# Japanese Wood and Carpentry Rustic and Refined

MECHTILD MERTZ



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by

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This book is dedicated to my parents, Carien and Christian.

## Foreword

The use of wood as a material for construction dates back to the beginnings of mankind and is common to most cultures across the globe. While the use of wood in architecture is not confined to Japanese civilization alone, Japan is undoubtedly the land where woodcraft, in carpentry and cabinetmaking alike, reached a level of refinement and mastery rarely seen elsewhere in the world.

The Japanese archipelago was not affected by the great glaciations of the Quaternary period, which allowed for the preservation of its natural and rich laurisilva. Owing to a subtropical climate extending to its northernmost regions and the development of intensive and effective silviculture, Japanese forests remain among the most diverse in the world. Given the severe earthquakes to which Japan is subject, wood became the primary construction material for human habitation from protohistoric Japan onwards. Indeed, wood has been used throughout the archipelago's history for the building of all types of edifices, whether rural or urban, from modest dwellings to palaces, military strongholds, temples or shrines. Even today, while concrete and metal are used in large modern buildings and structures, suburban housing still largely consists of wooden structures for the roof frames and floors as well as the for ceilings and walls. The same may be said of everyday objects and utensils, many of which are still made of wood, bearing witness to Japanese culture's long-lasting appreciation for this natural material endowed with a wealth of both technical and aesthetical qualities.

Japanese culture's love and deep respect for wood also derives from the vernacular worship of spirits (*kami*) that are believed to inhabit Nature. According to the various beliefs that shaped Shinto, forests have always been the natural abode of *kami*. Among the three major categories of divine bodies —natural, artificial, and human—trees are, without question, the preferred medium of the *kami*, hence the great number of shrines across Japan associated with a particular tree. The influence of such beliefs is also reflected in Japanese architecture. One such instance is the central pillar of the wooden support structure of traditional rural houses, the *daikoku-bashira* 大黑柱 (the Daikoku pillar), where the family worships Daikoku, the household deity of good fortune. The latter evolved as a result of Shinto-Buddhist syncretism wherein the ancient great god of the earth merged with the Indian deity Mahakala.

For these reasons, among many others, the study of wood culture in Japanese architecture calls for scholarship in several disciplines, including scientific, technical, and aesthetical. In this respect, Mechtild Mertz is ideally positioned to take on this challenge. As an ethno-botanist and historian of art and archaeology, she has a unique combination of knowledge that few other Western scholars could boast of. In addition to her expertise in dendroecology and xylology, she has studied wood species and their uses in Chinese and Japanese art for over twenty years. Her present work supplements her prior book *Wood and Traditional Woodworking in Japan* (published by the same editor in 2011), by focusing on the main species of wood traditionally used by Japanese woodworkers in temple, teahouse, and residential architecture, as well as in the production of mobile components and room dividers: i.e., doors, windows, screens, and shutters. The originality of

this work also lies in the reproduction of a number of plates from the Yūyō Mokuzai Shōran 有用木 材捷覧 (An Overview of Japan's One Hundred Most Important Timber Species). This book, published in Japan in 1876, presents some hundred among the most remarkable wood species of the country. Mechtild Mertz's present work includes thirty-two reproductions of these magnificent illustrations representing those species most commonly used in construction and furniture. Owing to the wealth of its pictorial material, not to mention the scientific precision and clarity of its content, this book constitutes an invaluable resource for and contribution to the study of woodcraft in Japan.

Nicolas Fiévé

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## Introduction

Although numerous publications have noted the rich variety of wood species used in the construction of Japan's civil and religious structures, few have focused on the wood itself. This book hopes to make up for that deficiency by drawing attention to the wood species used by Japan's carpenters, who so ingeniously exploit the extraordinary diversity of their country's forest resources.

By focusing on carpenters and their creations, this book complements my previous publication, *Wood and Traditional Woodworking in Japan*<sup>1</sup>, which explored the various techniques employed in the fields of joinery, carving, turning, bending, and, to a small extent, carpentry. In that book I pointed out that wood selection was guided by aesthetic, symbolic, and religious factors, as well as by considerations of mechanical and physical properties and local availability. One appendix detailed the Japanese vernacular names of wood species, their scientific names, and their English, French, and German names, while another furnished a four-language glossary which defined four hundred woodworking terms used by Japanese craftsmen.

