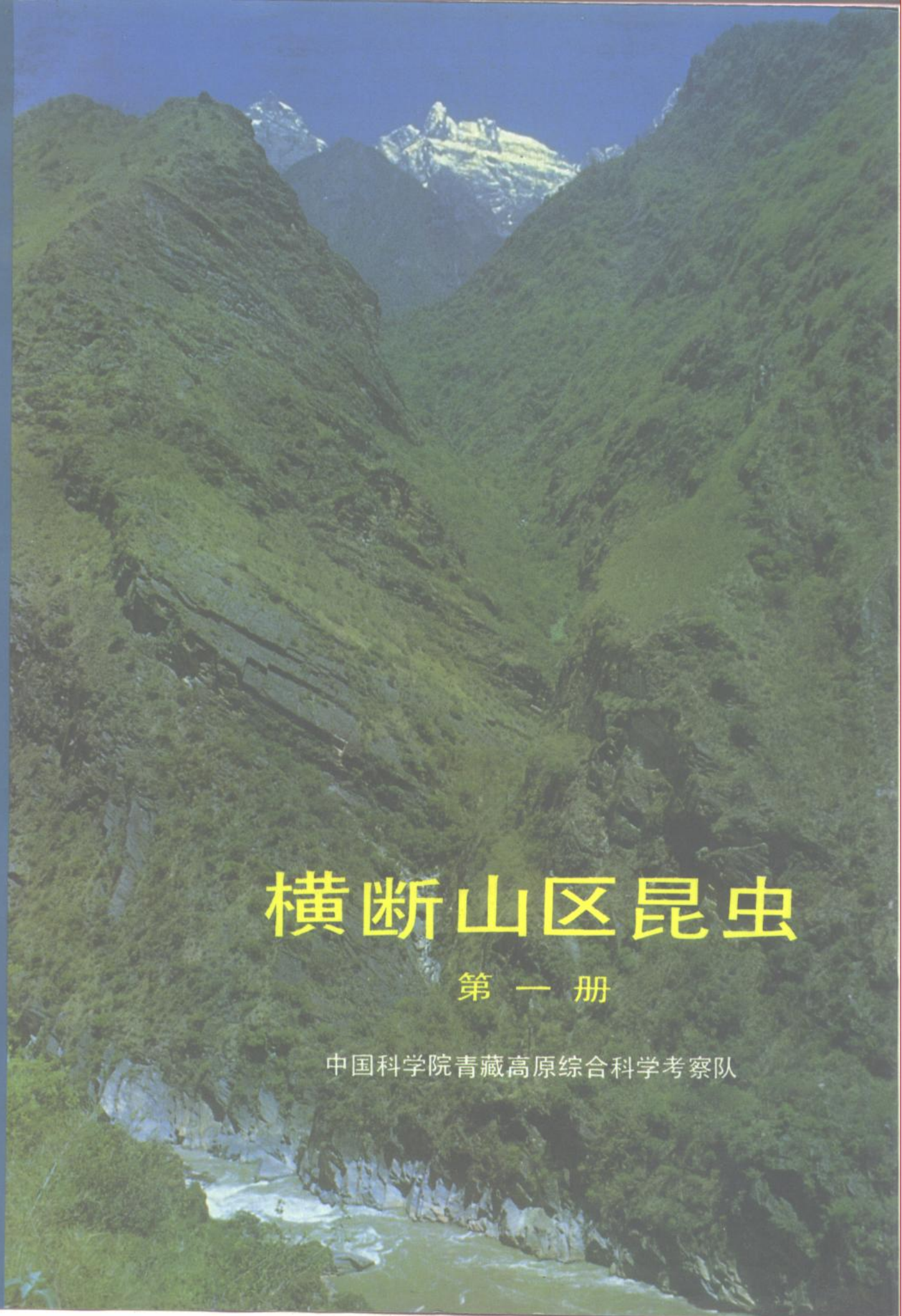
青藏高原横断山区科学考察丛书



横断山区昆虫

第一册

中国科学院青藏高原综合科学考察队

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中国科学院青藏高原综合科学考察队

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THE SERIES OF THE SCIENTIFIC EXPEDITION TO THE HENGDUAN MOUNTAINS, QINGHAI-XIZANG PLATEAU

INSECTS OF THE HENGDUAN MOUNTAINS REGION

Volume 1

The Comprehensive Scientific Expedition to the Qinghai-Xizang Plateau, Chinese Academy of Sciences

