Technologies to verify the origin and species or genus of wood and wood products

Dr. Andrea Olbrich* and Dr. Tereza Cristina Monteiro Pastore**

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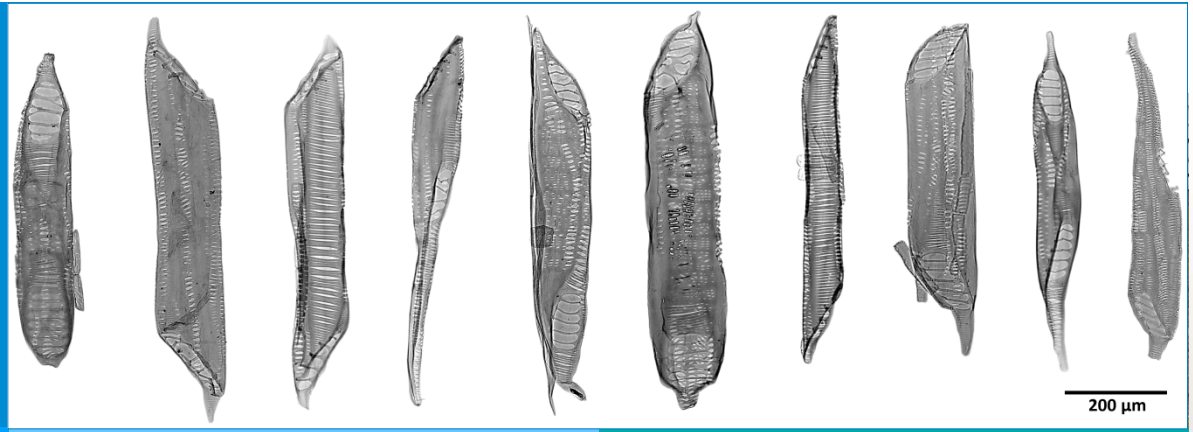

IUFRO 2019 Curitiba - Brazil
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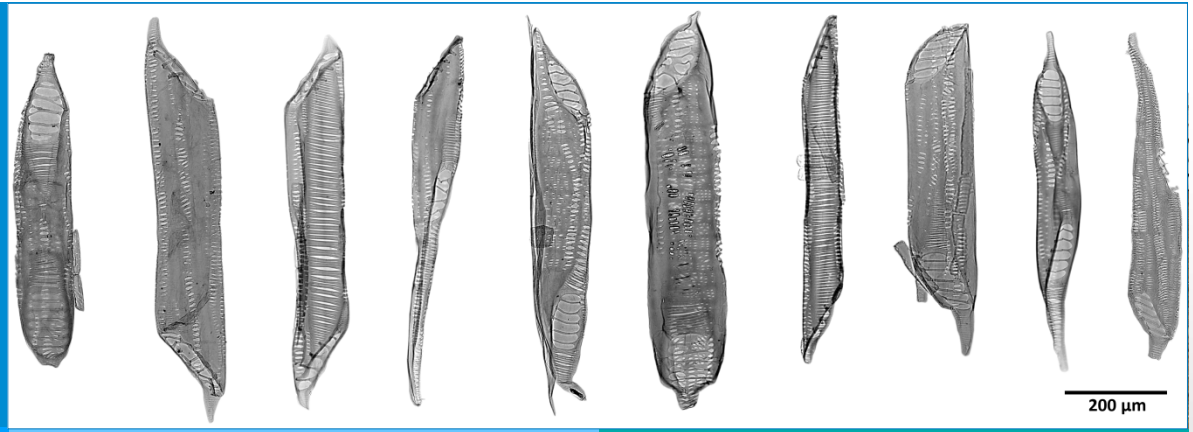
Identification of Asian timbers in pulp, paper and fiber boards

Dr. Andrea Olbrich, Helmling, Dr. Heinz, Sieburg-Rockel and Priv. Doz. Dr. habil. Koch
Thünen Institute of Wood Research, Germany



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Background of investigations

European Timber Regulation (EUTR)

Implemented in March 2013

Market participants‘ system of due diligence

- Risk assessment tool
- Environment and consumer protection
- Importer must declare species and origin

