

A RE-EVALUATION OF WOODS USED IN CHINESE HISTORIC FURNITURE (PART TWO)

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Abstract: *This second article discusses popular Chinese historic furniture woods relatively unfamiliar to the non-Asian collection. In this discussion, woods will be called by Chinese names accompanied by Latin or English names observing macroscopic features. This second part presents eleven prize woods used in Chinese regional furniture which are observed macroscopically, eight other secondary woods as encountered in Chinese historic furniture and a list of fifteen woods occasionally found in Chinese regional furniture.*

Key words: *Chinese historic furniture, Chinese regional furniture, timber nomenclature, wood identification, hardwood, softwood.*

1. Introduction

As part one of this study previously published in this journal illustrated (vol. 6. 55 No. 1), the identification of woods used in the making of Chinese historic furniture is complicated. This study aims to clarify and provide some clear definitions of these woods. This article commences with a study of valued woods employed in Chinese regional furniture. Here we examine Ju-mu (Zelkova), Yu-mu (northern Elm), Nan-mu (Phoebe), Zhange-mu (Camphor), Huang-Yang-mu (Boxwood), Bai-mu (Cypress), He-tao-mu (Walnut), You-mu (Teak), Yang-Huai-shu (Chinese Locust), Zuo-mu (Oak) and Shan-mu (Chinese Fir). Following this secondary woods found in Chinese historic

furniture are briefly described. Finally lesser common woods found in Chinese regional furniture are mentioned.

As previously mentioned (see part one) wood identification is perhaps one of the most confusing subjects in Chinese historic and regional furniture. Previous twentieth century research into this subject [6], [8], [18], [19], has been conducted on materials and sources available diligently, as well as close inspection of Chinese furniture in many western collections. The problem with identification is confused as the Chinese trade names for woods were based upon appearance, colour, and smell irrespective of species. In some cases more than one species of tree were given the same Chinese name, providing that the timber they yielded fulfilled the requisite

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criteria. This is not specific to China as issues of nomenclature are witnessed in the American timber trade of the seventeenth, eighteenth and nineteenth centuries [1]. A main objective of this article therefore is to arrange Chinese names with English and botanical names alongside them so that future references can be given in the correct order.

2. Basic knowledge for the identification of different kind of woods encountered in Chinese historic furniture

The woods listed in this article include softwoods known to have been used in Chinese historic furniture. Given the anomalies of terminological confusion, in which the same species can have more than one Chinese name, more than one species share the same Chinese name, while neither botanical nor Chinese names fit one-for-one onto English names, the practical solution is to retain the Chinese terms for general use. For inclusive purposes and vernacular representation, woods used for provincial pieces, secondary woods and some others used for small objects such as boxes and accessories are also listed here, albeit briefly.

3.1. The most valued woods in Chinese regional furniture

3.1.1. Ju-mu (zelkova), *Zelkova schneideriana*

The species of Ju-mu found in Jiangsu, Zhejiang and Anhui provinces is a large-leaf elm. It was a popular furniture-making wood in the Suzhou region [11]. Many pieces of furniture from Suzhou and Shanghai were made of it. Its wood is also comparatively denser and stronger, which plays an important role in Ming (1368~1644) and early Qing (1644~1911) furniture [19].

Macroscopic features

The arbor reaches 30 meters in height and the trunk, 1.5 meters in diameter. It is distinguished from its northern counterpart by a more refined ring porous structure that is apparent in the tangential surface, and by small medullary rays that are visible as fine reflective flecks across the radial surface. The sapwood is distinguished from the slightly darker heartwood, which varies in tonality from yellowish brown to coffee-brown. Jiangsu craftsmen traditionally divide Ju-mu into three types: yellow ju (*huangju*), red ju (*hongju*), and blood ju (*xueju*). Factors including the age of the tree are thought to account for these variations in color as well as ranging densities (.63-.79 g/cm³). Blood ju, with a reddish-brown coffee color as well as some feathery like figure in the tangential surface, is the most highly prized. Its beautiful grain looks like mountains piling up, called “pagoda pattern” by Suzhou cabinet makers [9].

