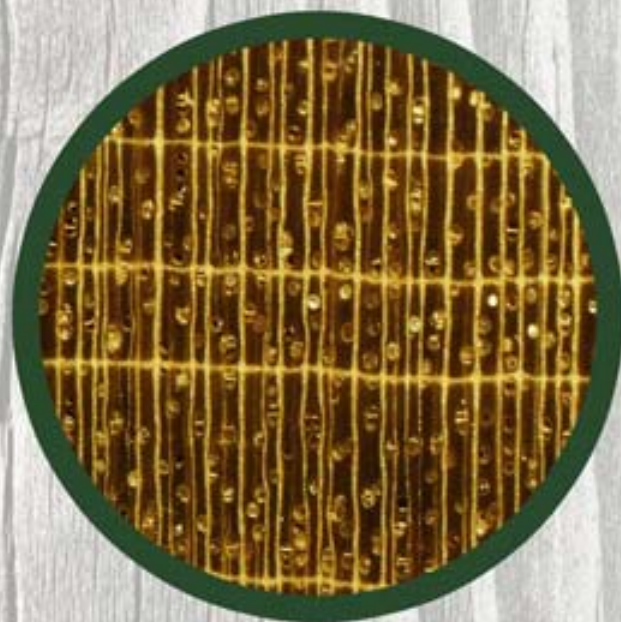




IDENTIFICATION MANUAL for five CITES-listed wood species

Edited by Zhou Yafei Ye Kelin
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FOREWORD

China, one of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) parties, is also a large country on wood and wood products import and export. Recently, international societies have attached great importance to China's massive consumption and import/export of wood resources from all over the world. Based on the CITES appendixes which were passed on the 15th conference of all parties, totally 36 wood species/classes belonging to 24 genus, 14 families were listed in the appendixes worldwide, where 9 species/classes belonging to 6 genus, 6 families were distributed and recorded in China.

This manual focused on five CITES-listed wood species, containing *Pericopsis elata* (LEGUMINOSAE), *Gonystylus bancanus* (THYMELAEACEAE), *Cedrela odorata* (MELIACEAE), *Swietenia macrophylla* (MELIACEAE), *Bulnesia sarmientoi* (ZYGOPHYLLACEAE). The characteristic descriptions of the five wood species were provided in the manual, which mainly includes wood Chinese name, scientific name, foreign name, family division, controlled grade by CITES, distribution, identification details, wood color and density, processing properties, physical quality, usage and the identifying features of similar species.

The compiling mission of this manual was organized and completed by the China CITES Management Authority with the Chinese Research Institute of Wood Industry (CRIWI), Chinese Academy of Forestry. This manual was prepared respectively in Chinese, English, French and Spanish version.

This manual was funded by the International Tropical Timber Organization (ITTO).

The purpose of this manual is to provide scientific basis of wood identification for law-enforcing departments, like customs and quality inspection quarantine departments, to regulate the import/export trade of wood timber, to provide professional technology support for improving China's protection of endangered species and the ability to fulfill CITES, and to promote rational utilization of forest resources from domestic and abroad.

Compiling Committee

1. Brief introduction

- 1.1 The purpose and significance of this manual 4
- 1.2 Brief introduction of CITES 4
- 1.3 Reasons for selecting the five wood species 5

2. Manual instruction

- Abbreviation list of wood features 8

3. General knowledge of wood identification

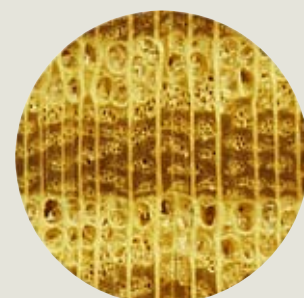
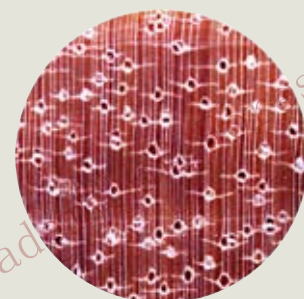
- 3.1 Basic knowledge of wood 13
- 3.2 Vessel 15
- 3.3 Vessels arrangements 16
- 3.4 Ray 17
- 3.5 Storied rays 18
- 3.6 Parenchyma 20
- 3.7 Odor 23
- 3.8 Hardness 23
- 3.9 General steps of wood identification 24

4. Descriptions of the wood features for five CITES-listed species and the difference from similar wood species

- 4.1 *Pericopsis elata* 29
- 4.2 *Gonystylus bancanus* 32
- 4.3 *Cedrela odorata* 36
- 4.4 *Swietenia macrophylla* 42
- 4.5 *Bulnesia sarmientoi* 47

5. Appendix

- ISO code for the countries 52
- Index table of the species 56
- Main identifying features of five species and similar species 58



1.