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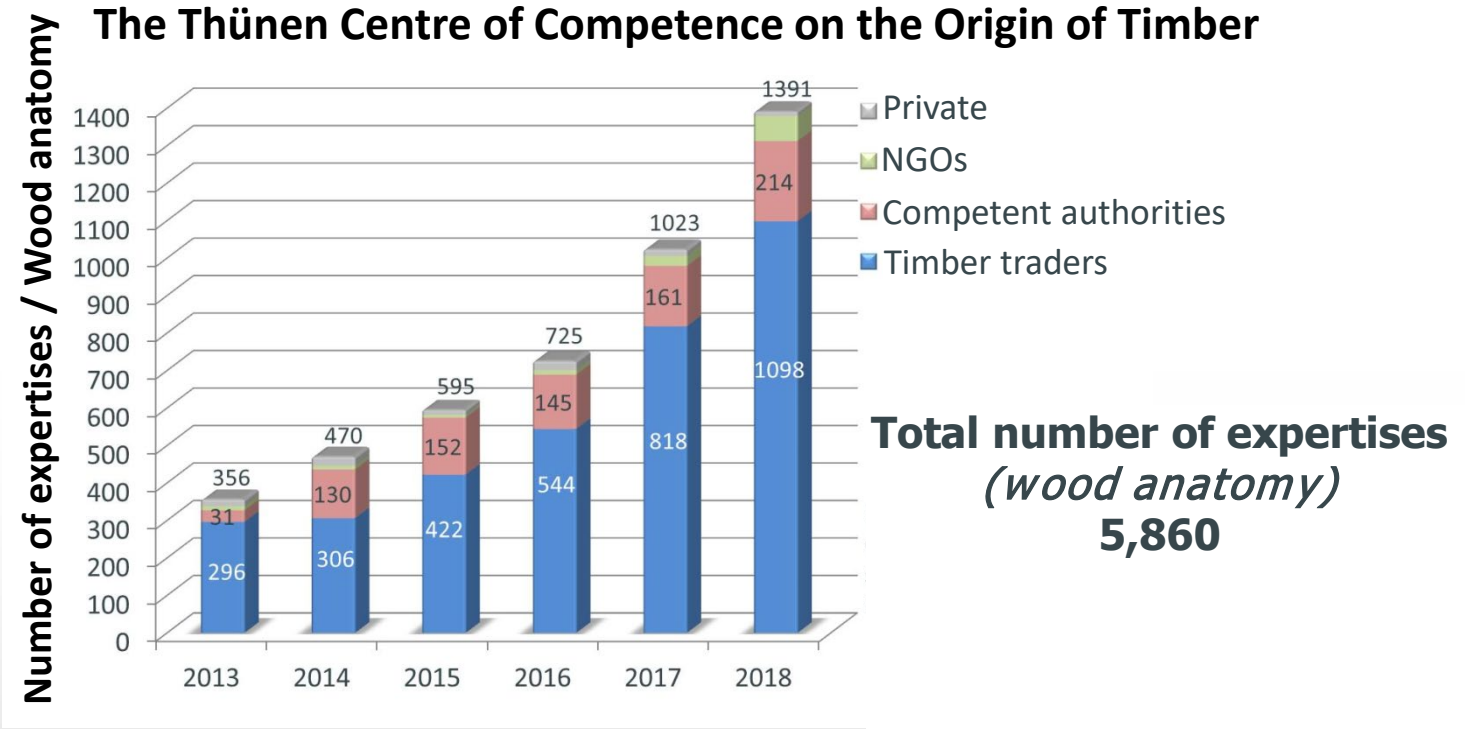
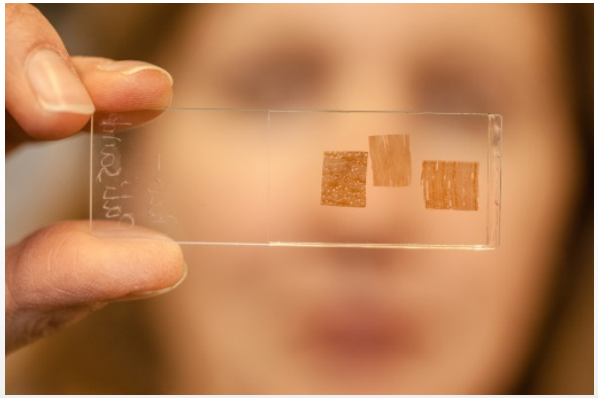
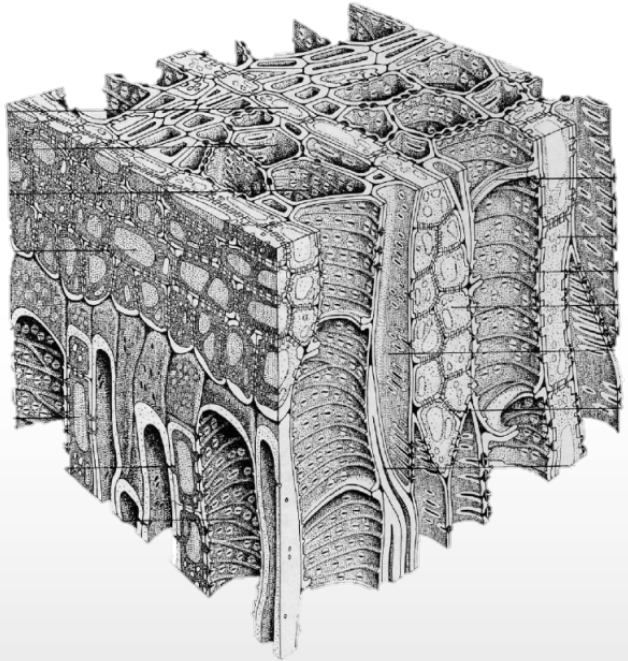
Timber identification in practice



