

Conservational Significance of Magnolia Living Collections in Shenzhen Fairy Lake Botanical Garden



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Summary

Collection of magnolias in Shenzhen Fairy Lake Botanical Garden started in 1991 when the Magnolia Garden was established. The collections now include more than 128 taxa. Among them 37 taxa have 1-2 known distribution sites, 33 taxa occurred in IUCN red list, 22 taxa were reported in China Rare And Endangered Plants. Study of the collections had identified 3 new species. A number of collections need further study to clarify their taxonomical identities. Further conservational significance of the collections includes the living collections of some critically endangered species of them the protection status has not been recognized by any authority organizations, e.g., *Manglietia rostrata* D. X. Li et R. Z. Zhou, *Michelia guangxiensis* Y. W. Law et R. Z. Zhou, *Michelia microcarpa* B. L. Chen et S. C. Yang, *Michelia fulva* Chang et B. L. Chen, etc. The living collections have set up a proper platform for understanding and conserving the diversity of China magnolias.

Introduction

Living plant collections in botanic gardens may include a big number of taxa and have a long history. The initial aims of the collections may not include conservation. As a response to the Global Plant Conservation Strategy, botanic gardens are generally integrating their living plant collections into conservation programs. This action may need to revise collection policy, reassess collections for conservation value, select target collections for propagation, etc. Magnolia collections in the Magnolia Garden of Shenzhen Fairy Lake Botanical Garden had been reassessed for the purpose to integrate it into conservation programs. The results showed that the collections are of great value and can be used as a platform for understanding and conserving China magnolias diversity.

Table 1. List of Taxa of Magnolias in the Living Collections of Shenzhen Fairy Lake Botanical Garden

1) The taxa Latin names are followed by their Chinese names.
2) * denotes protection by China national regulation, # denotes protection by IUCN, # denotes suggestion of protection from the present study.

