

# WORLDWIDE TRADE IN TIMBER PRODUCTS

## THE IDENTIFICATION CHALLENGE

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# The world's largest wood collections

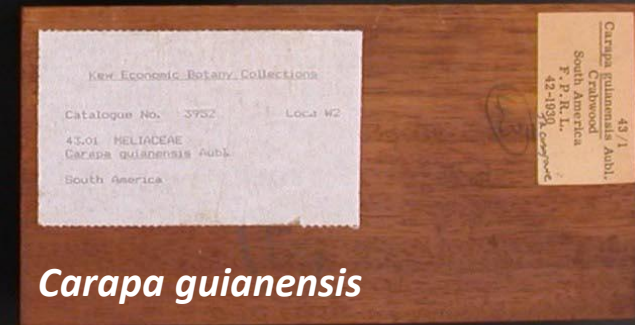
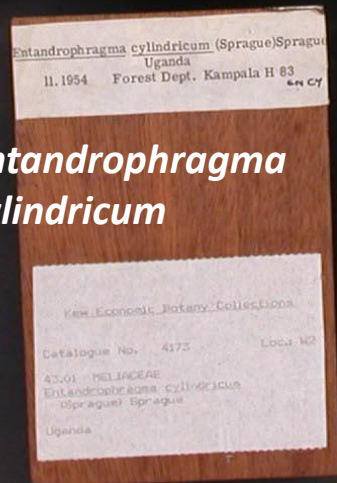
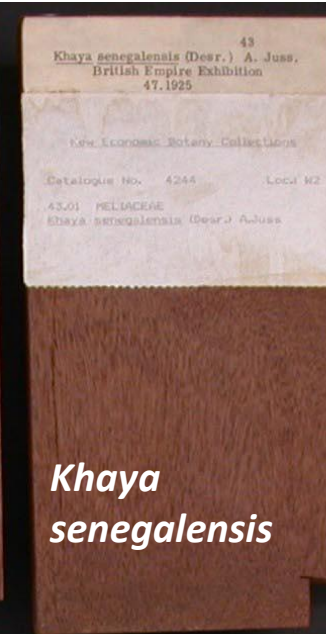
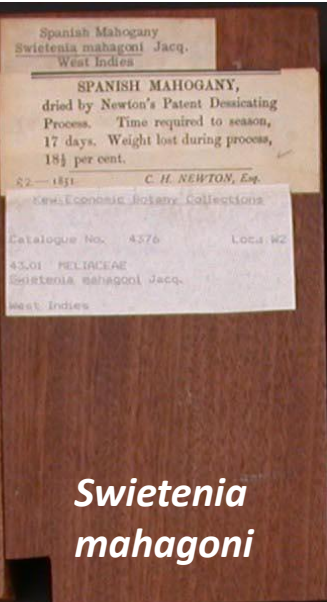
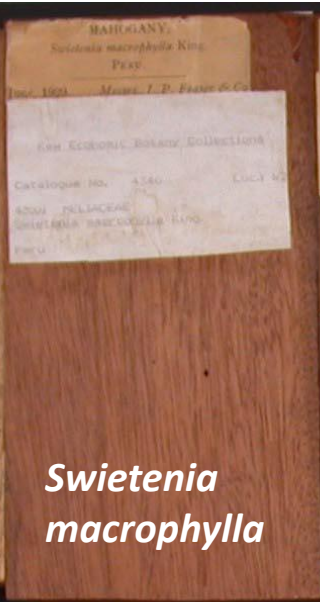
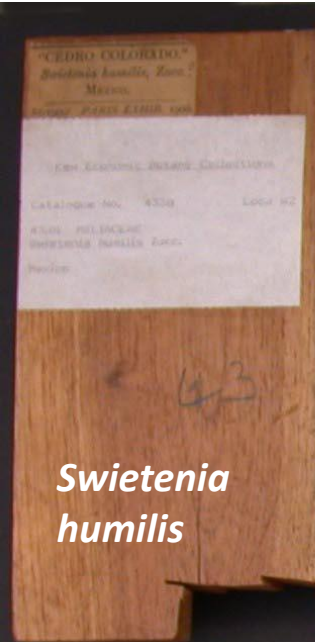
1988

