Fundamentals about *Eucalyptus* Trees, Woods & Fibers


www.celso-foelkel.com.br
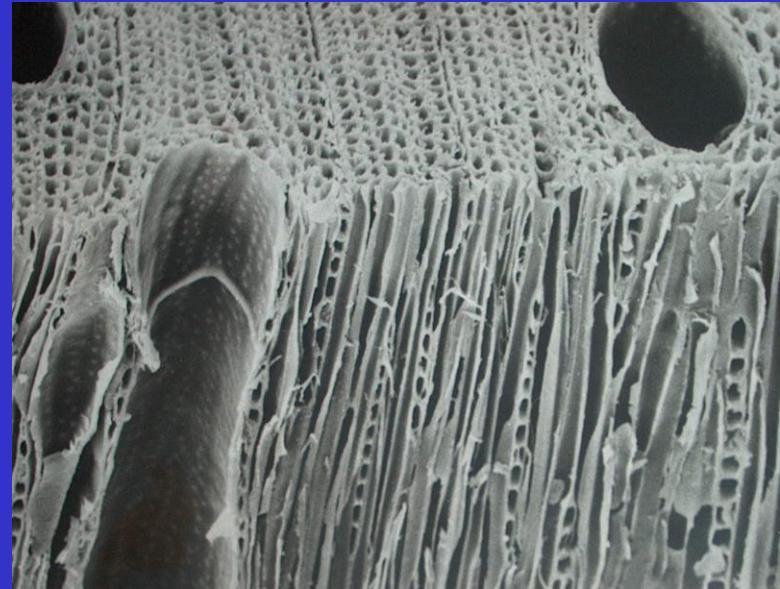
Forests & Trees

The good, the bad & the ugly…

Heaven and Hell…are very close to each other
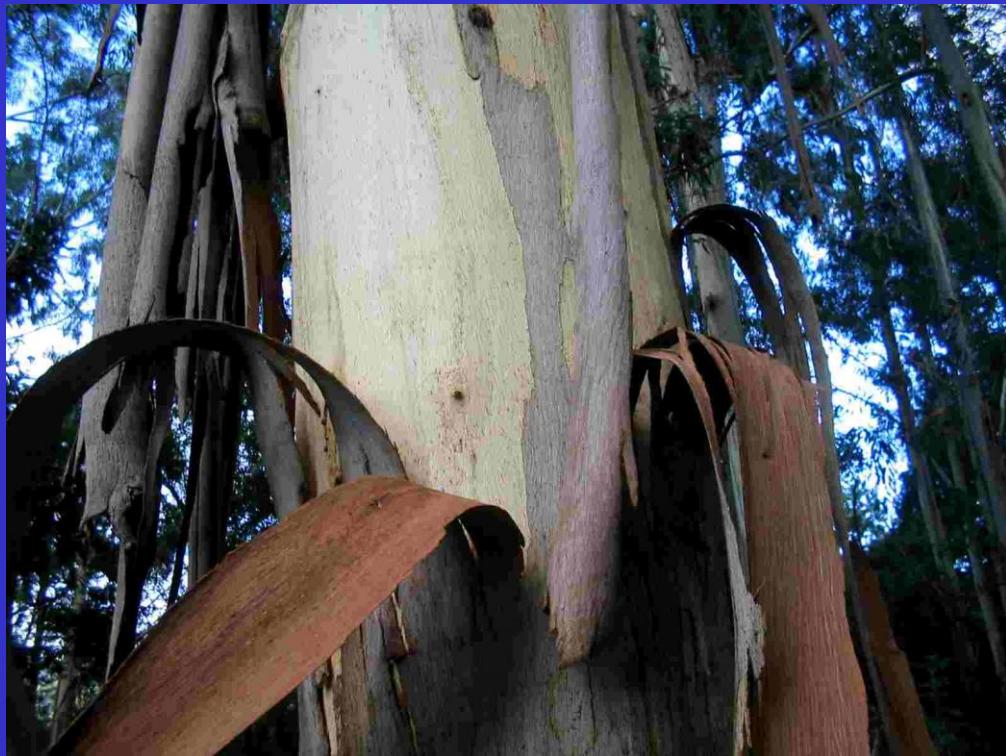
Forests

