



第二届国际木兰科植物 学术讨论会论文集

PROCEEDINGS

OF

THE SECOND INTERNATIONAL SYMPOSIUM

ON THE FAMILY MAGNOLIACEAE

夏念和 曾庆文 徐凤霞 吴七根 编



华中科技大学出版社

<http://www.hustp.com>



第二届国际木兰科植物 学术讨论会论文集

PROCEEDINGS

OF

THE SECOND INTERNATIONAL SYMPOSIUM

ON THE FAMILY MAGNOLIACEAE

夏念和 曾庆文 徐凤霞 吴七根 编

图书在版编目 (CIP) 数据

第二届国际木兰科植物学术讨论会论文集

=Proceedings of the Second International Symposium on the Family Magnoliaceae / 夏念和等编.

— 武汉: 华中科技大学出版社, 2011.9

ISBN 978-7-5609-7349-4

I. ①第… II. ①夏… III. ①木兰科—国际学术会议—文集 IV. ①Q949.72-53

中国版本图书馆 CIP 数据核字 (2011) 第 182742 号

第二届国际木兰科植物学术讨论会论文集

=Proceedings of the Second International Symposium on the Family Magnoliaceae

夏念和等 编

出版发行: 华中科技大学出版社 (中国·武汉)

地 址: 武汉市武昌珞喻路1037号 (邮编430074)

出 版 人: 阮海洪

策划编辑: 王 斌

责任编辑: 黎若君

责任校对: 段园园

责任监印: 张贵君

装帧设计: 百彤文化

印 刷: 利丰雅高印刷 (深圳) 有限公司

开 本: 889 mm × 1194 mm 1/16

印 张: 19

字 数: 240千字

版 次: 2012年3月第1版 第1次印刷

定 价: 88.00元



投稿热线: (020) 66638820 1275336759@qq.com

本书若有印装质量问题, 请向出版社营销中心调换

全国免费服务热线: 400-6679-118 竭诚为您服务

版权所有 侵权必究

Contents

I. Taxonomy, Systematics and Phytogeography

A New Classification System of the Family Magnoliaceae.....	XIA Nian-He (012)
How Did Magnolias (Magnoliaceae, Magnolioideae) Reach Tropical Asia?.....	Hans P. NOOTEBOOM (039)
Turning Points in the Taxonomic History of Magnolioideae — from Baillon to Dandy to DNA.....	Richard B. FIGLAR (047)
A New System for the Family Magnoliaceae.....	SIMA Yong-Kang, and LU Shu-Gang (055)
Diversity and Distribution of Magnoliaceae in India.....	Tikam Singh RANA, Baleshwar MEENA, and Bhaskar DATT (072)
Plants Used as Medicine and Spices of the Family Magnoliaceae in Vietnam.....	TRAN Cong Khanh (086)
Taxonomy and Biogeography of the Family Magnoliaceae from Vietnam.....	VU Quang Nam, and XIA Nian-He (095)

II. Anatomy, Embryology, Palynology and Cytology

Studies on the Morphology, Structure and Development in Magnoliaceae.....	LIU Yong, and XU Feng-Xia (116)
Observation on Megasporogenesis and Development of Female Gametophyte in <i>Parakmeria yunnanensis</i> Hu (Magnoliaceae).....	FU Lin, ZENG Qing-Wen, and XU Feng-Xia (125)
Floral Numerical Variation of <i>Michelia yunnanensis</i>	HAO Jia-Bo, and SIMA Yong-Kang (132)

III. Molecular Biology and Phylogeny

Determining Ploidy Levels and Relative Genome Sizes in <i>Magnolia</i> L.....	J. Kevin PARRIS, Thomas G. RANNEY, W. Vance BAIRD, and Halina T. KNAP (137)
Intraspecific Variation of cpDNA in <i>Magnolia virginiana</i> Native to Eastern-southeastern North America and Cuba.....	Hiroshi AZUMA, Richard B. FIGLAR, Peter Del TREDICI, Koen CAMELBEKE, Alejandro PALMAROLA-BEJERANO, and Mikhail S. ROMANOV (145)

