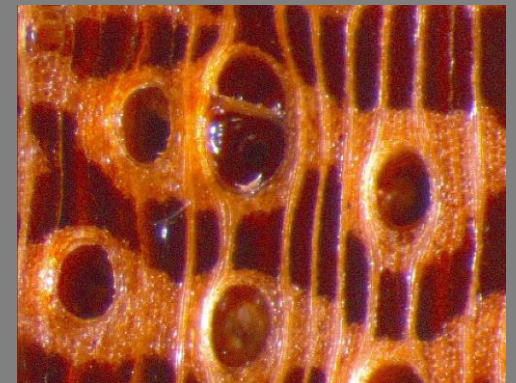
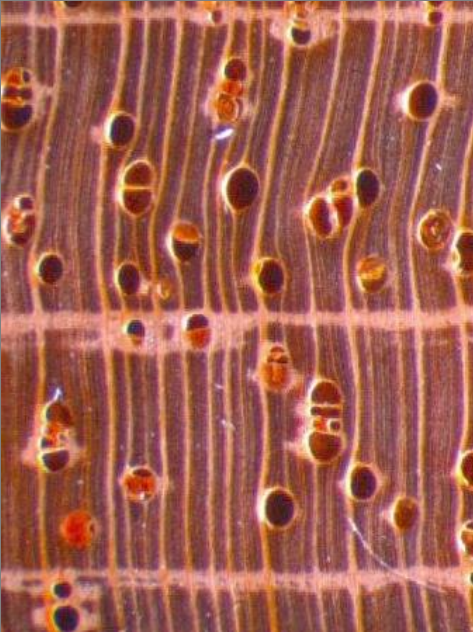


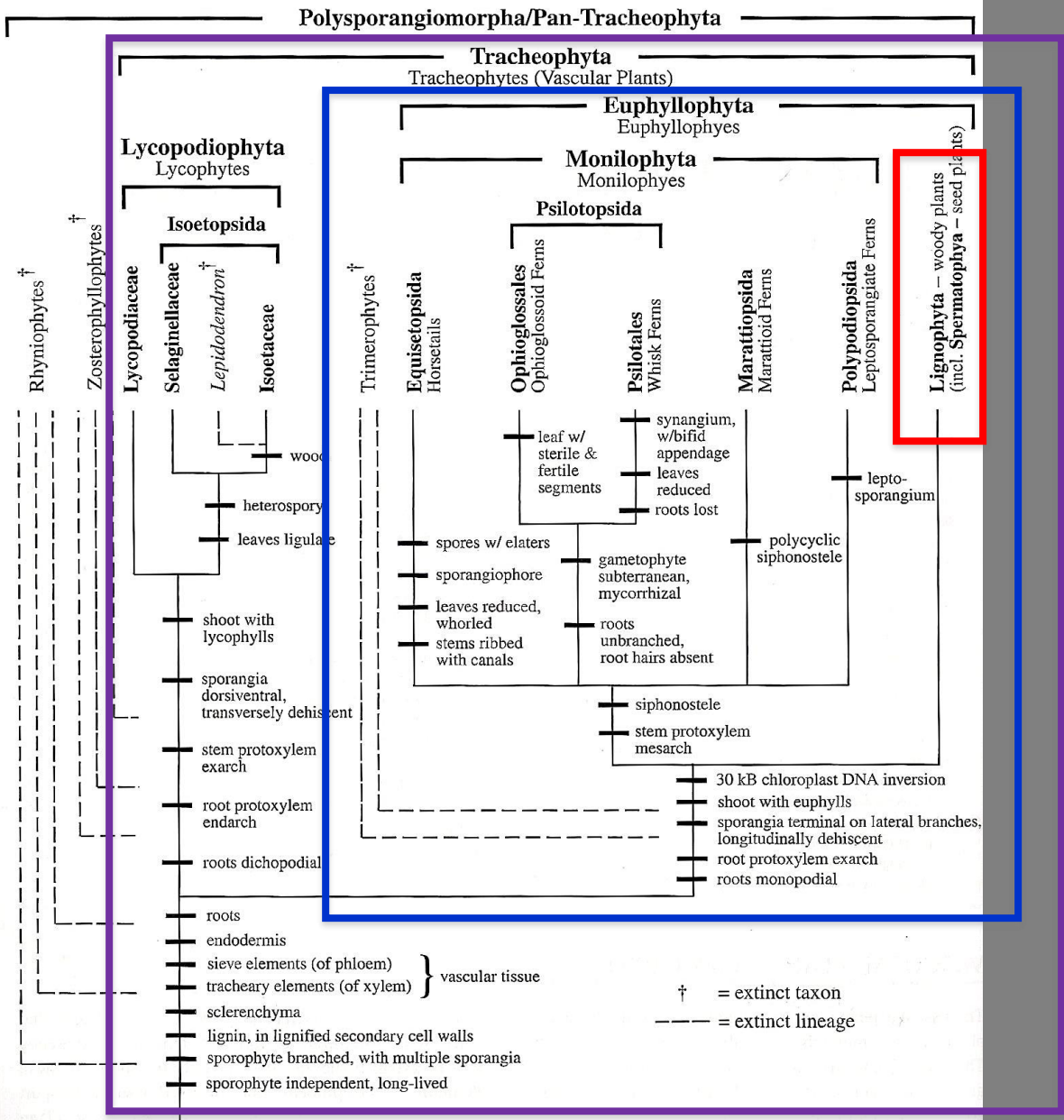


LIGNÓFITAS

Gregório CECCANTINI

BIB-124- Diversidade e Evolução dos Organismos Fotossintetizantes





LIGNÓFITAS

Embriófitas
Traqueófitas
Eufilófitas
Lignófitas

Espermatófitas
Gimnospermas
Antófitas=
Angiospermas

FIGURE 4.1 Phylogeny of the tracheophytes, the vascular plants, modified from Pryer et al. (2001a, 2004a,b) and Qiu et al. (2006, 2007), with selected apomorphies.