Forests

Forests

Forests

Forests

Forests

Forests

Trees

Trees

Trees

Trees - Forests - Woods - Society

Trees - Forests - Woods - Environment - Society

# Woods
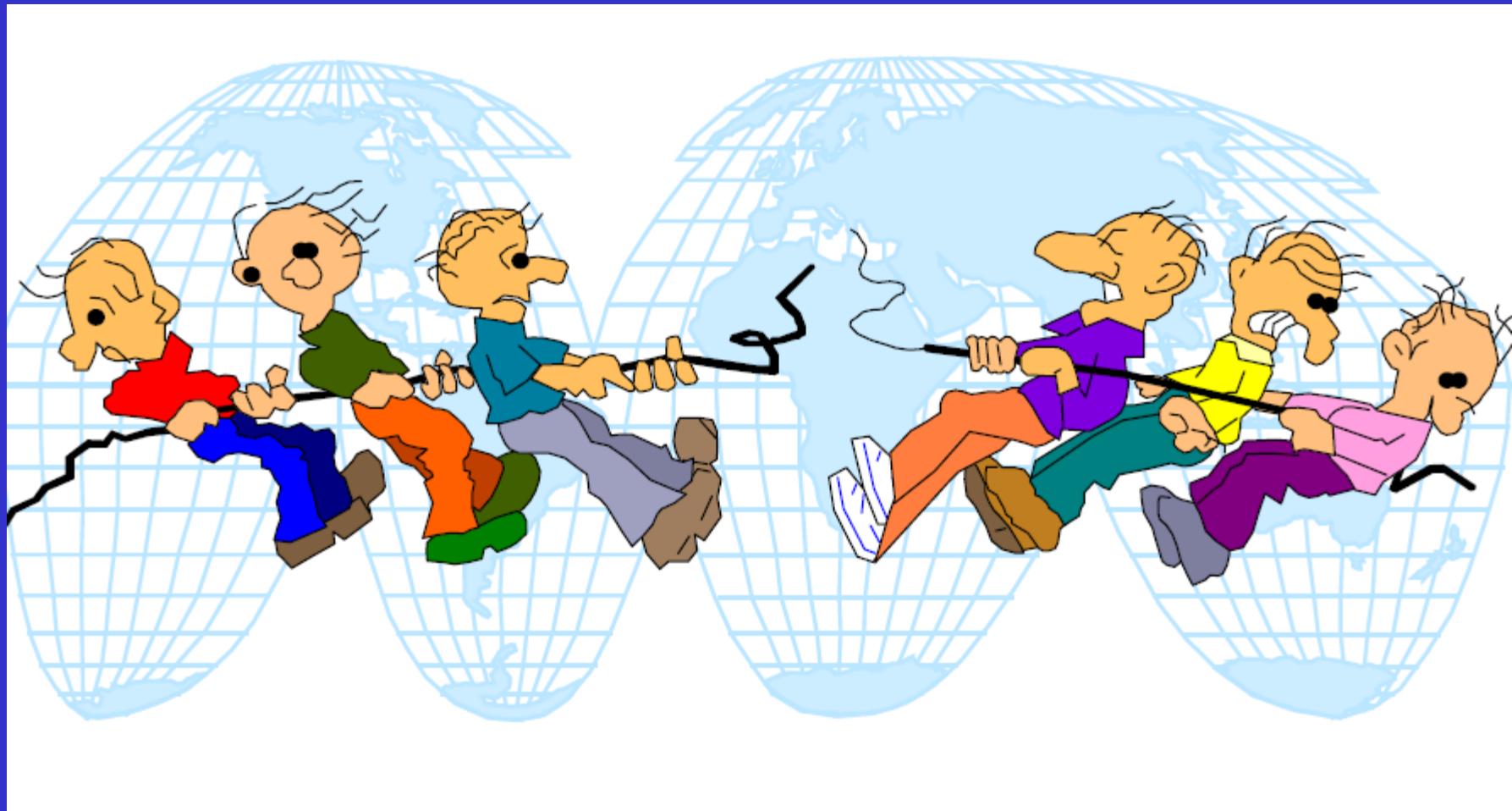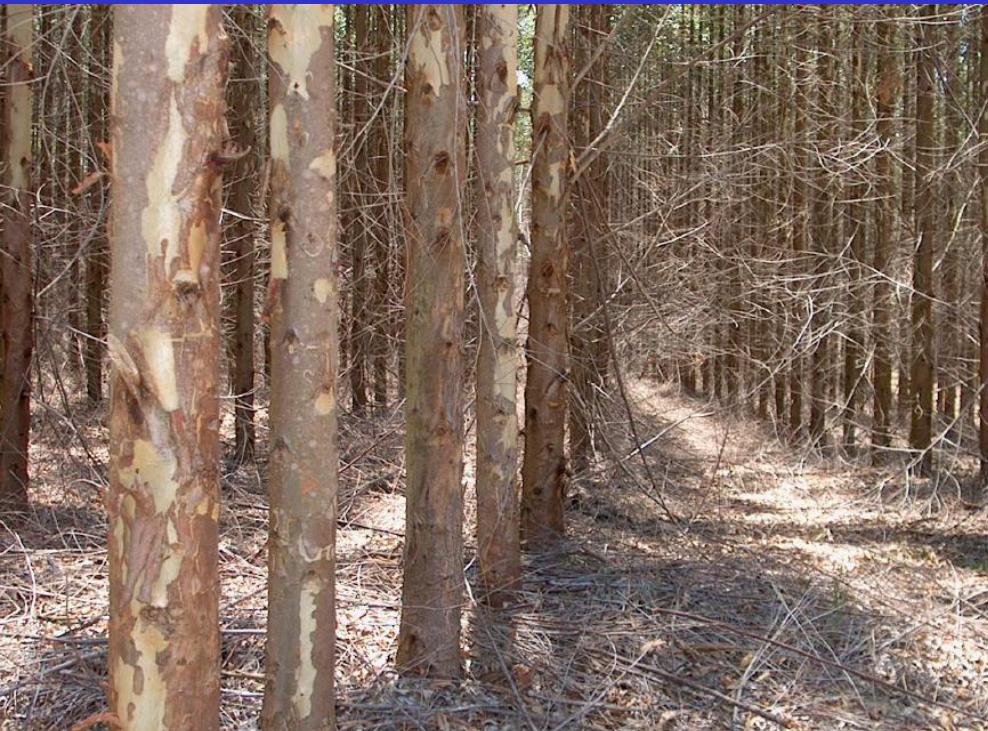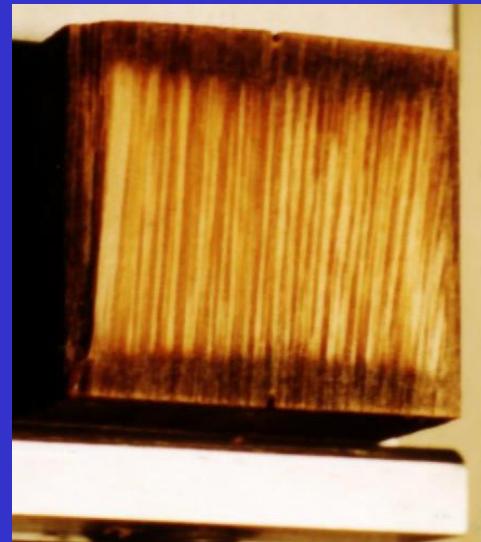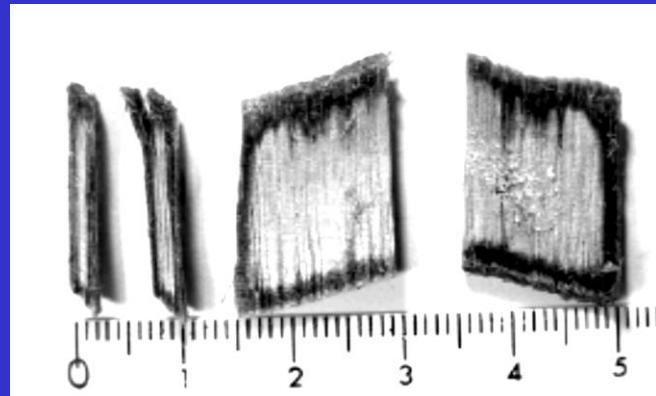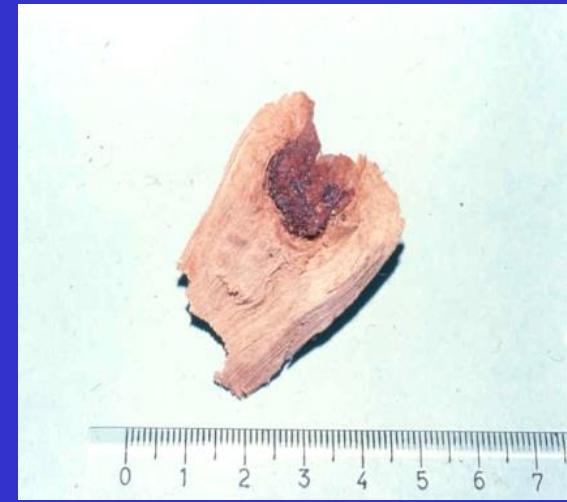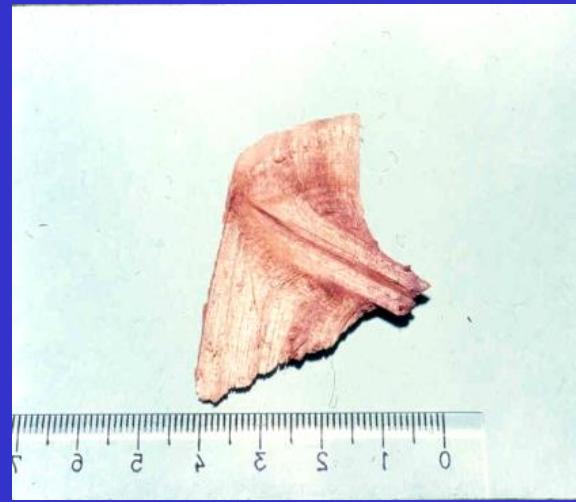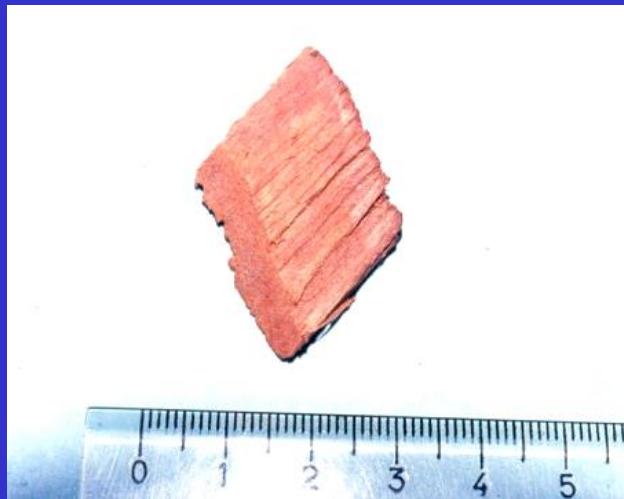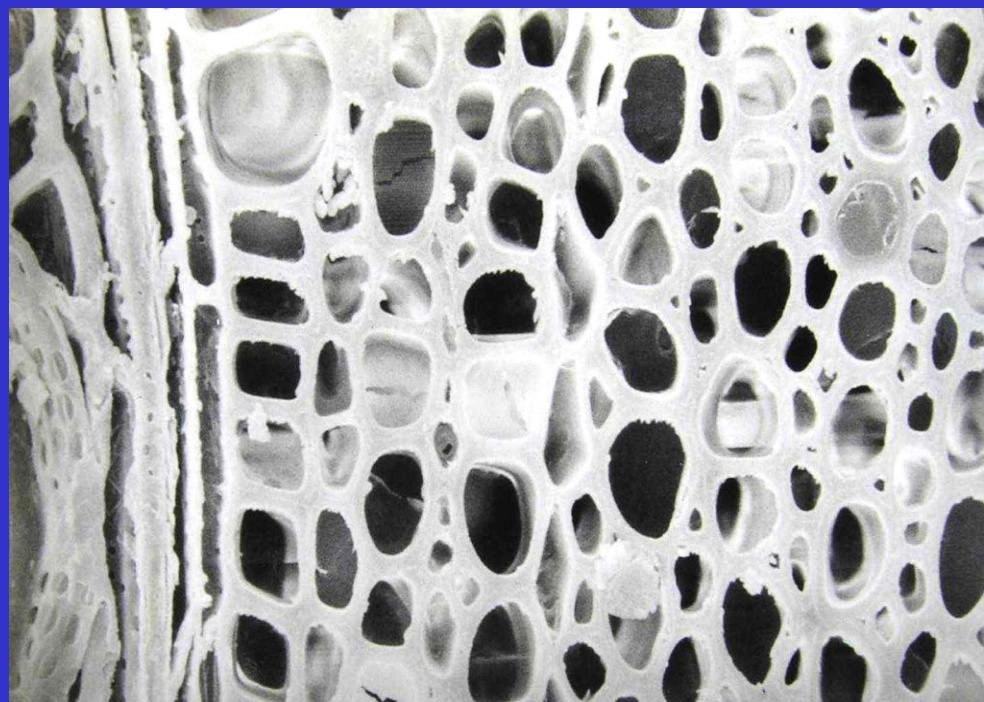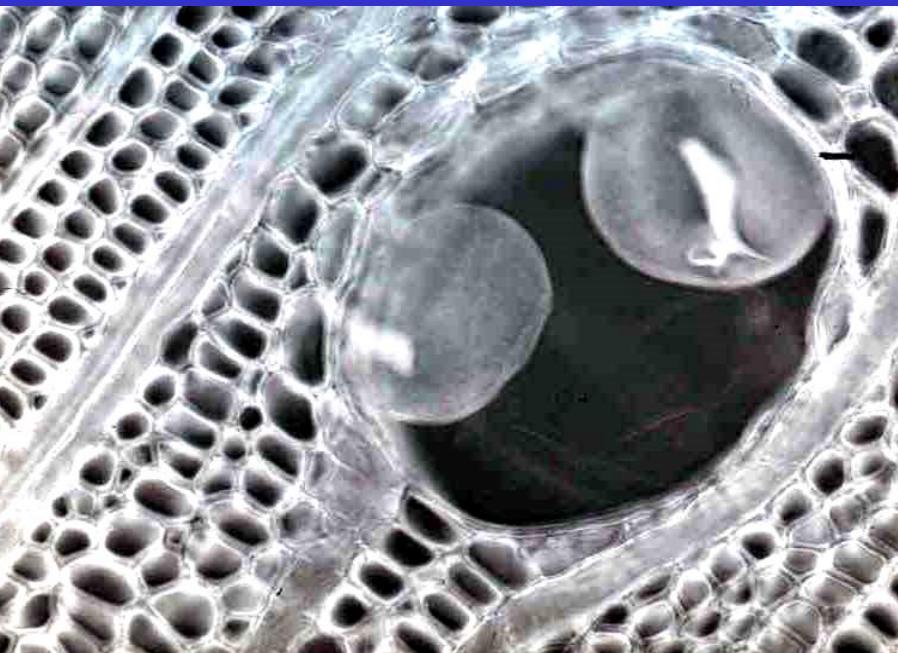
Woods