Identification of solid wood

- Three anatomical sections
- 80 - 100 microscopic features
- The natural grown wooden tissue





Identification of solid wood in practice

ITTO project (2015):

Development and implementation of a species identification and timber tracking system with DNA fingerprints and isotopes in Africa

Identification of solid wood in practice

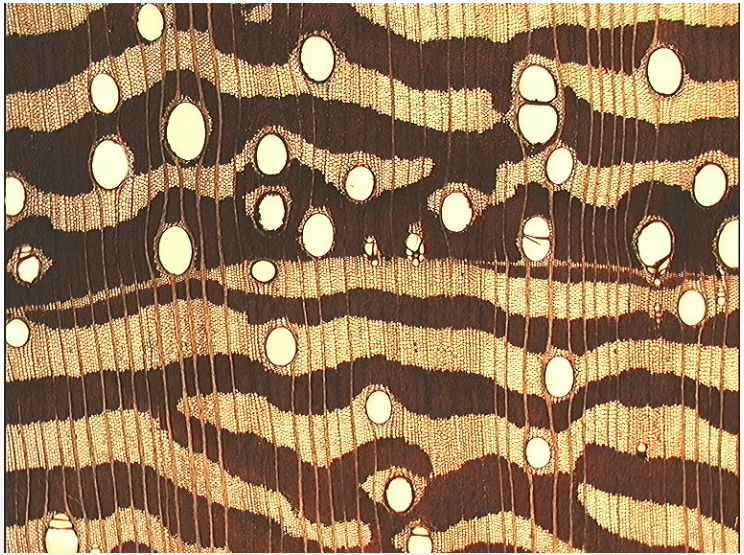
Sample identification of ITTO project

Anatomy:

- 100% on genus level
- 75% on species level

DNA (chloroplast fragment rbcl):