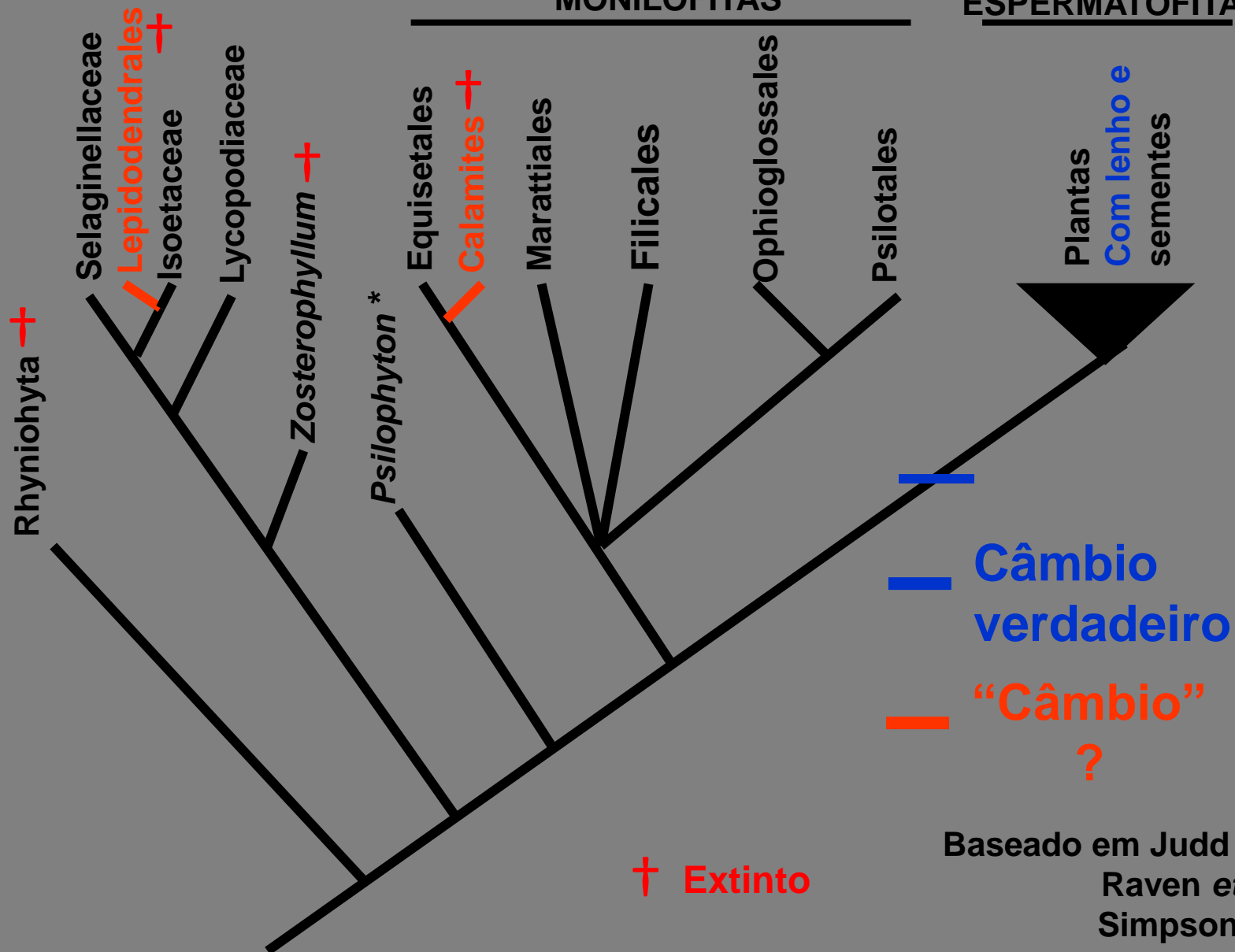
TRAQUEÓFITAS ou Plantas Vasculares

EUFILÓFITAS ou Plantas megáfilas

LICÓFITAS

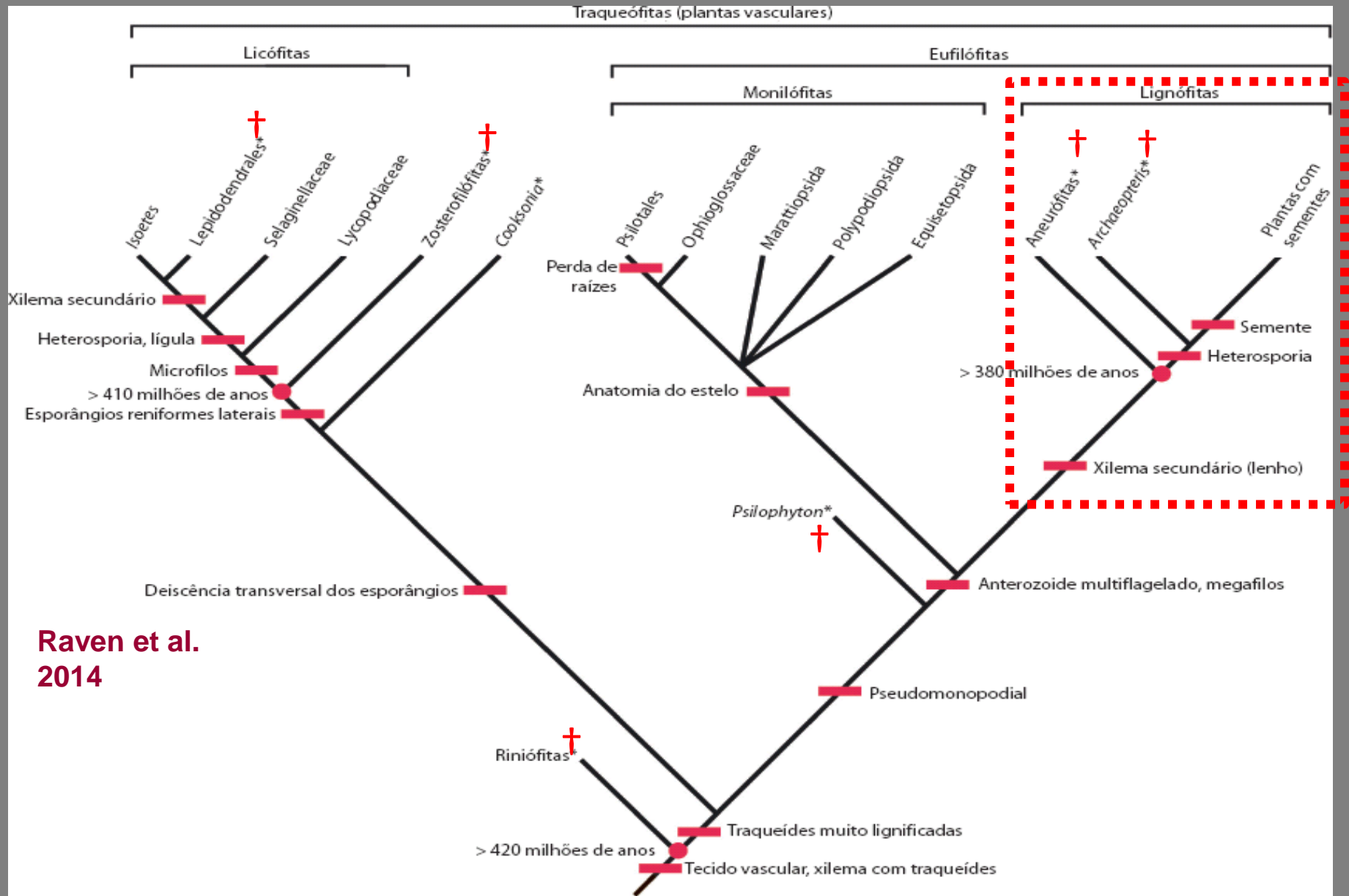
MONILÓFITAS

ESPERMATÓFITAS



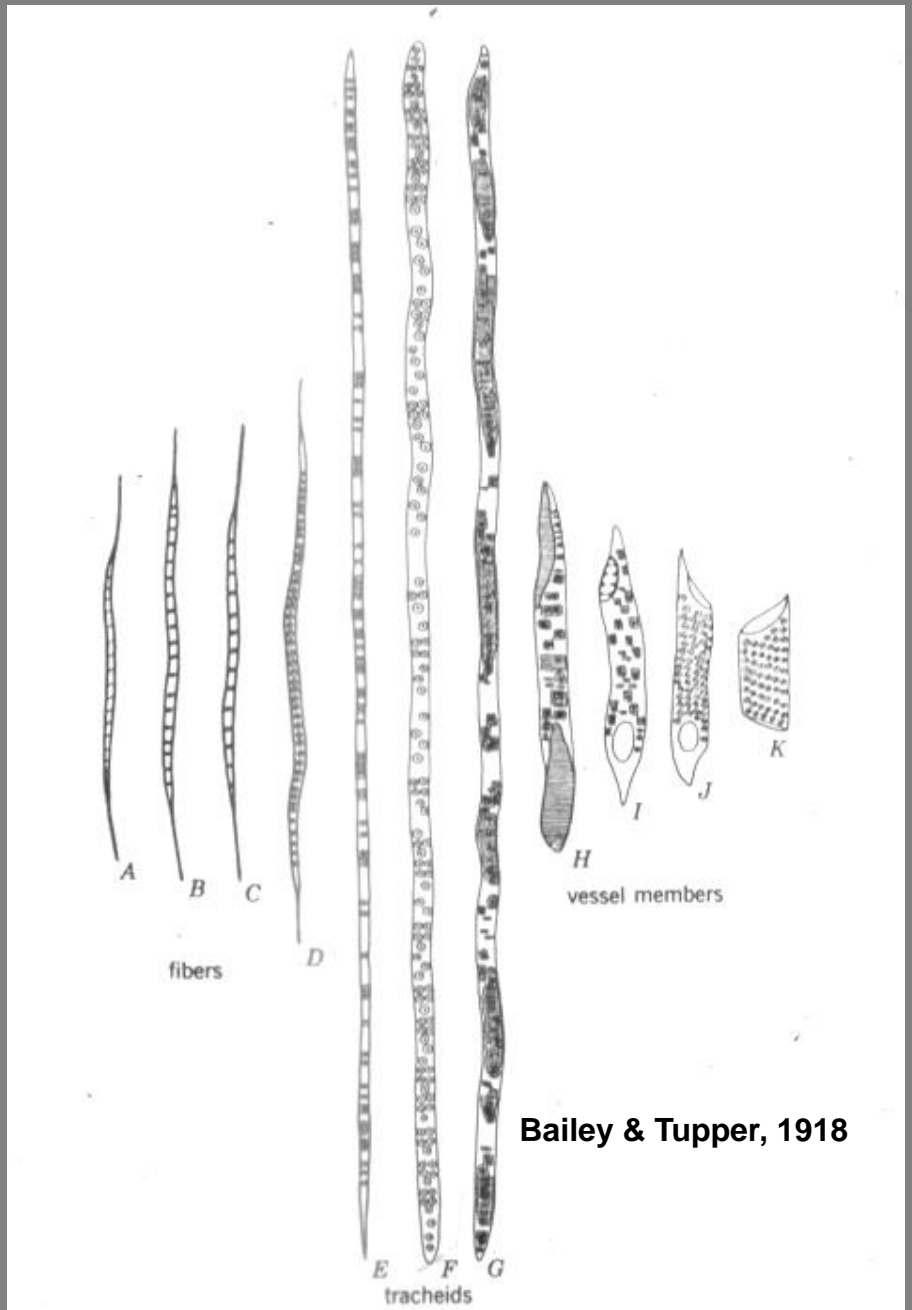
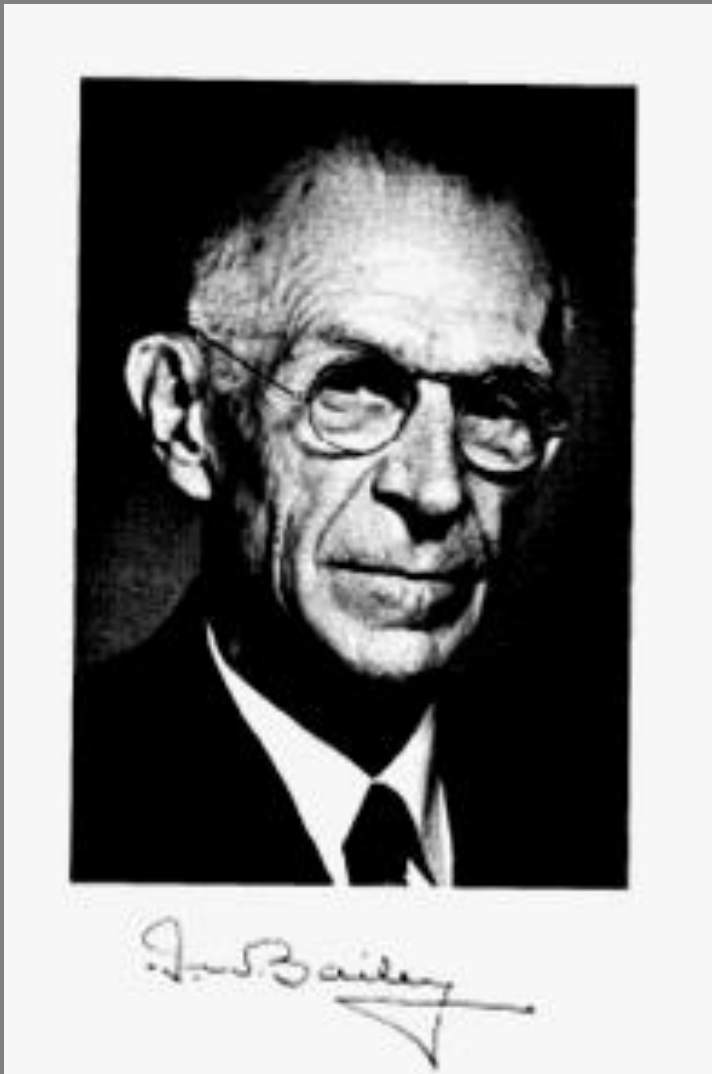
Baseado em Judd *et al.* 2008,
Raven *et al.* 2007 e
Simpson *et al.* 2006

LIGNÓFITAS



Raven et al.
2014

Células condutoras do xilema: traqueíde, elemento de vaso



Bailey & Tupper, 1918

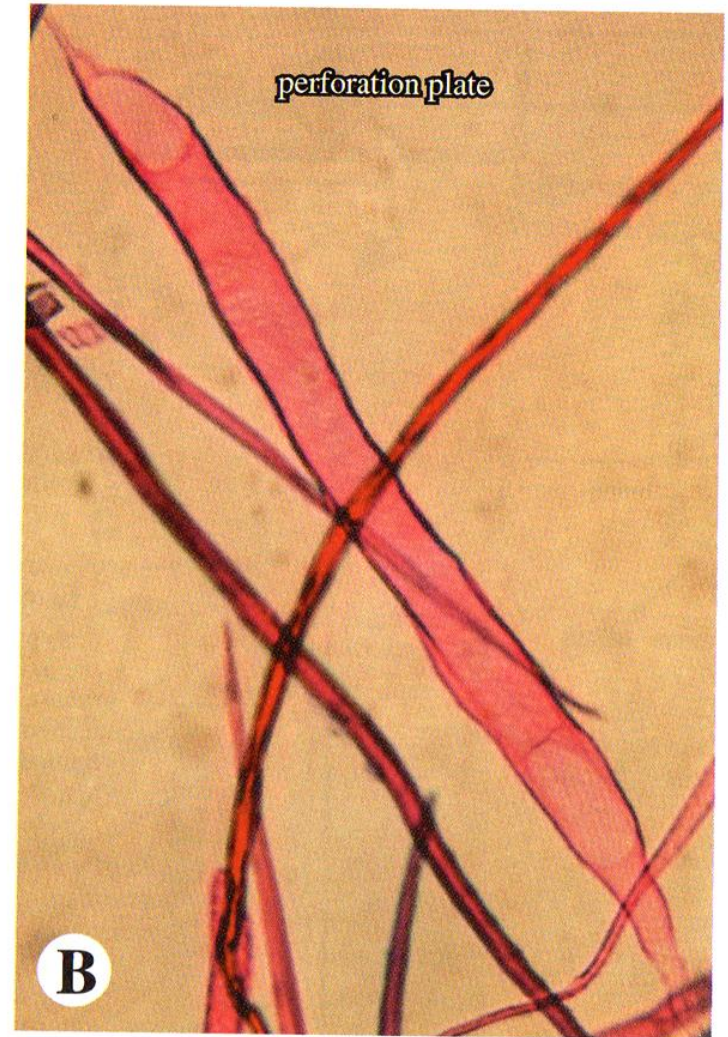
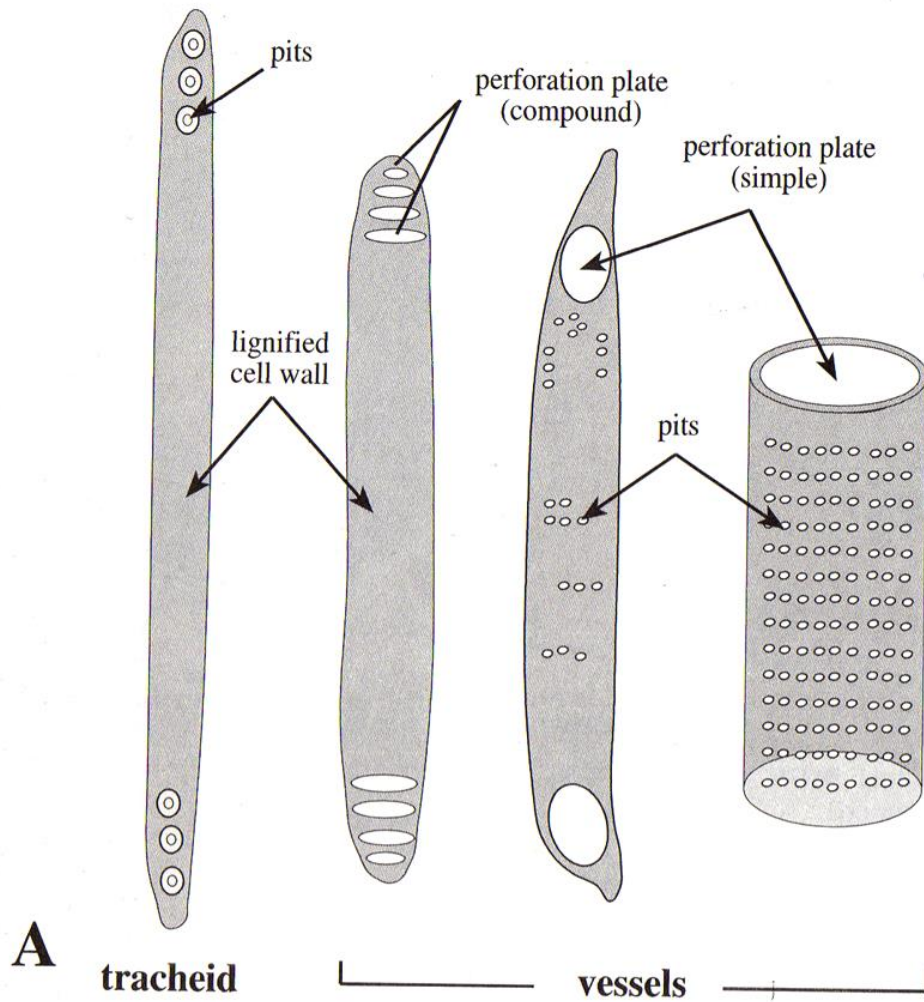


FIGURE 4.4 Conductive cells of vascular plants: tracheary elements. **A.** Types of tracheary elements. **B.** Vessel.