Woods

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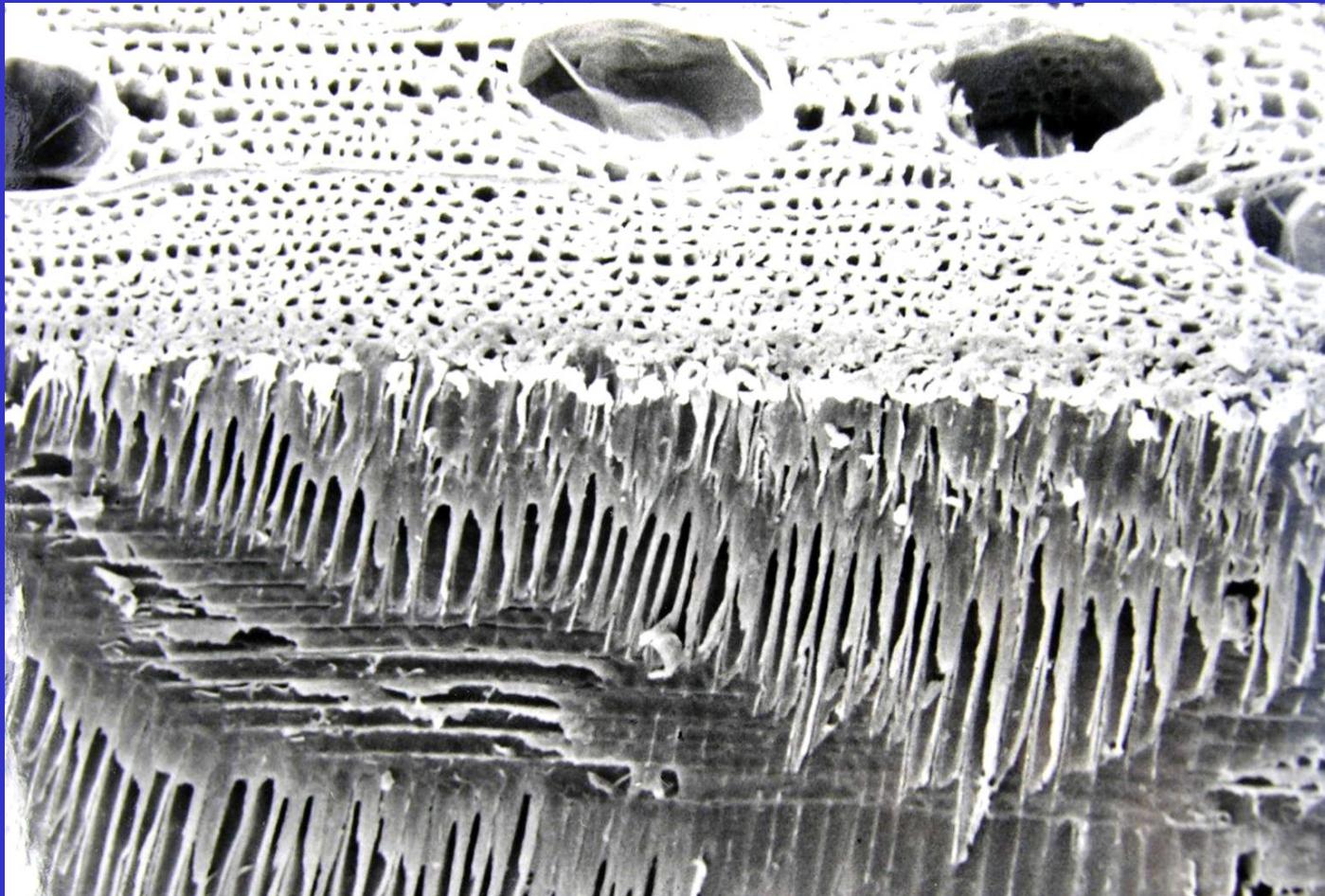
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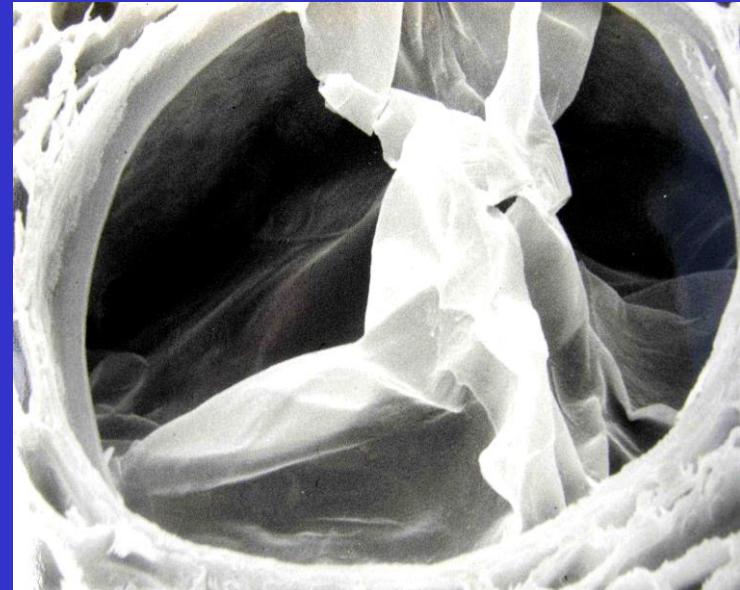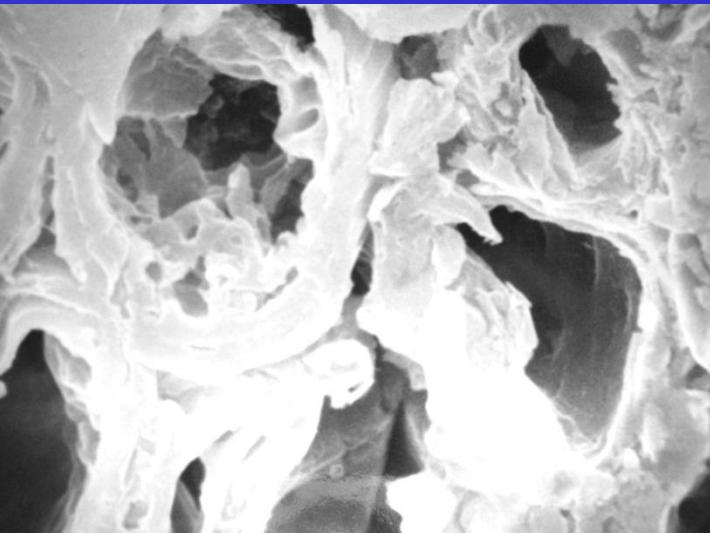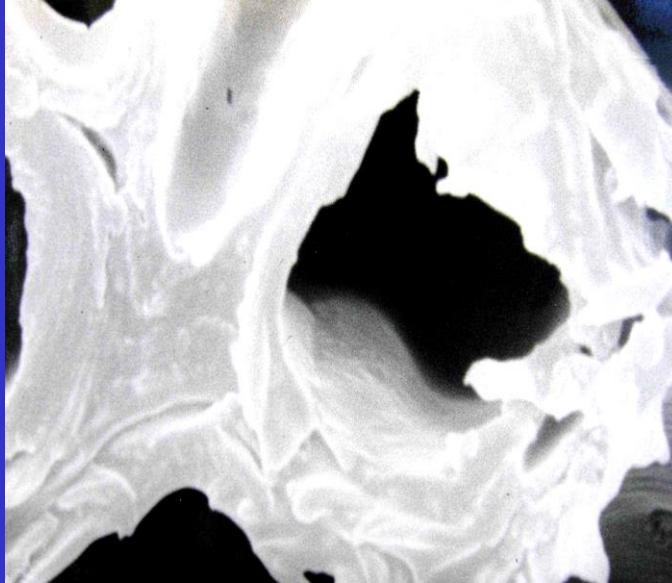
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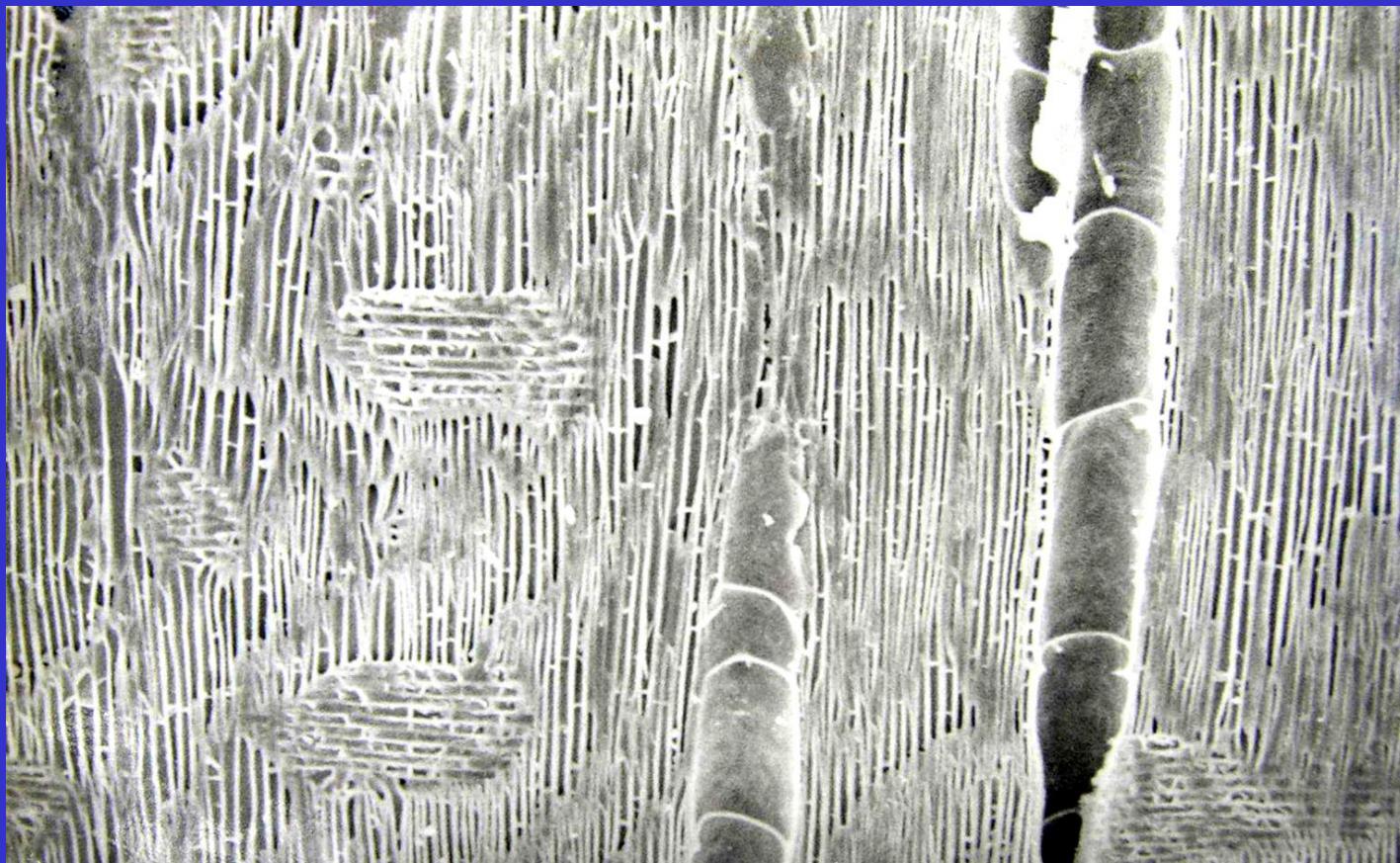
Woods