Brief introduction

1.1 The purpose and significance of this manual

As the only renewable and recyclable one of the four most important materials (steel, concrete, wood and plastic) in the world, wood plays an irreplaceable part in human living and development. With the improvement of people's living quality, the needs of wood, especially the precious wood, are growing day by day. The commercial timbers available in Chinese market have surpassed 200 species, most of which are imported hardwood species. Each species is different from another when it comes to its exterior features, physical and mechanical properties, machining qualities and price. Only by understanding wood precisely can we preserve and utilize wood resources properly. Therefore, it is of a realistic significance to identify wood species accurately. Furthermore, wood identification techniques by acting fast and accurately are superior necessary to people and organizations in every aspect of wood trading activities, like wood processing and machining, business, customs, quality inspection, researching and teaching, so on and so forth.

By issuing of this common commercial timber manual which was under the control of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), we aimed at carrying on the social and law-executive training of identification capability on wood species under the items of CITES and strengthening the regulation of timber trade in endangered species in order to improve China's capability of implementing CITES and preserving endangered wood species.

1.2 Brief introduction of CITES

To settle the growing threat which was posed by wild animals and plants trading on bio-resources, one plenipotentiary congress was organized by international societies in Washington DC., United States of America, in March 1973, from which the text of CITES was agreed upon, and in July 1975 the convention entered in force officially. Currently there are 175 parties.

The basic principle of CITES is to administer international trade of endangered wild fauna and flora samples via licensing and certification system. These trades include import, export, and re-export live or dead animals and plants and their partial derivatives (whether they are wild or artificial plantation /propagation). Till now, over 5, 000 species of wild animals and nearly 29, 000 species of wild plants are listed and controlled by CITES.

The species covered by CITES are listed in three Appendixes (Appendix I, II, III) based on three different, and different management measures will be taken respectively. Appendix I include species threatened by extinction. Trade in specimens of these species is strictly administrated and permitted only in exceptional circumstances, for example, non-profit fields, like researching, teaching, etc. Appendix II includes species not necessarily threatened by extinction, but by those must be controlled and permitted in order to avoid utilization incompatible with their survival. Appendix III covers species that are protected in at least one country, which has asked other CITES parties for assistance in controlling the trade. There are special rules in these cases and license or certificate will generally be required. Anyone who plans to import or export/re-export specimens of a CITES species should contact the target country's national CITES management authorities for information on the rules related.

China officially applied to government of Switzerland who preserved CITES convention for joining it on 25 December 1980, and the Convention formally entered into force in China on 8 April 1981. On 1 September 2006, China promulgated the "Regulations of the PRC Import and Export of Endangered Species" as one significant performance of national legislation. Based on the relevant provisions of the Convention, China formally established the management authority and scientific institution to fulfill CITES terms. The management office located in the State Forestry Administration of China, and the scientific institution located in the Chinese Academy of Sciences. Both the management authority and the scientific institution shared responsibility to fulfill CITES in China.

1.3 Reasons for selecting the five wood species

China, one of the CITES parties, is also a large country on wood and wood products import and export. Recently, international societies have attached great importance to China's massive consumption and import/export of wood resources from all over the world. Consequently, administration departments and enterprises engaging in import and export forestry products should fairly acknowledge and be familiar with wood species controlled by CITES, and it is a good way to avoid and resolve the risks and troubles encountered by import/export trading and producing enterprises by understanding the legitimate inspection of wood resources and strictly prohibiting illegal wood and wood products trading.

The convention is gradually extending its control area to tropical wood species with a tendency that is more and more apparent. Since the 12th conference of all parties in 2002, there has been more than 20 wood species listed in the appendixes of CITES. Only in the year of 2007, the 14th conference, four species which were *Bulnesia sarmientoi*, *Dalbergia retusa*, *Dalbergia stevensonii* and *Cedrela odorata* were listed in the appendix. Then in the 15th conference held in 2010, *Bulnesia sarmientoi* was raised to the appendix II, and *Ochrosia coccinea* was listed in the appendix II. Meanwhile, three species which were *Pinus koraiensis*, *Cedrela lilloi* and *Cedrela fissilis* were listed in appendix III. Based on the CITES appendixes which were passed on the 15th conference of all parties, statistics and arrangements referring to wood species were made domestically and internationally. The results indicated that 36 wood species/classes belonging to 24 genus, 14 families were listed in the appendixes worldwide, where 9 species/classes belonging to 6 genus, 6 families were distributed and recorded in China.

The latest wood species in the CITES appendixes are listed as Tab.1. The convention had entered into force since 25, March, 2010.