IV. Physiology, Ecology, Biodiversity and Conservation

Photosynthetic Characteristics of <i>Manglietia yuyuanensis</i> in Different-Aged Compound Mixed Forest Community at Mausoleum of Dr. Sun Yat-Sen.....	HE Kai-Yue, YANG Tong-Yi, LI Xiao-Chu, and XU Hai-Bing (151)
Study on Antibacterial Activity of Ultrasonic Wave Extracts from Leaves of Three Species of <i>Michelia</i> L.....	BI Hui-Min, and HE Kai-Yue (160)
Conservation of Rare and Endangered Species <i>Manglietia longipedunculata</i> (Magnoliaceae)	XIE Cong, FU Lin, ZENG Qing-Wen, LIU Dong-Min, WEN Xiang-Ying, and ZHONG Wen-Chao (166)

Special Propagation and Conservation of Rare and Endangered Native Thai Magnoliaceae	Piya CHALERMGLIN (180)
Botanical Knowledge of Magnoliaceae in Papua New Guinea.....	Kipiro DAMAS (185)
Conservation of Magnolias in Colombia.....	Marcela SERNA GONZÁLEZ (191)
<i>Magnolia ex situ</i> Collection at Arboretum Wespelaar, Belgium.....	Koen CAMELBEKE, and Philippe De SPOELBERH (199)
 V. Cultivation, Propagation, Gardening and Landscaping	
Comparison Tests on Growth of Seven Landscape Plants of Magnoliaceae.....	YANG Cheng-Hua, and ZHOU Jia-Wei (209)
The Introduction and Acclimatization of Magnolias in French Botanical Gardens and Arboreta	Thierry LAMANT (214)
<i>Mognolia</i> Cultivation, Propagation, Breeding and the Gardens Growing Them in Europe.....	Jim GARDINER (220)
Development of Guidelines for the Conduct of Tests for Distinctness, Uniformity and Stability of New Varieties of <i>Magnolia</i>	JIN Xiao-Bai (231)
Propagation of Rare and Endangered Plant <i>Magnolia odoratissima</i>	YANG Yao-Hai (236)
Studies on Seed Germination and Seedling Growth Mechanism of Six Endangered Magnoliaceous Plants	CAO Ji-Wu, LIU Chun-Lin, WU Yi, TANG Liang, LIU Jie, DU Kai-Guo, and PENG Li-Wei (247)
Timing and Hormones Affected Rooting of Stem Cuttings of <i>Magnolia grandiflora</i> L.....	GENG Fang, ZHANG Dong-Lin, LI Zhi-Hui, and CAO Ji-Wu (256)
Performance in Northern Florida of Yellow-flowered Cultivars Derived from <i>Magnolia acuminata</i>	Gary W. KNOX (262)
Commercial Nursery Production of Magnoliaceae in the Southern United States.....	Gary W. KNOX (270)
Comparison of the Growth of Five Magnoliaceous Trees in Ecological Scenic Forests in Zhongshan, Guangdong, China	JIANG Qian-Cai, WU Yong-Bin, WANG Jia-Bin, YANG Yu-Wang, HUANG Chuan-Teng, LIU Zhao-Xiang, and JIANG Bin (276)
Appendix I Scientific Committee.....	(283)
Appendix II Organizing Committee.....	(284)
Appendix III Program.....	(285)
Appendix IV Participants.....	(290)



第二届国际木兰科植物 学术讨论会论文集

PROCEEDINGS

OF

THE SECOND INTERNATIONAL SYMPOSIUM

ON THE FAMILY MAGNOLIACEAE

夏念和 曾庆文 徐凤霞 吴七根 编



华中科技大学出版社

<http://www.hustp.com>

中国·武汉

图书在版编目 (CIP) 数据

第二届国际木兰科植物学术讨论会论文集

=Proceedings of the Second International Symposium on the Family Magnoliaceae / 夏念和等编.

- 武汉: 华中科技大学出版社, 2011.9

ISBN 978-7-5609-7349-4

I. ①第… II. ①夏… III. ①木兰科 - 国际学术会议 - 文集 IV. ①Q949.72-53

中国版本图书馆 CIP 数据核字 (2011) 第 182742 号

第二届国际木兰科植物学术讨论会论文集

=Proceedings of the Second International Symposium on the Family Magnoliaceae

夏念和等 编

出版发行: 华中科技大学出版社 (中国·武汉)

地 址: 武汉市武昌珞喻路1037号 (邮编430074)