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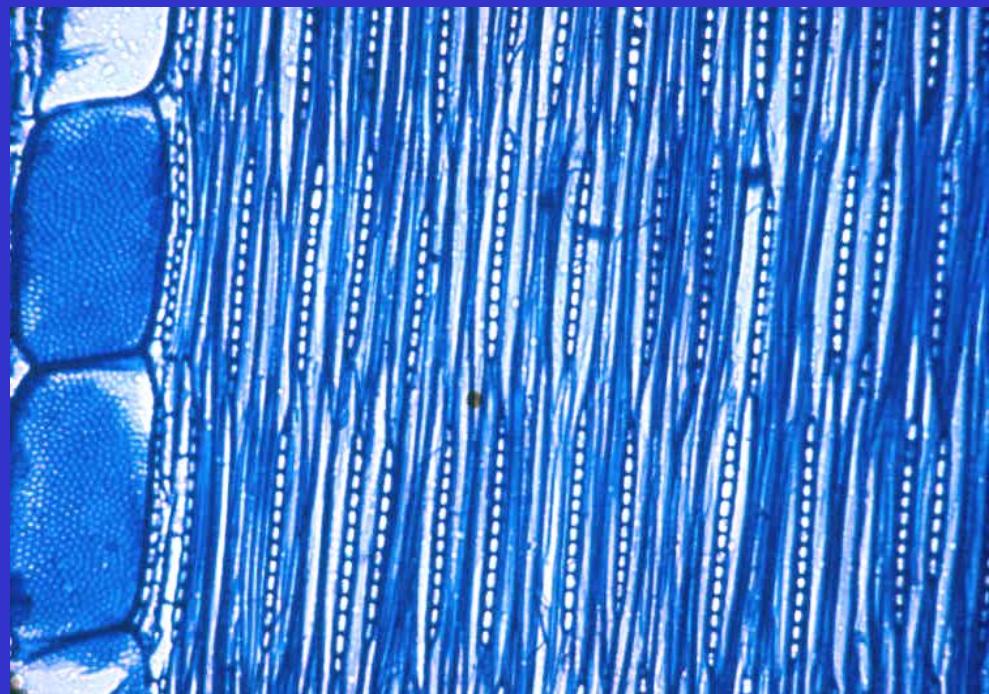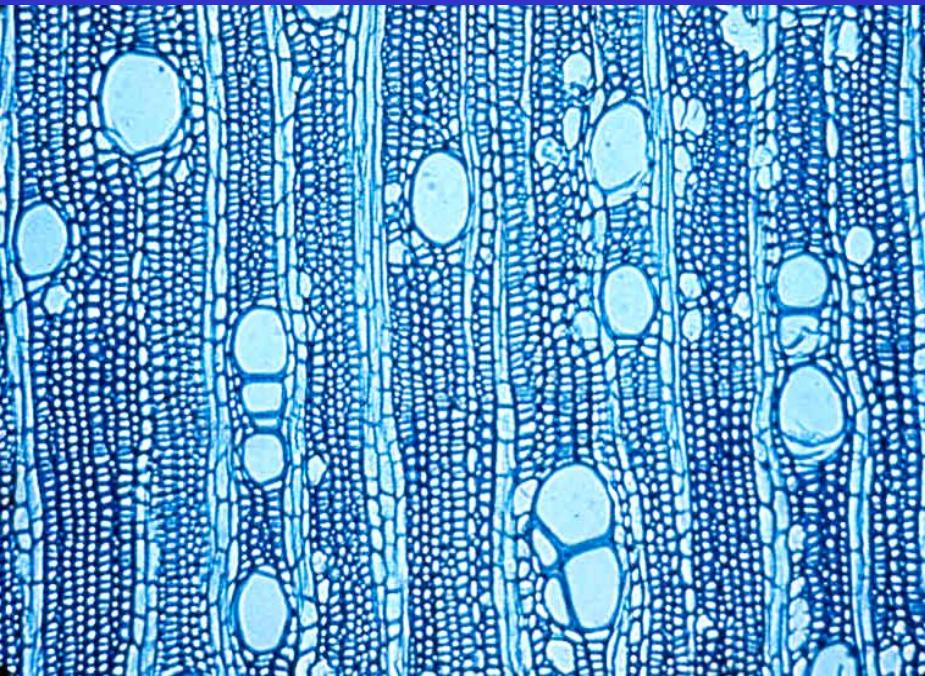
Woods

Woods

Woods

Fibers

Lignin:
- Brightness
- Opacity
- Stiffness

Hemicelluloses:
- Swelling
- Bonding
- Water retention

Fibril angle
- Fiber strength
- Colapsibility

α-cellulose
- Strength
- Yield

Softwoods
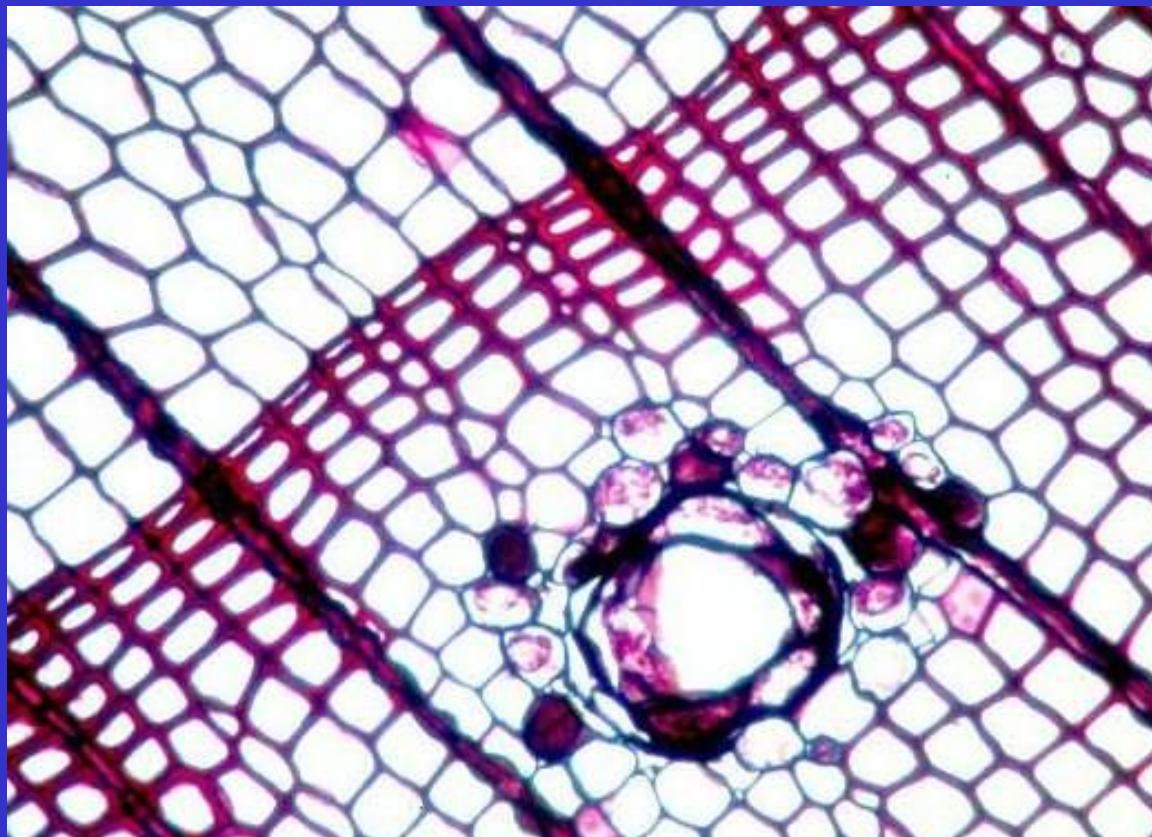
Softwoods

Softwood fibers

Pinus radiata

- Coarseness =   23   mg/100m
- Fiber population =   2,8 million/g
- WRV =   105   %
- Fines DPCJ =   1,2 %
- Fiber length Kajaani=   2,3 mm

Softwood fibers

Pinus taeda

- Coarseness = 21   mg/100m
- Fiber population   = 3,8 milhões/grama
- WRV = 95   %
- Fines Kajaani = 2,4 %
- Fiber length Kajaani = 2,1 mm