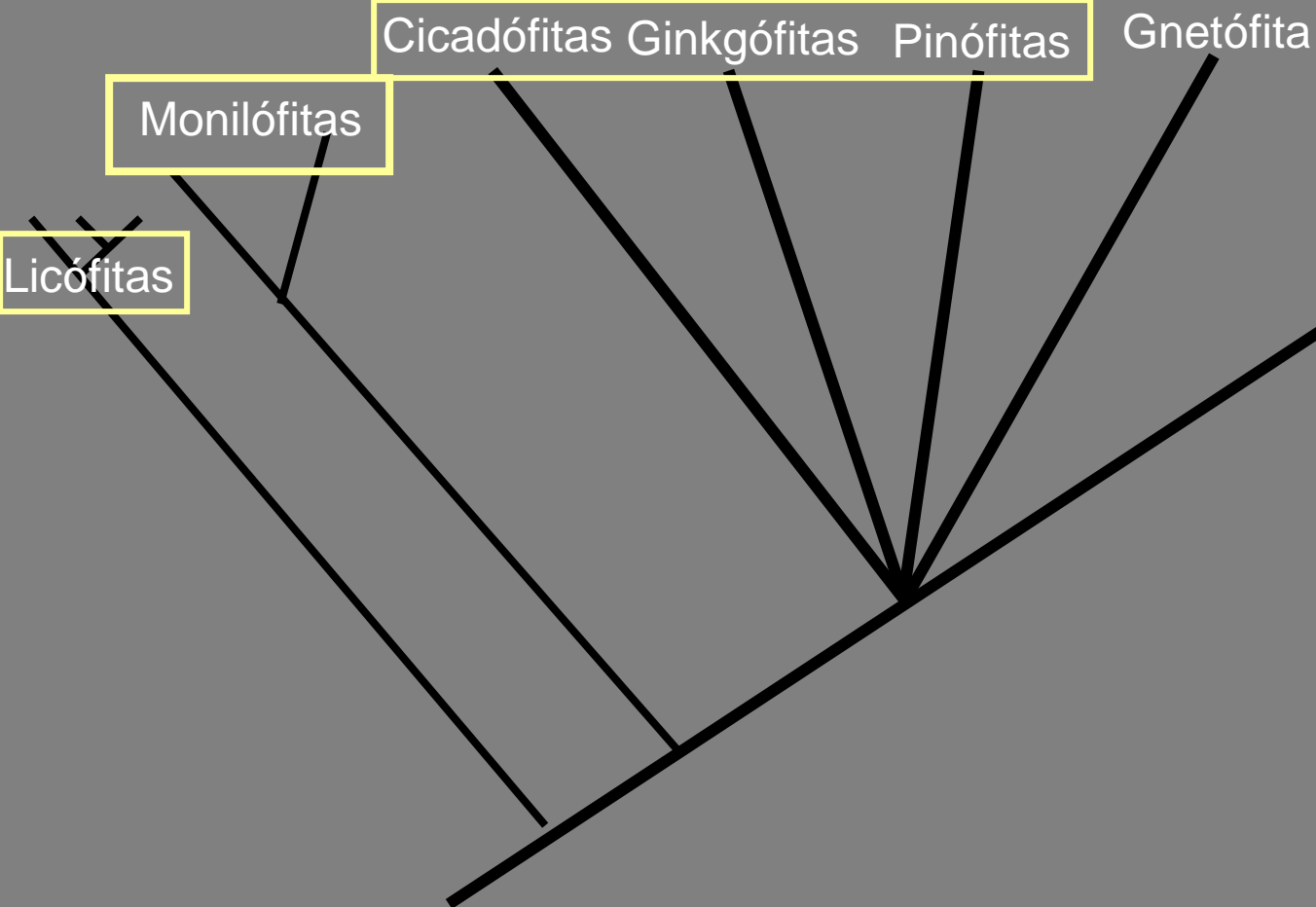
Traqueídes

TRAQUEÓFITAS

ESPERMATÓFITAS ou Plantas com sementes

ANGIOPERMAS

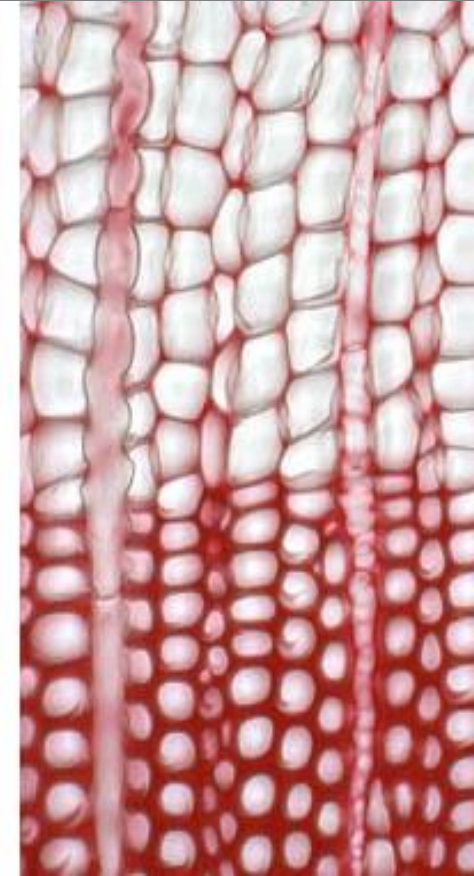
Plantas com
flores e frutos



Baseado em Judd *et al.* 2008,
Raven *et al.* 2007 e
Simpson *et al.* 2006

Camadas de crescimento anuais Traqueídes

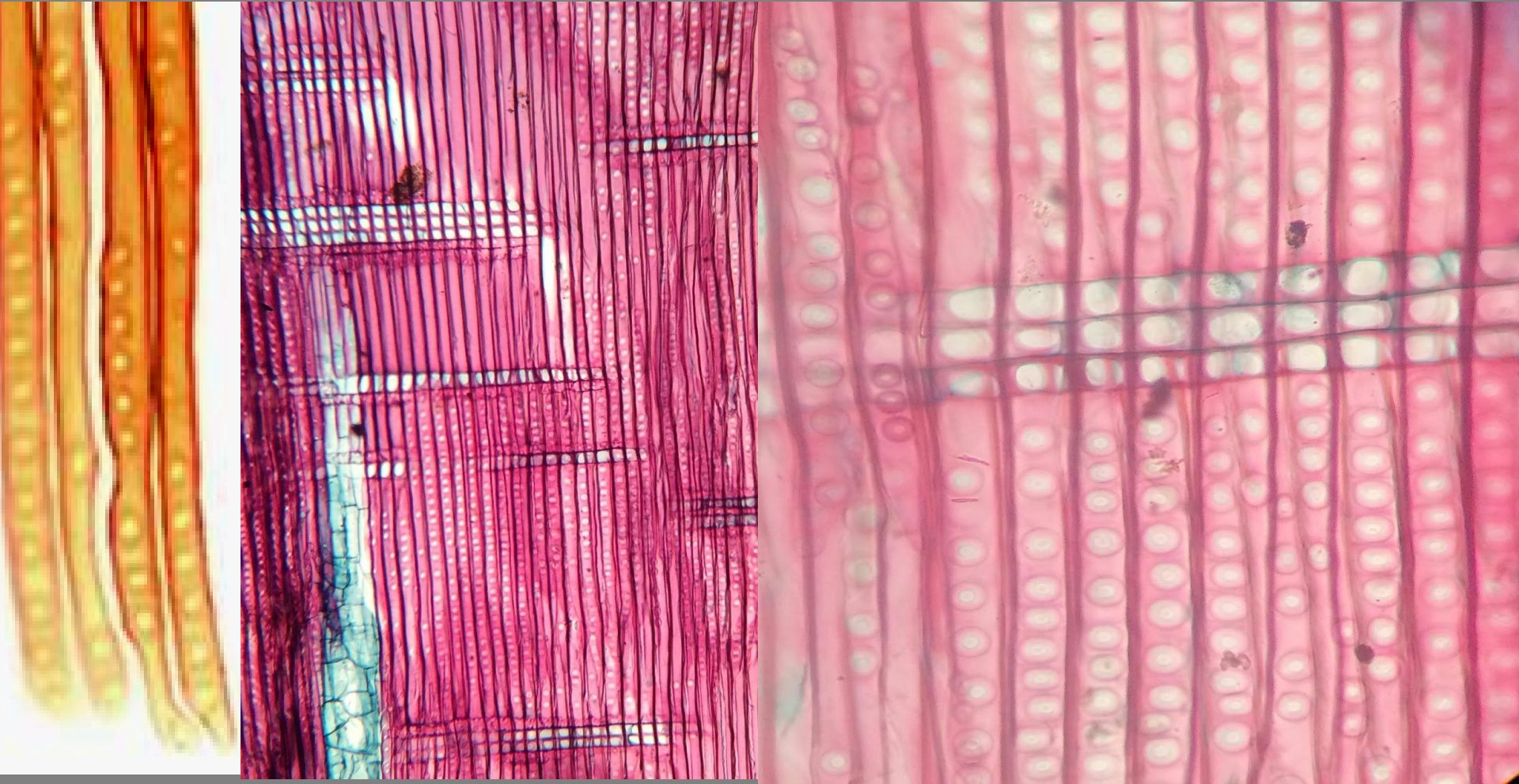
Pinófitas



Xilema de Pinófitas : traqueídes



Traqueídes



A scanning electron micrograph (SEM) showing a detailed view of a plant vascular element, likely a tracheid or vessel element. The structure is elongated and tapers towards the ends, with a distinct, slightly curved shape. The surface appears textured and fibrous. The background is dark and out of focus, highlighting the intricate details of the vascular element.

**O elemento de vaso
na evolução
das Traqueófitas**

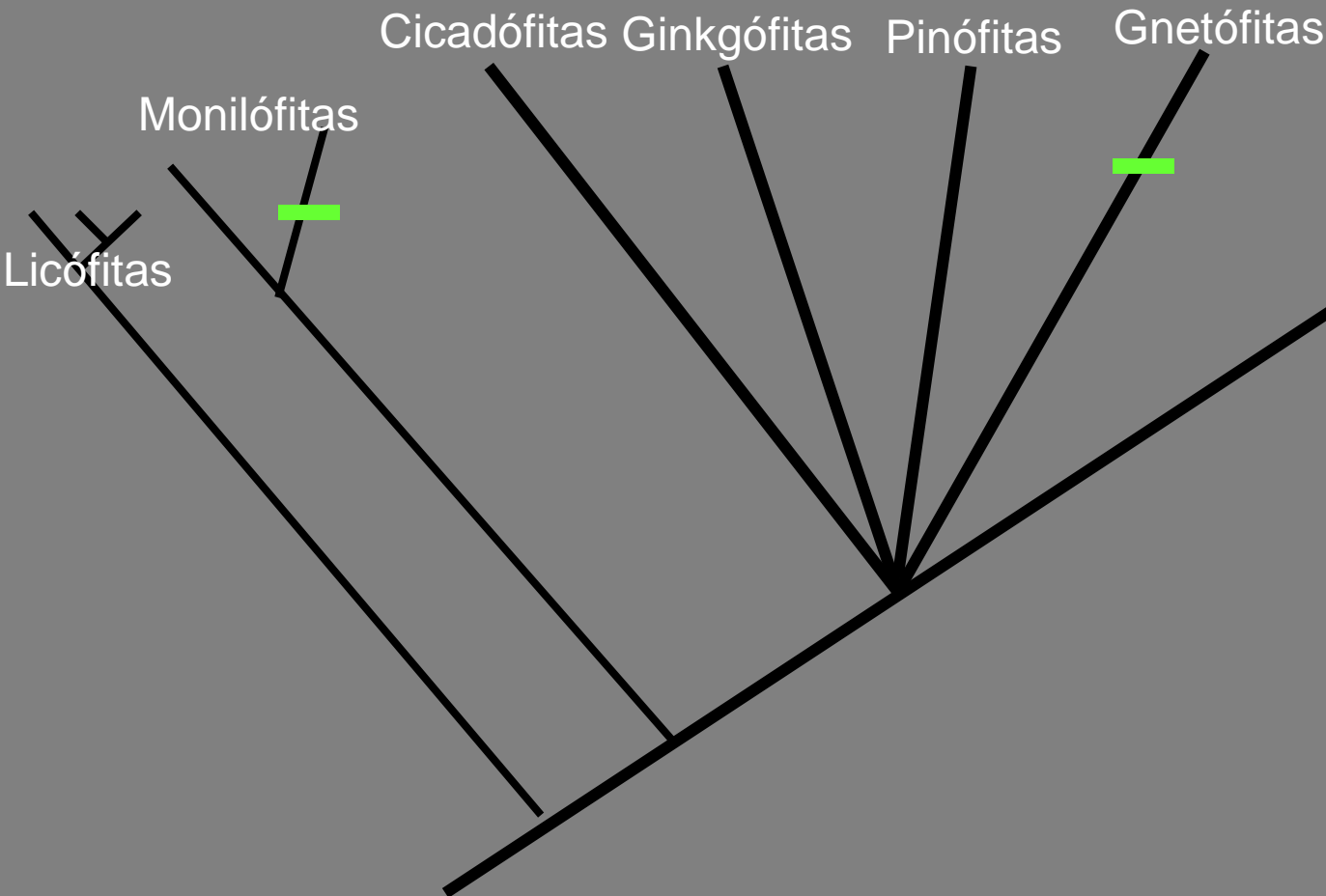
Elemento de vaso

Traqueófitas

ESPERMATÓFITAS /Plantas com sementes ou LIGNÓFITAS

ANGIOPERMAS

Plantas com flores e frutos



Baseado em Judd *et al.* 2008,
Raven *et al.* 2007 e
Simpson *et al.* 2006

elemento de vaso

TRAQUEÓFITAS

ESPERMATÓFITAS /Plantas com sementes ou LIGNÓFITAS

ANGIOPERMAS

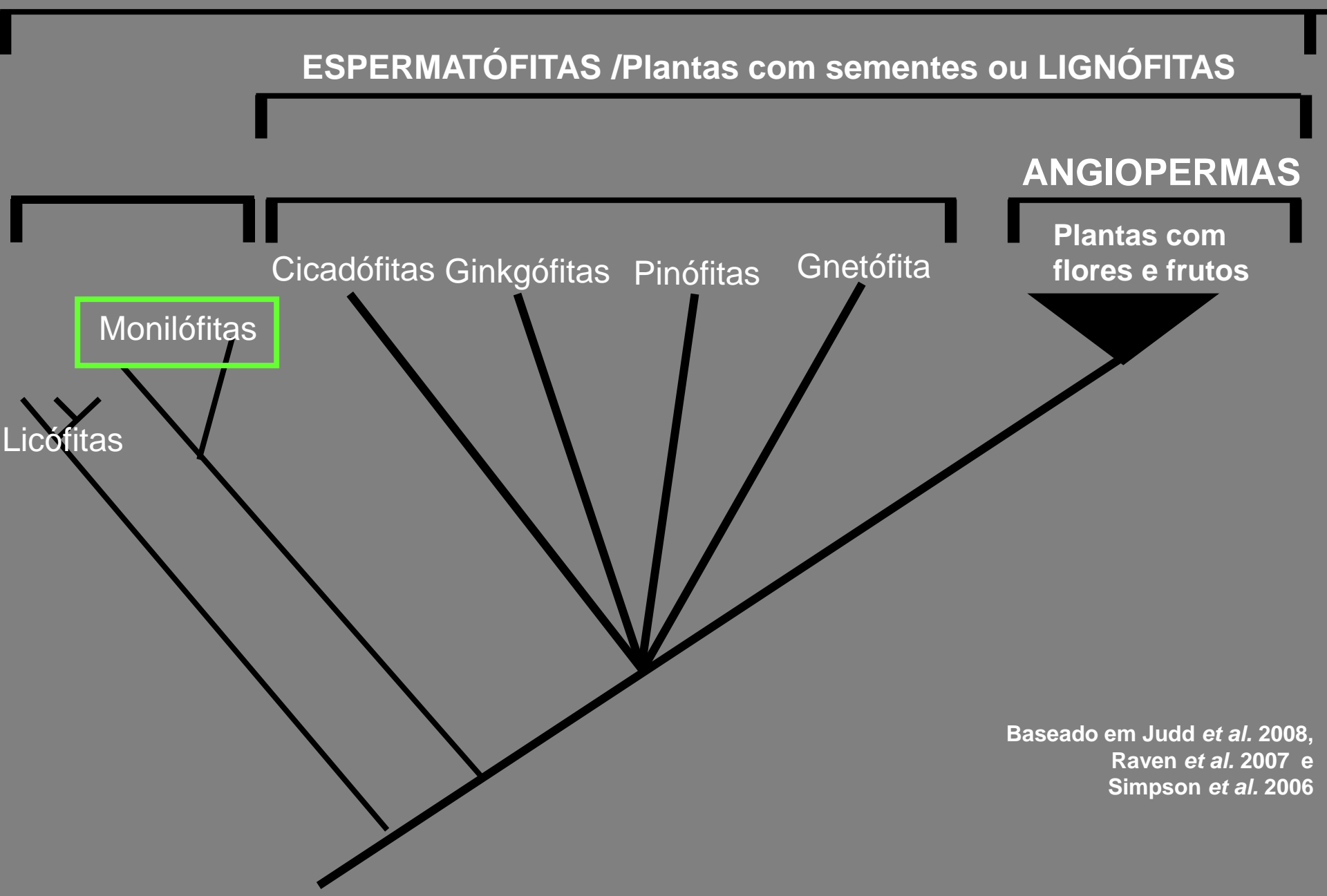
Plantas com
flores e frutos

Cicadófitas Ginkgófitas Pinófitas Gnetófitas

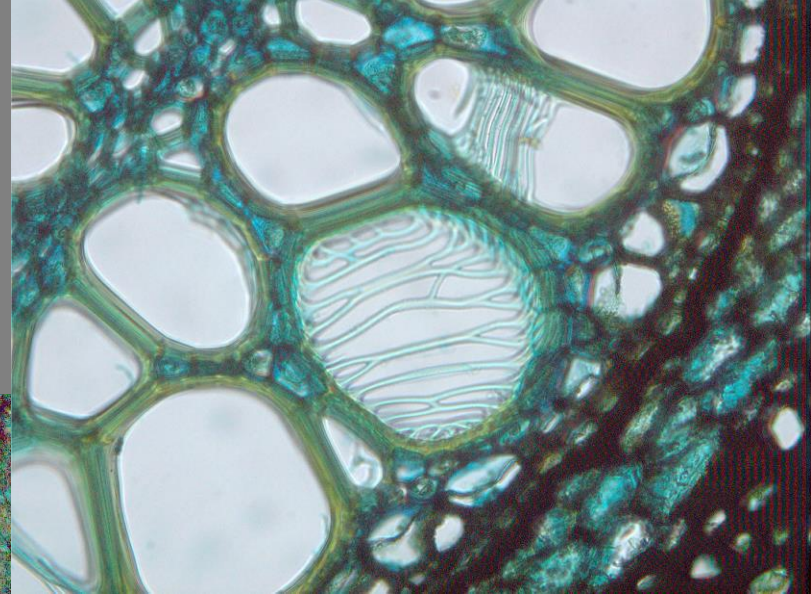
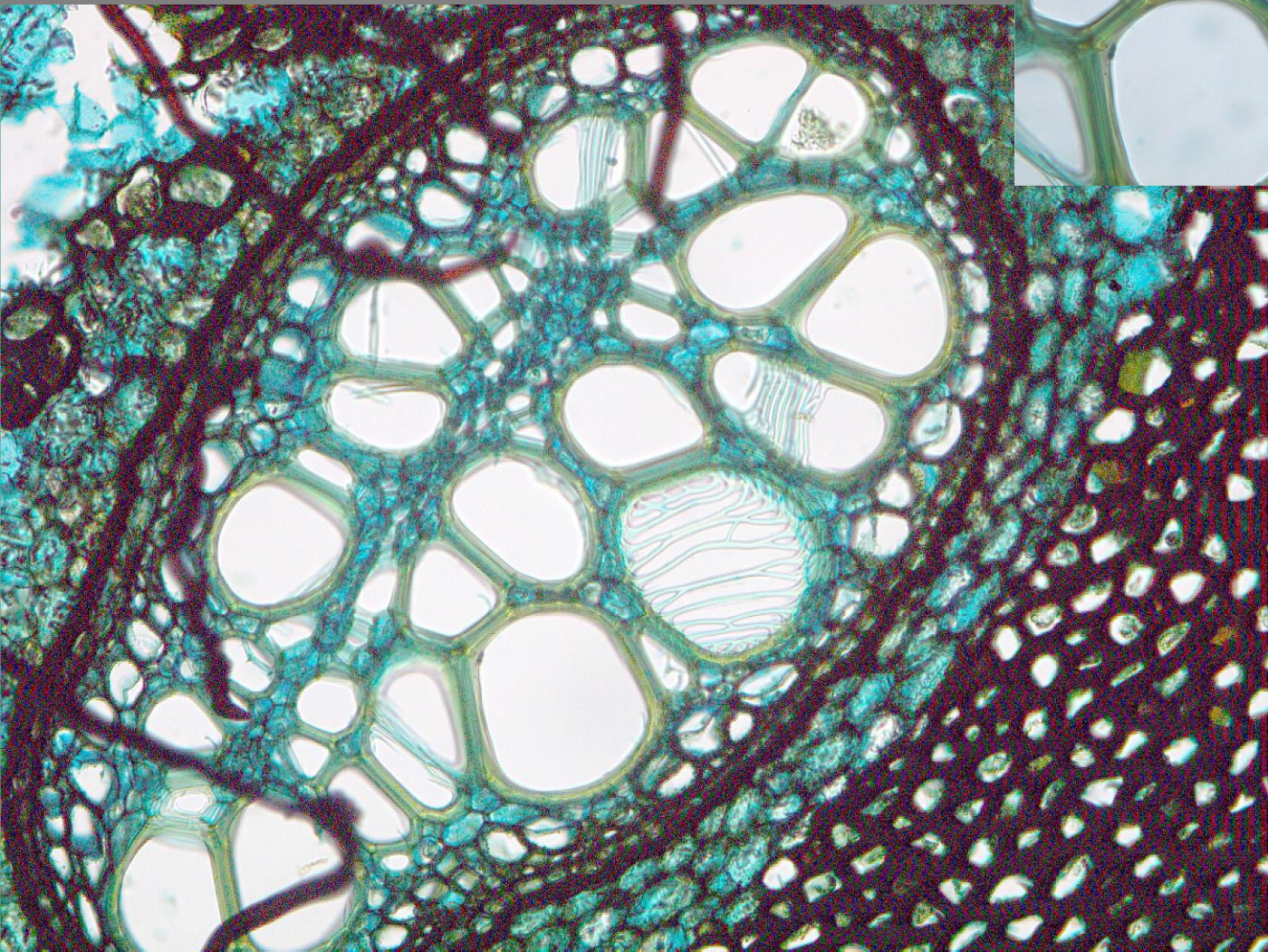
Monilófitas