Madison: 98,635  
Tervuren: 47,000  
Bogor: 41,679  
Highett: 40,200  
Syracuse: 40,000  
Washington: 40,000  
Utrecht: 35,000  
Amsterdam: 33,000  
Cambridge (Bailey-Wetmore): 31,000  
Nogent-sur-Marne: 30,250  
Princes Risborough: 30,000  
**Kew: 28,000**  
Oxford: 25,000

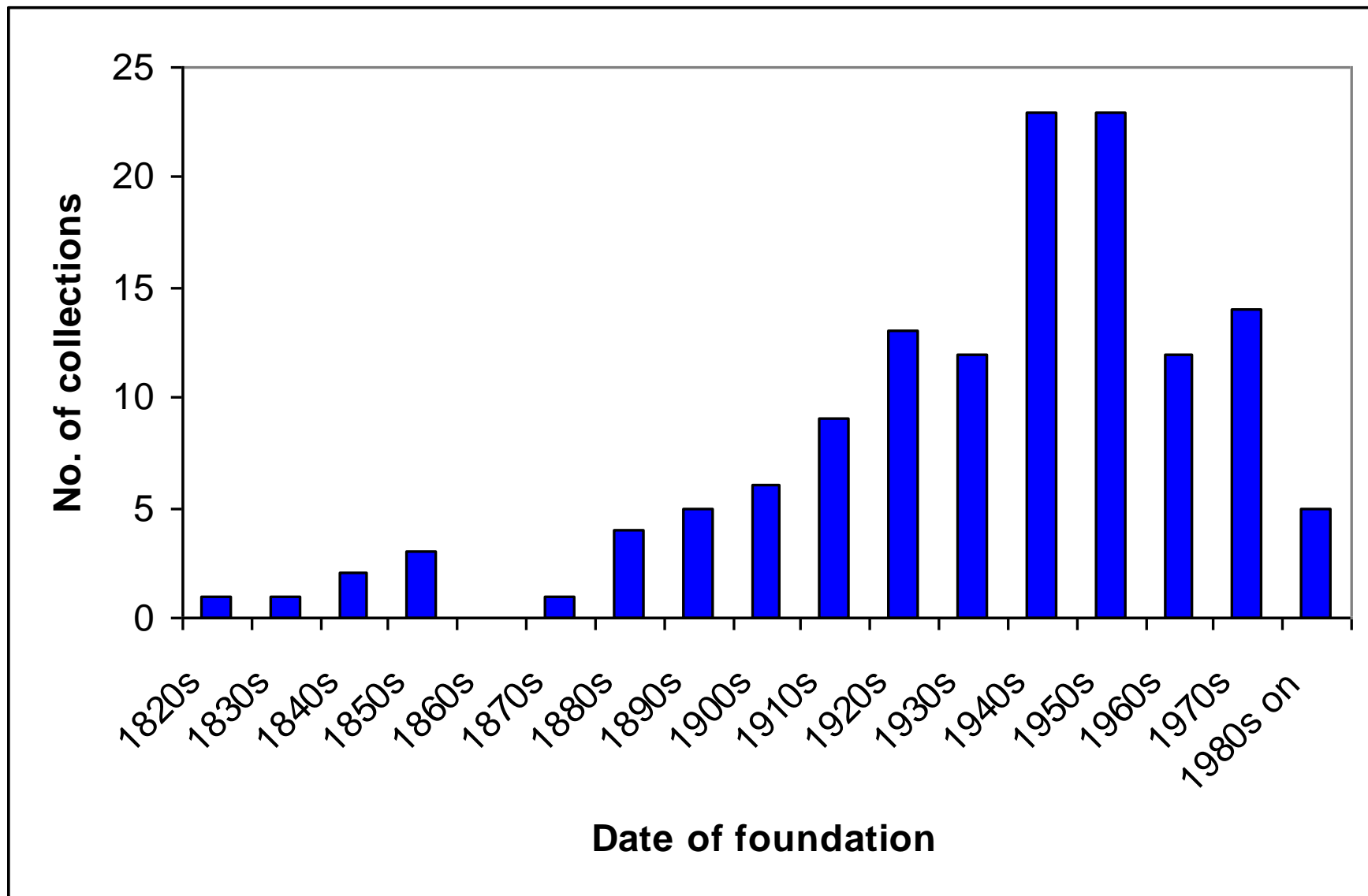
2005/6

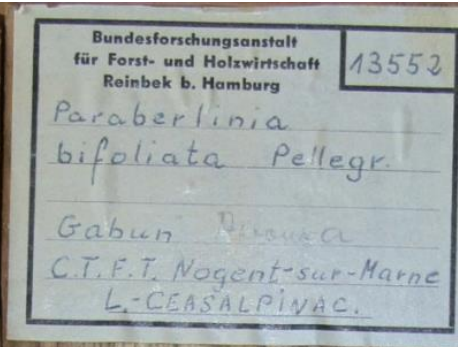
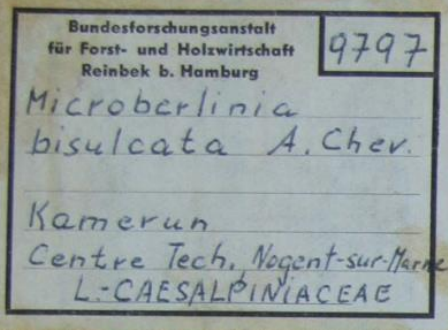
**Madison:** 105,000 (+7%)  
Tervuren: 57,940 (+23%)  
Highett: 47,720 (+19%)  
Bogor: 41,679 (no change)  
Syracuse: 40,000 (no change)  
Washington: 42,500 (+6%)  
Utrecht: 37,500 (+7%)  
Nogent-sur-Marne: 33,500 (+11%)  
Amsterdam: 33,000 (no change)  
**Kew: 33,000 (+18%)**  
Cambridge MA (Bailey-Wetmore): 31,000 (nc)  
Princes Risborough: 30,000 (no change)  
Oxford: 25,000 (no change)

# Some Meliaceae woods



# Institutional wood collections worldwide





2237

PROTA (Plant Resources of Tropical Africa)7(2) Timbers 2, 2012

*Microberlinia bisulcata* Zingana

*Julbernardia pellegriniana* (*Paraberlinia bifoliolata*) Beli, Awoura:

2,5,13,22,23,25,29,30,43,46,58,61,66,69,80,81,83,89,92,93,97,104,106,113,116,136,142,143

*Microberlinia brazzavillensis* African Zebrawood, Zingana, Zebrano (Three times the price!):

2,5,13,22,23,25,26,29,30,43,46,(47),(58),61,66,70,80,81,82,83,85,89,91,92,96,97,104,(106),115,116,(122),(131),(136),(142),(143)

Three woods indistinguishable  
to the trained eye!





# INSIDE WOOD

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[IAWA Modern Wood Data Sheet \(Excel format\)](#)  
[IAWA Fossil Wood Data Sheet \(Excel format\)](#)

### Browse & Search Images [\[image viewing hints\]](#)

### Browse by Taxonomy

Modern Wood [Family](#) or [Genus](#)  
Fossil Wood [Family](#) or [Genus](#)

