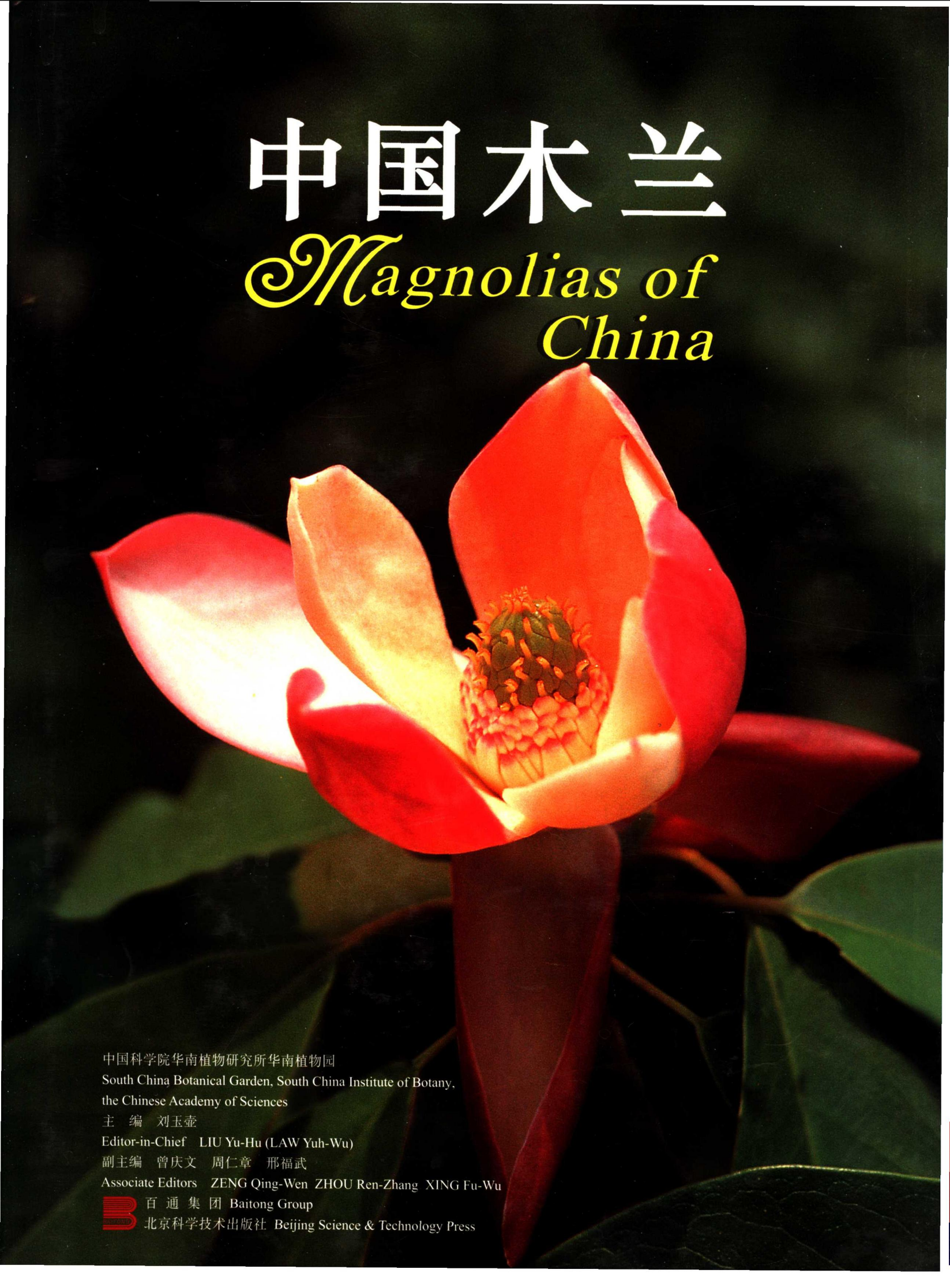
中国木兰

Magnolias of China



中国科学院华南植物研究所华南植物园

South China Botanical Garden, South China Institute of Botany, the Chinese Academy of Sciences

主　编　刘玉壶

Editor-in-Chief　LIU Yu-Hu (LAW Yuh-Wu)