The interest shown in that pioneering work on Japanese woodworkers encouraged me to expand my study of Japanese wood species to include the field of construction. Daiku, or carpenters, play a key role in the selection of wood species used in construction. In Japan they are differentiated according to their area of expertise. Miya-daiku, for example, specialize in temple and shrine construction, while sukiyadaiku craft the refined teahouses and tearooms known as chashitsu. Although not actually carpenters, tateguya are considered to be members of the same professional guild. These joiners carry out the construction of doors, sliding doors, folding screens, partitioning screens, and window frames. In addition to these highly specialized carpenters, there are others who specialize in the construction of simpler folk dwellings called minka. These include farmhouses (nôka), mountain dwellings (sanka), and traditional townhouses  $(machiya)^2$ .



**Figure 1.** The cutting direction, relative to the tree trunk, determines what type of grain the wood will display:

- X: a transverse, or cross, section, which produces a *koguchi* end grain.
- R: a radial section, which produces a *masame* straight grain.
- T: a tangential section, which produces an *itame* flatsawn grain.

(Based on Hoadley, 1990, p. 12.)

<sup>1</sup> Kaiseisha Press, Ôtsu, Japan. 1st English ed., 2011; 2nd English ed., 2016. Japanese ed., 2016.

<sup>2</sup> JAANUS.

It may be helpful here to note how certain techniques are employed to obtain various aesthetic effects. Object-orientated cutting, for one, plays an especially important role in bringing out certain desirable visual effects. The cutting direction – transverse, radial, or tangential – relative to the tree trunk is of crucial importance (fig. 1). By using a certain cutting direction, for example, the carpenter can reveal an eye-catching, expressive grain. The impressive pillars of the Amida Hall of Kyoto's Nishi Hongan-ji Temple (fig. 2) provide a good example. Cutting in another direction, however, can produce the kind of discrete wood grain generally favored for use in tearooms, where its subtle beauty will be appreciated by the attentive or initiated observer.

Japan's rich forest resources form the basis for its renowned woodworking fields and explain why the Japanese claim to possess a 'culture of wood'. This national self-image was evidenced by the manner in which Japan, soon after the Meiji Restoration of 1868, sought to represent itself at World Exhibitions.

The nation's new government was offered an



**Figure 2.** Expressive grain of Japanese zelkova (*keyaki*) on a pillar of Nishi Hongan-ji Temple's Amida Hall, Kyôto.

opportunity to demonstrate its capabilities to the world in January 1872, when Heinrich Ritter von Calice, Austria's first accredited ambassador to Japan, invited Emperor Meiji to participate in the Vienna World Exhibition.<sup>3</sup> The invitation was accepted, and an Exhibition Bureau (*Hakurankai Jimukyoku*<sup>4</sup>) was soon created in order to prepare for the event.

By participating, the new nation hoped to achieve five main objectives: 1) attain international recognition, 2) obtain information about other countries' products and technologies, 3) learn how to establish museums and hold expositions, 4) build recognition of, and a market for, Japanese products, and 5) survey other countries' levels of production, prices, and needs.<sup>5</sup>

Emphasis was placed on promoting the nation's natural resources, as well as its skills. All provinces were ordered to send the Exhibition Bureau reports on, and samples of, their local specialties. Meanwhile, in 1872, an official team surveyed the country in a search for anything that could be construed as constituting a 'national treasure'.

At the Vienna Exhibition of 1873, Japan presented a list of 133 wood species in its official catalog.<sup>6</sup> It also sent wood samples, some of which were quite large: three *shaku*, or ninety centimeters, in size.<sup>7</sup>

4 Barna, 2015, pp. 20-30.

6 Japanische Ausstellungs-Commission, pp. 22-26.

<sup>3</sup> Zorn 2015, p. 46.

<sup>5</sup> Tanaka 1964, pp. 7-14.