Licófitas

Baseado em Judd *et al.* 2008,
Raven *et al.* 2007 e
Simpson *et al.* 2006



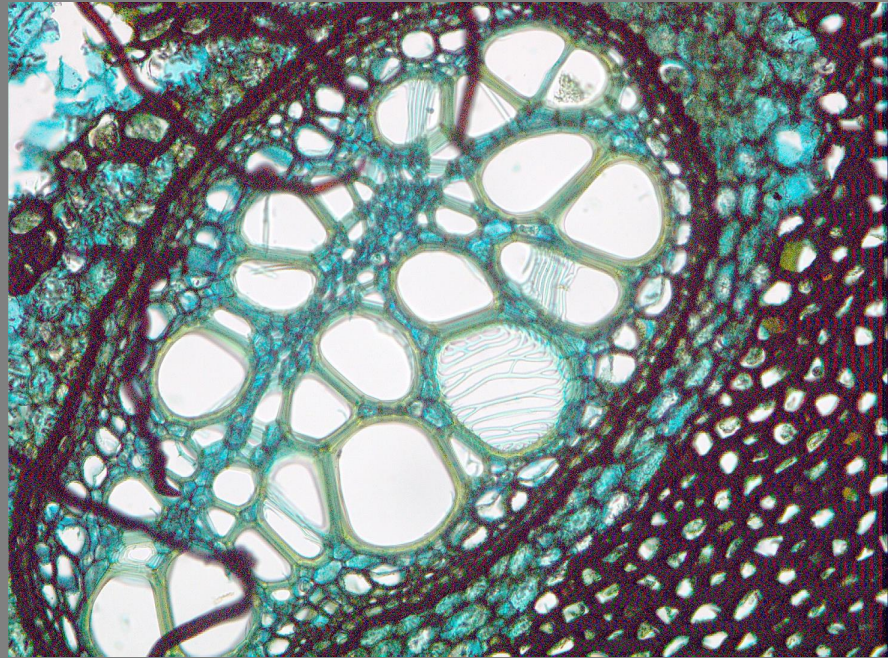
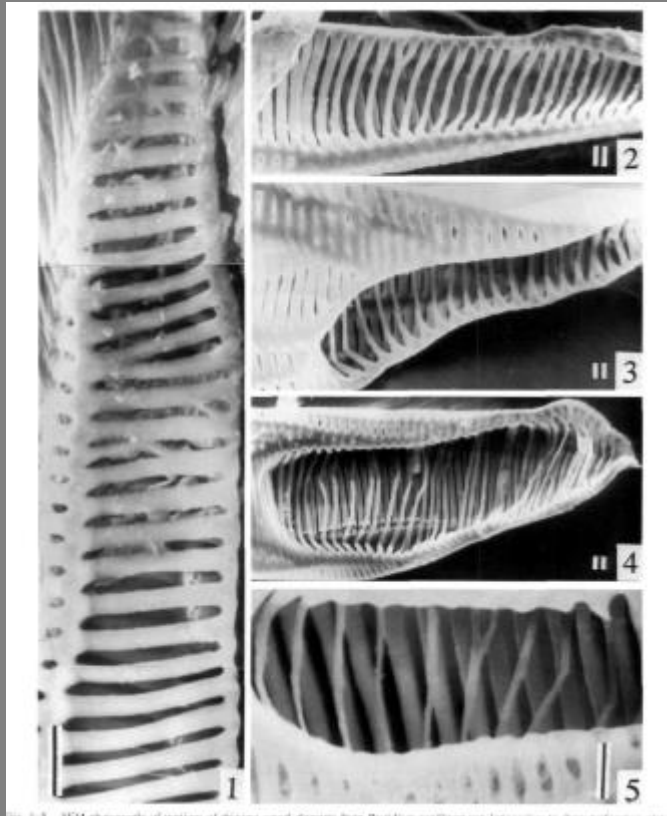
Elemento de vaso:
Placa de perfuração escalariforme