副主编　曾庆文　周仁章　邢福武

Associate Editors　ZENG Qing-Wen　ZHOU Ren-Zhang　XING Fu-Wu

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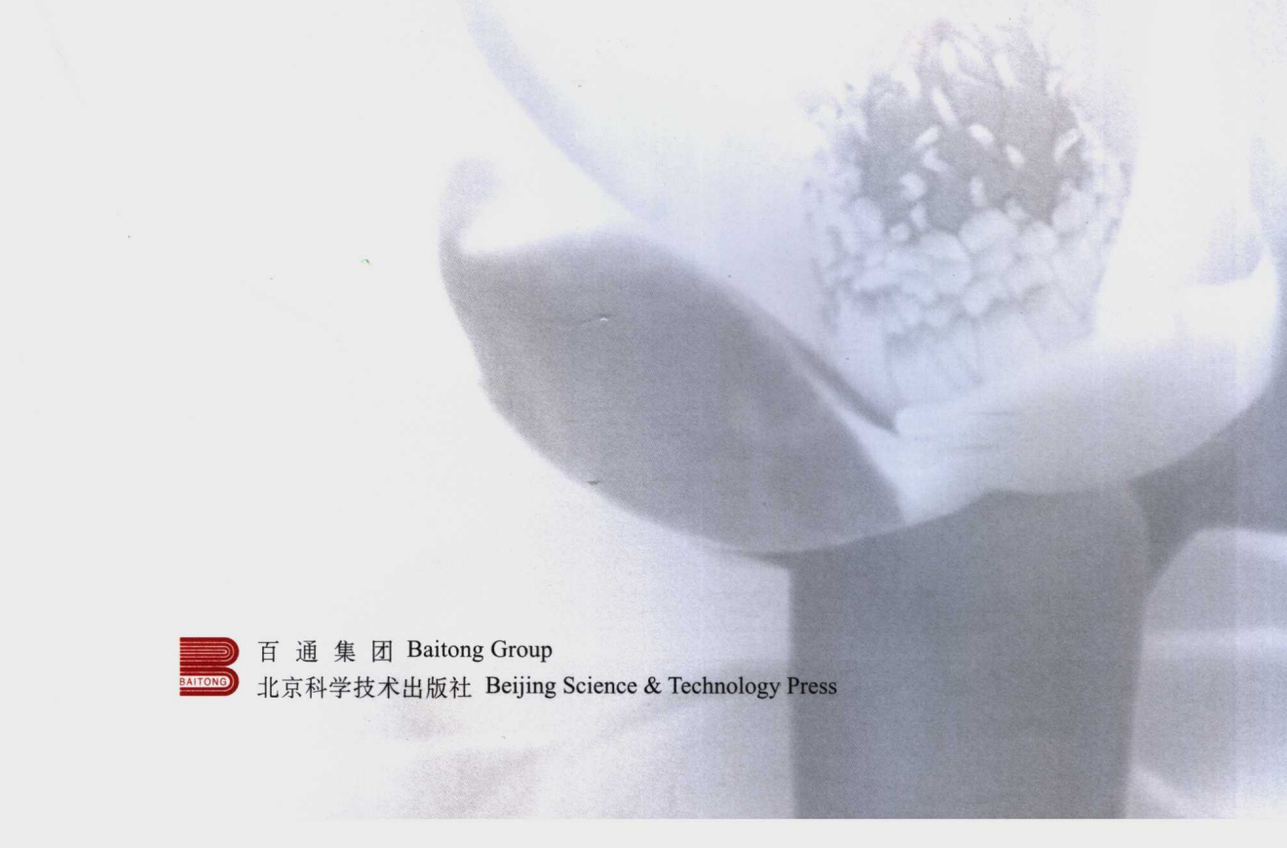

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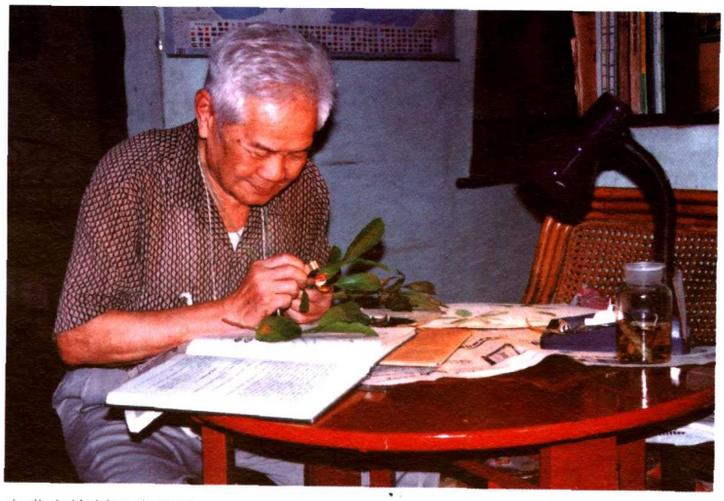
刘玉壶 教授

Professor LIU Yu-Hu



本书主编刘玉壶教授。

Editor-in-chief, Prof. LIU Yu-Hu.

刘玉壶教授是我国著名的木兰科系统分类学家，1917年出生于广东省中山县，1942年毕业于原中央大学森林系(今南京林业大学)，先后在原中央大学森林系、中央研究院植物研究所、中国科学院南京植物研究所、武汉植物研究所和华南植物研究所从事植物研究工作。从1985年起担任国际自然保护同盟(IUCN)物种生存委员会委员。1992年获国务院批准的政府津贴。他从事木兰科植物的研究工作已有30多年，在木兰科系统分类学方面有较高造诣，对木兰科植物的起源、进化及地理分布有非常深入的研究，共发表论文50余篇、专著近20卷，发表新分类群2属、28种、2变种，并有创见地提出了2亚科-2族-5亚族-16属的木兰科分类新系统。这一新系统已为国内外学者所引用和赞赏。同时，他还带领他的课题组在中国科学院华南植物研究所华南植物园(广州)建立了全世界种类最多的木兰科植物种质保存基地——木兰园，共迁地保存木兰科植物11属、130多种，为研究被子植物的起源和进化奠定了坚实的物质基础。

1982年5月18日作者在云南麻栗坡茨竹坝进行野外调查时与参加护送的部队官兵合影。

This picture showed that the author carried through a field investigation of Magnoliaceae under the guardianship of the PLA officers and soldiers in Cizhuba, Malipo, Yunnan on May 18, 1982.

Professor LIU Yu-Hu (LAW Yuh-Wu), a famous taxonomist on Magnoliaceae, was born in Zhongshan County of Guangdong Province in 1917. After graduating from Forestry Department of former Central University (now Nanjing Forestry University) in 1942, he worked there and afterwards in the Institute of Botany of Academia Sinica, Nanjing Institute of Botany, Wuhan Institute of Botany and South China Institute of Botany of the Chinese Academy of Sciences. He has been a member of Species Survival Committee of IUCN since 1985. As a leading scientist, he gained government allowance authorized by the State Council of China in 1992. Having been working on taxonomy, origin, evolution and distribution of Magnoliaceae for more than 30 years, he described 2 new genera, 28 new species and 2 new varieties and proposed a new taxonomic system that has been widely accepted by botanists all over the world. Totally he published more than 50 papers and 20 academic books. At the same time, under his leadership, a conservation base — the Magnolia Garden, with the richest species of magnoliaceous plants in the world, was set up in South China Botanical Garden (Guangzhou), which contains 11 genera and more than 130 species and thus establishes a solid foundation for the research on the origin and evolution of angiosperms.