<sup>7</sup> It is interesting to note that the Japanese team organizing the preparation for the Exhibition included Heinrich and Alexander von Siebold, sons of the well-known German physician and botanist, Philipp Franz von Siebold.

# 1. Miya-daiku, Temple and Shrine Carpenters



Kasuga Gongen Genki picture scroll (1309). Photo from the National Diet Library Digital Collections.

#### Large-Diameter Domestic Timber for Temples and Shrines

The *miya-daiku* is in charge of large-scale constructions characterized by many round or square pillars surmounted by bracket complexes consisting of bearing blocks called *masu* and bracket arms called *hijiki*. Set on top of *hashira* (pillars), these eave-supporting bracket complexes are called *tokyô* or *masugumi*<sup>1</sup> (fig. 1–1 and fig. 1–2).

As long as its supply lasted, the preferred timber species for such large-scale constructions as temples, shrines, palaces, and grand residences was hinoki cypress, a wood characterized by a pleasant scent, a very light, almost white color, strength, and resistance to humidity and decay (fig. 1–3 A+B). Another of its desirable characteristics is a fine, straight grain that allows it to be converted by means of wedge-assisted longitudinal splitting (fig. 1–5 A). Especially suited to this technique, *hinoki* had been converted in this manner since ancient times.

However, the reconstruction of Kyoto that took place following the Onin no  $\operatorname{Ran}^2$  caused the supply of large-diameter *hinoki* to dwindle, and, had it not been for the *oga*, a ripsaw that allowed wood to be cut lengthwise along the grain, progress would have been stymied. A two-man frame saw (fig. 1–5 B) that had been introduced to Japan from China in the fifteenth century, the *oga* made it possible to convert *keyaki* (fig. 1–4 A+B) and such other non-cleavable timber such as Japanese red pine (*akamatsu*) and Japanese black pine (*kuromatsu*) to be used to rebuild the large Kyoto temples that had burned. In the sixteenth century the Japanese invention of the *maebiki-oga* (fig. 1–6 A+B), a wide-blade ripsaw operated by just one person, provided another tool that enabled conversion of non-cleavable timber.

Higashi Hongan-ji Temple's enormous Japanese zelkova beams (fig. 1–4 C) testify to the *oga*'s efficiency. The wood was transported from the forests of Toyama and Niigata Prefectures. (*Keyaki* from northern areas has the advantage of being more warp-resistant.) Pine (*matsu*, mainly *akamatsu*) and hinoki cypress were used for the smaller parts further up in the roof.

Before the ravages of the Onin no Ran, however, cleavable *hinoki* was the wood of choice for large-scale construction. Constructed in 1227, the Main Hall of Daihō'on-ji Temple (popularly known as Senbon Shaka-dō) is one of the few structures in Kyoto that survived the devastation that occurred in the second half of the fifteenth century. One of its pillars – made from *hinoki* – still bears sword and spear gashes from that tumultuous period (fig. 1–3 B).

<sup>1</sup> Coaldrake, 1990, p. 16, JAANUS.

<sup>2</sup> A period of civil strife that lasted from 1467 to 1477.



**Figure 1–3 A.** Main Hall of Kyôto's Daihô-on-ji Temple, a.k.a. Senbon Shaka-dô, founded 1227. Photo: Alexandre Joly.



**Figure 1–3 B**. Battle scars left by the Onin no Ran on hinoki cypress pillar at Kyôto's Daihô-on-ji Temple, a.k.a. Senbon Shaka-dô. Photo: Alexandre Joly.

# 2. **Sukiya-daiku**, Carpenters of Refined Teahouses and Residences



*Toko-bashira* and secondary construction pillars.

The *sukiya-daiku* is in charge of the construction of *chashitsu*, rooms or small houses in which the tea ceremony is performed, and of refined wooden houses or residences, which often contain a *chashitsu*. The use of plain wood and the absence of decoration are the chief characteristics of these kinds of buildings.

#### Chashitsu

Tearooms, or *chashitsu*, come in several sizes and styles. Two excellent examples are Keijaku-an and Isui-tei (fig. 2-1 A), which, along with a waiting pavilion named Nyohô-tei (fig. 2-5), are located on the grounds of Hakusasonsô, the garden complex completed in 1916 by painter, Hashimoto Kansetsu.