Pinus taeda fibers

Pinus taeda fibers


10μm
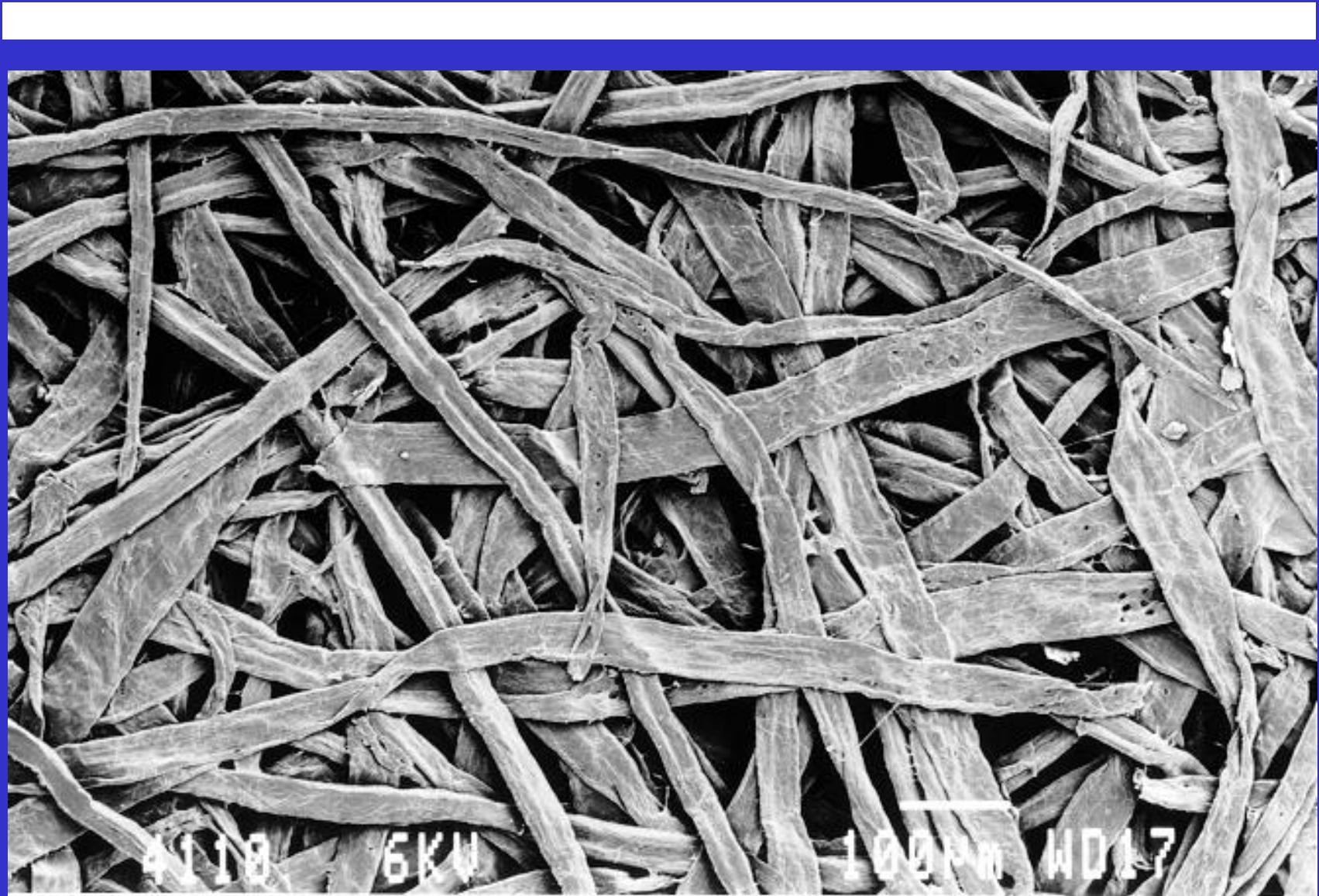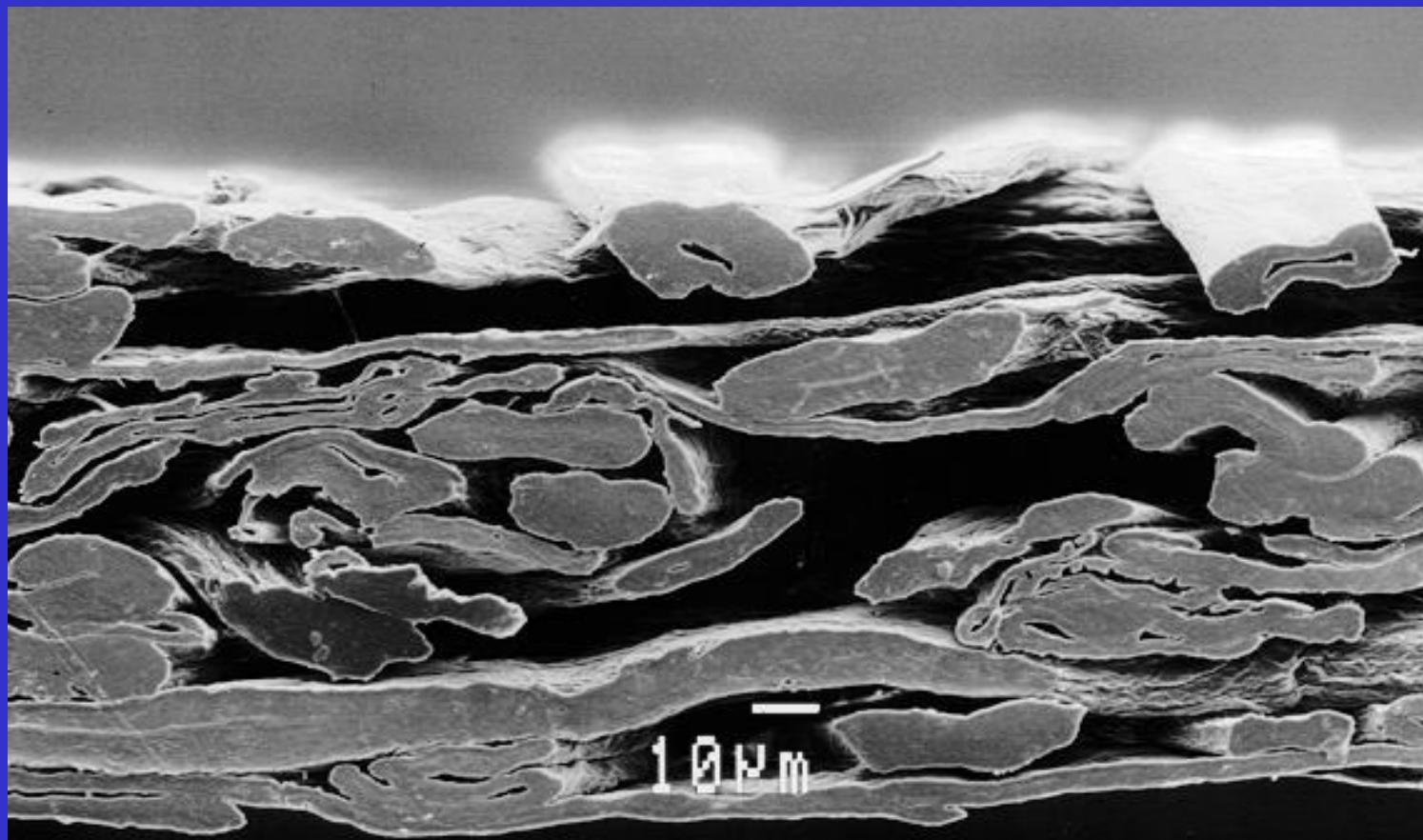
Hardwoods
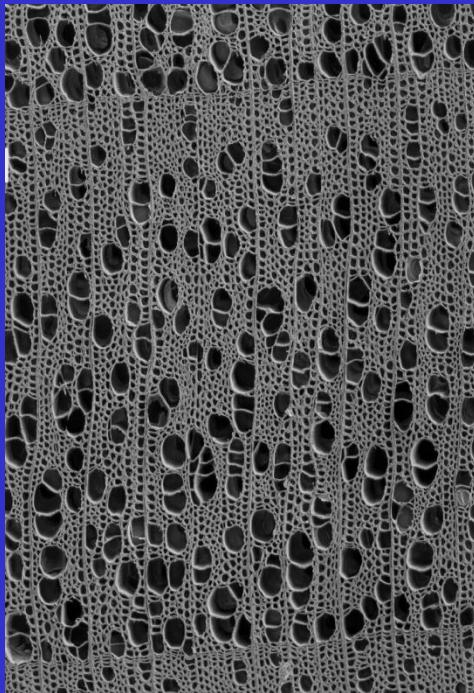
Aspen
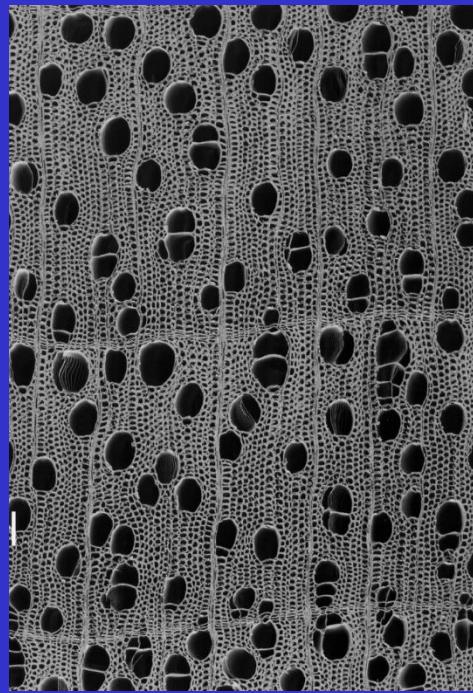
Birch
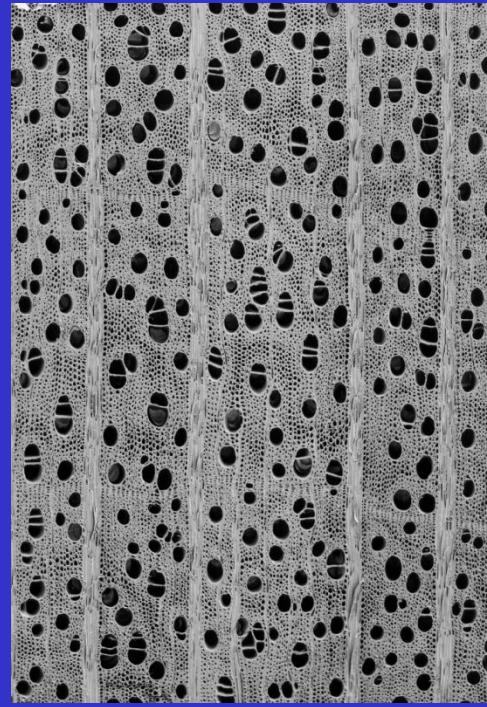
Maple
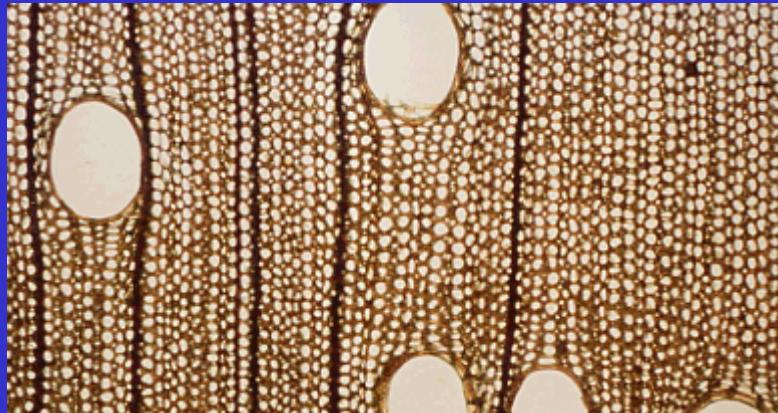
Acacia mangium

