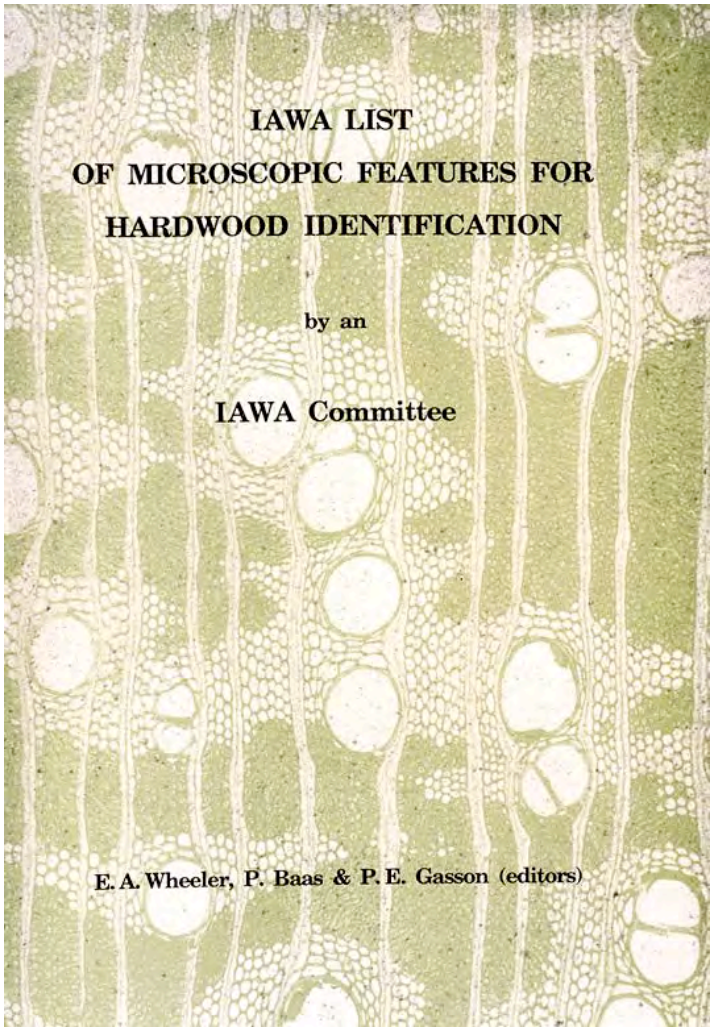


Order form at
International Association of Wood Anatomists Web Site

http://bio.kuleuven.be/sys/iawa

IAWA Hardwood Feature List

Definitions and Illustrations

Features 75-95. Axial Parenchyma

Numbered photographs from:
IAWA Committee. 1989. IAWA List of Microscopic Features for Hardwood Identification. IAWA Bulletin n.s. 10(3): 219-332.

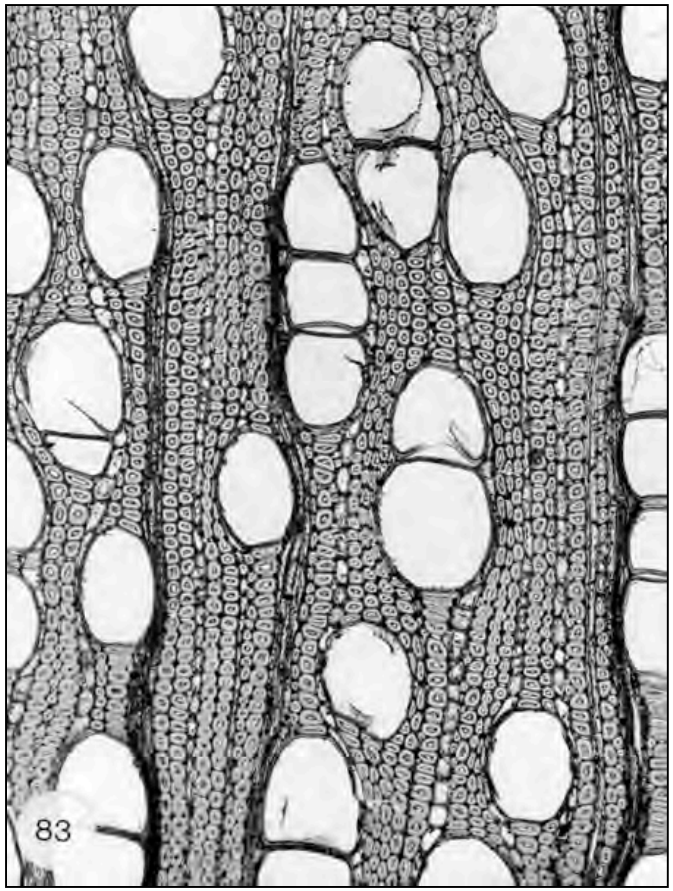
Photographs without numbers are associated with the InsideWood website hosted by N.C. State University Libraries.
http://insidewood.lib.ncsu.edu/search

Slide Set Assembled by E.A.Wheeler

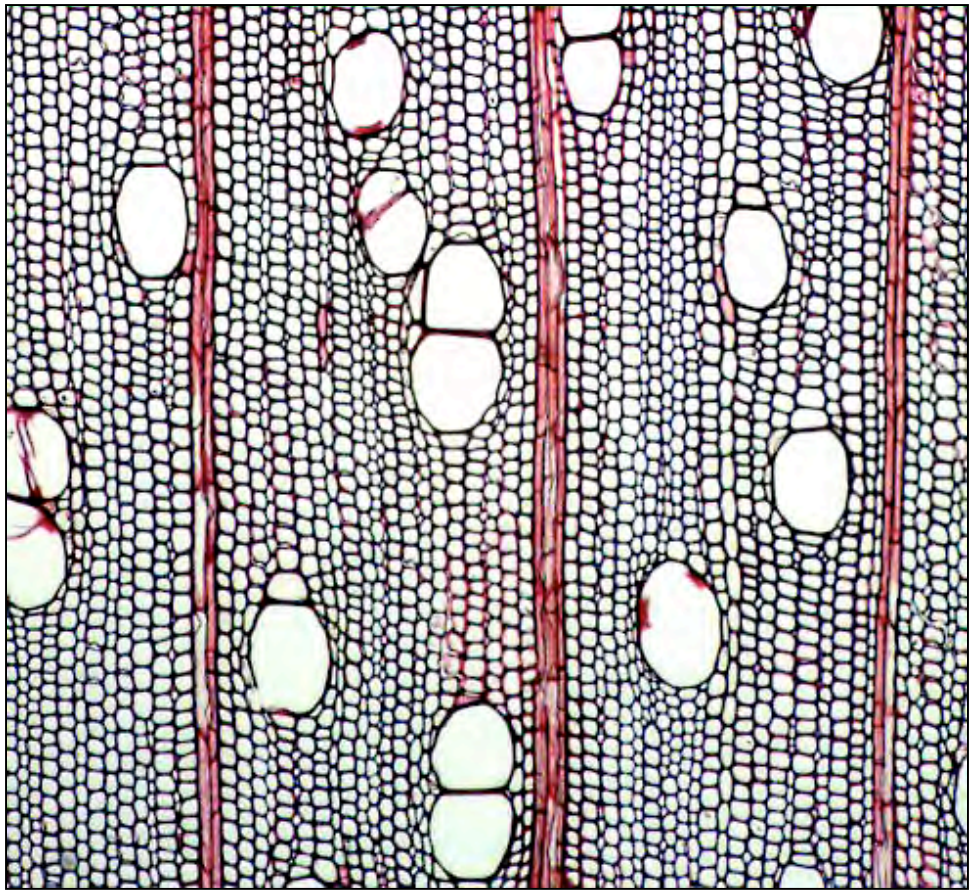
AXIAL PARENCHYMA

Comment: Various combinations of the three general types (Apotracheal, Paratracheal, and Banded) [descriptions follow] may be present in a given wood.

Feature 75. Axial parenchyma absent or extremely rare



Homalium foetidum (Salicaceae)
K. Ogata

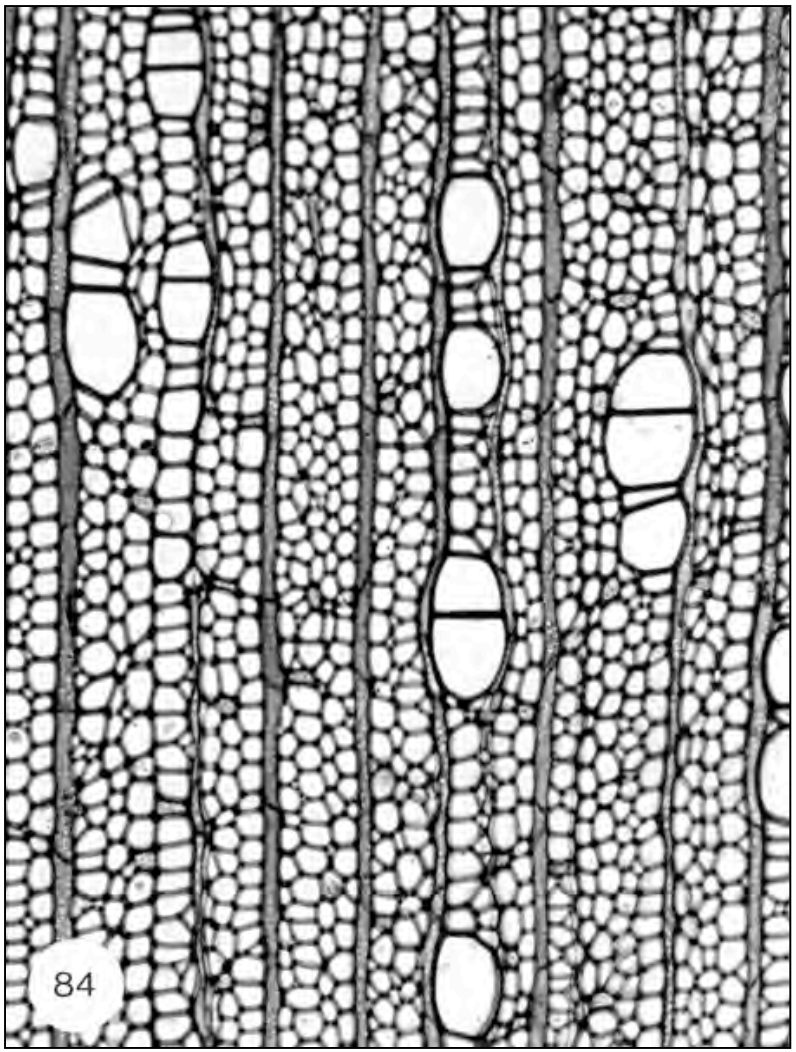


Schefflera morotoni: (Araliaceae) M.E. Bakker

APOTRACHEAL AXIAL PARENCHYMYA

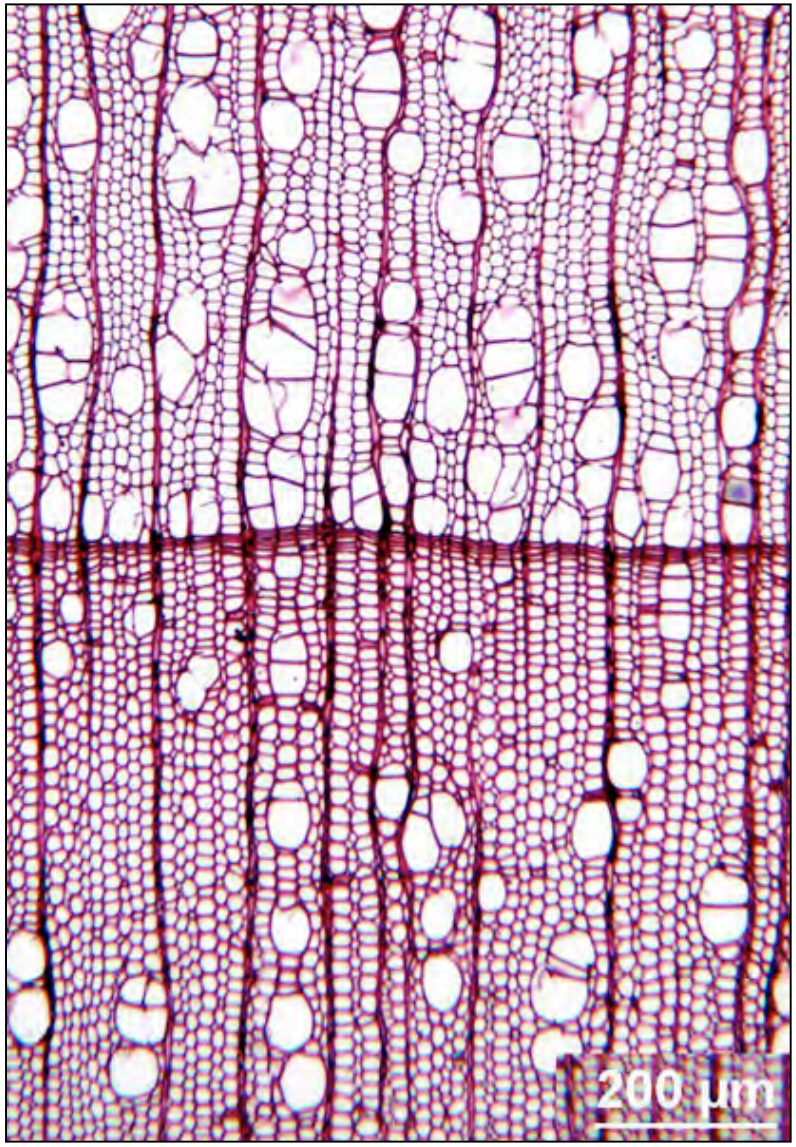
Apotracheal axial parenchyma = axial parenchyma not associated with the vessels.