1999年11月22日全国人民代表大会副委员长、中国科学院院长路甬祥院士视察华南植物园木兰园时与本书作者合影。

Prof. LU Yong-Xiang, vice-chairman of the committee of the National People's Congress, the academician and president of the Chinese Academy of Sciences, inspected the Magnolia Garden, South China Botanical Garden, photographed with the authors on November 22, 1999.

2000年1月20日美国密苏里植物园主任彼得·雷文教授参观华南植物园木兰园。

Prof. Peter Raven, the director of Missouri Botanic Garden, USA, visited the Magnolia Garden, South China Botanical Garden on January 20, 2000.

序

大约2亿年前，地球陆地生物圈发生了重大突变。绿色高等植物中的一支家族——有花植物（主要是被子植物）出现在现代太平洋形成之际，并迅速发展和演化成一个最大的家族，成为提供绿色产品（食物、药物、木材等）的基础。有花植物在当时的陆地生态系统中，主要是热带、亚热带森林中，尤其是在常绿阔叶林中，孕育着昆虫、鸟类、哺乳动物，特别是草食动物和包括人类在内的灵长类（猴、猿、猩猩等）动物，它们互相依存，互相制约，协同进化。

有花植物的花是什么？是怎样形成的呢？伟大诗人歌德曾经从木兰科植物的花中得到启发，认为植物的花是由能生殖的枝叶变化而来的。这一理论现已为绝大多数的植物系统学家所接受，木兰科植物也几乎被公认为是有花有果植物的先驱和代表，并将它们归为木兰植物门。木兰科植物是我国植物中的国宝，它是东亚和东南亚

地区常绿到落叶森林里的老寿星，繁衍了多样化的后代。它材质优良，久供建筑造船之用。其花大色丽，芬芳馥郁，玉兰、木笔（紫玉兰）、夜合（夜香木兰）、含笑、白兰等久已是名花，辛夷（紫玉兰）、厚朴亦是从汉朝开始有记载的常用药物和香料。木兰科植物作为突出的造园绿化材料，我国先民发现和栽培至少有2 500年的历史，而后才传入日本和欧美。所以它们不但有极宝贵的学术研究意义，也有极其广泛和重要的应用价值。木兰科植物对环境保护和改造的价值更大，它们和樟、楠、柯、栲、栎、木荷、蕈树所组成的极其多样化的，从东北南部到海南岛，从沿海和东南亚到喜马拉雅山，尤其是长江以南的常绿阔叶林是我国的一大特色，我国的“青山绿水”由此而来。从中生代到现在，常绿阔叶林至少有1亿多年起着稳定气候，涵养水源，培肥土壤的巨大生态作用，使江南、岭南鱼米之乡，富源不断。但是，由于5 000年来气候的变化，水土的流失和持续的人为破坏，虽然“继周八代争战罢”到晚唐诗人看到的自然景观中，江南仍然有现在已不能体会的“猿（长臂猿）啼洞庭树，人在木兰舟”的感受，即使再经过若干朝代，明代徐文长还见到猿，并画出它的形象，但是毕竟常绿阔叶的木兰已从黄河南岸退向南方的长江南岸。明朝用尽了江西、福建的楠木材料后，改用松杉，到现在长臂猿也就只有在海南和云南的深山才可见到了。不合理的开发利用，缺乏有效的保护，使国宝资源越来越少，木兰科植物某些属种的分布幅度越来越窄，繁殖能力越来越低，趋于珍稀濒危的境地，不绝如缕了。

有鉴于此，在中国科学院出版的《中国植物志》这一巨大科学系统工程的推动下，华南植物研究所刘玉壶教授和他的研究组勇担重任，为了摸清木兰科植物在我国的家底，分清其种类，为了今后进行深入综合研究的需要，为了有效迁地保护自然资源，将种质留给子孙后代，他们跋山涉水，“访贫问苦”，广泛收集我国木兰科许多属种的活材料，从1981年起在华南植物园中率先建成占地12万㎡的木兰园。现已集中我国木兰科植物11属130余种各类木兰、木莲、含笑等，成为装点祖国南大门植物园的一大特色。现系统地将这些宝贵的图片和科学资料公之于众，其目的是以此教育公众，并使公众从中获得这些树种的识别特点，并在提倡保护自然、提高绿色文明的过程中发挥巨大作用。

读者如能重视木兰这一国宝资源，村村寨寨一个小山头、一道沟地就地保护这些国宝级的乡土树种，在松杉遍野的华南广为种植，化一园为多园，那么珠江流域就能在全国率先做到“有山皆绿，无水不清”，恢复她本来的美貌。那么长江也会随之“客路青山下，行舟绿水前”。北方自也不必等待千年“黄河清，圣人出”了。谨以此为序，以祝其大成。

中国科学院院士

吴征镒

2002年7月12日于昆明

Preface

The global terrestrial biosphere underwent drastic changes approximately 200 millions years ago. A branch of higher green plants, the flowering plants in which mainly are angiosperms, emerged during the formation of the present Pacific Ocean. It achieved rapid development and evolved into the biggest plant group that provides the foundation of green products (food, medicinal materials, wood, etc.). At that time, the terrestrial ecosystem that the flowering plants roomed was mainly represented by tropical and subtropical forest, especially the evergreen broad-leaved forest, in which also bred insects, birds, mammals, especially herbivores and primates (monkeys, apes, orangutan, etc.), including human beings, with the relationships of mutual dependence, mutual restriction and coevolution.

