



THE KEYS TO THE BIRDS OF CHINA

(Third Edition)

Cheng Tso-Hsin



Science Press, Beijing, China

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Translated by Lei Fumin
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SYNOPSIS OF THE BOOK

This book was edited on the basis of the bird specimens collected over many years, as well as the related references. The key, according to the genealogical taxonomy of birds, from order, family, genus to species and subspecies successively, is the main part of the book. The key consists of 1 319 species found in China before the end of 2000. According to the development of ornithological studies in China, 9 families, 68 genera and subgenera, 185 species and 302 subspecies were added, and 1 order, 3 families and subfamilies, 2 genera, 28 species and 66 subspecies were revised from the second edition. In addition, 1 genus and 11 species were re-elevated.

The introduction to the topography of birds, as well as to measurements and coloration of bird plumages used for description are on the pages preceding the keys. A list of references and an index are attached to the end of the text.

This reference book can be used by researchers, teaching staff and students, as well as by amateurs of bird study to identify bird species.

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Cheng Tso-Hsin

THE RESUME OF THE AUTHOR

Cheng Tso-Hsin (1906~1998) was born in Changle, Fujian Province. He was an academician of the Chinese Academy of Sciences. He was also a famous ornithologist in China as well as in the world, and is the founder of modern ornithology of China. He graduated from Fujian Christian University, and received a Ph. D. degree from the Department of Biological Science, University of Michigan, in USA. After returning to China, he successively served as Professor and Chairman of the Department of Biology, Dean of Science College and Dean of Studies. From 1947~1949, he was invited to the USA as a visiting professor. For 1947~1949, he was appointed a Senior editor of the Natural Science Department, National Centre of Compilation and Translation in Nanjing, and served part-time as Professor of the Department of Biology, the Central University. After the founding of the People's Republic of China, he successively held positions as Research Fellow and Director of the Department of Vertebrate Systematics and Faunastics, the Institute of Zoology, Chinese Academy of Sciences, and held a concurrent posts as Professor of Peking University, Beijing Normal University, Northwest University and Lanzhou University, and Deputy Director of Beijing Natural History Museum and Director of the Institute of Natural History, Director of the Scientific Committee of Endangered Species of the PRC, President (or Honorary President) of the China Zoological Society and the China Ornithological Society, and Chief Editor of the Zoology and Zoogeography of the Encyclopedia of China. He was also a honorary member of the Science Society of USA and the American Ornithologists' Union, reporter of the Society of Japan, Germany and UK, the President of the World Pheasant Association, the Advisor of the International Crane Foundation, and the Honorary President of the XXII International Ornithological Congress.

Cheng Tso-Hsin made great contributions to research in Zoology and Zoogeography. He discovered 16 new subspecies of birds in China, published the books such as *The Distributional List of Birds in China*, *The Classification of Zoological Regions in China*, *the Taxonomy of Vertebrates*, *A Synopsis of the Avifauna of China* (in English), and edited the books *The Economic Birds of China*, *Fauna Sinica. Aves*, Vol. 1,2,4,6,10,11, totally over 10 million words.

He successively won the Second-class National Natural Science Award, the Significant Achievement Award of the National Conference of Science, the Special Award of the Progress of Science and Technology, Chinese Academy of Sciences, the Special Award by the National Association of Publications, the Science Honorary Award of the University of Michigan, the Special Conservation Achievement Award of the National Wildlife Federation, USA, the Lifelong Honorary Award of the China Wildlife Conservation Association, the Outstanding Achievement Award of Science and Technology of the Hong Kong Qiu Shi Science and Technologies Foundation. Award of Cai Guanshen's Foundation of the academician of the Chinese Academy of Sciences, etc. In 1992, he donated his awards to set up a foundation supporting the Cheng Tso-Hsin Award for Young Ornithologists.

ACKNOWLEDGEMENTS

The Keys to the Birds of China is translated from the third Chinese edition published in 2002 by Science Press. Prof. Li Xiangtao (Address: Beijing Natural History Museum, Beijing 100050, lxtlxt@263.net) was in charge of parts of the book from the preface to measurements, and from Sylviinae of Passeriformes to Emberinae. Prof. Lei Fumin (Address: Institute of Zoology, Chinese Academy of Sciences, Beijing 100080, leifm@panda.ioz.ac.cn) translates from Meropidae to Timaliinae of Passeriformes, figures and index. Prof. Zhang Zhengwang (Address: College of Life Sciences, Beijing Normal University, Beijing 100875, zzw@bnu.edu.cn) translates from Gaviiformes to Alcedinidae of Coraciiformes.