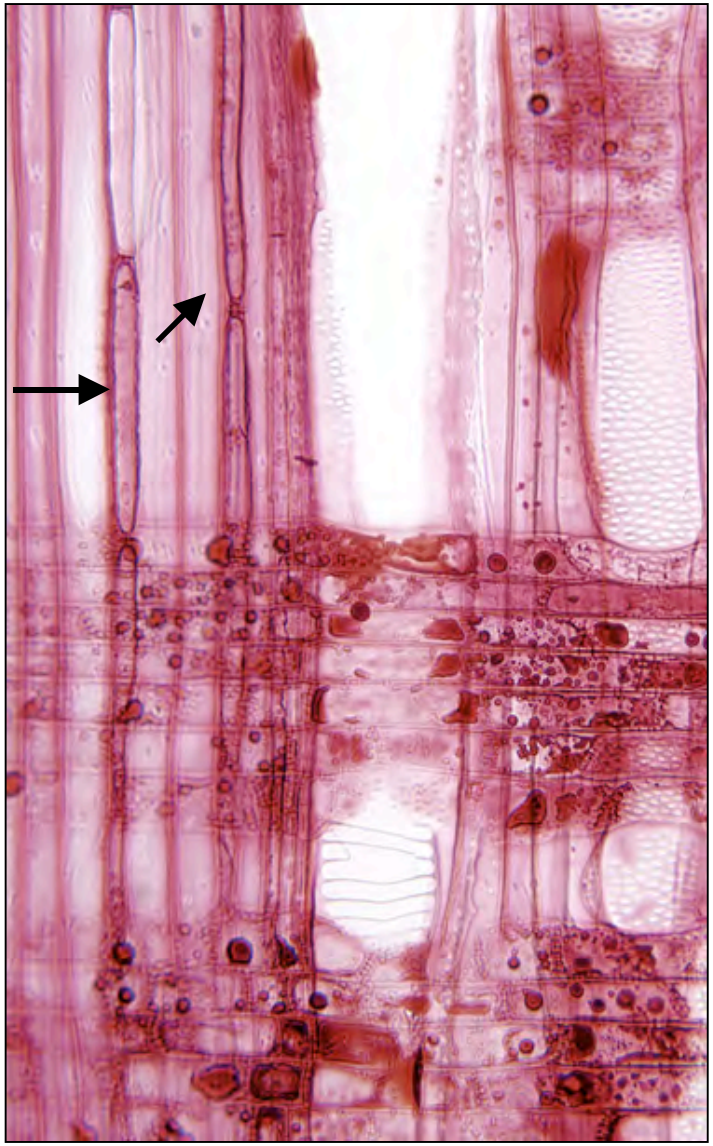
Feature 76. Axial parenchyma diffuse = single parenchyma strands or pairs of strands distributed irregularly among the fibrous elements of the wood.



Alnus glutinosa (Betulaceae)
P.E. Gasson

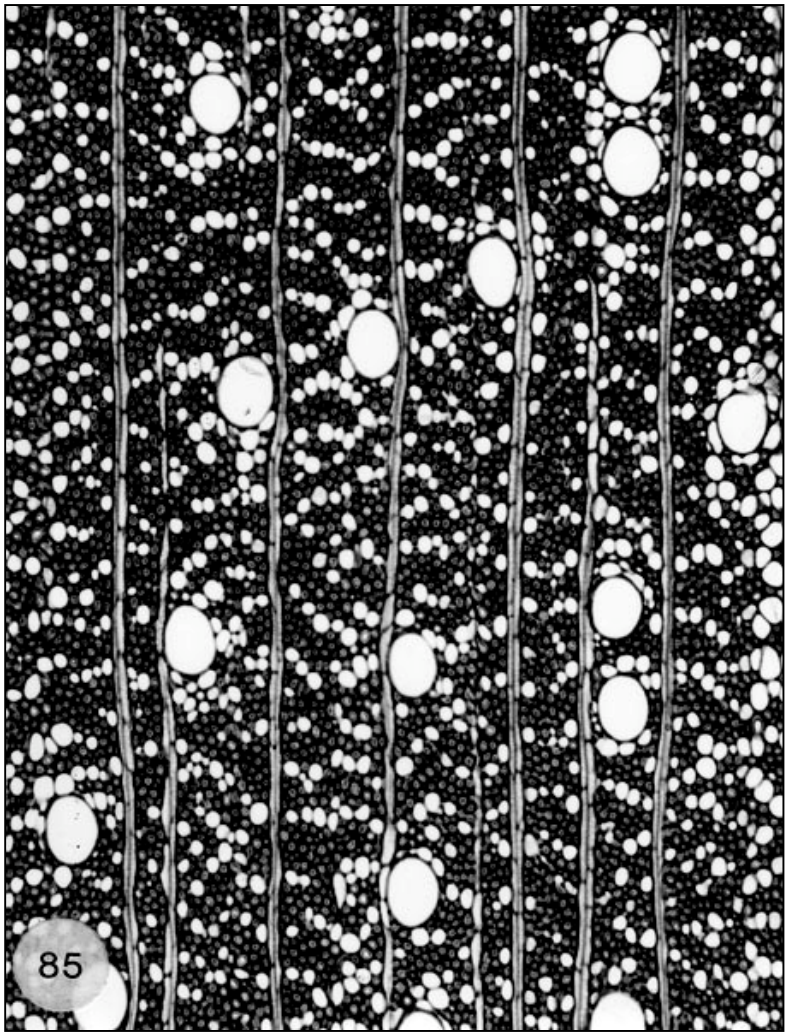
Feature 76. Axial parenchyma diffuse



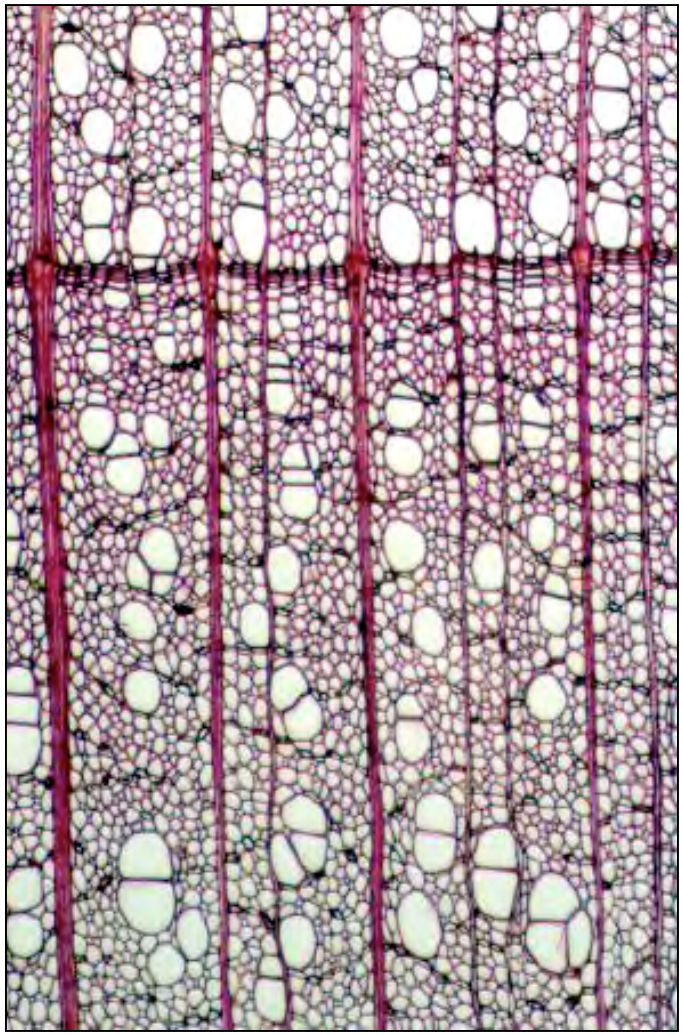


Alnus tenuifolia: (Betulaceae). Arrows point to axial parenchyma strands in radial section.
E.A. Wheeler

Feature 77. Axial parenchyma diffuse-in-aggregates = parenchyma strands grouped into short discontinuous tangential or oblique lines.



Agonandra brasiliensis (Opiliaceae)
P.E. Gasson

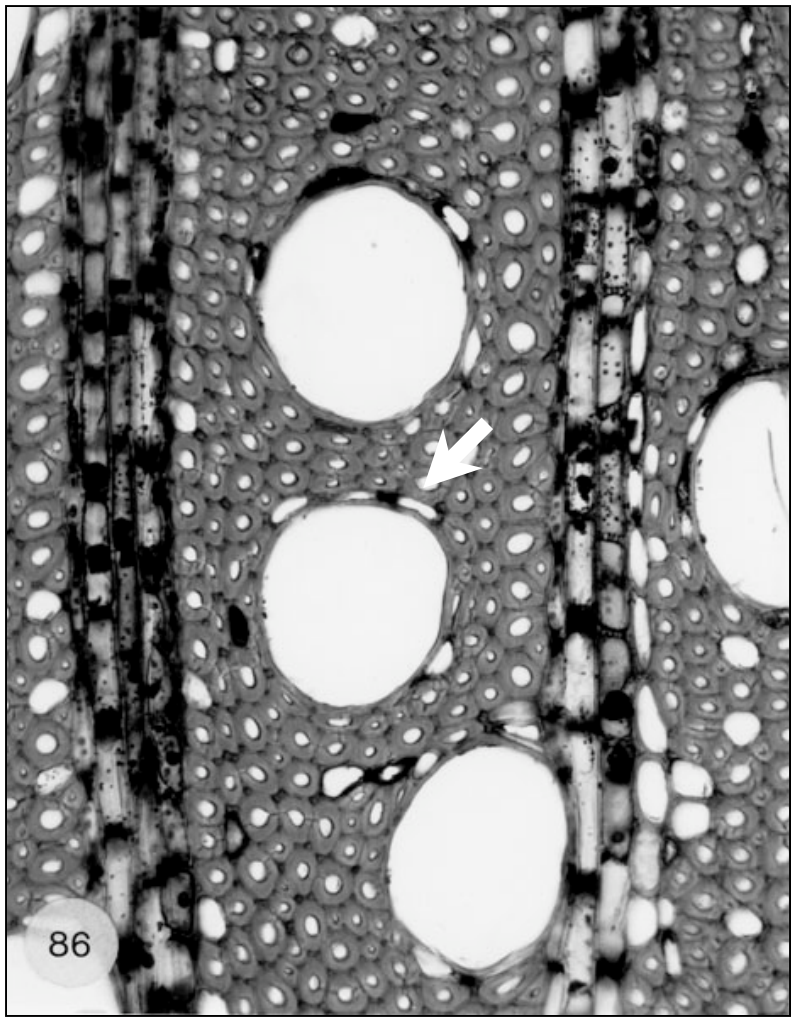


Tilia vulgaris (Tiliaceae)
M.E. Bakker

PARATRACHEAL AXIAL PARENCHYMYA

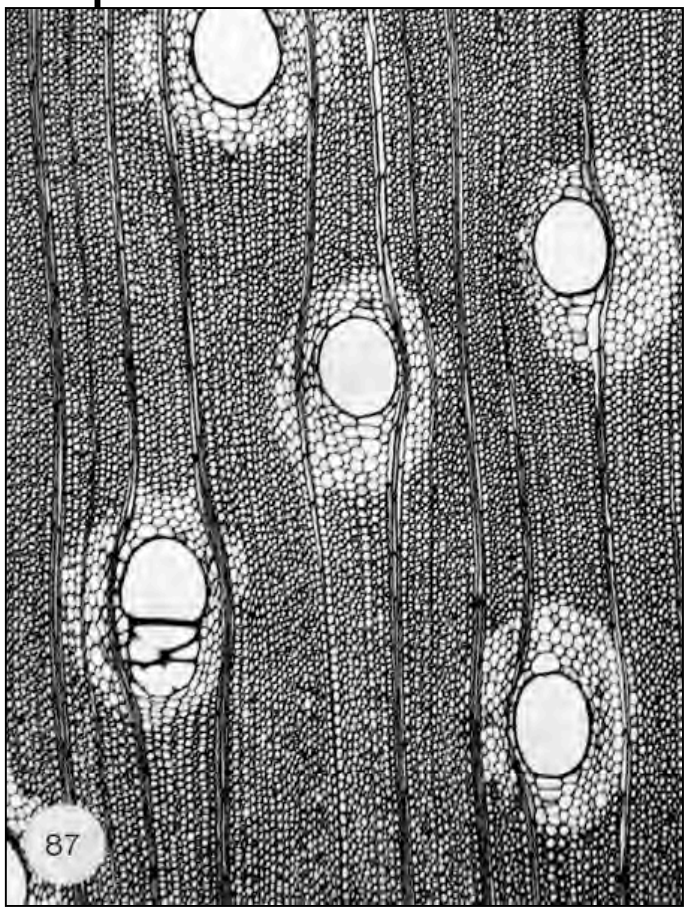
Paratracheal axial parenchyma = axial parenchyma associated with the vessels or vascular tracheids.

Feature 78. Axial parenchyma scanty paratracheal = occasional parenchyma cells associated with the vessels or an incomplete sheath of parenchyma around the vessels.

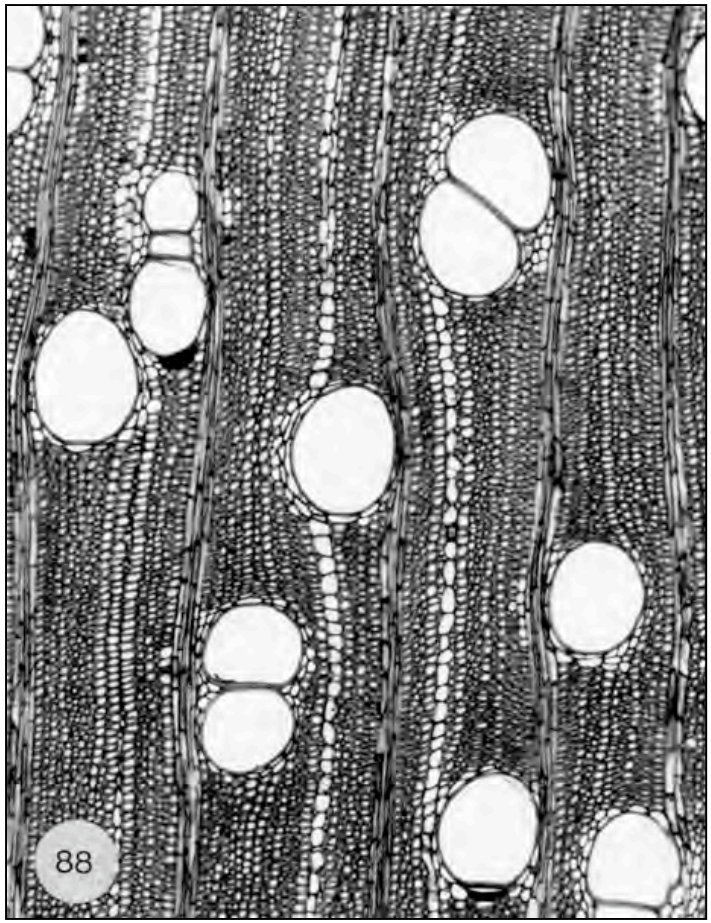


Agonandra brasiliensis (Opiliaceae)
P.E. Gasson.
Scanty paratracheal (arrow);
scanty diffuse axial parenchyma also present.

Feature 79. **Axial parenchyma vasicentric** = parenchyma cells forming a complete sheath of parenchyma around a solitary vessel or vessel multiple.



