

A CHECKLIST
OF WOODY PLANTS
FROM EAST ASIA

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Introduction

East Asia, including China, Japan and the Koreas, is one of the mega-biodiversity hotspots in the world. It is also the richest region among the floristics in the northern hemisphere. It possesses more than 30,000 species of seed plants, at least more than one-third of which are woody plants, and many of them are endemics. For various reasons, however, it has not been possible to catalogue all of the species together and list them under one work, to make it convenient for users who are interested in woody plants from this vast area.

Botanists have investigated the plants of East Asia ever since the time of Linneus, over 260 years ago, particularly botanists from the West at least until more than half century ago. Botanists from the West have written about its rich floras repeatedly in the past, and local botanists of East Asia in particular have focused on their own plants at least since the last 60 years. Though all of native species from east Asia have been recorded in their local floras, different names are still used worldwide, particularly in arboreta, gardens and landscapes.

Today, when you consult any particular flora from any country of East Asia, it is not surprising to see a common species referred to by one name in one work but by a different name in another work, even though the names represent only one species; and in fact, even if the species was recorded only once by each work. It is also for this reason that the work was started more than ten years ago, around the autumn of 2004 when the author worked at Brooklyn Botanic Garden as a Plant Taxonomist for New York Metroflora Project during period of 2001-2009. However, since his return to China in 2010, with various active projects, which took up most of his research time, it has now very recently become possible for the author to finish the work.

There are 152 families, 1264 genera, 11885 species, 141 subspecies and 1653 varieties of native woody plants from east Asia in the checklist; among them, 11 families, 38 genera, 224 species and 74 varieties are gymnosperms, and 141 families, 1226 genera, 11661 species, 141 subspecies and 1579 varieties are Angiosperms; and among later, 136 families, 1167 genera, 10988 species, 141 subspecies and 1563 varieties are Dicots, and 5 families, 59 genera, 673 species and 16 varieties are Monocots. In total, there are 13679 taxa (including species, subspecies and varieties) among 152 families and 1264 genera, and 4940 taxa (about 36.1%) are widely distributed, but 8739 taxa (about 63.9%) are endemic to East Asia; and among the endemic, 8110 taxa in China, 857 taxa in Japan and 337 taxa in Koreas, which represented by 92.8%, 9.8% and 3.9% respectively.

This checklist is based on the three important modern local floras from East Asia, i.e. *Flora of China* (**FOC**, 1994-2013), *Flora of Japan* (**FOJ**, 1995-2016) and *The Genera of*

Vascular Plants of Korea (GVPK, 2007). All native woody names (either trees, shrub, subshrub or shrublet, including lianas) have been examined and recorded. However, even though I have tried my best to sort out the same species, it is impossible for one person to collect all of the possible sources to compare those different species names from different works without solid and detailed research or consultation of every monograph work. It is evident that further study on some problematic taxa¹ is still needed, especially for those which have not been treated well in different floras, either regarding a different concept of taxa *sensu lato* or *sensu stricto*, both used locally and internationally by botanists or taxonomists today. However, this checklist does provide you with the general background of few problematic taxa that should be further studied or to be addressed carefully if possible.

¹ Particularly unsure about the distribution either within a province or in different countries, plus unknown origin or cultivation for some taxa. All of these has been marked with “?”.

Guide

There are two parts that compose this checklist, i.e. **Part I** lists families with their genera, and **Part II** lists the genera with their species as well as their distribution. The Engler concept of the family is adopted in the checklist and there are alphabetically recorded in Part I, not only because it is used in the local floras of East Asia but the greatest number of users are familiar with these works. Within Part II, the main text of the checklist, all of genera are arranged alphabetically but followed by their family name in the parenthesis, and so does each species within the genus to which they belong, plus their distribution.