Although smaller tearooms do exist, an ordinary-sized one is a *yojôhan*, meaning that it contains four and a half *tatami* mats.<sup>1</sup> A tearoom such as Keijaku-an (figs. 2–2 A–E), which consists of four and a half mats, is considered to be a *koma*, as opposed to larger *chashitsu*, called *hiroma*, that can range in size from four and a half to as many as eighteen mats. Six-mat Isui-tei (fig. 2–3) is one such *hiroma*<sup>2</sup>.

Some *chashitsu* are described as being *shoin*, or formal, in style, while others are considered *sôan*, or rustic. The level of a *chashitsu*'s formality – whether formal, semi-formal, or informal – plays an important role in determining the wood species and other material to be selected and the manner in which they will be processed.

*Sukiya-daiku* use a variety of refined materials and wood species that demand elaborate finishing techniques. This is especially true of anything connected with the *tokonoma*, or alcove. The *tokobashira*, the alcove's central decorative pillar, is usually made of precious wood, as are its *tokogamachi* (bottom frame) and *otoshi-gake* (lintel).

<sup>1</sup> The standard Kyoto *tatami* mat is 191 centimeters long, 95 centimeters wide, and 5 centimeters thick.

<sup>2</sup> See JAANUS.



**Figure 2–1 B.** Bamboo gutter along the edge of Keijaku-an's *hiwadabuki* (hinoki cypress bark) roof. Photo: Alexandre Joly.



Figure 2-1 C. Yoshino-sugi bark on the rear wall of Keijaku-an. Photo: Alexandre Joly.

# 3. *Tateguya*, Joiners of Doors, Windows, and Screens





A tsuitate. Photo: Benoît Jenn.

#### Techniques and Materials

*Tateguya* specialize in interior finishing. They craft the paper-covered sliding doors called *shôji*, the sliding doors known as *fusuma*, and the folding screens called *byôbu*. They also manufacture freestanding partitioning screens (*tsuitate*), wooden doors (*itado*), and shelves (*tana*).

The wood most frequently used for sliding doors and folding screens is Japanese cedar (*sugi*), especially the narrow-grained *Yoshino-sugi* found in Nara Prefecture. Its whitish outer *shirata* sapwood is used to make the lattice-like inner structure of sliding doors and folding screens. Compared to the reddish inner *akami* heartwood (fig. 3–1), *shirata* contains almost no resin. Using it rather than the *akami* thus ensures that resin will not stain the screen's paper covering or painted surface. This inner structure, called a *shitaji-bone*, is made of vertical and horizontal strips of wood (fig. 3–2 A + B). Boards made from magnolia wood (*hônoki*) are inserted into it, into which hand pulls, or *hikite* (fig. 3–2 C), which facilitate opening and closing, are then set.

#### Usage of the Outer Shirata Sapwood of Cedar

Sliding doors and folding screens are sometimes valuable art objects in themselves, and, as such, are handled with the utmost care when exhibited and when put into, or taken out of, storage.

Consisting of multiple joined panels, *byôbu* can vary in size. The standard screen consists of six panels and is approximately one and a half meters high and, when fully opened, three and a half meters long.

*Fusuma* are sometimes covered with thick printed paper called *karakami*. Or they can be covered with silk or with another valuable kind of fabric. They can serve as canvases for famous artists (fig. 3–3) and feature valuable paintings. *Byôbu* are displayed to celebrate a specific ceremony or occasion, to mark the seasons (fig. 3–4), or simply to divide a room. Once they have served their purpose, they will be carefully stored.

Because *byôbu* are made of such natural materials as Japanese paper, silk, cloth, pigments, starch, and *nikawa* (a glue-like substance made from the bones and skin of animals or fish), they are fragile and can be easily damaged by insects or the elements. The same is true of their sapwood skeleton. They thus require the kind of careful maintenance that includes periodic airings and inspections called *mushiboshi* and must be repaired or restored on a regular basis.



**Figure 3–2 A.** *Shitaji-bone* for sliding doors. They are made from Japanese cedar sapwood. Magnolia-wood boards, into which hand pulls called *hikite* will eventually be fitted, have already been set into them.