Pteridium aquilinum
Polypodiaceae
Monilófito

SEM STUDIES ON VESSELS IN FERNS. 2. *PTERIDIUM*¹

SHERWIN CARLQUIST² AND EDWARD L. SCHNEIDER



Pteridium aquinilinum
Polypodiaceae
Monilófito

elemento de vaso

TRAQUEÓFITAS

ESPERMATÓFITAS ou Plantas com sementes

ANGIOPERMAS

Plantas com
flores e frutos

Gnetófitas

Pinófitas

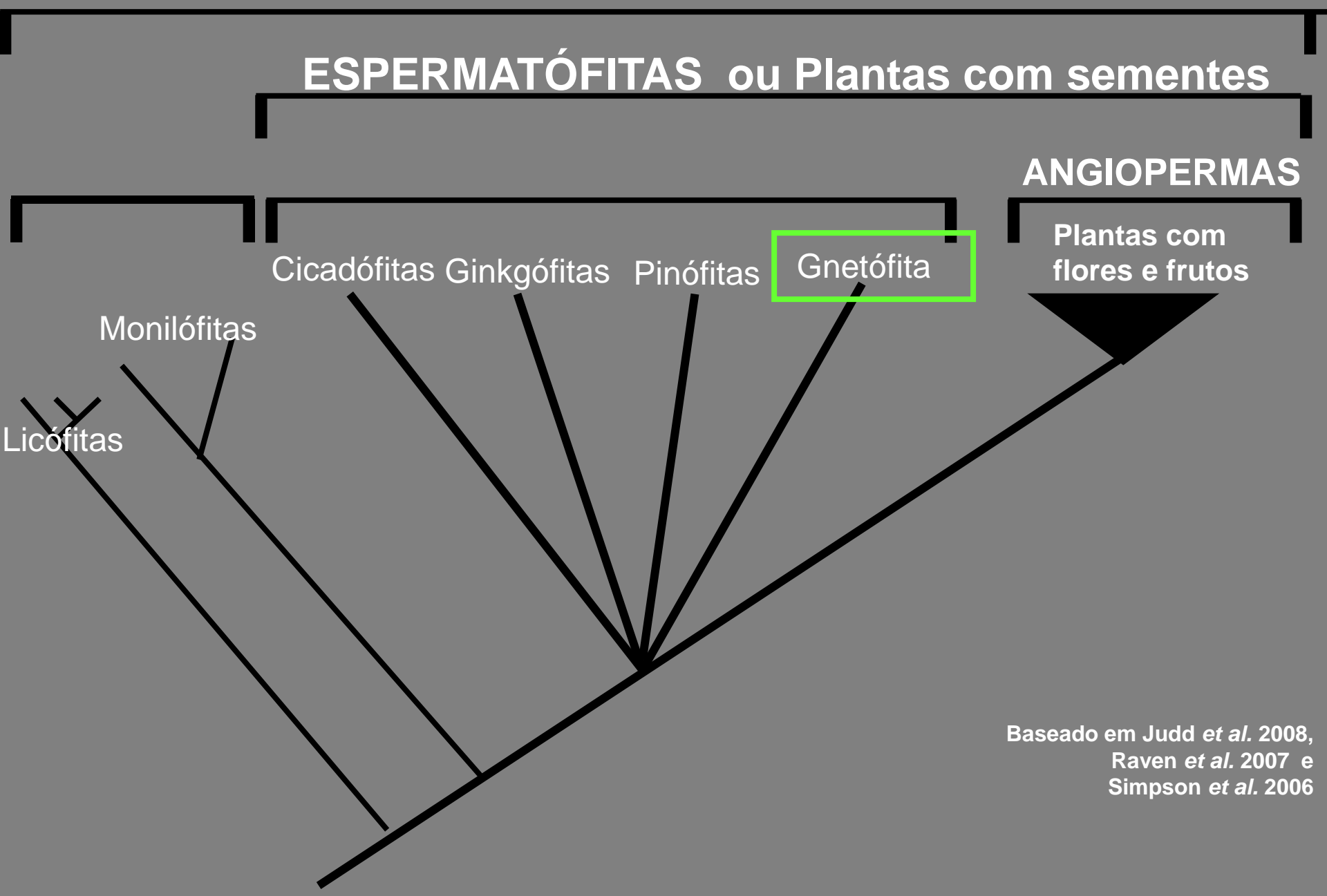
Ginkgófitas

Cicadófitas

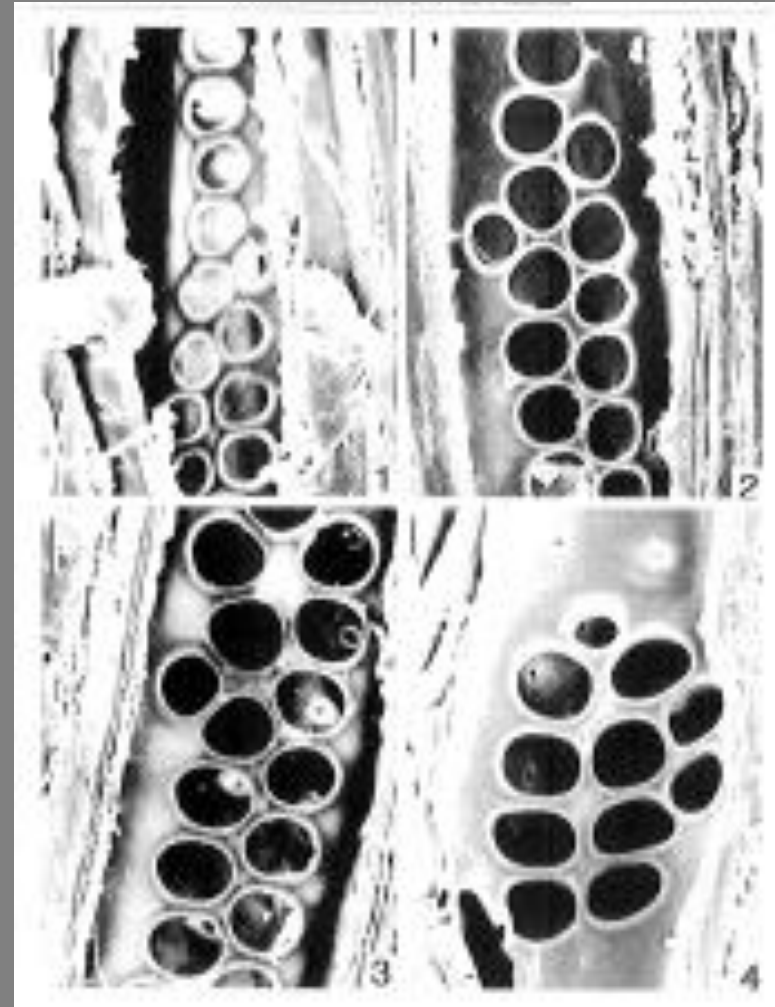
Monilófitas

Licófitas

Baseado em Judd *et al.* 2008,
Raven *et al.* 2007 e
Simpson *et al.* 2006

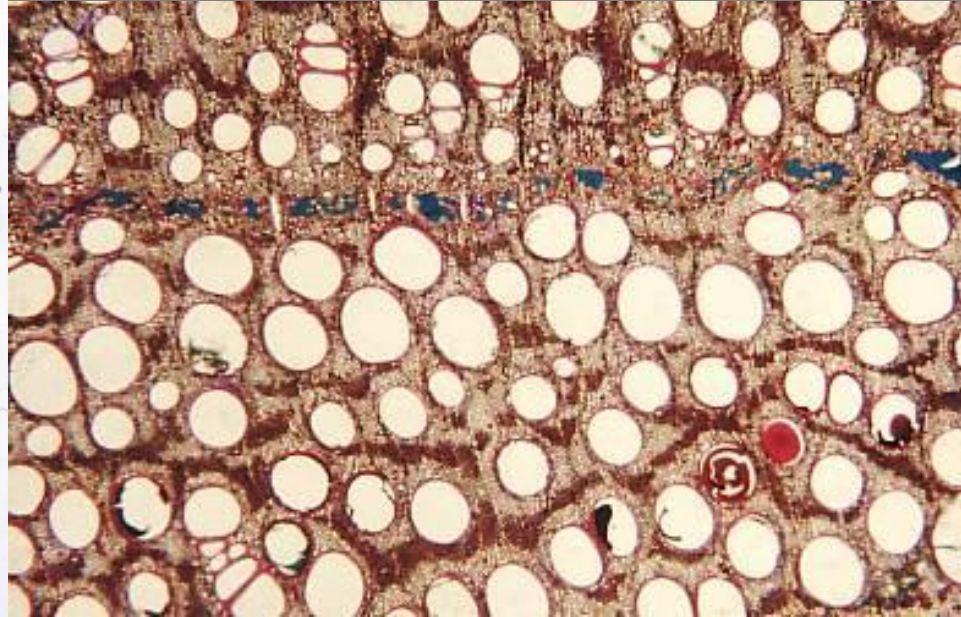


Gnetum, Gnetaceae
Arbusto



Carlquist 1966

Gnetum, Gnetaceae
Liana



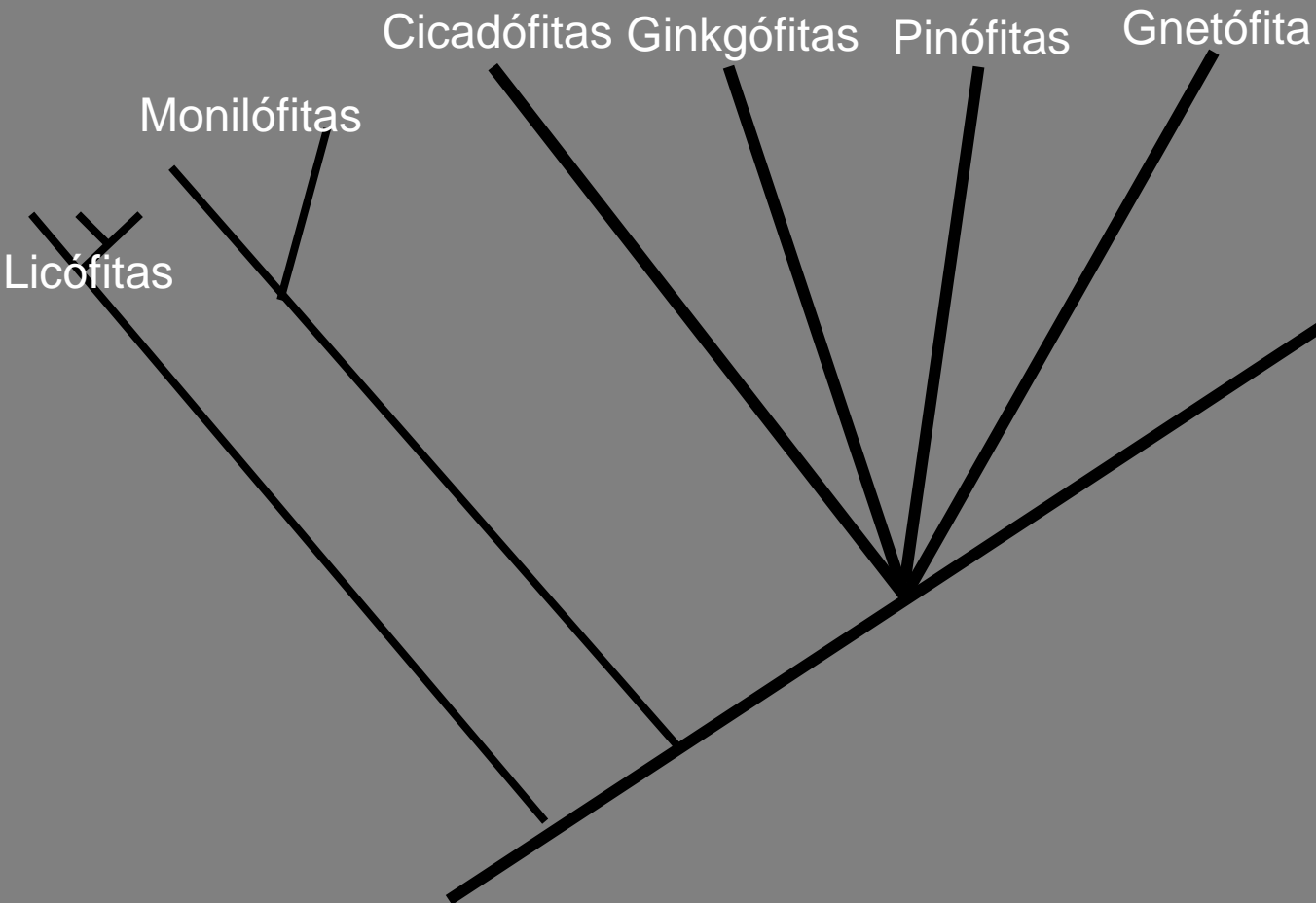
elemento de vaso

TRAQUEÓFITAS

ESPERMATÓFITAS /Plantas com sementes ou LIGNÓFITAS

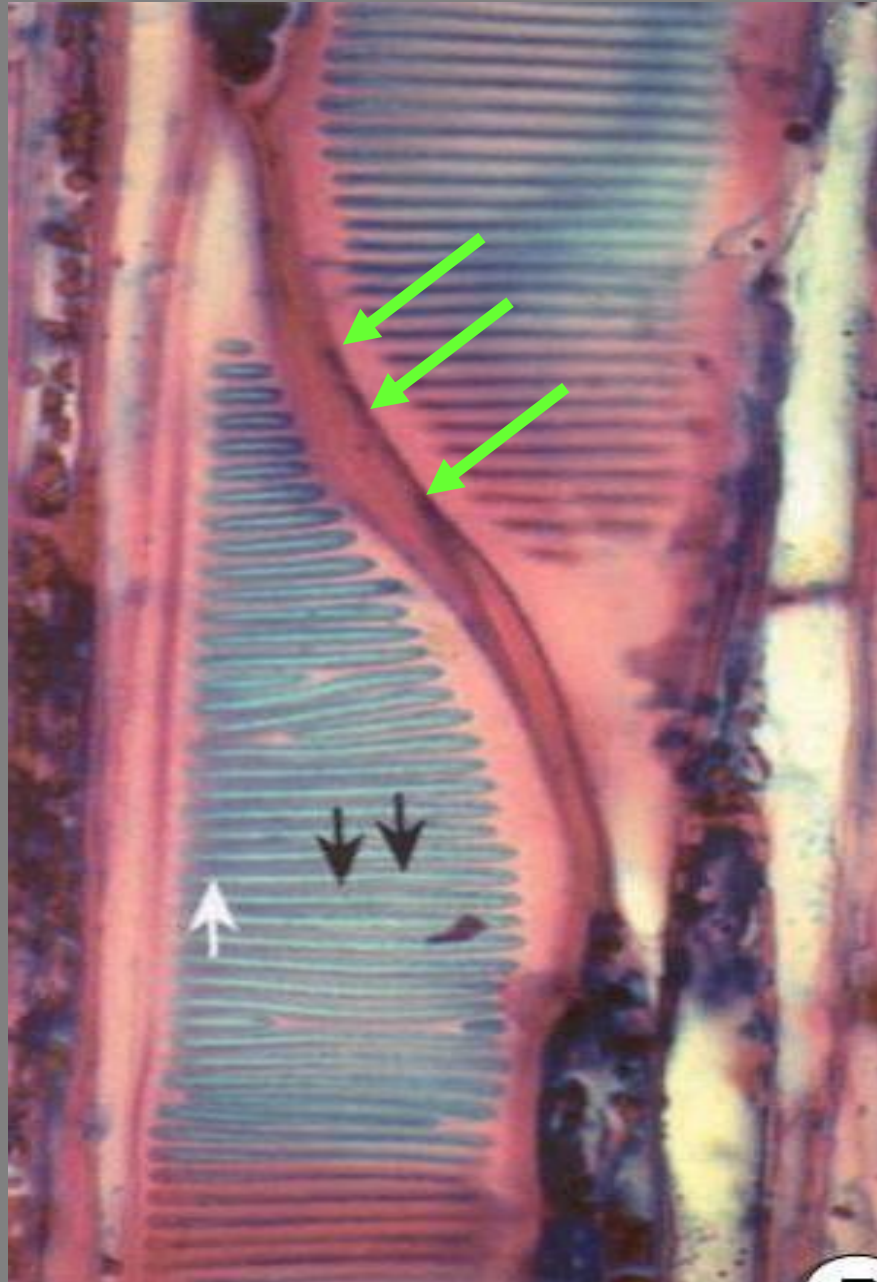
ANGIOPERMAS

Plantas com
flores e frutos



Baseado em Judd *et al.* 2008,
Raven *et al.* 2007 e
Simpson *et al.* 2006

Placa de perfuração



Elemento de Vaso

Clusia, Clusiaceae
Espermatófita

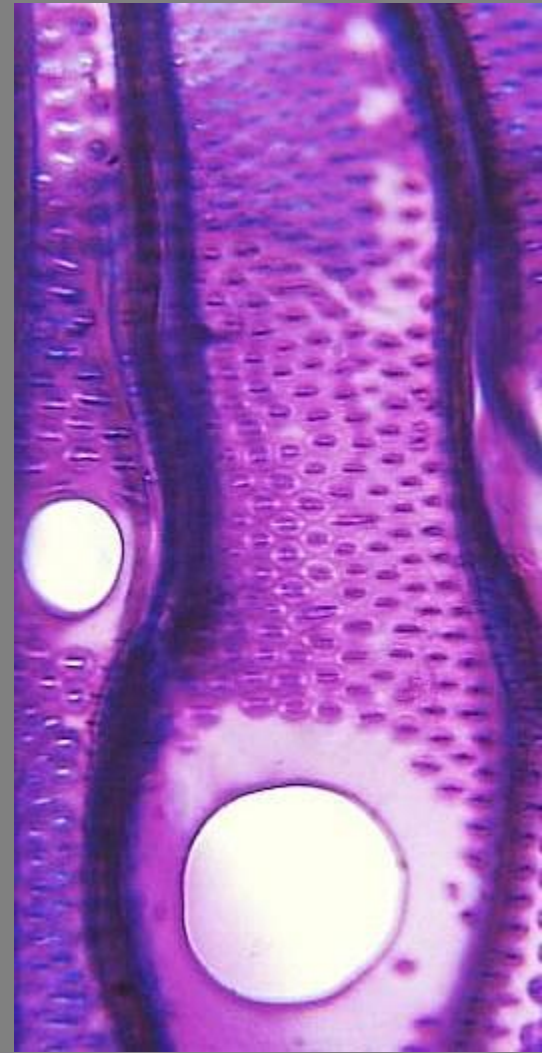
Diversidade de placa de perfuração



Iryanthera, Myristicaceae



Tovomita, Clusiaceae



Styrax, Styracaceae

Células condutoras do floema:

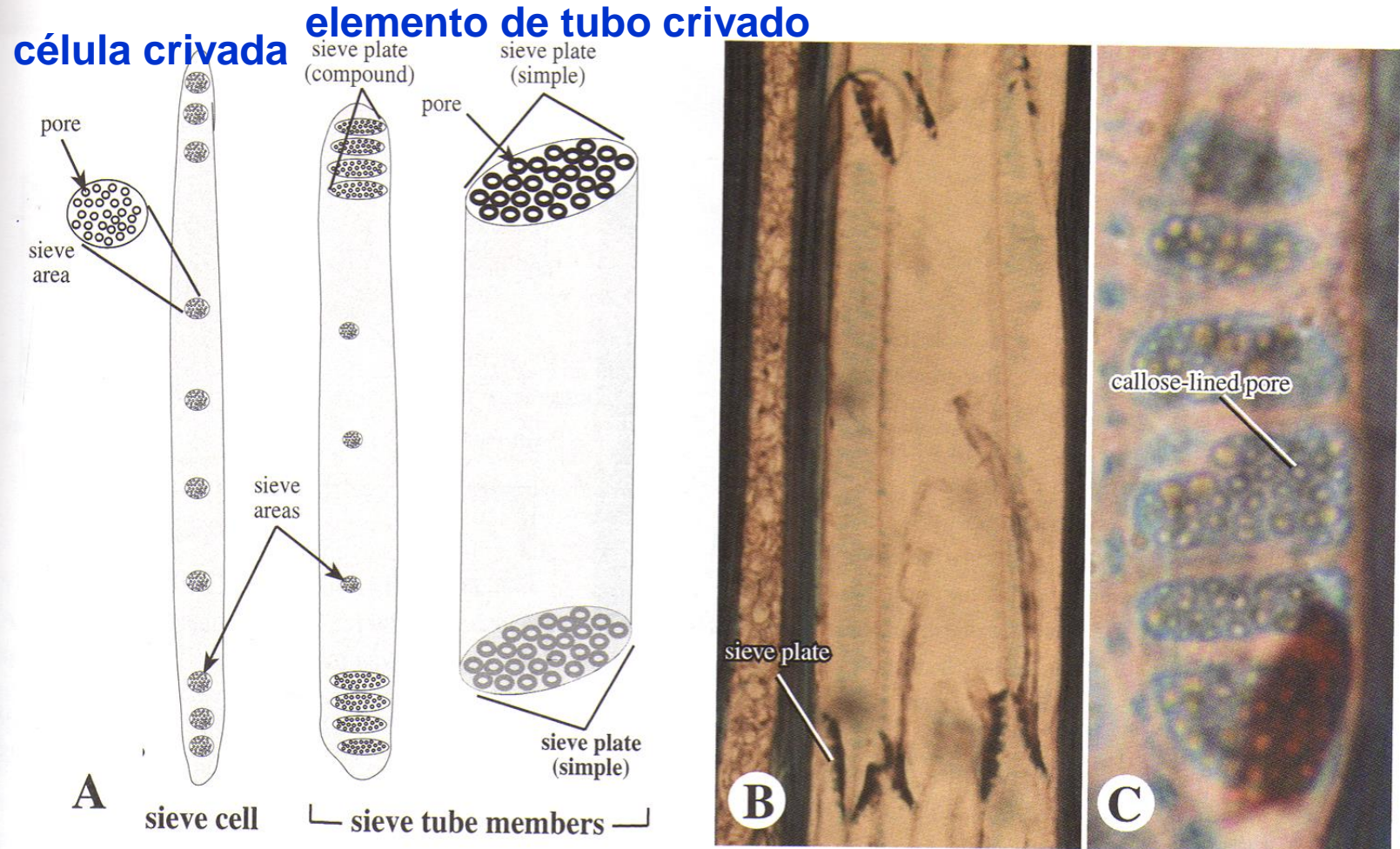
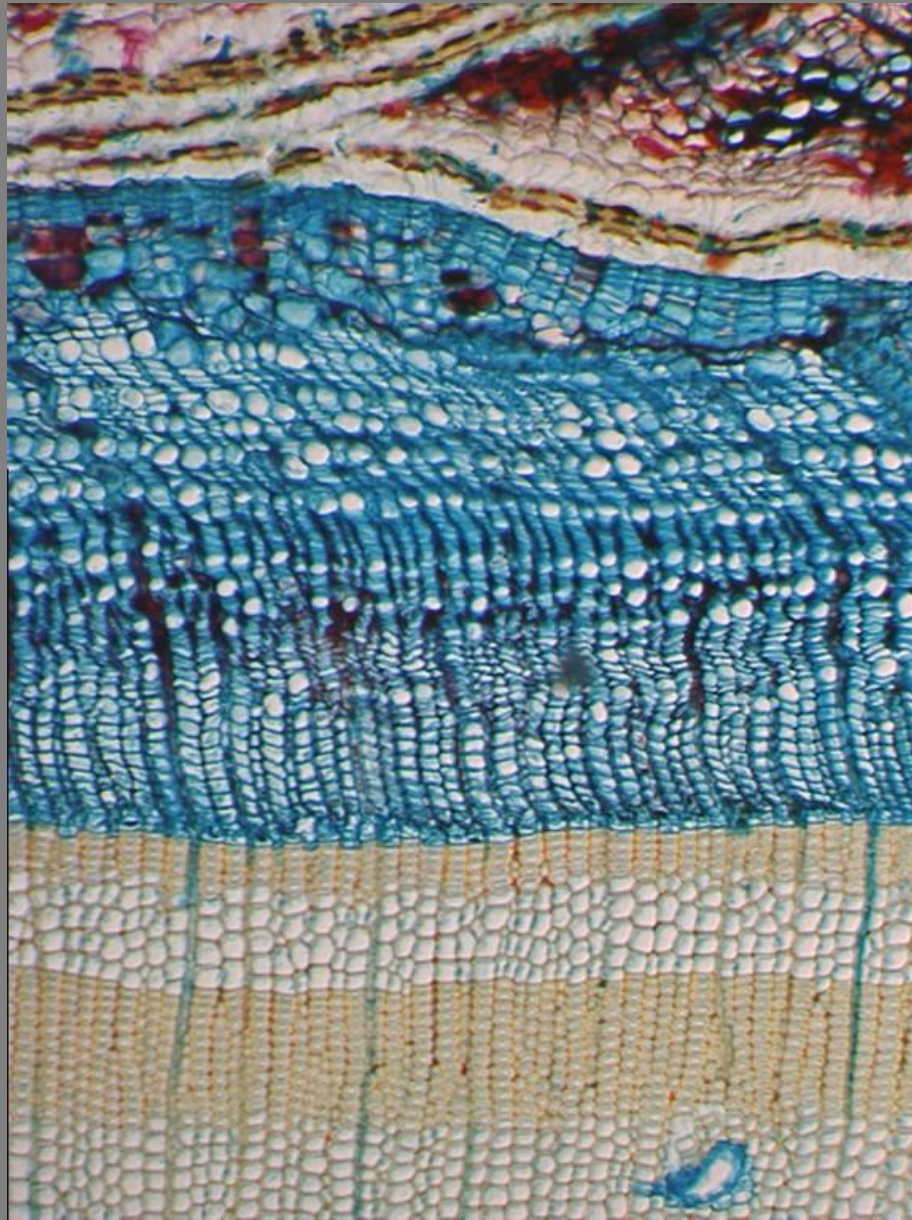