- 80% on genus level
- 20% on species level



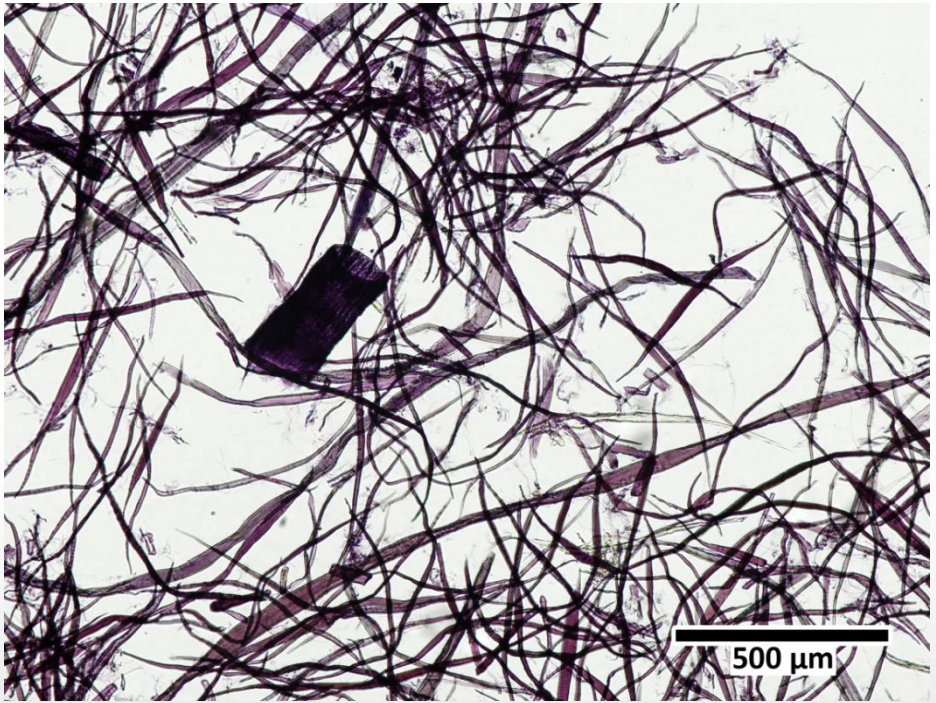
Wengé - *Millettia laurentii*

Timber identification in fiber products

- Macroscopic evaluation is not possible
- Wooden tissue is dissolved
- Mostly mixed timbers
- DNA destroyed and washed out

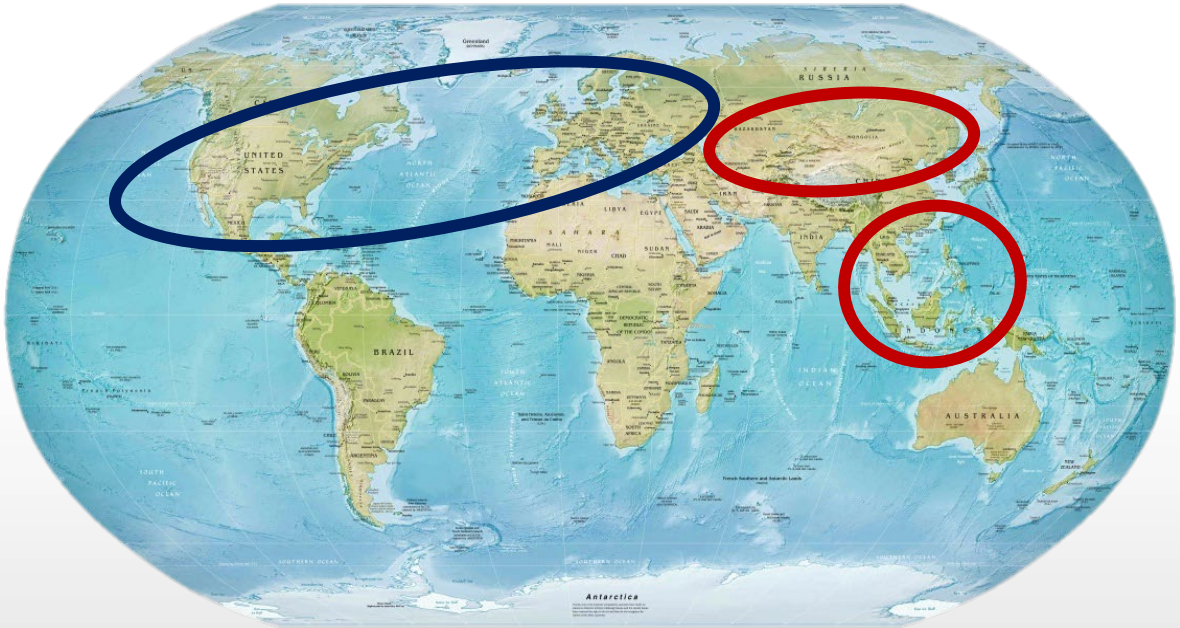
Timber identification in fiber products

- Maceration, staining of cells
- Light microscopy
- 12 microscopic features
- Matching with references