What is the flower of a flowering plant? How did it come from? Obtained enlightenment from the flowers of magnolias, the great poet Goethe thought that it was derived from reproducible branches and leaves. This theory is now widely accepted by most of the plant systematists, and Magnoliaceae is generally considered as the pioneer and representative of those plants with flowers and fruits and merged into Phylum Magnoliophyta . Just for this reason, Magnoliaceae is thought to be the national treasure of plant in our country. It is the eldest member of evergreen and deciduous forests in East Asia and Southeast Asia and has propagated diversified offsprings. The magnolias produce timber of good quality using for construction and shipbuilding, and their flowers are big, beautiful, and fragrant. Yulan (*Magnolia denudata*), purple magnolia (*Magnolia liliiflora*), Chinese magnolia (*Magnolia coco*), banana shrub (*Michelia figo*), white champak (*Michelia alba*) have been famous ornamental flowers for a long time, purple magnolia and officinal magnolia (*Magnolia officinalis*) are commonly used in medicine and as perfumes since Han Dynasty. Being outstanding garden plants, magnolias were discovered and has been cultivated in China for at least 2 500 years, and afterwards were introduced to Japan, Europe and America. They are important not only to scientific studies, but also for their practical usefulness. Magnolias still have more important functions in environment protection and improvement. Associating with *Cinamomum, Machilus, Lithocarpus, Castenopsis, Quercus, Schima* and *Altingia*, they form very diversified evergreen broad-leaved forests distributed from southern part of Northeast China to Hainan Island, from coastal China via Southeast Asia to Mount Himalaya, especially in the region south of Changjiang River, which present a major feature of China and bring us the splendid landscape of countryside with green hills and limpid rivers . From Mesozoic to present, during the long period at least 100 million years, these forests have played an important ecological role in climate stability, water maintenance and ground fertilization. They have made the vast area south of Changjiang River and south of Five Ridges become a land of plenty. Unfortunately, much has been changed due to the climatic change, soil erosion, and continuous man-made destruction over the last 5 000 years. Although disaster of war lasted for a long time since Zhou Dynasty, the poet in later Tang Dynasty could still enjoy the scene of gibbons crying in the trees on the bank, while he rowing a magnolia boat on the Dongting Lake that can never be seen today. Even after several dynasties, XU Wen-Chang, a painter in Ming Dynasty, could still find gibbons and drew their figures. But the broad-leaved evergreen forests of magnolias gradually retreated southward from area south of Yellow River to south of Changjiang River. After the timber of Nanmu (*Phoebe* sp.) from Jiangxi and Fujian provinces was exhausted in Ming Dynasty and was replaced by Pines and China firs, the gibbons disappeared there and now they can only be found in the remote mountains of Hainan and Yunnan provinces. Irrational exploitation and lacking of effective conservation measures caused these national treasures to become rarer and rarer, the distributive area of some species to become narrower and narrower, their capacity of natural reproduction to become reduced and finally rare and endangered, facing extinction.

For these reasons mentioned above and impelled by the grand project of Flora of China, Professor LIU Yu-Hu (LAW Yuh-Wu) and his research team in South China Institute of Botany, the Chinese Academy of Sciences initiated a comprehensive study on magnolias. In order to investigate the resources of Chinese Magnoliaceae, distinguish its species, meet the need of further comprehensive study in the future and carry out effectively *ex situ* conservation of germplasm of magnolias, they conducted extensive field trips to mountainous and remote areas in China to collect specimens and introduce living materials of magnolias. In 1981, for the first time they established a magnolia garden covering an area of 12 hectares and containing 11 genera and more than 130 species of Chinese magnolias including *Magnolia*, *Manglietia*, *Michelia*, etc.. This special collection forms a distinctive section in the South China Botanical Garden and makes the Botanical Garden of the South Main Gate of China more attractive. Now, Professor Liu and his team present their invaluable photographs and scientific data in this well-organized book, with the aim of increasing the understanding of people about these plants and the importance of nature conservation.

If all of us care the precious natural resource like Magnoliaceae, preserve these important native plants and widely plant them around villages, on hills or along ditches in south China, then the Pearl River Basin will be the first of our country to restore its original fine view of all the hills be green and all the waters be clean . And consequently, people who makes his trip on the River Changjiang will be able to enjoy the poetic beauty of passing under the green mountains, boating on the blue waters , and we do not have to wait for long when the Yellow River will become clear, too. These are my words to celebrate the publication of this book.

Wu Zheng-yi (C.-Y. Wu)

Academician of Chinese Academy of Sciences

July 12, 2002, Kunming

前　言

木兰科植物全世界共有16属300余种，主要分布于亚洲东部及东南部、北美洲东南部、中美洲及南美洲。我国产11属160余种，占全科属总数的69%，种总数的53%。我国从西南部至南部的滇、桂、粤、琼、黔及其邻近地区是木兰科植物的“现代分布中心”和“多样性保存中心”。我国是木兰科植物资源最丰富的国家，是名副其实的“木兰王国”。大量古孢粉化石研究和植物大化石的发现都说明木兰科植物可能起源于中国。

我国栽培木兰科植物已有2 500多年的历史，玉兰、紫玉兰等早在唐代就已传入日本，而后传到欧美各地。大多数木兰科植物树形优美，花大艳丽，高洁典雅，色彩缤纷，有紫、深红、桃红、粉红、黄、奶黄、纯白、乳白等众多花色，而且芳香袭人，深受广大群众的喜爱。美国著名植物学家Ernest H. Wilson (1876～1930)曾在他的论著中写道：“没有任何其他一类乔灌木能比木兰科植物在园林园艺界更著名、更受赏识，也没有任何其他一类乔灌木能比木兰科植物盛开更大、更丰富多彩的花朵”。木兰科植物具有非常高的观赏性，因而具有非常高的开发利用价值和广阔的市场前景，必将成为21世纪园林园艺界一颗璀璨的明珠。