Eucalyptus globulus
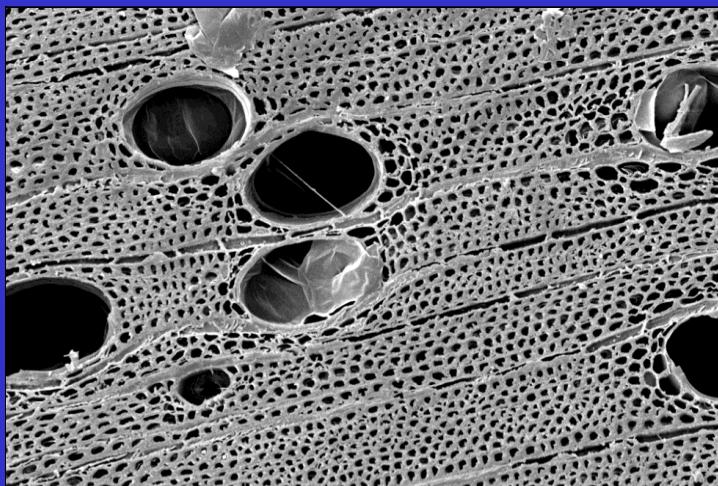
Eucalyptus urograndis

Eucalyptus fibers
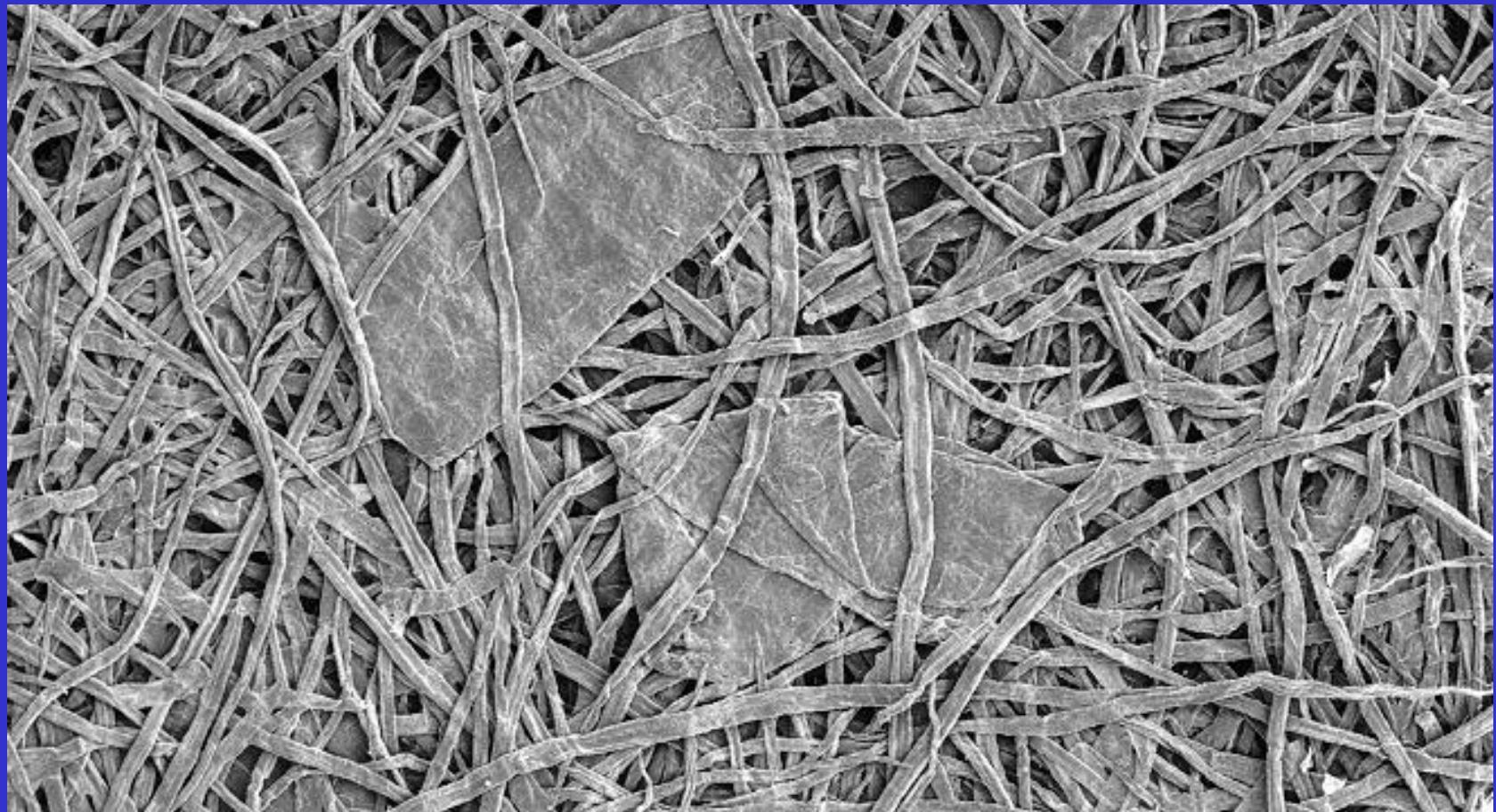
Paper made with *Eucalyptus* fibers
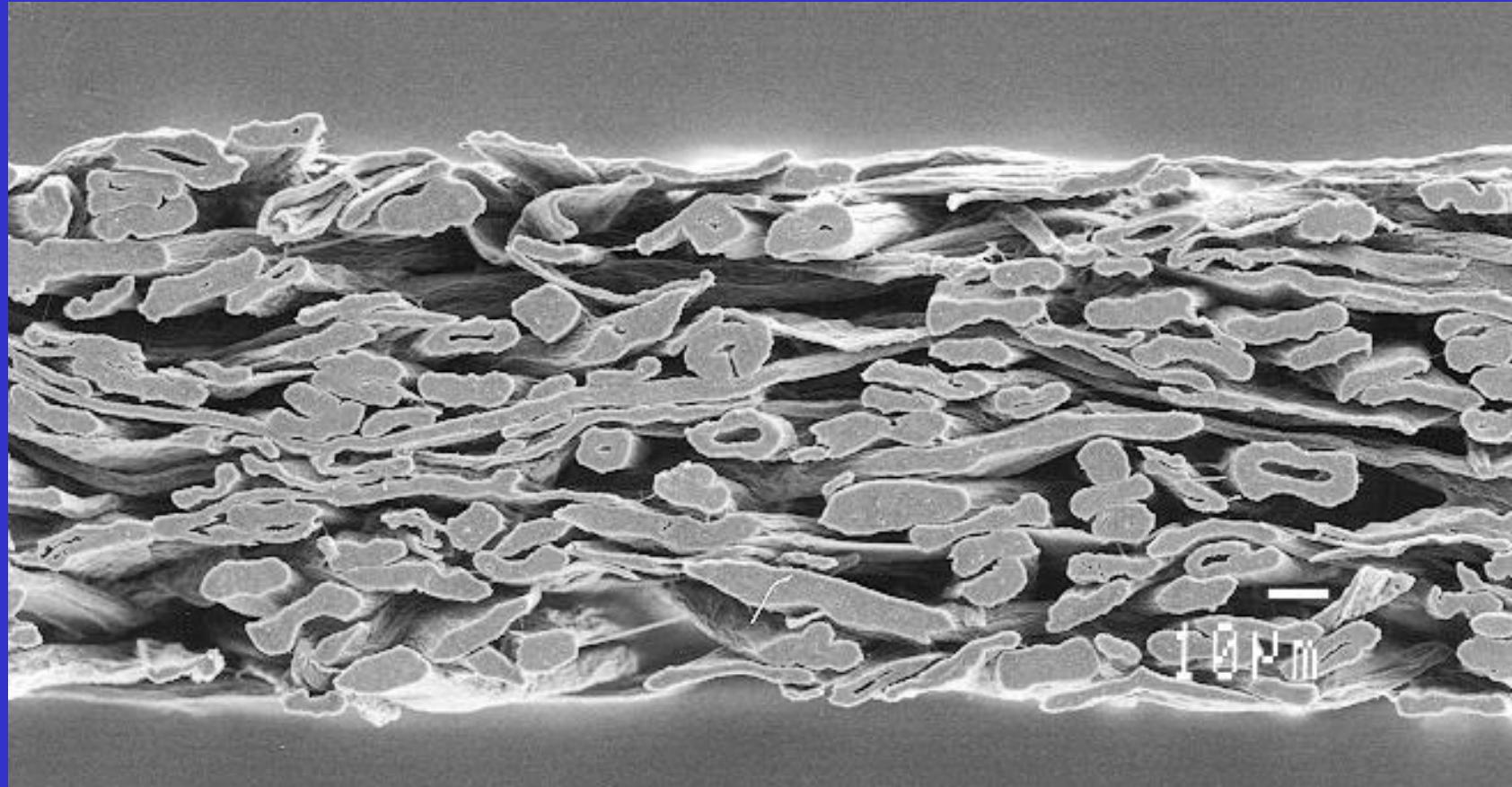
Fiber population is the real advantage
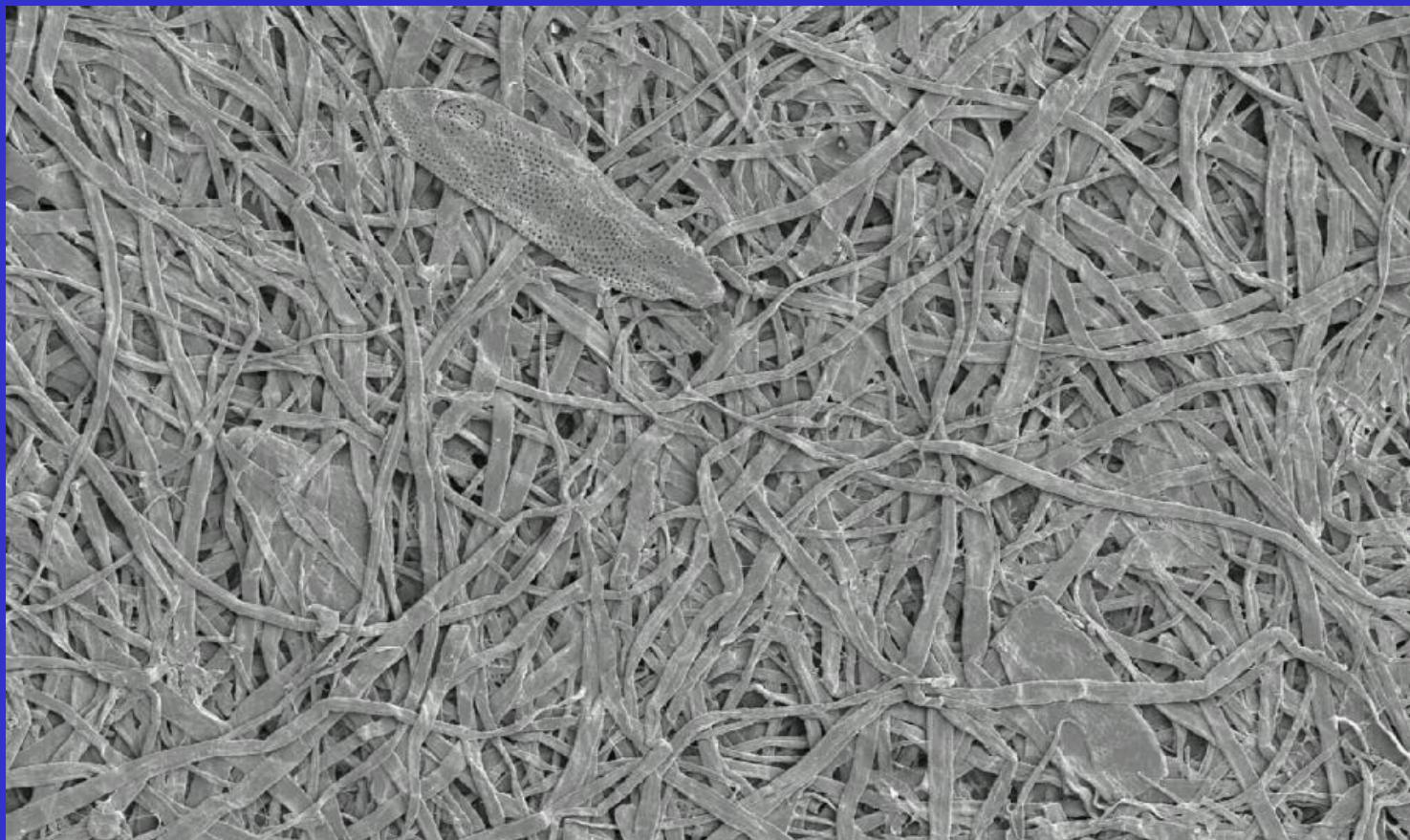
Cell wall thickness also makes the difference