Tab.1 The list of wood species in the CITES Appendix

Appendix I	Appendix II	Appendix III
ARAUCARIACEAE		
<i>Araucaria araucana</i>		
CARYOCRACEAE		
	<i>Caryocar costaricense</i>	
CUPRESSACEAE		
<i>Fitzroya cupressoides</i> <i>Pilgerodendron uviferum</i>		
JUGLANDACEAE		
	<i>Oreomunnea pterocarpa</i>	
LAURACEAE		
	<i>Aniba rosaeodora</i>	
LEGUMINOSAE		
<i>Dalbergia nigra</i>	<i>Caesalpinia echinata</i> <i>Pericopsis elata</i> <i>Platymiscium pleiostachyum</i> <i>Pterocarpus santalinus</i>	<i>Dipteryx panamensis</i> [Costa Rica, Nicaragua] <i>Dalbergia retusa</i> [Guatemala] <i>Dalbergia stevensonii</i>
MAGNOLIACEAE		
		★ <i>Magnolia liliifera</i> var. <i>obovata</i> [Nepal]
MELIACEAE		
	<i>Swietenia humilis</i> <i>S. macrophylla</i> <i>S. mahagoni</i>	<i>Cedrela odorata</i> [Colombia, Peru Guatemala, Bolivia] <i>Cedrela lilloi</i> [Bolivia] <i>Cedrela fissilis</i> [Bolivia]
PINACEAE		
<i>Abies guatemalensis</i>		
		★ <i>Pinus koraiensis</i> [Russia]
PODOCARPACEAE		
<i>Podocarpus parlatorei</i>		★ <i>P. nerifolius</i> [Nepal]
TAXACEAE		
	★ <i>Taxus chinensis</i> and its intraspecific taxa ★ <i>T. cuspidata</i> and its intraspecific taxa ★ <i>T. fuana</i> and its intraspecific taxa <i>T. sumatrana</i> and its intraspecific taxa ★ <i>T. wallichiana</i>	

THYMELAEACEAE	
★ <i>Aquilaria</i> spp. <i>Gonystylus</i> spp. <i>Gyrinops</i> spp.	
TROCHODENDRACEAE	
	★ <i>Tetracentron sinense</i> [Nepal]
ZYGOPHYLLACEAE	
<i>Guaiacum</i> spp. <i>Bulnesia sarmientoi</i>	

NOTE : ★ indicate that China has distribution record of the species or the species contained in its senior taxon

The manual contained the next five CITES-listed wood species:

1) *Pericopsis elata* belonging to LEGUMINOSAE 2) *Gonystylus bancanus* belonging to THYMELAEACEAE 3) *Cedrela odorata* belonging to MELIACEAE 4) *Swietenia macrophylla* belonging to MELIACEAE 5) *Bulnesia sarmientoi* belonging to ZYGOPHYLLACEAE;

Where

Pericopsis elata, *Gonystylus bancanus* and *Swietenia macrophylla* were listed in the Appendix II, which have been laying great emphasis on by international societies recently; *Cedrela odorata* and *Bulnesia sarmientoi* were listed in Appendix III in 2007, and then the later one was raised to Appendix II in 2010.

Cedrela odorata and *Bulnesia sarmientoi* are in urgent need of wood identification knowledge, wood samples and specialized documents as the time been listed in the appendix is short.

By giving the characteristic descriptions of the five wood species, which mainly includes wood Chinese name, Latin name, foreign name, family division, controlled grade by CITES, distribution, identification details, wood color and density, machining properties, physical quality, usage and the identification method of similar species, the goal of this manual is to provide scientific basis of wood identification for law-enforcing departments, like customs and quality inspection quarantine departments, to regulate the import /export trade of wood timber, to provide professional technology support for improving China's protection of endangered species and the ability to fulfill CITES, and to promote rational utilization of forest resources from domestic and abroad.

2.

Manual instruction



Distribution area of the species



Trade not controlled by CITES



Main exporting countries



Trade controlled by CITES appendix III



Wood species similar to CITES species



Trade controlled by CITES appendix II



Broad-leaved trees (Hardwoods)



Absence of the feature

Abbreviation list of wood features

Abbreviations	English name
GR	Growth ring
EW	Earlywood
LW	Latewood
RPW	Ring porous wood
V	Vessel(Vessel pore)
SV	Solitary vessel
RMV	Radial Multiple vessel
R	Ray
SR	Storied ray
P	Parenchyma
MP	Marginal parenchyma
BAP	Banded apotracheal parenchyma
PP	Paratracheal parenchyma
APP	Aliform paratracheal parenchyma
LAPP	Lozenge aliform paratracheal parenchyma
CPP	Confluent paratracheal parenchyma

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 Research Institute of Wood Industry

Family name of the species
 The species is broad-leaved tree
 (Hardwood)
 Trade controlled or not controlled by CITES
 Identifying features

Identification manual for five CITES-listed wood species

Scientific name of the species

4.5
Bulnesia sarmientoi



ZYGOPHYLLACEAE

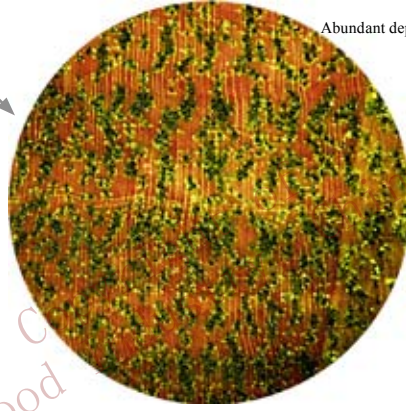
Key identifying features
 Abbreviations for English name