出 版 人: 阮海洪

策划编辑: 王 斌

责任编辑: 黎若君

责任校对: 段园园

责任监印: 张贵君

装帧设计: 百彤文化

印 刷: 利丰雅高印刷 (深圳) 有限公司

开 本: 889 mm × 1194 mm 1/16

印 张: 19

字 数: 240千字

版 次: 2012年3月第1版 第1次印刷

定 价: 88.00元



投稿热线: (020) 66638820 1275336759@qq.com

本书若有印装质量问题, 请向出版社营销中心调换

全国免费服务热线: 400-6679-118 竭诚为您服务

版权所有 侵权必究

THE SECOND INTERNATIONAL SYMPOSIUM ON THE FAMILY MAGNOLIACEAE

5 – 8 May 2009
Guangzhou, China

ORGANIZED BY:

1. South China Botanical Garden (**SCBG**), Chinese Academy of Sciences (**CAS**)
2. Botanic Gardens Conservation International (**BGCI**)
3. Magnolia Society International (**MSI**)
4. Guangdong Botanical Society
5. Magnolia Branch, Guangdong Botanical Society

CO-ORGANIZED BY:

1. Shenzhen FairyLake Botanical Garden
2. Shenzhou Magnolia Garden and Breeding Center, Xuwen
3. Kunming Institute of Botany, CAS
4. Nankunshan Nature Reserve of Guangdong Province
5. Forestry Bureau of Wenshan Prefecture, Yunnan Province
6. People's Government of Xichou County, Yunnan Province

SPONSORED BY:

1. Bureau of International Cooperation, CAS
2. National Nature Science Foundation of China
3. Guangdong Palm Landscape Architecture Co., Ltd.

The 2nd International Symposium



Workshop on the Family Magnoliaceae

Guangzhou, China 5-8 May, 2009





▲ South China Botanical Garden (SCBG), Botanic Gardens Conservation International (BGCI) and Magnolia Society International (MSI) unanimously agreed to establish a “World Magnolia Center” based at South China Botanical Garden, CAS and signed the MoA.



▲ The plaque of “World Magnolia Center” based at SCBG, CAS.



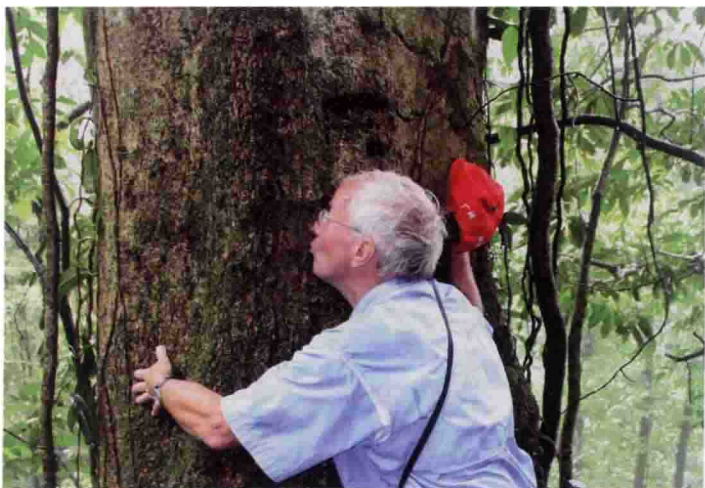
▲ During the symposium, the participants visited the Magnolia Garden, SCBG, CAS.



▲ During the symposium, the participants had an excursion to Nankunshan Provincial Natural Reserve, Longmen County, Guangdong Province, China.



▲ After the symposium, some participants hunted the wild magnolias in Xiaoaogou National Natural Reserve, Fadou Town, Xichou County, Yunnan Province, China.



▲ The famous magnolia expert Mr. Richard B. Figlar affectionately kissed the large tree of *Pachylarnax sinica* (*Manglietiastrum sinicum*).

**MoA on the Co-Establishment of "World Magnolia Center" in
South China Botanical Garden (SCBG)**

1. The family Magnoliaceae is one of the most primitive taxa of angiosperms, with a high ornamental, economic and ecological value. It is also one of the highest proportion of the threatened plants. Therefore, it is important and necessary to establish a 'World Magnolia Center' which will contribute to Target 8 of the CBD's Global Strategy for Plant Conservation (GSPC) and help ensure good practice in relation to Access and Benefit Sharing in line with the requirements of the CBD.
2. South China Botanical Garden (SCBG), Botanic Gardens Conservation International (BGCI) and Magnolia Society International (MSI) unanimously agreed to establish a 'World Magnolia Center' based at South China Botanical Garden, CAS.
3. With the assistance of BGCI and MSI, SCBG will carry out the *ex situ* conservation research of the world Magnolia Germplasm on the basis of its present Magnolia Garden. Exchange with botanic gardens, farms and nurseries in Asia, America and Oceania will be facilitated for carrying out introduction and cultivation experiments, *ex situ* conservation and restoration studies. This center will become the living plant germplasm conservation center and the research base for Magnolia conservation and restoration worldwide, which will be open to the international and serves for the international. In so doing, BGCI and MSI will give full support.
4. BGCI and MSI will recommend higher level academic professionals or experienced amateurs carry out collaborative research in SCBG, hold seminars, train personnel and exchange experience.
5. SCBG, BGCI and MSI exchange information using their own websites as a platform.
6. SCBG welcomes members of BGCI and MSI to visit SCBG and its Magnolia garden. SCBG will also provide any convenience for them.
7. To well build the world Magnolia Center, SCBG will work to raise the necessary funds to carry out related work. BGCI and MSI can provide some support within their capabilities.