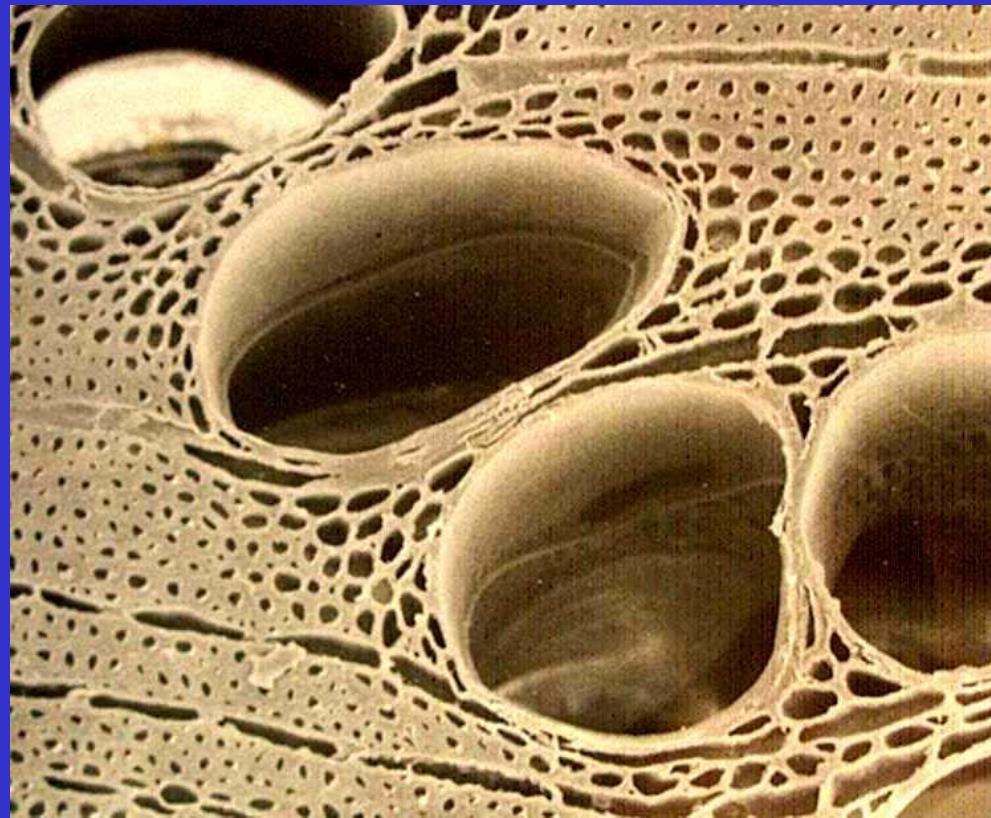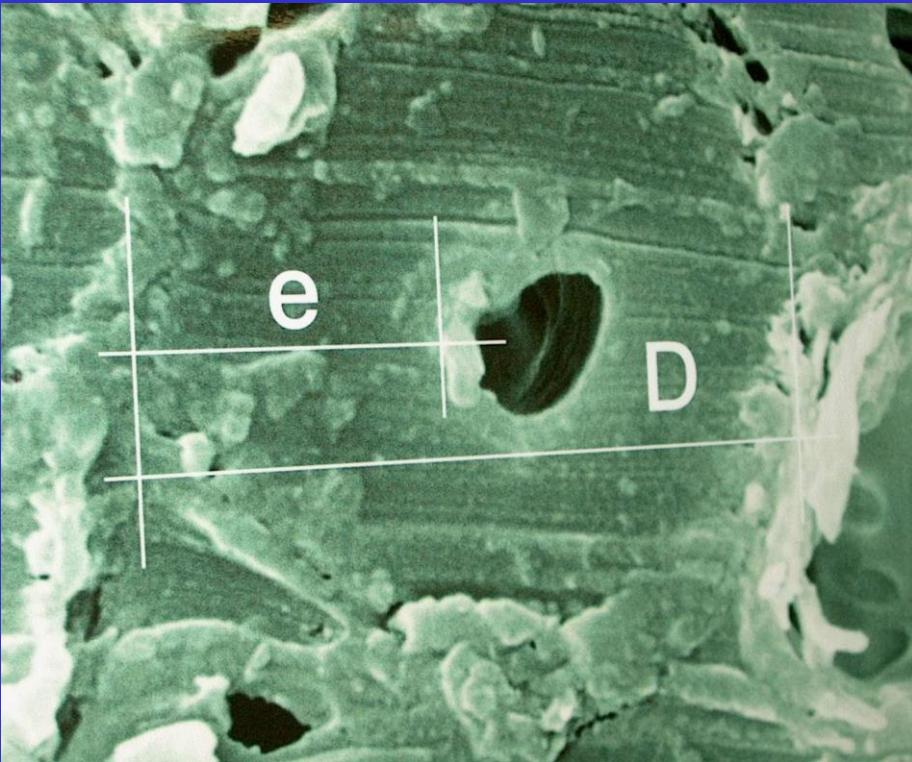
Cell wall thickness also makes the difference
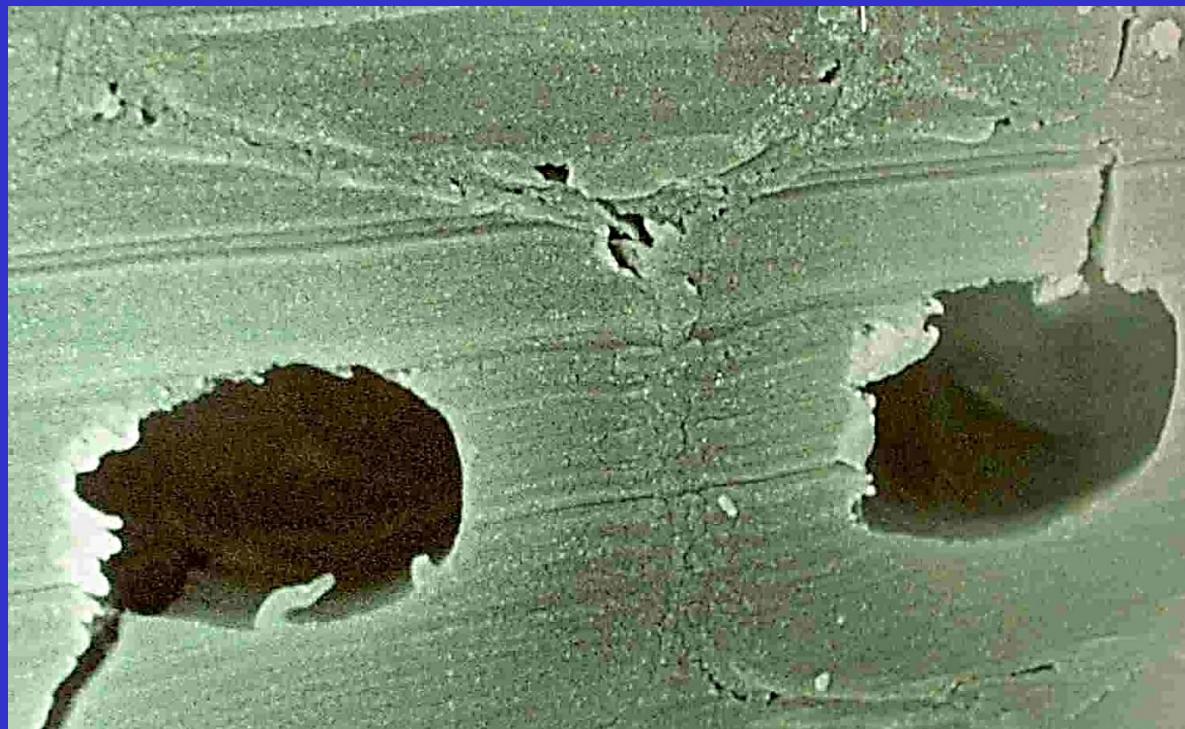
Cell wall thickness also makes the difference
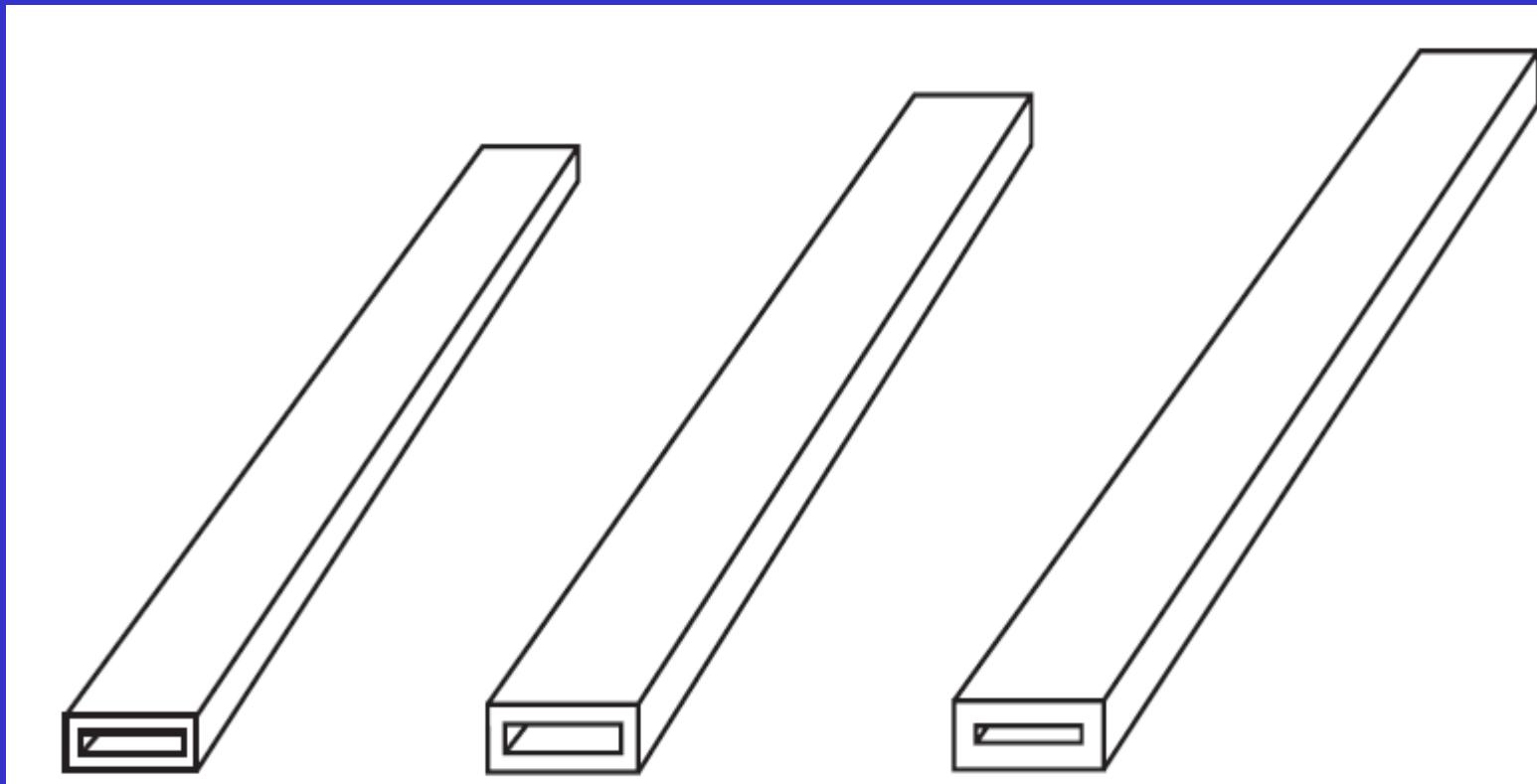
Cell wall thickness also makes the difference