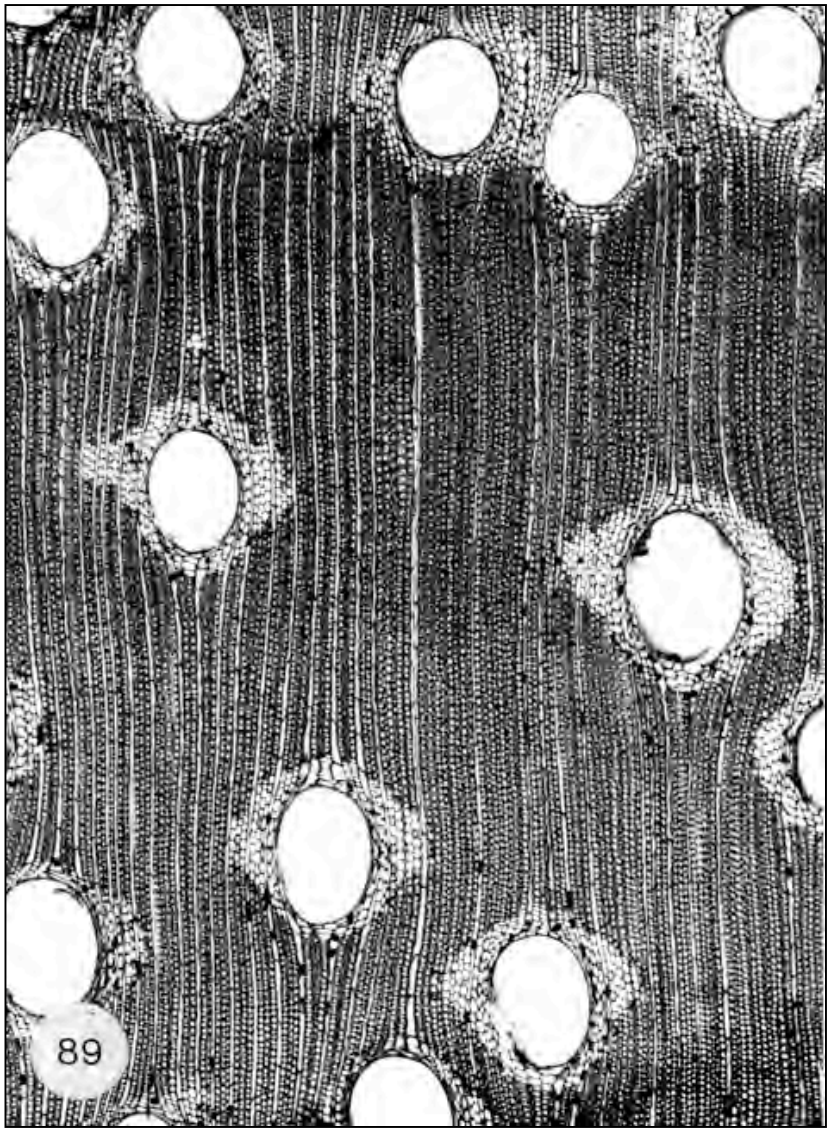
Piptadeniastrum africanum
(Leguminosae - Mimosoideae)
Parenchyma sheath broad
P.E. Gasson



Khaya grandifoliola (Meliaceae)
Parenchyma sheath narrow
P.E. Gasson

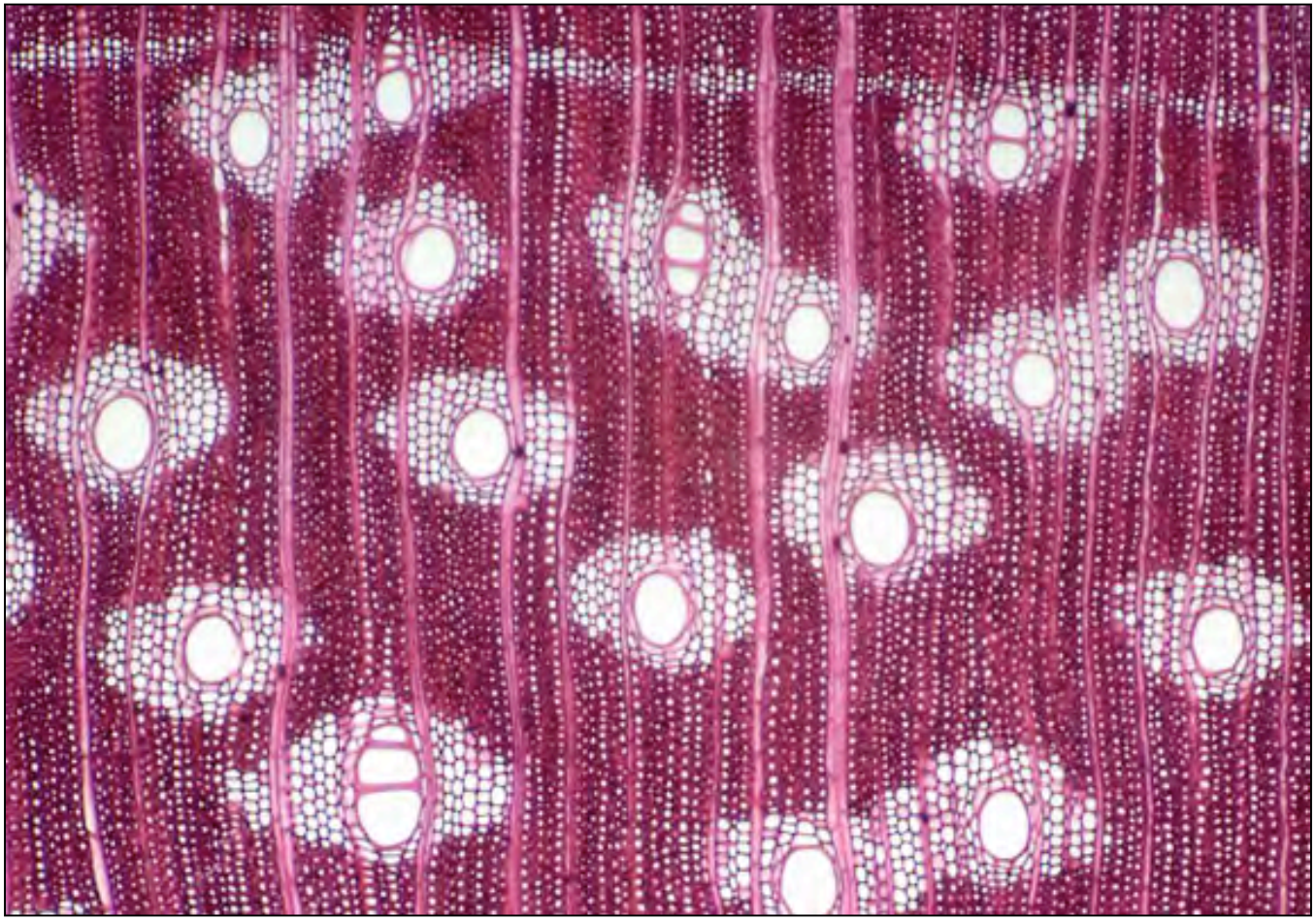
Feature 80. Axial parenchyma aliform = parenchyma cells surrounding or to one side of the vessel and with lateral extensions.

Feature 81. Axial parenchyma lozenge-aliform = parenchyma cells surrounding or to one side of the vessel and with lateral forming a diamond-shaped outline



Microberlinia brazzavillenis
(Leguminosae - Caesalpinioideae)
P.E. Gasson

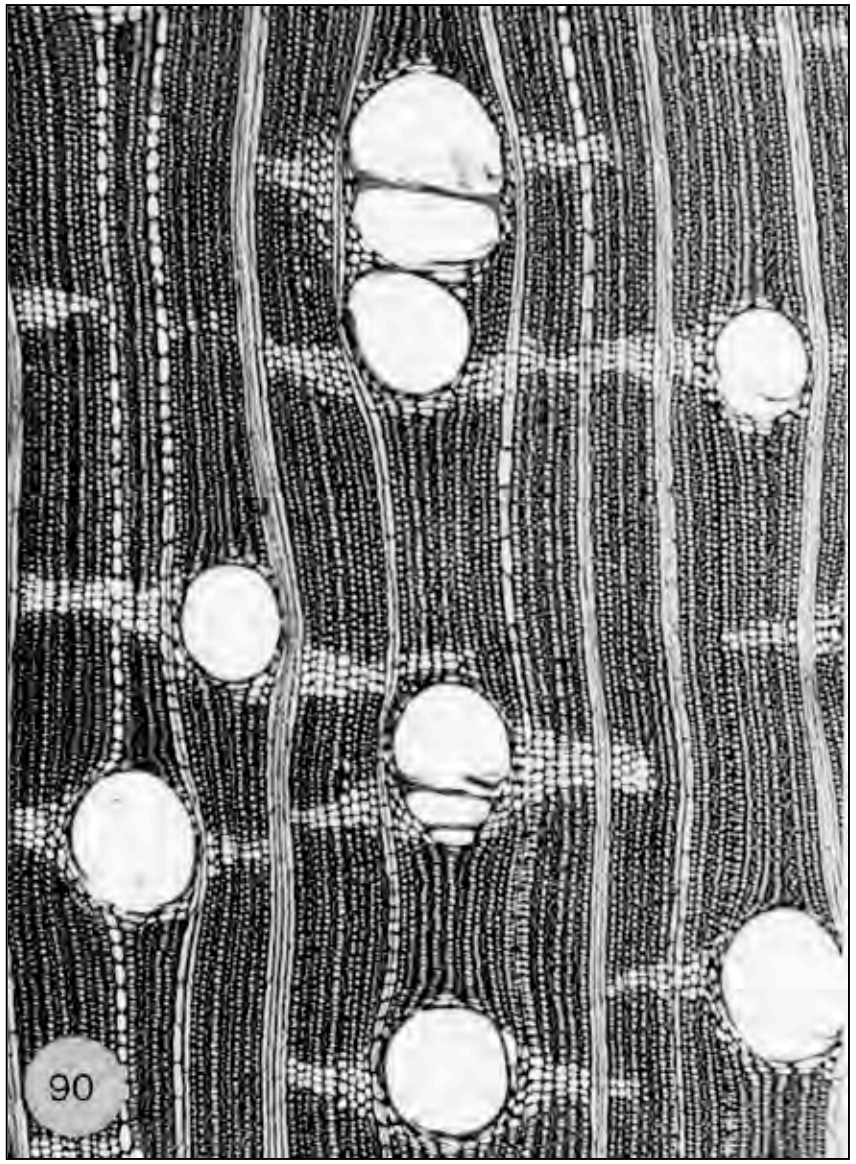
Feature 81. Axial parenchyma lozenge-aliform



Tamarindus indica (Leguminosae-Caesalpinioidea) M.E. Bakker

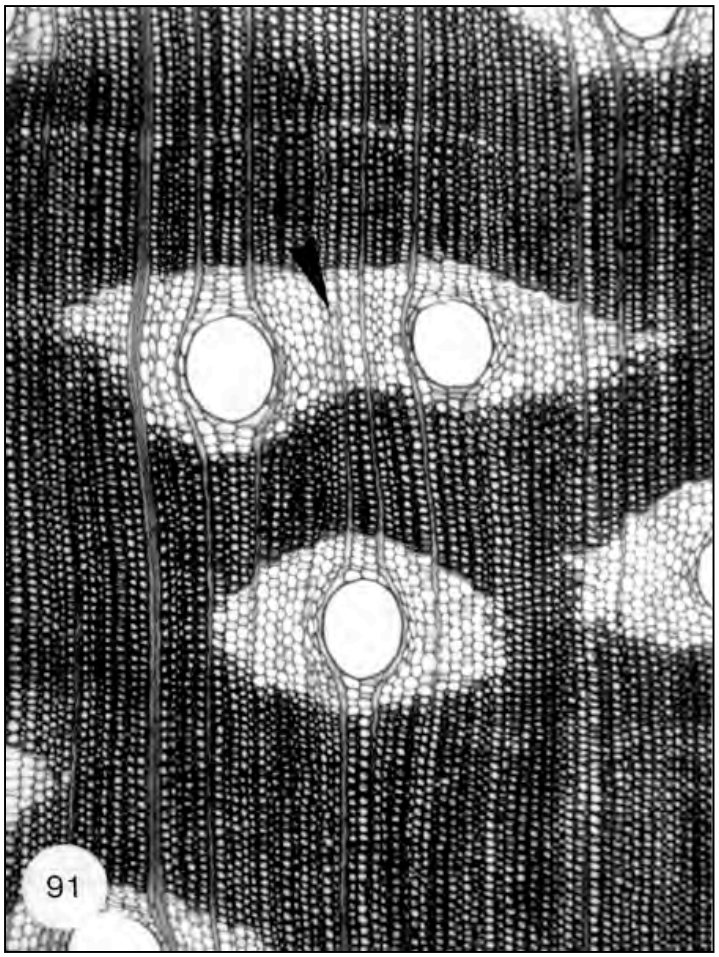
Feature 80. Axial parenchyma aliform = parenchyma cells surrounding or to one side of the vessel and with lateral extensions.

Feature 82. Axial parenchyma winged - aliform = parenchyma cells surrounding or to one side of the vessel and with lateral extensions being elongated and narrow

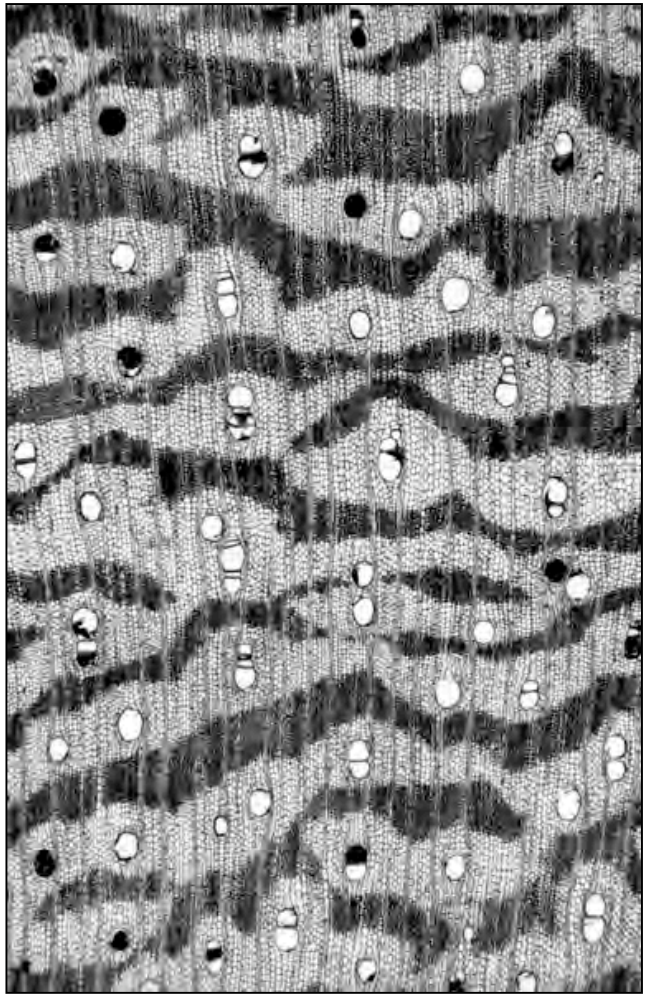


Brosiumum rubescens (Moraceae)
P.E. Gasson

Feature 83. **Axial parenchyma confluent** = coalescing vasicentric or aliform parenchyma surrounding or to one side of two or more vessels, and often forming irregular bands.