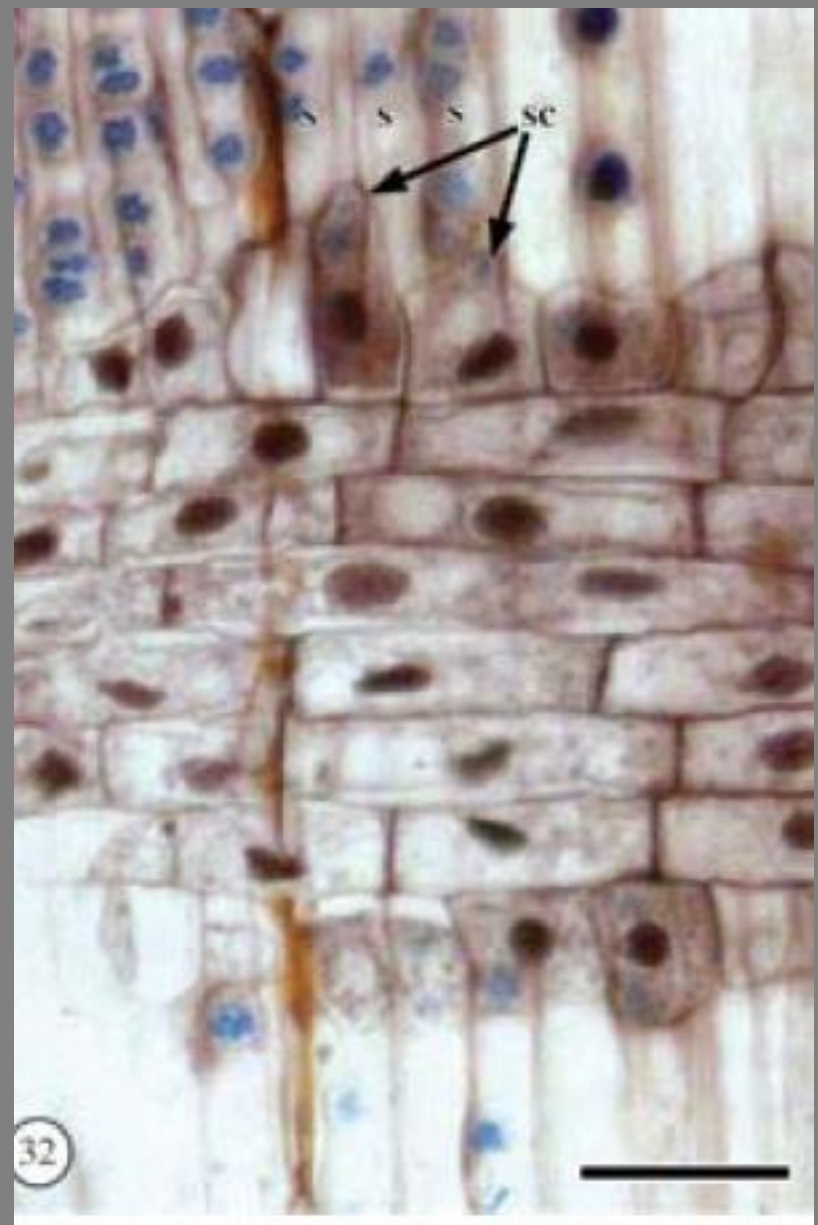
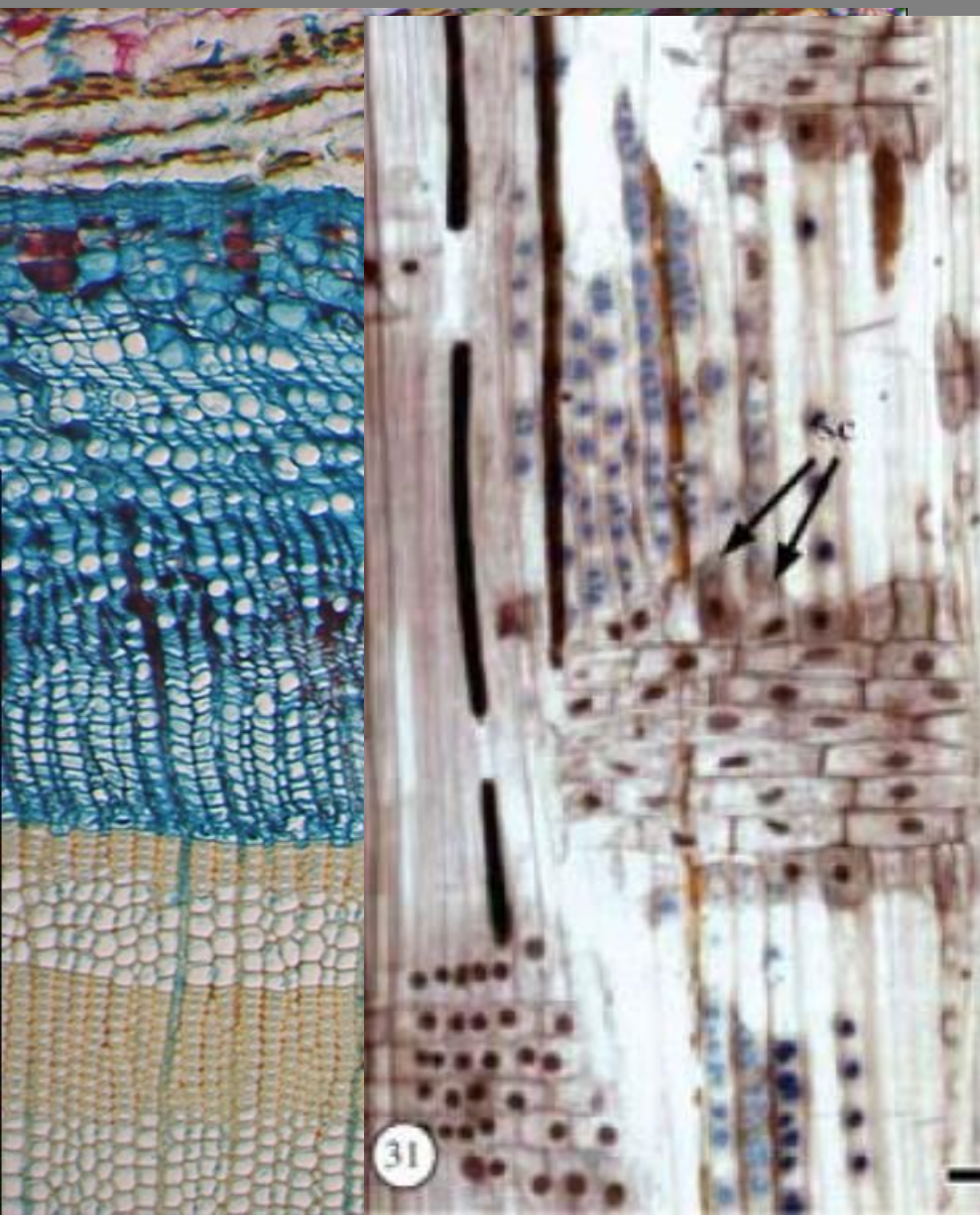
FIGURE 4.5 Conductive cells of vascular plants: sieve elements. A. Types of sieve elements. B,C. Sieve tube members.

Floema de “Gimnospermas”: células crivadas

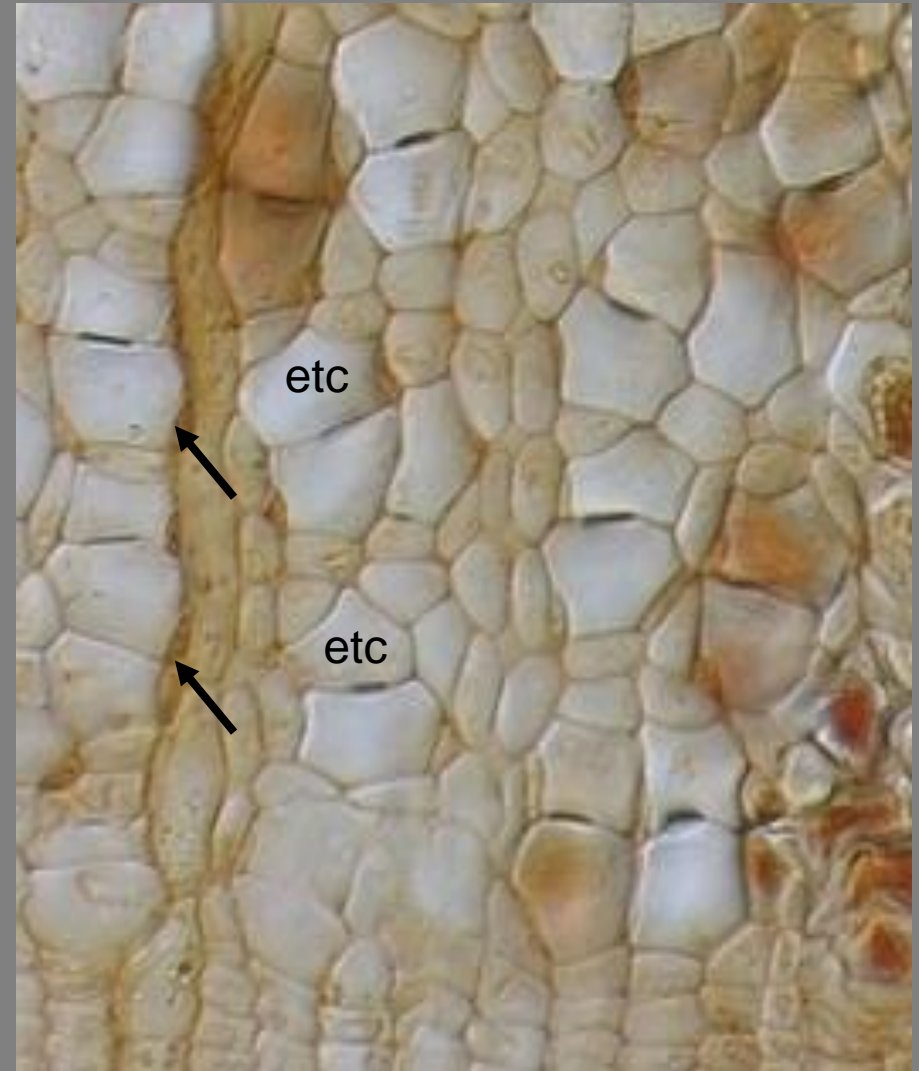
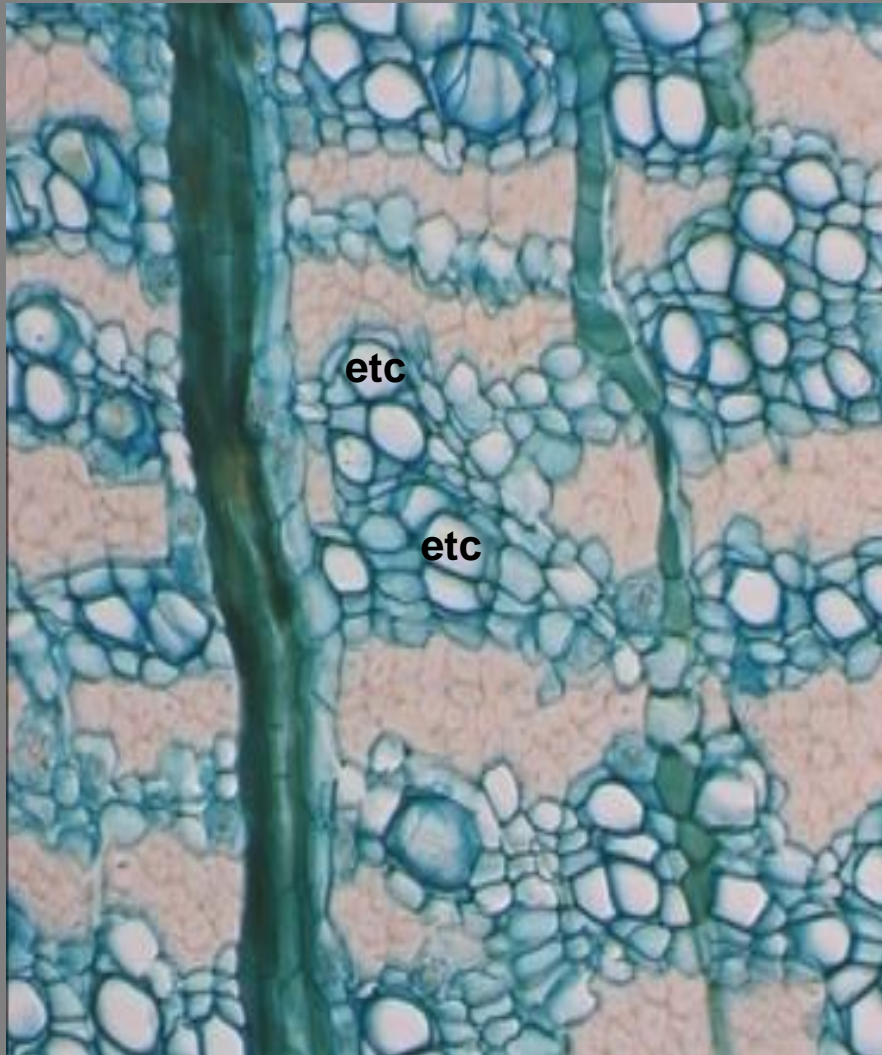
+
célula de Strasburger



