

The background of the slide is a composite of two microscopic images of plant tissue. The left side shows a longitudinal section of a stem, revealing the layered structure of the cortex, pith, and vascular bundles. The right side shows a transverse section of a stem, highlighting the vascular bundles arranged in a ring, with large xylem vessels and smaller phloem elements.

PAREDE CELULAR E TECIDOS FUNDAMENTAIS

BIB 313

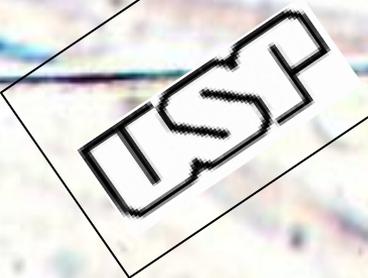
**Morfologia e Anatomia Comparadas de
Plantas Vasculares**

Prof Dr. Gregório Ceccantini

USP Universidade de São Paulo

Célula vegetal

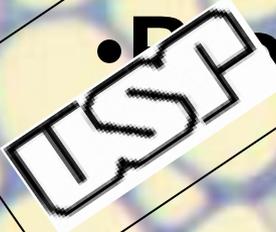
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Como reconhecer células e tecidos?



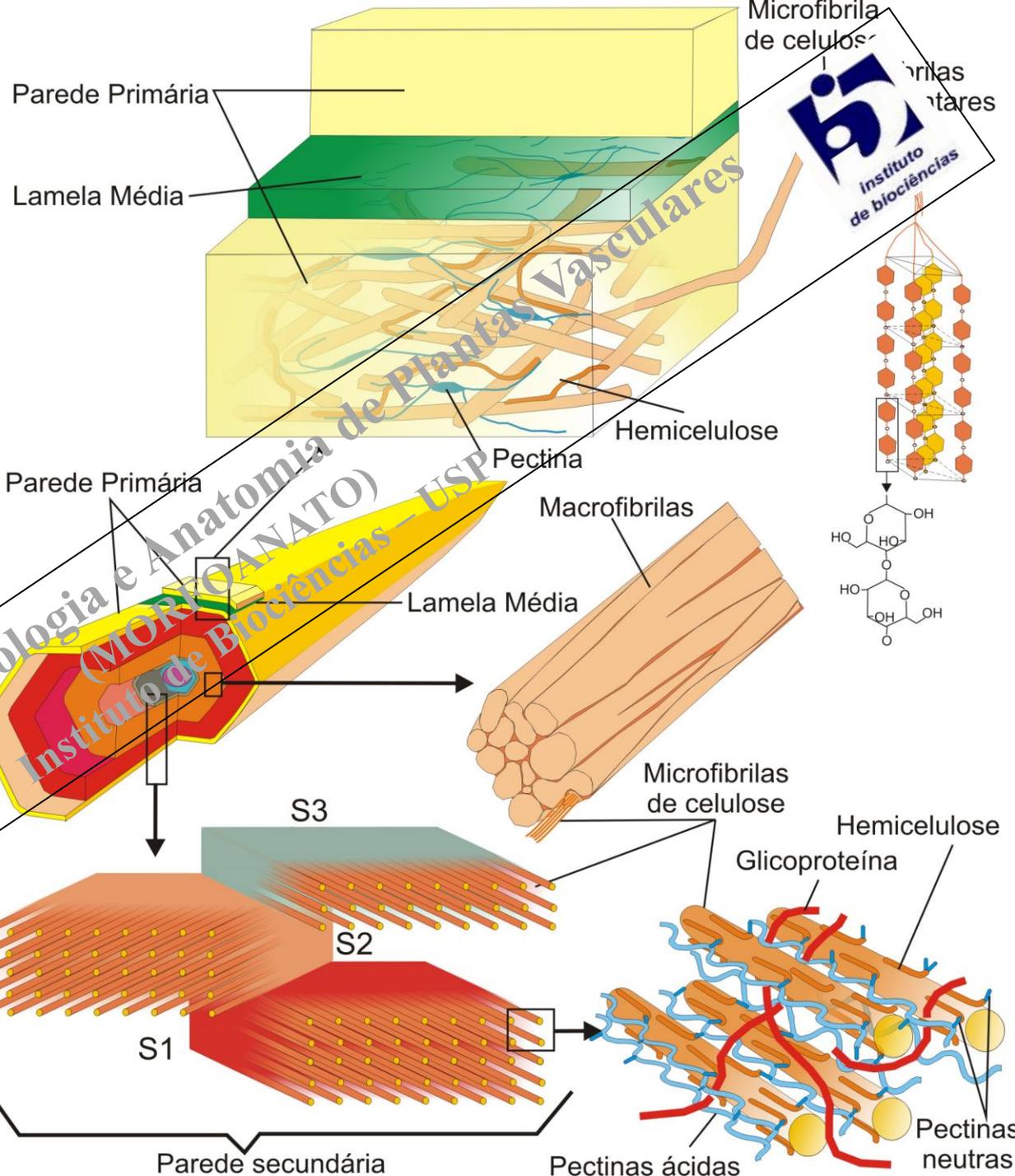
- Características da parede
- Morfologia: Forma, espessura, posição, comunicações
- Propriedades químicas da parede
- Propriedades físicas da parede



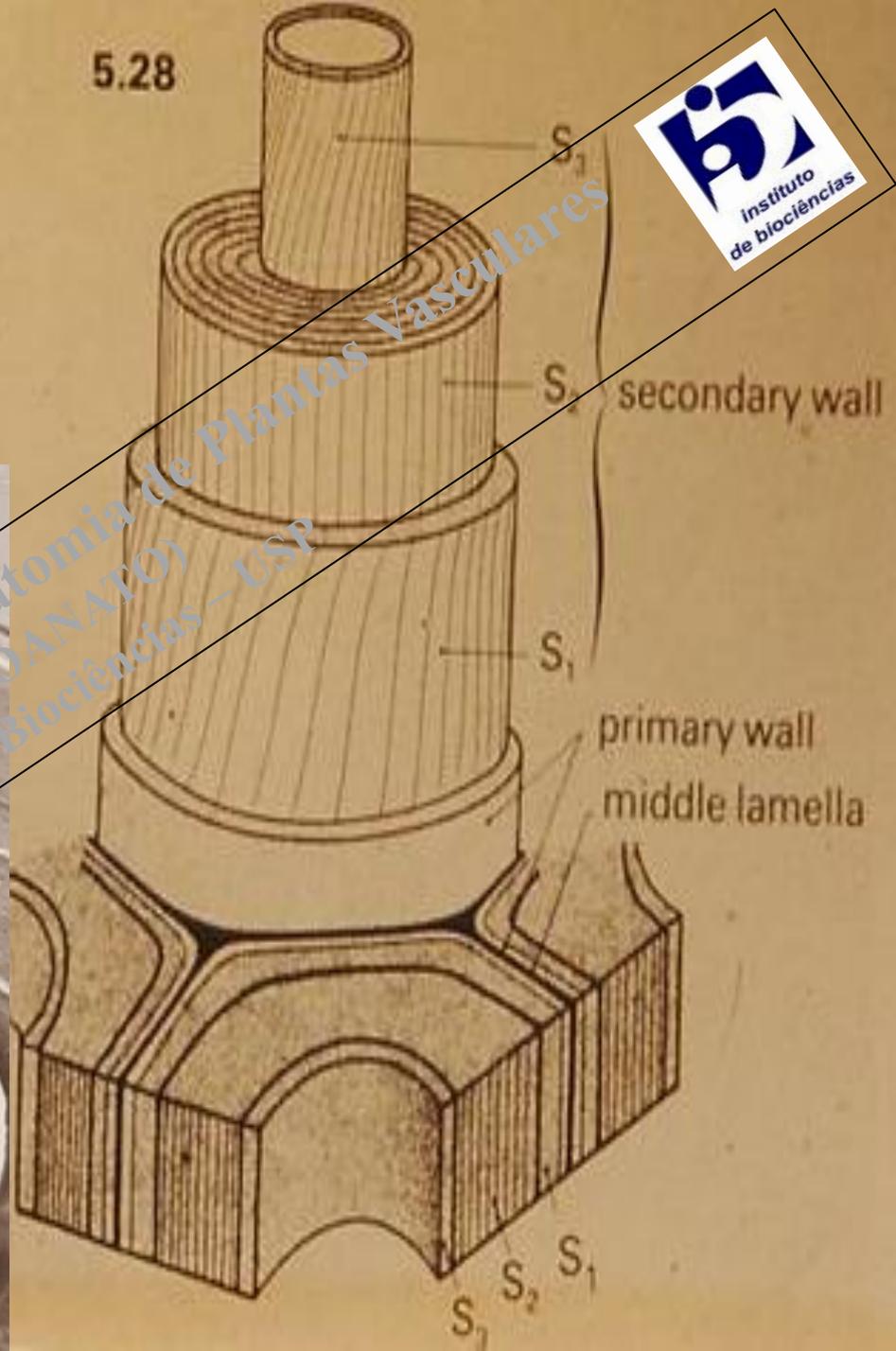
Célula vegetal - parede

- **Célula = parede + protoplasto**
 - Protoplasto = membrana + citoplasma + organelas
- **Parede – várias camadas**
 - **Parede primária - permite crescimento**
 - Celulose + hemicelulose + pectinas + proteínas
 - Fibrilas desorientadas
 - Campo de pontoação primária com plasmodesmas
 - Plasmodesmas com pontes de membrana e citoplasma
 - **Parede secundária**
 - Celulose + hemicelulose + pectina + **lignina**
 - 3 camadas S_1 , S_2 , S_3
 - Fibrilas paralelas e alternadas
 - **PONTOAÇÃO**

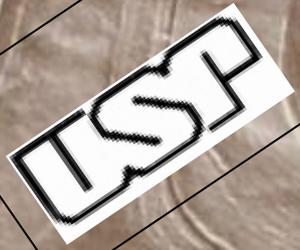
Parede



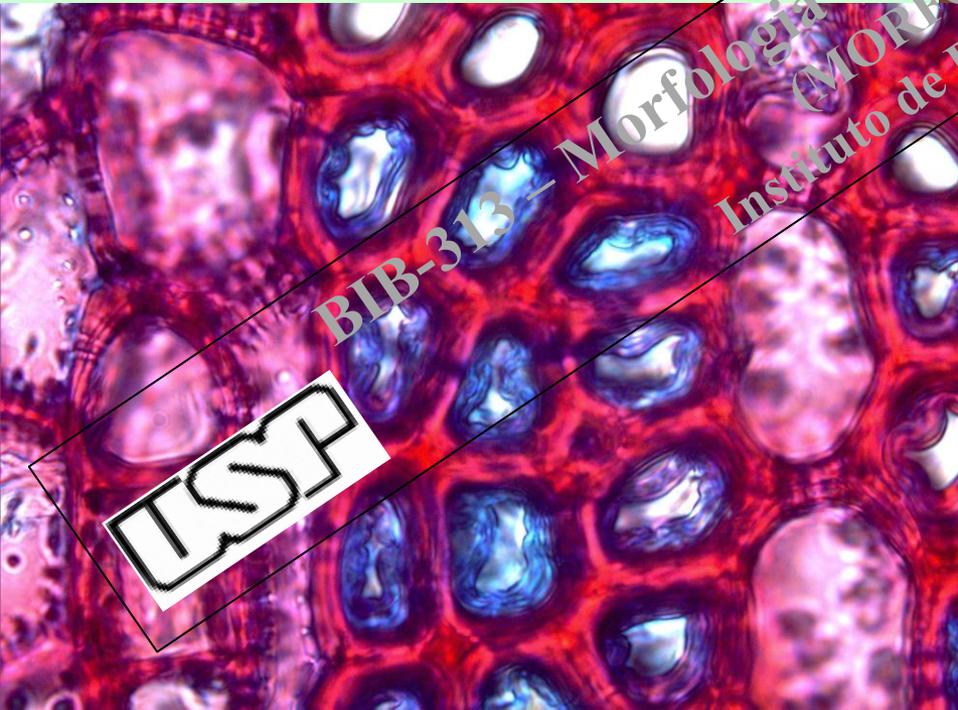
Camadas da Parede



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Parede terciária

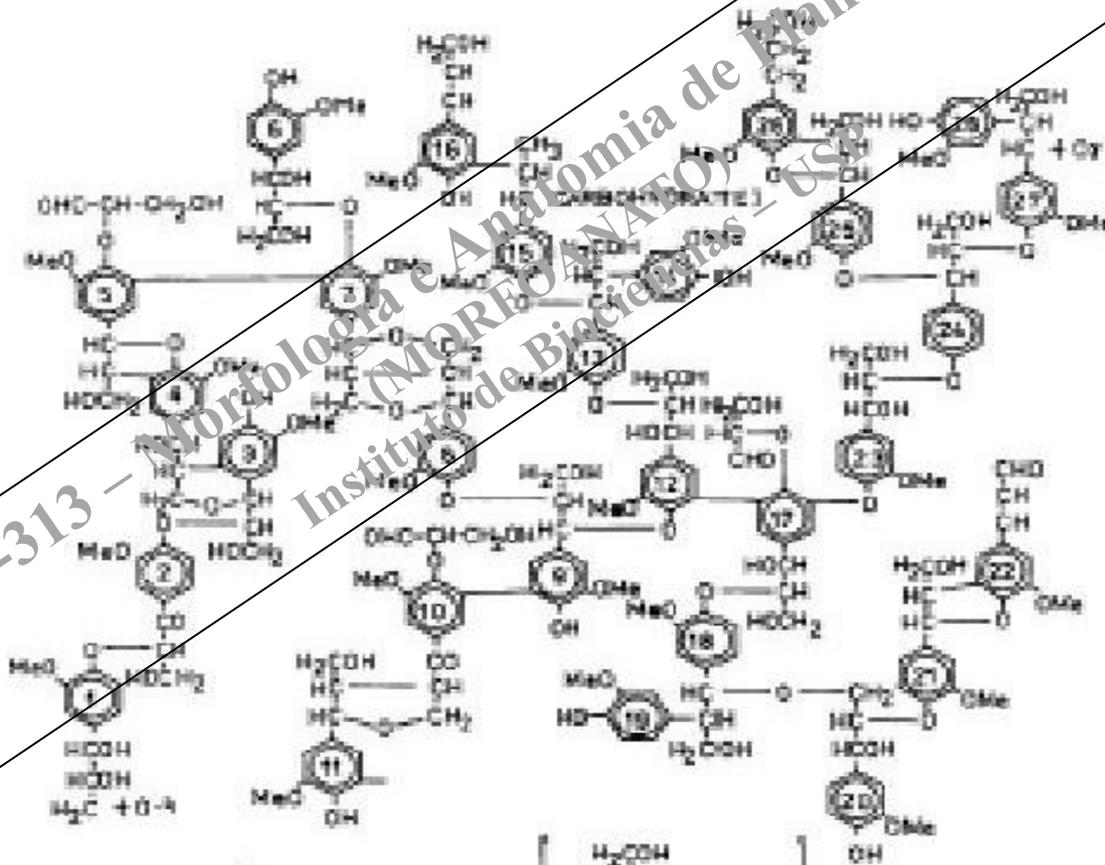


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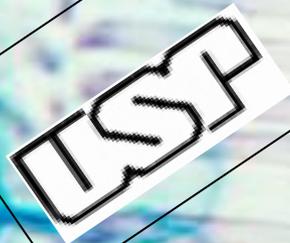
Lignina

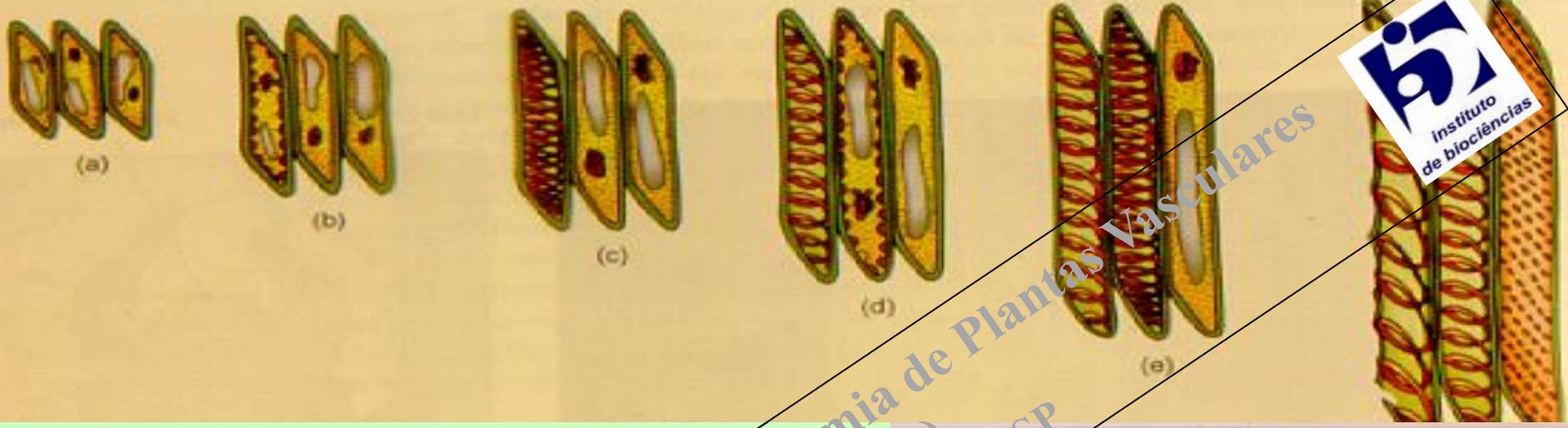
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Espessamentos de parede

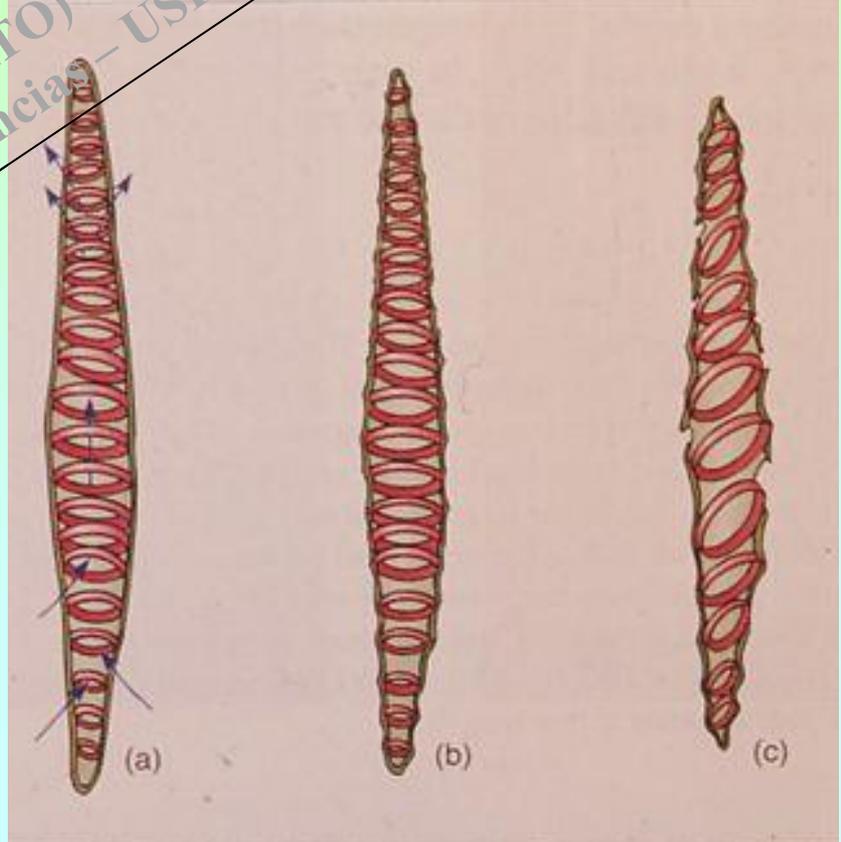
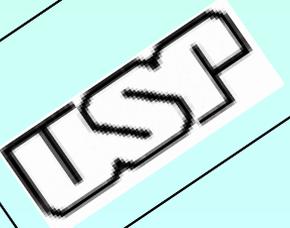
- Anelar – anéis de parede
- Helicoidal ou espiralado
- Escalariforme
- Reticulado
- Pontado