### Enter IAWA Feature Numbers and Codes

Enter an IAWA Feature Number followed by one coding letter below:

- p (present)
- a (absent)
- r (present required)
- e (absent required)

Example: 1p 5p 13r 22p 24a 30e

Hint: when allowing mismatches, it is useful to use codes r or e

0 mismatches allowed ▾

### Search InsideWood by Keyword [\[keyword searching hints\]](#)

Search by taxa, common name, author of publication, authority, etc.

Example: Gasson

The InsideWood database has 7,708 descriptions and 40,104 images.  
6,012 Modern Wood descriptions and 37,938 Modern Wood images  
1,696 Fossil Wood descriptions and 2,166 Fossil Wood images



http://insidewood.lib.ncsu.edu/search



## Techniques available at Kew

Wood anatomy: well established

Chemical isolation: some taxa e.g. *Dalbergia nigra*

NIR spectroscopy: being developed

Molecular techniques: limited for wood

**The major limitation for all laboratories trying to identify CITES-listed taxa is a serious lack of authentic reference samples**

A second limitation is that even if there was a comprehensive reference collection (which there isn't), no single technique can answer the identity problem

Research on anatomical, genetic and chemical characteristics of the genera in international timber trade:

*Dalbergia* (Leguminosae-Papilionoideae) 250 species

*Quercus* (Fagaceae) 525 species

*Palaquium* (Sapotaceae) & relatives

*Camposperma* (Anacardiaceae) & relatives

Mahoganies: *Swietenia*, *Entandrophragma*, *Khaya* etc.

Dipterocarps: a massive task!

CITES-listed species and genera

## Applicable techniques

**Light microscopy: the first port of call – often sufficient**

SEM

Metabolite profiling ultimately for species identification (require extraction?)