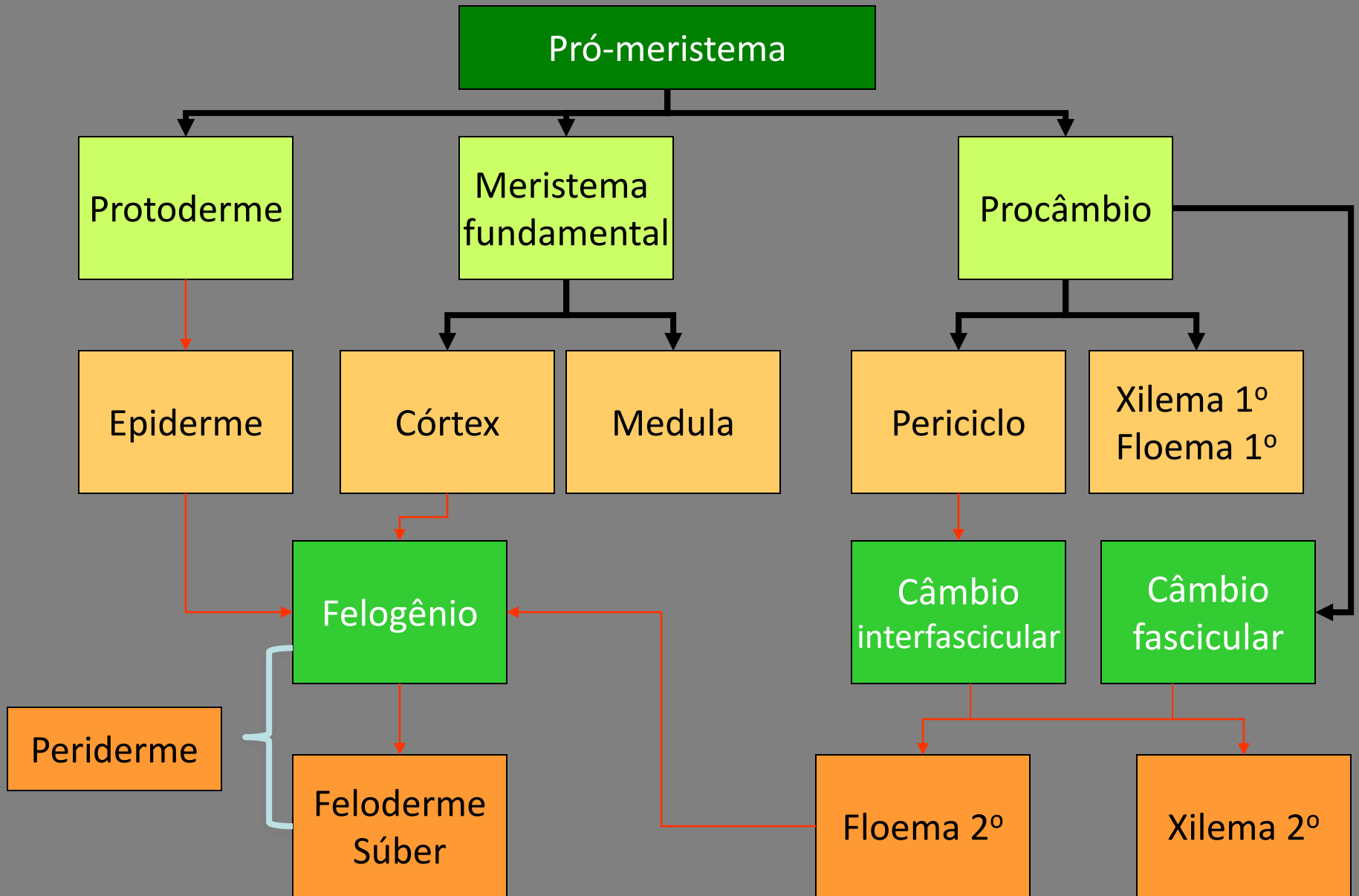
Floema de "Gimnospermas": células crivadas + célula de Strasburger



Floema de Angiospermas: elementos de tubo crivado (+ célula companheira)



Corpo secundário da planta



LIGNÓFITAS ou Plantas Lenhosas

ESPERMATÓFITAS/ Plantas com sementes ou LIGNÓFITAS

“Gimnospermas”

ANGIOSPERMAS

Plantas com
flores e frutos

Cicadófitas Ginkgófitas Pinófitas Gnetófitas

*Archaeopteris**

*Aneurófitas**

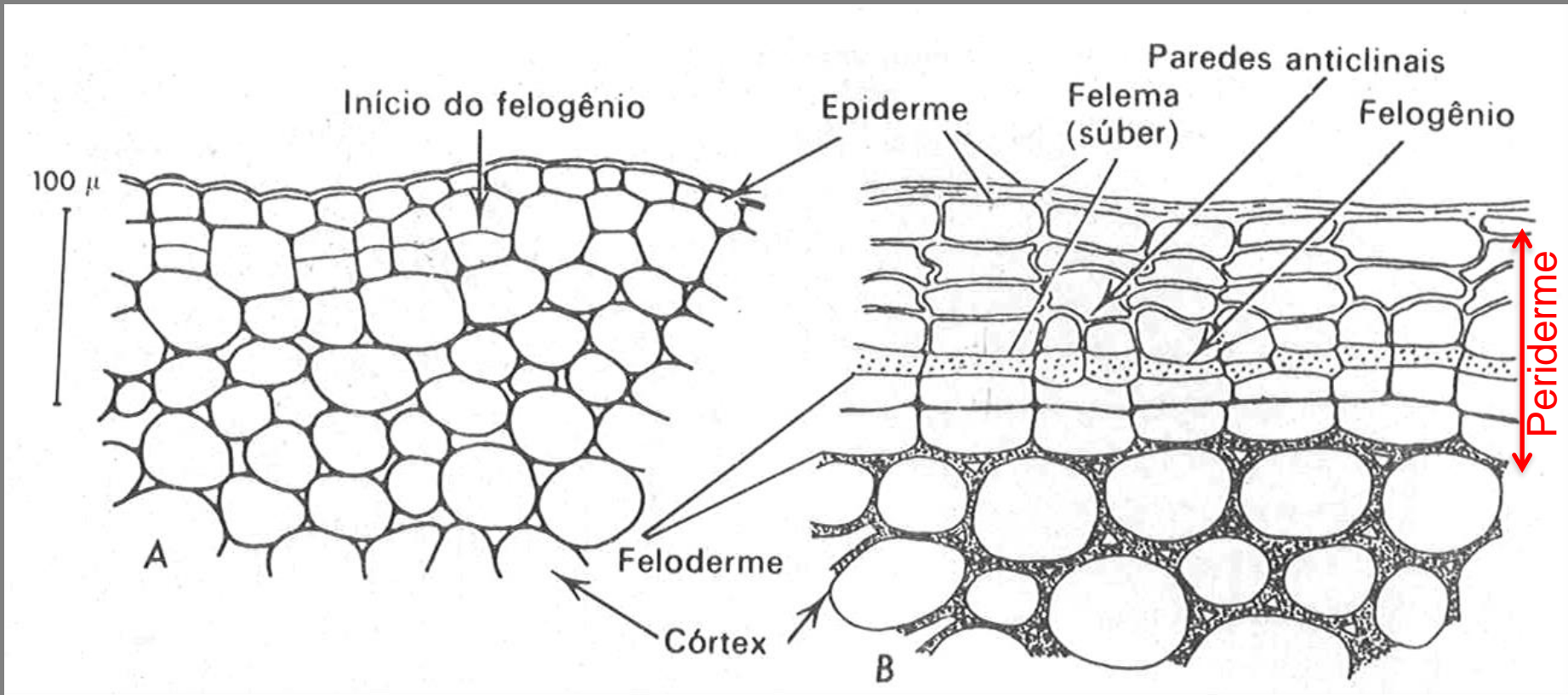
*Extintos

Baseado em Judd *et al.* 2008,
Raven *et al.* 2007 e
Simpson *et al.* 2006

— Câmbio vascular

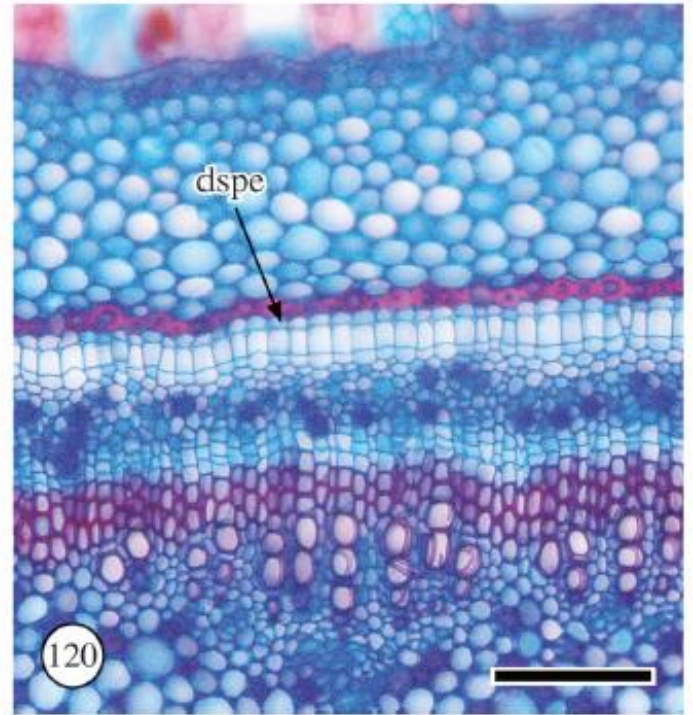
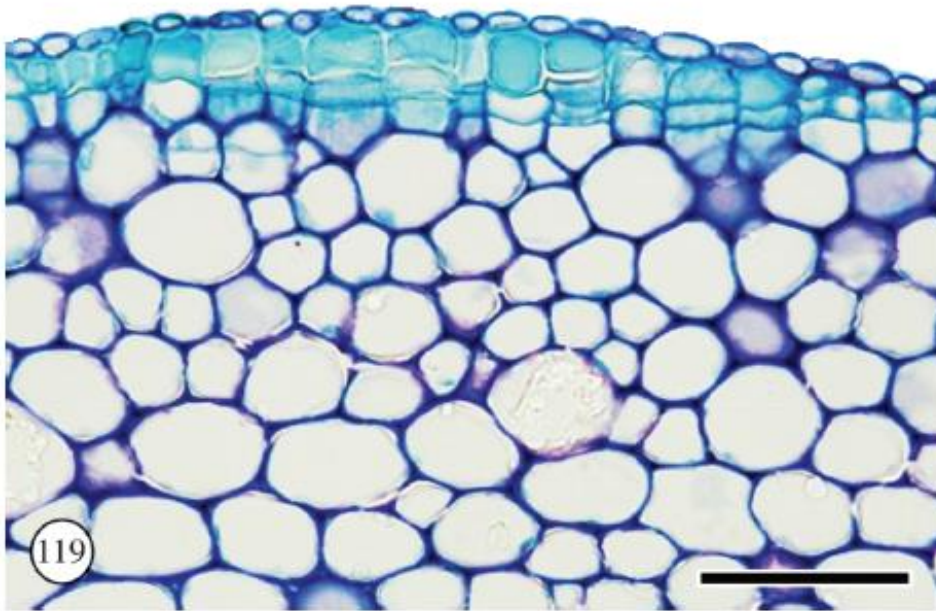
— Câmbio da casca = felogênio

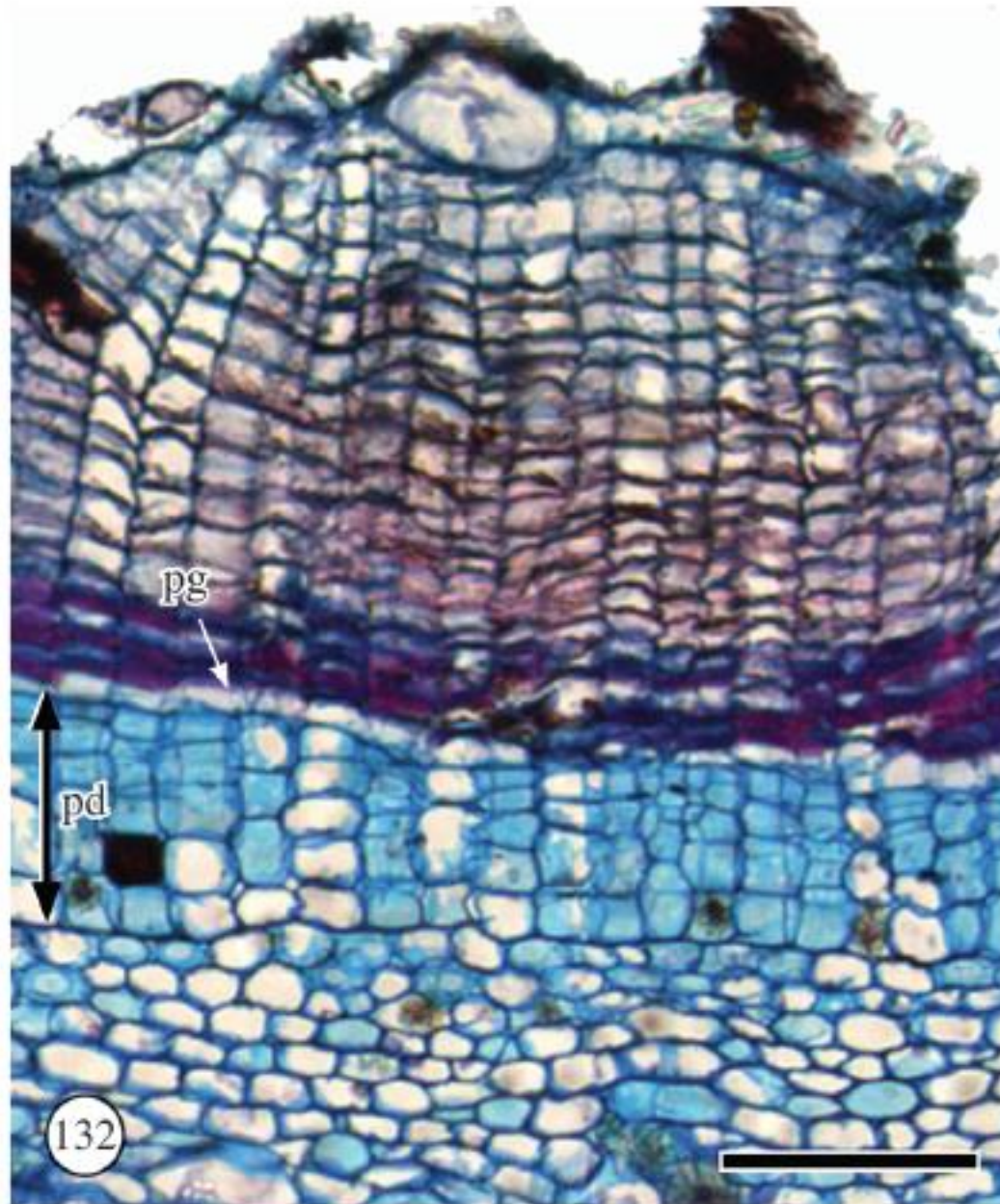
Felogênio dá origem à periderme

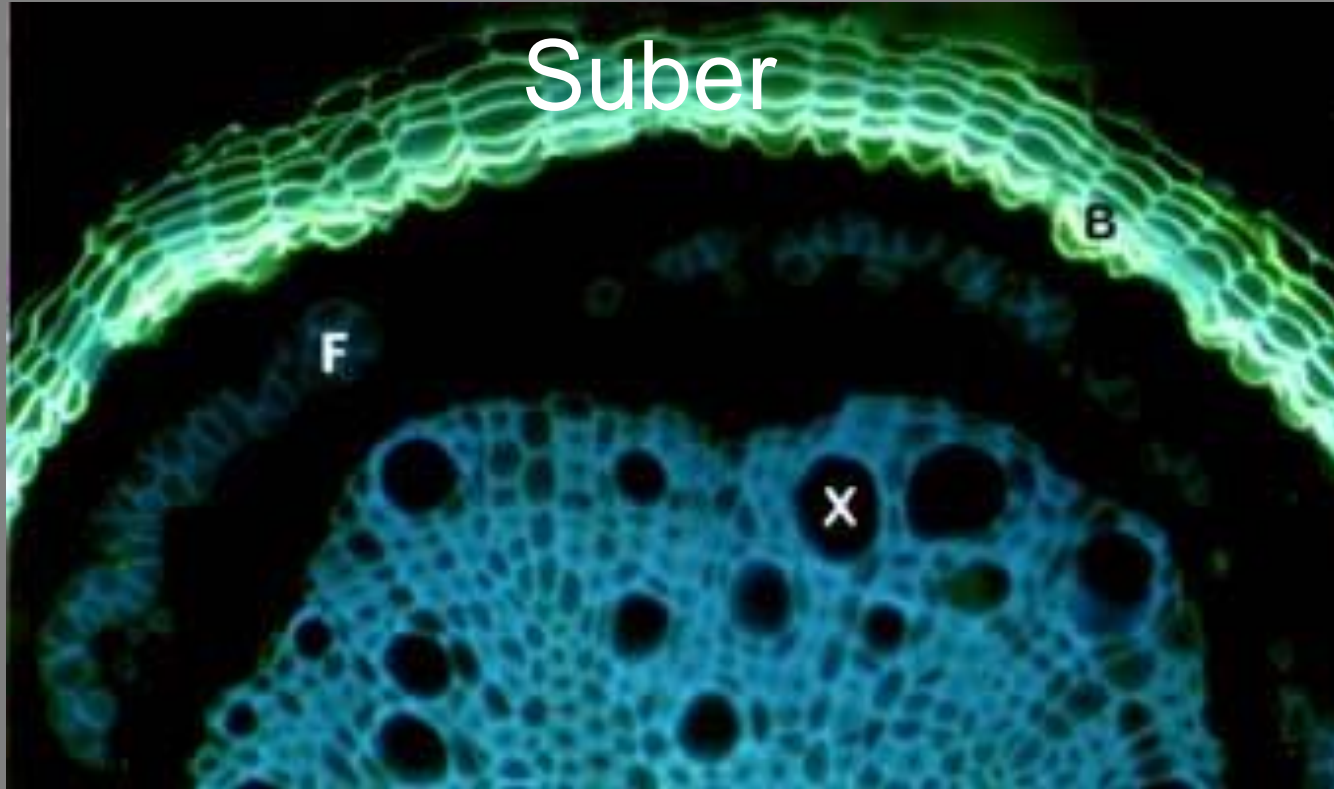


(Esau 1974)