Espessamentos de parede

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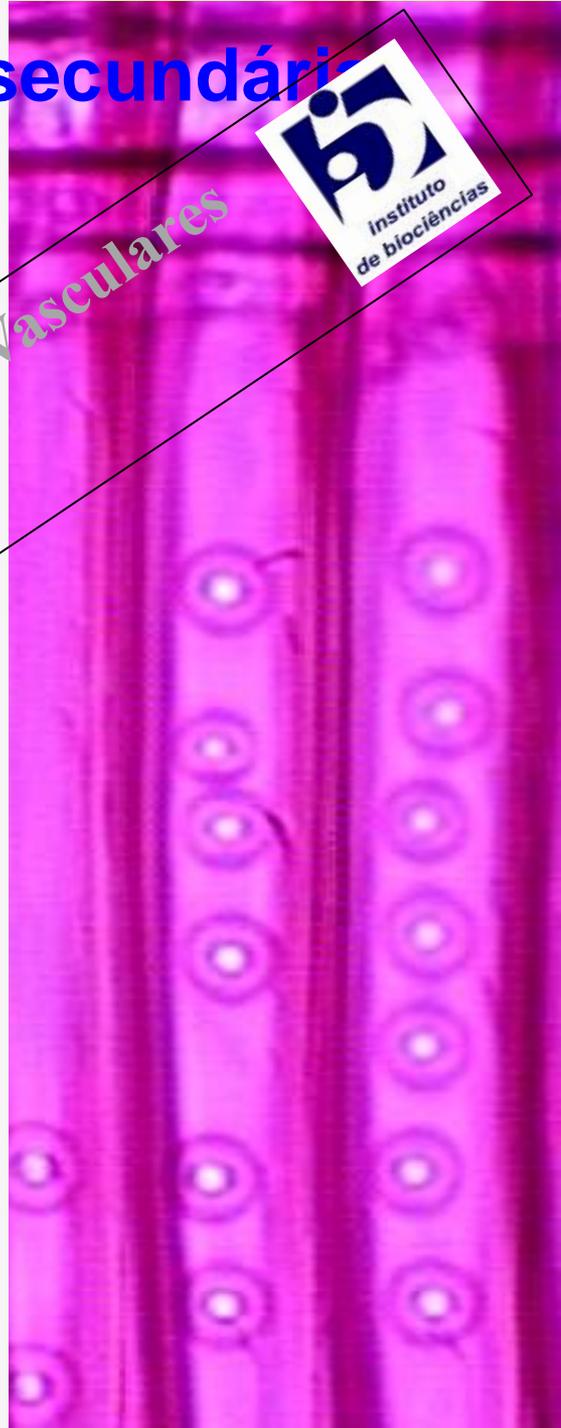
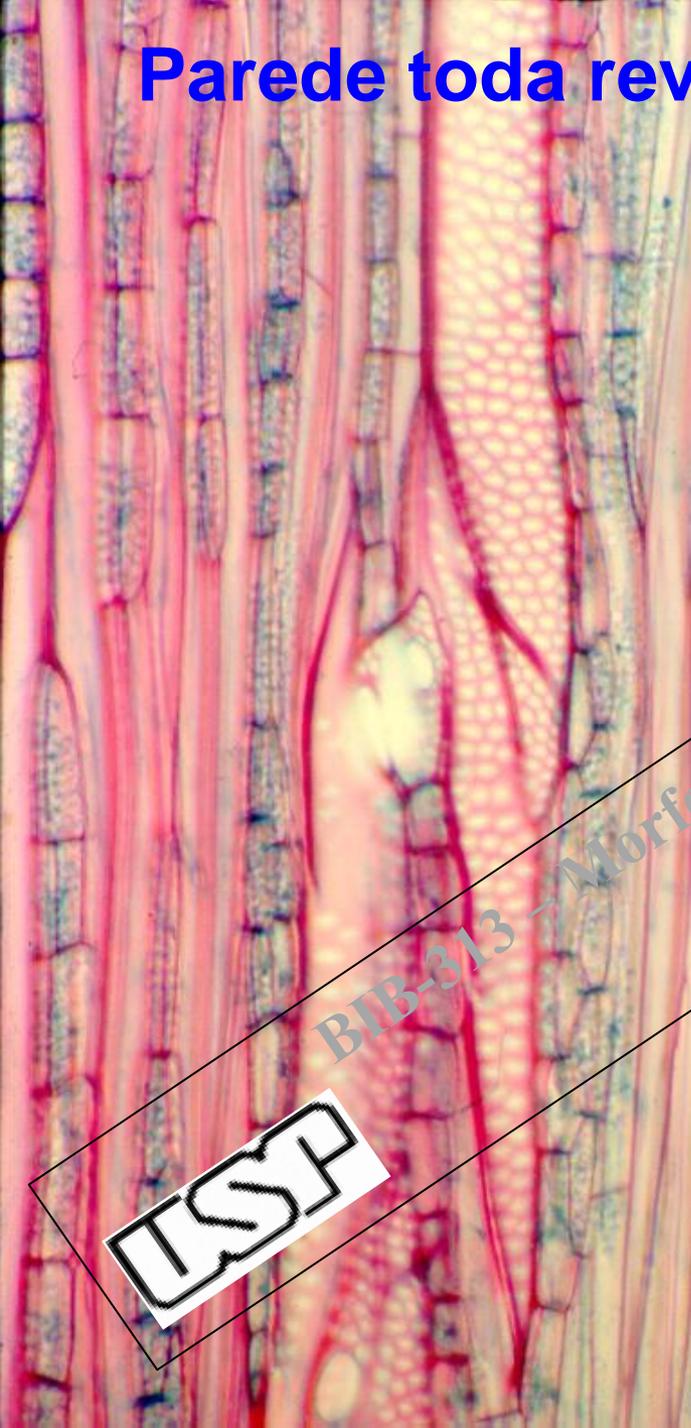


Espessamentos de parede

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Parede toda revestida de camada secundária



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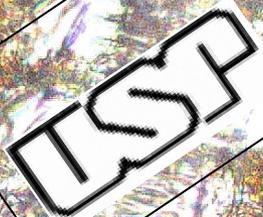
USP

instituto
de biociências

Reagente Sudan III substâncias lipídicas



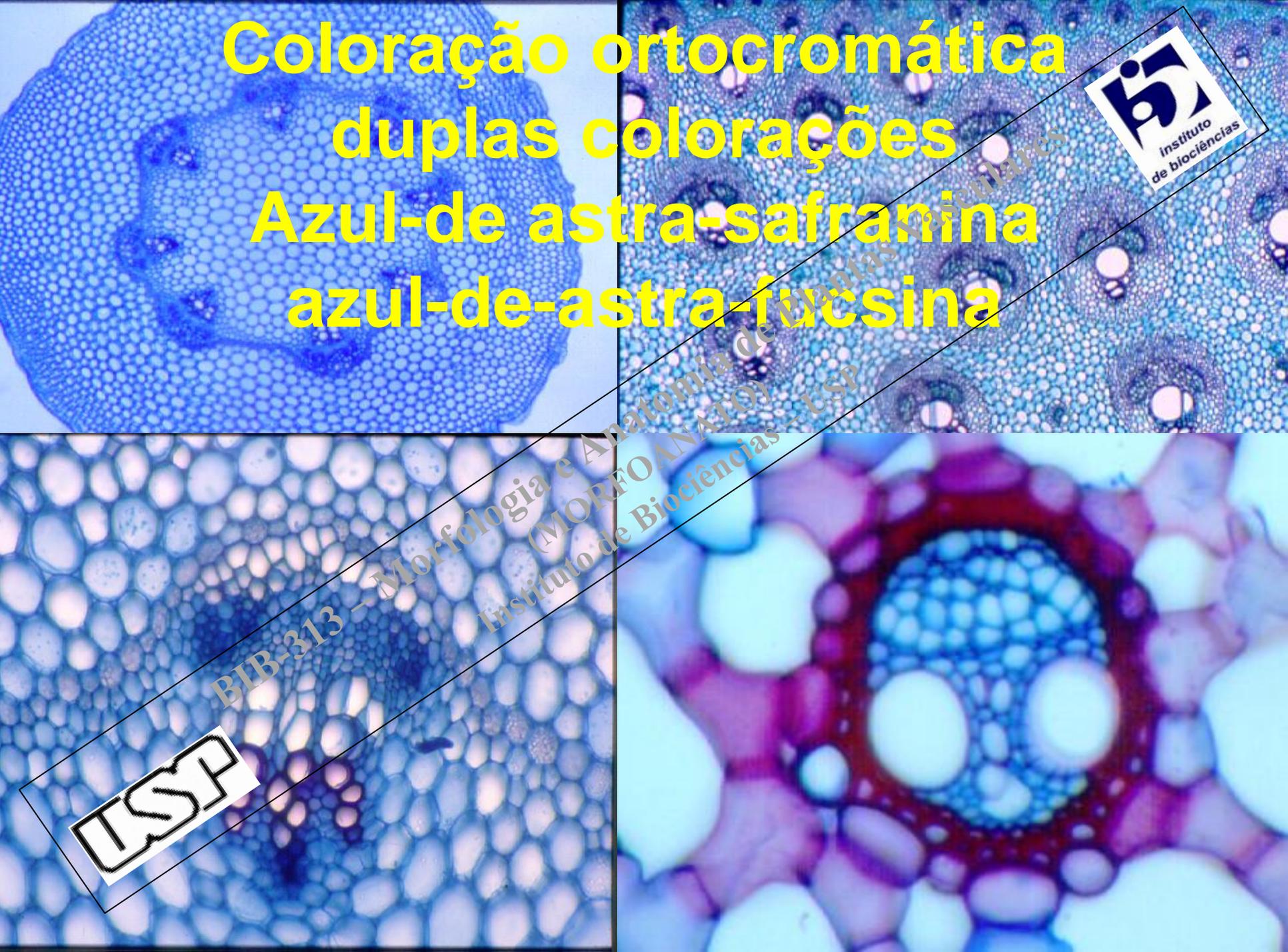
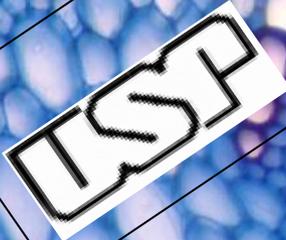
BIB 211 - Morfologia e Anatomia de Plantas Vasculares
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Instituto de Biociências - USP



Coloração ortocromática duplas colorações Azul-de astra-safranina azul-de-astra-fucsina



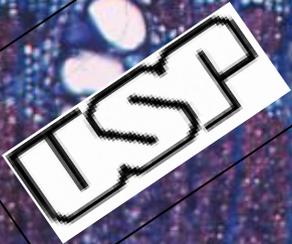
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Coloração ortocromática duplas colorações Azul-de-astra/safranina acridinas



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Coloração ortocromática duplas colorações orange-G/violeta-cristal



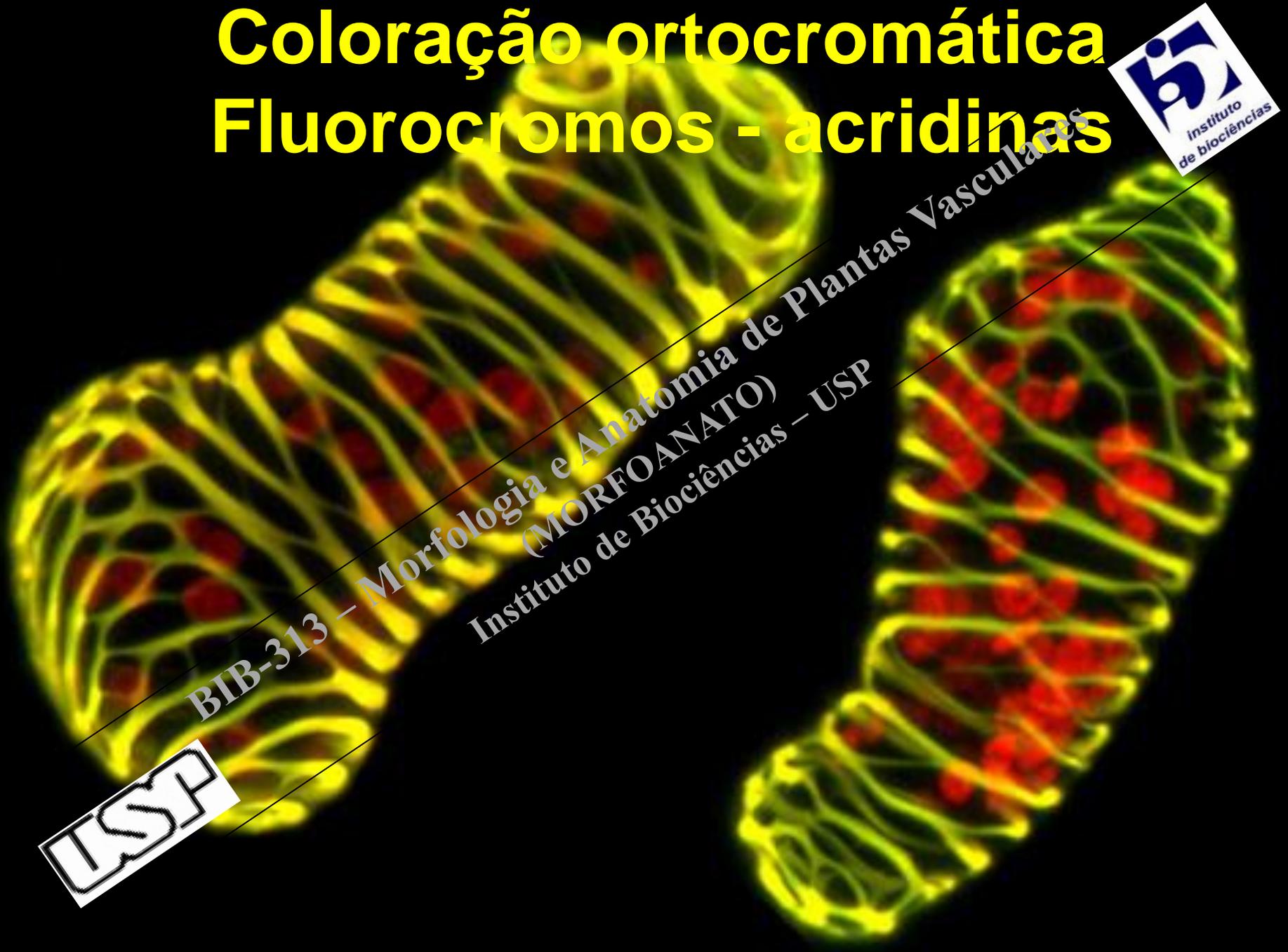
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Coloração ortocromática Fluorocromos - acridinas



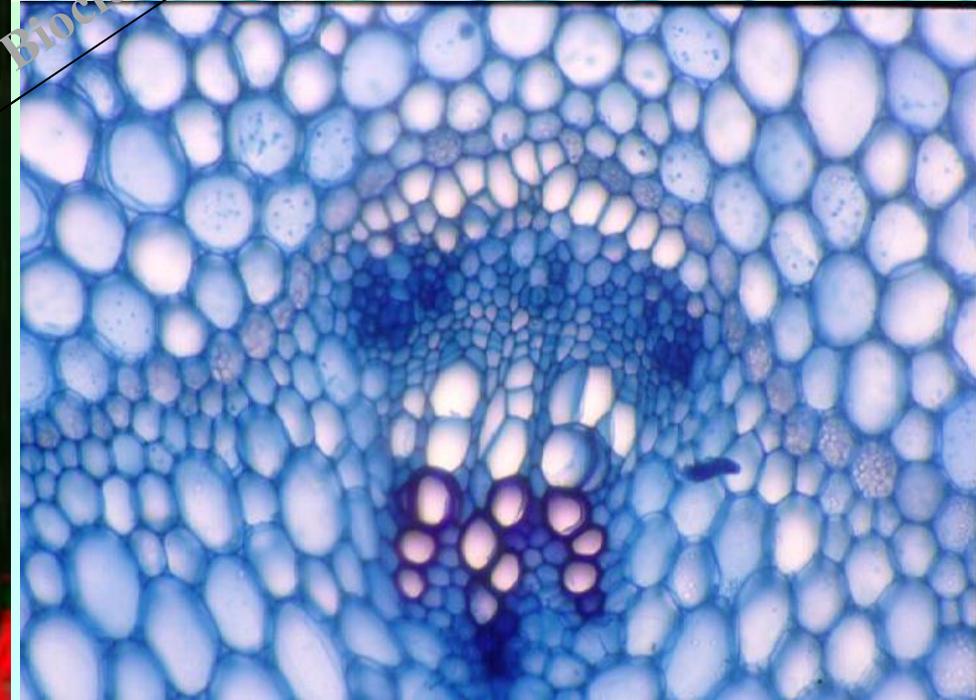
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Fluorocromo específico x difusão de corante coloração inespecífica



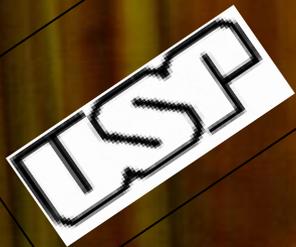
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Coloração inespecífica x específica