然而，由于早期人们对木兰科植物资源的过度利用，热带、亚热带原始森林遭受日益严重的破坏，生态环境不断恶化，许多木兰科植物的自然繁殖能力逐渐衰退等原因，致使木兰科植物的不少种类已趋濒危。在我国重点保护的珍稀濒危植物名录中，木兰科植物就有30多种，是被子植物中生存受严重威胁种类最多的科之一。因此，保护木兰科植物种质资源，抢救其珍稀濒危种类，合理地进行开发利用和多学科研究，对于保护生物多样性和恢复已退化的热带、亚热带森林生态系统以及保护人类赖以生存的生态环境都具有非常迫切和重要的意义。

早在20世纪50年代，中国科学院华南植物研究所在前所长陈焕镛院士的倡导下，已开始着手收集木兰科植物。从1981年开始，在国家自然科学基金（资助项目批准号为85231，39570059和30070084）、国家环保局、中科院生物局、广东省环保局、美国木兰协会研究基金及香港嘉道理农场暨植物园的支持与资助下，在编著《中国植物志》这一巨大科学系统工程的带动下，华南植物研究所在全国率先开展了“中国木兰科植物及其珍稀濒危种类的引种繁殖研究”项目。由刘玉壶、周仁章、曾庆文、陈万利和庞成发等组成木兰科植物迁地保育研究课题组，对全国14个省区的木兰科植物进行系统的调查、采集和引种，在华南植物园建立了面积达12万m^2的木兰科植物种质基因库——木兰园，共迁地保育木兰科植物11属130多种，其中有90多种已开花，近1/3已结果。该课题组掌握了木兰科植物的引种繁殖、栽培管理和病虫害防治等一整套迁地保育的技术与方法，同时在选育园艺新品种和开展木兰科植物快速繁殖的研究方面也都取得了较大进展，已筛选并繁殖了70多种树形优美、花色艳丽、有较大推广价值的园林绿化和荒山造林树种约10万余株苗木，推广应用至全国13个省区、40多个县市及日本、美国等国内外共50多个单位，以进行园林绿化和退化森林生态系统的恢复与重建工程，取得了良好的经济效益和社会效益。在该木兰园的带动下，全国掀起了保护和研究木兰科植物的高潮，各地相继建立了100多个木兰园，为我国的生物多样性保育研究事业作出

了重要贡献。

该木兰园已成为世界上收集木兰科植物种类最多的活植物研究基地。华南植物研究所木兰课题组以木兰园为研究基地，对木兰科进行以系统分类学、细胞学、孢粉学、胚胎学、形态解剖学、植物化学、保护生物学等方面为主的多学科综合研究，共发表有关论文50多篇、专著8册，发表新分群2属、28种、2变种，有创见地建立了2亚科-2族-5亚族-16属的木兰科分类新系统，取得了“中国木兰科植物种质保存和开发利用研究”成果。该成果已于1996年4月29日通过了由国家环保局科技标准司主持的成果鉴定。由

赵善欢院士为组长的鉴定小组一致认为："该项目在木兰科稀有、濒危种的调查、引种、繁殖、保存以及系统分类方面的研究已达到了国际领先水平，为我国开展生物多样性保育研究作出了重要贡献。"该成果已分别获得1998年度中国科学院自然科学二等奖、1998年度广东省自然科学二等奖及1998年度中国科学院广州分院与广东省科学院科技进步一等奖。

在对木兰科的研究取得重大进展的基础上，华南植物研究所于1998年5月在广州成功地主持召开了"国际木兰科植物学术讨论会"。会议代表来自中国、美国、荷兰、俄罗斯、日本、新加坡等17个国家和地区，共103人。会议就世界木兰科植物在分类区系、系统进化、民族植物学、古植物学、细胞学、孢粉学、胚胎学、形态解剖学、分子生物学、植物化学、栽培育种、物种保护和资源开发利用等方面进行了深入的交流和研讨。国外代表对我国在木兰科植物的多学科研究和种质保存方面所做的富有成效的工作深表赞赏，并希望今后能加强合作研究。

经过20多年的努力，《中国木兰》这本书终于和广大读者见面了。20多年来，作者对我国的野生木兰科植物资源及我国有栽培的少量国外种进行了较深入的调查和研究，取得了大量的第一手资料，本书就是在此基础上编著而成的。编著此书的主要目的有二：①为广大植物学工作者进行有关木兰科植物的科学研究提供基本资料；②为广大林业工作者和园林工作者推荐一批应用价值和观赏价值较高的木兰科植物，以丰富造林及园林观赏植物的种类，提高园林绿化的水平与效果。本书可供植物学工作者、林业工作者、园林科研人员、园林绿化工作者、学校相关专业的师生以及木兰花卉爱好者参考。

为了更好地将中国木兰科植物推向世界，本书以中英文双语种出版，其主要内容包括：

①全书共收录木兰科植物11属170种、1杂交种、1亚种、6变种，其中46种和1变种（种名后加ined.）为第一次收录，每种植物分别列出其中文名、别名、学名、主要的形态特征、花果期、原产地、保护级别及在园林绿化上的应用等内容。

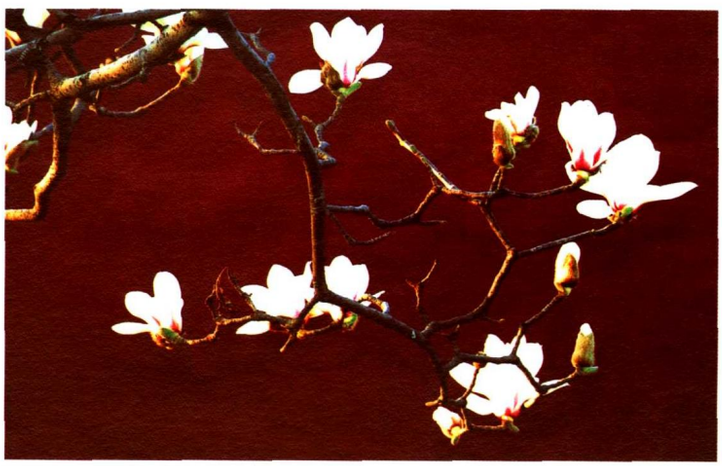
②全书共有彩色手绘图93幅、黑白手绘图44幅、彩色照片552幅，其中大多数植物都附有花、果解剖图和整株景观。