Microscopic features

Ju-mu belongs to *Zelkova* genus according to Rong [18]. It is a ring-porous wood. It has vessels in latewood arranged in tangential bands or diagonal pattern, in multiples and in clusters. Perforations simple. Inter-vessel pits alternate, mostly polygonal sometimes rounded, non-vestured. Vessel-ray pits similar to intervessel pits. Helical thickenings present, only in narrow vessel elements. Vascular tracheids, associated with parenchyma, with helical thickening. Fibres of medium wall thickness. Fibre pits not very distinct, simple to minutely bordered. Axial parenchyma partly stored, paratracheal. Paratracheal axial parenchyma scanty to vasicentric. Prismatic crystals present in chambered axial parenchyma cells usually in chains of 5 or more than 5. Rays multiseriate, 2–15 cells wide, mostly 8-12 cells wide. Height

of commonly 40 to 75 cells. Rays heterocellular (Kribs type heterogeneous III) or homocellular. Homocellular ray cells procumbent.

3.1.2. Yu-mu (northern elm), *Ulmus species*

Yu-mu (Northern Elm, *Ulmus*) is traditionally the most common hardwood used in the manufacture of furniture in Northern China [12]. The sapwood tends to be yellowish-brown in tone, whereas the heartwood is typically more of a chestnut brown colour; both possess a striking, wave-like grain, which make it ideal for wooden chair seats and table tops. The colour of the furniture made of its wood darkens with age [10].

Working properties

This wood dries with difficulty, and is of medium density and hardness, making it an attractive material for furniture manufacture. [11]. Those that grow on the hillsides are of better quality due to the density caused by compression wood. It expands and contracts with weather changes, so unfortunately it can warp badly and is extremely vulnerable to rot and woodworm attack. However, if specifically seasoned it will provide a good quality timber for furniture making.

3.1.3. Nan-mu (phoebe), *Lauraceae* family, *Phoebe nees*

Nan-mu is a native of China. More than thirty varieties are found south of the Yangzi River, Hai-nan island and Vietnam [16]. It is a large, slow growing tree of the evergreen *Lauraceae* family that develops with a long straight trunk ranging from 10 to 40 meters in height, and 50 to 100 centimeters in diameter. While sharing some characteristics with the coniferous cedar, it bears no botanical relationship. Its

timber is a durable, serviceable material, which probably lacks a common English working equivalent name. While definitely below the woods already mentioned above in quality, and above all without the wonderful translucence of Hua-Li (see part one), nan-mu is a useful wood for domestic pieces where a lighter tonality is desired. This silvery-brown soft wood was traditionally valued as one of the best materials for cabinet construction. Many attractive country pieces are found in this wood, and it has undoubtedly been used for furniture as long as any of the indigenous woods [14].

Working properties:

Once dry, the wood does not warp or split, unlike many woods it can be sanded and polished to create a smooth, hard surface, making it ideal for furniture manufacture. Its colour shades off into yellow-browns and is at its best when used for simple or even slightly provincial design. In addition to furniture, nan-mu is also used in the construction of houses and boats because it is highly resistant to decay. Nan-mu also emits a pungent fragrance when freshly worked. The aromatic smell and oily nature of the wood make it ideal for repelling all forms of insects and moths. Nan-mu burl is typically used for decorating cabinet doors and table panels.

3.1.4. Zhang-mu (Camphor), *Lanraceae* family, genus *cinnamomum*, species *C. camphora* (L.)

Camphor is a large evergreen tree of the *Lanraceae* family. It frequently grows to large proportions often approaching 50 meters in height with trunks achieving up to 5 meters in diameter. It can be located in large quantities distributed south of the Yangzi River including the Hai-nan Island. It is most plentiful in Taiwan, followed by Jiangxi and Fujian provinces [11]. For the

Chinese, it is a wood much prized in the making of good chests [13].

Macroscopic features

It has a moderately fine and even texture and its interlocked grain pattern imparts a light and dark striped figure patterned with its open pores appearing as slanted parallel lines in the radial surface. The pale sapwood of camphor is clearly distinguished from the heartwood, whose colour is yellow with green or brown tinges when fresh but exposure to light it turns dark brown, occasionally having dark streaks. The fragrance of camphor is intense after freshly cut, and its strong scent does not diminish with time, so the camphor wood, often employed in whole or in part for the manufacture of furniture designed to contain textiles, due to its insect repellent qualities. Apart from its weight, the timber is a little alike its close relative Greenheart [17].