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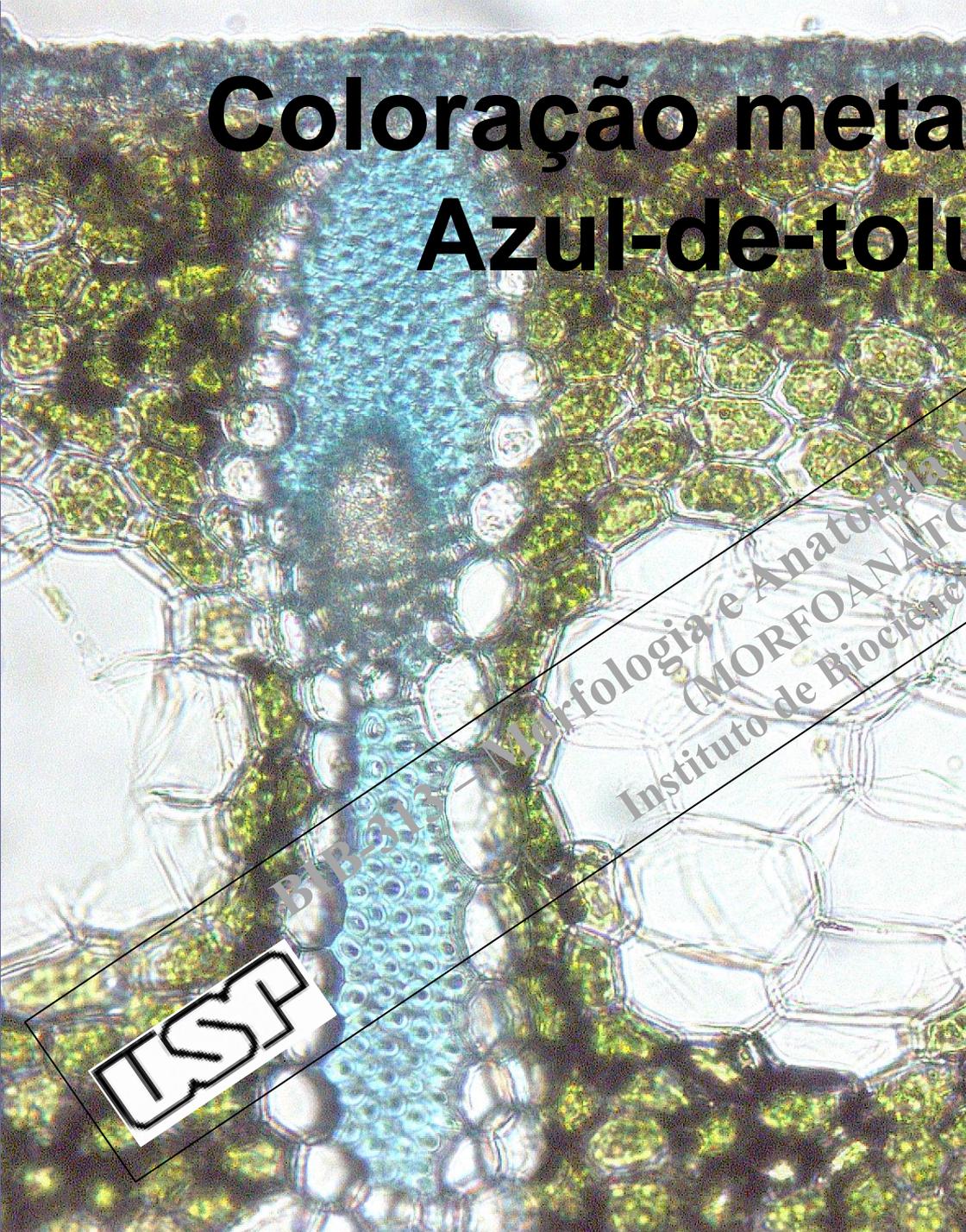
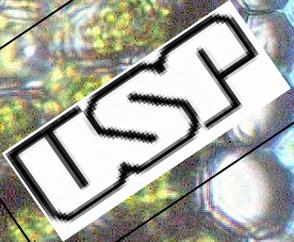
Lacmóide - calose

Azul-de-astra/safranina

Coloração metacromática Azul-de-toluidina

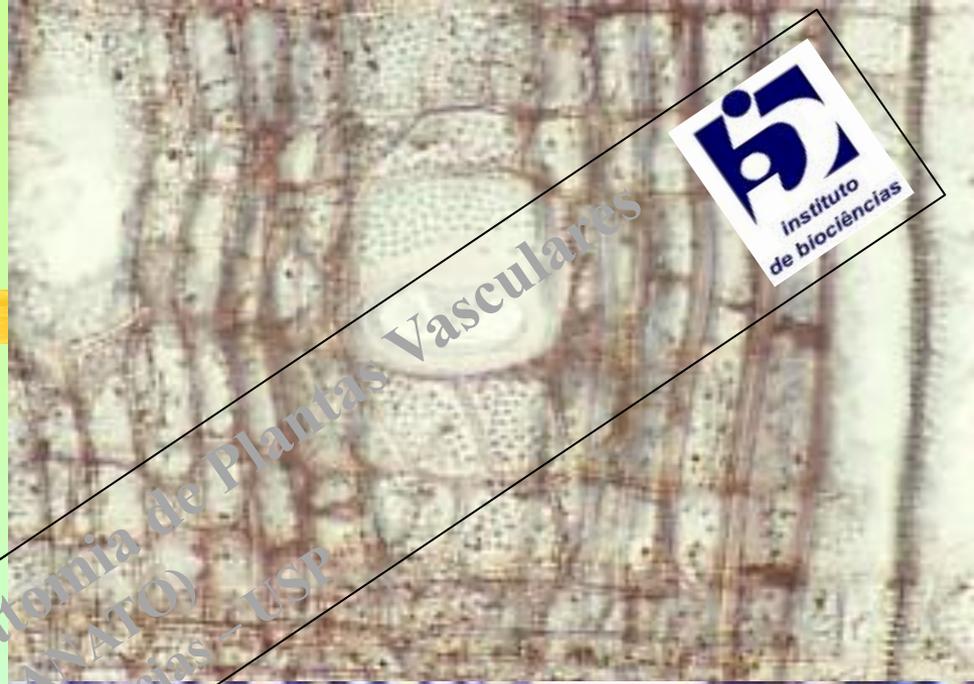


BIBCA - Bibliografia em Morfologia e Anatomia de Plantas Vasculares
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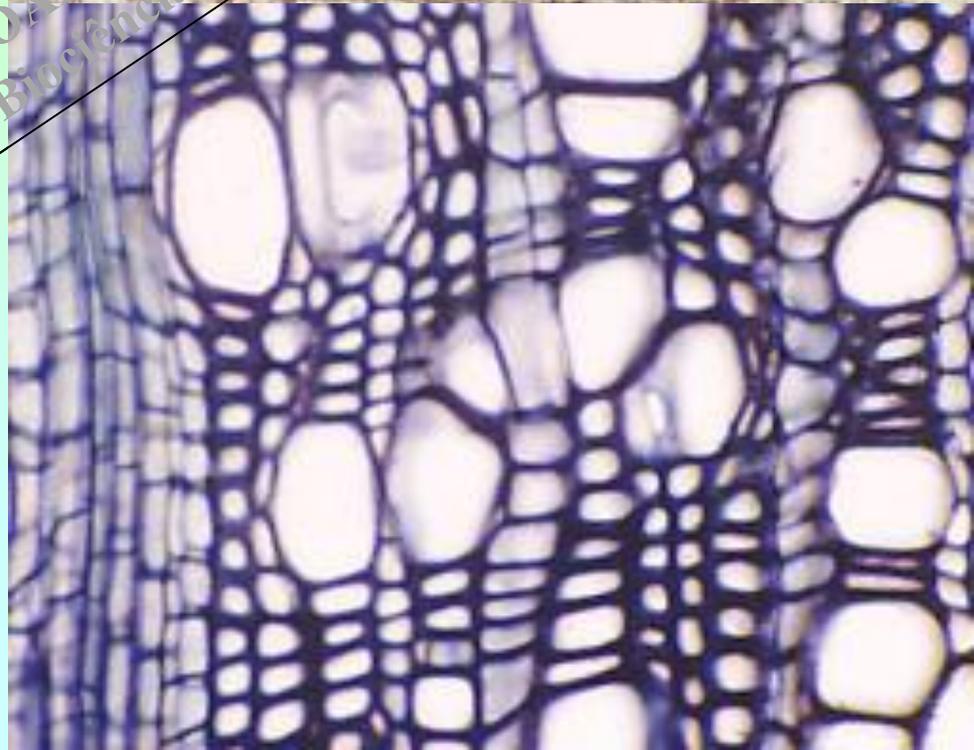
Coloração metacromática

hematoxilina e mordentes



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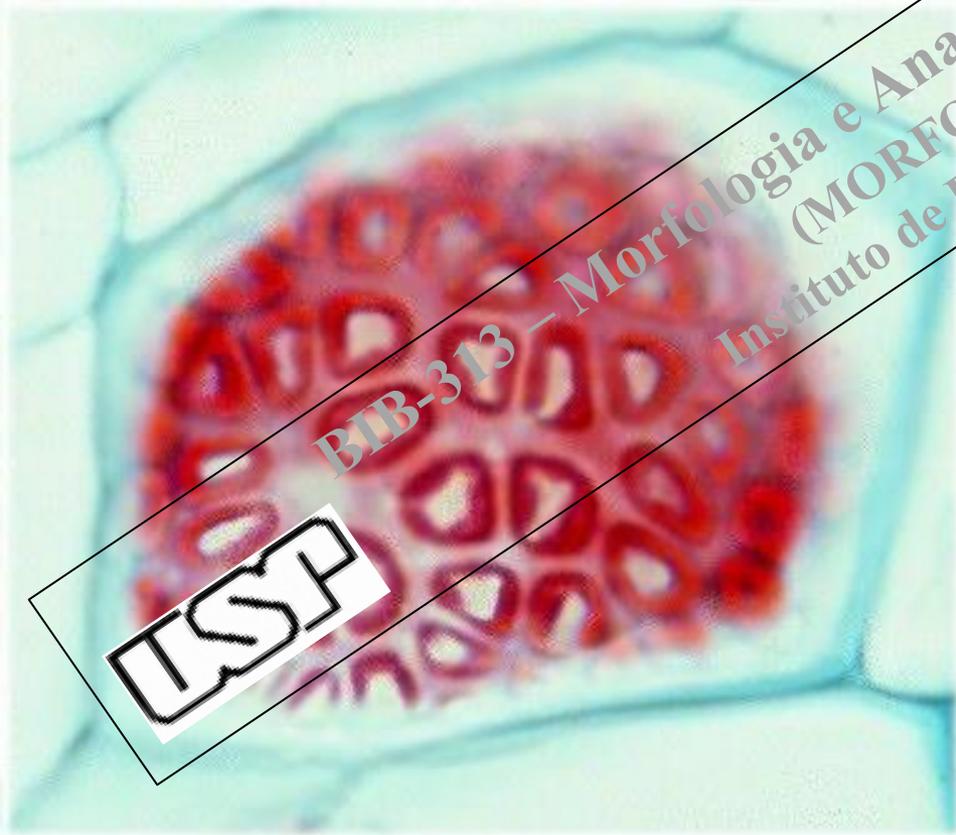
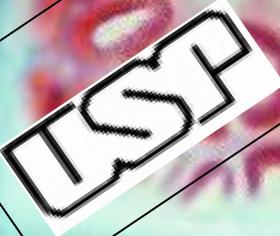
USP



Refringência – IR diferentes



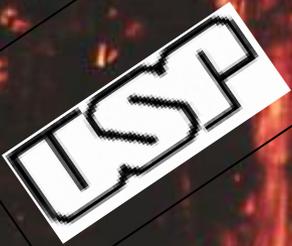
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Birrefringência

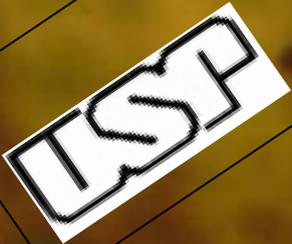


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Autofluorescência

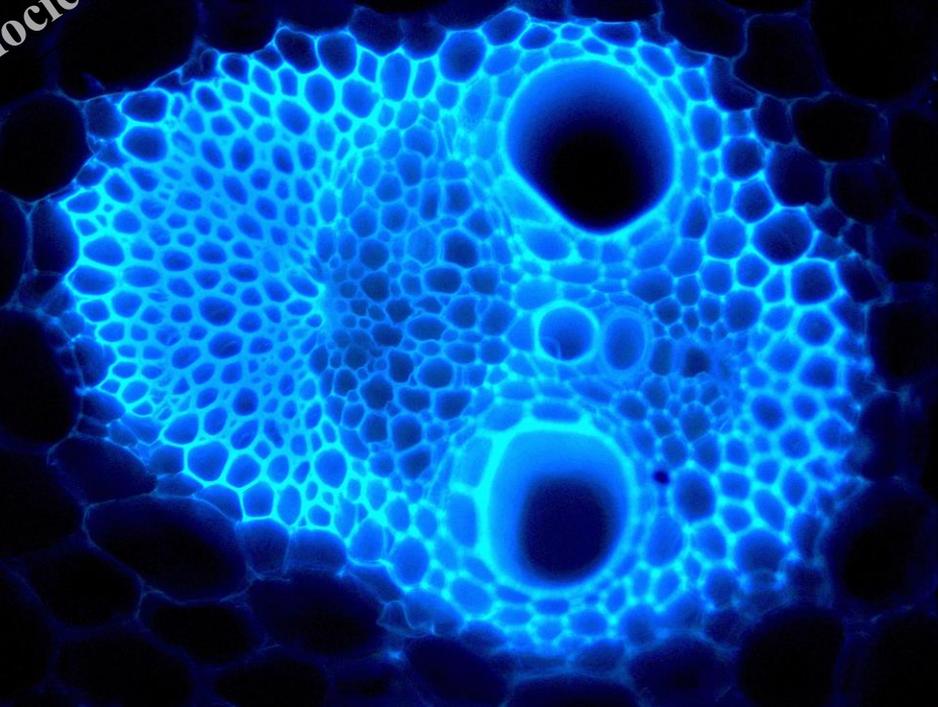
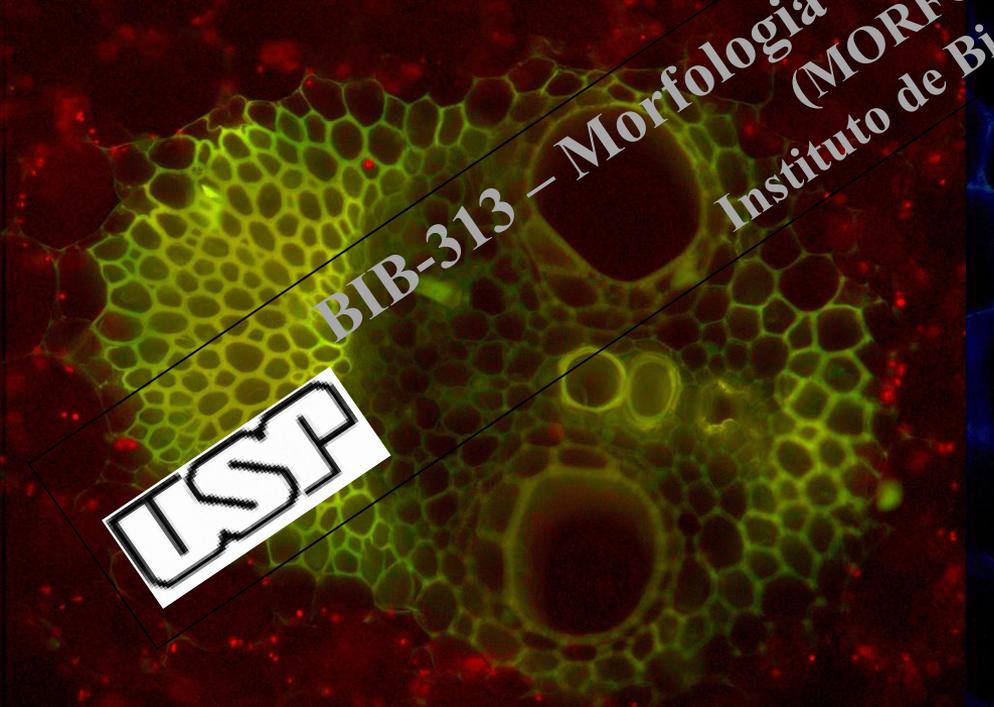
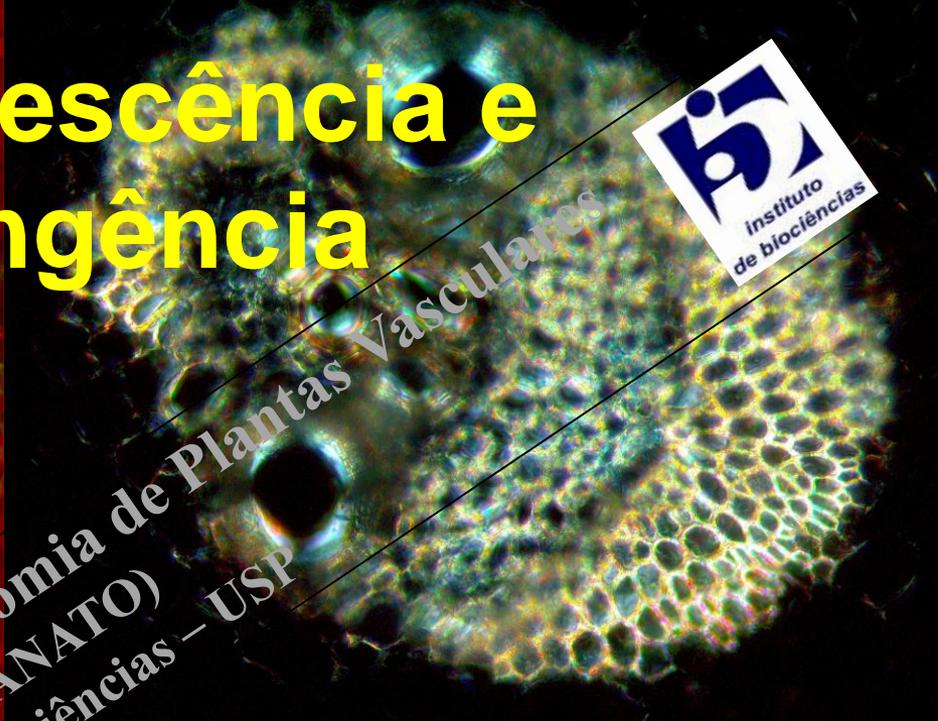
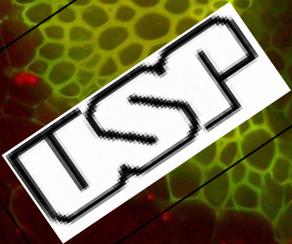
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Autofluorescência e birrefringência