We would like to thank Mrs. Cheng Chen Jiajian (Lydia Chen Cheng), wife of the late Prof. Cheng Tso-Hsin for her permission and encouragement for this work. Many thanks to Prof. Xu Yangong, Prof. Yuan Decheng, Dr. Qu Yanhua, Mr. Wang Gang, Mr. Zhao Hongfeng, Mr. Yin Hao, Mr. Zhang Xiaohui and Mr. Xu Long for their help, as well as to the editors, Ms. Wang Jun and Mr. Gao Feng for their professional experiences.

We should also thank the China Association for Science and Technology for the financial support.

PREFACE TO THE THIRD EDITION

On the second anniversary of Academician Cheng Tso-Hsin is passing away, his book *The Keys to the Birds of China* (the third edition) will be printed by the Science Press. It is at the behest of Professor Cheng that we revised this book. I believe that it is also the best way for us to commemorate Professor Cheng and to carry out his last wishes.

Thirty-four years have passed since *The Keys to the Birds of China* (the second edition) was published in 1966. With the long-term scientific effort, as more and more people strengthen the consciousness of environment protection and devote much attention to problems of biodiversity conservation and as, more and more birds are found, recorded and protected, the key of birds seems more and more indispensable. Owing to the needs of their work, many people have duplicated, mimeographed, and even transcribed the contents of the book. Researchers, teachers, managers of nature reserves, as well as customs house officers all expect a reprint of this reference book, that has played a big role in science and social practice.

Of course, it is impossible to incorporate all the birds in thousands of postures in a book of systematic keys. Many readers often feel that it is difficult for them to determine the name of a bird with this book because of the limitations of the written language, especially to identify the specimens of young birds or an incomplete specimen. In addition, it is also difficult for bird-watchers to identify bird species in the field. Consequently, atlases and illustrated handbooks of the Chinese birds have been published one after another both at home and abroad, greatly making up for the deficiency of this book.

We can hardly identify a species, however without the help of a systematic key. The establishment and nomination of a species have a precise scientific definition and limitation. Only when denomination of a species is strictly followed through the description of a type specimen can the species be approved by the scientific community. We have made many mistakes and have learnt many lessons in this respect. Inexact denomination has caused academic confusion and indistinct judgment has touched off pointless arguments. Whenever we come across these problems, we all expect the publication of a new systematic key.

In order to increase the scientific value and practical value of the book, Professor Cheng expended much time and energy on the revision of the text and on the completion of new content during his lifetime. Whether species or subspecies were newly described or were new records of birds discovered in China, he always collected such literature and took notes seriously. In the revised edition, he added new keys to 9 families, 68 genera and subgenera, 185 species and 302 subspecies. Following the thorough development of ornithological studies in China, he also revised 1 order, 3 families and subfamilies, 2 genera, 28 species and 66 subspecies from the second edition. In addition, 1 genus and 11 species were re-elevated. This book is also an embodiment of the results and painstaking effort of Chinese bird researchers throughout the country. With the assistance from Associate Professor Xu Yangong, one of Professor Cheng's students, Professor Zheng Huaijing, his son, and Mr. Gao Feng, the editor, as well as Lu Taichun, Ding Changqing, Lei Fumin, He Fenqi, Sun Yuehua, Qiao Gexia, all Professor Cheng's students, and Professor Yang Lan, ornithologist in the Kunming Institute of Zoology, I can finish the posthumous manuscript systematically and offer it sincerely to the reading public. In this effort Professor Cheng's behest has been fulfilled.

I believe that advanced methods for identifying species will be found and will be used in future systematic keys developments of science, such as protein electrophoresis, chromosome analysis, sonograph analysis, and DNA fingerprint identification. I hope that systematic keys, as a foundation stone, will be revised and supplied by numerous others. I also believe that this book will be brightened and exceeded by efforts of future generations. The research of ornithology in China must attain a lofty realm in the future. At that time, it is entirely possible that the research we are engaged in today will not be worthy of mention. It will also console the soul of Professor Cheng a great deal in the nether world. May I here present this book as a gift to the coming significant IOC Beijing meeting.