Working properties

Slow drying is needed to avoid degradation. It is light to medium in weight (.42-.54 g/cm³) and soft to medium in hardness. It is relatively stable but not particularly strong as a timber. The surface can be polished to a rich luster. This species is used for furniture, light construction, internal and external joinery and flooring.

3.1.5. Huang-Yang-mu (Boxwood), *Buxus sempervirens*

Boxwood is a small tree. Due to its limited dimensions, it is rarely used for complete components in pieces of furniture. It can be found being utilized for small, carved objects and use as a decorative inlay [11]. This wood has been used in China for centuries as an inlay material, as well as for desk pieces. Numerous varieties, which all produce

material of similar characteristics, are widely distributed throughout China.

Macroscopic features

The tree grows very slowly, with some varieties reaching only 10 to 15 cm diameter after 100 years. The sapwood and heartwood of boxwood are indistinguishable, and their freshly cut pale-yellow colour turns to a warm brownish-yellow tone after exposure. The timber is light yellow in colour with a very fine and even texture. The grain is often straight but may be quite irregular, especially in wood from the smallest trees. The structure is so fine that even with a hand lens the vessels can barely be seen and growth rings are only faint. Because of its extremely small vessel cells, the texture is exceptionally smooth and fine, and the surface polishes to a silky luster with little effort. Freshly worked boxwood has an earthy fragrance.

Working properties

Boxwood is very durable and dense (.83.93 g/cm³), the timber is difficult to dry and especially prone to split, so it needs care in drying to avoid surface checks. It finishes well and its fine even texture and hardness make it especially suitable for carving. Usually it was used to make such items as mathematical rules and scales, inlaying furniture, parts of musical instruments, chessmen, rollers and silk shuttles [5]. With age, boxwood turns from its white colour to orange-amber, and finally to a dark amber-brown. With a strong mixture of yellow and oak spirit stain cheaper whitewoods are often coloured to simulate Huang-Yang-mu.

3.1.6. Bai-mu (Cypress), *Cypress family*, *Cupressus L.*

Cypress is categorized as a 'miscellaneous soft wood' located in both

Northern and Southern Chinese furniture with the northern type having a higher value. Late Ming connoisseurs [20] noted the use of Si-chuan cypress as a suitable furniture-making material, and Qing dynasty records from the Yuan-ming-yuan also indicate that southern cypress was of comparable value to nan-mu [11].

There are several cypress varieties found in modern China. The most highly sought is the Weeping Cypress (*C. funebris*) as it has the best working properties and is very durable. It is heavily concentrated in Si-chuan province where it can be found to grow to a height of thirty meters with a two meters diameter trunk. The heartwood of Weeping Cypress has a yellowish-brown tonality, and is sometimes slightly streaked with red. With oxidation the colour darkens whilst the sapwood is paler in appearance.

Working properties

Bai-mu can produce a good quality surface finish with a reflective finish. Applications of coatings are limited due to its oily nature. It is therefore best oiled or waxed only. One disadvantage is its pungent aroma. The grain is generally quite straight and evenly textured. The weight, density (± 0.58 g/cm³) and hardness are both medium to high. Drying is relatively slow, and requires attention to avoid warpage problems. It has good insect repellent properties and moisture resistance (when dried slowly). This finely textured material can be used to achieve good results by the cabinet maker [11].

3.1.7. He-tao mu (Walnut): *Juglandaceae* family, genus *Juglans*, regia L.

It is a very dense hardwood when seasoned and is usually found in Northern Chinese furniture. It is considered a rare and better wood by furniture dealers and collectors in China than in the west [2].

Although this wood was used for furniture primarily during the Qing Dynasty in the Shan-xi province, which generally demonstrates refined workmanship, Ming furniture made from this wood can still be found today in relatively small numbers.