<i>Alcornoque</i>	<i>A. cathartii</i> (Hook. f. et Thoms.) Dandy *	长蕊木兰
<i>Liriodendron</i>	<i>L. chinense</i> (Hemsl.) Sargent *	鹅掌楸 (马褂木)
<i>L. chinense</i> × <i>L. tulipifera</i>	<i>L. tulipifera</i> L.	北美鹅掌楸
<i>Magnolia</i>	<i>M. albosericata</i> Chun & C.H. Tsong	绍毛木兰
	<i>M. amoena</i> Cheng #	天目木兰
	<i>M. biondii</i> Pamp.	望春玉兰
	<i>M. champii</i> Bonth. #	香港木兰
	<i>M. coco</i> (Lour.) DC.	霍舍花
	<i>M. cylandrica</i> Wilson	黄山木兰
	<i>M. dessoigniana</i> Rehder & Wilson. #	光叶木兰
	<i>M. delavayi</i> Franch.	山玉兰
	<i>M. delavayi</i> Franch. var.	红花山玉兰
	<i>M. deudata</i> Desr.	玉兰 (白玉兰)
	<i>M. deudata</i> Desr. var. <i>multitepala</i> Law	多瓣白玉兰
	<i>M. glabrata</i> Law et R. Z. Zhou	华中木兰
	<i>M. grandiflora</i> L.	荷花玉兰
	<i>M. grandiflora</i> L. var. <i>jancaolata</i> Aiton	翠叶荷花玉兰
	<i>M. guangxiensis</i> Law et S. C. Yang	广南木兰 (香木兰)
	<i>M. henryi</i> Dam *	大叶木兰
	<i>M. kobus</i> DC.	日本辛夷
	<i>M. liliiiflora</i> Desr.	紫玉兰
	<i>M. odoratissima</i> Law et R. Z. Zhou *	馨香木兰 (馨香木)
	<i>M. officinalis</i> Rehd. & Wils. subsp. <i>biloba</i> (Rehd. & Wils.) Law *	凹叶厚朴
	<i>M. paenata</i> Dandy #	福建木兰
	<i>M. pilocarpa</i> Z. Z. Zhou & Z. W. Xie	罗田木兰
	<i>M. polytepala</i> Law et R. Z. Zhou #	多瓣紫玉兰
	<i>M. sieboldii</i> K. Koch	天女花
	<i>M. sinensis</i> (Rehd. et Wils.) Stapf **	圆叶木兰 (绣毛木兰)
	<i>M. sinostellata</i> P. L. Chiu & Z. H. Chen	景宁木兰
	<i>M. soulangeana</i> Soul. & Bod.	二乔木兰
	<i>M. sprengeri</i> Pamp. #	武当木兰 (武当玉兰)
	红花玉兰	<i>M. sprengeri</i> Pamp. var. <i>elongata</i> (Rehd. et Wils.) Stapf.
	<i>M. stellata</i> Maxim.	日本毛木兰
	<i>M. tonii</i> W. C. Cheng **	宝华木兰
	<i>Manglietia</i>	香木莲
	<i>M. aromatica</i> Dandy **	桂南木莲 (仁昌木莲)
	<i>M. chingii</i> Dandy	球果木莲
	<i>M. conifera</i> Dandy #	落叶木莲
	<i>M. decidua</i> Q. Y. Zheng *	川滇木莲
	<i>M. douglasii</i> Finet & Gagnep. #	木莲
	<i>M. fordiana</i> Oliver	滇梓木莲
	<i>M. forrestii</i> W. W. Sm. ex Dandy #	英木莲
	<i>M. glauca</i> Blume	大果木莲
	<i>M. grandis</i> Hu & Cheng **	广南木莲
	<i>M. guangxiensis</i> D. X. Li et R. Z. Zhou #	海南木莲
	<i>M. hainanensis</i> Dandy #	中雨木莲
	<i>M. hookeri</i> Cubitt & W. W. Sm. #	红花木莲
	<i>M. insignis</i> (Wall.) Blume #	马关木莲
	<i>M. manguiana</i> Chang & B. L. Chen	大叶木莲
	<i>M. megarhiza</i> Hu & Cheng **	藤广木莲
	<i>M. niechangensis</i> Law et D. X. Li #	毛桃木莲
	<i>M. noto</i> Dandy	荷花木莲
	<i>M. ovata</i> D. X. Li et R. Z. Zhou #	珊瑚木莲
	<i>M. ovata</i> Chang & B. L. Chen #	厚叶木莲
	<i>M. pscheyphila</i> H. T. Chang **	梅花木莲
	<i>M. parviflora</i> Law et R. Z. Zhou #	巴东木莲
	<i>M. patungensis</i> Hu #	矮木莲
	<i>M. rostrata</i> D. X. Li et R. Z. Zhou #	绣毛木莲
	<i>M. rufibrata</i> Dandy #	昌宁木莲
	<i>sp.</i>	凤庆木莲
	<i>sp.</i>	四川木莲
	<i>M. szechuanica</i> Hu #	广西木莲
	<i>M. tenuipes</i> Dandy	天油木莲
	<i>M. tianchiensis</i> D. X. Li et Law #	