Part I, Families and Genera, the families here recorded with three parts of the numbers which represented by **a**, the total genera as well as their total taxa number (including species, subspecies and varieties), **b**, wide distributed taxa (non endemic to East Asia) and endemic taxa number to East Asia, and **c**, the endemic taxa number to East Asia distributed in China, Japan and Korea. This is illustrated in the example below:

	Taxa	Total Number	Non endemic, endemic	Endemic Number in China, Japan, Korea
Family Taxa Number	CORNACEAE	5g 45 sp 9 subsp 14 var	23, 45	44, 2, 5
Genera and Their Number	<i>Aucuba</i>	10 sp 6 var	2, 14	14, 1, 1
	<i>Benthamidia</i> = <i>Cornus</i>			
	<i>Bothrocaryum</i> = <i>Cornus</i>			
	<i>Chamaepericlymenum</i> = <i>Cornus</i>			
	<i>Cornus</i>	26 sp 7 subsp 4 vars	14, 23	22, 1, 4
	<i>Helwingia</i>	4 sp 4 var	3, 5	5, 0, 0
	<i>Mastixia</i>	3 sp 2 subsp	3, 2	2, 0, 0
	<i>Swida</i> = <i>Cornus</i>			
	<i>Toricellia</i>	2 sp	1, 1	1, 0, 0

Part II, Genera and Species as well as their distribution here recorded with two parts which are represented by the species name (*black Italic*) and their distribution, as well as their elevation when available. The species name is recorded alphabetically with the full spelling of each accepted woody plants of eastern Asian seed plants from FOC, FOJ, and GVPK; and all of taxa of species, subspecies and varieties, with their distribution recorded by the abbreviations. However, only the synonyms (both genera, species, subspecies, and varieties) are listed within the parenthesis after the accepted name if they are different from the above three floras, or listed as equals to which they belong. This is illustrated in the example below:

Genera (Family)	Helwingia (Cornaceae)
	<i>Helwingia chinensis</i> Batalin
Species A	1000~2600 m, China: s GS, GZ, w HB, HX, s SX, SC, YN; n Myanmar, Thailand
Elevation and distribution	<i>Helwingia chinensis</i> var. <i>crenata</i> (Lingelsheim ex Limpricht) W. P. Fang 1400~1900 m, China: se GS, GZ, s SX, SC, YN
Species B	<i>Helwingia himalaica</i> J. D. Hooker & Thomson ex C. B. Clarke (1000~)1700~3000 m, China: GD, GX, GZ, HB, HX, SC, XZ, YN; Bhutan, n & ne India, n Myanmar, Nepal, n Vietnam
Elevation and distribution	<i>Helwingia japonica</i> (Thunberg) F. Dietrich < 3000 m, China: AH, FJ, GD, GX, GZ, HY, HB, HX, JS, JX, SD, SJ, SC, TW, YN, ZJ; Japan: s HA, HO, KY, RK, SK; s Korea; Bhutan, n Myanmar
...	<i>Helwingia japonica</i> (Thunberg) F. Dietrich var. <i>hypoleuca</i> Hemsley ex Rehder 1200~2800 m, China: n GZ, w HB, s SX, SC, ne YN
Species Z	<i>Helwingia japonica</i> (Thunberg) F. Dietrich var. <i>papillosa</i> W. P. Fang & T. P. Soong 2100~3400 m, China: se GS, s SX, ne & sw SC
Elevation and distribution	<i>Helwingia japonica</i> (Thunberg) F. Dietrich var. <i>zhejiangensis</i> (W. P. Fang & T. P. Soong) M. B. Deng & Yong Zhang 100~2500 m, China: TW, ZJ
	<i>Helwingia omeiensis</i> (W. P. Fang) H. Hara & S. Kurosawa 600~1700 m, China: se GS, n GX, GZ, HB, HX, s SX, SC, YN

The distribution names and their abbreviation of the local division for each country, i.e. China (province), Japan (county), Democratic of People Republic of Korea and Republic of Korea (both province, commonly known as North Korea and South Korea, respectively), are also provided, plus local maps to show their positions in each country. The following abbreviations are used throughout the checklist for the distribution of each taxa, but for other places in Asia, the name of their country is spelled fully, then followed by the continent outside of Asia.

China (see map below)

HL	Heilongjiang
AH	Anhui
HY	Henan
BJ	Beijing
HB	Hubei
CQ	Chongqing (i.e., former e SC)
HX	Hunan
FJ	Fujian
JS	Jiangsu
GS	Gansu
JX	Jiangxi
GD	Guangdong
JL	Jilin
GX	Guangxi
LN	Liaoning
GZ	Guizhou
MC	Macao
HN	Hainan
NM	Nei Mongol
HJ	Hebei
NX	Ningxia
HK	Hong Kong
QH	Qinghai