References

- North America and Europe (available)
- Southeast Asia
- Temperate Asia (needed)



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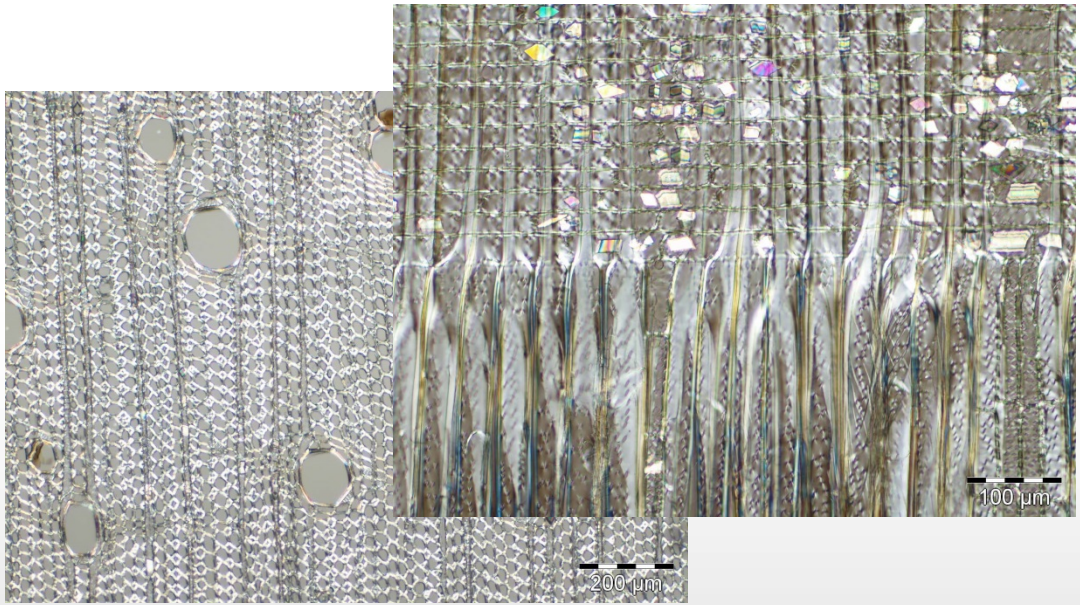
Wood chips of APP (Indonesia)

46 (of 59 samples) Ramin - CITES II



ASIA PULP & PAPER UNDER INVESTIGATION PART TWO

THE RAMIN PAPER TRAIL

GREENPEACE

www.greenpeace.org/ramintrail

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References for the identification of fibers

- Maceration (CH_3COOH / H_2O_2)
- Preparation
- Microscopy

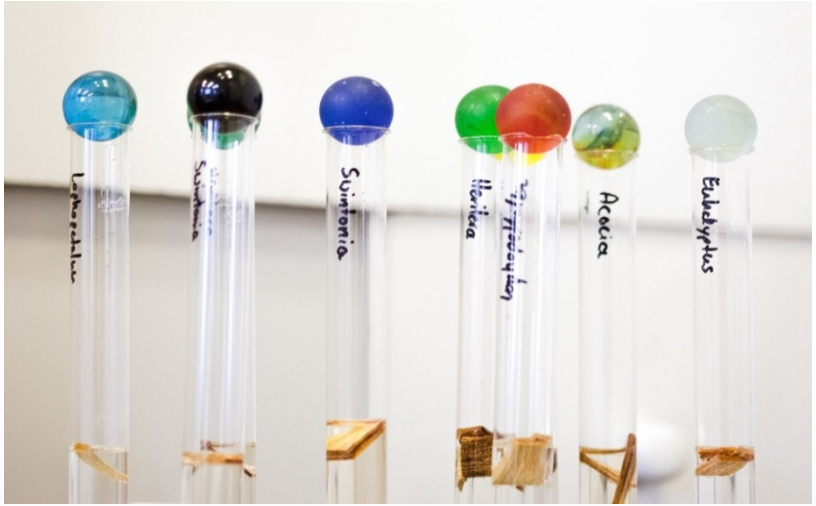
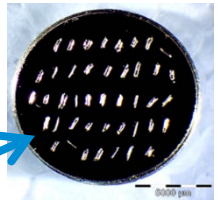
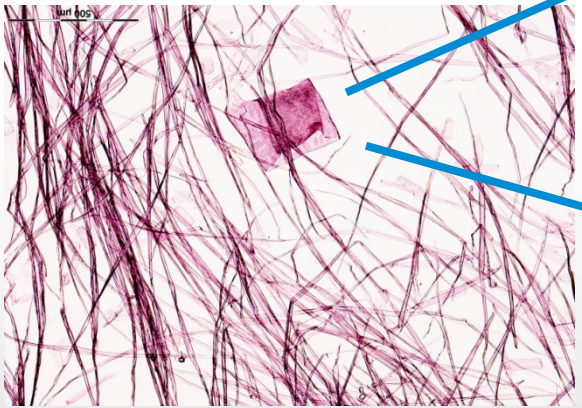
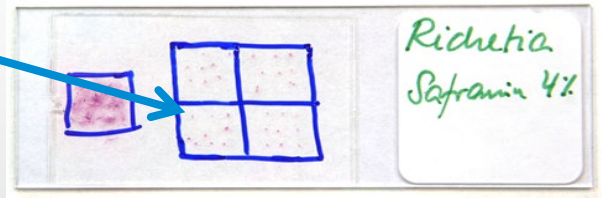