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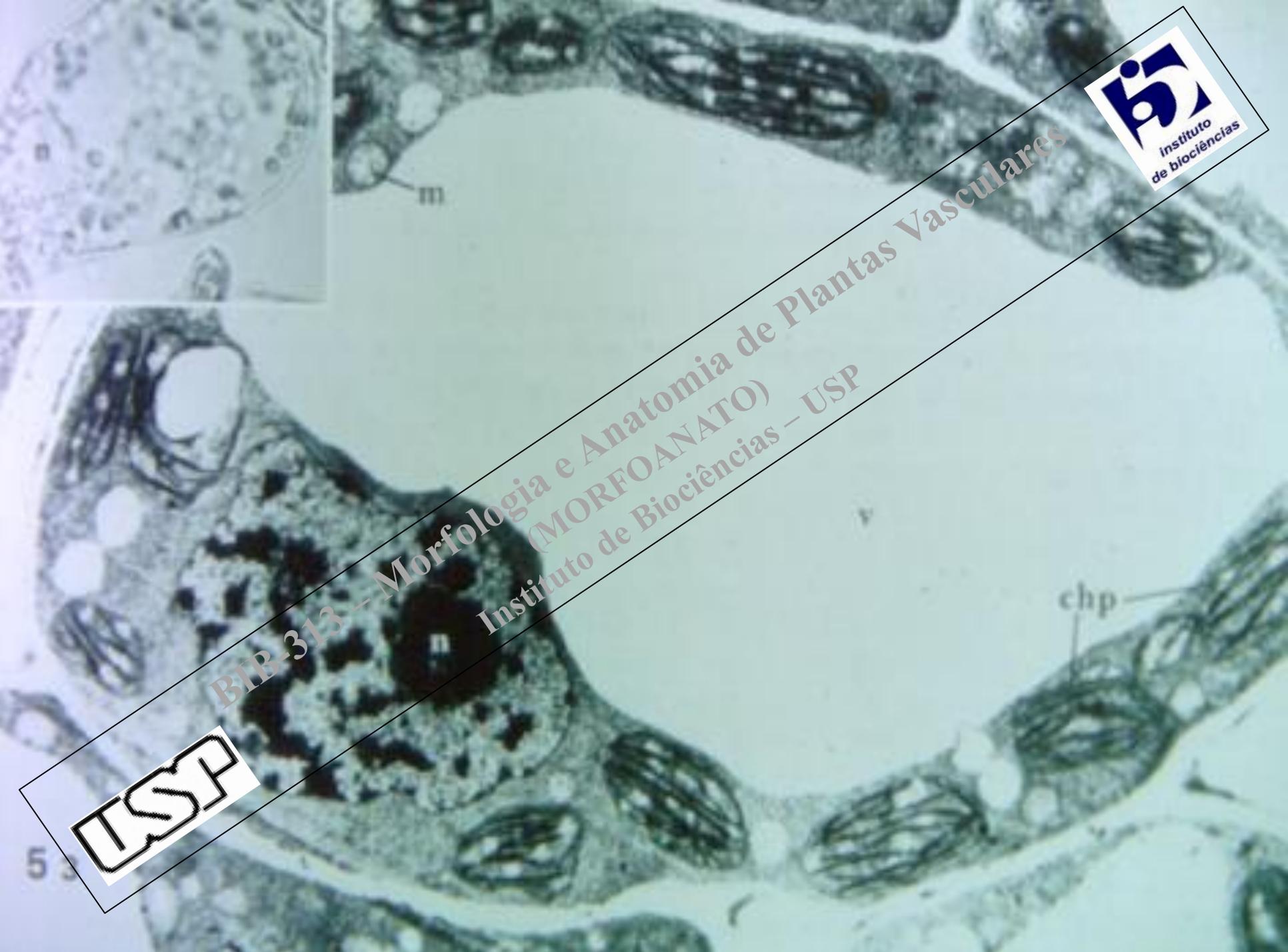


Parênquima

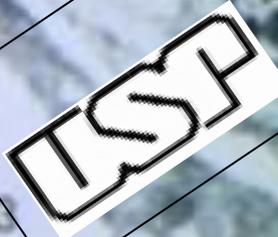


- Tipicamente de paredes finas
- Geralmente parede só celulósica, mas pode lignificar
- Geralmente mantém células vivas
- Vacúolo grande e plastídios presentes
- Possui espaços intercelulares
- Onipresente nos órgãos vegetais - fundamental
- Comunicações
 - Campo de pontuação primária
 - Pontuação simples (qdo tem parede secundária)

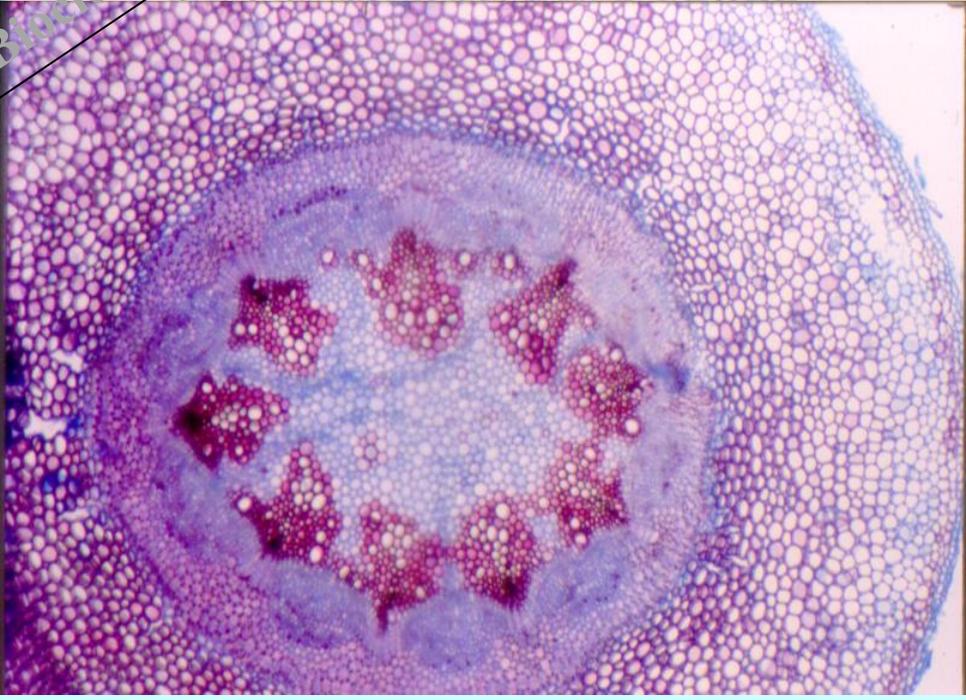
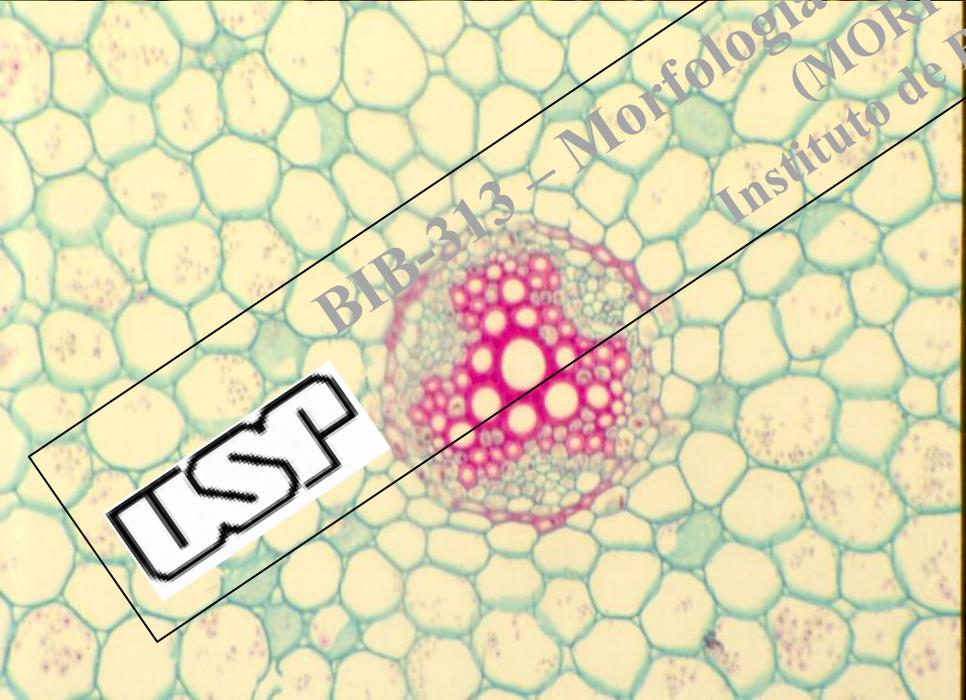
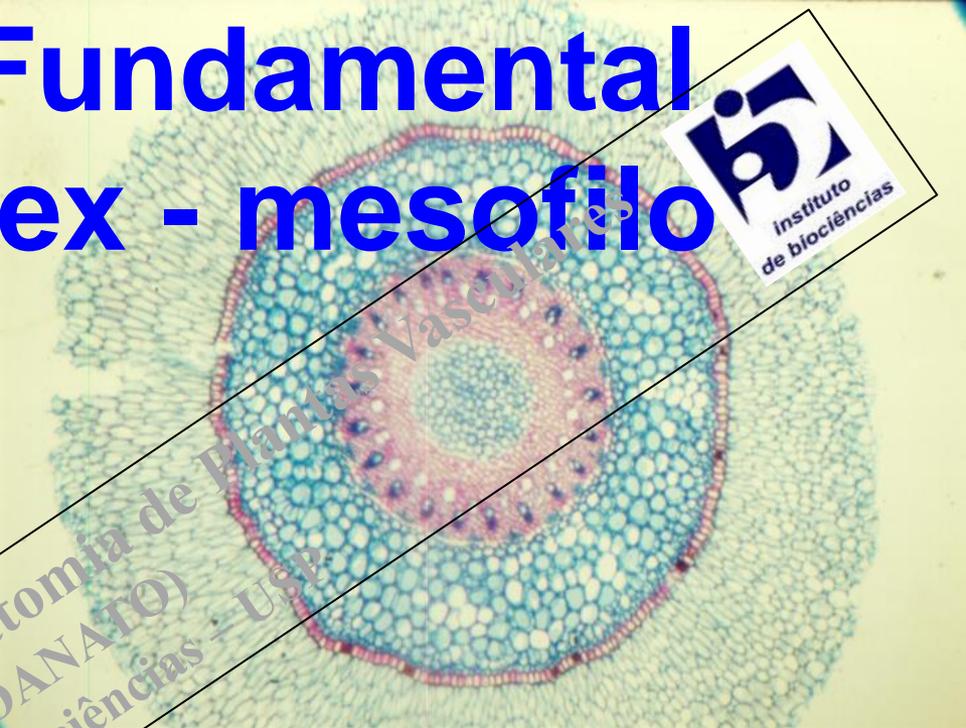
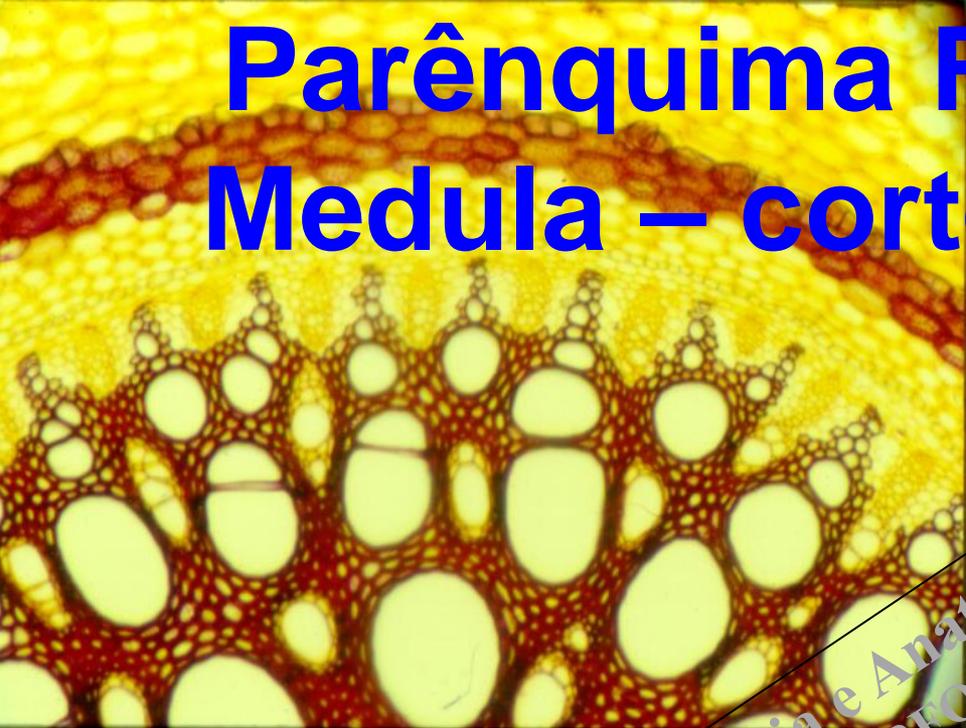




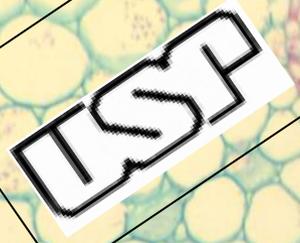
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Parênquima Fundamental Medula – cortex - mesofilo



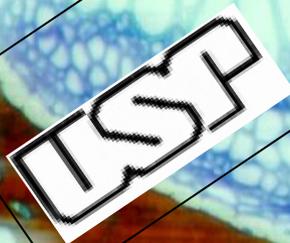
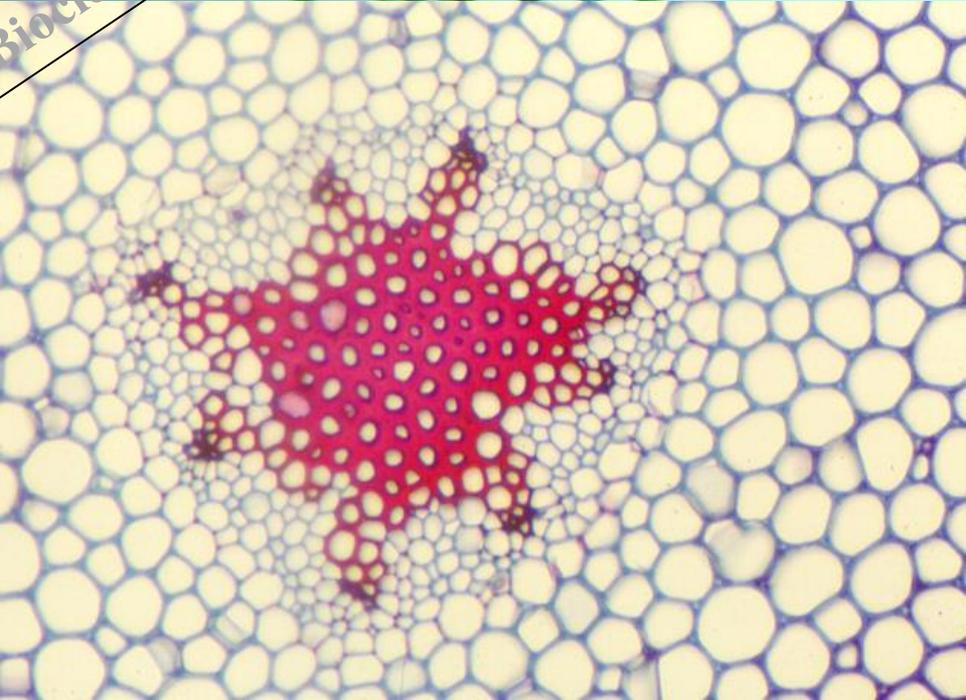
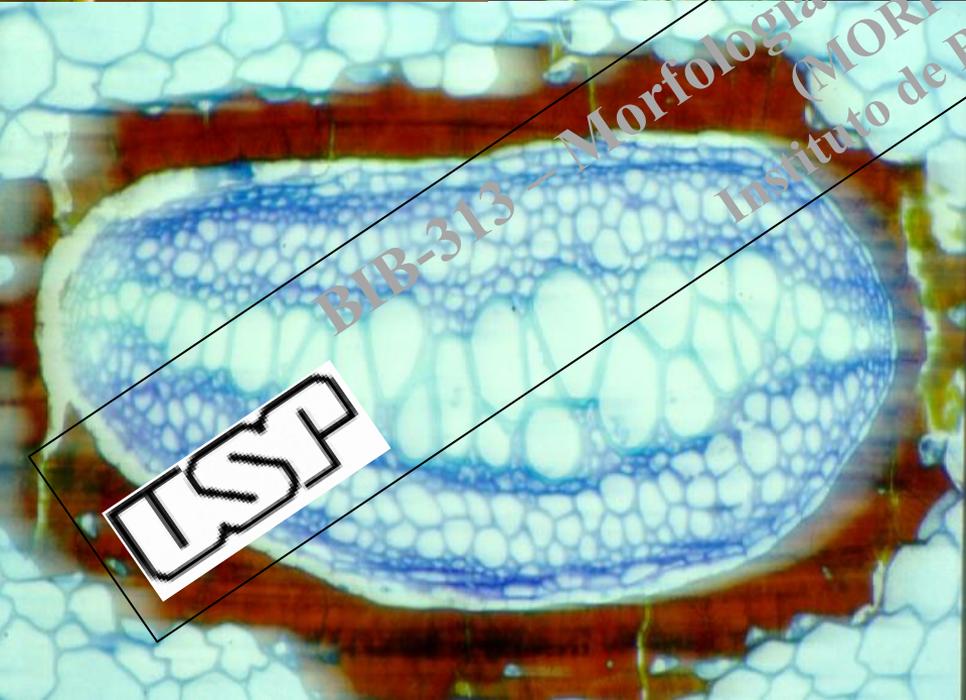
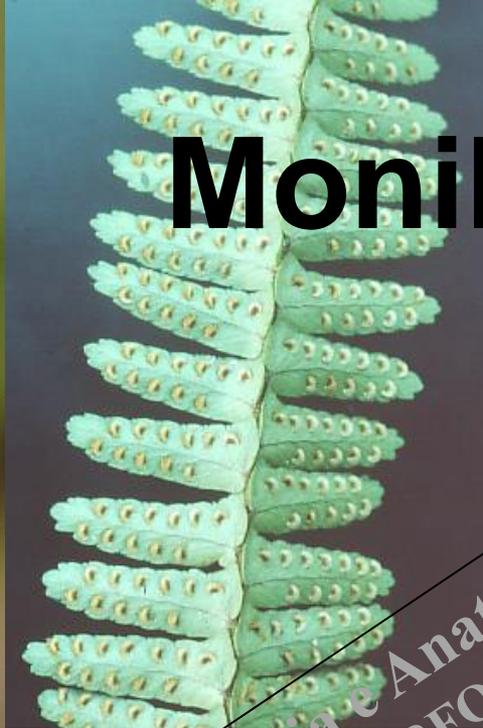
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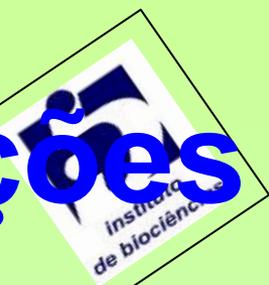
Monilófitas



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Parênquima - especializações



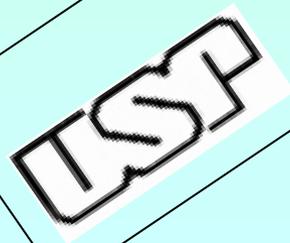
- **Parênquima clorofiliano = clorênquima**
- **Parênquima de reserva**
 - **Parênquima aquífero = hidrênquima**
 - **Parênquima amilífero**
 - **Parênquima aerífero = aerênquima**
 - **Outras reservas, fenóis, cálcio, lipídeos**
- **Parênquima de Transfusão**

