

A REEVALUATION OF WOODS USED IN CHINESE HISTORIC FURNITURE

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Abstract: *This article discusses popular Chinese historic furniture woods relatively unfamiliar to the non-Asian collections. In this discussion, woods will be called by Chinese names accompanied by Latin or English names observing macroscopic and some microscopic features. Woods encountered in Ming and Qing hardwood furniture are discussed; Zi-tan (Sandalwood), Huang-hua-li (Yellow flowering pear), Hong-mu (Mahogany - redwood), Ji-chi mu (Chicken Wing Wood), Tie-li mu (Ironwood), Wu-mu (Northern Elm), and Hua-mu (burl). The article is presented in two parts. Part one introduces the reader to the complexities and challenges of understanding these woods, as well as presenting seven invaluable species used in Chinese fine furniture.*

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

1. Introduction

The question of which woods were used in the making of Chinese historic furniture is complex. Access to China's material culture by non-Chinese scholars has been limited from 1912 to the present date. Asian researchers such as Rong [17], Shixiang [20], and Western researchers like Ellsworth [9], Darrah [7], in the twentieth-century have studied the materials and sources available carefully, as well as conducting tests on furniture itself. The conclusion of this work is not satisfactory, because the Chinese timber industry named woods according to their appearance, colour, and smell regardless of what types of tree species they came from. This meant that timber from the same tree

cut at different angles or from different regions might have been marketed under different names. In some cases more than one species of tree were called by the same Chinese name, providing that the timber they yielded fulfilled the requisite criteria. A central aim of this article is to align Chinese names with English and botanical names.

China has been deforesting herself throughout the whole of her habitable area for many centuries [11]. The primary historic furniture woods discussed here seem to have been procured possibly even during Ming dynasty (1368~1644), in large measure from beyond Chinese borders. The Philippines and the East Indies [16], generally seem to have made their contribution quite regularly over the centuries to China's diminishing supplies.

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Ming and early Qing (1644~1911) furniture makers favoured the expensive imported hardwoods. These are dense, tropical hardwoods which have an attractive grain and rich colour, in some cases so dense in grain that they sink in water. Softwoods with strong visual characteristics were also favoured. Close examination of extant furniture shows that secondary materials were used for the back and interior of furniture; back panels of cabinets, sides of drawers, drawer bottoms and carcass material for lacquered or veneered furniture. Therefore, wood used in Chinese historic furniture conforms to this practice, which falls into these two groups: primary woods, mainly being of the hardwood type and secondary woods, mainly being of the softwood type.

Furniture woods vary widely in colour, pore size, figure, strength, and workability. Generally, softwoods are less expensive, easier to cut and shape, having less figure than hardwoods, whereas hardwoods tend to allow for a higher standard of accuracy in joint makings, take stains and finishes better, provide more varied colour and grain, and have a greater resistance to wear.

However, the names of hardwoods and softwoods sometimes can be misleading because they do not always refer to the respective strengths of the wood. Within the hardwood range there are the soft and easily worked woods like Nan-mu (Chinese name), and dense and hard woods like ebony. The same range exists within the softwood family, soft pine and yew being two polar extremes.

2. Why identify woods used in Chinese historic furniture?

With the growth in new and the expansion of existing museum collections in China as witnessed in recent years, interest in Chinese historic furniture has greatly increased [13], therefore it has

become more important to identify the materials used in making extant examples. Firstly, the identification of wood is of great significance in appraising Chinese historic furniture, the wood species is one of the main factors which are related to its evaluation. Secondly, the first stage for the curation of historic furniture [6], is to understand and identify the materials from which it is constructed. Thirdly the conservator-restorer needs to establish what wood or woods the piece is made from before conducting any treatment regime. For these purposes, it is important to establish a wood classification.

3. The challenge of wood identification in Chinese historic furniture

This task requires technical abilities and research references. Some woods can be identified macroscopically through prominent key features, whilst others require microscopic analysis, as they are less distinct at the macroscopic level. The ability to recognise wood used in Chinese historic furniture can be complicated for several reasons.

Firstly, several woods were used in the construction of an object, or another type was substituted for the original during restorations. In such instances, only a close and thorough examination of the object can make an accurate identification possible.

Secondly, the ancient Chinese names for woods were given on the basis of the aromatic qualities of the woods or on the similarity in color or grain to an already understood ideographic description as above mentioned (this would certainly have been the manner in which imported woods were also named). However, these names give no clue to the type of tree this wood comes from, nor does it give the slightest indication of the origin of the wood, imported or indigenous.