	<i>M. yunnanensis</i> Law	
	<i>M. zhejiangensis</i> R. Z. Zhou et Law	
	<i>M. alba</i> DC.	
	<i>M. armenica</i> R. Z. Zhou	
	<i>M. bailliana</i> Law et R. Z. Zhou	
	<i>M. balansae</i> (A. DC.) Dandy	
	<i>M. biacuminata</i> Law et R. Z. Zhou	
	<i>M. calcicola</i> C. Y. Wu ex Y. W. Law & Y. F. Wu #	
	<i>M. cavaleriei</i> Finet & Gagnep.	
	<i>M. champaco</i> L.	
	<i>M. chapensis</i> Dandy	
	<i>M. charitacea</i> B. L. Chen & S. C. Yang	
	<i>M. compressa</i> (Maxim.) Sarg.	
	<i>M. compressa</i> (Maxim.) Sarg. var. <i>lanensis</i> S. Y. Lu	
	<i>M. coriacea</i> Chang & B. L. Chen #	
	<i>M. crassipes</i> Y. W. Law	
	<i>M. doltsopa</i> Buch.-Ham. ex DC.	
	<i>M. douglasensis</i> D. X. Li et Law #	
	<i>M. figo</i> (Lour.) Spreng.	
	<i>M. floribunda</i> Finet & Gagnep.	
	<i>M. foveolata</i> Merr. ex Dandy	
	<i>M. foveolata</i> Merr. ex Dandy var. <i>cinerascens</i> Y. W. Law & Y. F. Wu	
	<i>M. fulgens</i> Dandy	
	<i>M. fulva</i> Chang & B. L. Chen #	
	<i>M. funingensis</i> D. X. Li et Law #	
	<i>M. gigantea</i> D. X. Li et R. Z. Zhou #	
	<i>M. guangxiensis</i> Y. W. Law & R. Z. Zhou #	
	<i>M. gushanensis</i> D. X. Li et Law #	
	<i>M. hedyosperma</i> Y. W. Law #	
	<i>M. iacoi</i> W. W. Sm. #	
	<i>M. longistamina</i> Y. W. Law #	
	<i>M. maculata</i> Dandy	
	乳源木莲	<i>M. maculata</i> var. <i>sublancea</i> Dandy
	镇康木莲	<i>M. martinii</i> (Levl.) Levl.
	华盖木	<i>M. maudiae</i> Dunn
	铜色含笑	<i>M. medicis</i> Dandy
	白兰花	<i>M. microcarpa</i> B. L. Chen & S. C. Yang #
	香香含笑	<i>M. microphylla</i> Law et R. Z. Zhou #
	柏林含笑 (柏林苦梓、云南苦梓)	<i>M. oipara</i> Chang & B. L. Chen
	海南苦梓 (苦梓含笑)	<i>M. pachycarpa</i> Y. W. Law & R. Z. Zhou #
	双尖含笑	<i>M. pingbianica</i> R. Z. Zhou et Law #
	石灰含笑 (灰岩含笑)	<i>M. platyptala</i> Hand.-Mazz.
	平伐含笑	<i>M. polytepala</i> R. Z. Zhou
	黄兰	<i>M. shiluensis</i> Chun et Y. F. Wu *
	乐昌含笑	<i>M. skinneriana</i> Dunn
	麻栗含笑	<i>M. sphaerantha</i> C. Y. Wu ex Y. W. Law & Y. F. Wu #
	台湾含笑	<i>M. szechuanica</i> Dandy #
	兰屿含笑	<i>M. velutina</i> DC.
	西畴含笑	<i>M. wilsonii</i> Finet & Gagnep. **
	紫花含笑	<i>M. xanthantha</i> C. Y. Wu ex Y. W. Law & Y. F. Wu #
	南亚热带	<i>M. xinningia</i> Law & R. Z. Zhou #
	法平含笑	<i>M. yunnanensis</i> Franch. ex Finet & Gagnep.
	合笑	<i>M. yunnanensis</i> Law & R. Z. Zhou
	多花含笑	<i>Parakmeria</i>
	金叶含笑	<i>P. lotungensis</i> (Chun & C. H. Tsong) Y. W. Law #
	臭毛含笑	<i>P. lutchensis</i> Cheng #
	福建含笑	<i>P. yunnanensis</i> Hu #
	亮叶含笑	<i>Paramichelia</i>
	棕毛含笑	<i>P. bailliana</i> (Pierre) Hu *
	富宁含笑	<i>Talauma</i>
	广西含笑 (高大含笑)	<i>T. bodsonii</i> Hook. f. & Thomson #
	广西含笑	<i>Toongiodendron</i>
	香气含笑	<i>T. odorum</i> Chun #
	壮南含笑	<i>Woonongia</i>
	长蕊含笑	<i>W. septentrionalis</i> (Dandy) Y. W. Law
	醉香含笑 (火力楠)	