B. Close-up of the whitish sapwood that makes up a *shitaji-bone*.

**C.** Close-up of magnolia-wood board piece into which a *hikite*, or hand pull, will be inserted. Photos: Usui Hiroaki.

# 4. Daiku, General Carpenters



The Kiso House, Musée de l'Homme, Paris.

In addition to the highly specialized carpenters dealt with previously, there are others, known simply as *daiku*, who are in charge of the construction of folk dwellings called *minka*. A general term, *minka* can refer to *nôka* (farmhouses), *sanka* (mountain dwellings), or to houses occupied by practitioners of specific trades, for example weavers. *Daiku* also craft the townhouses known as *machiya*.

Traditionally, *minka* were built by local *daiku* with assistance from the community. As they worked, *daiku* used local materials, labor, and skills and faithfully adhered to the architectural styles and forms dictated by each region's lifestyle. Because such features tended to change very slowly from one period to another, *minka* are rich in local color, blend very well with the landscape, and retain a variety of regional structural characteristics.<sup>1</sup> A farmhouse in the Tango Peninsula eighty kilometers north of Kyoto, a weaver's house in Nagano Prefecture's Kiso district, and a traditional townhouse in Kyoto furnish good examples of the handiwork of *daiku*.

#### The Kamiseya Farmhouse

Built in the 1940s in Kamiseya, a village located in a mountainous area of the Tango Peninsula, the Kamiseya Farmhouse illustrates sustainable wood usage. As such, it serves as a particularly good example of a traditional Japanese farmhouse, or  $n\delta ka$ . A two-storied structure, it has a *kayabuki* thatched roof covered with broad-leaf bamboo grass, or *sasa* – a very rare roof type, but typical of its region (fig. 4–1). Damaged by a fire in 1944, the house was abandoned and then fell into ruin. The house's owner permitted a research team from Kyoto's Research Institute for Humanity and Nature under the leadership of ecologist Yumoto Takakazu and forest scientist Oku Hirokazu to investigate the house's wooden composition. Microscopic wood identification<sup>2</sup> of all its wooden parts was done in order to study the criteria that had governed wood selection (fig. 4–2).

The wood had been selected to serve one of three structural functions:

- Pillars and beams. These composed the main structure of the building, and for the most part had been constructed of large conifers and wood species with specific properties, such as hardness. The wood species most commonly used was two-leaf pine (*ni-yô matsu*), followed by Japanese chestnut (*kuri*), Japanese cedar (*sugi*), and hinoki cypress.
- 2. Pegs. Used for joining the structural timber parts, these elements must be made from a very hard wood, such as the Japanese evergreen oak (*akagashi*), and this was indeed the wood species found to have been used the most. Other species that had been utilized were Japanese chestnut and Japanese cedar.
- 3. Roof rafters. Tied together with rope, they had been made from small diameter broadleaves obtained from the peripheral *satoyama*, the secondary forest surrounding the village. The main tree species used was Japanese chestnut. Hornbeam (*shide*), Japanese deciduous oak (*konara*), two-leaf pine (*ni-yô matsu*), and several other small-diameter wood species had also been

<sup>1</sup> JAANUS.

<sup>2</sup> Wood Identifications were carried out by Professor Sugiyama Junji and his team at Kyoto University's Research Institute for Sustainable Humanosphere.

# Part II

# Facsimiles of Thirty-Two Pages from the Yûyô Mokuzai Shôran Handbook



The front cover of the Yuyô Mokuzai Shôran.

This part consists of actual size facsimiles of thirty-two pages photographed by Alexandre Joly, taken from the *Yûyô Mokuzai Shôran*, a handbook illustrating Japanese wood species that was created for the 1876 Philadelphia and the 1878 Paris World Exhibitions.

The handbook's introduction explains that large tree trunks are used for architectural construction and shipbuilding, while tables, chairs, boxes, containers, and even smaller objects such as combs, chopsticks, and abaci, are made from wood of lesser dimensions. It laments that transportation difficulties render it unfeasible to introduce and exhibit large samples of Japan's most commonly utilized wood species. 'To compensate,' the introduction explains, 'we have glued thin sections – cut length-wise and cross-wise – of as many wood species as possible into this small volume.'