Signed by:

Huang Hongwen, Director

On behalf of South China Botanical Garden (SCBG)



Date:

5/5/2009

Signed by:

S.F. Oldfield

Sara Oldfield, Secretary General

On behalf of Botanic gardens Conservation International (BGCI)

Date:

5.5.09

Signed by:

Susan P Treadway

Susan Treadway, President

On behalf of the Magnolia Society International (MSI)

Date:

5 May, 2009

Foreword

The family Magnoliaceae is one of the most primitive taxa of angiosperms (flowering plants). Knowledge of this family is essential for the researches on the origin, evolution, floristic geography and systematics of angiosperms.

Most of magnolias are widely enjoyed for their beautiful tree-shape, large colorful fragrant flowers, and their elegance. Many species provide high quality timber, are grown as ornamentals, or are used for medicine and perfume. Furthermore, many species are dominant constituents of tropical and subtropical forests. Due to degradation of natural habitats, and decline of their natural reproductive abilities, many magnoliaceous plants have become endangered or extinct in the wild. For these reasons it is important to engage in multi-disciplinary studies of magnolias, to conserve the germplasm of magnoliaceous plants, and to rescue the rare and endangered species.

The region of South and southwest China along with neighbouring areas, is the center of origin and diversity of the family Magnoliaceae. China has more magnoliaceous species than any other countries. Since the 1950's, South China Botanical Garden (SCBG), Chinese Academy of Sciences (CAS), has carried out significant multi-disciplinary researches on the Magnoliaceae, including introduction, propagation, and conservation of rare species, work has also been done on the systematics, morphology, cytology, embryology, palynology, phytochemistry, and floral biology of Magnoliaceae. A magnolia garden, which contains 11 genera and about 150 species of Magnoliaceae, has been established and has become one of the world's largest conservation centers for magnoliaceous germplasm. In May 1998 SCBG successfully organized and held "The First International Symposium on the Family Magnoliaceae". This symposium greatly stimulated cooperative research on Magnoliaceae worldwide.

In order to exchange recent research progress, enhance the conservation and sustainable utilization of magnoliaceous plants, and promote the cooperative research worldwide, SCBG together with Botanic Gardens Conservation International (BGCI), Magnolia Society International (MSI), and Guangdong Botanical Society, jointly organized "The 2nd International Symposium on the Family Magnoliaceae" on 5–8 May 2009 in Guangzhou (Canton), China. The symposium was co-organized by Shenzhen Fairy Lake Botanical Garden, Shenzhou Magnolia Garden and Breeding Center, Xuwen, Kunming Institute of Botany of CAS, Nankunshan Nature Reserve of Guangdong Province, Forestry Bureau of Wenshan Prefecture, Yunnan Province, and People's Government of Xichou County, Yunnan Province. The symposium was sponsored by the Bureau of International Cooperation of the Chinese Academy of Sciences, the National Natural Science Foundation of China, and Guangdong Palm Landscape Architecture Co., Ltd. The co-organization with BGCI and MSI strengthened greatly the appeal of this symposium. The financial support from the Bureau of International Cooperation of CAS and the National Natural Science Foundation of China made the scholars from the main magnoliaceous distribution area and the third-world countries could attend this symposium. It created a good chance to improve the third-world countries' research level on the family Magnoliaceae and promote the extensive exchange and cooperation among the colleagues worldwide. We would like to express our deep appreciation to Prof. Wu Zhen-yi (China) and

Dr. Peter H. Raven (USA), Honorary Chairmen of the Scientific Committee of this symposium, for their strong support and congratulations, though they could not attend this symposium because of busy work.