湖北白玉兰	<i>M. obovata</i> Dandy
日本毛木兰	<i>M. alba</i> DC.
宝华木兰	<i>M. armenica</i> R. Z. Zhou
香木莲	<i>M. bailliana</i> Law et R. Z. Zhou
桂南木莲 (仁昌木莲)	<i>M. balansae</i> (A. DC.) Dandy
球果木莲	<i>M. biacuminata</i> Law et R. Z. Zhou
落叶木莲	<i>M. calcicola</i> C. Y. Wu ex Y. W. Law & Y. F. Wu #
川滇木莲	<i>M. cavaleriei</i> Finet & Gagnep.
木莲	<i>M. champaco</i> L.
滇梓木莲	<i>M. chapensis</i> Dandy
英木莲	<i>M. charitacea</i> B. L. Chen & S. C. Yang
大果木莲	<i>M. compressa</i> (Maxim.) Sarg.
广南木莲	<i>M. compressa</i> (Maxim.) Sarg. var. <i>lanensis</i> S. Y. Lu
海南木莲	<i>M. coriacea</i> Chang & B. L. Chen #
中雨木莲	<i>M. crassipes</i> Y. W. Law
红花木莲	<i>M. doltsopa</i> Buch.-Ham. ex DC.
马关木莲	<i>M. douglasensis</i> D. X. Li et Law #
大叶木莲	<i>M. figo</i> (Lour.) Spreng.
藤广木莲	<i>M. floribunda</i> Finet & Gagnep.
毛桃木莲	<i>M. foveolata</i> Merr. ex Dandy
荷花木莲	<i>M. foveolata</i> Merr. ex Dandy var. <i>cinerascens</i> Y. W. Law & Y. F. Wu
珊瑚木莲	<i>M. fulgens</i> Dandy
厚叶木莲	<i>M. fulva</i> Chang & B. L. Chen #
梅花木莲	<i>M. funingensis</i> D. X. Li et Law #
巴东木莲	<i>M. gigantea</i> D. X. Li et R. Z. Zhou #
矮木莲	<i>M. guangxiensis</i> Y. W. Law & R. Z. Zhou #
绣毛木莲	<i>M. gushanensis</i> D. X. Li et Law #
昌宁木莲	<i>M. hedyosperma</i> Y. W. Law #
凤庆木莲	<i>M. iacoi</i> W. W. Sm. #
四川木莲	<i>M. longistamina</i> Y. W. Law #
广西木莲	<i>M. maculata</i> Dandy
天油木莲	