Thick-walled
relative to perimeter
⇓
Collapse resistance
⇓
Less bonding
Bulk
Bulk softtness

Thin-walled
⇓
Collapse susceptability
⇓
More bonding
Adhesion to dryer
Surface softness

Acacia
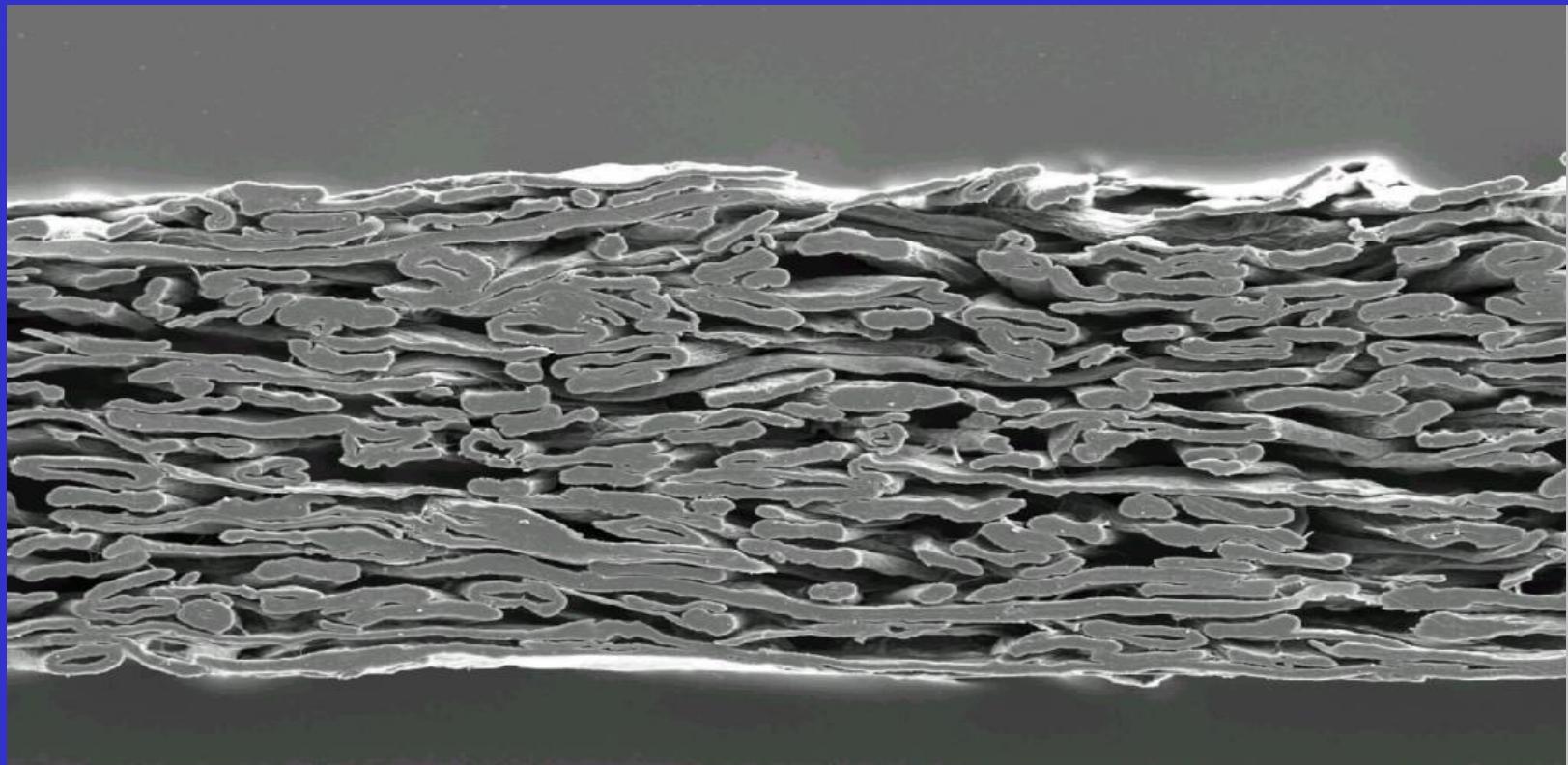
HWD's pulps

| Species	Coarseness	Fiber population	Fiber length	Pentosans	Fines DPCJ	WRV	Cell wall thickness	°SR
Unity	mg/100m	million	mm	%	%	%	micra	°SR
E. urograndis	6 - 8	20 - 23	0,70 – 0,75	15 - 18	8 - 9	120 - 130	3,5 - 4,2	20 - 22
E. globulus	8 - 9,5	17 - 22	0,7 – 0,8	19 - 22	7 - 8	110 - 115	4,0 - 5,0	17 - 19
E. nitens	5,5 - 6,5	23 - 24	0,65 – 0,75	15 - 17	8,0 – 9,5	125 - 130	3,0 - 3,5	22 - 24
Acacia mangium	6,5 - 8	26 - 28	0,6 – 0,65	14 - 16	9 - 10	125 - 135	3,4 - 3,6	24 - 26
A . mearnsii	8,5 - 10	16 – 19	0,65 – 0,75	19 - 22	7 - 8	100 - 105	4,5 - 5,5	15 - 17