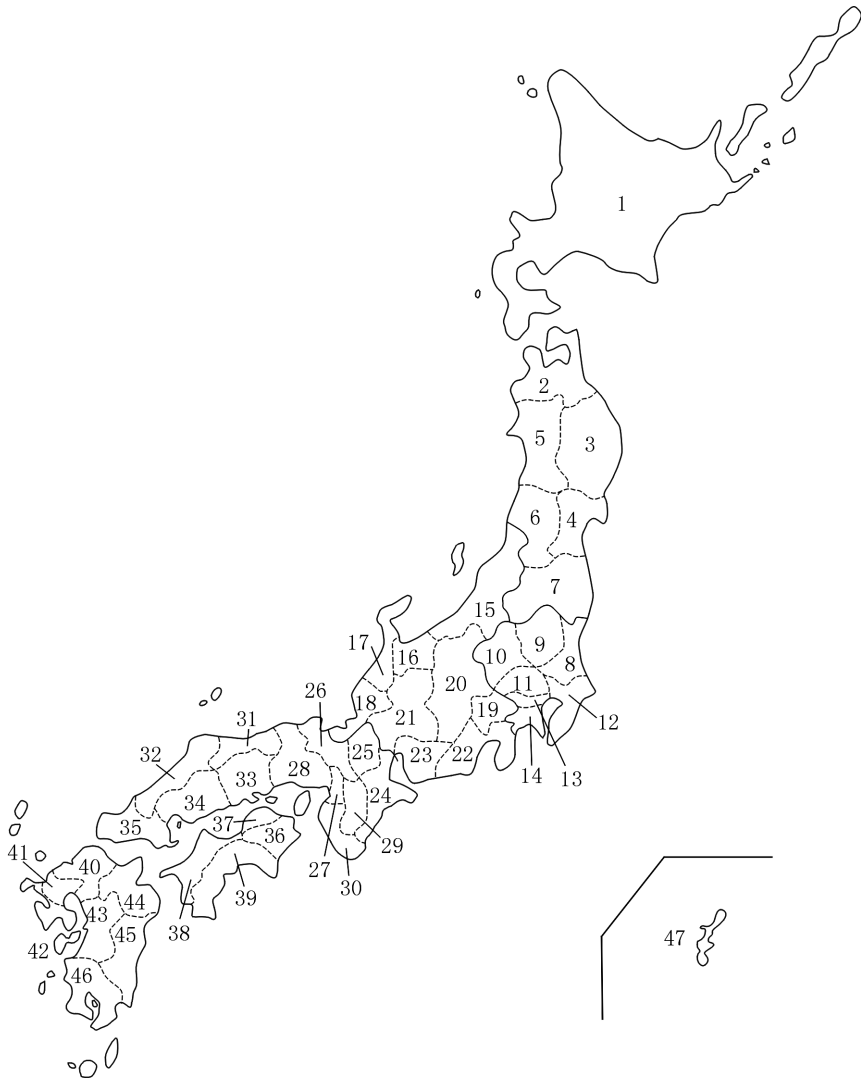
SH	Shanghai	TJ	Tianjin
SX	Shaanxi	XJ	Xinjiang
SD	Shandong	XZ	Xizang (Tibet)
SJ	Shanxi	YN	Yunnan
SC	Sichuan	ZJ	Zhejiang
TW	Taiwan		



Japan (see Map below)

Japan is usually divided into following five regions: **HA:** Hokkaido; **HO:** Honshu (Northern-Tohoku, Western-Chugoku, and Central); **KY:** Kyushu; **RK:** Ryukyu; **SK:** Shikoku; however, further division into county are as following (the numbers show their position in the map):

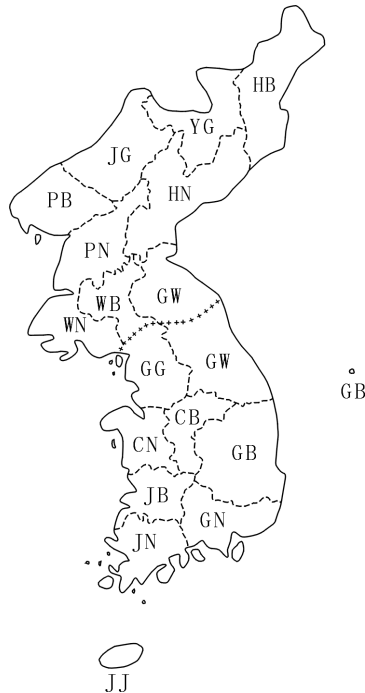
Aichi 23	Miyazaki 45
Akita 5	Nagano 20
Aomori 2	Nagasaki 42
Chiba 12	Nara 29
Ehime 38	Niigata 15
Fukui 18	Oita 44
Fukuoka 40	Okayama 33
Fukushima 7	Okinawa 47
Gifu 21	Osaka 27
Gumma 10	Saga 41
Hiroshima 34	Saitama 11
Hokkaido 1	Shiga 25
Hyogo 28	Shimane 32
Ibaraki 8	Shizuoka 22
Ishikawa 17	Tochigi 9
Iwate 3	Tokushima 36
Kagawa 37	Tokyo 13
Kagoshima 46	Tottori 31
Kanagawa 14	Toyama 16
Kochi 39	Yamagata 6
Kumamoto 43	Yamaguchi 35
Kyoto 26	Yamanashi 19
Mie 24	Wakayama 30
Miyagi 4	