乳源木莲	<i>M. maculata</i> var. <i>sublancea</i> Dandy
镇康木莲	<i>M. martinii</i> (Levl.) Levl.
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平伐含笑	<i>M. polytepala</i> R. Z. Zhou
黄兰	<i>M. shiluensis</i> Chun et Y. F. Wu *
乐昌含笑	<i>M. skinneriana</i> Dunn
麻栗含笑	<i>M. sphaerantha</i> C. Y. Wu ex Y. W. Law & Y. F. Wu #
台湾含笑	<i>M. szechuanica</i> Dandy #
兰屿含笑	<i>M. velutina</i> DC.
西畴含笑	<i>M. wilsonii</i> Finet & Gagnep. **
紫花含笑	<i>M. xanthantha</i> C. Y. Wu ex Y. W. Law & Y. F. Wu #
南亚热带	<i>M. xinningia</i> Law & R. Z. Zhou #
法平含笑	<i>M. yunnanensis</i> Franch. ex Finet & Gagnep.
合笑	<i>M. yunnanensis</i> Law & R. Z. Zhou
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广西含笑 (高大含笑)	<i>T. bodsonii</i> Hook. f. & Thomson #
广西含笑	<i>Toongiodendron</i>
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壮南含笑	<i>Woonongia</i>
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展毛含笑	<i>M. macrocarpa</i> B. L. Chen & S. C. Yang #
黄心含笑	<i>M. microphylla</i> Law et R. Z. Zhou #
深山含笑	<i>M. oipara</i> Chang & B. L. Chen
白花含笑	<i>M. pachycarpa</i> Y. W. Law & R. Z. Zhou #
小叶含笑	<i>M. pingbianica</i> R. Z. Zhou et Law #
马关含笑	<i>M. platyptala</i> Hand.-Mazz.
厚果含笑	<i>M. polytepala</i> R. Z. Zhou
大围山含笑	<i>M. shiluensis</i> Chun et Y. F. Wu *
阔瓣含笑	<i>M. skinneriana</i> Dunn
多瓣含笑	<i>M. sphaerantha</i> C. Y. Wu ex Y. W. Law & Y. F. Wu #
石碌含笑	<i>M. szechuanica</i> Dandy #
野含笑	<i>M. velutina</i> DC.
毛果含笑 (球花含笑)	<i>M. wilsonii</i> Finet & Gagnep. **
四川含笑	<i>M. xanthantha</i> C. Y. Wu ex Y. W. Law & Y. F. Wu #
阔瓣含笑	<i>M. xinningia</i> Law & R. Z. Zhou #
峨眉含笑	<i>M. yunnanensis</i> Franch. ex Finet & Gagnep.
峨眉含笑	<i>M. yunnanensis</i> Law & R. Z. Zhou
峨眉含笑	<i>Parakmeria</i>
乐东拟单性木兰 (乐东木)	<i>P. lotungensis</i> (Chun & C. H. Tsong) Y. W. Law #
峨眉拟单性木兰	<i>P. lutchensis</i> Cheng #
海南拟单性木兰	<i>P. yunnanensis</i> Hu #
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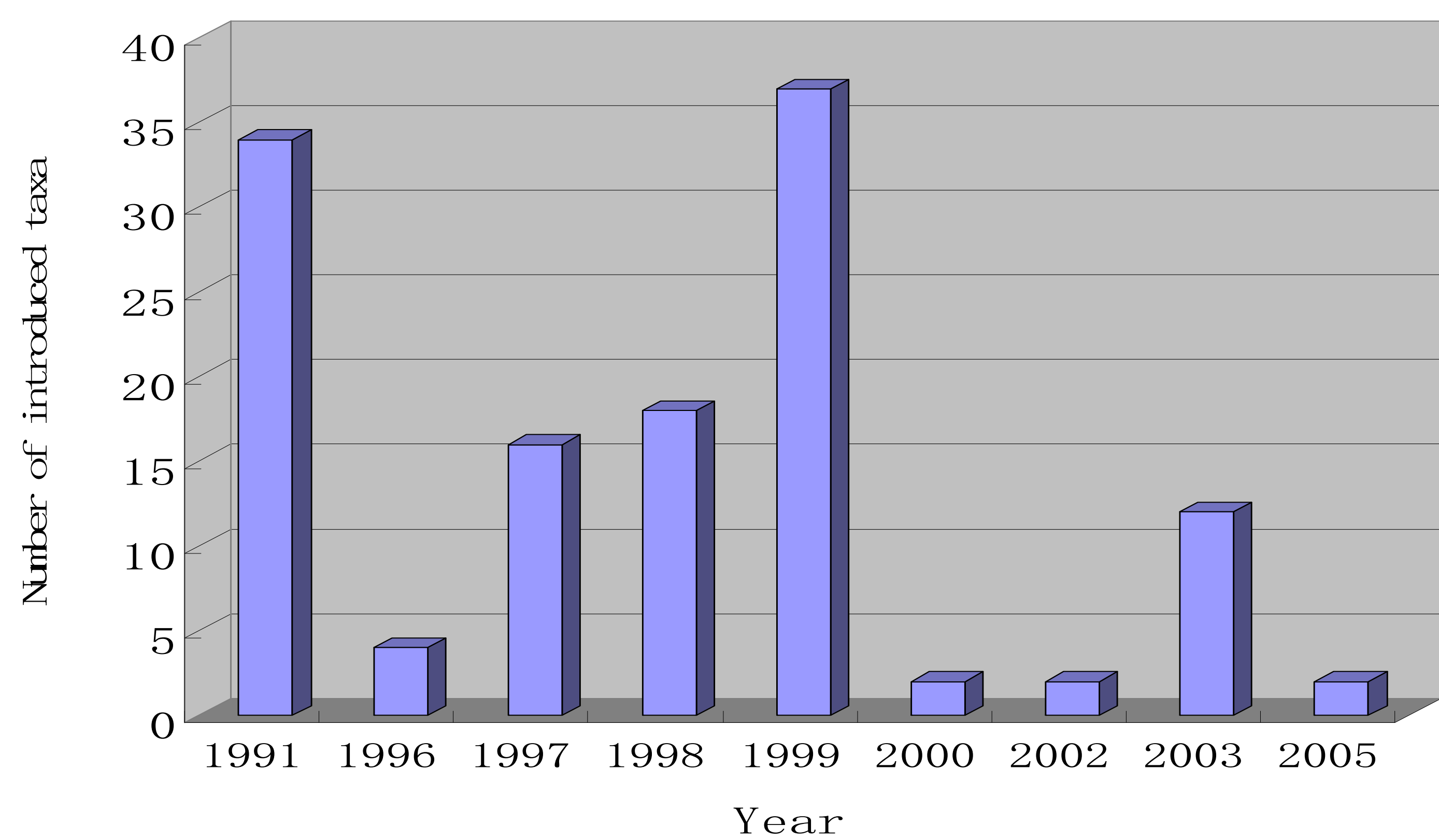


