



中国科学院中国动物志编辑委员会主编

# 中国动物志

硬骨鱼纲

鲈形目(五)

虾虎鱼亚目

伍汉霖 钟俊生 等 编著

中国科学院知识创新工程重大项目

国家自然科学基金重大项目

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## 内 容 简 介

本志是《中国动物志》硬骨鱼纲鲈形目的第五分卷,记述中国所产虾虎鱼亚目的9科5亚科106属307种(其中有一新种),为中国虾虎鱼亚目Gobioidei的系统研究总结。

本志是著者在全国各地(包括香港特别行政区和台湾省)广泛调查和标本采集的基础上,根据30余年来积累的大量标本、资料和国内外文献整理编著而成。内容分总论和各论两个部分。总论包括中国虾虎鱼类的研究简史、形态特征、生态学特征、区系组成与地理分布、分类系统与演化和经济利用。各论则按系统进行分类,着重记述种级阶元,对它们的异名、形态特征、地理分布、生活习性和经济利用进行介绍,同时也就调查所及做了介绍,并附插图。各科、亚科、属、种均有检索表。书后有参考文献、英文摘要、中名索引及学名索引等。

本志是迄今记录有关中国鲈形目虾虎鱼亚目鱼类内容最丰富和较为完整的基础资料。可供国内外鱼类学家、水产学家、水产工作者以及水产院校、综合性大学生物学系动物学专业的师生参考。

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## 前 言

虾虎鱼亚目鱼类是现生的鲈形目鱼类中最大的一个类群，全世界虾虎鱼类有 9 科 (Akihito *et al.*, 2002; Nelson, 2006), 270 属, 约 2211 种(Nelson, 2006)。它们广泛分布于亚洲, 大洋洲, 非洲, 南、北美洲及欧洲的热带、亚热带和温带水域中。中国地处亚洲东部, 跨越热带、亚热带及温带水域, 沿岸地形复杂, 有珊瑚礁区、岩礁区、滩涂区和石砾区, 岛屿星罗棋布, 境内河川纵横交错, 是虾虎鱼类生息的最好场所, 因而中国也是世界上虾虎鱼类较为丰富的国家之一。中国现有虾虎鱼类 9 科 5 亚科 106 属 307 种(其中有一新种), 占世界虾虎鱼类总数 2211 种的 13.9%。

在中国, 由于虾虎鱼类体型小, 数量少, 多数种类无经济价值, 因而对它的研究长期以来乏人问津。早在 20 世纪 30~40 年代, 我国学者就开始对虾虎鱼类进行研究和报道, 受条件的限制, 当时仅有局部水域的采集及零星的报告, 缺乏大范围的调查和系统研究。直到 50 年代, 我国鱼类学家郑葆珊教授先后对黄海、渤海及南海的虾虎鱼类进行了系统的、比较全面的调查和采集, 其研究成果于 1955 年、1962 年分别发表在《黄渤海鱼类调查报告》和《南海鱼类志》中。

20 世纪 50 年代末至 60 年代初, 我国著名鱼类学家、恩师朱元鼎教授和著者开始对东海的虾虎鱼类进行比较系统的调查和采集, 经过多年的整理, 其研究成果见于 1963 年出版的《东海鱼类志》中的虾虎鱼亚目。从 1975 年开始, 著者参加了由朱元鼎教授主持的福建海洋及淡水虾虎鱼类的调查, 其研究成果见于 1984~1985 年出版的《福建鱼类志》。1977 年, 著者在国家水产总局南海水产研究所主持下对南海诸岛海域的虾虎鱼类进行较大范围的调查采集, 其研究成果见于 1979 年出版的《南海诸岛海域鱼类志》。1983~1987 年, 著者参加了由中国水产科学研究院珠江水产研究所主持的对海南岛及广东的淡水及河口虾虎鱼类所进行的大范围调查, 其研究成果见于 1986 年出版的《海南岛淡水及河口鱼类志》和 1991 年出版的《广东淡水鱼类志》。