Parênquima clorofiliano Clorênquima

- Comuns em tecidos verdes
 - Caules, folhas, raízes, frutos, casca



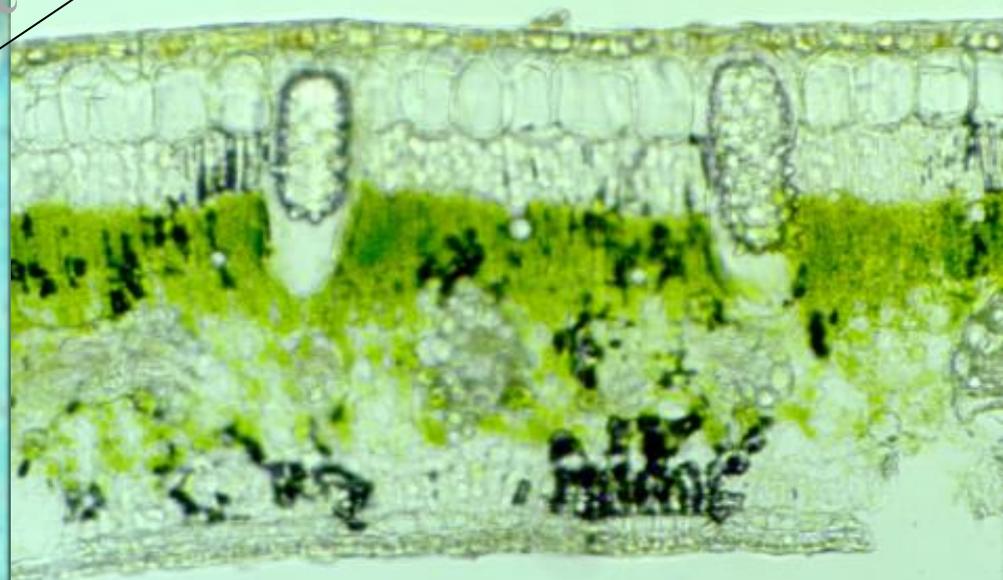
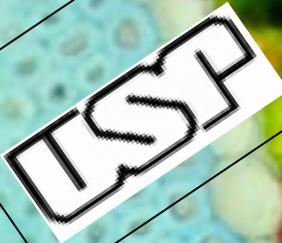
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Parênquima clorofiliano Clorênquima



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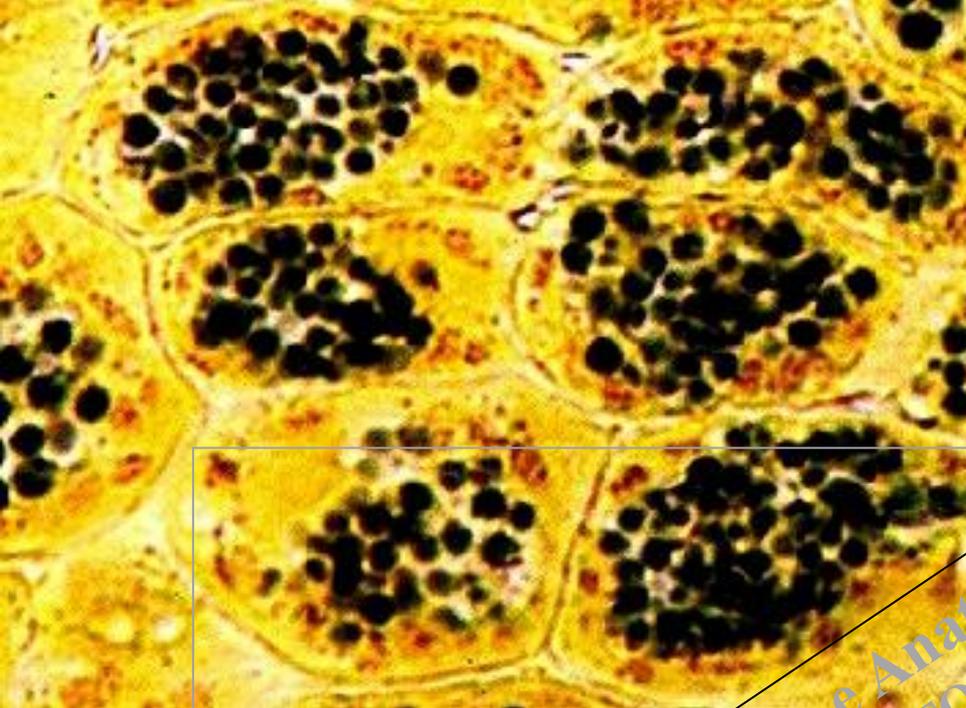
Parênquima de reserva



- Frutos, sementes, caules, sistemas subterrâneos tuberificados
 - Água
 - Lipídios
 - Açúcares
 - Proteínas
 - Cristais orgânicos e sais orgânicos

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Parênquima de reserva



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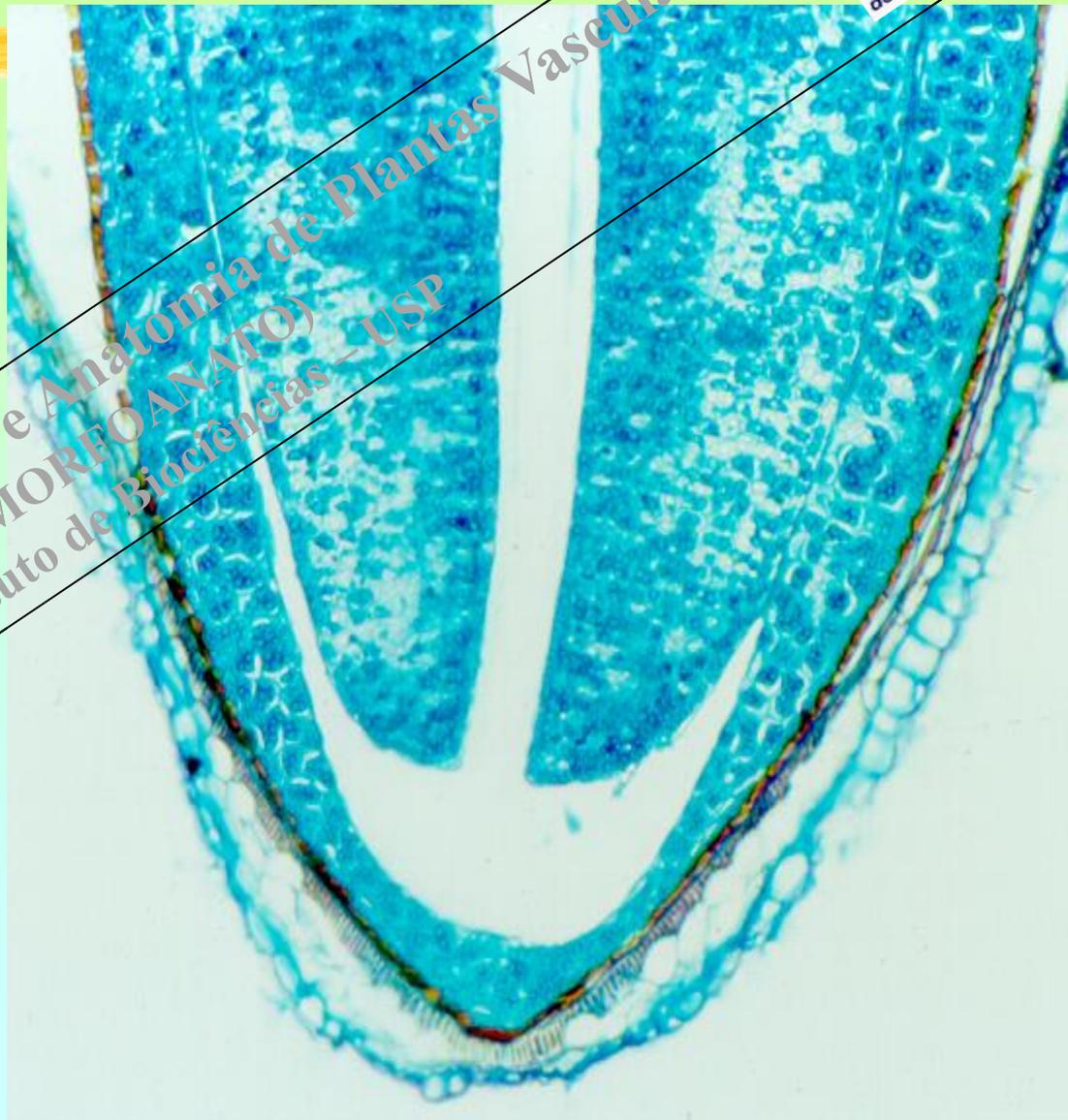
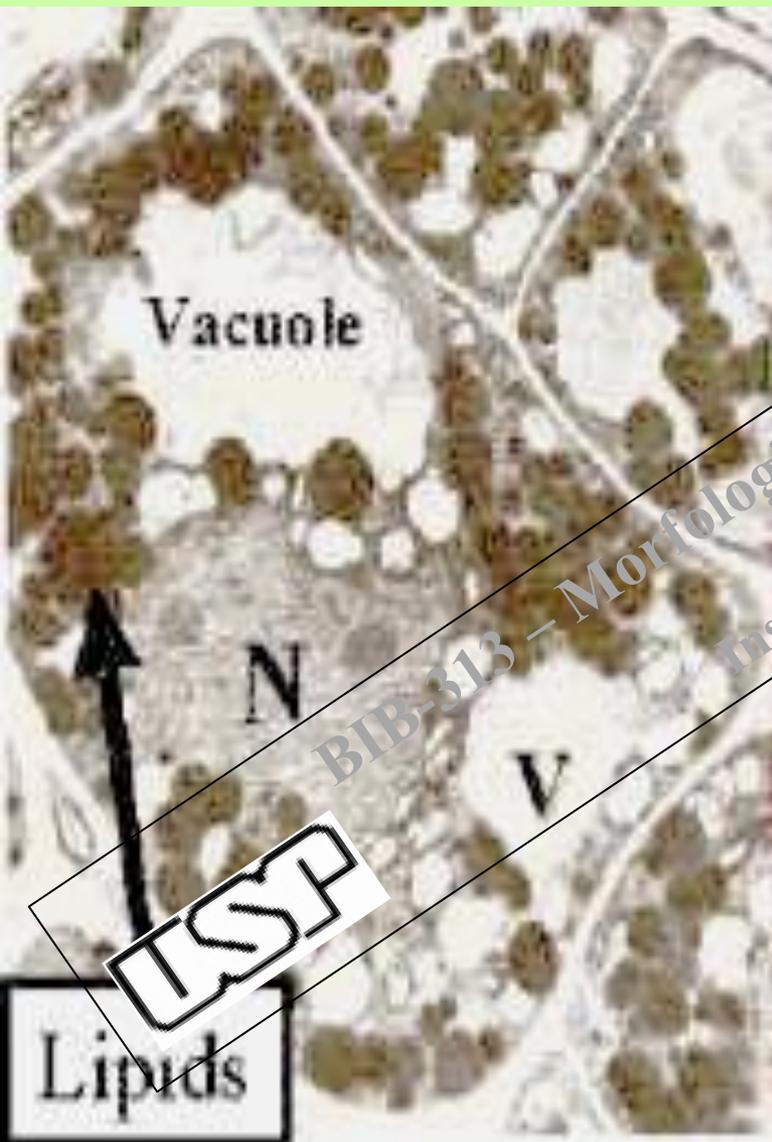


amilífero
feijão
Phaseolus vulgaris

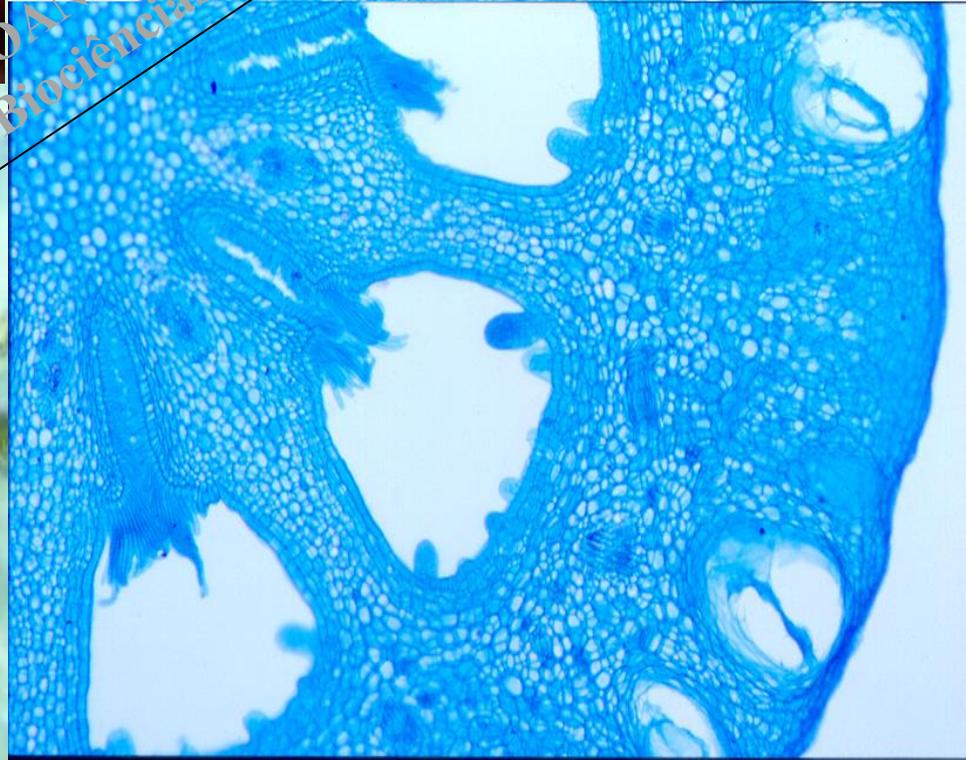
amilífero
Batata
Solanum tuberosum

Parênquima de reserva

Lipídicos

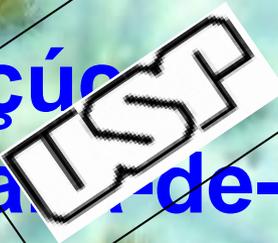


Parênquima de reserva

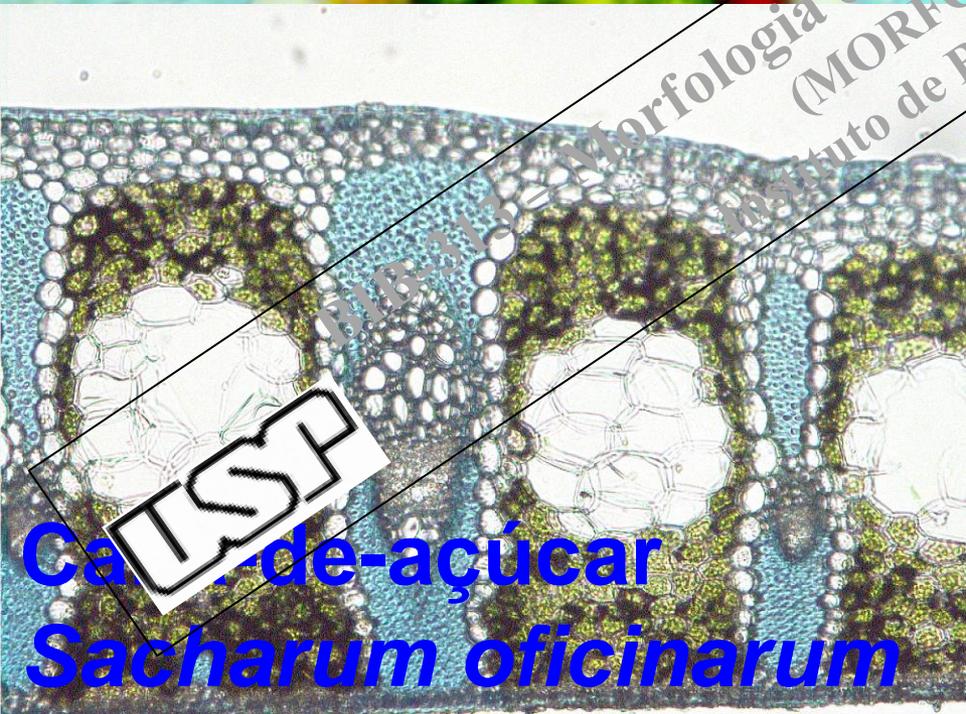


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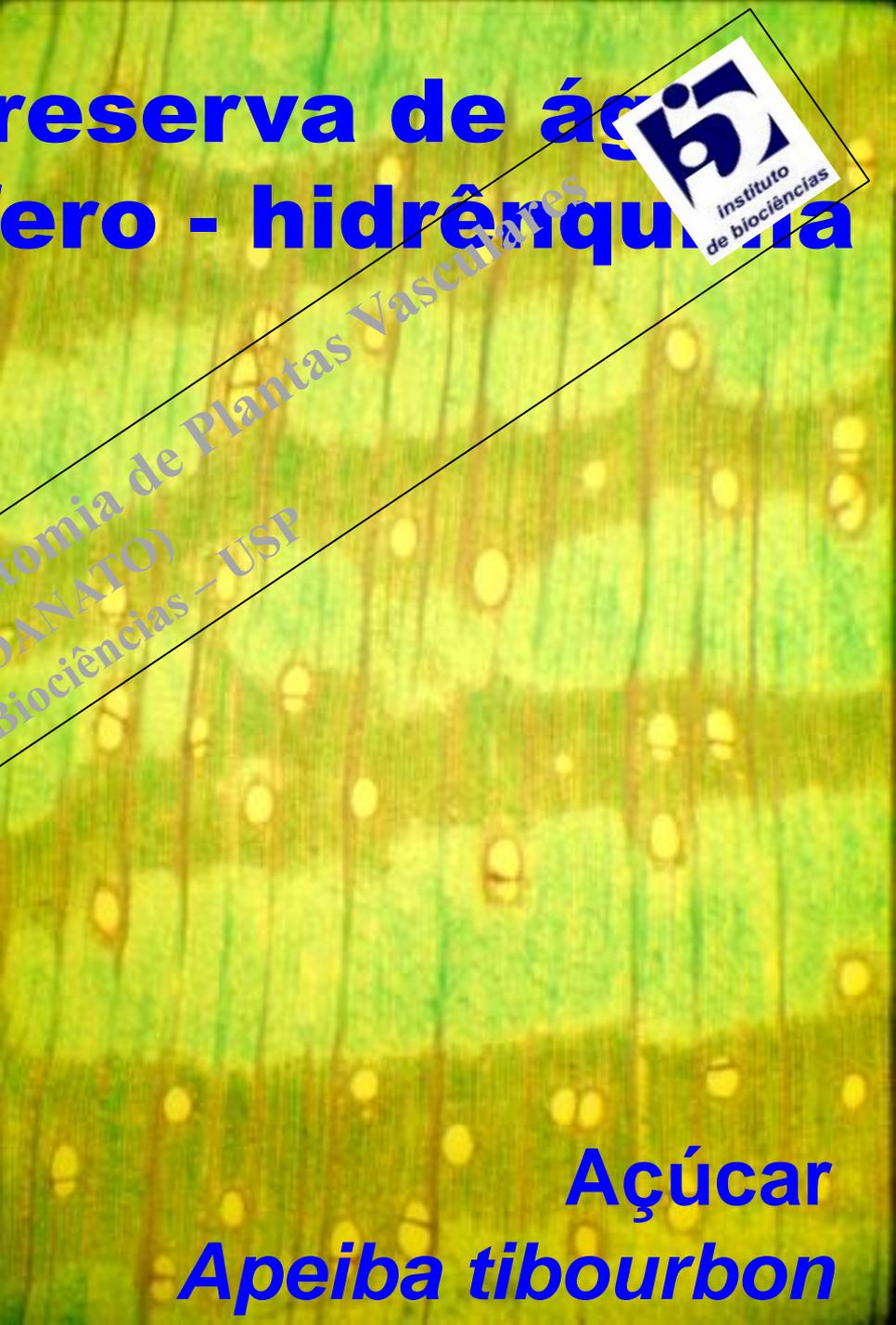
Açúcar
Cana-de-açúcar
Sacharum officinarum