It encompasses a variety of species such as True Walnut (*J. regia* L.), Manchurian Walnut (*J. mandsharica* M.). It typically has an open-grain texture, with colours tending towards golden brown to reddish brown. True walnut is a deciduous tree reaching 20 meters in height that produces an edible nut that can be pressed into a high-quality vegetable oil. Its light-colored sapwood is clearly distinguishable from the heartwood, the latter being reddish-brown to chestnut-brown in colour, and sometimes even purplish, or with darker striated patterning. Walnut is easily confused with nan-mu, however, the surface of walnut tends to have more of an open-grained texture, and the colour tends more towards golden-brown or reddish-brown when contrasted with the olive-brown tones of nan-mu. Furthermore, its freshly worked surface emits a distinctive fragrance.

Working properties

The timber is fairly hard but easy to work when freshly seasoned and frequently has attractive grain patterns being marked with a variety of figures that are hard to match in other woods. It can be easily bleached and stained yellow orange, or brown/red. It dries very slowly, but is quite stable afterwards. Typical use is for gunstocks, but is also used in all kinds of high-quality furniture. Walnut is considered one of the finest of the cabinet woods. It has always been an expensive wood, consequently much of it is converted into veneer, particularly the finely marked varieties and burls.

3.1.8. You-mu (Teak), *Verbenaceae* family, *Tectona grandis*

Teak is a very valuable wood and is prized throughout the world. It has been heavily exploited for more than a century and is increasingly difficult to obtain. Its timber is valued in China principally for its extraordinary durability. In India and Burma, beams of the wood in good preservation are often found in buildings many centuries old, and teak beams have lasted in palaces and temples more than 1,000 years. The timber is practically imperishable under cover.

Macroscopic features

Teak is an attractive golden to dark brown, sometimes reddish brown, with a straight grain, sometimes wavy. It is strong, of medium weight, and of average hardness. Termites eat the sapwood but rarely attack the heartwood; it is not, however, completely resistant to marine borers. Teak is unique in that it does not cause rust or corrosion when in contact with metal.

Working properties

Because of its natural oils, teak is very durable and resistant to moisture and drying effects of exposure to weather. Its wood has the most dimensional stability. It is easily worked, and dresses to a very smooth finish. It is sought for the decks, trim and detail work in expensive boats, and fine furniture, flooring, carving, joinery, cabinetwork, paneling, turnery and veneer.

3.1.9. yang-Huai-shu (Chinese Locust), *Robinia Pseudoacacia L.*

Locust is distributed throughout China, however the best is considered to come from northern China. It initially appears quite similar to northern elm. In the

Northern Song (960~1279 architecture treatise *Yingzao fashi*, [14], locust and elm (*yu*) were categorized 'miscellaneous hardwoods' of similar sawing difficulty. However, locust is appreciably more dense (.79-.81 g/cm³), and the surface is more coarsely textured. The pores in the early wood can be relatively large; the grain is relatively straight but unevenly textured.

Working properties

The timber is hard and very strong. It is relatively easy to dry, with little warp; however, it tends to develop large cracks. After drying, the wood is quite stable and naturally resistant to moisture and insect damage. It is difficult to cut and to surface; however, afterwards, it reveals a lustrous surface.

3.1.10. Zuo-mu (Oak), *Quercus* genus

The timber of oak has long been known as an excellent furniture-making material [11], extensively used for country furniture for carcass work and as a cabinet wood in its own right. It grows mostly in the northern part of China and Korea (called Gao-li mu in Korean). Botanists have identified one hundred and forty types of oaks widely distributed throughout China [15]. Its colour can vary from yellow to pale brown, depending on the species and conditions of growth. The sapwood and heartwood are not clearly distinguished. Distinctive medullary rays appear in the tangential surface as short dark lines; in the radial surface, they appear as lustrous flecks woven through the longitudinal grain.

Working properties

Technically, oak is strong, reliable, durable. it is extremely dense and hard. The material is difficult to dry and not easy to work. Oak can react with ferrous metals due its high tannin content.

3.1.11. Shan-mu (China Fir), *C. lanceolata* (Lamb.) Hook.

China fir is a kind of common wood used in many of the Southern regional furniture pieces, such as buckets, stools, cabinets and etc.