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内 容 简 介

本书是1981—1984年横断山区昆虫区系考察和研究的系统总结。共记载本区的昆虫纲19目，230科，1 971属，4 758种及蜘蛛纲蜱螨目6科，23属，68种，总计20目，236科，1 994属，4 826种。其中记述新属24属，新种850种。除种类记述外，还对本区昆虫区系特征、分布规律、区系渊源及种类分化等做了深入的讨论。本书可供有关科研单位的科研工作者、高等院校师生、农林医等部门的植保、医药和防疫工作者参考。

青藏高原横断山区科学考察丛书

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第一册

中国科学院青藏高原综合科学考察队

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《青藏高原横断山区科学考察丛书》序

辽阔的青藏高原，包括西藏全部、青海南部，以及四川西部和云南西北部。大部分地区海拔在4 000m以上，四面以巨大的落差急剧下降，衬托出世界屋脊的磅礴气势，素有世界第三极之称。由于青藏高原独特的地质历史和自然条件、丰富的生物组成和生物群落类型，成为地球上一个独具特色的地理单元。青藏高原蕴藏着丰富的自然资源，又是许多少数民族生活和居住的地区，且地处边陲，合理保护和开发这一地区的自然资源，对发展经济，改善人民生活，以及巩固民族团结和加强国防建设都有重要的意义。

为了探索青藏高原形成和演变的历史，研究自然条件的特点及其对周围环境的影响，研究自然资源的数量和质量及其合理开发利用的途径。解放以后，中国科学院对这里进行了多次科学考察，特别是自1973年起组织了青藏高原综合科学考察队，对这一地区进行了更为全面、系统的综合性研究。

1973—1980年期间，考察队重点对西藏自治区进行了考察。其科学成果将集中反映在陆续出版的《青藏高原科学考察丛书》(西藏部分)及论文集和画册中。有些成果在实际生产中已得到推广和应用，在国际和国内产生了深远的影响。

考察队从1981年起将考察研究的重点转移到横断山区。横断山地处我国西南的藏东、川西和滇西北一带，是青藏高原的一个组成部分。在行政区域上包括西藏自治区的昌都地区，四川省阿坝、甘孜、凉山及云南省丽江、迪庆、怒江和大理等地(州)区，总面积约50万平方公里。

横断山脉在地质构造上处于南亚大陆与欧亚大陆镶嵌交接带的东翼，是我国东部环太平洋带与西部古地中海带间的过渡地带。地质构造复杂，新构造运动活跃。本区地势由西北向东南倾斜，大部为高山峡谷，山脉、河流南北纵贯，相间并列，高差很大，自然地理条件独具一格，生物区系绚丽多彩，且富含古老和孑遗类型，是研究生物和地学中许多重大理论问题的关键性地区。

横断山脉自然资源丰富，尤以多种矿产、水利、森林、草场等资源最为丰富。但是随着人口的增长和开发利用的加剧，自然资源承受的人类压力日益加大，有些地区生态平衡遭到了破坏。为了合理利用自然资源，必须研究本区的自然资源特点，探索其合理保护利用与开发的方向和途径。

横断山区科学考察工作主要围绕6个课题进行：①横断山脉形成的原因和地质历史。②横断山区自然地理特征及其与高原隆起的关系。③横断山区自然垂直地带的结构及其规律。④横断山区生物区系的组成。⑤横断山区自然保护与自然保护区。⑥横断山区自然资源的评价及其合理开发利用。

为了使科学考察研究更密切地与当地的经济开发工作结合起来，在自然资源评价与开发利用方面着重抓了农业自然资源条件与自然资源系列制图；亚高山暗针叶林采伐与更新；地方能源的综合利用；畜牧业发展战略及干旱河谷农业自然条件与开发利用等5项

综合专题的考察研究。

横断山区的综合科学考察研究工作由中国科学院-国家计划委员会自然资源综合考察委员会负责组织领导。参加此次考察研究的包括中国科学院有关研究所、高等院校和地方科研与生产部门等单位计40余个，约300多人，涉及40多个专业。