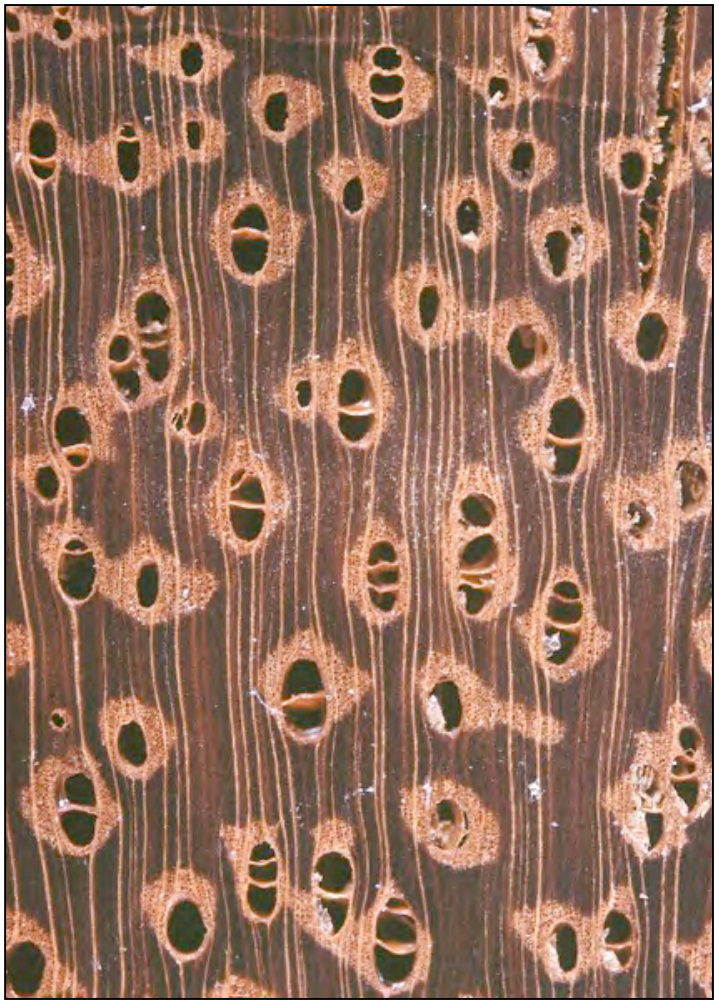


Parkia pendula (Leguminosae - Mimosoideae)
P.E. Gasson
Lozenge-aliform parenchyma also present

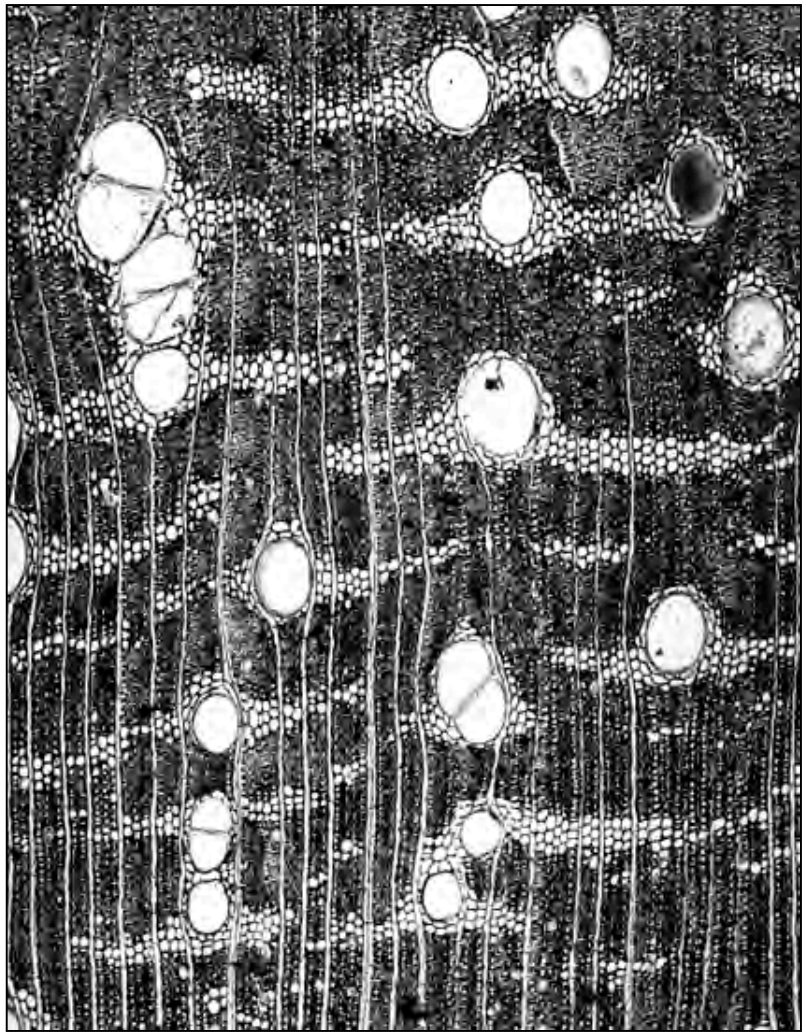


Ormosia excelsa: P.E. Gasson

Some woods have vasicentric, aliform, and confluent paratracheal parenchyma. [Aliform and confluent often co-occur]

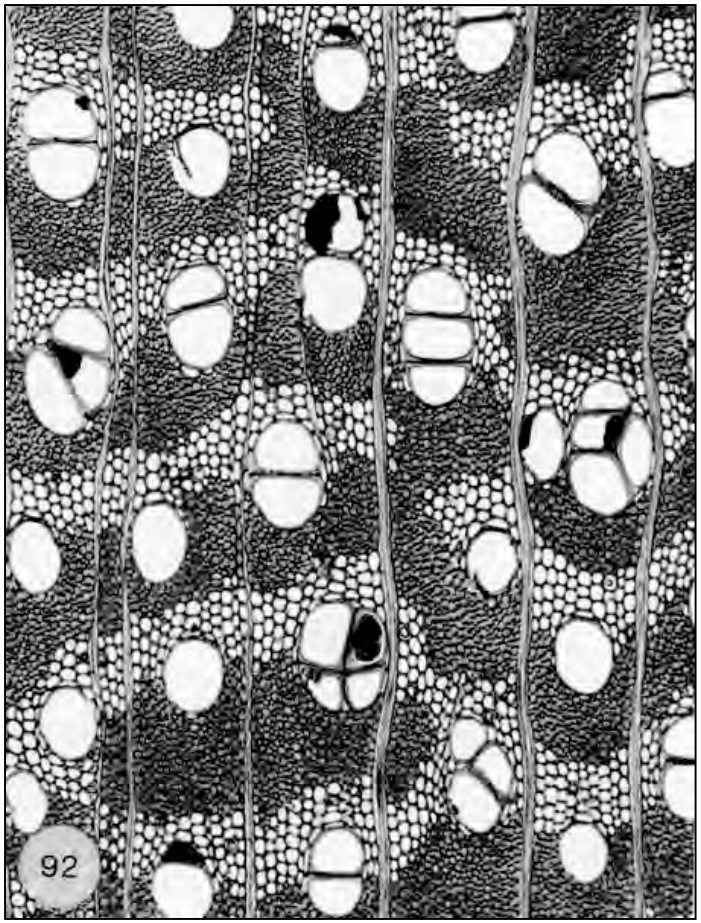


Vasicentric with broad sheath, aliform, and occasional confluent parenchyma *Cassia fastuosa.* L.Y.T. Westra (Leguminosae - Caesalpinioideae)

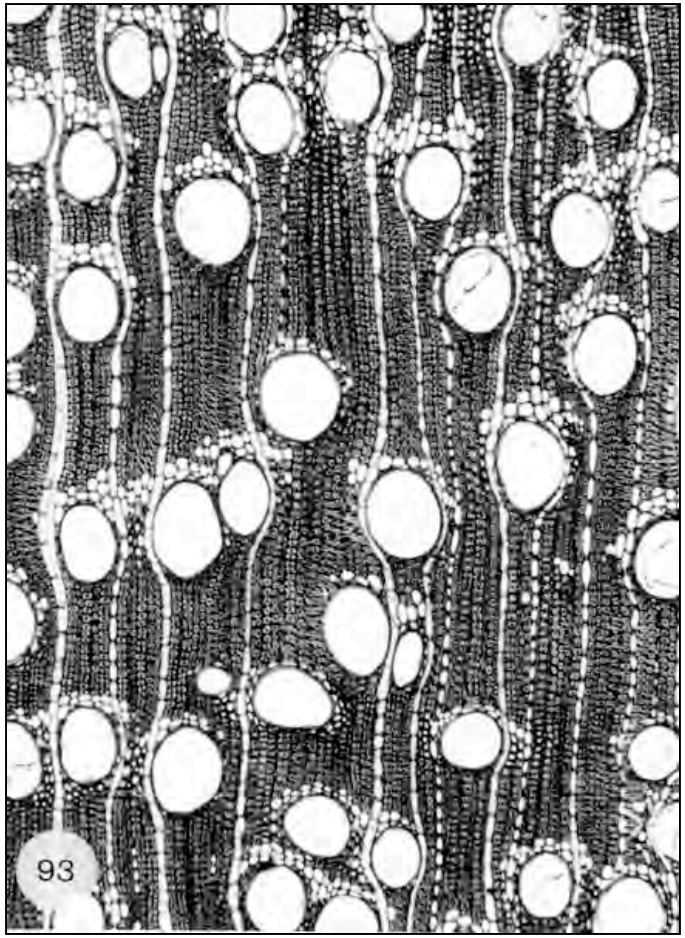


Winged-aliform and confluent parenchyma; diffuse parenchyma also present *Pterocarpus erinaceous.* (Leguminosae - Papilionoideae) RMCA,Tervuren,Belgium

Feature 84. **Axial parenchyma unilateral paratracheal** = paratracheal parenchyma forming semi-circular hoods or caps only on one side of the vessels and which can extend tangentially or obliquely in an aliform or confluent or banded pattern.

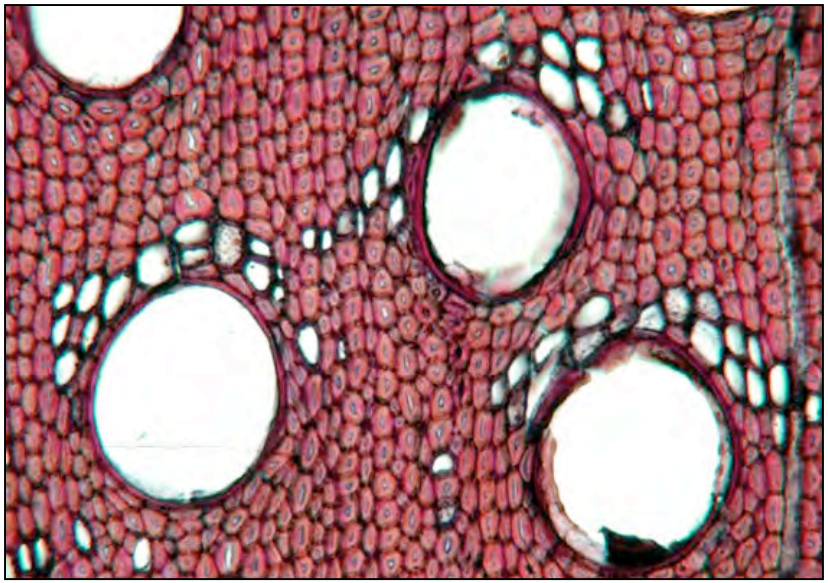


Peltogyne confertiflora P.E. Gasson
(Leguminosae - Caesalpinioideae)
Confluent also

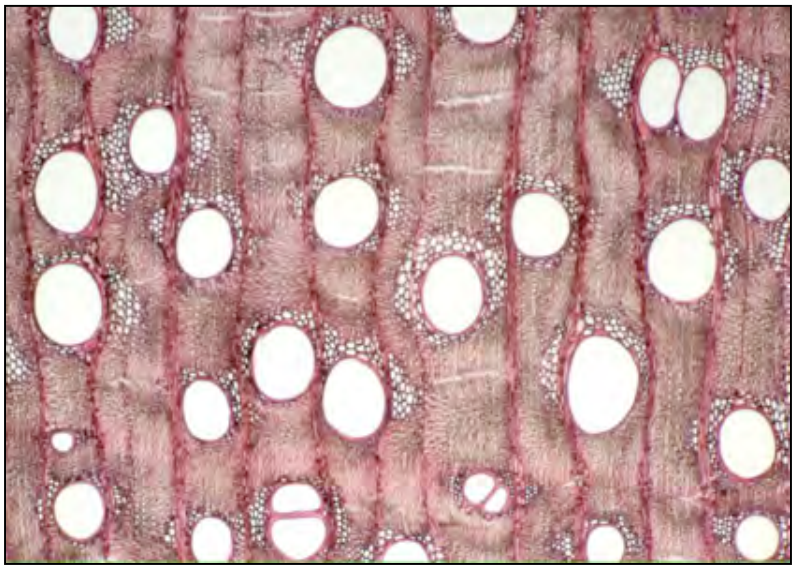


Caraipa grandiflora. P.E. Gasson
(Clusiaceae)

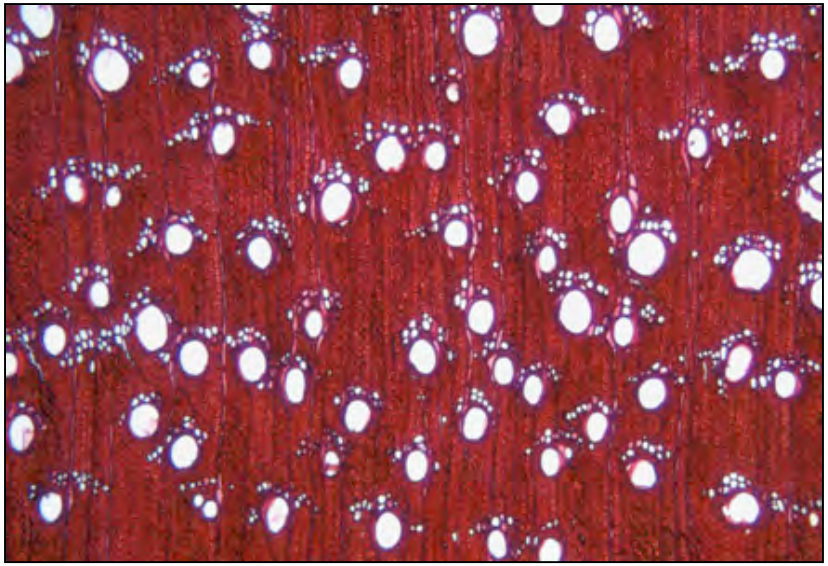
Feature 84. Axial parenchyma unilateral paratracheal