Macroscopic features

It has straight and even grained with a medium to fine texture. Creamy white to pale brown color, its sapwood is indistinguishable from heartwood. Light and soft with low strength, shock resistance, and decay resistance.

Working properties

It works fairly easily with hand or machine tools. Glues, screws, nails, stains, paints, and varnishes well. It is used primarily for general construction, as well as boxes, crates, sash, doors, trim, plywood, and pulpwood.

4.1. Other woods

All listed as follows are the accepted secondary woods in Chinese historic furniture.

4.1.1. Shui-qv-liu (Manchurian ash), *Fraxinus mandshurica* Rupr.

It is lighter in weight than the western varieties and is of a deeper reddish-brown colour. This timber is found in Chinese as well as in Korean and Japanese furniture. The Chinese variety seems to have a less vigorous grain than that usually encountered in Korean pieces, and when it is not dyed it is difficult to distinguish it from Chinese northern elm, Yu-mu [4].

4.1.2. Zhi-shu(Catalpa), *Bignoniaceae* family, genus *catalpa*

Catalpa is a very important wood in China. It is slightly redder than Nan-mu but of the same general appearance, and was used as a secondary wood. The first character for *Chair*, in Chinese was borrowed from the name of this wood [19].

4.1.3. Feng-shu (Maple), *Acer* genus

Maple is a tough, moderately heavy and fine-grained timber. Its colour varies from cream to yellow. As a hard-wearing and fine-finishing wood it is ideal for fine-quality cabinet work. Imperfections in the surface show up very clearly.

4.1.4. ying-tao-shu (Cherry), *Prunus* species

Cherry wood is the finest of the fruit wood family. It has a dense, even-natured grain and varies in colour from the cream of the sapwood to the dark-red-brown of the heartwood. It works well, despite its toughness, and finishes to be an appealing shine. Apart from its use in the solid, cherry has been popular for turned items, decorative inlay and for legs of modern factory-made furniture with faked cherry wood tops. Cherry stains well. Poplar and fruitwood can be used as substitutes.

4.1.5. Hua-mu (Birch), *Betula* species

Birch is a close-grained and fairly heavy wood, soft-brown in colour and similar to maple in character. Large amounts of this wood are used for modern plywood. Birch works well and finishes to such a fine lustrous surface that it is often used to imitate cherry and maple. Some of the knotty and curly varieties make excellent veneer for fine furniture.

4.1.6. Xiang-chun-shu (Chinese mahogany), *Meliaceae* family, genus *cedrela*; the most common species is *sinensis*

It is found in many parts of North, Central, and West China. It is a wood often used for good local furniture, it can diffuse an aromatic odor [3].

4.1.7. Zhong-guo-Huai (Chinese scholar tree), *Sophora japonica* L.

It is one of the common timber trees of China, good for general construction and for furniture as well.

4.1.8. Ma-wei-song (Masson Pine), *Pinaceae* family, *massoniana* Lamb.

It is commonly used in less expensive southern Chinese furniture, mainly for kitchen cabinets. In Southern provinces bright red lacquer was often used to paint the wedding cabinets made of pine for decoration.

5.1. Lesser known woods used in Chinese regional furniture

Apple: *Malus* Mill.

Arbor-Vitae: *Cupressaceae* family, *thuja orientalis*.

Chinese chestnut: *Fagaceae* family, genus *castanea*, the most common species is *mollissima*.

Eaglewood: *Lignaloës*.

Machilus: *Lauraceae* family, genus *Machilus*, closely related to species phoebe Nan-mu.

Mulberry: *Morus alba* L.

Palm wood: *Palmae* family, *camaerops fortunei*. Its bark is used for the rope of the under webbing of soft cane seats.

Peach: *Pyrus persica*.

Pear: *P. calleryana* Decne.

Poplar: *Salicaceae* family, genus *populus*, with many species.

Sandalwood: *Santalaceae* family, *Santalum album* Linn.

Schima: *Theaceae* family, genus *Schima*, with various species in tropical Asia.

Spruce: *Pinaceae* family, genus *Picea*, with many species.