③书后附有木兰科植物的栽培繁殖技术与方法、刘玉壶的木兰科分类系统和植物中名（包括别名）索引。

本书在编写过程中，承蒙全国人民代表大会副委员长、中国科学院院长路甬祥院士为本书题写内封书名；我国著名的植物学家吴征镒院士为本书作序；中国科学院华南植物研究所胡启明教授对本书提出宝贵意见；百通集团顾问林有润教授参与此书的审阅；中国科学院华南植物研究所高级绘画师邓盈丰先生和余峰女士历20余载，以严谨、求实的科学态度为本书绘制了大量彩色、黑白解剖图；张桂才、王学文、朱亮锋、潘述江、苏耀平、李应兰、庞成发、林有润、樊汉明、郝刚、马国华、陈有卿等同事对木兰科植物研究工作予以莫大的支持和帮助；在野外工作期间，得到了全国有关地方政府、植物研究部门、林业部门以及自然保护区的鼎力相助，特别是云南省林业科学院高级工程师李达孝先生，文山州林业局高级工程师杨绍诚先生、张廷俊先生、徐家汉先生和昆明植物研究所副研究员孙卫邦先生、龚洵先生等，长期为本课题组的野外调查和种苗采集提供极大的帮助；本书部分图片由吕胜由、王亚玲、邬家林、吴光弟、孙卫邦、龚洵、盛宁、郑庆衍、闵成林、杨松、庄平、邹高顺、崔铁成、杨廷栋、张廷俊、毛宗国、李亚、王飞罡、陈荣道等人提供；木兰科植物的研究分别得到国家自然科学基金、国家环保局、中科院生物局、广东省环保局、美国木兰协会研究基金及香港嘉道理农场暨植物园的大力支持与资助。正是由于诸多单位和个人的共同努力，此书才得以顺利出版，在此谨向为本书的出版付出心血的单位和个人表示最诚挚的感谢！

编著者

2002年12月于广州



Introduction

The family Magnoliaceae is one of the most primitive groups of angiosperm (flowering plants), which comprises 16 genera and over 300 species mainly distributed throughout east and southeast Asia , southeast North America, Central America and South America. Approximately 11 genera and more than 160 species of Magnoliaceae are found in China, which include 69% genera and 53% species of Magnoliaceae in the world. Southwest and South China including the provinces of Yunnan, Guangxi, Guangdong, Hainan, Guizhou and their neighboring areas are the center of modern distribution and diversity conservation of the magnoliaceous plants. China is the country with the richest species of Magnoliaceae, so it deserves the reputation of Magnolia Kingdom . A great deal of ancient pollen and magnolioid fossil records suggest that magnolias were possibly originated in China.

China has the history of magnolias cultivation for more than 2 500 years. Yulan (*Magnolia denudata*) and purple magnolia (*Magnolia liliiflora*) have been introduced to Japan since Tang Dynasty, afterwards throughout Europe and America. Most of magnolias are widely enjoyed by their beautiful tree forms and large, elegant, fragrant and colorful flowers ranged from purple, carmine, pink, yellow to pure white, creamy white, etc.. No group of trees and shrubs is more favorably known or more highly appreciated in gardens than magnolias, and no group produces larger or more abundant blossoms than them. so stated by the great plant explorer Ernest H. Wilson (1876~1930). Since most of magnolias are highly ornamental, they have high value of exploitation and utilization and broad market prospects. In the 21th century, they will be the bright star for landscape-gardening and horticulture.

However, due to the over-exploitation of the resources of magnoliaceous plants, degradation of their natural habitats and decline of natural reproductive capability, many magnoliaceous plants have become endangered and extinct in the wild. More than 30 species of magnoliaceous plants have been listed in China s Red Data Book of Endangered Plants as rare and endangered species. Magnoliaceae has become one of the families which contains most of the rare and endangered species in angiosperm. Therefore, in order to conserve the biodiversity, to restore the degraded tropical and subtropical forest-ecosystem and to protect the environment which mankind relies on, it is necessary and very important to conserve the germplasm of magnoliaceous plants, to rescue the rare and endangered species and to carry vigorously on the multidisciplinary research for their rational exploitation and utilization.

In 1 950s, under the leadership of Professor CHUN Woon-Young, former director and academician of South China Institute of Botany, the Chinese Academy of Sciences, the project of collecting magnoliaceous plants was begun. Since 1981, sponsored by the National Natural Science Foundation of China (The granted numbers are 85231, 39570059 and 30070084), State Environmental Protection Administration of China, Biological Bureau of the Chinese Academy of Sciences, Guangdong Environmental Protection Bureau, Research Grants of the Magnolia Society International (USA) and Hongkong Kadoorie s Farm and Botanic Garden, and impelled by the grand project of Flora of China , South

China Institute of Botany for the first time initiated the project Studies on the introduction and propagation of Chinese magnoliaceous plants and its rare and endangered species . Members of the project research team included LIU Yu-Hu, ZHOU Ren-Zhang, ZENG Qing-Wen, CHEN Wan-Li and PENG Cheng-Fa. They carried through the systematic investigation, collection and introduction of magnoliaceous plants from 14 provinces and regions in China, and established a conservation base for germplasm of magnoliaceous plants — the Magnolia Garden, which covers an area of 12 hectares and contains 11 genera and more than 130 species of Magnoliaceae. Among these trees, more than 90 species have come into blossom, and nearly 1/3 of the species have come into fructification. A series of *ex situ* conservation techniques and the methods for introduction, propagation, cultivation, diseases and pests control as well as the management of magnoliaceous plants were brought forward. Significant achievements were made in the study of Magnoliaceae including the selection of new cultivars and the fast propagation method of plants. More than 70 species including over 100 000 individuals of magnoliaceous plants with elegant tree forms, showy flowers and valuable characters were selected and propagated for landscaping and afforestation. They were spreaded to more than 50 institutions including 13 provinces/regions and more than 40 counties in China and some foreign countries such as Japan and USA, being used for landscape-gardening and recovering the degraded ecosystems of the forest. Better economic and social benefits were obtained by this activity. Led by the Magnolia Garden, a high tide of researching and conserving magnoliaceous plants has been raised and more than 100 magnolia gardens have been established one after another. By this means, the significant contributions on the biodiversity conservation and research project of China have been obtained.