Thirdly, although sometimes grain patterns and colour are helpful for

identifying wood, no two trees of the same genus have the same fingerprint [15], being different in colour or grain pattern. Furthermore, grain patterns vary depending on how the conversion of the wood is orientated when sawn. If it is cut straight down the middle (longitudinal), the grain pattern will be in vertical lines. If it is quarter-sawn, the pattern will be irregular. The various methods of cutting boards from a tree produce all manner of differing grain patterns, figure and colour.

Finally, the effects of time and various stains, particularly on historic furniture, can also cause endless speculation as to the nature of a wood. The bleaching effects of sunlight (U.V. radiation), can make different woods look similar (such as faded *Juglans* compared to faded *Dalbergias*). To add to this confusion, all types of cheap and featureless woods have been used to simulate exotic and expensive timber, for example, beech and elm can be stained to simulate Huang-hua-li.

Fourthly, it is difficult to add species and genera names to a group of woods marketed by one Chinese name. In any event, to do so would require that the tests be definitive, for which samples of the living tree would have to be available. But for some of the trees from which these varieties are nearly extinct, it is not easy to get the samples. For this reason, hardwoods used in early Chinese furniture must continue to bear their Chinese rather than Latin or English names [2].

Finally, because of the fact that the Chinese distinction between hardwood and softwood differs from that in the West, the terminology for Chinese woods could be much more confusing for western researchers. The term hardwood in China refers to the woods of the tropical variety, whose density, hardness and imperviousness are qualified enough to resist the boring insects, and the softwoods are regarded as miscellaneous woods [14],

whilst in the west the deciduous nature of woods characterizes them as hardwoods.

This is by no means an easy task: even the most experienced timber specialist hesitates before making a positive identification. Certainly no photograph can effectively replace the experience of handling and working with wood, supported by scientific method.

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

The woods listed in this study include all of the most important hardwoods and 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 in part two, albeit briefly. Illustrations showing visual characteristics have not been presented here, these being adequately given in other publications [3], [20].

5. The most invaluable woods used in Chinese historic furniture

5.1. Zi-tan mu (red sandalwood), *Leguminosae* family, *Pterocarpus* genus

Zi-tan is an exceptionally rare tropical hardwood species. It is recorded in the third century in Cui Bao's 'Explanations of Ancient Modern Matter', that Zi-tan grows mainly in Indo-China and is also found in

the Chinese provinces of Yun-nan, Guangdong and Kwangsi, and on Hai-nan Island but most of Zi-tan mu was imported from Southern India, Annam, and the Philippines, among others and hence it is a real importation [18].

The Chinese consider Zi-tan the most precious of all woods and have used it from ancient times to the present for making furniture and other objects such as musical instruments, pictorial screens, display stands, lamp-stands, chessboards, brush pots, most of them now in the collection at the Beijing Palace Museum [1].

In ancient China, Zi-tan was reserved for the imperial household and privileged citizens. As an esteemed wood for fine cabinetwork, 'jinxing' Zi-tan, literally the 'golden-threaded purple sandalwood' as called by the Chinese, is not another species, but the same wood of Zi-tan with an artificially filled surface. Orange powder is produced when Zi-tan is abraded with fine steel wool or with horse reed, a material used as sandpaper by Ming and Qing dynasty cabinetmakers [10]. If this powder is left in open pores of the grain and covered with a thin lacquer coating, golden-threaded Zi-tan is produced. This is marked by slender fibers under the polished surface, which catch the light, like fine wires covered with foil, in such a way as to suggest its name. Such variants are highly collectable by the Chinese connoisseur [9].

Due to the rarity of Zi-tan, only the imperial household was allowed to use Zi-tan in China from the 17th to the 19th century. According to the imperial workshop records [4], in the reign periods of Yongzheng and Qinglong (1723~1796), the supplies of Zi-tan were scarce by the eighteenth century. From then on, Hong-mu began to be used to replace Zi-tan for fine furniture making [22]. Although Hong-mu can be stained to resemble Zi-tan and can be worked to reproduce fine black jade blade, sun-warmed stone that true Zi-tan effuses, it can never have its density or

weight. With antique Zi-tan furniture pieces so few and far between, and export of antique Zi-tan furniture from China forbidden by law, the rare Zi-tan furniture made currently observing old traditions are ever more valuable.

While the tree is relatively rare, it is not extinct. New resources have been found throughout the centuries, and those from India, China and Southeast Asia have been supplying the modern-day makers.