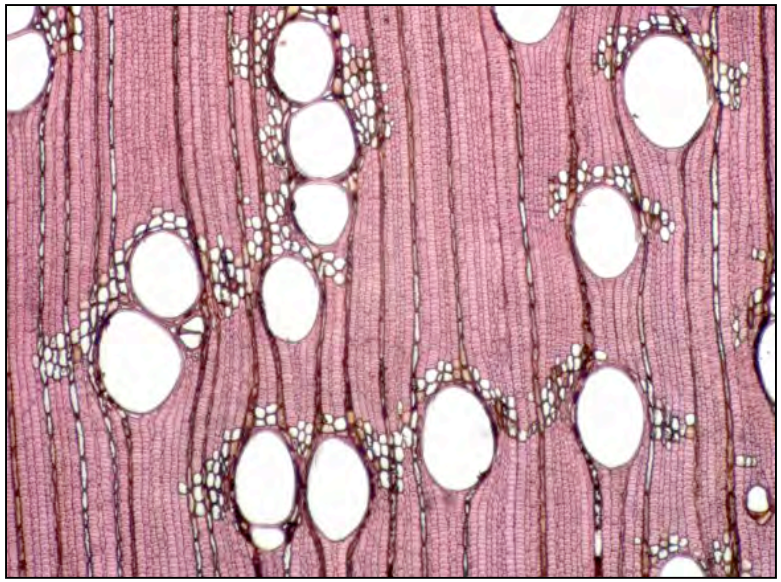
Asteropeia micraster: R.B.Miller (Asteropeiaceae)



Anadenanthera peregrina: Els Bakker (Leguminosae-Mimosoideae)



Asteropeia micraster: R.B.Miller

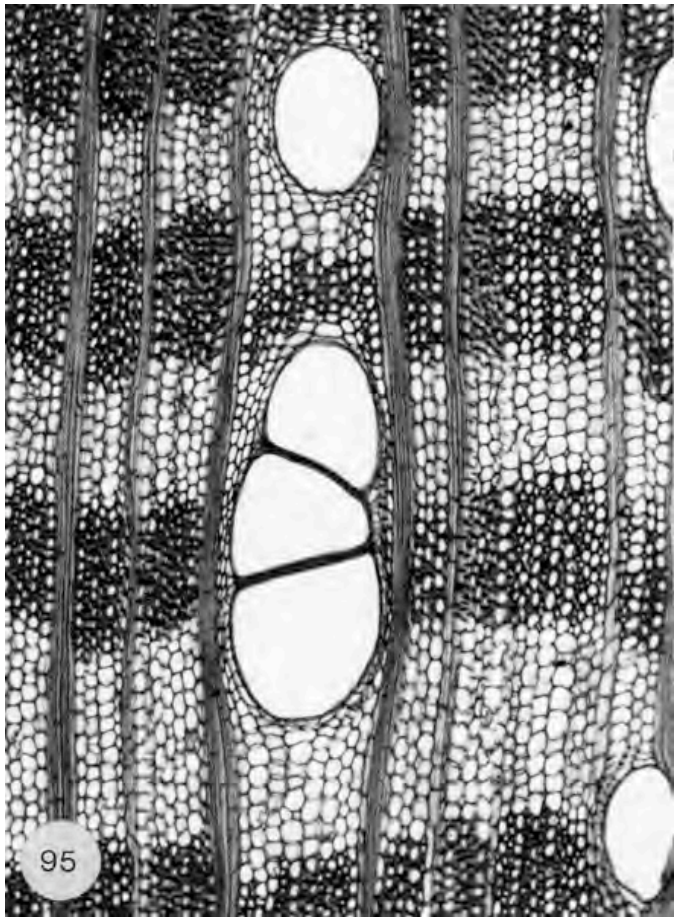


Haploclathra verticillata: Els Bakker (Clusiaceae)

BANDED PARENCHYMA

Comments: Parenchyma bands may be mainly independent of the vessels (apotracheal), definitely associated with the vessels (paratracheal) or both. Bands may be wavy, diagonal, straight, continuous, or discontinuous.

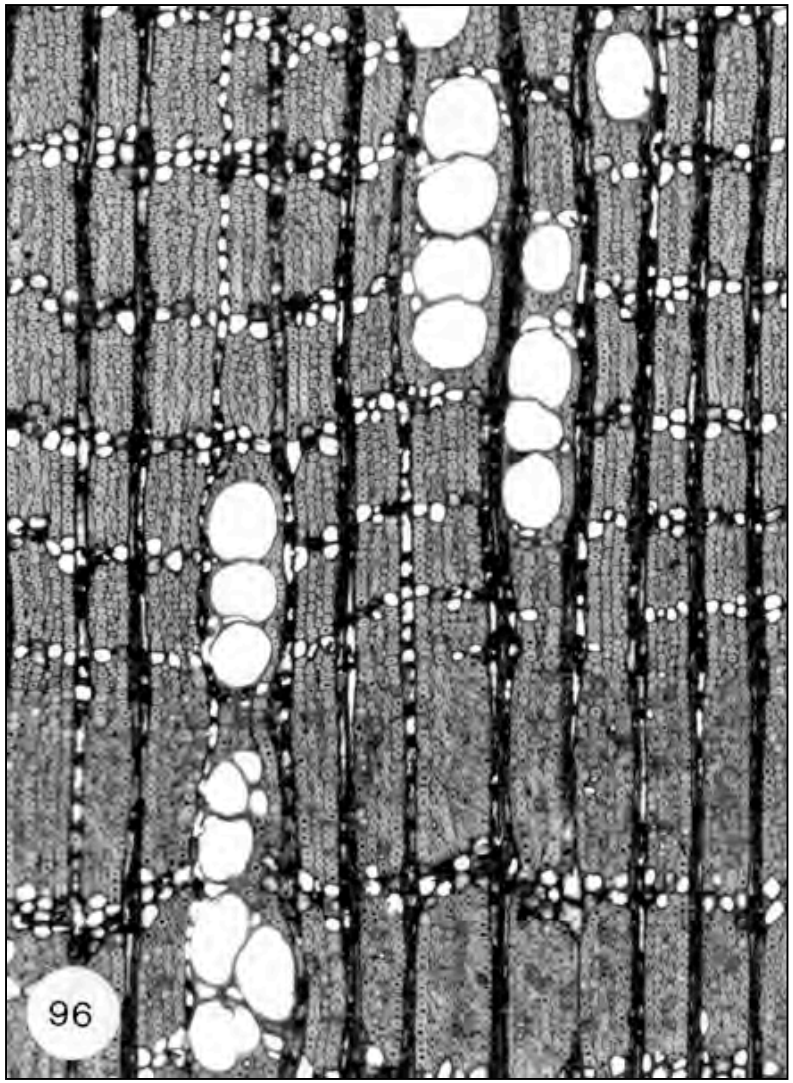
Feature 85. Axial parenchyma bands more than three cells wide



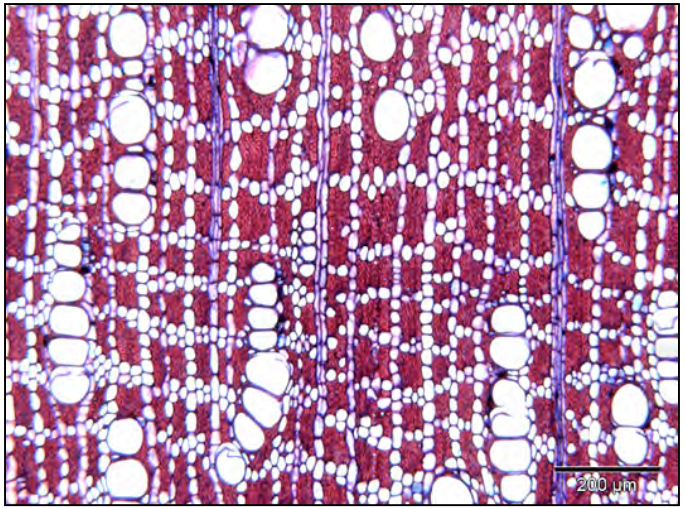
Ficus retusa (Moraceae) P.E. Gasson

Pongamia pinnata (Leguminosae-Papilionoideae)
FFPRI, Tsukuba, Japan

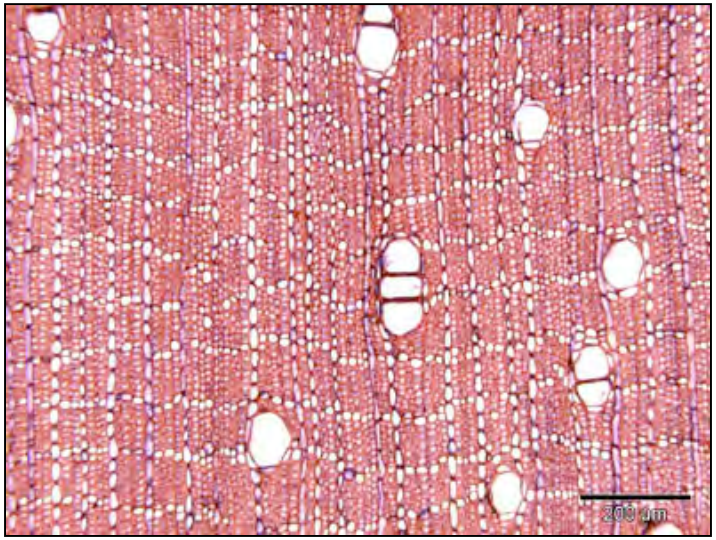
Feature 86. Axial parenchyma in narrow bands or lines up to three cells wide



Autranella congolensis (Sapotaceae) P.E. Gasson

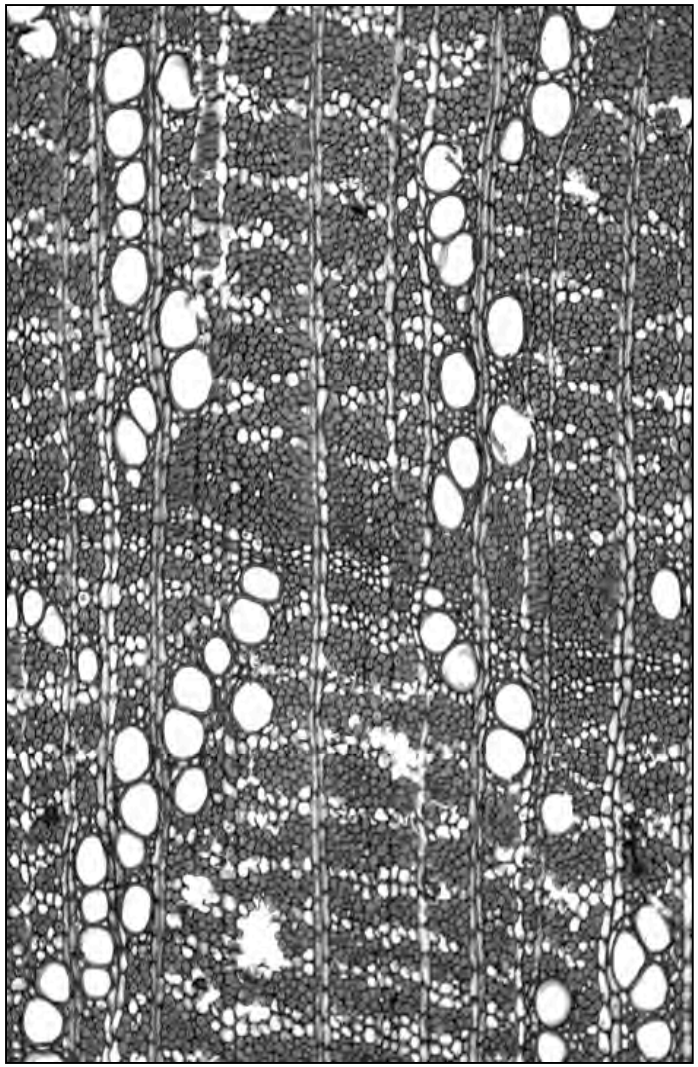


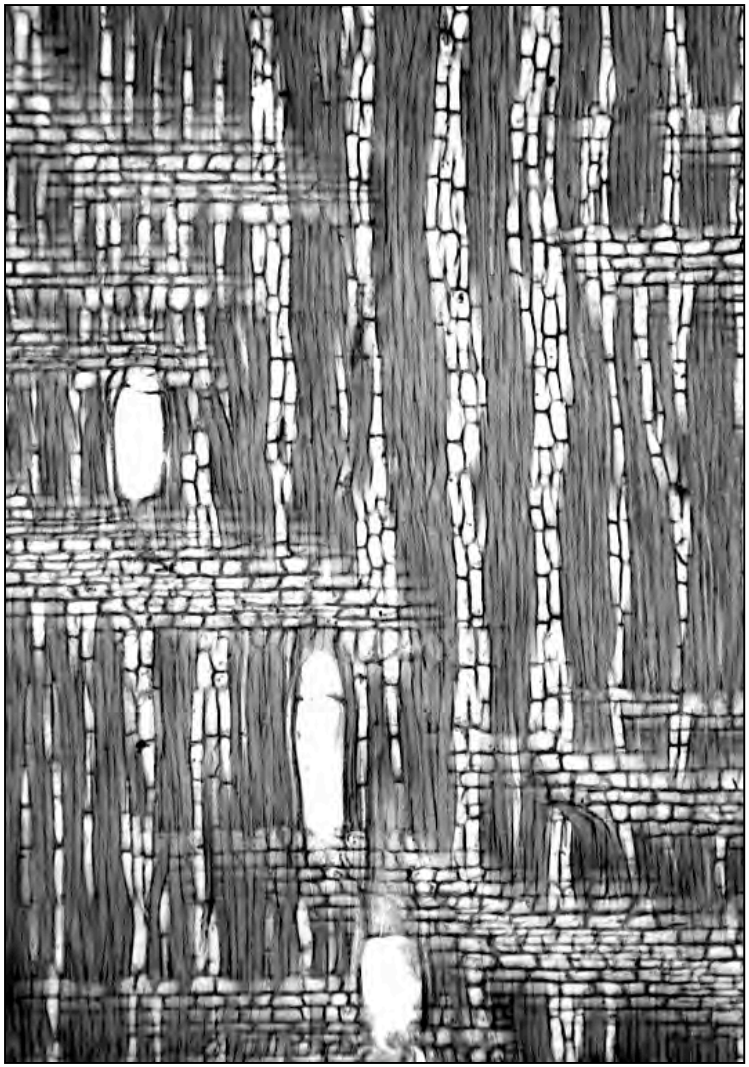
Mimusops schliebenii (Sapotaceae) F. Lens