NIRS (Near Infrared Spectroscopy) for species recognition (non-destructive)

DNA sequencing (easiest from leaves and cambial region, much more difficult from heartwood)

Stable isotopes for geographical origin, not identification

Machine Vision image analysis of sanded surfaces ultimately for “field use”



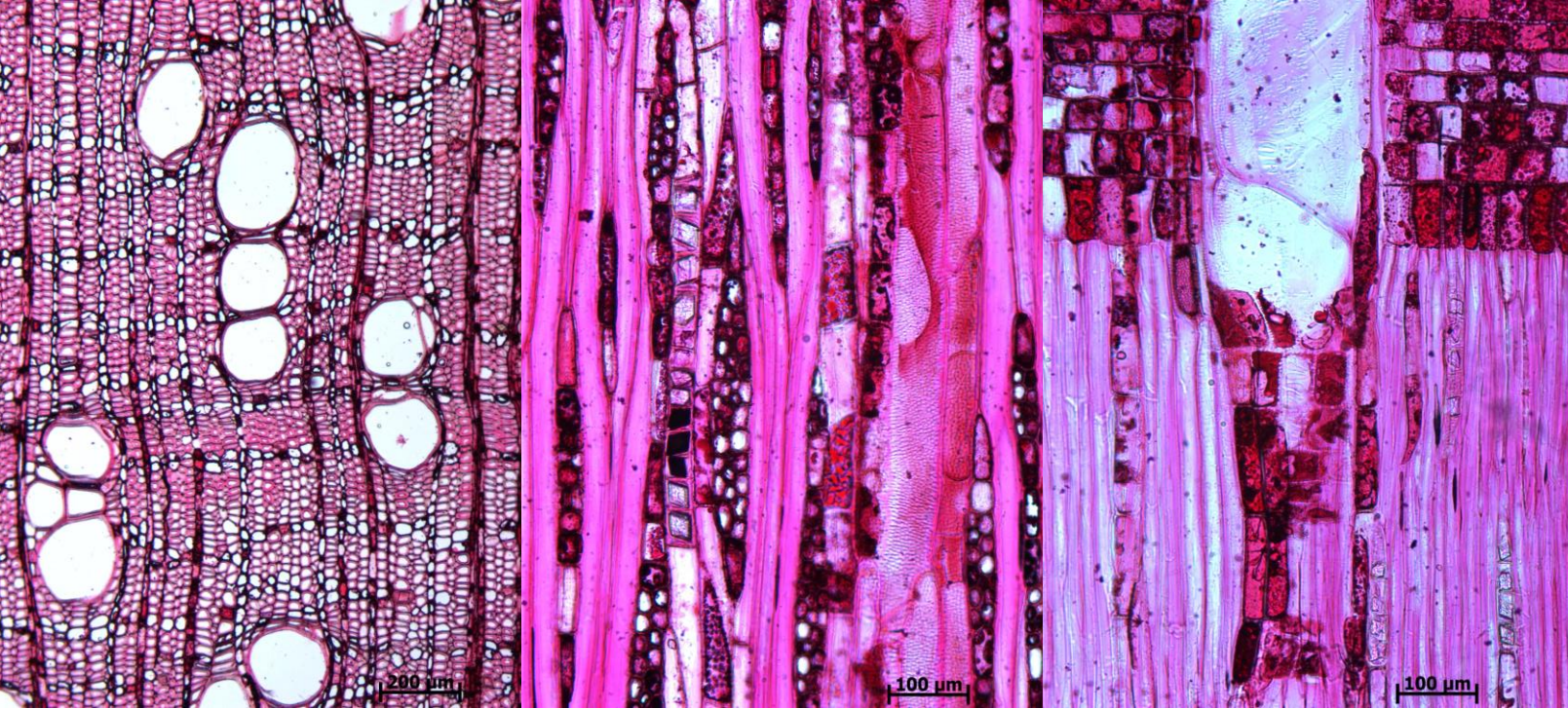
Four plywoods: 16mm/11 inner layers, 12mm/7, 9mm/5, 5mm/3  
Face veneers are c.200 $\mu$ m thick and hardly visible