Cheng Chen Jiajian
(Lydia Chen Cheng)

June 27, 2000

PREFACE TO THE SECOND EDITION

Many new results of bird surveys and researches have been reported throughout the country, especially in Xinjiang, Qinghai and Southwest China, since this book (the first edition) was published. As a result of avifaunal explorations and studies of systematic ornithology during recent years, there has been an increase of 11 species and more than 30 subspecies, including some new subspecies. Moreover, some other synonymous subspecies are deleted in this edition. This edition incorporates substantial changes in the characteristics used in the keys following the increase in bird specimens and reference materials as well as the development of research work. Some inexact keys are revised in this edition. The names of the birds reflect corresponding changes according to *the International Animal Nomenclature* published in 1961.

Two appendices to the first edition, the distribution table of birds in China and the table of number of species of birds in China, are deleted in this new edition. These tables will be appended to the revised and enlarged edition of *the Distributional List of Birds in China*.

Although we expended much times and energy on the revision of the text of the book, it is impossible to avoid errors and omissions. We hope the readers of the book can put forward suggestions at any time, so we can constantly revise the book and better support the needs of research work on avian taxonomy in China.

Cheng Tso-Hsin

(Institute of Zoology, Chinese Academy of Sciences)

January, 1966

PREFACE OF THE FIRST EDITION

This systematic key to the Chinese birds was edited on the basis of specimens collected over the years, as well as the related references. The key, according to the systematics of birds, from order, family, genus to species and subspecies successively, is the main part of the book. If there is only one species in China of a genus or family (or subfamily), the key is only to the genus or family (or subfamily). Using the same method, if there is only one subspecies in a species, the key is only to the species. The key consists of 1140 species of birds found so far in China, as well as subspecies with only a few exceptions.

The measurements used in the book are mainly based on the specimens collected in the Institute of Zoology, Chinese Academy of Sciences. The source is indicated if the data is quoted from the references. Some measurements, however, are still quoted from the references even though we have collected few specimens.

The characteristics used in the key are verified with the specimens for the most part. This effort is incomplete, however, because there are a few birds lacking systematic study, especially the comparative analysis among the subspecies. This book represents only the result of investigations and studies at present. It is the basis for further development of avian research. We hope readers can put forward suggestions, so that we can revise the book in a second edition.

I would like to thank Mr. Qian Yanwen, Liu Changjiang, Jiang Zhihua, Guan Guanxun, Jin Shanke, Xian Yaohua, Ma Dehui, Zhang Yinsun, Zhang Tanxin, Tan Yaokuang and others in the Department of the Avifauna for their assistance. Finally I thank Ms. Lu Jizhen for her splendid drawings.

Cheng Tso-Hsin

(Institute of Zoology, Chinese Academy of Sciences)

December, 1962

HOW TO USE THE KEY

In taxonomy, species identification is made usually with the aid of a key. To make a key, we pick out some different and easily identified characters, that cover all members of each sub-taxonomic unit under the taxa, for example, the species in the genus, the subspecies in the species and so on. We write them down as clauses; in the end we arrange them by pairs. In using the key, you should find the very clause that describes the character you are looking for. You can make a conclusion if a taxon unit (e. g. , genus, species, subspecies, etc.) listed at the end of a clause. If a code instead of a unit is listed at the end, you should go on to find the clause the code refers to, until you find the name of the taxon unit at the end.

Although, there are some “common” characters in birds in the higher taxon units, that is, at the genus and above the genus category, these “common” characters are variable to some extent, and some characters are so peculiar that they cannot be completely included in the key. As a result, sometimes, it is difficult to describe the higher taxon unit. For that task you can not make a conclusion until you have looked up the taxonomic monographs, compared the characters of the higher taxon unit in detail, or found out the detailed characters of all the species included.

1. The characters of species and subspecies in this key are derived from the adult birds, especially male birds, in the breeding season. As to the female, poults and male birds in non-breeding season, there are other narrations in the key.
2. Since there are individual variations in a population, a series of specimens are needed for identifying the subspecies.
3. It is better to have comparable specimens in using the key. Identification cannot be definite without a comparison of specimens, such as the lighter or darker coloration of plumages.
4. Parts of the body and colors of the feather should refer to the terms of morphology and the coloration of bird plumages.