Photo: Ilja Hendel



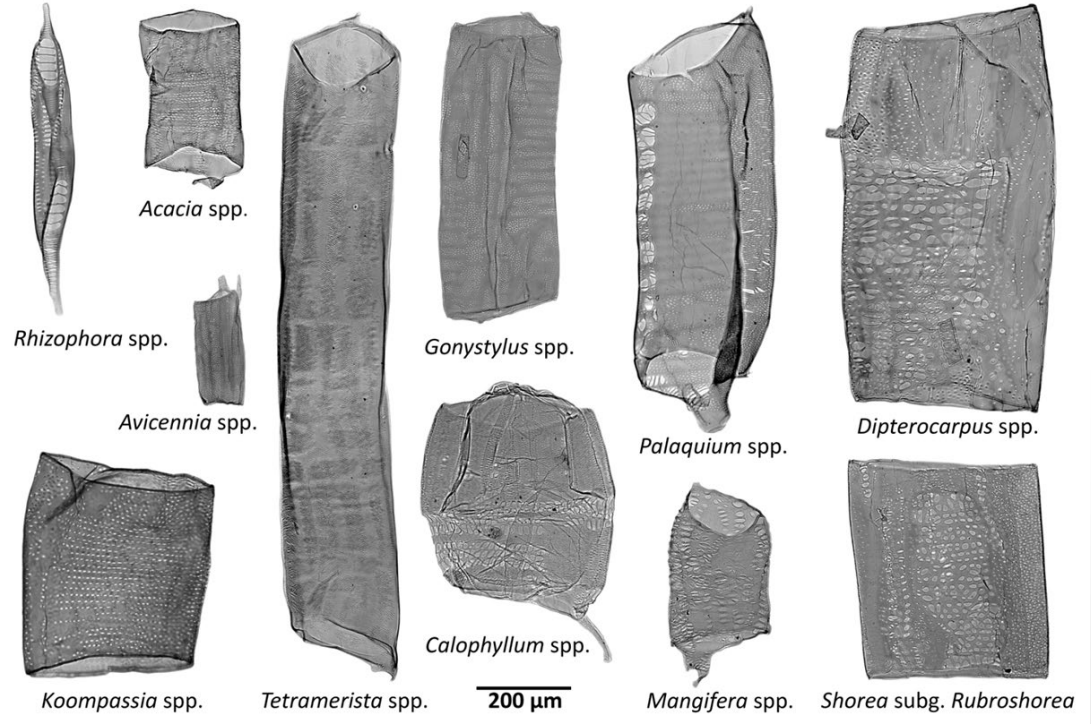




Characteristics of vessel elements

- Dimensions (length / width)
- Perforation plates
- Intervessel pits

  (size / arrangements)
- Vessel-ray pits (APS or VAS)
- Helical thickenings
- Tyloses