Zi-tan is a slow growing evergreen tree, and grows very slowly, with a limited girth; 25 cm diameter. The timber is hard and has a thin sapwood with a reddish brown colored pith. Its colour also gives it, in Chinese eyes, great dignity, which can be jet dark, dark purple or red purplish. It has a very close grain, which is usually straight and sometimes cannot be discerned because of the density of the wood; occasionally, however, it has a small, wavy curl similar to crab claws or tiger features in it. Although its grain is not as colorful and prominent as that of Huang-hua-li, the subtle texture and coloring of aged Zi-tan wood are incomparable. Over time, the surface of Zi-tan furniture darkens and develops a fine surface patina. When this wood is cleaned down to its unfilled surface, it is still as hard and as smooth as though it were filled; it is dense enough to the point that it sinks in water rather than floats and this is respected by the Chinese timber merchant, being imported and sold by weight. In ancient Chinese literature, it was recorded that Zi-tan and Huang-hua-li were worth as much and expensive as gold [21].

Zi-tan, literally purple sandalwood, the botanical name of which is said to be the genus *Pterocarpus* which belongs to *Leguminosae* family [17], although it is also attributed by some researchers such as Duhalde, to the *Dalbergia* species [12]. According to Rong [17], within the genus of *Pterocarpus* there are about fifteen species, most of which grow in tropics.

Two species grow in China: Zi-tan (*Pterocarpus santalinus*) and rosewood (*Pterocarpus indicus*). The American scholar Schafer [19], has studied the Zi-tan problem and believes that the Zi-tan wood which the Chinese imported from Indochina is rosewood. Therefore, since what we call Zi-tan is not a single species, at least one of the species included in Chinese terms Zi-tan must be rosewood.

Its main microscopic features are as follows: Diffuse-porous wood, vessels arranged in multiples, commonly short (2-3 vessels) radial rows. Perforation plates simple, inter-vessel pits alternate and vested. Vessel-ray pits with distinct borders or with reduced borders or apparently simple, similar to inter-vessel pits, rounded or angular. Other deposits in heartwood vessels present (orange brown). Fibres of medium wall are thick. Fibre pits mainly restricted to radial walls, simple to minutely bordered. Axial parenchyma banded, apotracheal parenchyma diffuse in aggregates and paratracheal aliform and confluent. Axial parenchyma fusiform and as strands. Average number of cells per axial parenchyma strand 2. Rays exclusively uniseriate. Rays composed of a single cell type (homocellular). Homocellular ray cells procumbent. Storied structure present, all rays storied, axial parenchyma storied, vessel elements storied, fibres storied. Water extract with fluorescent (light blue).

Zi-tan being hard and dense is suitable for delicate carving. There are two kinds of furniture made of Zi-tan, one is plain in order to display its natural appearance and the other is to indicate its subtlety for intricate carving because of its fine texture of the wood grain. When worked, the wood becomes a bright orange-red. Its fibers are laden with deep-red pigment that can be used for dye. It can be polished to be lustrous and provide a reflective surface.

5.2. Huang-hua-li mu (scented rosewood), *Leguminosae* family, *Dalbergia* genus

Huang-hua-li, literally ‘yellow flowering pear,’ a highly prized wood found in Chinese historic furniture is not as rare as Zi-tan. Many pieces of furniture were made of Huang-hua-li wood during the Ming period. Today, it is still used for traditional style furniture. It was available both within the boundaries of China such as Hai-nan Island, Guang-dong province and from South–East Asia such as India, Burma, Sumatra, the Malay Archipelago, and the Philippine Islands. Colour, figure and density of this fragrant wood from different locations vary accordingly [5].

Huang-hua-li described as a pale-honey colour ranging to a deep burnt-orange brown may be accurate for one genus or species but does not hold for the entire group varying with each example. The undertone of orange-gold is constant but individual examples may appear as dark as black mahogany and as light as boxwood. The name of Huang-hua-li has led to the misconception that this wood is always light. When new, these woods have a very different appearance as they are stained, filled or often lacquered. Regardless of when the wood was finished, the manner in which it was treated determines its later appearance. This is one reason for the wide range of colour in any group; another reason is bleaching by light. Its grain is very dense and ranges from straight to wild and vigorous patterns with surprisingly few knots.