Koreas (from Ma, 2011 & Park, 2007):

North Korea (KP, Democratic People's Republic of Korea) are divided into following: **GW:** Kangwon (Gangwon-Do, Kangwon-do); **HB:** North Hamgyong (Hamgyong-Bukto, Hamgyong-pukto); **HN:** South Hamgyong (Hamgyong-Namdo, Hamgyong-namdo); **JG:** Chagang (Jagang-Do, Changang-do); **PB:** North Pyongan (Pyongan-Bukto, Pyongan-pukto); **PN:** South Pyongan (Pyongan-Namdo, Pyongan-namdo); **WB:** North Hwanghae (Hwanghae-Bukto, Hwanghae-pukto); **YG:** Yanggang (Yanggang-Do, Ryanggang-do); **WN:** South Hwanghae (Hwanghae-Namdo, Hwanghae-namdo).

South Korea (KR, Republic of Korea) are divided into following: **CB:** North Chungchong (Chungcheongbuk-Do, Chungcheongbuk); **CN:** South Chungchong (Chungcheongnam-Do, Chungcheongnam); **GB:** North Kyongsang (Gyeongsangbuk-Do, Gyeongsangbuk); **GG:** Kyonggi (Gyeonggi-Do, Gyeonggi); **GW:** Kangwon (Gangwon-Do, Gangwon); **JB:** North



Cholla (Jeollabuk-Do, Joellabuk); **JJ**: Cheju (Jeju-Do, Jeju); **JN**: South Cholla (Jeollanam-Do, Jeollanam); **GN**: South Kyongsang (Gyeongsangnam-Do, Gyeongsangnam).

RUSSIA (RU) is divided into European part, Siberia (east and west) and Far East, and the later were further divided into following used in the checklist: **AM**: Amurskaya (Amur Oblast); **CA**: Chukotka Autonomous Okrug; **JA**: Jewish Autonomous Oblast; **KH**: Khabarovsk (Khabarovsk Krai); **KM**: Kamchatskaya (Kamchatka Krai); **MG**: Magadanskaya (Magadan Oblast); **PR**: Primorsky (Primorsky Krai); **SA**: Sakhalinskaya (including Kuriles; Sakhalin Oblast); and **YU**: Yukutia (Sakha Republic).

Asia is divided into: **Central Asia**: Azerbaijan, Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, Uzbekistan, and Mongolia; **South Asia**: Bangladesh, Cambodia, India, Laos, Myanmar, Pakistan, Sri Lanka, Thailand, Vietnam; **Southeast Asia**: similar with the area covered by *Flora Malesiana*, ie Indonesia, Malaysia, Maldives, New Caledonia, Papua New Guinea, Philippines, Singapore; **West Asia**: Bahrain, Iran, Iraq, Israel, Kuwait, Saudi Arabia, Turkey, United Arab Emirates, Yemen; **Himalayas**: Bhutan, Nepal, also including ne & nw India, n Pakistan.

Other geographical abbreviations:

c: Central, e: East, s: South, w: West, Is.: Island(s), Pen: Peninsula.

PART I
Families and Genera

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Major interesting: *Euonymus* (Celastraceae), *Aristolochia* (Aristolochiaceae) and *Euphorbia* (Euphorbiaceae) of east and south Asia, Metroflora of New York (2001—2009) , Metroflora of Shanghai (shflora.ibiodiversity.net/index.html, since 2015), and Invasive Flora of China; Chinese History of Plant Taxonomy and Taxonomic Literature of China as well as East Asia (www.planttaxonomists.cn/default.php, since 2014); and Natural History of *Metasequoia* (www.metasequoia.org, since 2001).

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