From all wood's production areas, only the most famous production places are given, the first listed being the one that provided the handbook's wood sample.

The handbook also makes note of the way in which each wood species is used. *Ken* 建 (construction), for example, indicates that the wood is used for architectural construction; *sen* 船 (ship) denotes that it is used for shipbuilding or naval construction; and ki 器 (implements) designates that the wood is suitable for making tables, chairs, boxes, and containers. The handbook also explains that *yanagi* (willow) is used for game boards, *utsugi* (deutzia) for wooden nails, and *hakuyô* (poplar) for Japanese sweets skewers.

The introduction concludes by stating that family names – which the handbook terms 'ordo' (order) – have been taken from De Candolle<sup>1</sup>'s taxonomic system and refers readers to his *Théorie* elémentaire de la botanique.<sup>2</sup>

Each wood species is represented by actual wood samples that have been thinly sliced in transverse, radial, and tangential sections and glued onto a single page.

The transverse, or cross, section is pasted at the top, while the radial and tangential sections appear at the bottom. The heading lists the standard Japanese name in roman letters, the scientific species name, and finally the family (order) name. On the right hand side of the page, the handbook makes note, in Japanese, of non-standard local names, distribution areas, and uses. For certain wood species, the handbook editors provide an additional comment. Distribution areas are not identified in accordance with the modern Japanese prefectural system; instead, pre-Meiji-era administrative province names are used.<sup>3</sup>

<sup>1</sup> Augustin Pyramus de Candolle, 1778–1841.

<sup>2</sup> The scientific species nomenclature is based on the taxonomic system established by the Swiss botanist Augustin Pyrame de Candolle (1778–1841) and refers explicitly to his important work *Théorie élémentaire de la botanique, ou exposition des principes de la classification naturelle et de l'art de décrire et d'etudier les végétaux* published in 1813.

<sup>3</sup> The Japanese authors were perhaps inspired by German forestry professor Hermann Nördlinger (1818– 1897), who published a series of volumes entitled *Querschnitte von hundert Holzarten* (Cross sections of one hundred wood species). Rather than printed images, the volumes contained thin cross sections of genuine wood mounted on sheets of paper. 11 volumes, each containing 100 cross sections, were published between 1852 and 1888. [*IAWA Journal*, Vol. 29 (4), 2008, pp. 439–457.] The *Handbook* in the author's possession contained a letter written by Nördlinger in 1888 to Supreme Forestry Advisor Probst in which he alludes to the *Handbook*.

The following list denotes the thirty-two selected wood species, the handbook number, and its scientific name in the handbook. The list is completed by the current scientific name and the English name.