Smaller, more numerous
 V

Key identifying features

Wood: diffuse porous wood
 Vessel: mostly solitary and less short radial and tangential multiple; barely visible to the naked eye, very small; more numerous, abundant deposits
 Parenchyma: not visible with a hand lens
 Ray: storied (thin)

Stereoscopic microscope picture, ×16, transverse section



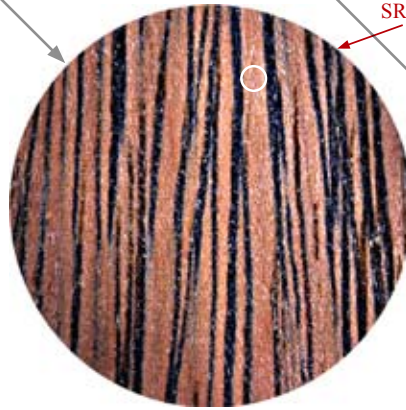
General characteristics

Heartwood olive green or dark brown, gray to black stripes; distinctly differs from sapwood; yellow or yellow green or black deposits in vessels; distinctive aromatic odor; wood glossy; grain straight or oblique, texture fine and even; heavy

General characteristics

Picture of solid wood

Stereoscopic microscope picture, ×16, tangential section

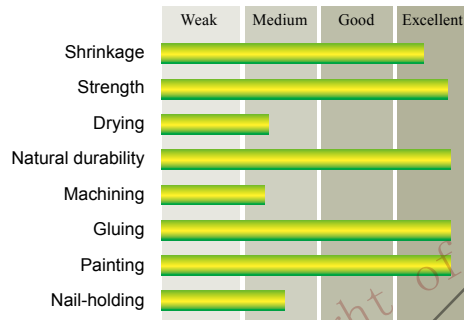


SR (thin)

4. Descriptions of the wood features for five CITES-listed species and the difference from similar wood species



Processing properties



Main uses
Flooring, sculpture, furniture, tool handle



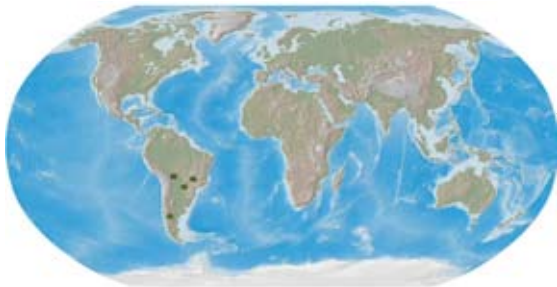
Cuatiacum officinale, *C. sanctum*, *B. arborea*, *Ocotea rodiaei*, *Tabebuia serratifolia*