This symposium presented and exchanged updated research progress of Magnoliaceae worldwide in systematics, phytogeography, cytology, anatomy, molecular biology, phytochemistry, germplasm conservation, conservation biology, physiology, ecology, cultivation, propagation and cultivar breeding, etc. Totally 151 participants from 19 countries and regions attended this symposium, among them, 42 from abroad, 109 from China. The program of this symposium included keynote addresses, oral presentations, poster sessions, general discussions and symposium excursion. Totally 11 participants from 6 countries made keynote addresses, 21 participants from 15 countries made oral presentations, and 8 participants from 4 countries displayed their posters. Many participants brought their papers, books and magnolia experimental materials for exchange. This symposium had achieved great success under the effort of every respect, had set up a good platform for exchange and cooperation among the magnolia colleagues worldwide.

This Proceedings included 29 papers from the participants, and presented the updated research progress of Magnoliaceae worldwide in systematics, phytogeography, cytology, anatomy, molecular biology, phytochemistry, germplasm conservation, conservation biology, physiology, ecology, cultivation, propagation and cultivar breeding, etc. We are sure that it will greatly enhance the extensive communication and cooperation among the colleagues worldwide, and will serve as a valuable reference for those who are interested in magnoliaceous plants.

Editors
Guangzhou, China
May 2011

Contents

I. Taxonomy, Systematics and Phytogeography

A New Classification System of the Family Magnoliaceae.....	XIA Nian-He (012)
How Did Magnolias (Magnoliaceae, Magnolioideae) Reach Tropical Asia?.....	Hans P. NOOTEBOOM (039)
Turning Points in the Taxonomic History of Magnolioideae — from Baillon to Dandy to DNA.....	Richard B. FIGLAR (047)
A New System for the Family Magnoliaceae.....	SIMA Yong-Kang, and LU Shu-Gang (055)
Diversity and Distribution of Magnoliaceae in India.....	Tikam Singh RANA, Baleshwar MEENA, and Bhaskar DATT (072)
Plants Used as Medicine and Spices of the Family Magnoliaceae in Vietnam.....	TRAN Cong Khanh (086)
Taxonomy and Biogeography of the Family Magnoliaceae from Vietnam.....	VU Quang Nam, and XIA Nian-He (095)

II. Anatomy, Embryology, Palynology and Cytology

Studies on the Morphology, Structure and Development in Magnoliaceae.....	LIU Yong, and XU Feng-Xia (116)
Observation on Megasporogenesis and Development of Female Gametophyte in <i>Parakmeria yunnanensis</i> Hu (Magnoliaceae).....	FU Lin, ZENG Qing-Wen, and XU Feng-Xia (125)
Floral Numerical Variation of <i>Michelia yunnanensis</i>	HAO Jia-Bo, and SIMA Yong-Kang (132)

III. Molecular Biology and Phylogeny

Determining Ploidy Levels and Relative Genome Sizes in <i>Magnolia</i> L.....	J. Kevin PARRIS, Thomas G. RANNEY, W. Vance BAIRD, and Halina T. KNAP (137)
Intraspecific Variation of cpDNA in <i>Magnolia virginiana</i> Native to Eastern-southeastern North America and Cuba.....	Hiroshi AZUMA, Richard B. FIGLAR, Peter Del TREDICI, Koen CAMELBEKE, Alejandro PALMAROLA-BEJERANO, and Mikhail S. ROMANOV (145)

IV. Physiology, Ecology, Biodiversity and Conservation

Photosynthetic Characteristics of <i>Manglietia yuyuanensis</i> in Different-Aged Compound Mixed Forest Community at Mausoleum of Dr. Sun Yat-Sen.....	HE Kai-Yue, YANG Tong-Yi, LI Xiao-Chu, and XU Hai-Bing (151)
Study on Antibacterial Activity of Ultrasonic Wave Extracts from Leaves of Three Species of <i>Michelia</i> L.....	BI Hui-Min, and HE Kai-Yue (160)
Conservation of Rare and Endangered Species <i>Manglietia longipedunculata</i> (Magnoliaceae)	XIE Cong, FU Lin, ZENG Qing-Wen, LIU Dong-Min, WEN Xiang-Ying, and ZHONG Wen-Chao (166)