Diospyros cooperi (Ebenaceae) F. Lens

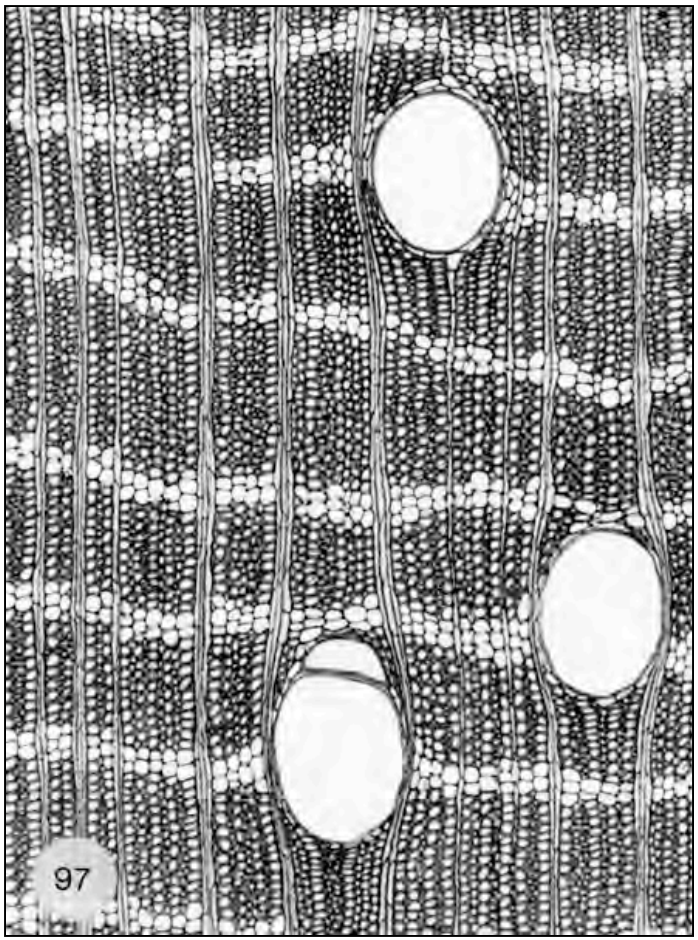
Feature 86. Axial parenchyma in narrow bands or lines up to three cells wide



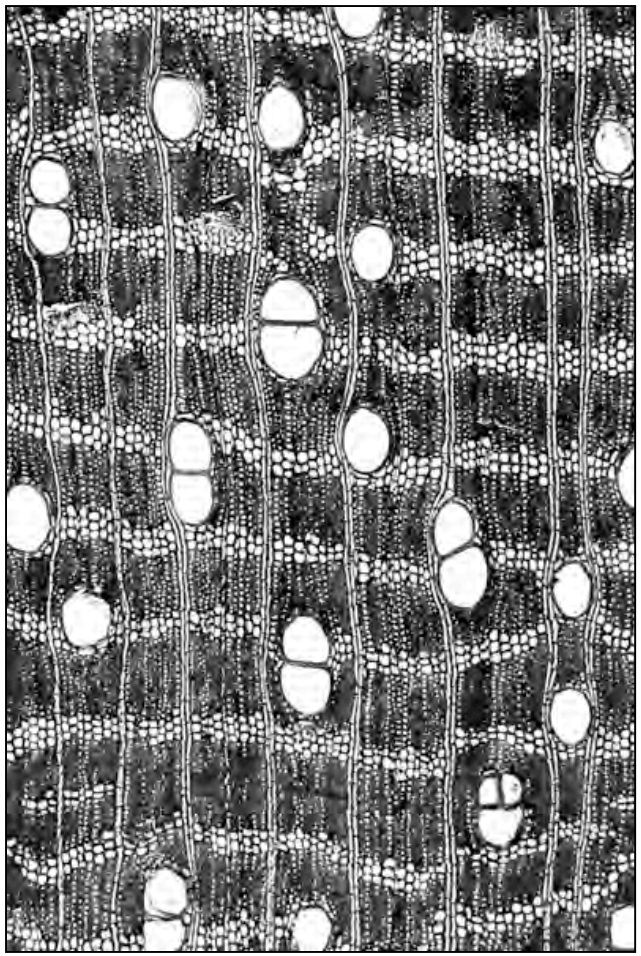


Olax subscorpioidea: S.M. Manchester (Olacaceae). Radial section shows strands of parenchyma bands

Feature 87. **Axial parenchyma reticulate** = parenchyma in continuous tangential lines of approximately the same width as the rays, *regularly* spaced and forming a network with them. The distance between the rays is approximately equal to the distance between the parenchyma bands.

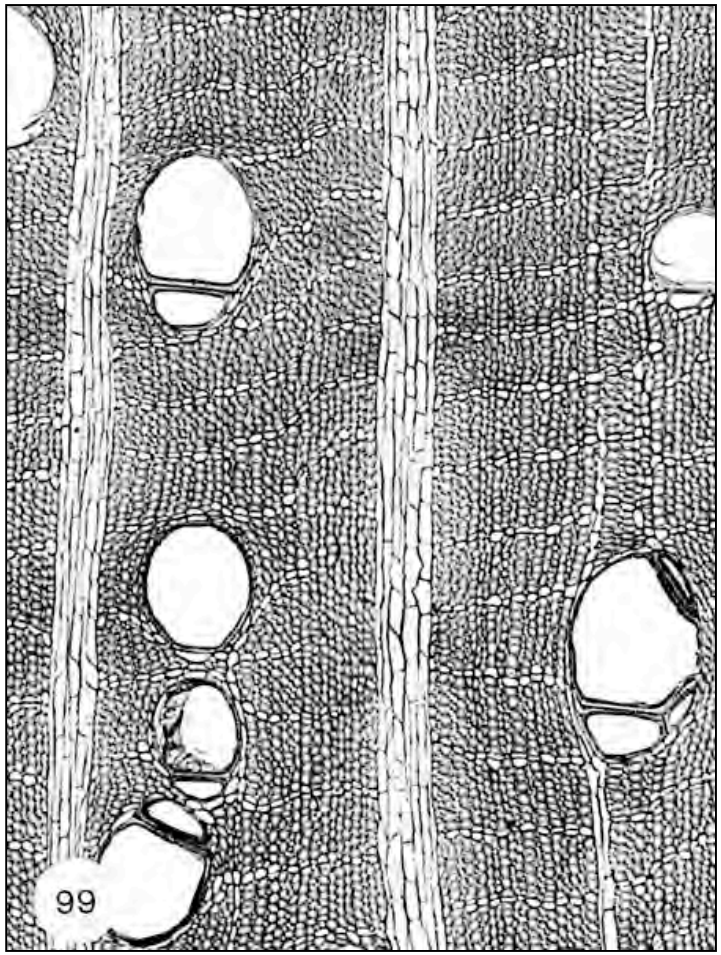


Bertholletia excelsa P.E. Gasson (Lecythidaceae) (note also feature 86 - parenchyma in narrow bands)

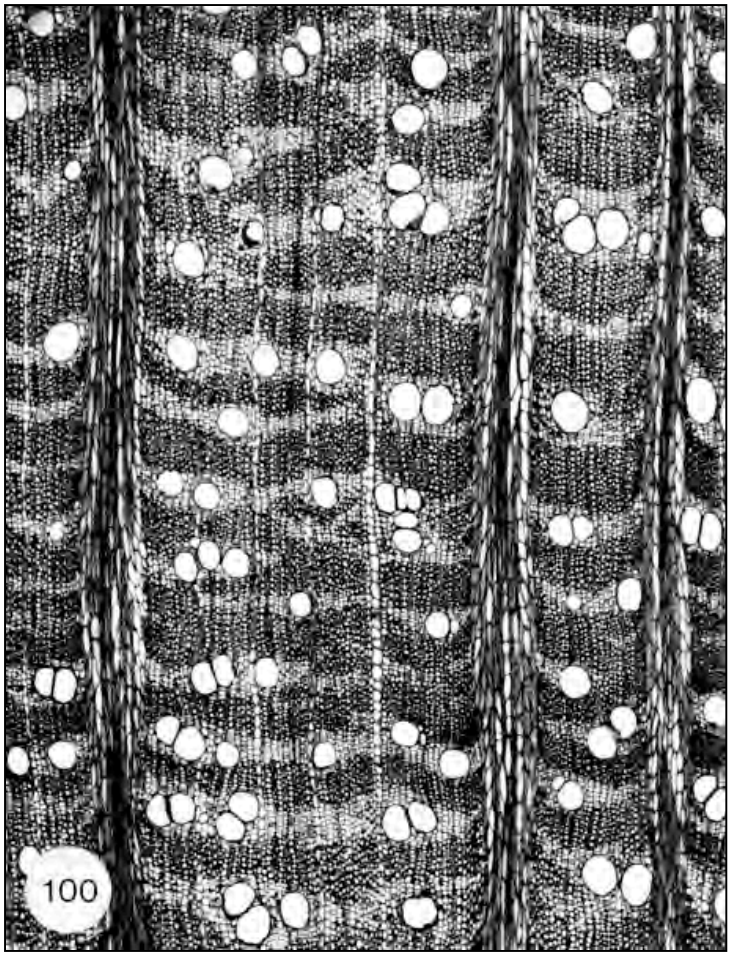


Guarea thompsonii. RMCA, Tervuren, Belgium (Meliaceae)

Feature 88. **Axial parenchyma scalariform** = parenchyma in fairly regularly spaced fine lines or bands, arranged horizontally or in arcs, appreciably narrower than the rays and with them producing a ladder-like appearance in cross section. The distance between the rays is greater than the distance between the parenchyma bands.



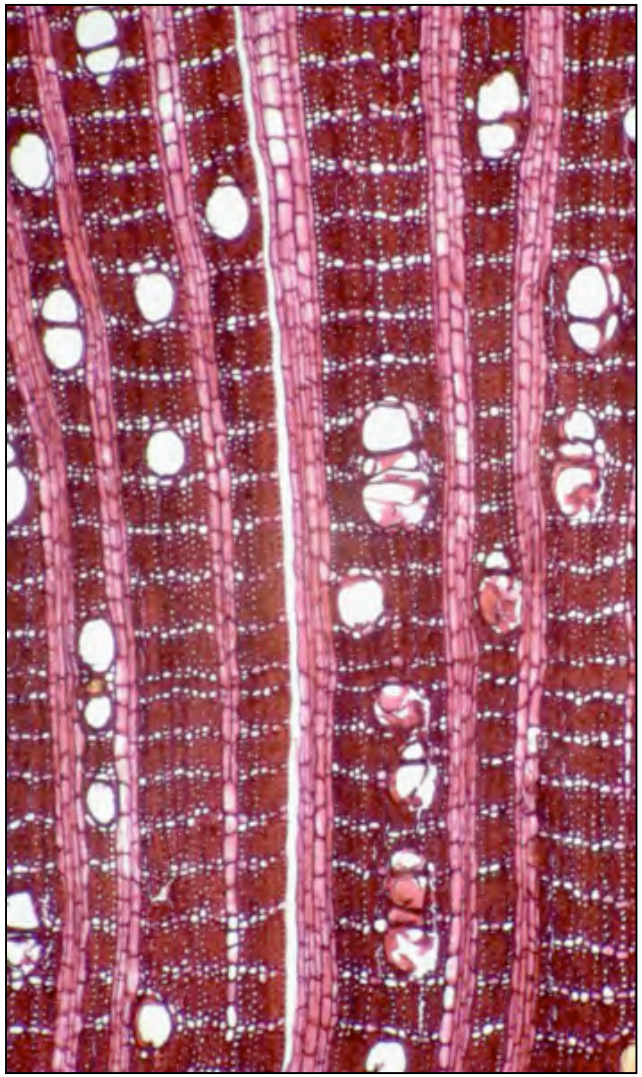
Onychopetalum sp. (Annonaceae) P.E. Gasson



Cardwellia sublimis (Proteaceae) E.A.Wheeler

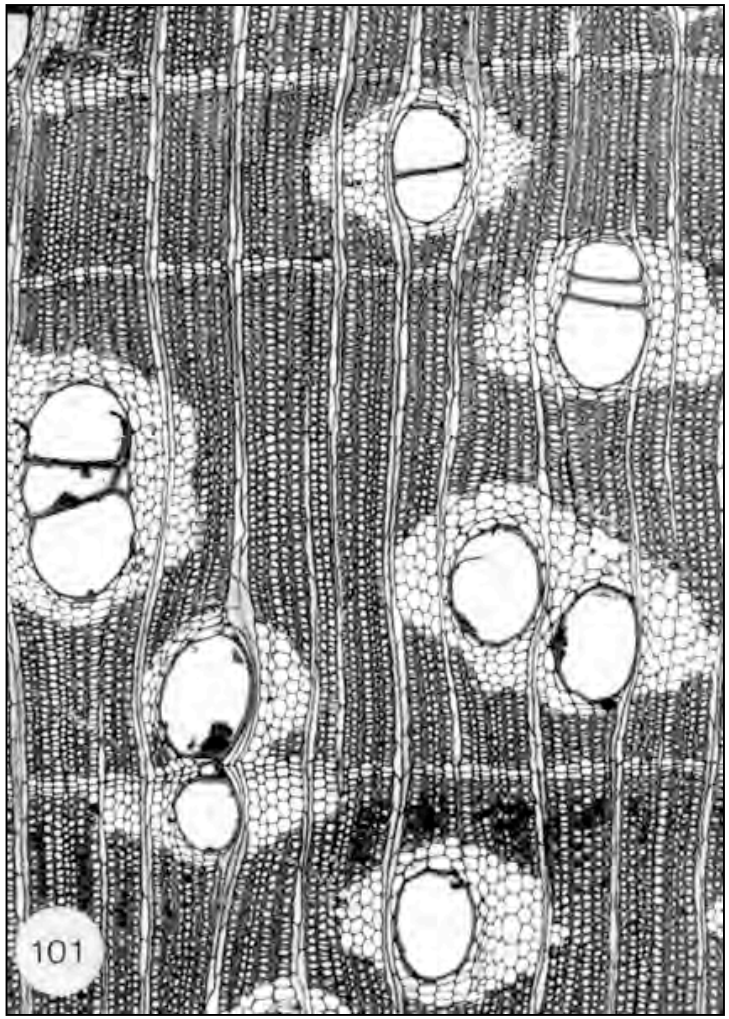
Feature 88. Axial parenchyma scalariform

Alphonsea arborea. L.Y.T. Westra
(Annonaceae)

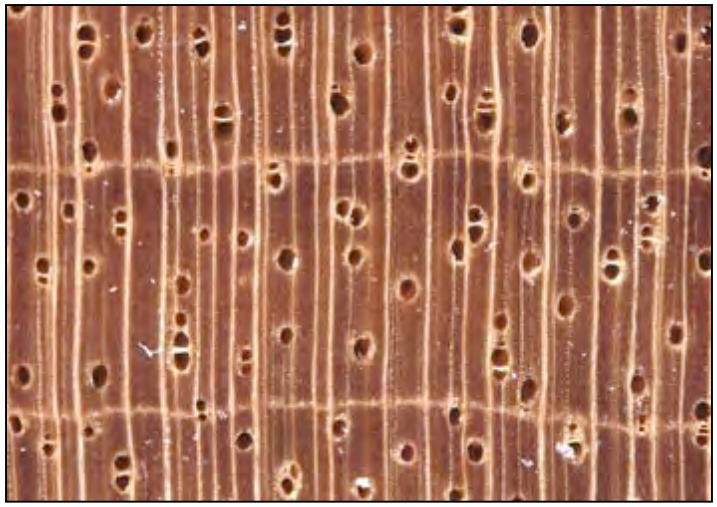


Alphonsea arborea. M.E. Bakker
(Annonaceae)

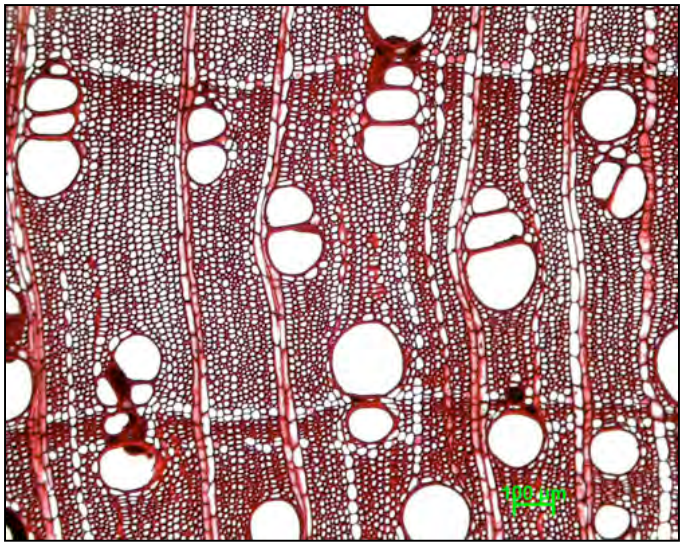
Feature 89. **Axial parenchyma in marginal or seemingly marginal bands** = parenchyma bands which form a more or less continuous layer of variable width at the margins of a growth ring or are irregularly zonate.