AR



AR, BO, BR, PY



Wood products

Main processing properties

Main uses

Index of chapter

Wood species similar to CITES species

Main exporting countries of wood for the species

Main distribution area of the species

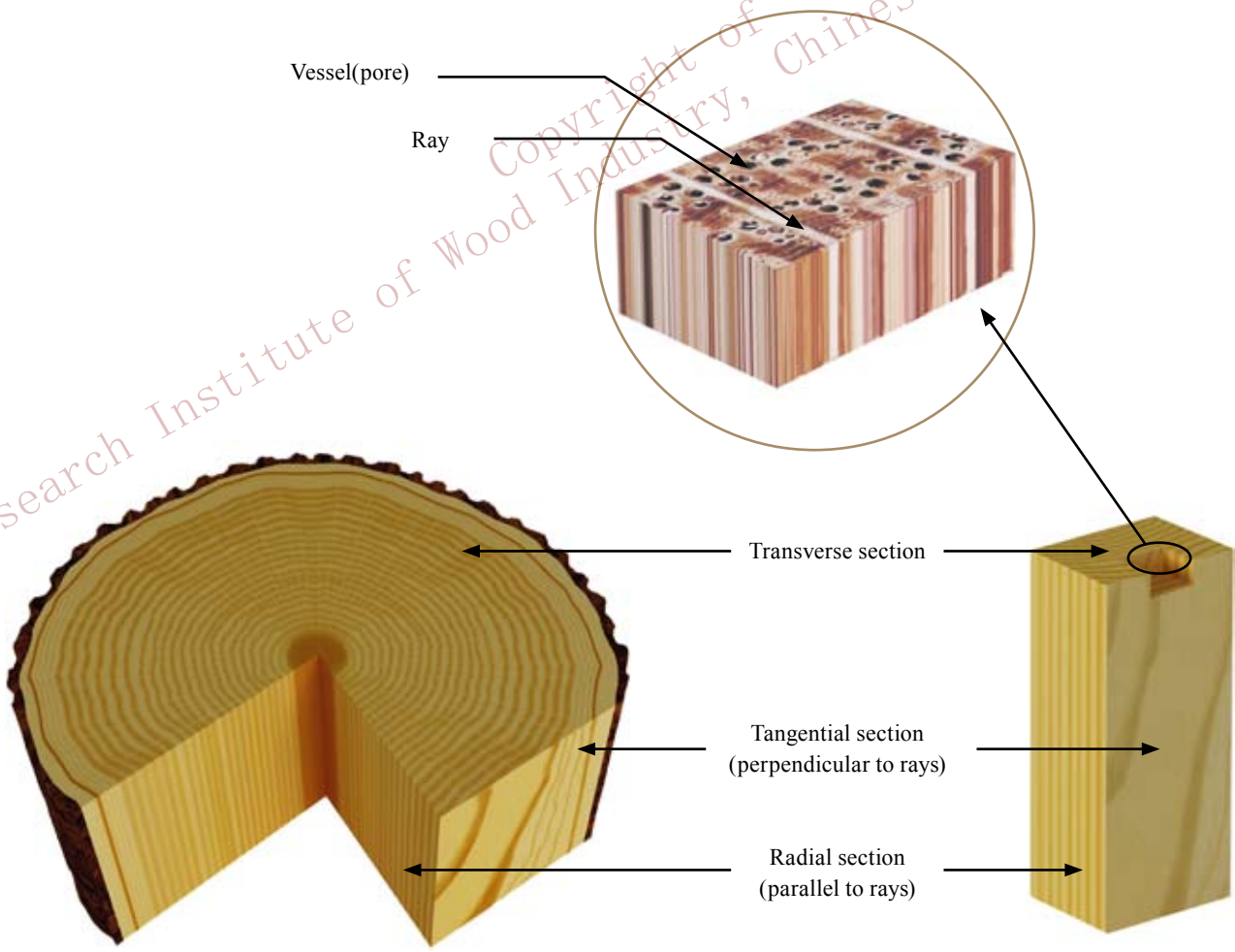
Distribution map for the species

4

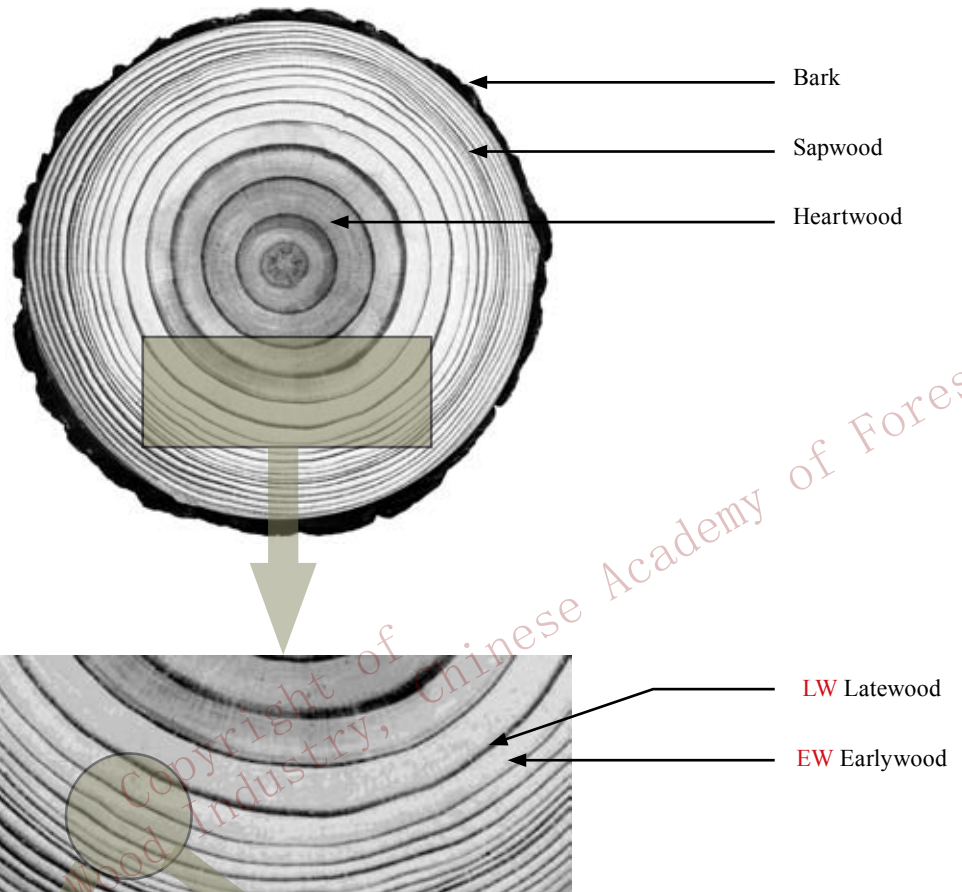
3.