The Magnolia Garden becomes a research base of the living magnoliaceous plants and it possesses the world s richest and best magnoliaceous collection. Based on the Magnolia Garden, the Magnoliaceae research team of the South China Institute of Botany has made significant achievements on the polydisciplinary study of Magnoliaceae mainly involving systematics, cytology, palynology, embryology, morphology, phytochemistry and conservation biology, etc.. Totally 8 academic books and more than 50 papers were published. Within

them, 2 new genera, 28 new species and 2 new varieties were described, and a new taxonomic system, which consists of 2 subfamilies, 2 tribes, 5 subtribes and 16 genera was proposed. The achievement project Studies on the conservation, exploitation and utilization of the germplasm of Chinese magnoliaceous plants were gained. The achievement was appraised by Science and Technology Standard Department of State Environmental Protection Administration of China on April 29th, 1996. The whole appraiser group led by academician ZHAO Shan-Huan considered identically that the project has reached international advanced level in the study of rare and endangered species of Magnoliaceae including investigation, introduction, propagation, conservation and systematics, and made important contribution for the biodiversity conservation research of China. In 1998, this project gained the Secondary Award of Natural Sciences of the Chinese Academy of Sciences, the Secondary Award of Natural Sciences of Guangdong Province and the First Award of Science and Technology Progress of Guangzhou Branch of the Chinese Academy of Sciences and the Guangdong Academy of Sciences respectively.

Based on the significant achievements in the study of Magnoliaceae, South China Institute of Botany successfully organized and held The International Symposium on the Family Magnoliaceae in May 1998 in South China Botanical Garden, Guangzhou, China. This symposium brought together 103 scientists and experts from 17 countries and regions, including China, USA, Netherlands, Russia, Japan, Singapore, etc.. They exchanged knowledge on taxonomy, evolution, ethnobotany, paleobotany, cytology, palynology, embryology, morphology, molecular biology, phytochemistry, biodiversity, conservation, exploitation and utilization, cultivation and breeding, propagation and plant pathology of Magnoliaceae. The foreign scientists and experts greatly praised our efficacious research work on polydisciplinary studies and germplasm conservation. They hoped to enhance the cooperative research in the future.

After more than 20 years hard work, the book Magnolias of China is now available for readers at last. The book mainly based on the first-hand data by investigating the wild magnoliaceous species in China and some cultivated species from foreign countries. Our principal purpose is to provide basic information for the botanists in magnolia studies, to introduce the high application and ornamental value of magnoliaceous plants and to increase the species for afforestation and landscape-gardening. It is one of the valuable reference books for botanists, silviculturists, landscape architects, teachers and students as well as the magnolia amateurs.

The book is highly valuable both on its scientific and artistic sides. It gathered together all the available informations about Magnoliaceae; both the illustrations and descriptions are excellent.

In order to introduce Chinese magnoliaceous plants to the world well, the book is published bilingually in Chinese and English. Its main contents include: 1) The book includes 170 species, 1 hybrid, 1 subspecies and 6 varieties belonging to 11 genera. Among them, 46 species and 1 variety which were added ined. behind their latin names are embodied for the first time. Botanical name and Chinese name are both given to each species, along with brief description of morphological characters, florescence and fructescence, habitat, geographic distribution, conservation status and usage in landscape-gardening; 2) The book is fully illustrated with 93 color drawings, 44 black and white sketches and 552 color photographs. Most of the species are shown with pictures of flowers, fruits and whole plants; 3) At the end of the book, there are appendices of the cultivation and propagation techniques of magnolias, the taxonomic systems of Magnoliaceae by LIU Yu-Hu, and the index of Chinese names (including alternative names).

During the process of compiling the book, we are grateful to Professor LU Yong-Xiang, vice-chairman of the committee of the National People s Congress, the academician and president of the Chinese Academy of Sciences, for his title epigraph in the book, to Professor WU Zheng-Yi, Academician of Chinese Academy of Sciences and famous plant taxonomist, for the preface of the book written by him, to Professor HU Qi-Ming, South China Institute of Botany, the Chinese Academy of Sciences, for his valuable comments made to the book, to professor LIN You-Run, the consultant of Baitong Publishing Group, for his examination on the manuscript, to Senior Drawer DENG Ying-Feng and YU Feng of South China Institute of Botany, the Chinese Academy of Sciences, for their assistance in drawing a great deal of color drawings and black and white sketches with strict and accurate scientific attitude for more than 20 years, to our colleagues, including ZHANG Gui-Cai, WANG Xue-Wen, ZHU Liang-Feng, PAN Shu-Jiang, SU Yao-Ping, LI Ying-Lan, PANG Cheng-Fa, LIN You-Run, FAN Han-Ming, HAO Gang, MA Guo-Hua and CHEN You-Qing, etc., for their support and help to our research, to related local governments, botanical institutions, forestry institutions and nature reserves all over China, for their great assistance during our field investigation, especially to Senior Engineer LI Da-Xiao of Yunnan Academy of Forestry, to Senior Engineer YANG Shao-Cheng, ZHANG Ting-Jun and XU Jia-Han of Forestry Bureau of Wenshan Prefecture, to Professor SUN Wei-Bang and GONG Xun of Kunming Institute of Botany, the Chinese Academy of Sciences, for their great assistance in field investigation and introduction, to LU Sheng-You, WANG Ya-Lin, WU Jia-Lin, WU Guang-Di, SUN Wei-Bang, GONG Xun, SHENG Ning, ZHENG Qing-Yan, MIN Cheng-Lin, YANG Song, ZHUANG Ping, ZOU Gao-Shun, CUI Tie-Cheng, YANG Ting-Dong, ZHANG Ting-Jun, MAO Zong-Guo, LI Ya, WANG Fei-Gang and CHEN Rong-Dao, for their supply of some photos. We are also grateful to the National Natural Science Foundation of China, State Environmental Protection Administration of China, Biological Bureau of the Chinese Academy of Sciences, Guangdong Environmental Protection Bureau, Research Grants of the Magnolia Society International (USA) and Hongkong Kadoorie s Farm and Botanic Garden, for their financial support. Because of many correlative institutions and individuals cooperation, the book publishes successfully. We would like to take this chance to express our sincere acknowledgements.