Intsia bijuga (Leguminosae-Caesalpinioideae)
K. Ogata

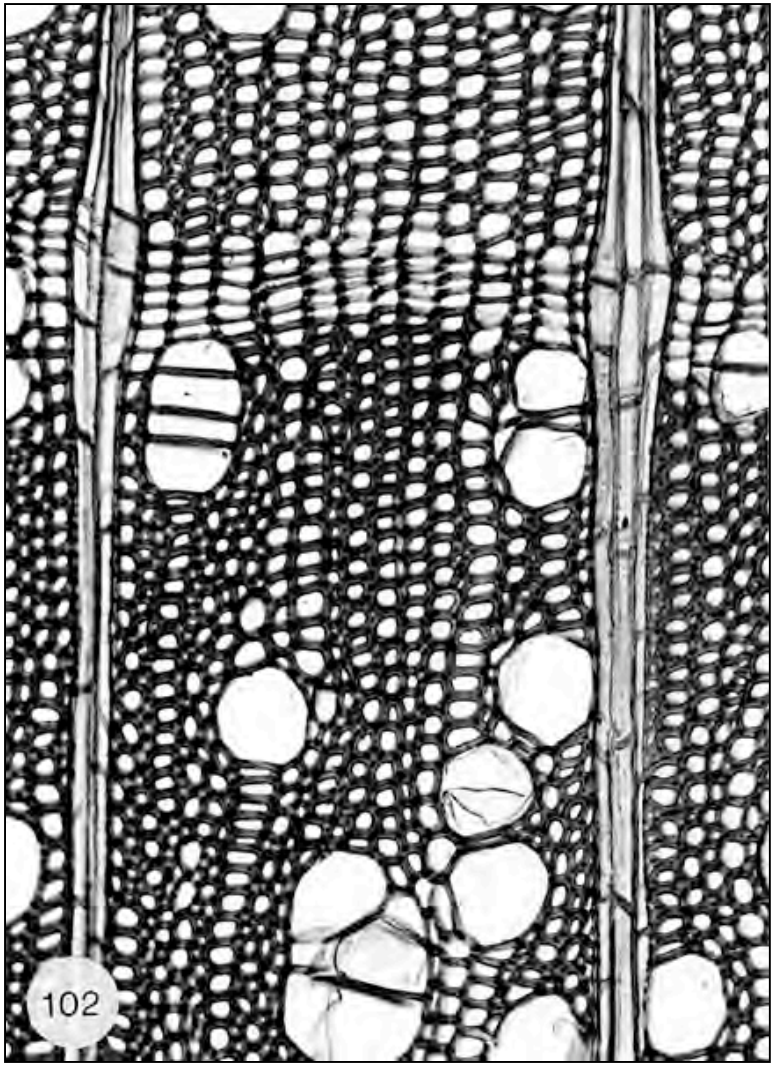


Beilschmiedia tawa: L.Y.T. Westra (Lauraceae)

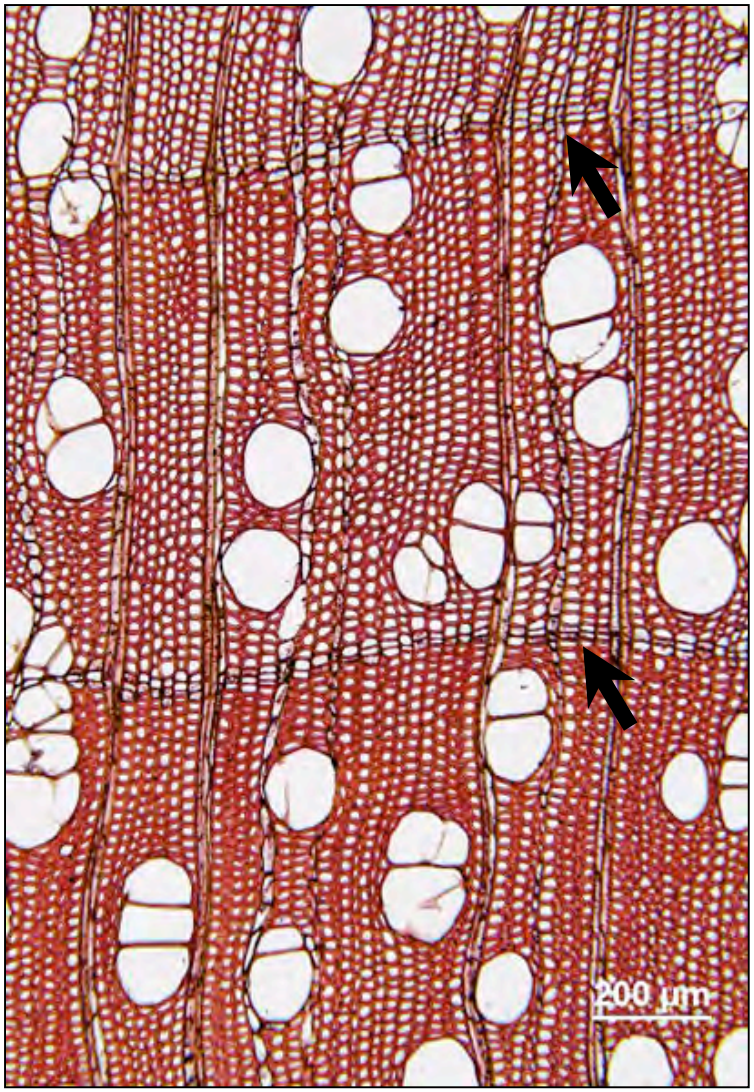


Swietenia mahogani: P.E. Gasson (Meliaceae)

Feature 89. Axial parenchyma in marginal or seemingly marginal bands



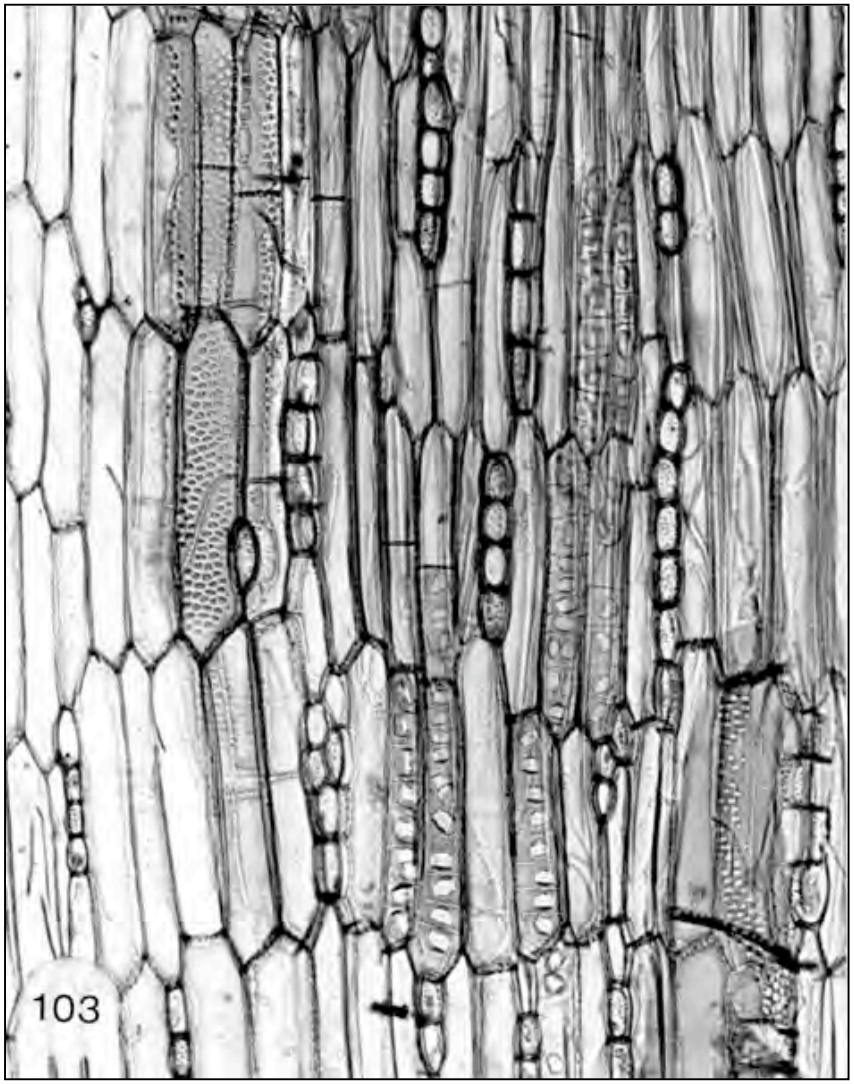
Michelia compressa (Magnoliaceae)
P.E. Gasson



Michelia scortechinii (Magnoliaceae)
E.A. Wheeler

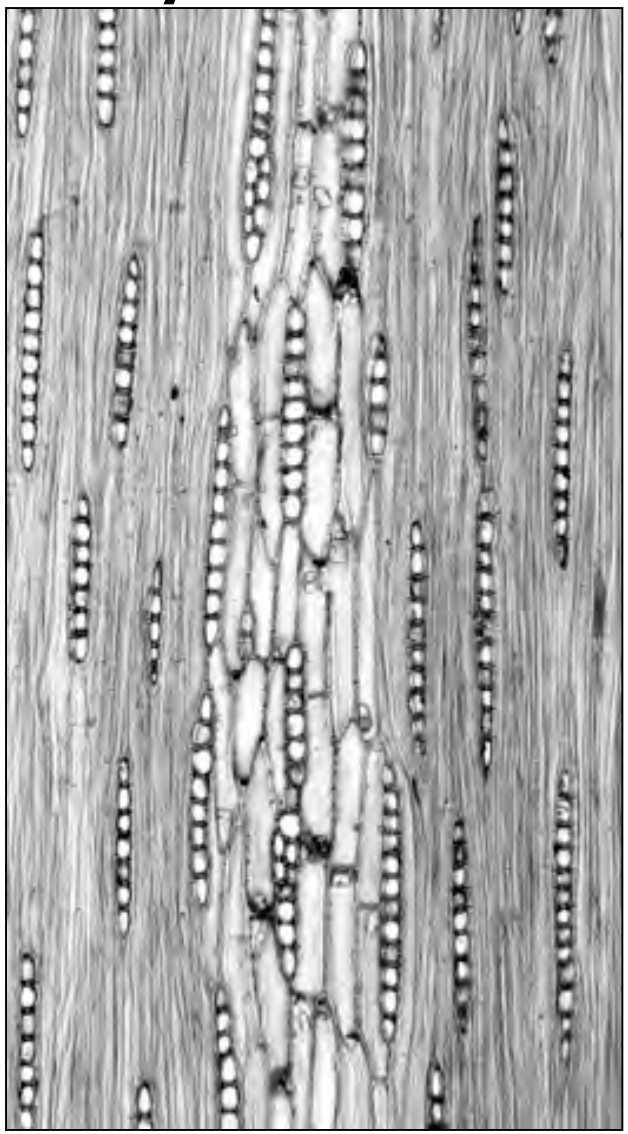
AXIAL PARENCHYMA CELL TYPE/STRAND LENGTH

Feature 90. Fusiform parenchyma cells = parenchyma cells derived from fusiform cambial initials without subdivisions or tip growth. In shape they resemble a short fiber.