上述地区鱼类志的出版为《中国动物志》的编写提供了较为系统和完整的基础资料。自那时以来, 在恩师指导下, 著者和同事们继续开展对中国虾虎鱼类的调查和采集工作。1986 年 12 月, 恩师不幸仙逝, 但是他对我国虾虎鱼类开拓性的研究工作一直激励着我们。30 多年来, 我们总共采获各种虾虎鱼类标本 1.1 万尾, 这为本书的编写提供了可靠的物质基础。

由于中国地域广阔, 而虾虎鱼类广泛分布于大陆沿岸及内陆水域的广大地区, 要对虾虎鱼类进行全国性调查采集, 仅依靠我们少数几个人是很难完成的。为此, 中国科学院水生生物研究所、动物研究所和海洋研究所三个单位的鱼类研究室为我们提供室藏的

所有虾虎鱼类标本、文献资料,以供我们鉴定和测量之用,对本志的编撰工作给予了很大的支持。

在调查采集和标本测定过程中,台湾鱼类学家给了我们很大的帮助。1994年冬,著者应台湾大学沈世杰、中央研究院动物研究所(现为生物多样性研究中心)李信彻和邵广昭诸教授联合邀请赴台湾进行为期一个多月的采集,先后在台北、基隆、台东、花莲、苏澳、台中、新竹、台南、屏东、高雄、高屏溪、曾文溪等地进行采集。1999年4月,著者再次赴台湾在大溪渔场、恒春垦丁公园、鹅銮鼻等海域进行采集,获得许多台湾产的虾虎鱼类标本。

此外,曹文宣院士、孟庆闻、苏锦祥、杨君兴、陈银瑞、张其永、张春光、张洁、邓思明、陈湘舜、陈素芝、秦克静、王存信、武云飞、罗云林、宋佳坤、唐文乔、吴小清、蓝家湖、解玉浩、李明德、刘静、陈真然诸教授;台湾:方力行、曾晴贤、欧庆贤、黄登福、杨鸿嘉、刘振乡、于名振等教授及赖春福社长;香港:潘敬宇、Y. Sadovy。日本:水野信彦、上田高嘉、瀬能宏、蓝泽正宏、木村清朗、高木和德、道津喜卫、藤田清、目黑胜介、坂本胜一、池田佑二、杉山佳代、岩田明久、林公义、石锅寿宽、田北彻、多部田修、岩槻幸雄、本村浩元;韩国:田祥麟、姜彦钟;澳大利亚:D. Hoese、H. K. Larson;英国:A. C. Gill;瑞士:M. Kottelat;德国:R. Fricke;新加坡:Kelvin K. P. Lim;美国:J. E. Randall、V. G. Springer、S. Schaefer、L. R. Parenti、E. O. Murdy;加拿大:J. S. Nelson等鱼类学家还为我们提供技术资料、研究报告、标本、文献,进一步充实了本志的内容。

为了提高本志的编著水平,著者还赴英国大不列颠自然历史博物馆(British Natural History Museum)、美国自然历史博物馆(Am. Mus. Nat. Hist.)和史密森国家自然历史博物馆(Natl. Mus. Nat. Hist., Smithsonian Ins.)测量和查阅保存于该馆的采自中国的虾虎鱼类模式标本及资料。

日本三重大大学的木村清志;高知大学的冈村收、町田吉彦;京都大学的中坊彻次;东京大学总合研究博物馆的阿部宗明、新井良一;东京大学海洋研究所的塚本胜己;日本国立科学博物馆松浦启一;新加坡大学 Peter K. L. Ng;英国 Bristol 大学 P. J. Miller;加拿大安大略皇家博物馆(Royal Ontario Mus. Canada)的 R. Winterbottom 分别邀请著者在他们的实验室做短期虾虎鱼类研究,并惠赠大批虾虎鱼类标本。