In order to distinguish between Hua-li itself, Chinese researchers [10], [21], prefer to divide it into two major groups: Lao-hua-li and Xin-hua-li. Here Lao-hua-li is Huang-hua-li. In trying to differentiate between these two major groups, a primary point to remember is that the finest figured grain with a clear, translucent surface is Huang-hua-li, while the coarser grain and

softer wood is Xin-hua-li. These two groups can be differentiated quite easily once the surface has been cleaned down to the bare wood and all stain, lacquer and fillers removed. Huang-hua-li is then a dry, light-sand color; Xin-hua-li is always darker, but of the same shade and will feel coarser to the touch. If a solution of turpentine mixed with a small amount of oil is applied to these woods, Huang-hua-li will not darken appreciably. This solution will merely clarify the grain and bring out the golden-orange undertones, but Xin-hua-li will go a few shades darker.

It is altogether possible that some Xin-hua-li could be of the same genus as Huang-hua-li, but from an inferior group of timber or from a part of the tree closer to the sapwood, it would still be marketed under the Chinese group of Xin-hua-li. The different names do indeed reflect variations of tone or grain, but it must be kept in mind that these could be the result of surface treatments, or even of different methods of cutting the same log, as well as from a differentiation of species.

The testing of a considerable body of hardwood furniture at Shanghai Museum [8], revealed that objects all made of a timber which the Chinese furniture makers would have called hua-li were made either of a species of *Pterocarpus* (Possibly padauk) or of a species of *Dalbergia* (rosewood). Coincidentally, the testing result is the same as the Philadelphia Museum of Art furniture numbers; 1969-25-2 and 1966-128-1.

The main microscopic features of Huang-hua-li are as follows:

Diffuse-porous wood, vessels arranged in multiples, commonly short (2-3 vessels) radial rows (rarely 4). Perforation plates simple, inter-vessel pits alternate and vested. Vessel-ray pits with distinct borders or with reduced borders or apparently simple, similar to inter-vessel pits, rounded or angular. Other deposits in heartwood vessels present (yellowish to

light red). Fibres very thick-walled. Fibre-pits mainly restricted to radial walls, simple to minutely bordered. Axial parenchyma banded. Axial parenchyma bands marginal (or seemingly marginal), fine, up to three-cell-wide. Axial parenchyma apotracheal and paratracheal. Apotracheal axial parenchyma diffuse and diffuse in aggregates. Paratracheal axial parenchyma scanty, aliform, and unilateral. Aliform parenchyma winged (infrequent). Axial parenchyma fusiform and as strands. Average number of cells per axial parenchyma strand 2. Rays multiseriate, (1-)2-3-(4) cells wide. Rays composed of a single cell type (homocellular) and two or more cell types (heterocellular) (very inconspicuous). Homocellular ray cells procumbent. Heterocellular rays with square and upright cells restricted to marginal rows, mostly 1 marginal row of upright or square cells. Storied structure present, all rays storied, axial parenchyma storied, vessel elements storied, fibres storied. Water extract without fluorescent.

It has a characteristic scent when worked and a natural golden sheen when polished which gives it a translucent quality. It varies in weight and is resistant to boring insects. The timber is hard, and suitable for sculpture and furniture.

5.3 Hong-mu (amboyna), *Leguminosae* family, *Pterocarpus indicus*

Hong-mu (literally redwood), the south-east Asian rosewood of which large quantities of Qing furniture were made, was only used extensively in China from the second half of the Qing dynasty. It is very deceptive because the wood is not red in its finished state. In fact, when it has aged it is even less red than Huang-hua-li. Hong-mu, whether dark or faded, closely resembles brown English walnut, and it has no orange undertones. The colour range of Hong-mu, if it has not been stained or coloured artificially, is always walnut to tobacco-

brown. Later examples, from the 19th and 20th century, are usually stained almost black to imitate Zi-tan, though it lacks the rich deep grain and luster of this wood. [22]. Hong-mu cannot be bleached as light a color as Huang-hua-li; the grain can be as dense as some Huang-hua-li, but it never has the same vigour or translucent quality. Given its relative abundance, nowadays, the term of Hong-mu furniture is the synonym of Chinese classical furniture made from the high quality hardwoods.

Sapwood is light-colored, distinct from the heartwood, which is pale yellow to dark reddish brown; grain is crossed or wavy; texture is moderately fine to moderately coarse; wood shavings water colour is a fluorescent blue. Growth rings are distinct, marked by large pore rings (wood-ring-porous). Pores of the early wood are visible to the naked eye, while those which occur in the later formed wood are visible only with lens, solitary, and in radial multiples of 2-3 or more; tyloses are occasionally present. Parenchyma is indistinct or distinct to the naked eye, aliform, but usually in confluent bands, closely-spaced. Rays are fine, hardly visible to the naked eye, conspicuous on tangential surface due to storied arrangement (ripple marks).