General knowledge of wood identification

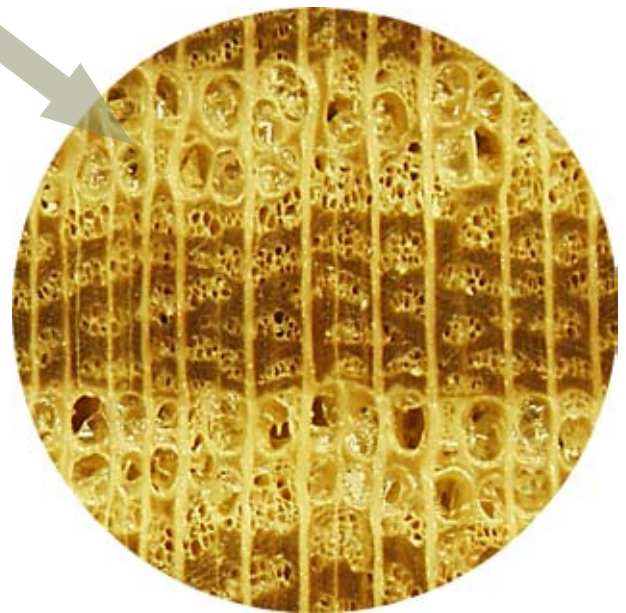
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3.1 Basic knowledge of wood



