



THE PLANTS ON THE
CHANGBAISHAN MASSIF OF CHINA

中国长白山植物

祝廷成 严仲铠 周守标 主编



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内 容 简 介

长白山位于中国东北部,与朝鲜相邻,是欧亚大陆东岸的最高山。作为国家级自然保护区,长白山拥有完好的大片原始森林,植物种类繁多,植被的垂直分布十分明显,展示了地球表面植被水平分布(落叶阔叶林、针叶阔叶混交林、针叶林、苔原)的缩影。海拔1800m以上的高山苔原,是欧亚大陆山地苔原的南端——中国独一无二的高山苔原。由于地理位置、地质、气候等生态环境因子的变化,使长白山的植物区系和植物群落与我国其他山区以及北美洲相比,有明显的特点。

本书是一部图文并茂的专著。书中收录了800余种植物、1000余幅彩色图片,这些图片主要源于作者们对长白山植物多年来考察与研究积累的第一手材料。每种植物都附有文字说明,对植物的形态、生态特性、生态环境及其利用价值等进行了论述,向读者完整系统地展示了长白山丰富多彩的植物种类和自然景观。

本书可供从事植物学、生态学、环境科学、地理学、森林学和自然保护的科研人员和大专院校有关专业师生阅读。

A Brief to the plants on the Changbaishan Massif of China

Locating in the northeast part of China and adjoining to Korea, the Changbaishan Massif is the highest massif in the east coast of Eurasia. It is a national natural sanctuary, with a large area of undamaged primitive forests consisting of abundant plant species, and has a clear vertical vegetation distribution pattern, which displays a miniature of horizontal vegetation distribution pattern on the earth surface (deciduous broad-leaved forest, coniferous forest and tundra). The alpine tundra especially with an elevation of more than 1,800m locating in the south border of mountain tundra in Eurasia is the unique alpine tundra in China. The floristic composition and vegetation on the Changbaishan Massif is different from those in other regions of China or in North America because of such factors as geographical location, geology, climate, and the variation in ecological environments.

In this book, there are almost 800 species of plants described and more than 1,000 color pictures selected from firsthand materials accumulated during the authors' survey and research for many years. To each plant species is attached a caption which describes the morphological and ecological characteristics, habitats and uses of the plant, thereby shows rich plant species and beautiful natural landscapes to readers.

This book may be used by botanists, ecologists, geography and forestry scientists, as well as the teachers and students in related fields in colleges and universities.

作者简介



植物学教授 祝廷成

1926年7月生,吉林省吉林市人。

1950年7月,东北师范大学生物系毕业,留校任教至今。

1952年12月,哈尔滨工业大学研究生班毕业。

1978年10月,任教授,已培养硕士生20名,博士生16名,博士后7名。

1985~1986年,加拿大萨斯卡彻温大学植物生态系访问教授,合作研究长白山与洛基山北段植物的比较。

在学术团体中,先后当选为吉林省植物学会副理事长;吉林省农业生态经济研究会理事长;吉林省生态学会理事长;中国生态学会常务理事、顾问;中国草地学会副理事长、名誉理事长;中国草地生态研

究会副理事长、名誉理事长;国际草地大会(IGC)第十六、十七届常任理事,是IGC的第一位中国理事,代表亚洲东部地区。

学术上专攻草地生态,同时研究长白山植物。已发表论文284篇(其中国外发表28篇),主编专著6部。获教育部、农业部、中国科学院科研成果奖10项,中共吉林省委、吉林省政府授予“首批省管优秀专家”。

关于长白山植物的主要著作有:《长白山地理风光》、《长白山生物资源的保护》、《中国东北经济树木图说》、《长白山高山植物与北美洲的比较》、《中国长白山高山植物》等。

Brief introduction of the chief

(Zhu Tingcheng, Professor of Phytoecology)

Professor Zhu Tingcheng was born in July 1926 in Jilin City of Jilin Province P. R. China. He graduated from the Biology Department of Northeast Normal University in 1950 and then became a teacher in the same university, a position he still occupies. In 1952, he graduated from the postgraduate course of Harbin Industry University and was promoted professor of phytoecology in 1978. He has trained 20 master students, 16 Doctoral students and 7 Postdoctoral fellows. During the period from 1985 to 1986, he worked in the Phytoecological Department of Saskatchewan University as a visiting professor, conducting collaborative research on the comparative study on floristic composition between Changbai Mountain and the Northern parts of the Rocky Mountains.