日本著名虾虎鱼类学家明仁天皇对著者主编的本书给予很大的关照和支持,几年来先后赠送日本产虾虎鱼类标本 60 余种,并提供大量文献资料。1989 年、1995 年、1999 年及 2001 年,著者 4 次应邀赴日进行访问,先后在明仁天皇的赤坂御所鱼类学研究室(Lab. Ichthyol., Crown Prince's Place)和宫内厅生物学御研究所(Biolog. Lab., Imperial Household)做短期虾虎鱼类研究和交流,受到明仁天皇的 10 次接见,在皇宫内和明仁天皇讨论有关虾虎鱼类分类的学术问题。明仁天皇对著者的中国虾虎鱼类研究工作提出了很好的建议

和宝贵意见。李思忠教授审阅全稿并提出修改意见。对上述有关专家给予本志的热忱支持和帮助，在此表示衷心的感谢。

本志所依据的标本为：①1959年，东海区海洋调查队水产资源试捕工作组所采得；②1960年，由上海水产学院、中国科学院海洋研究所、动物研究所组成的东海鱼类区系调查工作组在东海沿岸所采集；③1975~1978年，闽南渔场鱼类资源调查队所采得；④著者于1956~2002年自渤海至南海西沙群岛、香港、台湾及内陆各水域采得；⑤有一些是中国科学院水生生物研究所、动物研究所、海洋研究所、昆明动物研究所，中国水产科学研究院东海水产研究所、南海水产研究所、珠江水产研究所，大连水产学院，台湾中央研究院动物研究所、台湾大学、高雄中山大学、台湾清华大学的标本；⑥有一些是日本宫内厅生物学御研究所、日本国立科学博物馆、东京大学总合研究博物馆、高知大学、三重大学；新加坡大学；加拿大安大略皇家博物馆；英国 Bristol 大学；英国大不列颠自然历史博物馆；美国自然历史博物馆等保存的西太平洋、南中国海、东海及中国大陆的虾虎鱼类标本。

本书作者庄棣华承担了鱼类彩图摄影的工作。各论中的鱼类外形图有的是借用已发表过的有关文献中的图，由牟阳重新描绘，并且都注明原有出处；有的是根据标本由牟阳绘制的，作者在此谨致谢忱。

由于虾虎鱼类体态变异大，体型微小，种类繁多，给鉴定工作带来较大困难；还有不少种类尚待发现，因而本志中存在疏漏、错误在所难免，祈望读者给予指正。

伍汉霖

2007年9月于上海水产大学

## Preface

The fishes of suborder Gobioidae, is the biggest group of those in present living Perciformes. There are about 2211 species belongs to 270 genera of 9 families in the world (Akihito *et al.*, 2002; Nelson, 2006). They distributed over the waters along temperate, subtropical to tropical zone of Asia, Australia, Africa, North and South America and Europe. China located at the eastern part of Asia, which lies over the zones of tropical, subtropical and temperate, possesses highly complicated physical geographical structures, which composed of coral reefs, rocky shores, rubble shores, and mudflats, thousands of islands and rivers, and which become the best habitats for Gobioid fishes to live and hence China is one of the most species rich countries over the world in terms of Gobioid fishes. China possesses 307 species of 106 genera, 5 subfamilies and 9 families, which is 13.9% of total 2211 species, and where becomes one of the richest places in the number of the species of Gobioid fishes over the world.

The Gobioid fishes in China have long received little attention in researches due to their small size, low numbers, and lack of economic value. Although ichthyologists of China began to study and report on the Gobioid fishes as early as the 30's~40's of the 20th century, various constraints have restricted specimen collection and reports to limited areas, and there was no investigation or systematic research on a wider scope. It was not until the 50's that the ichthyologist of China, Bao-Shan Zheng, conducted more systematic and thorough investigations and specimen collection on the Gobioid fishes from the Yellow Sea, Bo-hai Sea and South China Sea. His results were published in the *Report on the investigation on the fishes of Yellow and Bo-hai Sea* and *Fishes of the South China Sea* in 1955 and 1962 respectively.