Searching a species in the key is an analytic process. In principle, the key should include characters that fit all individuals in the population and not include

special characters. These characters should have definitive but overlapping range and should be easily observed. The optimal key not only guarantees the accuracy of the identification, but also takes the phylogenetic relationship into account, for example, it is better to make all species of the same subgenus converge. As a result of limited data and the level of research, however, it is difficult to conform to the standards above-mentioned. In addition, there are errors that need to be corrected in practice. To reduce and prevent errors, it is better to compare the initial outcome to the narration of the taxon or authentic specimens after you have gotten the initial outcome of the search. Sometimes, it is necessary to refer to taxonomic monographs.

Cheng Tso-Hsin

(Institute of Zoology, Chinese Academy of Sciences)

June, 1996

THE TOPOGRAPHY OF A BIRD

The names of different parts of the body of a bird are shown in the accompanying figure—the topography of a duck.

I. Head: including upper head, lower head and sides of head.

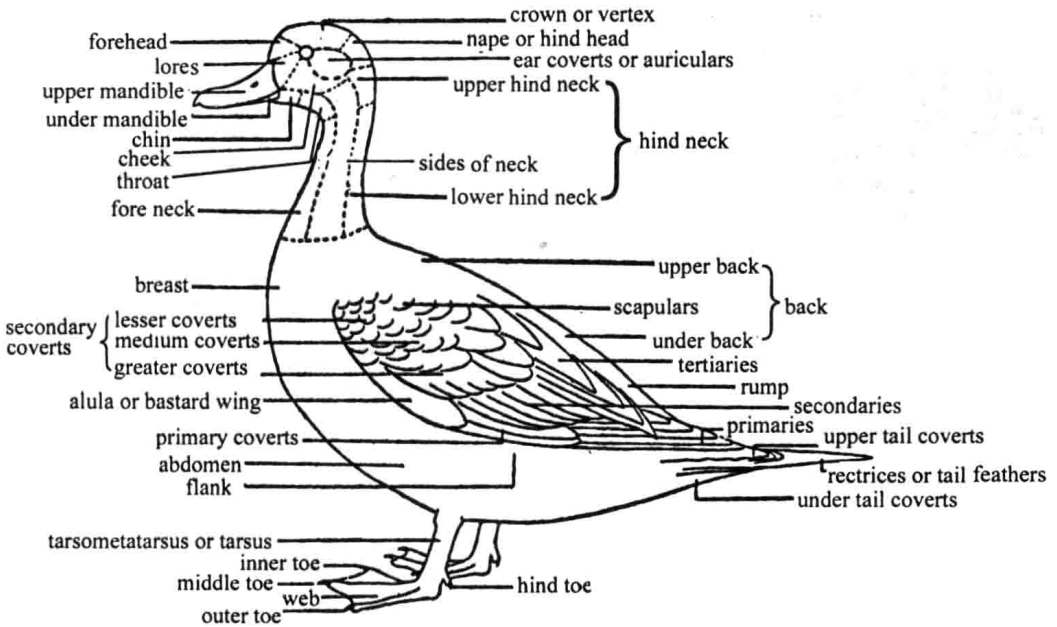


Fig. 1 Schematic drawing of external morphological characters of birds

(I) Upperparts of head:

1. Forehead: The forefront part of the head, connected with the base of upper mandible.
2. Crown or vertex: Following the forehead, on the middle of the head.
3. Hind head or nape: Behind the crown and in front of the upper neck. It is the last part of the head.
4. Medium coronary stripe: A stripe in the middle of crown, from the forepart to the rear.
5. Lateral coronary stripes: The stripes on the sides of the crown.
7. Occipital crest : The greatly elongated or erected feathers on the hind

head.

8. Comb: The naked and erected part on the crown.

9. Frontal plate: The naked horny plate on the forehead.

10. Usually, there are two nostrils on the upper mandible. The nostrils can be divided into two types listed below:

(1) Nostril pervious.

(2) Nostril impervious.

(II) Sides of the head:

1. Lore: Behind the corners of the bill, and in front of the eyes.

2. Circum-orbital region: Around the eyes, naked or feathered.

3. Orbital ring or eye ring: Rings around the eyes.

4. Cheek: Below the eyes, above the throat, as well as above and behind the base of the lower mandible.

5. Ear coverts or auriculars: The feathers covered the ears, behind the eyes (Fig. 2).

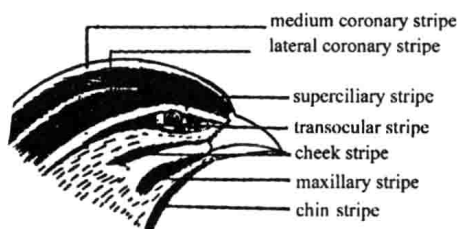


Fig. 2 Sketch map of different patches on head

6. Supercilium or superciliary stripe: The stripes above the eyes. The short ones called the bars of the brow, and the long ones called the eyebrows (Fig. 2).