Parênquima de reserva de açúcar Parênquima aquífero - hidrênquima

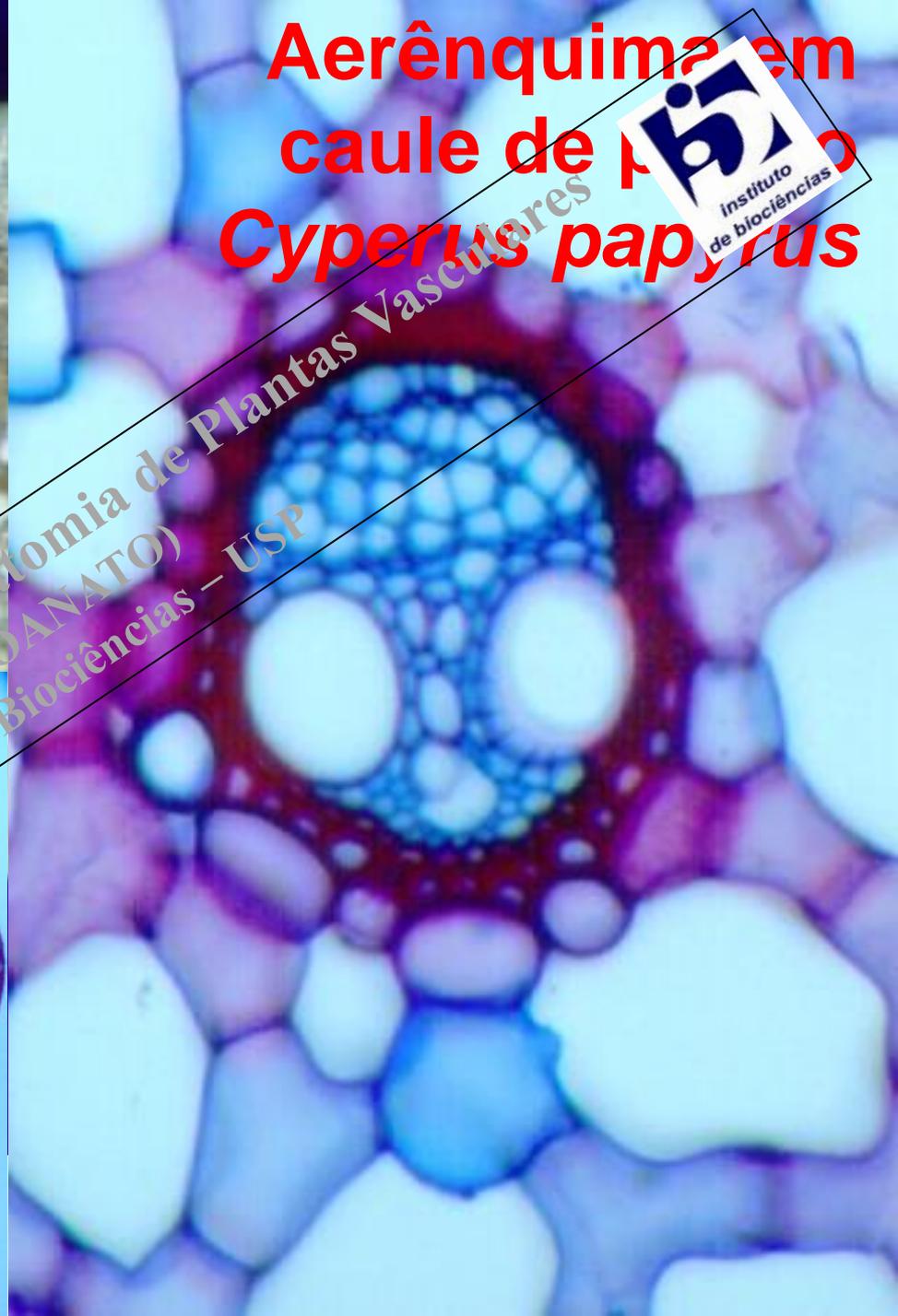
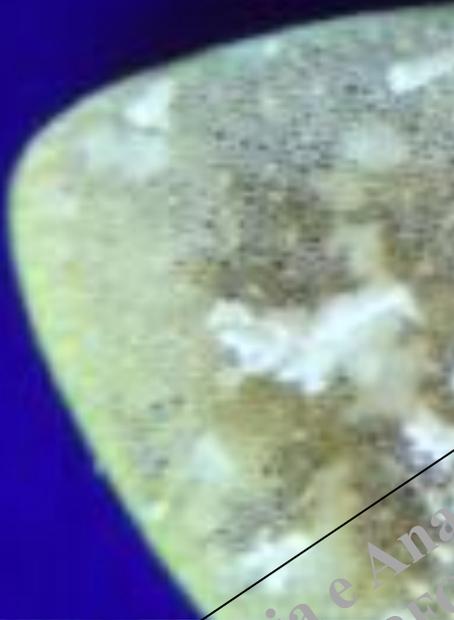


Canal de-açúcar
Sacharum officinarum



Açúcar
Apeiba tibourbon

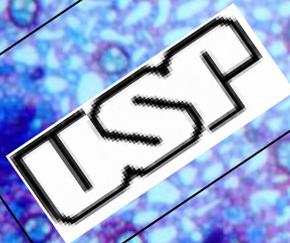
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Aerênquima em caule de *Cyperus papyrus*



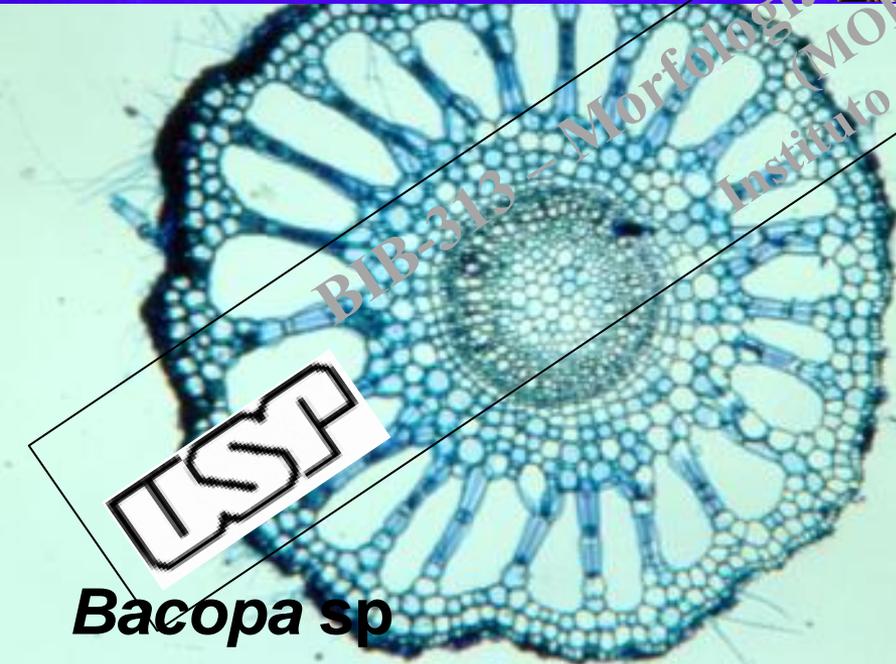
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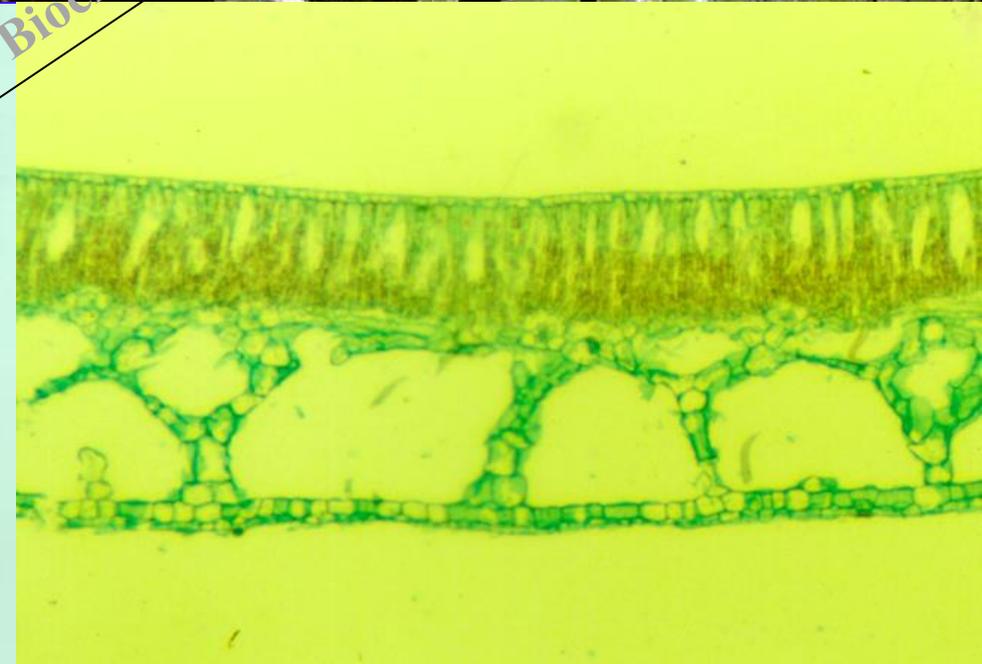
Aerênquima – parênquima aerífero



Nymphaea sp



Bacopa sp

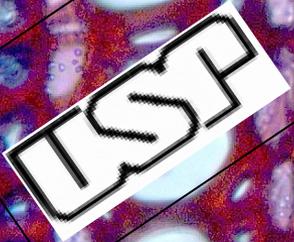


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Parenquima de cicatrização - máculas



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Colênquima

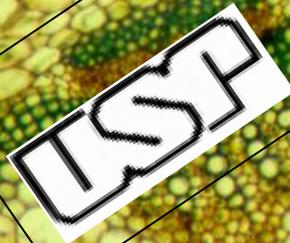
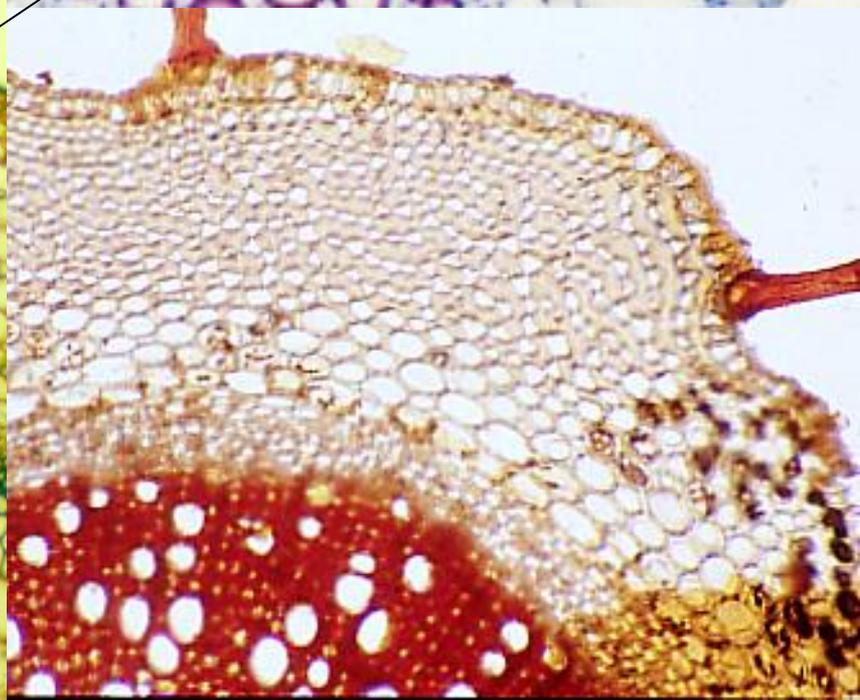
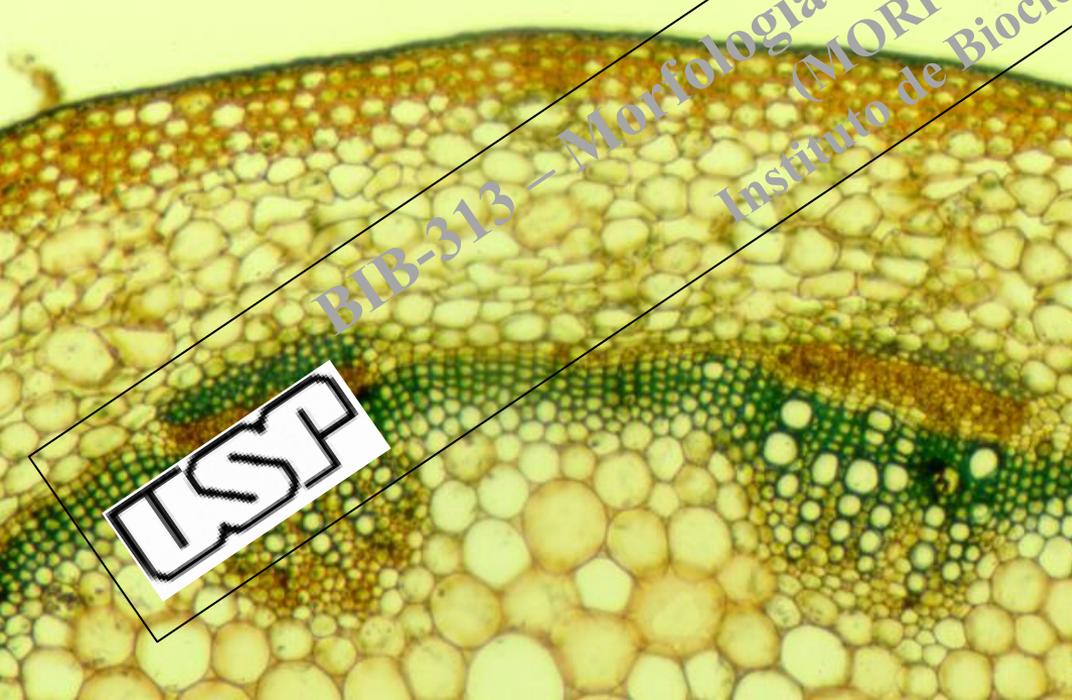


- Tipicamente de paredes espessas ou muito espessas
- Paredes celulósica primária
- Geralmente mantêm células vivas
- Pode possuir ou não espaços intercelulares
- Várias classificações
- Típico de órgãos jovens, efêmeros, em crescimento primário
- Periferia dos órgãos

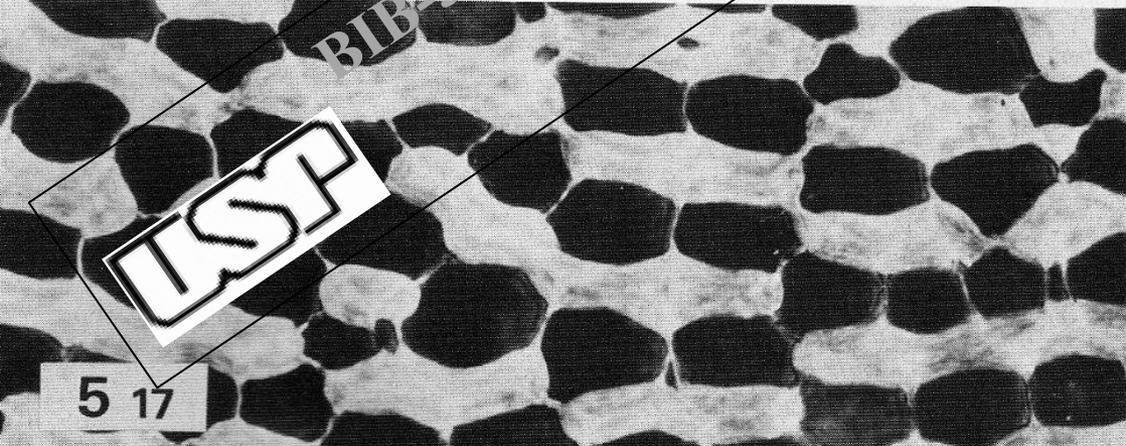
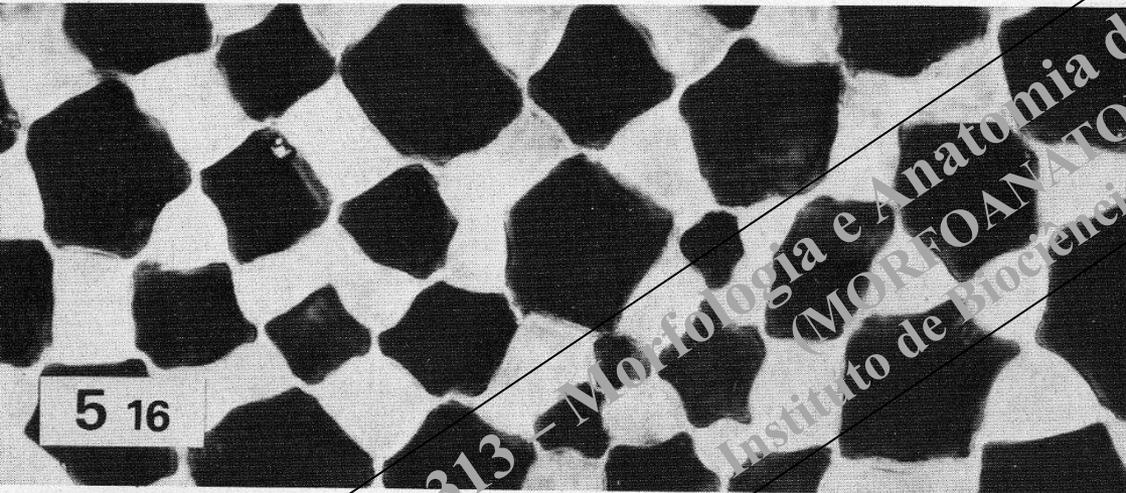
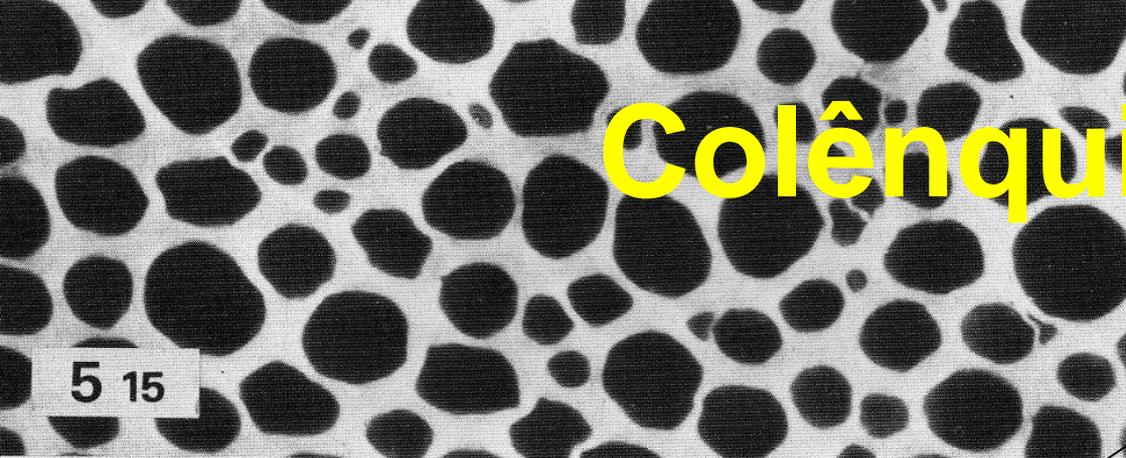
Colênquima