Professor Zhu ever was Vice Chairman of the Plant Society of Jilin Province, Chairman of the Agricultural Eco-economy Research Society of Jilin Province, Honorary Chairman of the Ecological Society of Jilin Province, Standing Member and Consultant of the Chinese Society of Ecology, Vice and Honorary Chairman of the Chinese Society of Grassland and Vice Chairman of the Chinese Research Society of Grass-

land Ecology and a Member of the continuing committee of the 16th and 17th International Grassland Congress (IGC) as the representative for eastern Asia.

Professor Zhu has major interests in both grassland ecology and Changbai Mountain plants. He has published 284 scientific articles, of which 28 have been published in foreign journals. In addition, he acted as editor-in-chief in the compilation of 6 specialized works. He has been awarded 10 prizes for science and research achievement from the China Education Ministry, the China Agriculture Ministry and the Chinese Academy of Sciences, and has been conferred as a First Group Excellence Expert by the Jilin Provincial Government.

Professor Zhu has published many works about Changbai Mountain Plants, including Geographic Scenery of Changbai Mountain, Protection of Changbai Mountain Plant Resources, Illustrated Books on China Northeast Economical Arbor, Research on Comparison between Alpine Plants of Changbai Mountain and Plants of North America and Alpine Plants of China Changbai Mountain.

中国长白山植物

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序

巍巍长白山,风光无限;茫茫林海,掩映湖光山色。举世闻名的长白山位于吉林省东南部中朝边界,是我国边疆大地上一颗璀璨的明珠,是吉林省实施可持续发展战略和生态省建设的重要基础。

长白山被誉为“立体资源宝库”,是欧亚大陆北半部最具代表性的自然综合体,是地球上少有的“物种基因库”和“自然博物馆”。1980年,经联合国教科文组织批准,长白山加入国际“人与生物圈”保护区网,被列为世界自然保留地。长白山不仅生态环境优良,而且还蕴藏着丰富的森林、矿产、野生动、植物以及旅游等资源。山上的奇花异草、珍禽异兽品种繁多,是国内外生物学家向往的研究对象,为国内外动、植物学研究提供了大量的珍贵素材。

由我国著名生态学家、东北师范大学祝廷成教授等编著的《中国长白山植物》和高玮教授等编著的《中国长白山动物》,收录了长白山1000多种动、植物的生态本底,图文并茂,栩栩如生,是东北师范大学50年来考察、研究长白山生物的系统总结,对长白山动、植物资源的研究、开发、利用具有较高的参考价值。相信这两部书将深化人们对长白山的了解,强化对动、植物资源的保护意识,促进人与自然的和谐共处,对吉林省生态省建设和经济发展必将起到重要的促进作用。

吉林省省长



2002年10月31日

Preface

Lofty With a vast landscape, spacious forests and beautiful sceneries, the world famous Changbaishan Massif lies on the border between China and DPRK, partly in the Southeast of Jilin Province. It is a brilliant pearl in the spacious border land of China and an important base for Jilin Province to implement sustainable development strategy and eco - province construction.

Changbaishan Massif is honored as a "solid store of natural resources". It is the most typical representative natural complex in the northern half of Eurasia. It is also a gene pool of rare species and a natural museum of the world. It has been entitled to join in the international nature reserve network of Man and Biosphere in 1980 under the ratification of UNESCO and is ranked as a world nature reserve. Changbaishan Massif not only has excellent ecological environment but holds in store abundant woods, water, mineral products, wild plants and animals, tourist resources and so on. The number of rare flowers and grasses, as well as rare animals on the mountain is enormous. They are the precious research materials that biologists at home and abroad have been dreaming of for many years.

"The plants on the Changbaishan Massif of China "compiled by Professor Zhu Tingcheng from Northeast Normal University, a famous ecologist in China, and "The animals on the Changbaishan Massif of China" complied by Professor Gao Wei, have collected ecological informations about more than 1,000 species of plants and animals in Changbaishan Massif. They are described by pictures and texts in these books and are the systematical summaries through the fifty years of exploratory search of Changbaishan Massif by Northeast Normal University. The two books possess high academic values for the research, exploitation and utilization of the resources of Changbaishan Massif. It is certain that the two books will make the readers acquainted with Changbaishan Massif and raise public awareness to protect plants and animals, promote harmonious coexistence between man and nature. They will also have importants and positive impacts on eco - province construction and economic development of Jilin Province.