Special Propagation and Conservation of Rare and Endangered Native Thai MagnoliaceaePiya CHALERMGLIN (180)
Botanical Knowledge of Magnoliaceae in Papua New Guinea.....Kipiro DAMAS (185)
Conservation of Magnolias in Colombia.....Marcela SERNA GONZÁLEZ (191)
<i>Magnolia ex situ</i> Collection at Arboretum Wespelaar, Belgium.....Koen CAMELBEKE, and Philippe De SPOELBERH (199)
 V. Cultivation, Propagation, Gardening and Landscaping	
Comparison Tests on Growth of Seven Landscape Plants of Magnoliaceae.....YANG Cheng-Hua, and ZHOU Jia-Wei (209)
The Introduction and Acclimatization of Magnolias in French Botanical Gardens and ArboretaThierry LAMANT (214)
<i>Mognolia</i> Cultivation, Propagation, Breeding and the Gardens Growing Them in Europe.....Jim GARDINER (220)
Development of Guidelines for the Conduct of Tests for Distinctness, Uniformity and Stability of New Varieties of <i>Magnolia</i>.....JIN Xiao-Bai (231)
Propagation of Rare and Endangered Plant <i>Magnolia odoratissima</i>.....YANG Yao-Hai (236)
Studies on Seed Germination and Seedling Growth Mechanism of Six Endangered Magnoliaceous PlantsCAO Ji-Wu, LIU Chun-Lin, WU Yi, TANG Liang, LIU Jie, DU Kai-Guo, and PENG Li-Wei (247)
Timing and Hormones Affected Rooting of Stem Cuttings of <i>Magnolia grandiflora</i> L.....GENG Fang, ZHANG Dong-Lin, LI Zhi-Hui, and CAO Ji-Wu (256)
Performance in Northern Florida of Yellow-flowered Cultivars Derived from <i>Magnolia acuminata</i>.....Gary W. KNOX (262)
Commercial Nursery Production of Magnoliaceae in the Southern United States.....Gary W. KNOX (270)
Comparison of the Growth of Five Magnoliaceous Trees in Ecological Scenic Forests in Zhongshan, Guangdong, ChinaJIANG Qian-Cai, WU Yong-Bin, WANG Jia-Bin, YANG Yu-Wang, HUANG Chuan-Teng, LIU Zhao-Xiang, and JIANG Bin (276)
Appendix I Scientific Committee.....(283)
Appendix II Organizing Committee.....(284)
Appendix III Program.....(285)
Appendix IV Participants.....(290)

A New Classification System of the Family Magnoliaceae

XIA Nian-He*

Key Laboratory of Plant Resources Conservation and Sustainable Utilization, South China

Botanical Garden, Chinese Academy of Sciences, Guangzhou 510650, China.

(*Author for correspondence. E-mail: nhxia@scbg.ac.cn)

Abstract: Magnoliaceae is one of the most primitive family of angiosperms. It is widely distributed in tropical and subtropical regions of the world. There is no widely accepted generic concepts in the family. The genera number of the family varies from 2 to 17. Based on the revision of literature and herbarium specimens, a new classification system is proposed. The family Magnoliaceae is divided into two subfamilies with 17 genera. Within the subfamily Magnolioideae, two tribes and 16 genera are recognized. In the tribe Magnolieae, the genus *Magnolia sensu* Dandy, which is proved to be polyphyletic by different molecular analysis, is cut into smaller genera. The genus *Magnolia* is defined to include Dandy's *Magnolia* sect. *Magnolia*, sect. *Theohordon*, and Sect. *Splendens* Vazquez. Sect. *Rytidospermum* and Sect. *Oyama* are to be upgrade to generic level; Sect. *Gwillimia* and Sect. *Lirianthe* are united to be accommodated in the revived genus *Lirianthe*. The genus *Manglietiastrum* Law is reduced to a synonym of *Pachylarnax* Dandy, while the genus *Woonyongia* Law is recognized as a distinct genus from *Kmeria* Dandy. In the tribe Micheliaceae, five genera are recognized. The genera *Paramichelia* and *Tsoongiodendron* are reduced to synonymy of *Michelia*. Consequently the infrageneric systems for the large genus *Manglietia*, *Yulania* and *Michelia* are also established. The systematical arrangement of the new classification system of Magnoliaceae are as follows:

Subfam. I. **Magnolioideae**

Tribe I. **Magnolieae**

1. **Manglietia** Blume
2. **Magnolia** L.
3. **Lirianthe** Spach
4. **Houpoëa** N. H. Xia & C. Y. Wu
5. **Dugandiodendron** Lozano
6. **Talauma** Juss.
7. **Oyama** (Nakai) N. H. Xia & C. Y. Wu
8. **Kmeria** Dandy
9. **Woonyongia** Law
10. **Pachylarnax** Dandy
11. **Parakmeria** Hu