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Colênquima



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Esclerênquima

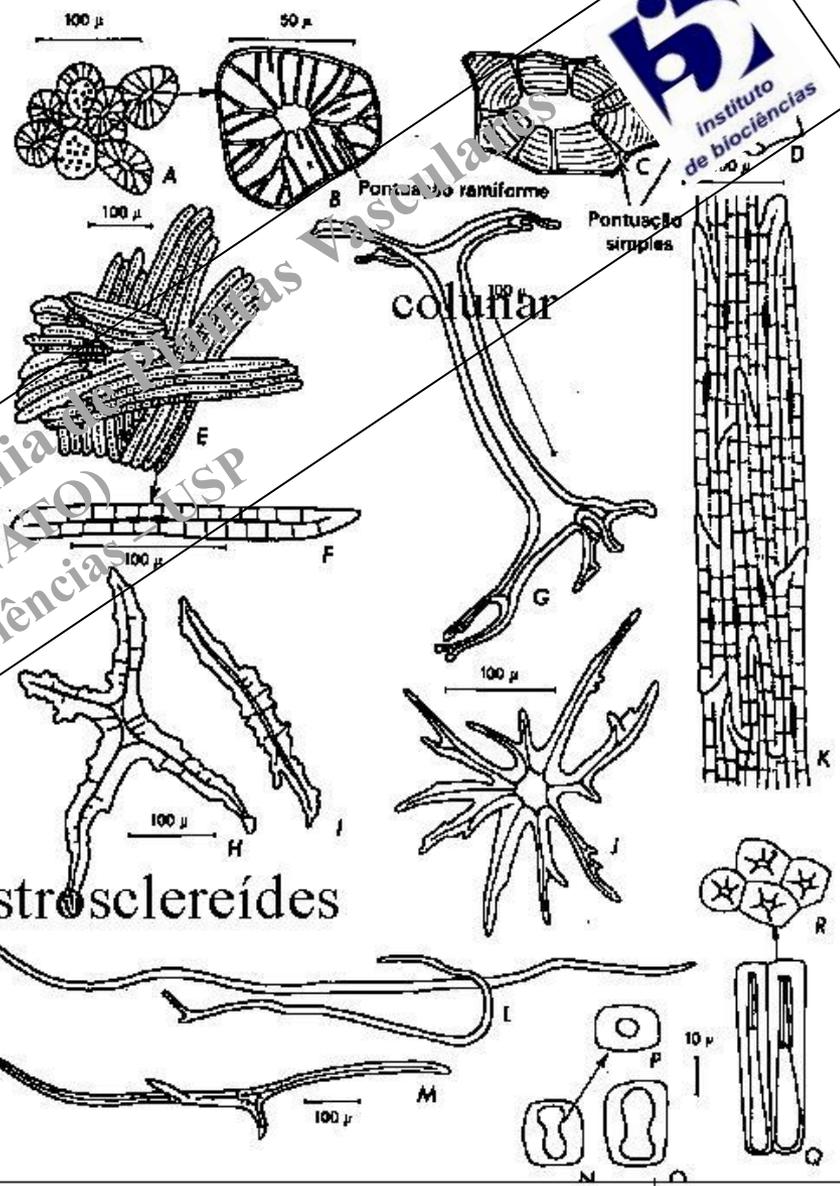


- Tipicamente de paredes espessas ou muito espessas
- Paredes celulósica e lignificada, primária e secundária
- Raramente mantêm células vivas na maturidade
- Típico de caules, pecíolos, sementes em crescimento primário
- Tipos celulares:
 - Esclereídes
 - Fibras
 - Fibrosclereídes

Esclereídes

Diversidade de formas

pétreas = braquiesclereídes



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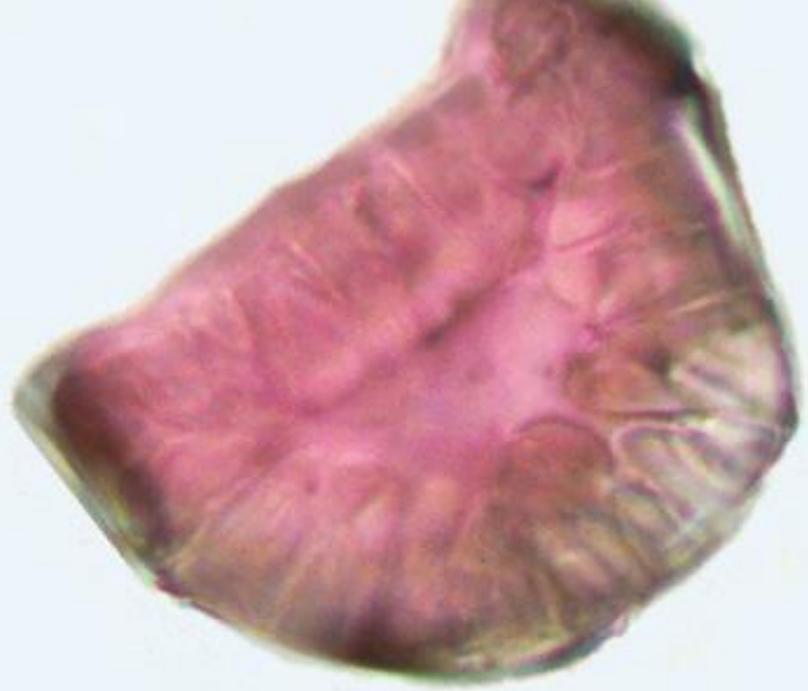
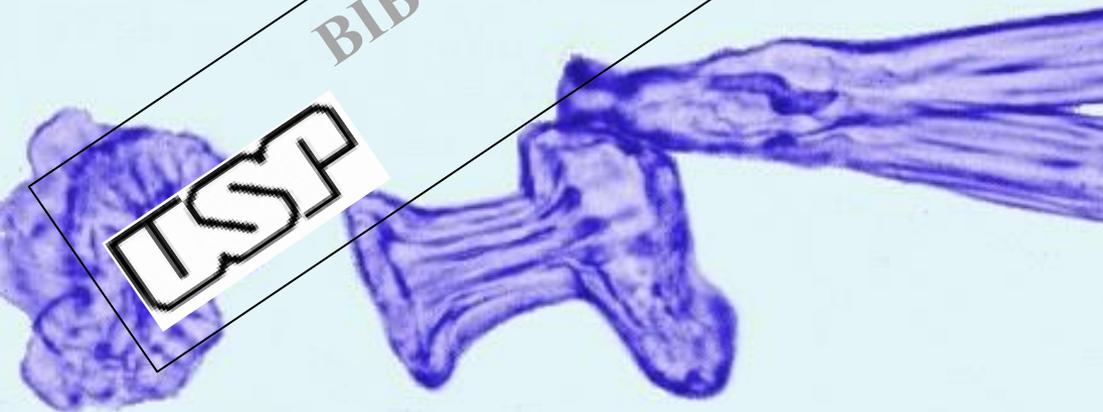
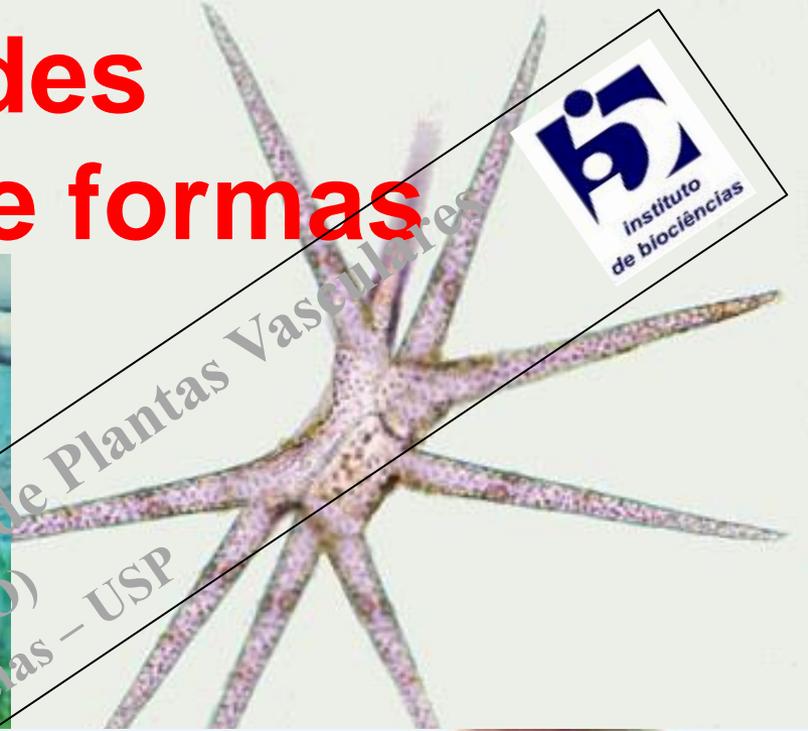
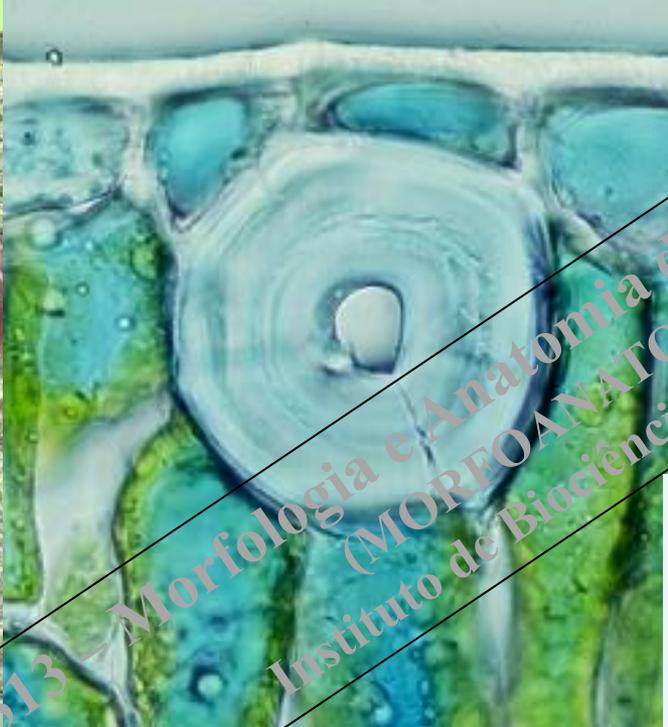
colunares

astrosclereídes

macrosclereíde

Esclereídes

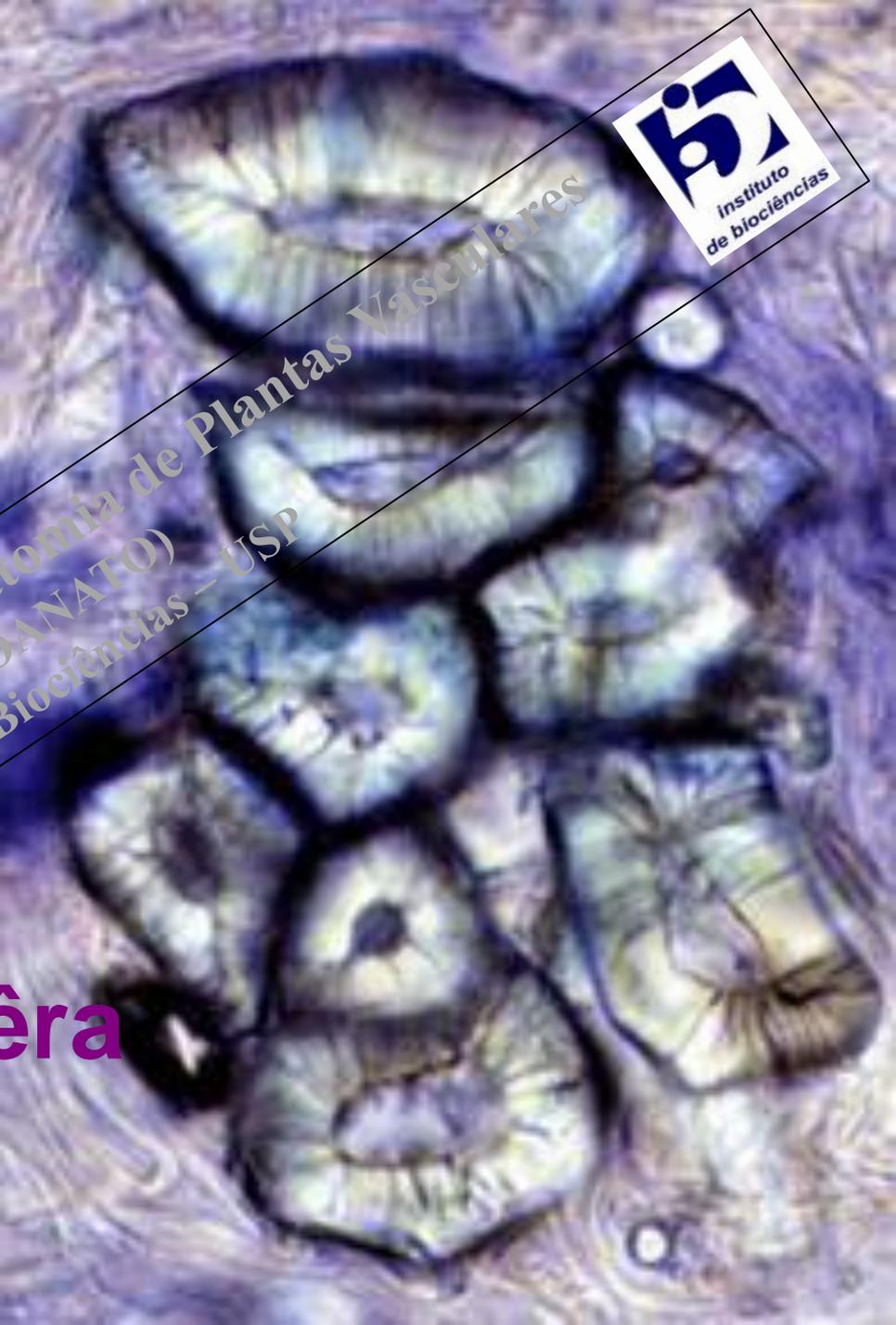
Diversidade de formas



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Esclereídes de pêra
Células pétreas
Pyrus communis





Plantas Vasculares

Cu

Wx

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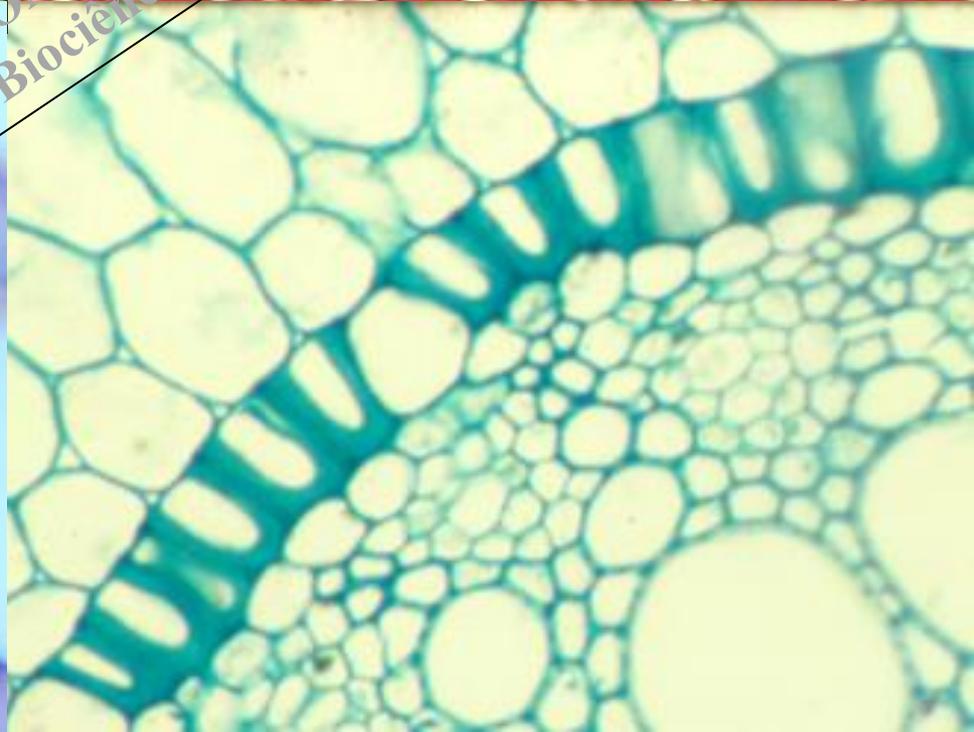
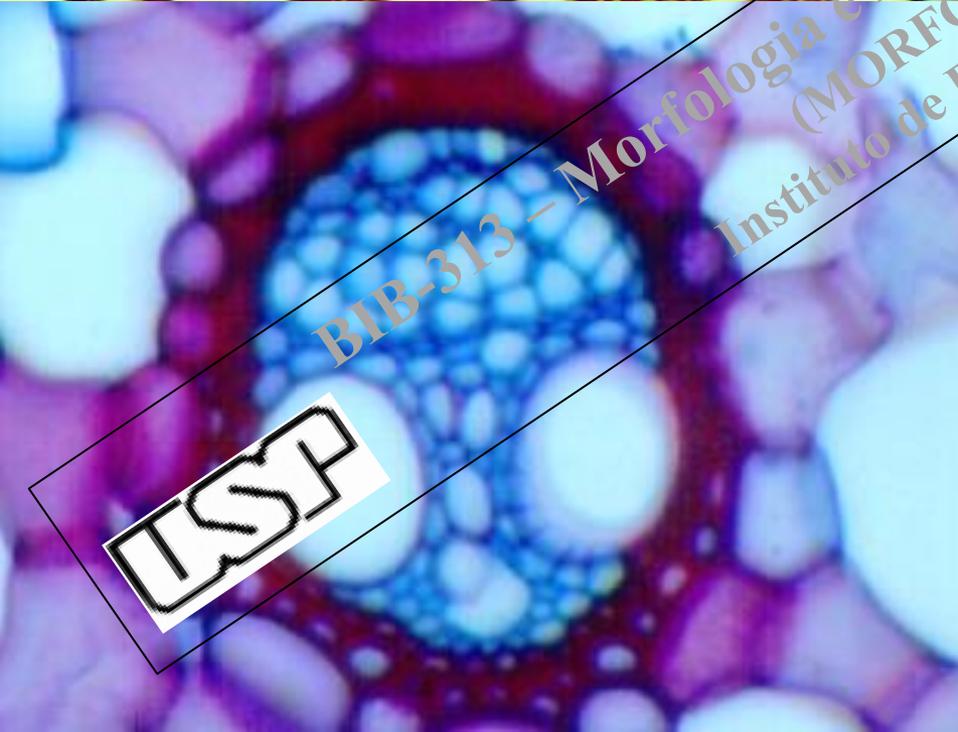
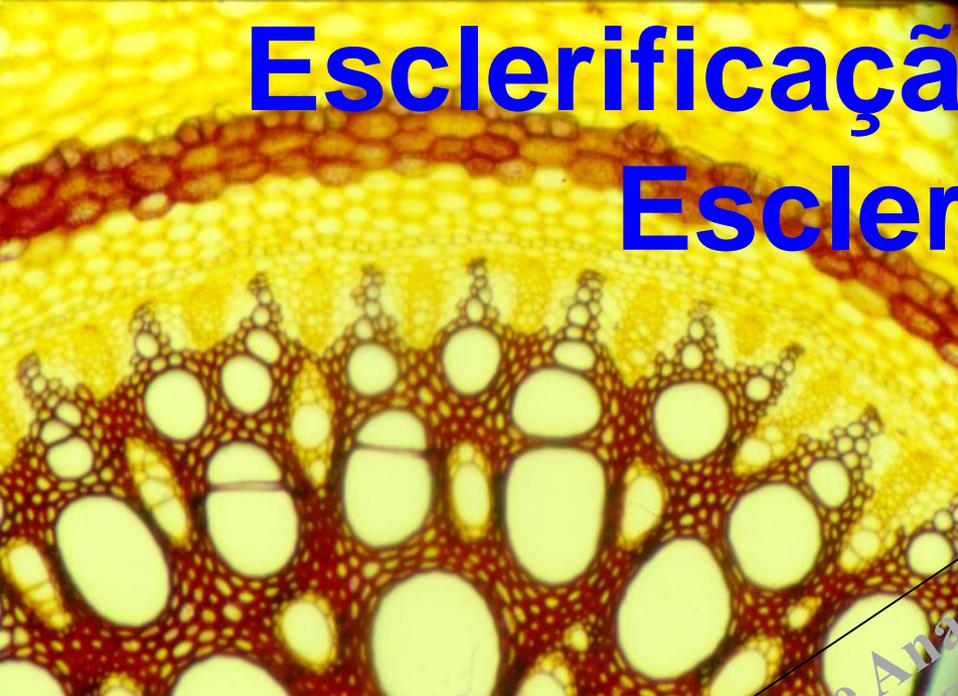
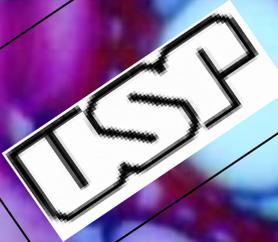
Esclerôides de pêra – células pétreas
Pyrus communis
Camadas polilamelares típicas