Jilin Provincial Governor: Hong Hu
Oct. 31, 2002

前 言

长白山是欧亚大陆东侧的最高山,是我国著名的休眠火山,海拔 2 744m,雄峙于我国东北的东南部。以它独特的林海奇峰、温泉瀑布、异兽珍禽和丰富的植物,集自然秀美于一体,成为旷世罕见的名岳。迷宫般的原始森林,莫测的天池湖泊,飞流倒挂的长白瀑布以及那变幻莫测的云海,使长白山成为世人瞩目的生态旅游胜地。

长白山拥有保护完好的大片的原始老林(针、阔混交林和针叶林)。植物种类繁多,有明显的垂直分布景观,因此,称之为“立体植物园”。长白山东濒太平洋,由于气候、地形的影响,气温随海拔的升高而有规律地递减,使得山体植物自下而上,明显分成 5 个垂直分布带。从山下到山顶的 2km 垂直高度内,就如同由温带森林进入了北极苔原,展示了地球表面植物水平分布几千公里的缩影。首先映入眼帘的是枝叶繁茂、葱葱郁郁的阔叶林、针阔叶混交林、针叶林这 3 个森林带。红松、落叶松、鱼鳞松、紫椴、白桦、黄菠萝以及各种槭树等交织成荫,鳞次栉比,高插入云。林下灌木、草本以及藤本植物蔓延缠绕,密布其间。越过森林带,则是另一番景象;龙钟老态的亚高山岳桦林带,矮小屈曲的树木,显示了其顽强的生命力。岳桦林下的牛皮杜鹃、蓝靛果忍冬、越桔、高山桧以及草苳蓉、金莲花、七瓣莲等草木,更为沉寂的山腰增添了几分秀色。海拔 1 800 ~ 2 000m 以上是欧亚大陆山地苔原的南端——我国独一无二的高山苔原带。无数鲜花,姹紫嫣红,似“天国花园”般的美丽。长白山万紫千红、绚丽多彩的植物,正是本书论述的重点。

长白山是美丽的、神秘的,它的雄伟和神奇,远在天地初开的洪荒时代,便受到中华民族祖先们的注视。早在周秦之前,人们称长白山为“不咸山”;汉朝称它“单单大岭”;魏时称“盖马大山”;南北朝称“徒太山”;唐代称其为“太白山”;自金代始称“长白山”。1677 年,清朝政府派官员实地考察长白山,记载了山顶“香木丛生,黄花灿烂,碧水澄清,微波荡漾”,第一次将它的美丽和富饶披露世间。1909 年长白山的地方官员,登山拍摄了天池、瀑布、峰峦、嘉木,共 40 余张照片,始为这座名山敞开了几扇窗口,引起人们的浓厚兴趣。但是,历史上的记录,无论文字方面,还是形象方面都不够完整,不足以揭示长白山巍峨秀丽的自然全貌。

新中国成立以后,人民政府组织科学工作者对长白山多次进行考察。1960 年在长白山建立了自然保护区,1979 年在长白山建立“联合国‘人与生物圈’森林生态系统研究定位站”,将它列入国际自然保护区网。东北师范大学位于长白山脚下,广大师生经常登山,进行教学和科学研究。在此过程中,笔者实地拍摄了植物照片,年积月累,收藏了千余幅之多,是本书选辑图片的来源之一。同时,为了在科学性的前提下,反映不同的植物种属,还从同行友人及摄影艺术家手中征集多幅珍品,基本上表达了长白山色彩纷呈、令人心旷神怡的奇花异草和茂林佳卉。

倘使本书的问世,能对植物学、生态学、森林学、地理学以及自然保护科学的发展有所促进,能为从事这些领域的教学和科研人员提供参考,能有助于吉林生态省的建设,那正是笔者和本书其他编著者的心愿。

杨承禄、杨野、尹力钊、刘子德、苏楠、李太允、魏成录、黄变才、吴光弟、韩璎、李钟杰、金洪锡、吕秀、李岛等先生为本书提供了一些照片,在此顺致谢意!

本书在编辑、出版过程中,承蒙北京科学技术出版社和延边人民出版社大力支持,多方协助,敬致衷心的感谢。由于水平有限,深感多有不足之处,殷切希望批评指正。

谨以此书作为向吉林生态建设的一份献礼!