Without pores
Conifers



With pores
Broad-leafed trees

4. Verify the presence or absence of pores

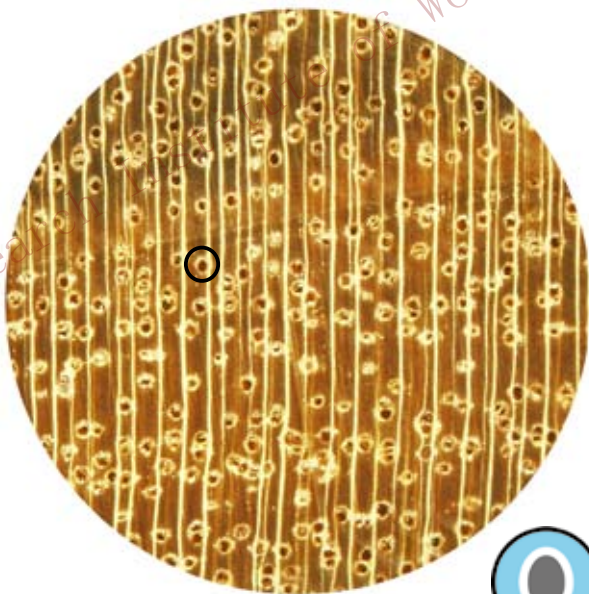


Without pores-Conifers

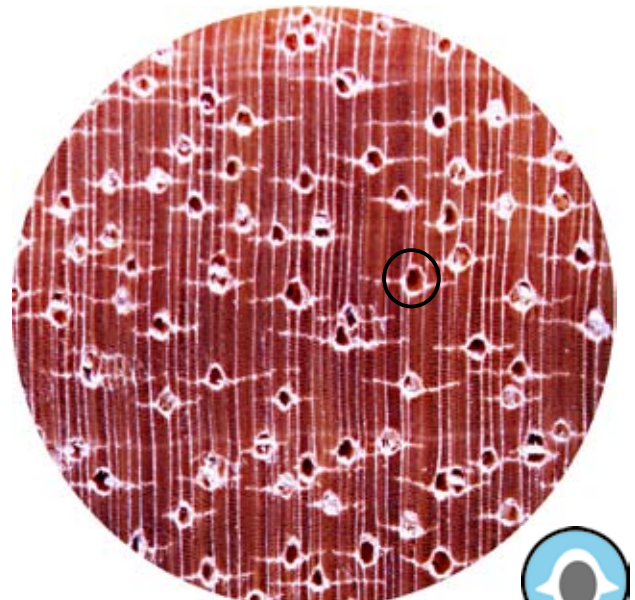


With pores-Broad-leaved trees

5. Verify the types of parenchyma

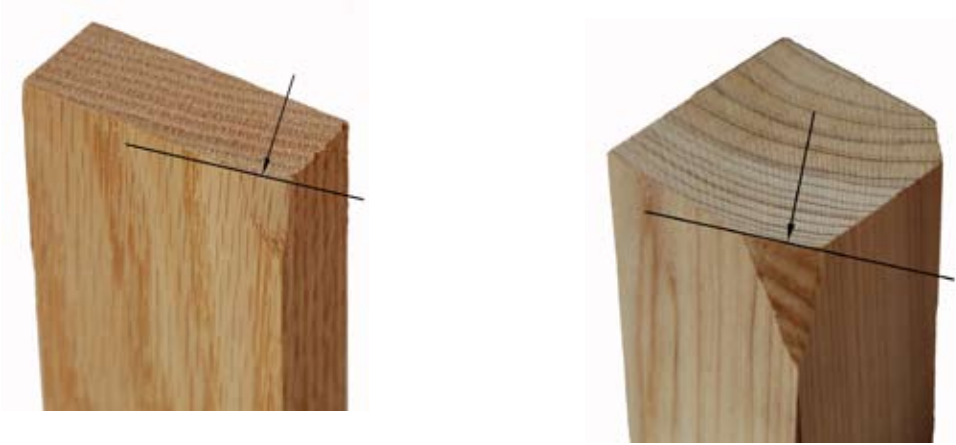


Paratracheal parenchyma **PP**

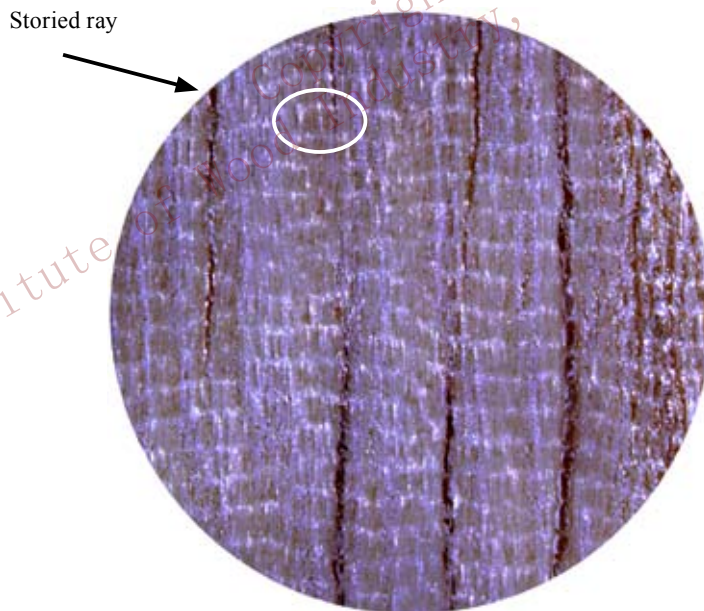


Aliform paratracheal parenchyma **APP**

6. Trim a smooth surface on the tangential section with sharp knife



7. Verify the presence or absence of storied rays



8. Consult the description for the species and verify the species

- Consult wood identifying features
- Refer to the general features of wood
- Refer to the geographical range

4.

Descriptions of the wood features for five CITES-listed species and the difference from similar wood species

Table3 Five CITES-listed wood species and similar wood species

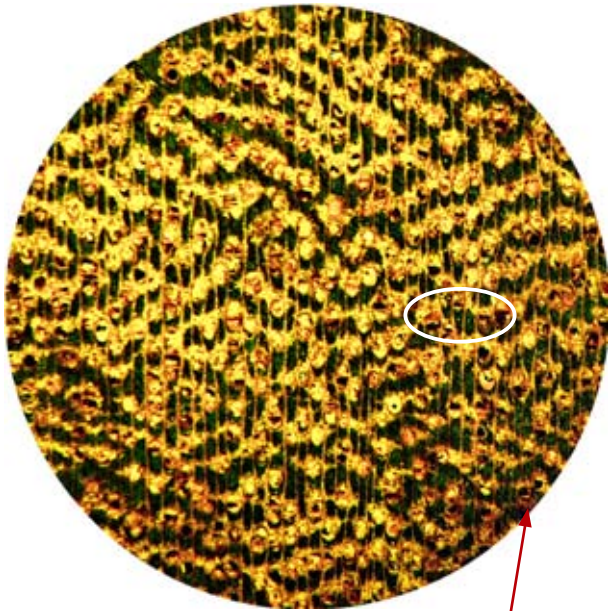
NO.	CITES species	Family name	similar the species
1	<i>Pericopsis elata</i>	LEGUMINOSAE	(1) <i>P. africana</i> (2) <i>Baikiaea</i> spp.
2	<i>Gonystylus bancanus</i>	THYMELAEACEAE	(1) <i>Brosimum alicastrum</i> (2) <i>B. utile</i> (3) <i>Jaearanda copaia</i> (4) <i>Simaruba amara</i>
3	<i>Cedrela odorata</i>	MELIACEAE	(1) <i>Carapa</i> spp. (2) <i>Cedrela</i> spp. (3) <i>Guarea</i> spp. (4) <i>Khaya</i> spp. (5) <i>Hymenaea courbaril</i> (6) <i>Myroxylon balsamum</i> , (7) <i>Swietenia</i> spp.
4	<i>Swietenia macrophylla</i>	MELIACEAE	(1) <i>Carapa</i> spp. (2) <i>Cedrela</i> spp. (3) <i>Guarea</i> spp. (4) <i>Khaya</i> spp. (5) <i>Hymenaea courbaril</i> (6) <i>Swietenia</i> spp.
5	<i>Bulnesia sarmientoi</i>	ZYGOPHYLLACEAE	(1) <i>Cuaiacum officinale</i> (2) <i>C. sanctum</i> (3) <i>B. arborea</i> (4) <i>Ocotea rodiaei</i> (5) <i>Tabebuia serratifolia</i>