Felogênio = câmbio da casca





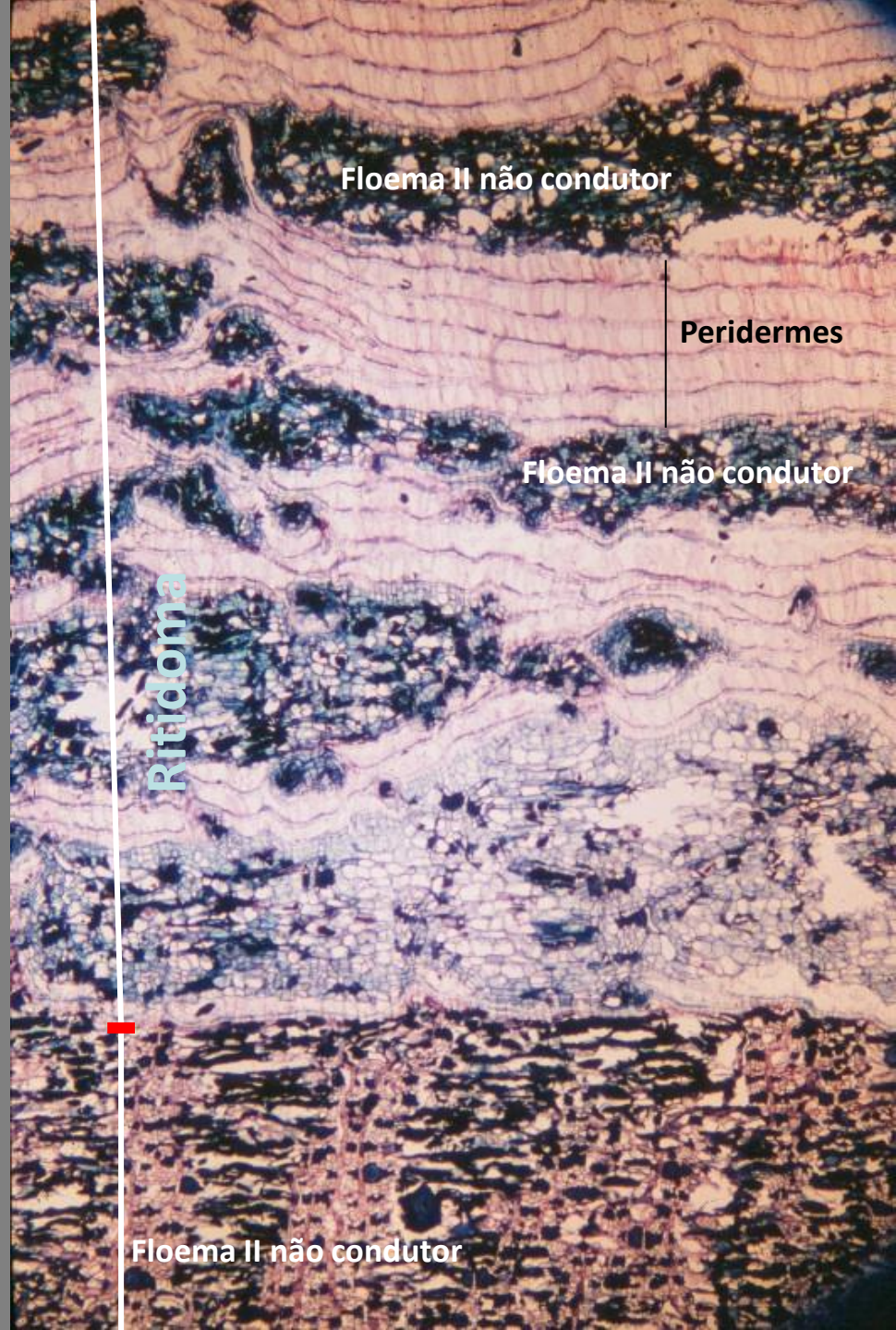
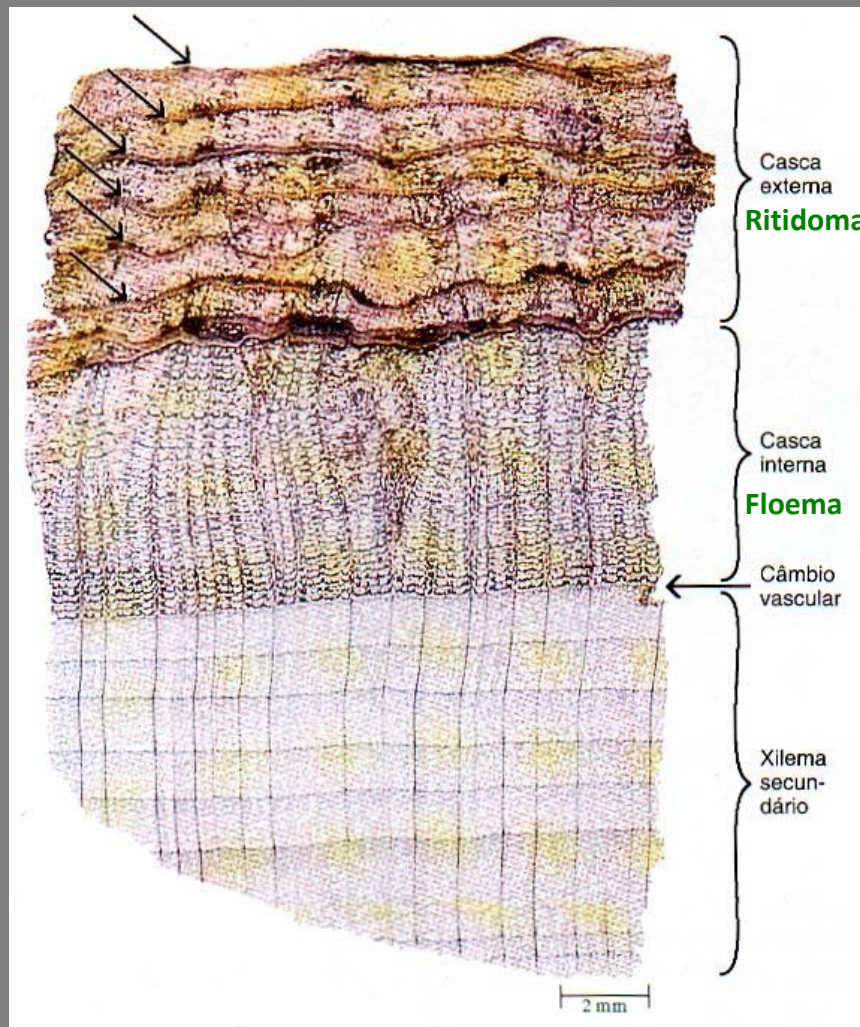


Periderme

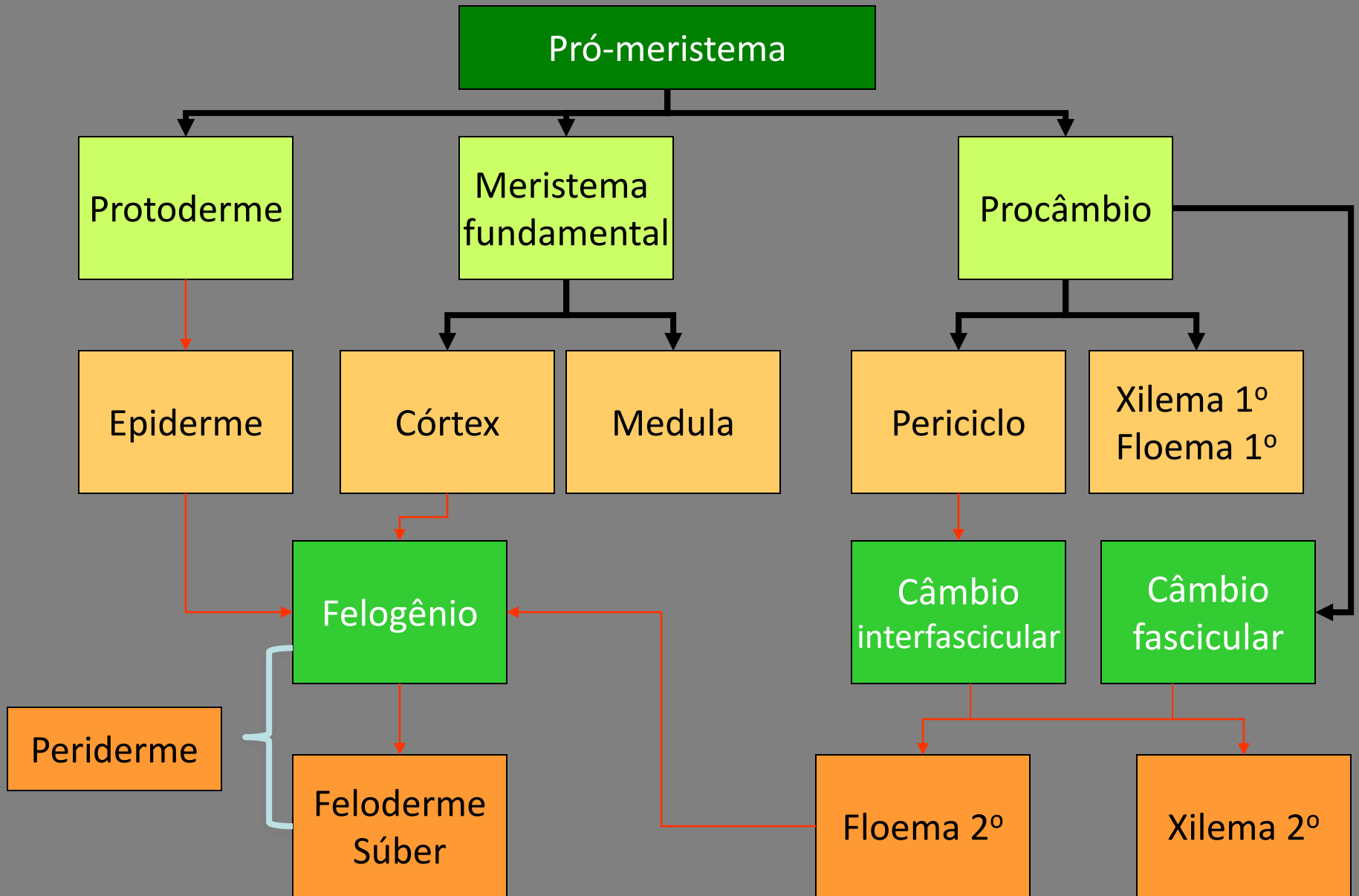
Súber



Periderme/Ritidoma



Corpo secundário da planta

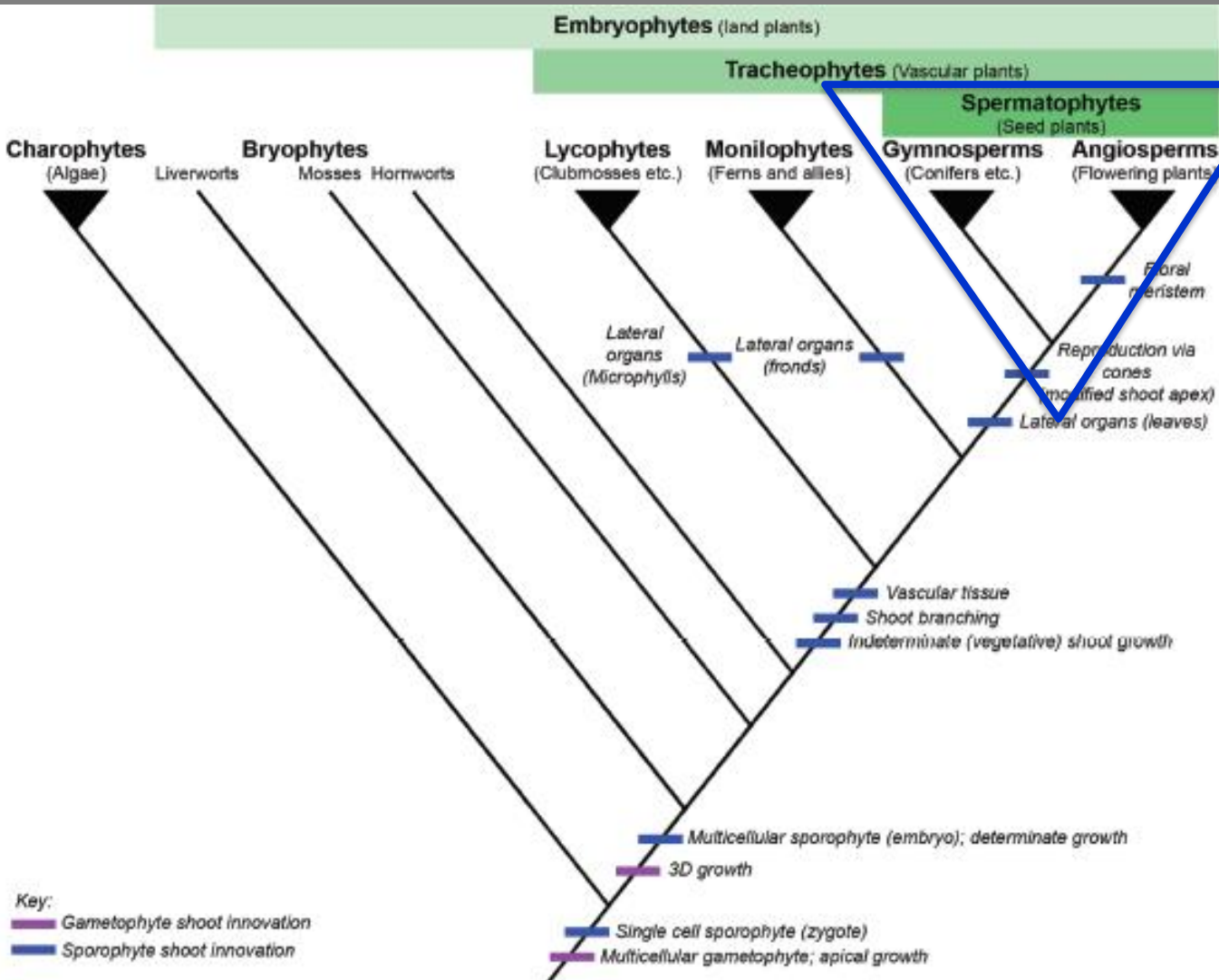


Jardim Paleobotânico, Formação Mata, Mata-RS araucarias de 220 Ma



Arizona EUA - *Petrified Forest National Park*





Embriófitas
 Traqueófitas
 Licófitas
 Monilófitas
 Traqueófitas
 Lignófitas

Espermatófitas
 Gimnospermas
 Antófitas=
 Angiospermas