Willow: *S. babylonica* L.

Yew: *T. chinensis* (Pilger) Rehd.

Undoubtedly, bamboo, *Bambusa arundinaria*, was used in Chinese furniture from time immemorial, both in its natural state and dyed and lacquered. Its natural form was simulated in the hardwoods as early as the 16th century in China. In the poorer mountain regions those who were not well off were forced to rely on bamboo as a furniture material.

Conclusion

The wood species mentioned above in this article were used in Chinese historic and regional furniture with some of them still being employed in modern furniture manufacture. Where possible the species of the above named woods have observed the broader Linnaean terms and it is clear that the provision of western classification to Chinese names for groups of woods is helpful.

When it is possible to couple a Linnaean classification with any certainty to a Chinese group, this has been done even though it may be only for one species in

the group. This second part of this study has again illustrated that the study of Chinese woods is a complex one. Previous attempts to present Chinese woods used in Chinese furniture making has been mainly conducted in China. Western scholarship on the subject has been most effective when research has been interned in Chinese cultural institutions. A lot of work was done in the 1990s through the *Journal of Classical Furniture* and it is unfortunate that this learned society declined in the late 1990s. This brief and modest study has attempted to draw attention to the vast opportunities for further research in this field.

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References

1. Bowett A., 2012. *Woods in British Furniture Making 1400-1900: An illustrated Historical Dictionary*. Oblong Books, London.
2. Bruce G., 1995. *Chinese Classical Furniture*. Oxford University Press, New York.
3. Cheng J., Yang J., Liu P., 1992. *Encyclopedia of Chinese Timber*. Chinese Forestry Press, Beijing.
4. Cheng J., Yang J., Liu P., 1992. *Chinese Wood Records*. Chinese Forestry Press, Beijing.
5. Clunas C., 1988. *Chinese Furniture, Victoria and Albert Museum, Far Eastern Series*. Bamboo Publishing Ltd, London.
6. Darrah J., 1992. *Furniture Timbers*. In: *Victoria and Albert Museum Bulletin*. Issue 04. London.
7. Ecke G., 1962. *Chinese Domestic Furniture*. Hong Kong University Press, Hong Kong.
8. Ellesworth R., 1998. *Chinese furniture: Hardwood examples of the Ming and Early Ch'ing Dynasty*. Collins, London.
9. Evarts C., 1991. *Chinese Ming Domestic Furniture*. In: *Journal of the Classical Chinese Furniture Society*. Vol. 2 No. 1: 72.
10. Evarts C., 1998. *Traditional Chinese Furniture: From Sumptuous Palaces to Courtyard Dwellings*. In: *Classical and Vernacular Chinese Furniture in the Living Environment*. Hong Kong. Yungmingtang. pp 22-33.
11. Evarts C., 1999. *C.L. Ma Collection: Traditional Furniture from the greater Shanxi Region*.
12. Jianqing T., 1996. *Classic Chinese Furniture for the Qing Dynasty*. Phillip Wilson Publishers, London.
13. Kates G., 1962. *Chinese Household Furniture*. Dover Publications Inc., New York.
14. Li-Jie, 1103. *The Yingzao Fashi: Treatise on Architectural methods*. Directorate of Buildings and Construction for Emperor Huizong of Song, China.
15. Liu P., Yang J., Lu J., 1993. *Tropical Timber of South-East Asia*. Chinese Forestry Press, Beijing.
16. Meniado J., Tamolang F., et al. 1975. *Wood Identification Handbook, Vol.1*. Manila Government Printing Office, Washington.

17. Rendle B., 1970. *World Timbers*, Vol. 3, Asia and Australia and New Zealand. Ernest Benn Limited, London.
18. Rong C., 1959. *Classification of Chinese Woods*. Shanghai and Science Technology Press, Shanghai.
19. Shixiang W., 1985. *Classic Chinese Furniture –Ming and Early Qing Dynasties*. Joint Publishing Co. (H.K.) and Cultural Relics Publishing House, Beijing.
20. Shixiang, W., 1991. *Development of Furniture Design and Construction from the Song to the Ming*. In: *Oriental Arts*. January, pp. 58-71.