4.1

Pericopsis elata



LEGUMINOSAE



CPP

Key identifying features

Wood: diffuse porous wood

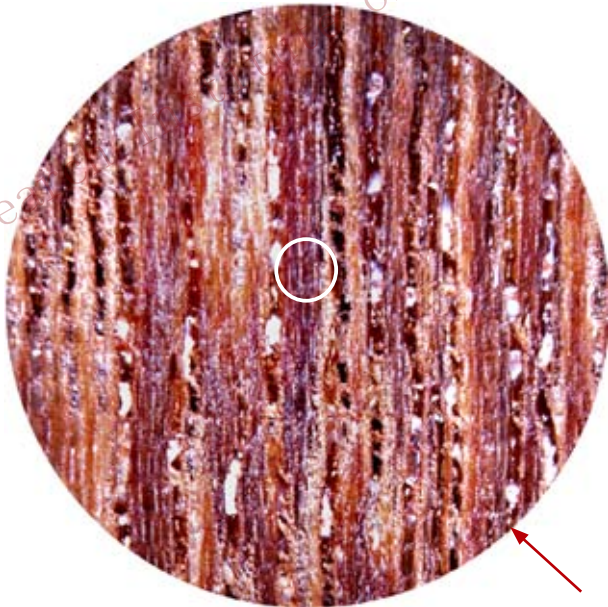
Vessel: solitary and radial multiple; slightly large and numerous, visible to the naked eye, distinct with a hand lens

Parenchyma: paratracheal, aliform to confluent paratracheal

Ray: slightly storied, medium, often difficult to detect

General characteristics

Heartwood yellow to dark brown; wood glossy, grain diagonal or interlace, texture very fine and even; weight medium to heavy, hardness medium



SR



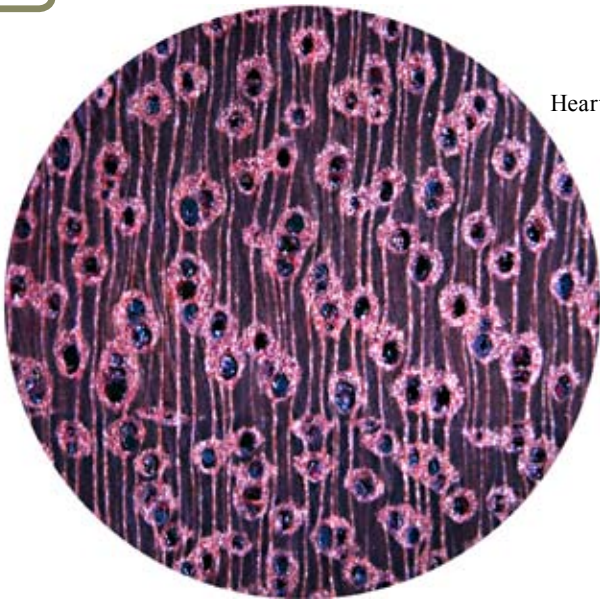
4. Descriptions of the wood features for five CITES-listed species and the difference from similar wood species



4.1.1 *Pericopsis africana*



LEGUMINOSAE



V
Slightly large
Heartwood more reddish

CPP

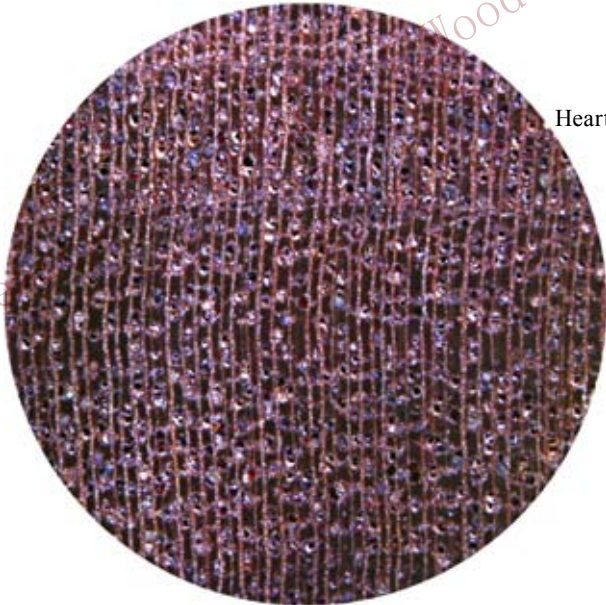


Africa

4.1.2 *Baikiaea* spp.



LEGUMINOSAE



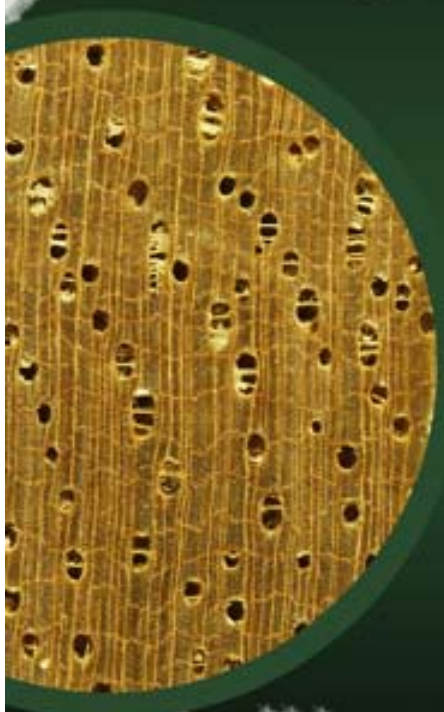
V
Smaller
Heartwood more reddish



(*B. phurijuga*)



AO, BW, NA, ZM, ZW



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