Atlas of vessel elements

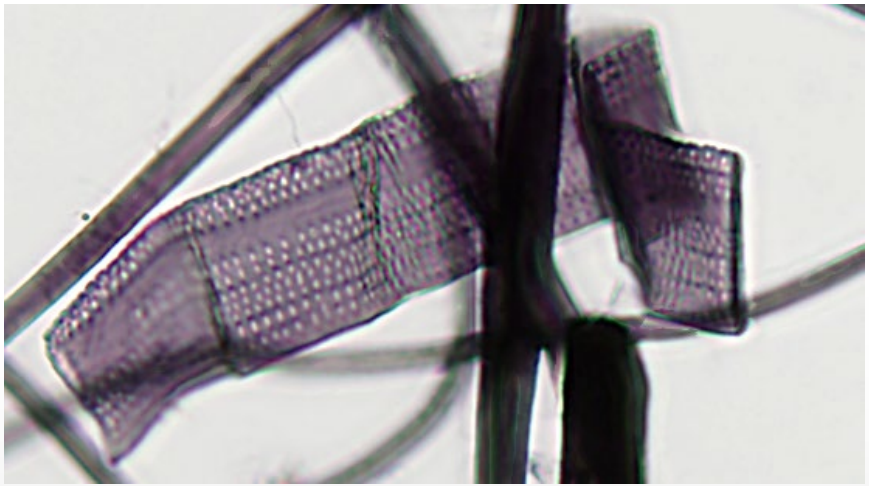
Introduction

- Practical background
- Preparation
- Anatomical features

Main features of vessel elements

Monocots

- No vessel-ray pitting
- Axial continued pit fields and regions without pits



Main features of vessel elements

Hardwoods with simple perforation plates

APS: All **P**its **S**imilar (in size and shape)

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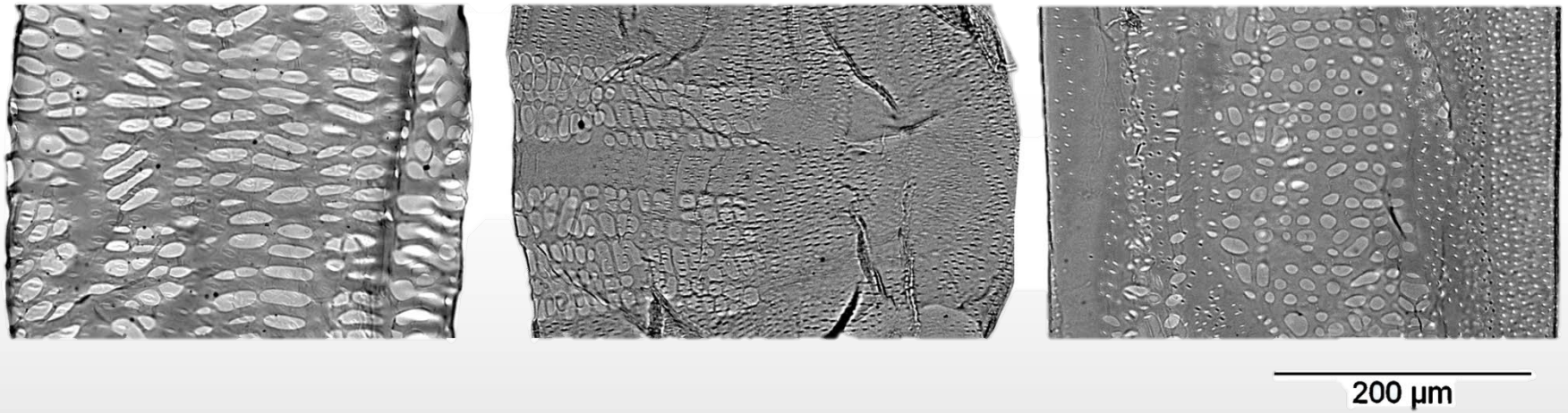
Main features of vessel elements