《青藏高原横断山区科学考察丛书》将系统地总结青藏高原综合科学考察第二阶段的成果。

《青藏高原横断山区科学考察丛书》包括横断山区农业自然条件与农业自然资源评价、横断山区的地方能源资源、横断山区亚高山暗针叶林采伐与更新、横断山区畜牧业、横断山区干旱河谷的自然条件与农业资源开发利用、横断山地质构造、横断山区镁铁-超镁铁岩、横断山区锡矿带和富碱侵入岩带地球化学与成矿、横断山区花岗岩类地球化学、横断山区地层、横断山区古生物、横断山区哺乳动物化石与生活环境、横断山区地热与水热活动区名录、腾冲地热、横断山区自然地理、横断山区地貌与第四纪地质、横断山区气候、横断山区冰川、横断山区泥石流、横断山区土壤地理、横断山区森林、横断山区植被、横断山区沼泽与泥炭、横断山区湖泊综合研究、横断山区自然垂直带结构特征及分布规律、横断山区植物(横断山区古植物区系、横断山区地衣、横断山区真菌、川西地区大型经济真菌、横断山区维管束植物、横断山区植物起源与演化)、横断山区鸟类、横断山区哺乳类动物、横断山区昆虫、横断山区鱼类、横断山区两栖爬行动物志、横断山区甲壳动物。我们希望它能在探索青藏高原的奥秘和我国社会主义建设中发挥积极的作用。

中国科学院青藏高原综合科学考察队

PREFACE OF "THE SERIES OF THE SCIENTIFIC EXPEDITION TO THE HENGDUAN MOUNTAINS REGION OF QINGHAI-XIZANG PLATEAU"

The vast Qinghai-Xizang Plateau, consisting of the Xizang (Tibet) Autonomous Region, the southern part of Qinghai, western part of Sichuan and northwestern part of Yunnan provinces, is often eulogized as the third polar of the world. The major parts of the Plateau are 4 000 metres above sea level, while the areas around drop drastically setting off the tremendous monentum of the roof of the world. The particularities of the geological history and physical conditions, the variety of biological composition and the different types of bio-communities make the Qinghai-Xizang Plateau a unique geographical unit. As the Plateau, being rich in natural resources, lies on the border regions where inhabit many national minorities, the rational conservation and utilization of the natural resources in this region are of particular importance in developing economy, improving the local livelihood and consolidating national solidarity as well as strengthening national defence.

Ever since the foundation of new China, have many scientific surveys been carried out in this region so as to make a better understanding of the history of the formation and evolution of the Qinghai-Xizang Plateau, to study the characteristics of its natural conditions, their effects on the environment around and the quantity and quality of the natural resources and thus, to find a way of exploiting and utilizing them rationally. Especially after the forming of the Qinghai-Xizang Plateau Comprehensive Scientific Expedition Team in 1973, an even more comprehensive, systematic research has being made on this region.

A survey was mainly carried out on the Xizang (Tibet) Autonomous Region during the period of 1973—1980. The scientific findings of the survey, part of which have already been extended and applied to actual production and have brought a far-reaching influence both inside and outside China, will be concentratedly compiled in the series of scientific survey on Qinghai-Xizang Plateau (Xizang Volume), proceedings and pictorials.

Since 1981, the survey team has shifted its major research area to the Hengduan Mountains Region which is a constitutional part of the Qinghai-Xizang Plateau and is located in the east of Xizang, west of Sichuan and northwest of Yunnan provinces in southwest China. The total area of this region is about 0.5 million square kilometres and administratively including Changdu district of Xizang, Aba, Garzê Liangshan of Sichuan and the Lijiang, Dêqên Nujiang and Dali districts of Yunnan.

The Hengduan Mountains is complicated in geological structure and active in new tectonic movements. It lies on the east flank of the juncture area where South Asia and Eurasia are mounted. It is the transitional region between the east zones encircling the Pacific and the west zones of ancient Mediterranean. The altitude

of this area declines from northwest to southeast. Most parts of the area are characteriesed by a series of paralleled mountain ranges and rivers from south to north, and with a sharp altitudinal differentiation. Its unique physical conditions and variety ecosystems being rich in flora and fauna with abundant relic species, give the area a critical nature for the fundamental research in the field of biology and earth science.

The Hengduan Mountains Region is abundant in natural resources, among which multi-mineral products, hydrological resources, forest and grasslands account for the great part. But with fast growth of the population and an extensive exploitation and utilization of the natural resources, the human pressure on natural resources has vastly increased which even caused ecologic equilibrium damagement in some part of the area. In order to make a more reasonable utilization of natural resources, it is necessary to study the characteristics of the resources in this region so as to work our certain ways and methods for protecting, utilizing and exploiting them rationally.