Aeschynomene elaphroxylon
P.E. Gasson

Feature 91. Two cells per parenchyma strand



Amphitecna latifolia (Bignoniaceae)
P.E. Gasson

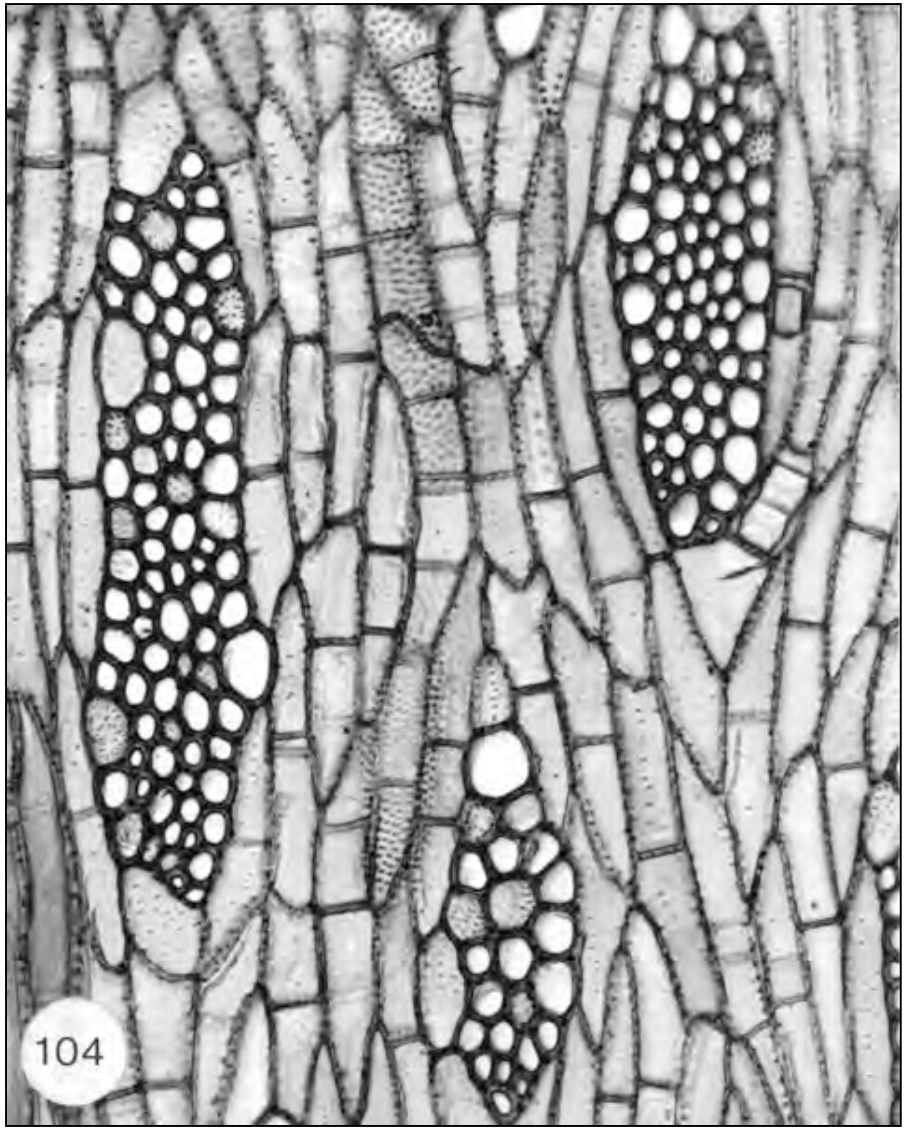
Feature 92. Four (3-4) cells per parenchyma strand

Firmiana simplex (Malvaceae - Sterculiaceae)
E.A. Wheeler

AXIAL PARENCHYMA CELL TYPE/STRAND LENGTH

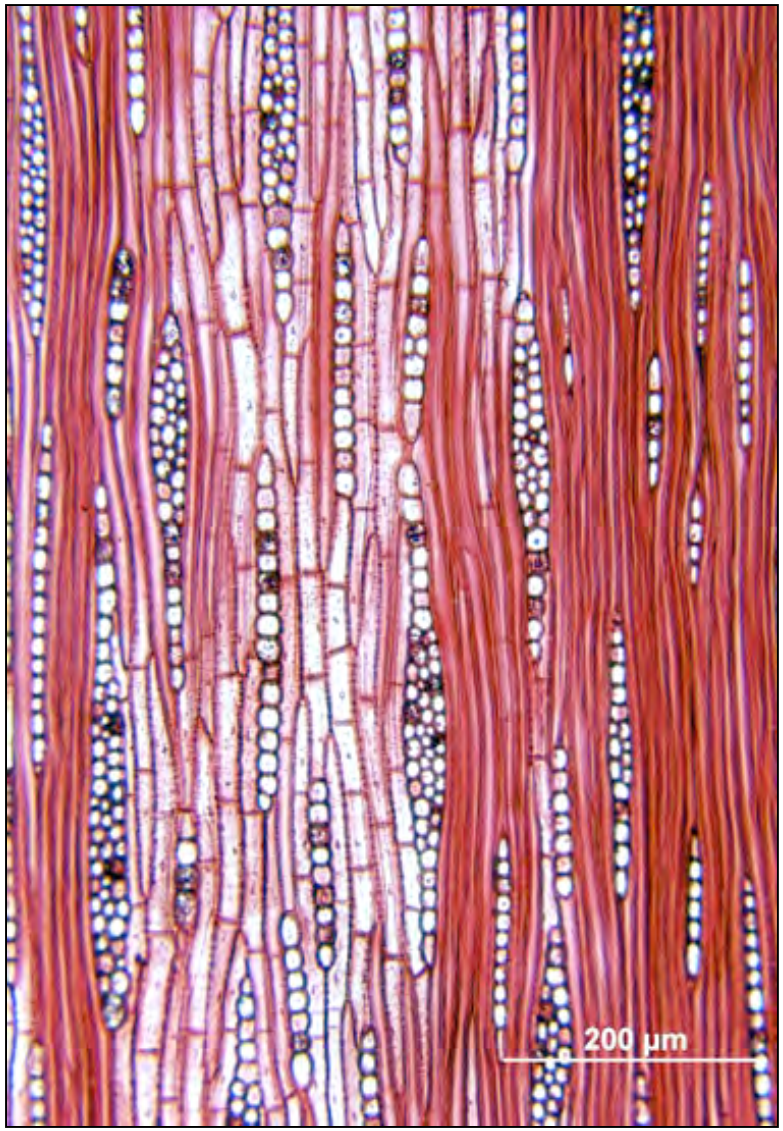
In some species, combinations of [axial parenchyma cell type/strand length] features occur, e.g., . . . ‘two cells per parenchyma strand’ and ‘four (3-4) cells per parenchyma strand’.

Shown here two (feature 91) to four (feature 92) cells per parenchyma strand.



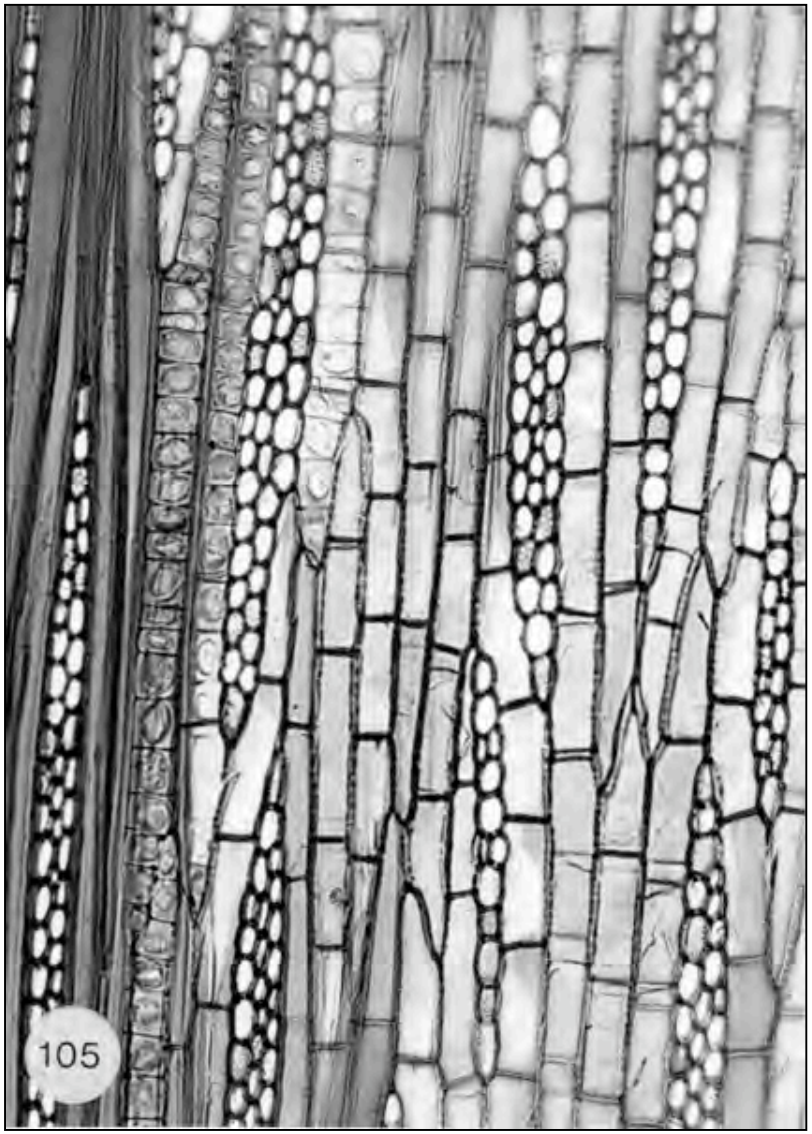
Cordia absyssinica (Boraginaceae)
P.E. Gasson

Feature 93. Eight (5-8) cells per parenchyma strand



Carya laciniosa (Juglandaceae)
E.A. Wheeler

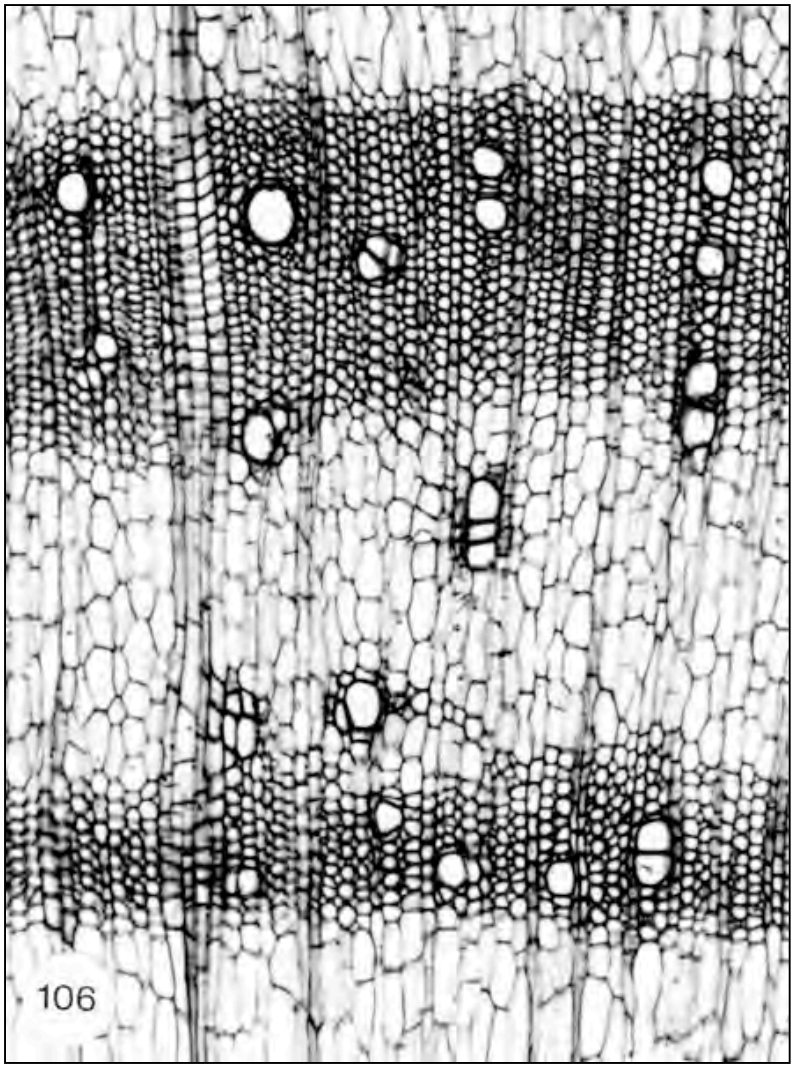
Feature 94. Over eight cells per per parenchyma strand



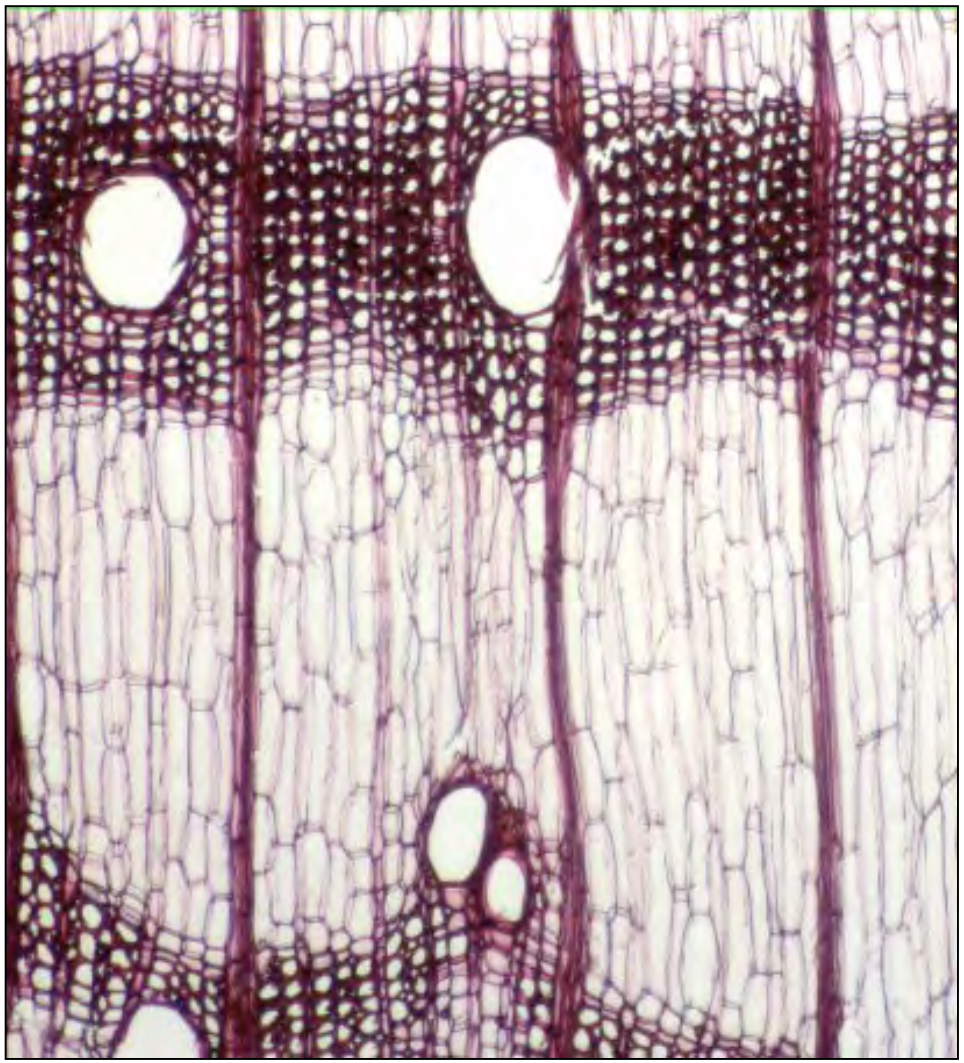
Bertholletia excelsa (Lecythidaceae)
Features 93 and 94 both present P.E. Gasson

Feature 95. Unlignified parenchyma

Unlignified parenchyma usually occur in broad bands, [this feature] is restricted to a small number of taxa.



Entelea arborescens (Tiliaceae)
P.E. Gasson



Apeiba tibourbou: (Tiliaceae)
M.E. Bakker