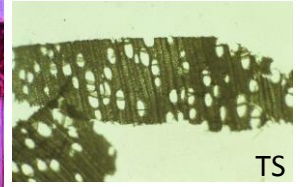
*Sterculia*

*Camnosperma*

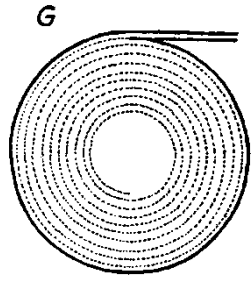
*Palaquium*



*Palaquium clarkeana*  
TS, TLS, RLS



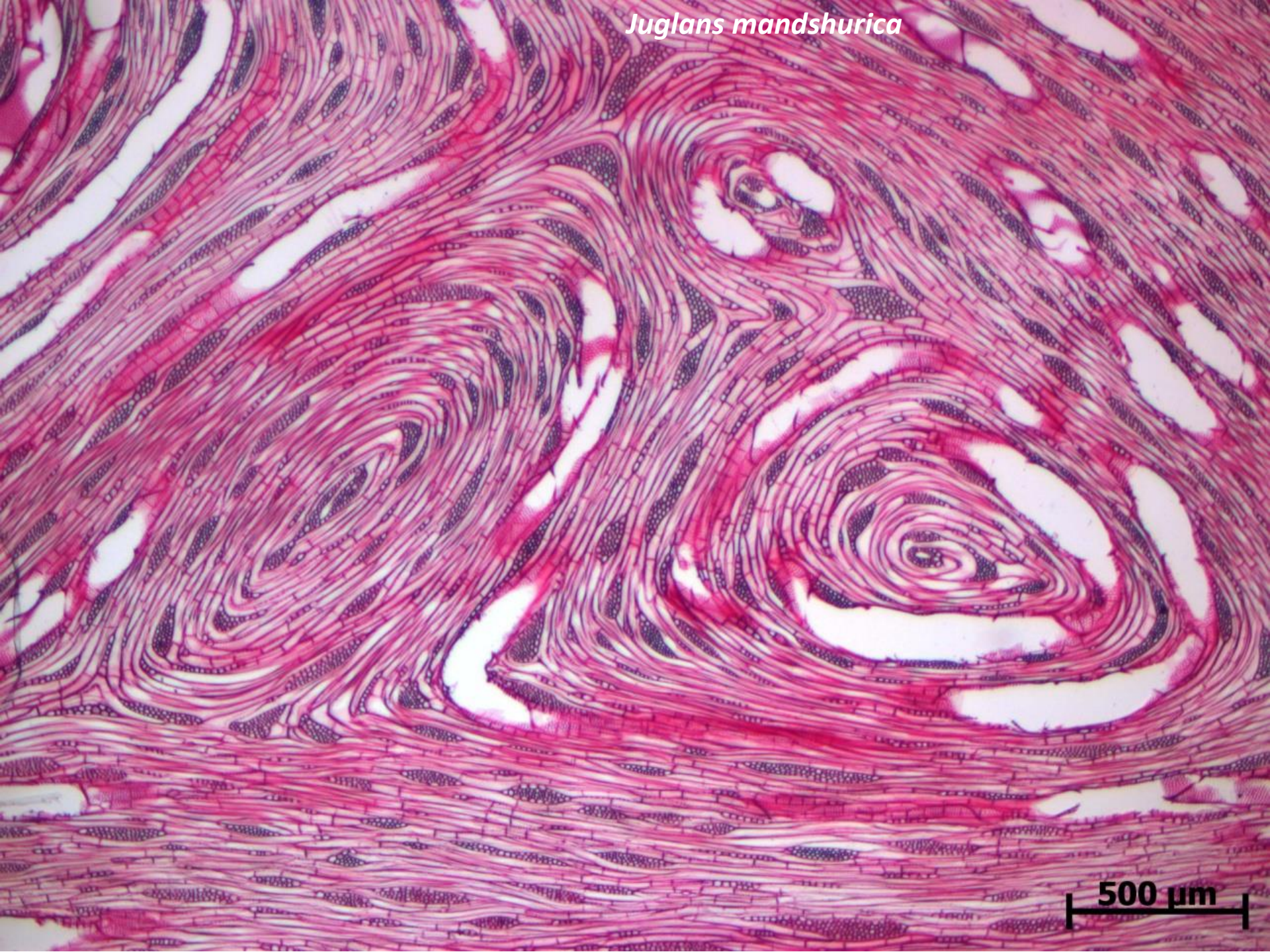
TS



Left to right, all TLS  
*Camptosperma brevipetiolata*  
*Camptosperma pteripentandra*  
*Canarium salamonense*



*Juglans mandshurica*



500 μm