Hong-mu emits a strong sour odor when worked, so its equivalent southern Chinese term is “suan-zhi”, literally meaning “sourwood”. It can be stained easily. Its wood is moderately hard and moderately heavy, which makes it easily workable.

5.4. Ji-chi mu (Siamese senna): *Ormosia* family

Ji-chi mu, literally ‘Chicken-wing wood,’ another precious hardwood found in Chinese furniture making, has been identified as *Ormosia hosiei* and *Cassia siamea*. According to Rong [17], and Hou Zhouggnno [23], there are at least forty

species under this genus, twenty-six of which have been found in China.

Its name originated from the grain figure that forms good patterns of the feathers near the neck and wings of a bird or landscape scenery, and is often noted as the most unusual of all the tropical hardwoods. The attractive clear grain has always been prized by Chinese furniture makers. Many pieces of 18th century Chinese furniture were made of this handsome masculine timber, but pieces made from this wood in Ming dynasty are also known. Ji-chi wood is still being used today.

Ji-chi wood has a distinctly rougher grain and a much grayer and browner colour when compared with the previous woods such as Hong-mu and Huang-hua-li. It is typically dark brownish purple, with light and dark grains interleaved. Wood marketed under this name varies greatly in both colour and grain. Beijing craftsmen classify them as two kinds, an old and a new. New Ji-chi wood is coarse and purplish-black in colour, some of the grain lines being purple, others black and the grain is not very clear; while the old Ji-chi wood is denser and of a purplish-brown colour, the grain, especially in straight cuts, forms very good patterns suggesting the feathers near the neck and wings of a bird. The grain of this group has such a range that the wild heavier porcupine-needle grain of palm wood has been mistaken for chicken-wing wood. Its sapwood is white or creamy white turning light brown on drying; distinctly marked off from the heartwood, which is light yellow when fresh, turning brick red with age; grain is crossed; texture is moderately fine. Pores are slightly visible to the naked eye, generally solitary with reddish deposits. Parenchyma is fairly distinct to the naked eye, usually aliform and confluent, and scarcely in bands of fine lines. Rays are fine not visible to the naked eye.

It is also a good working wood, hard and heavy with excellent durability. The new Ji-chi wood has a tendency to split. In making furniture, Chinese cabinet-makers ensured they used timbers with attractive grain in visible positions to enhance the object's appeal despite a minimum of decoration. A good texture of Ji-chi wood can be used to the best advantage when it forms the splat of a chair or the back central panel of a bed.

Ji-chi wood tends to turn gray-chestnut brown with exposure and lack of attention. Originally it seems in most instances to have been filled with a thin lacquer coating, which prevented it oxidizing to a dull grey appearance.

5.5. Tie-li mu (Ceylon ironwood), *Mesua ferrea*

From the tallest of all hardwood trees, Tie-li mu is also the least expensive wood used for making fine furniture. It grows in the East Indies and also in Guang-dong and Kwangsi provinces in China where it has often been used for building houses [16]. Tie-li mu has large timbers, and was used extensively for furniture during the Ming and early Qing periods [20].

Typically, the most affordable Chinese classical hardwood furniture is made of Tie-li mu.

The colour and the pattern of its grain somewhat resemble those of Ji-chi mu, but Tie-li mu is coarser in texture and more open in grain. That's why the furniture dealers often passed off Tie-li mu furniture as being made of Ji-chi mu to get a better price. In Rong's classification [17], Tie-li mu is described as follows: 'It is a large evergreen arbor with a straight trunk. Its wood is hard and durable, with a dark red pith and fine beautiful grain.'

Diffuse-porous wood, vessels arranged in diagonal and/or radial pattern, exclusively solitary. Vessel outline

rounded. Perforation plates simple. Intervessel pits alternate and small. Vessel-ray pits with narrow borders or apparently simple, rounded or angular and horizontal to vertical, of two distinct sizes or types in the same ray cell, of the same type in adjacent elements, located throughout the ray. Helical thickenings absent. Tyloses in vessels present, thinwalled and sclerotic. Other deposits in heartwood vessels present, red-brown. Vascular or vasicentric tracheids commonly present (vasicentric tracheids). Fibres very thick-walled. Fibre pits mainly restricted to radial walls, simple to minutely bordered. Axial parenchyma banded and not banded. Bands much wider than rays, fine, up to three cells wide. Parenchyma bands wavy. Axial parenchyma apotracheal. Apotracheal axial parenchyma diffuse in aggregates. Rays exclusively uniseriate. Rays composed of two or more cell types. Heterocellular rays with square and upright cells restricted to marginal rows.