Handbook Number	Japanese name	scientific name in the handbook (current name)	English name
1	SUGI (ACAMI)	CRYPTOMERIA JAPONICA	Japanese cedar (heartwood)
2	SUGI (SHIRATA)	CRYPTOMERIA JAPONICA	Japanese cedar (sapwood)
3	YAKU-SUGI	CRYPTOMERIA JAPONICA	Yakushima cedar
7	HINOKI	CHAMAECYPARIS OBTUSA	hinoki cypress
8	SAWARA	CHAMAECYPARIS PISIFERA	sawara cyoress
9	HIBA	THUJOPSIS DOLABRATA	hiba arborvitae
10	NEDZUKO	THUJOPSIS LAETEVIRENS (THUYA STANDISHII)	Japanese thuja
13	AKA-MATSU	PINUS DENSIFLORA	Japanese red pine
14	KURO-MATSU	PINUS MASSONIANA (PINUS THUNBERGII)	Japanese black pine
16	KARA-MATSU	PSEUDOLARIX KAEMPFERI (LARIX KAEMPFERI)	Japanese larch
21	TSUGA	ABIES TSUGA (TSUGA SIEBOLDII)	Japanese hemlock
23	MOMI	ABIES FIRMA	Japanese fir
29	AKA-GASHI	QUERCUS ACUTA	Japanese evergreen oak
33	KUNUGI	QUERCUS SERRATA (QUERCUS ACUTISSIMA)	sawtooth oak
35	KONARA	QUERCUS CRISPULA (QUERCUS SERRATA)	Japanese deciduous oak
36	KURI	CASTANEA VULGARIS (CASTANEA CRENATA)	Japanese chestnut
41	YANAGI	SALIX JAPONICA	willow
42	YAMANARASHI	POPULUS SIEBOLDII	poplar
44	SORO, also SHIDE	CARPINUS SP.	hornbeam
45	KEYAKI	PLANERA JAPONICA (ZELKOVA SERRATA)	Japanese zelkova
47	KUWA	MORUS ALBA	mulberry
56	HÔNOKI	MAGNOLIA HYPOLEUCA	bigleaf magnolia
57	KATSURA	CERCIDIPHYLLUM JAPONICUM	katsura tree
59	KIRI	PAULOWNIA IMPERIALIS (PAULOWNIA TOMENTOSA)	foxglove tree, paulownia, royal paulownia
61	KIWADA	PHELLODENDRON AMURENSE	Amur cork-tree
67	KAKI	DIOSPYROS KAKI	Japanese persimmon
68	KURO-GAKI	DIOSPYROS KAKI	black persimmon
70	MUME	PRUNUS MUME	Japanese apricot
75	TOCHINOKI	AESCULUS TURBINATA	Japanese horse-chestnut
82	YENJU	SOPHORA JAPONICA	pagoda tree
84	TSUBAKI	CAMELLIA JAPONICA	Japanese camellia
95	SARU-SUBERI	LAGERSTROEMIA INDICA	crape myrtle



No. 1 SUGI (heartwood) Local name: sugi 杉 Uses: architectural construction, implements, shipbuilding Distribution: Kii, Kumano, Shingû, Yamato, Tosa, Mikawa, Tôtômi, Satsuma, Iwaki, Ugo

# Glossary

Rômaji	Kanji	English	
abura	油	oil	
aite-bashira	相手柱	secondary post or pillar	
akami	赤身	heartwood	
ate-sabimaruta	档錆丸太	'rusty hiba log', a decorticated <i>hiba</i> log on which dark mold spots have been allowed to form in order to impart a rustic quality	
azumaya	四阿	thatch-roofed, rustic hut found in rural areas during the Asuka, Nara, and Heian periods, particularly in the eastern part of Japan	
bengara	弁柄	bengala, red iron oxide, red pigment	
byôbu	屏風	folding screen	
chashitsu	茶室	tearoom or detached teahouse	
chôjiboku,	停止木	protected trees, trees banned from cutting	
chôna	手斧、釿	adze	
daiku	大工	carpenter	
debushi	出節	small protuberances on the surface of hiba logs created by neatly sawing off small branches	
fuchi	縁	sliding door frames	
fujizuru	藤蔓	wisteria vine	
fuki-urushi	拭漆	'wiped-off lacquer' technique	
fusuma	襖	paper or silk-covered sliding door	
ganryô	顔料	pigments	
hakubutsukan	博物館	museum	
Hakurankai Jimukyoku	博覧会事務局	World Fair Exhibition Bureau	
hari	梁	beam	
hashira	柱	pillar, post	
hata	機	handloom	
hegi-ita	剥板	split board	
hegu	剥ぐ	to tear off, to peel off	
hijiki	肘木	bracket arm	
hikite	引手	hand pull	
hinoki-sabimaruta	檜錆丸太	'rusty hinoki log', a decorticated <i>hinoki</i> log on which dark mold spots have been allowed to form in order to impart a rustic quality	
hiroma	広間	tea ceremony room larger than four and a half <i>tatami</i> mats in size	
hisashi	廂	projecting roof	
itado	板戸	wooden door	
itame	板目	flat-sawn grain	
ji-matsu	地松	native or domestic pine	
juhi	樹皮	bark	
kabedome	壁止め	post between two walls	
kake-amado	掛け雨戸	suspended sliding storm shutter	
kaki-shibu	柿渋	persimmon extract	
kami-zan	上栈	upper frame	
Kansai	関西	region of western Honshu that includes the cities of Osaka, Kobe, and Kyoto	

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