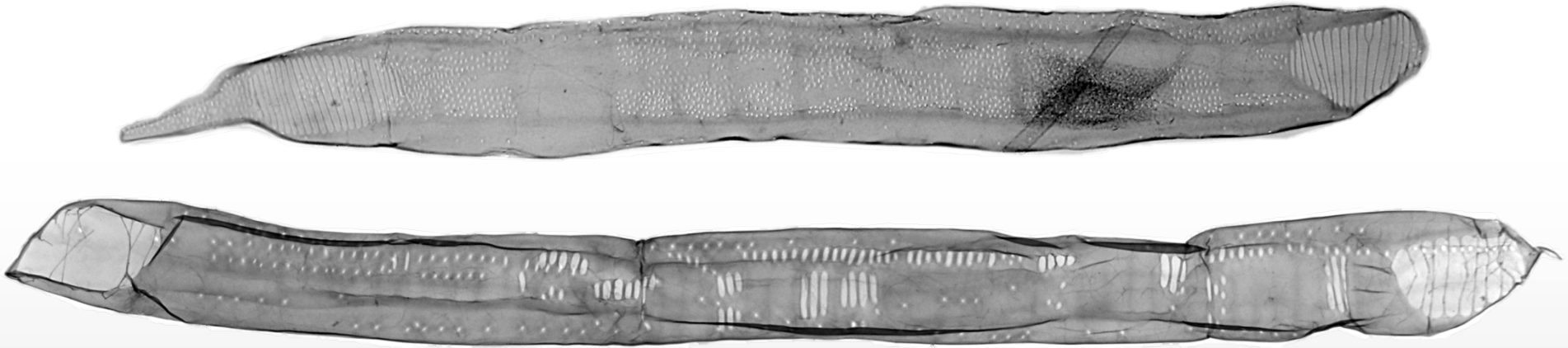
Hardwoods with simple perforation plates

VAS: Vessel-ray pits Apparently Simple



Main features of vessel elements

Hardwoods with scalariform perforation plates



Olbrich, Helmling, Heinz, Sieburg-Rockel and Koch - Thünen Institute of Wood Research

References for the identification of vessel elements

Helmling S, Olbrich A, Heinz I, Koch G (2018)

Atlas of Vessel Elements

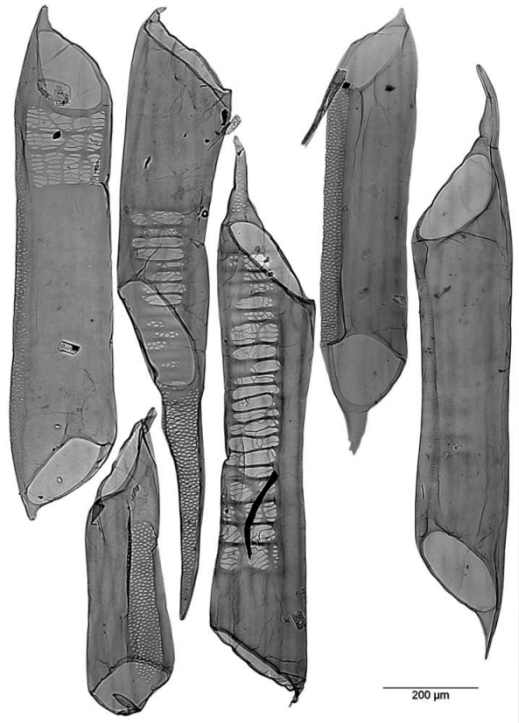
Identification of Asian Timbers

IAWA Journal 39 (3)

- Open access -

http://booksandjournals.brillonline.com/content/journals/10.1163/22941932-20180202

Summary



- References for 38 Asian timbers are established
- Determination of the wood origin is not possible
- All selected timbers can be clearly identified (evaluated with blind-tests)

Thank you!

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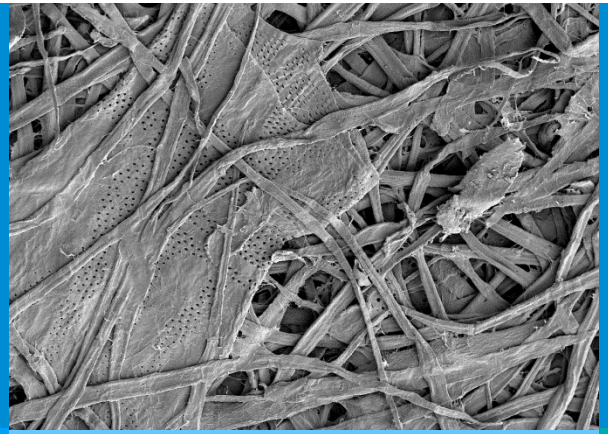

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