There are six major subjects in the research work being carried out in the Hengduan Mountains: ① The giological history of the Hengduan Mountains. ② The physiographical characteristics of the Hengduan Mountains Region and their relationship with the rise of the Plateau. ③ The structure and rule of the altitudinal belts of the Hengduan Mountains Region. ④ The composition of bio-communities in the Hengduan Mountains Region. ⑤ The natural conservation and nature reserves in the Hengduan Mountains Region. and ⑥ Evaluation of the natural resources in the Hengduan Mountains Region and their rational development and conservation.

Five integrated projects have also been given special attention in the research on natural resources evaluation, expoilation and utilization. They include as following: compilation of a series of maps on the conditions of agricultural resources; deforestation and regeneration of subalpine coniferous forest in subalpine areas; the multiple utilization of local energy resources; strategy for the development of animal husbandry and finally the management of the natural resources in the arid valleys. This has been done in line with the purpose of linking scientific research closely to the development of the local economy.

The integrated survey on the Hengduan Mountains Region is organized by the Commission for Integrated Survey of Natural Resources under the Chinese Academy of Sciences and the State Planning Committee. There are more than 300 people, coming from more than 40 institutions including different institutes of the Chinese Academy of Sciences, universities and local scientific research and production departments engaged in natural resources research. A series of scientific publications on the Hengduan Mountains will provide the results acquired from the second phase of the integrated scientific survey in the Qinghai-Xizang Plateau. It is designed that this series will consist of 39 volumes and 48 monographs. It is also expected that this series will play an important role in exploring the wonders of the Qinghai-Xizang Plateau and in the construction of China.

The Comprehensive Scientific Expedition
to the Qinghai-Xizang Plateau, the
Chinese Academy of Sciences

前　言

横断山区为青藏高原的组成部分，位于我国西南部的藏东、川西和滇西北，面积约50万平方公里，行政区划上包括西藏的昌都地区(芒康、左贡、类乌齐、江达、察雅)，四川的甘孜州、阿坝州、凉山州的安宁河以西和云南的怒江州、大理州、迪庆州和丽江地区。地质构造上为南亚次大陆与欧亚大陆镶嵌交接带的东翼，是我国东部环太平洋带与西部古地中海带间的过渡地带。由于造山运动的结果，形成本地区大部为高山峡谷，山脉河流南北纵贯，相间排列，整个地势由西北向东南倾斜，气势雄伟磅礴，自然景观绚丽多彩，气候、植被、生态条件复杂多变，生物种类十分丰富，是我国自然资源的一大宝库。研究横断山区昆虫区系的组成与特点，不仅对探明该区自然条件的特点，自然资源的状况及合理开发利用的途径都有重要的意义，而且对进一步揭示喜马拉雅山的隆起与青藏高原的形成和演替历史以及对自然环境的影响提供新的科学依据。

1981—1984年期间，中国科学院横断山区综合科学考察队昆虫组对该区进行了系统的考察。中国科学院动物研究所昆虫分类研究室先后有21人次参加了野外工作，其中参加时间最长的有王书永、张学忠、崔云琦3人。总共收集昆虫标本达17万多号，为研究该区昆虫区系的起源、演化和区系特征积累了丰富的资料。1984—1989年期间，先后又经全国16个单位共93位专家的共同努力，共计鉴定昆虫纲19目，230科，1 971属，4 758种，其中包括新属24个，新种841个(其中有322个新种已先行发表)；鉴定蜘蛛纲蜱螨目6科23属68种，其中包括新种9个(有7个已先行发表)。另外，对建国以来我国昆虫学工作者在本区采集积累的零星标本，也一并整理鉴定，汇集于本书中。

《横断山区昆虫》是我国继《西藏昆虫》之后，青藏高原科学考察的又一成果，是西藏昆虫考察研究的继续和发展。这一专著的特点是：就地域性昆虫区系调查来说，其规模之大，种类之多是建国以来最令人瞩目的；就其研究的深度来讲，不少类群，不仅仅局限于种类鉴定和新种记述，而且还对区系组成及其特点进行了程度不同的分析，这就为进一步探讨该地区区系的形成、演变及其与周围地区昆虫区系的关系和相互影响提供了广泛的基础，使之能对该地区昆虫区系的特点提到理论的高度来认识，具有更高的学术价值。编写过程是由各个昆虫类群的作者根据编委会统一规定的格式和要求撰稿，先送各编委(各有关目的主审人)修改后，再由编委会讨论定稿。因此，本书既有统一的形式与规格，又有各专题的独立成篇，各抒己见，体现"百花齐放，百家争鸣"的方针。总论部分是王书永、谭娟杰两位同志根据各篇的基本内容，做了大量统计分析工作撰写而成。