Figure 1. Numbers of wild magnolia taxa introduced into the magnolia garden counted on a year bases over the years of its history .



Figure 2. *Manglietia stella* G. L. Jiao species novo discovered from the living collections of the magnolia garden.

Table 2. Number of protected taxa and recommended taxa for protection in the magnolia living collections of Shenzhen Fairy Lake Botanical Garden.

	Number of taxa
Protection by China national regulation	18
Protection by IUCN	30
Recommended for protection from this study	25

Discussion

Among all the conservational activities taxonomical identification and conservational status assessing play a pioneering role. Taxonomical identities and conservational status had been studied upon the living collections in the magnolia garden of Shenzhen Fairy Lake Botanical Garden. A number of new taxa had been found and a big number of taxa had been found to be rare and endangered and recommended for authority organizations to consider for protection. The remarkable outcome of this study showed once again that botanic garden living collections can play a leading role in plant diversity conservation.

Magnolia living collections in Shenzhen Fairy Lake Botanical Garden can be used as a valuable platform for understanding and conserving China magnolias. According to statistics from the newly published book, China Magnolias (Liu et al. 2004), more than 2/3 of China magnolia taxa had been included in the living collections. The collections could be used for studying taxonomical identities and phenogenetical relationships of *Magnoliaceae*. Furthermore, the collections could be used in propagation programs for forestation and degraded habitat restoration.

Conclusion

- China magnolias have a very high ratio of rare and endangered species. The conservation status had not been properly assessed. More than 25 taxa had been found to be rare and endangered and should be considered by authority organizations for protection based on a preliminary assessing work in this study.
- The magnolia garden of Shenzhen Fairy Lake Botanical Garden had collected more than 2/3 of China magnolia taxa. These collections can be used as a national platform for understanding and conserving China magnolias.
- Living collections in botanic garden could be very important for plant conservation given it has been integrated with other conservation activities.

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