Esclerificação de células Esclereídes



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Nymphaea sp.
Nymphaeaceae
Gerald D. Carr

Nymphaea sp

Nymphaeaceae



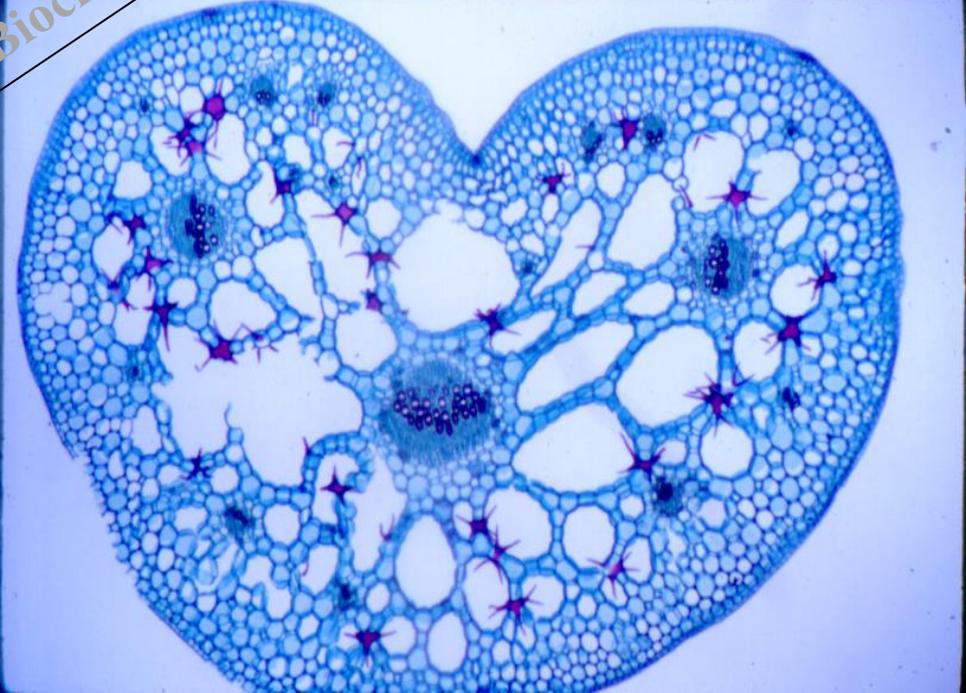
Nymphoides sp

Menianthaceae

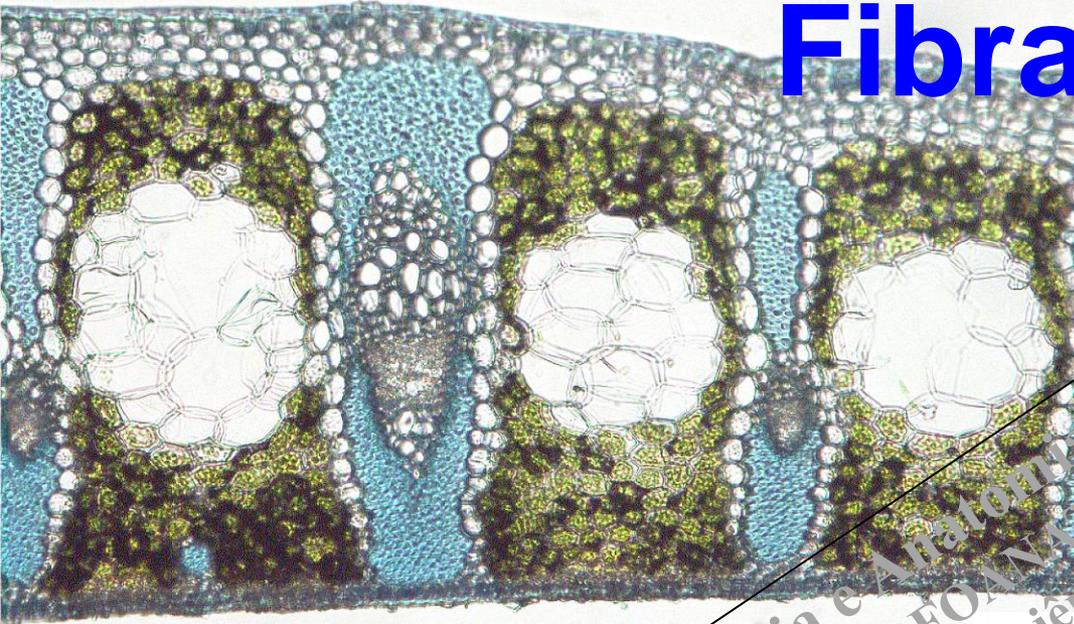


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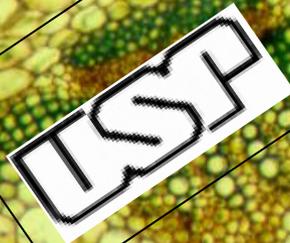
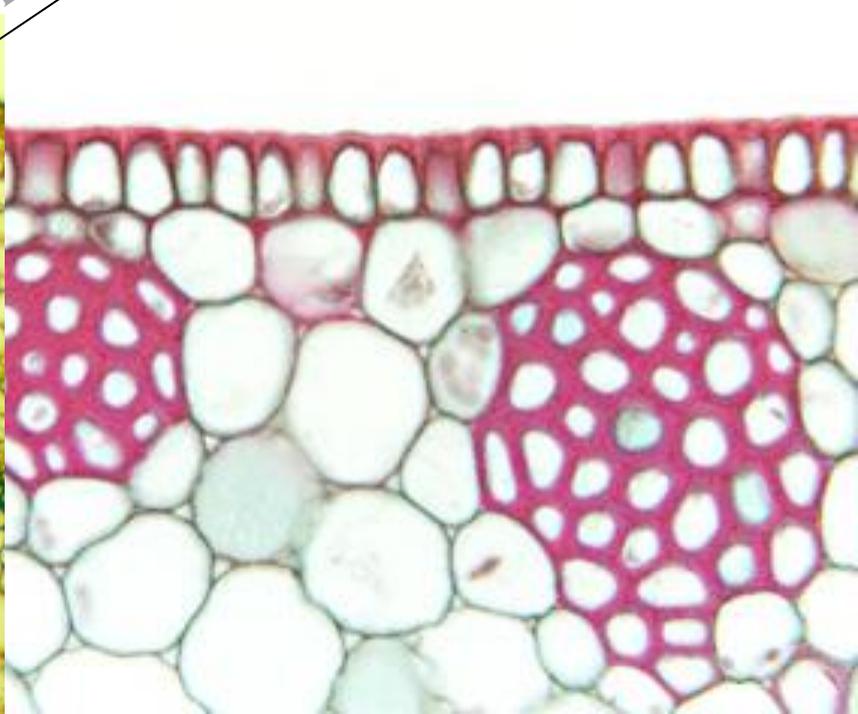
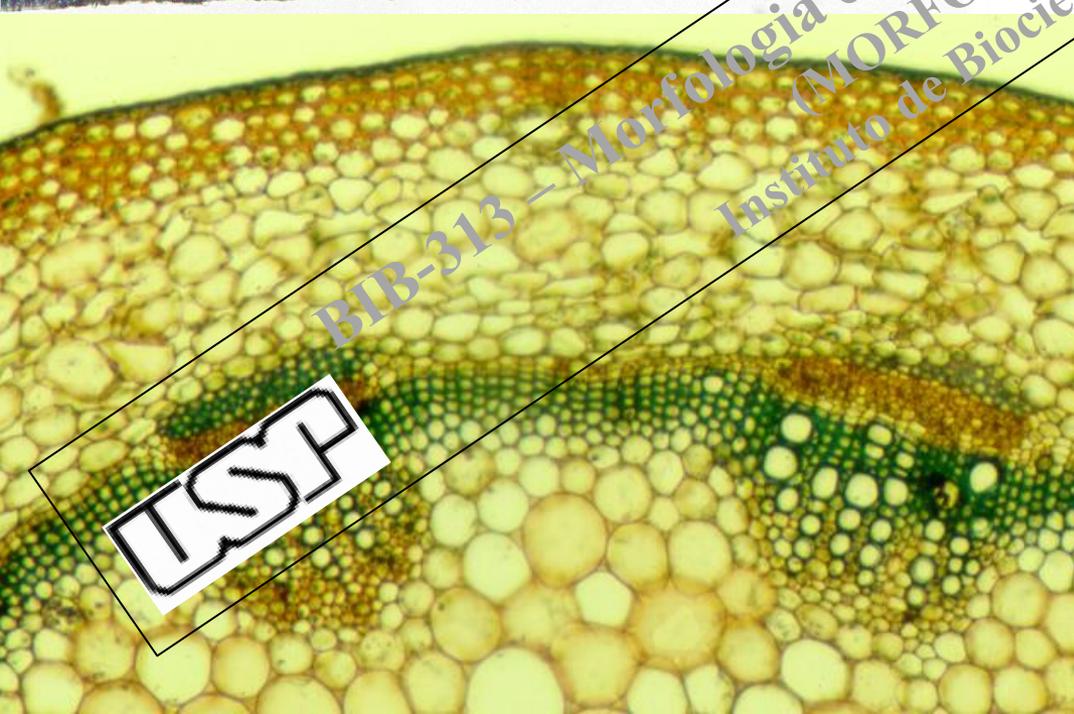
Esclereídes



Fibras



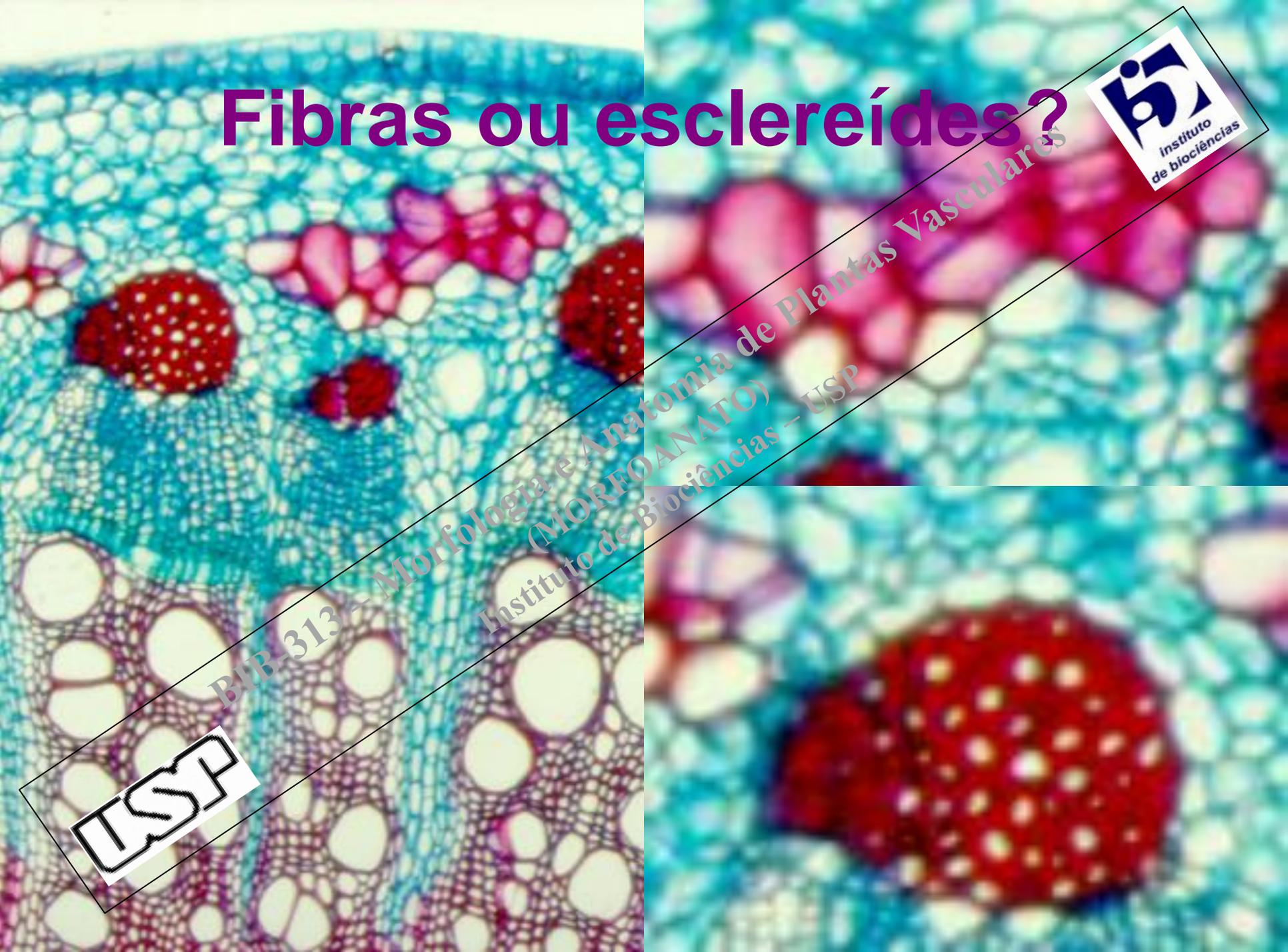
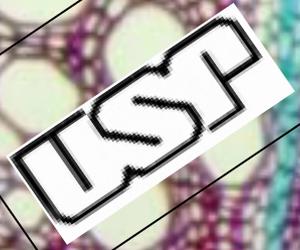
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Fibras ou esclereídes?



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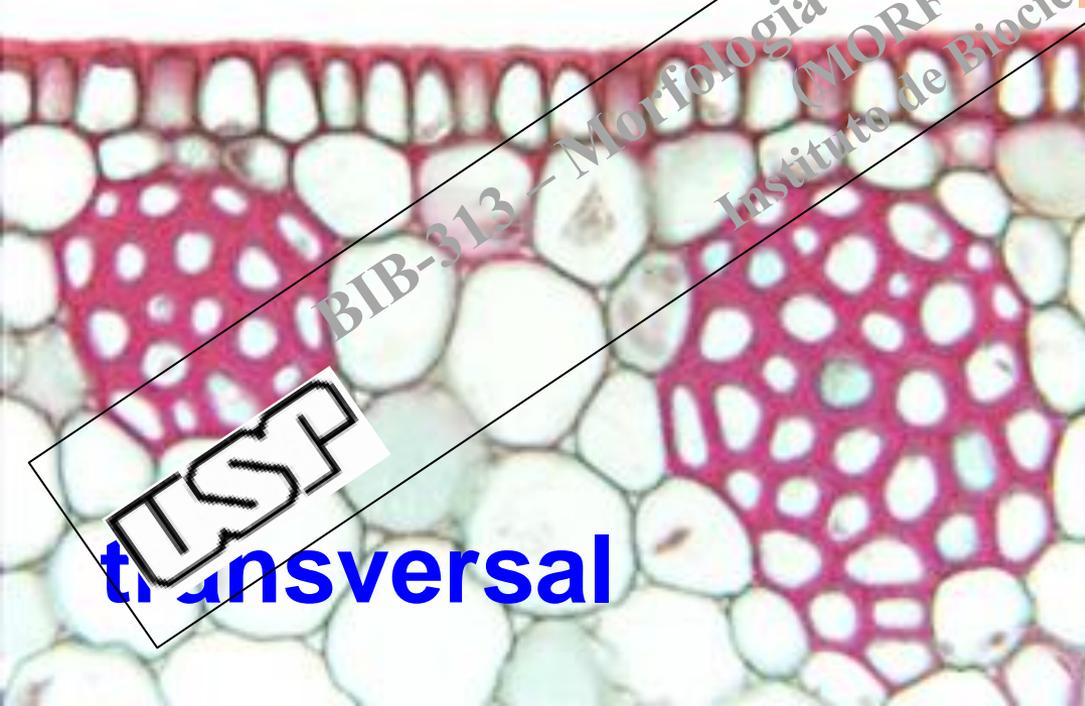


Fibras ou esclereídes? importância dos cortes longitudinal e macerações



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maceração



transversal



longitudinal

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