The wood is very hard and durable. It is a good material for building houses and furniture.

5.6. Wu-mu (Ebony), *Ebenaceae* family, various species of *Diospyros*.

Wu-mu is a highly prized cabinet wood in China. It includes various species of *Diospyros*. Large pieces are scarce since it never makes a stout tree, and the pale yellowish-white or pinkish sapwood has to be discarded so it is traditionally used in the manufacture of small articles such as musical instruments, handles of small tools and cutlery, small articles of turnery, and cabinet work like stringing, paneling and inlays in veneer form in high-class furniture [9]. For example, the cabinetmakers use the darker, wholly black, material as a contrast to other brightly colored woods.

Its sapwood is very thick, light buff to pinkish buff, sharply contrasted from the heartwood, which is jet black with occasional streaks of light yellowish brown; grain is straight; texture is very fine and even, sometimes with irregular brown streaks; pores are not visible to the naked eye, solitary, and in radial multiples of 2-3 or more, arranged in slightly radial pattern, with yellowish deposits in the sapwood. Parenchyma is fairly distinct with the hand lens, fine, continuous, and slightly wavy. Rays are very fine, not visible to the naked eye. Heartwood is strong, very heavy and extremely hard; it holds a natural gum which gives its dark surface a subdued luster.

Wu-mu requires a great deal of care to work as it is very brittle and has a good reputation to resist the fungal and insect's attack such as termites. It is often imitated by holly or sycamore (both white woods) stained black, because it is expensive.

5.7. Hua-mu (Burl wood)

One peculiar kind of wood often used in Chinese historic furniture is called Hua-mu (literally 'flower wood'), or burlwood. Burlwood is not the wood of a specific tree but rather refers to wood cut from a large knot or twisted root, or from the junction of the trunk and roots which is full of interesting and distorted figure caused by the changes in direction of the wood fibers as they branch out as roots, and by the effects of compression from bearing the weight of the tree. Some other theories suggest [2], that they result from falling trees, fire or frost damage, invading fungus or bacteria, or even woodpeckers. Therefore, Hua-mu can come from any kind of tree usually including birch, camphor, poplar, elm, ash, nan-mu, cypress, willow, amboina (*Lingoum indicum*) as well as the burls of Huang-hua-li and the rosewood group indigenous to southeast and central Asia, and always

has a circular grain or pattern on its surface. Certain species, such as camphor, elm, nan-mu, cypress, and willow seem to be more susceptible to burl growths.

Because of its unique pattern, it is often used for the top part of a stool or a center decoration piece. In the Beijing Palace Museum of China [20], for example, there is a set of four Zi-tan wood armchairs with curved rests with splats made in three sections, the middle one having a Hua-mu panel. However, in Chinese furniture the most common type of burl encountered is that of birch, the burl of camphor and the Nan-mu burl. Nan-mu burl is often described as having a 'grape seed pattern,' [4], which describes the tiny seed-like bud formations within it. When members of this group are finished and filled, it is visually almost impossible to differentiate between them. In any case, all burls were marketed under the name of Hua-mu, and the group is easily identifiable. Hua-mu cannot possibly be confused with any of the other groups of woods used in Chinese furniture. It was popular in the south of China as an inlay in the tops of large tables, in combination with a light wood, probably boxwood.

Hua-mu has been prized since ancient times for its beauty and scarcity. Beijing craftsmen call it chromosome 'Yingzi,' usually in combination with the name of the tree from which it comes, e.g. Nan-mu Yingzi and Zi-tan Yingzi [20]. Burl wood panels tend to be small and the use of different kinds of wood on one object lends colour and textural contrast to it. That is why the Chinese cabinet-makers prefer to use the burl wood to decorate the tops of most recessed-leg tables and barrel-form stools.

6. Conclusion

The wood species mentioned in this article were used in Chinese historic furniture and some of them are still used in

modern furniture manufacture. To conclude, although the species of the invaluable hardwoods have not been adequately determined, the broader Linnaean terms do help by giving a western classification to Chinese names for groups of woods. 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. The second part of this study will look at further prized woods used in Chinese regional furniture and consider others used as secondary woods in Chinese furniture. Finally lesser-used woods encountered in Chinese furniture will be briefly mentioned.

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