of fauna, ecological types of species, protection of resources, description, taxonomy and measurements of the amphibians in Sichuan. The second part includes diagnoses of genera, families and orders, with keys to the adults, tadpoles and eggs of the amphibians in Sichuan. Each species possesses a written description, with Chinese name, Latin name, English name, morphological description, biological

data, geographic distribution and protection grades, as well as color drawings, photographs, and ink line drawings. The book contains pictures of morphological descriptions including color drawings (of adults, tadpoles, and eggs), color photographs (of adults, tadpoles and eggs, and of habitats), and ink line drawings (of adults, tadpoles and eggs). There is also a table of geographic distribution of Sichuan's amphibians, a list of Sichuan's protected wild amphibians, index of Chinese names, and index of Latin names. This color handbook is useful for species identification by comparing the written description with the morphologically illustrated pictures, along with the character drawings and keys.

The color handbook was written by Fei Liang and Ye Changyuan. The color drawings by Li Jian and Wang Yisheng are based on type specimens, topotype specimens, and specimens from localities of Sichuan. For some species without specimens, such as *Oreolalax weigoldi*, the drawings were made from literature. The frog *Scutiger* (*S.*) *maculatus* was drawn using a specimen collected from Jiangda, Tibet. Zhong Shengxian and Yuan Shijun translated the Introduction and Preface of this color handbook. The book received great support from Huang Yongzhao of Chongqing Natural Museum, and Hu Jinchu and Deng Qixiang *et al.* of Sichuan Normal University, by providing valuable specimens and literature. Xie Feng, Jiang Jianping, Li Shengquan and Zhong Shengxian of the Chengdu Institute of Biology, the Chinese Academy of Sciences, also provided photographs for this book. Deng Xiangsui, Hu Tieqing and Pu Tao from the Sichuan Forestry Bureau and Chen Li from the China Forestry Publishing House carefully checked and kindly approved the draft and pictures of the book, and gave valuable and useful comments on revising the contents of the book. Fei Xiang also helped with the computer processing and map-making. Here, the authors of the book would like to express sincere thanks to them all.

Though the *Colour Handbook of Amphibians of Sichuan* was completed based on many years' expeditions in the field and indoor studies by the authors, it was still very difficult to make the drawings with correct colors. This required a large amount of living animals since the colors of amphibians are very complicated and the preserved specimens would easily fade. For the colors of amphibians that varied in different individuals of the same species, this book used some color photographs in order to illustrate the color changes among individuals in one species. Because of those difficulties, the high quality required for this book, and lack of experience of the writers and artists, this color handbook must have some mistakes and errors. We sincerely hope that the readers put forward amendments and suggestions to correct the mistakes and improve this book.

Fei Liang
28 August, 1997

四川两栖类原色图鉴

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THE COLOUR HANDBOOK OF THE AMPHIBIANS OF SICHUAN

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