《横断山区昆虫》从组队考察、标本制作、整理鉴定到编写定稿，前后共经历了9个春秋，它吸引了我国大部分昆虫分类学家为之共同奋斗，把完成这一任务看做是自己的历史使命。它的问世是全国昆虫分类学工作者大协作的结晶。在一定程度上代表了我国一个时期这支科技队伍的成长情况。这项工作自始至终得到中国科学院动物研究所在人力、物力等方面的大力支持；全国各有关单位选派有关专家参加本书的编写，在此一并致

谢。

本书内容涉及的对象十分广泛，而我们的经验又很不足，知识有限，谬误之处在所难免，敬请各方读者不吝赐教，以便日后更正。

编委会

1989年9月

FOREWORD

The Hengduan Mountains Region, a constitutional part of the Qinghai-Xizang Plateau, is situated in the east of Xizang, west of Sichuan and northwest of Yunnan provinces in southwest China. The area of this region is about 0.5 million square kilometres and administratively including the Qamdo Prefecture of Xizang (Markam, Zogang, Riwoqê, Jomda, Chag'yab), Garzê, Aba, Liangshan (the west of Anning River) of Sichuan, and the Nujiang, Dali, Dêqên and Lijiang prefectures of Yunnan. In geological structure, it lies on the east flank of the juncture where south Asia subcontinent and Eurasia are mounted. It is the transition region between the east zone encircling the Pacific and the west zone of ancient Mediterranean. As a result of tectogenesis, the altitude of this area declines from northwest to southeast. Most part of the region is characterized by a series of parallel mountain ranges and rivers from north to south and with a sharp altitudinal differentiation. Its unique physical conditions and various ecosystems being rich in flora and fauna make it a valuable area for scientific study. Study on the composition and basic characteristics of the insect fauna in the Hengduan Mountains Region not only gives a better understanding of the formation and evolution of Qinghai-Xizang Plateau and its influence on the environment around, but also has direct or indirect significance in appraising the natural resources and finding a rational way of exploiting and utilizing them.

During the period from 1981 to 1984, totally 21 persons of the Insect Research Group of the Comprehensive Scientific Expedition to the Hengduan Mountains Region, Academia Sinica, took part in the field collections, among them, Wang Shuyong, Zhang Xuezhong and Chui Yunqi made the greatest contributions. 0.17million specimens were collected, which are valuable materials to study the origin, evolution and the characteristics of insect fauna there. From 1984 to 1989, owing to the great efforts by 93 entomologists who belong to 16 different institutions, most of specimens are identified and the results are listed as follows; within Insecta, 19 orders, 230 families, 1 971 genera, 4 758 species, among them there are 24 new genera and 841 new species (329 new species were published previously), and within the Acarina, 6 families, 23 genera, 68 species, among them 9 new species (7 new species were published previously). In addition, all other specimens sporadically collected from this area are also contained in it.

This book is another important achievement of Qinghai-Xizang Plateau Scientific Expedition after the publication of "Insects of Xizang". It is unprecedented either in broadness of expedition scale or in the great number of included species in the regional survey of insect fauna since 1949 in China. Within most of the studied groups, there are not only the results of identification, but also the analysis of their faunal composition and distributional features, which give much better basic materials to understand the formation and evolution of insect fauna in this region and its relationship with the neighbouring. This book is an elaboration of papers in accordance with the uniform and claim of the Editorial Committee. The general

discussion based on all papers is contributed by Wang Shuyong and Tan Juanjie.

This work attracting most of the Chinese insect taxonomists who consider it and a historical mission and spent 9 years from field collection, identification to final manuscripts. This is also a result of cooperation among insect taxonomists and reflects the advances in insect taxonomy of our country. Finally, thanks are due to the Institute of Zoology, Academia Sinica and related institutions and entomologists for support of the expedition and for the completion of this book.

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