Authors

December, 2002, Guangzhou

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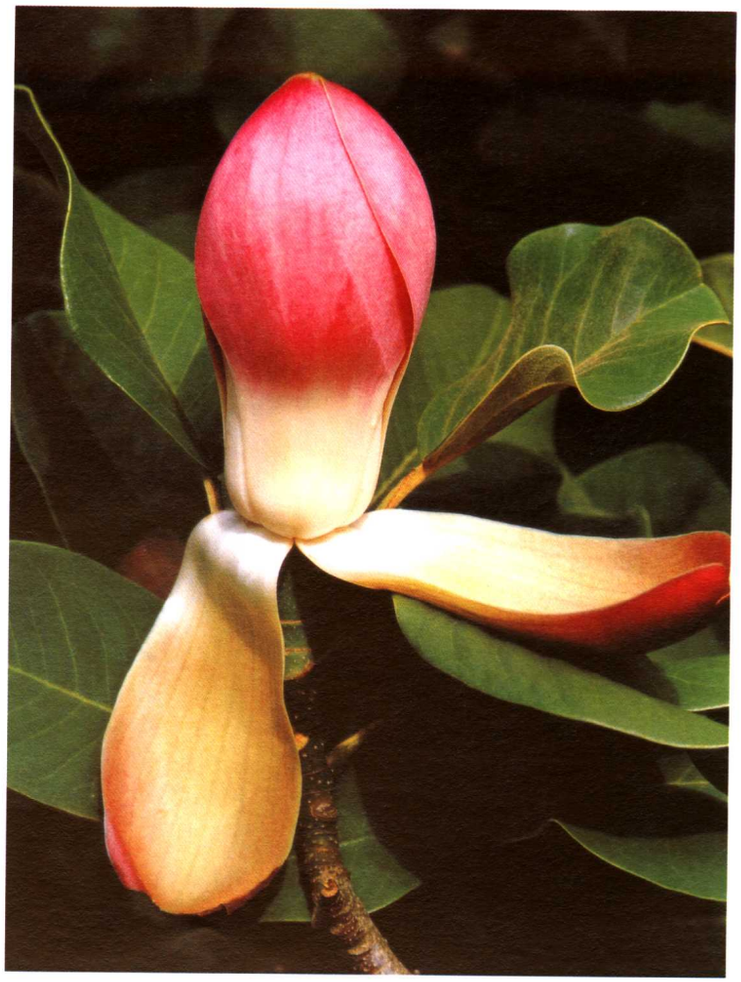

木 兰 科

Magnoliaceae Jussieu, Gen. Pl.: 280 (1789)

Trees or shrubs, evergreen or deciduous, usually hairy, rarely glabrous; buds enclosed by hooded stipules. Leaves simple, alternate, sometimes fascicled on twig apex and becoming pseudoverticillate, entire, rarely lobed, penniveined, petiolate; stipules adnate to petioles or free from petioles, caducous, remaining annular stipular scars on twigs after falling off, if adnate to petioles, also remaining stipular scars on petioles. Flowers large, terminal or axillary, solitary, rarely 2~3 clustered into cymes, usually bisexual, rarely polygamous (andro-dioecious), monoecious or dioecious; spathaceous bracts 1 to several below tepals; tepals 6~9(~45), in 2 to many whorls, 3 (~6) in each whorl, usually fleshy, sometimes outer ones nearly leathery, or reduced to sepaloid; stamens numerous, free, spirally arranged on the lower part of elongated tori, anthers linear, 2-locular, longitudinally dehiscent, introrsely or laterally, rarely extrorsely dehiscent, filaments stout, sometimes elongated, connectives usually produced into long or short appendages, insect-pollinated; gynoecia sessile or stipitate; carpels few to numerous, folded, usually free, sometimes connate at base or rarely connate entirely, spirally arranged on the upper part of tori; ovules 2~14 per carpel, biseriate on ventral sutures. Fruit aggregates apocarpous or sometimes syncarpous; mature carpels (follicles) woody, bony or leathery, usually dehiscent along dorsal or ventral sutures or along dorsal and ventral sutures, rarely connate to each other, thickly woody or fleshy, irregularly dehiscent; seeds 1~12 per follicle, suspended on filiform and elastic pseudofuniculi, exserted from follicles; seed coats usually comprised of exotestae, mesotestae and endotestae; exotestae red and leathery, mesotestae fleshy and oily, endotestae rigid and bony; mature carpels rarely samaroid, seeds connate to endotestae; embryos minute and anatropous; endosperm copious and oily.

Sixteen genera and approximately 300 species, mainly distributed in E and SE Asia, SE North America, Central America and South America. Eleven genera and approximately 160 species occurred in China, mainly in SE to SW China, gradually decreasing northeastwards and northwestwards.