7. Transocular stripe: The stripes through the eyes, from the base of the lower mandible, or forehead, or lore to behind the eyes (Fig. 2).

8. Cheek stripe or malar stripe: The stripes through the cheeks, from the forepart to the rear (Fig. 2).

9. Maxillary stripe: The stripes between the cheeks and the throat, elongated backward from the base of the lower mandible (Fig. 2).

10. Facial dish: The eyes face forward and the feathers around the eyes form a facial dish.

(III) Lower parts of head:

1. Chin: Behind and under the base of the lower mandible, and in front of the throat.

2. Mental stripe: The stripes pass through the middle of the chin.

3. Wattle or lappet: The naked skin droops under the head.

II. Neck :

(I) Upper part: Hind neck: It can be divided into upper hind neck and lower hind neck.

1. Upper hind neck or nape: The fore part of the hind neck, connected with the hind head.
2. Lower hind neck: The rear part of the hind neck, connected with the back.
3. Nuchal crest: The crested feathers on the neck.
4. Ruff: The collar-like long feathers on the neck.
5. Cape: The cape-like long feathers on the hind neck.

(II) Sides of the neck.

(III) Under part:

1. Throat: It can be divided into gula or upper throat and jugulum or lower throat. The fore part of gula often under the head.
2. Fore neck: Behind the throat, presented only in the species with long neck.
3. Gular pouch: A flexible pouch on the throat.

III. Body: The largest part of the body of a bird.

(I) Upperparts:

1. Back: Behind the lower hind neck and in front of rump. It can be divided into upper back and lower back. The former part is connected with the lower hind neck and the later part is connected with the rump.
2. Scapular region: Between the sides of back, as well as between the bases of the wings. It is often called scapulars for the elongated feathers.
3. Interscapular region: Between the scapular regions.
4. Mantle: Including the upper back, the scapular region and the inner wing coverts.
5. Rump: The last part of the body, behind the lower back and in the front of the upper tail coverts.

(II) Sides of body:

1. Sides of breast: On the sides of the breast.
2. Flanks or sides of body: On the sides of rump, near the lower part of the rump.
3. Sides of abdomen: On the sides of the abdomen, below the flanks.

(III) Underparts :

1. Breast: The forefront part of the underparts. Its fore part connected with the fore neck or throat and its rear connected with abdomen . It can be divided into chest or upper breast and lower breast.
2. Abdomen: It is connected with the breast in the fore part and ended to the vent.
3. Crissum: The feathers around the vent.

The upper parts of head, neck and body are collectively called the upperparts, and the under parts of head, neck and body are collectively called the underparts.

IV. Bill: The terms of different parts of bill related to the keys are listed below (Fig. 3):

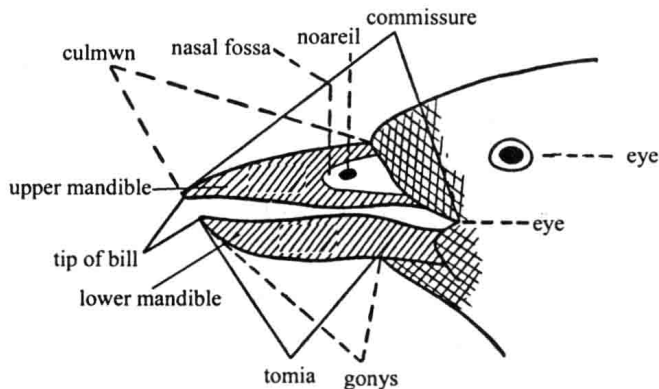


Fig. 3 Sketch map of different parts of bird bill

1. Upper mandible: The upper part of the bill. The base of upper mandible is connected with the forehead.
2. Lower mandible: The lower part of the bill. The base of lower mandible is connected with the chin.
3. Rictus or angle of mouth: The area of the bases of upper mandible and lower mandible connected each other. The distance between the upper mandible and lower mandible of the opened bill is called gape.
4. Commissure: The line from the rictus to the tip of the bill.
5. Culmen: The ridge of the upper mandible.
6. Gonys: The bottom of the lower mandible.
7. Tip of bill: The tip of the bill.
8. Tomia: The edges of the bill.