From late 50's to the beginning of 60's, a famous ichthyologist of China, Professor Yuan-ding Zhu (Yuan-ting Chu), who was also my teacher, and me started a comparative systematic study and specimen collection on the Gobioid fishes of the East China Sea. After years of data compiling, the results were published as the part "suborder Gobioidae" in *The fishes of the East China Sea* in 1963. In 70's, the author under the supervision of Professor Chu thorough investigated and specimen collected on the Gobioid fishes from Fujian Province. The results were published in *The Fishes of the Fujian Province* 2 vols in 1984 and 1985. In 1977, under the competent authority by "South China Sea Fisheries Institute, China National

Bureau of Aquatic Products” , the author conducted some research on the Gobioid fishes from the islands of the South China Sea. The results were published in *The fishes of the Islands of South China Sea* in 1979. From 1983 to 1987, under the competent authority by “Pearl River Fisheries Research Institute, Chinese Academy of Fisheries Science” the author investigated on the freshwater and estuaries Gobioid fishes of Hainan and Guangdong Province. The results were published in the *The freshwater and estuaries fishes of Hainan Island* and *The freshwater fishes of Guangdong Province* in 1986 and 1991.

The above reports have provided more systematic and complete baseline information for the production of the series of *Fauna Sinica*. Since then, under the supervision of Professor Chu, I with my colleagues continued undertaking the investigations and specimen collections on the Gobioid fishes of China. Unfortunately, Professor Chu Yuan-ting passed away in the December of 1986. Nevertheless, his pioneer works on the Gobioid fishes of China continued inspiring us. In the last 30 years or more, we have collected more than 11 thousand specimens of different Gobioid species, which served as an important and reliable material basis for the production of this book.

Owing to the large area coverage of China and the wide distribution of Gobioid fishes along the coastal and inland waters, it was virtually impossible to rely on our limited manpower to complete investigations and specimen collections of Gobioid fishes over the entire territory of China. The Institute of Hydrobiology, Institute of Zoology and Institute of Oceanology of the Academia Sinica have offered enormous support to the production of this book by kindly providing their specimen and literature collections for our examinations and measurements.

During the course of investigations and specimen collections, the ichthyologists of Taiwan have provided us with great helps. In winter 1994, I was invited by Professor Shih-Chieh Shen of National Taiwan University, Prof. Sin-Che Lee and Prof Kwang-Tsao Shao of Research Centre of Biodiversity, Academia Sinica to participate in their specimen collections for more than a month. The locations visited included Taipei, Keelung, Taitung, Hualien, Suao, Taichung, Hsinchu, Tainan, Pingtung, Kaohsiung, Kaoping River and Tsengwen River. In April 1999, I visited Taiwan again to undertake specimen collections at Tashi fishing ground, Kenting National Park, Hengchun and the coastal waters of Eluanbi, and obtained many specimens of Gobioid fishes from Taiwan.

Besides, the following ichthyologists and academics have provided us with technical information, research papers, specimens and literature:

Academician of CAS Wen-Xuan Cao, Profs. Qing-Wen Meng, Jin-Xiang Su, Jun-Qing

Yang, Yin-Rui Chen, Qi-Yung Zhang, Chun-Guang Zhang, Jie Zhang, Si-Ming Deng, Xiang-Lin Chen, Su-Zhi Chen, Ke-Jing Qin, Cun-Xin Wang, Yun-Fei Wu, Yun-Lin Lo, Jia-Kun Song, Wen-Qiao Tang, Xiao-Qing Wu, Jia-Hu Lan, Yu-Hao Xie, Ming-De Li, Jing Liu, Zhen-Ran Chen; Taiwan: Lee-Shing Fang, Chyng-Shyan Tzeng, Ching-Hsewn Ou, Deng-Fwu Hwang, Hung-Chia Yang, Chen-Hsiang Liu, Min-Chen Yu, Mr. Chun-Fu Lai; Hong Kong: Drs. K.Y. Poon, Y. Sadovy. Japan: N. Mizuno, T. Ueda, H. Senou, M. Aizawa, Seiro Kimura, K. Takagi, Y. Dotsu, K. Fujita, K. Meguro, K. Sakamoto, Y. Ikeda, K. Sugiyama, A. Iwata, M. Hayashi, T. Ishinabe, T. Takita, O. Tabeta, Y. Iwatsuki, H. Motomura; Korea: E-J. Kang, S-R. Jeon; Australia: D. Hoese, H. K. Larson; UK: A. C. Gill; Switzerland: M. Kottelat; Germany: R. Fricke; Singapore: Kelvin K. P. Lim; USA: J. E. Randall, V. G. Springer, S. Schaefer, L. R. Parenti, E. O. Murdy; Canada: J. S. Nelson. This has further enriched the content of this book.