张连成

2002年9月

Foreword

The Changbaishan Massif, rising prominently in the south of Northeast China, attains the greatest elevation in the region, with its highest peak reaching 2,744m. The mountain range is characterized by dormant volcanoes, extensive and unusual forests and awe-inspiring peaks, hot springs and waterfalls, rare water fowl and other unusual wildlife, and a great variety of alpine plants. It is an exceptionally magnificent massif of grandeur and beauty, attracting a global interest as a tourist resort. It is renowned for its dense flourishing forests, deep and beautiful lakes, the spectacular Changbai Waterfalls, and rapidly changing cloud formations. The Changbaishan Massif is noted for a cubist garden of plants for its intact primitive forests containing many different plant species in a distinctive vertical distribution. It borders the Pacific Ocean on the east. Owing to its distinctive climate and topography its temperature drops gradually and regularly with the increase of the elevation, resulting in five vertical vegetation zones from the foot to the top. As one ascends a distance of only 2 km from the foot of the mountain to the top, one can observe in miniature the vegetation types that are horizontally distributed over an area of several thousand square kilometers, as if traveling from temperate forests to arctic tundra. First one meets the three forest zones: broad-leaved forests, mixed needle-leaved and broad-leaved forests, and needle-leaved forests, all of which are lush and green, and with dense branches. *Pinus koraiensis*, *Larix gmelinii*, *Tilia amurensis*, *Betula platyphylla*, *Phellodendron amurense*, and various maple species mix to form thick forests reaching into the clouds. Shrubs, herbaceous plants and trailing and twining lianas form a dense ground cover. At the upper limit of the forest zones, one views the wonderful subalpine zone of *Betula ermanii*, with gnarled trees of short and crooked trunks and an indomitable vitality. The ground layer of the *Betula ermanii* forest is mostly composed of shrubs and herbaceous plants, such as *Rhododendron chrysanthum*, *Lonicera cyanocarpa*, *Vaccinium vitisidaea*, *Juniperus sibirica*, *Boschniakia rossica*, *Trollius chinensis* and *Trientalis europaea*. These shrubs and herbaceous plants add beauty to the secluded hill slopes. At elevations of 1,800 ~ 2,000m, the lower limit of the alpine tundra appears, which is unique in China. Numerous flowers weave a spectacular carpet of colors, gorgeous and dazzling, rivalling the "Garden of the Kingdom of Heaven". The characteristic alpine plants are the focus of this album.

The Changbaishan Massif is beautiful and mysterious. Its magnificence and mystery have been recorded by the Chinese people since the cultivation of virgin soil in historical times. Prior to the Zhou and Qin dynasties (1066 - 206 B. C.), it was called "Buxian Shan", then "Dandan Daling" during the Han dynasty (206 B. C. - 200 A. D.), "Gaima Dashan" during the Kingdom Wei (220 - 265 A. D.), "Tutai Shan" during the South - North dynasty (420 - 581 A. D.), and "Taibai Shan" during the Tang dynasty (618 - 907 A. D.). The name of "Changbai Shan" was born in the Jin dynasty and has been used ever since. In the Year of 1677, the Qing government dispatched officials to make an on-the-spot investigation of the Changbaishan Massif. They first recorded and revealed its beauty and floristic richness. Their records are as follows, "the top of the mountain is overgrown with shrubs of a lovely smell, brilliant yellow flowers are everywhere, and ripples are on the dark blue lake." In 1909, local government officials climbed up the mountains and took over 40 pictures of the lakes, waters, ridges and peaks, and attractive tress. Consequently, this famous mountain massif began to become widely known and attracted great interest. Nevertheless, the historical records, both written and pictorial, cannot fully reveal the overall value of the Changbaishan Massif.

After the founding of new China, the central government organized repeatedly scientific expeditions to the Changbaishan Massif. In 1960, a nature reserve was established, and in 1979 the Changbaishan Forest Ecosystem Research Station was built for the Biosphere Research Network and related projects of the "Man and Biosphere" program sponsored by the UN. Teachers and students of Northeast Normal University, privileged by the situation of their school at the base of the Changbaishan Massif, often climb the mountains for teaching and scientific research. In this process, I kept taking photographs of the alpine plants. As the saying goes, "the finest fragments of fox fur, sewn together, will make a robe." Thus, I have accumulated, over a long period of time, over 1,000 photographs, which constitute the major source of the selected photographs of this album. In order to show different plant landscapes for both scientific and aesthetic purposes, I have also collected many valuable photographs from my colleagues, friends and professional photographers. This collection reflects the rare and characteristic alpine flowering plants and the dense forests containing many valuable and decorative trees. As a result, readers can derive a general view about the Changbaishan alpine plants and admire their beauty with pleasure and interest.

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The publication of this album is to facilitate the development of botany, ecology, forestry, geography and nature conservation science, and is intended as a reference for scientific researchers in these fields. This is the shared aspiration of the authors and editors of this album. Acknowledgements and thanks are due to Beijing Science and Technology Publications and Yanbian Renmin Publications for collaboration and support in the edition and publication of this book.

Zhu Tingcheng
September. 2002

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