In order to further improve the level of production, the authors visited the British Natural History Museum, American Museum of Natural History and National Museum of Natural History, Smithsonian Institution to undertake measurements and identification of the type specimens of Gobioid fishes from China.

Moreover, I was also invited separately by Drs. Seishi Kimura of Mie University; O. Okamura and Y. Machida of Kochi University; T. Nakabo of Kyoto University; T. Abe and R. Arai of University Museum, University of Tokyo; K. Tsukamoto of Ocean Research Institute, The University of Tokyo; K. Matsuura of National Science Museum, Japan; Peter K. L. Ng of National University of Singapore; P. J. Miller of University Bristol, UK; R. Winterbottom of Royal Ontario Museum, Canada, to their laboratories to undertake short-term gobies research, during which I was also given many goby specimens.

His Majesty Emperor Akihito of Japan, a well known goby specialist, has also shown his great support to our production of this book by providing us with specimens and literature of more than 60 goby species from Japan. In 1989, 1995, 1999 and 2001, I was invited to an academic discussion with his Majesty Emperor Akihito at the Laboratory of Ichthyology, Crown Prince's Palace and Biological Laboratory Imperial Household. During these stays, I was received by His Majesty for more than 10 times to discuss with him various taxonomic issues on the gobies. His suggestions and opinions on the research of gobies in China were highly valuable. Professor Si-Zhong Li had kindly proof-read the whole draft and recommended amendments.

I would like to take this opportunity to express my whole-hearted gratitude to the all the people above for their sincere support and assistance.

The sources of specimens on which this book is based are as follows: ①from Marine Fishery Resources Investigation Group of East China Sea Area collected in 1959; ②from Fish Fauna Investigation Group of East China Sea which consist of Shanghai Fisheries College, Institute of Oceanology and Institute of Zoology, the Chinese Academy of Sciences collected in 1960; ③from Fishery Resources Investigation Group of South-Fujian Coast Fishing Ground collected in 1975~1978; ④ by the authors between 1956 and 2002 collected from continental inland, coasts and insular waters; ⑤ collections from Institute of Hydrobiology, Institute of Oceanology, Institute of Zoology, Kunming Institute of Zoology, the Chinese Academy of Sciences; East China Sea Fisheries Research Institute, South China Sea Fisheries Institute, Pearl River Fisheries Research Institute, Chinese Academy of Fisheries Science; Dalian Fisheries College; Research Centre of Biodiversity, Academia Sinica, Taiwan, National Taiwan University, National Sun Yat-Sen University Kaohsiung, Tsing Hua University, Taiwan; ⑥collections from Indo-Pacific, South and East China Seas kept in: Biological Laboratory, Imperial Household; National Science Museum, Japan; University Museum, University of Tokyo; Kochi University; Mie University, Japan; National University of Singapore; Royal Ontario Museum, Canada; University of Bristol, U K; British Natural History Museum, U K. and American Museum of Natural History.

The author of this book, Chong Deehwa, also took part in color photos taking. Some of the morphological illustrations in **SYSTEMATIC DESCRIPTION** were adopted from the respective published literature and re-drawn by Mrs Yang Mu with acknowledgement of their sources. Some were drawn by Mrs Yang Mu based on the actual specimens. The authors would like to take this opportunity to express their gratitude.

The wide morphological variations, small size and high number of species of gobies have made taxonomic identification of them rather difficult. There are yet new species to be discovered. We are open to the readers' opinions where there might be omissions and mistakes.

Han-lin Wu  
Shanghai Fisheries University  
2007.09

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