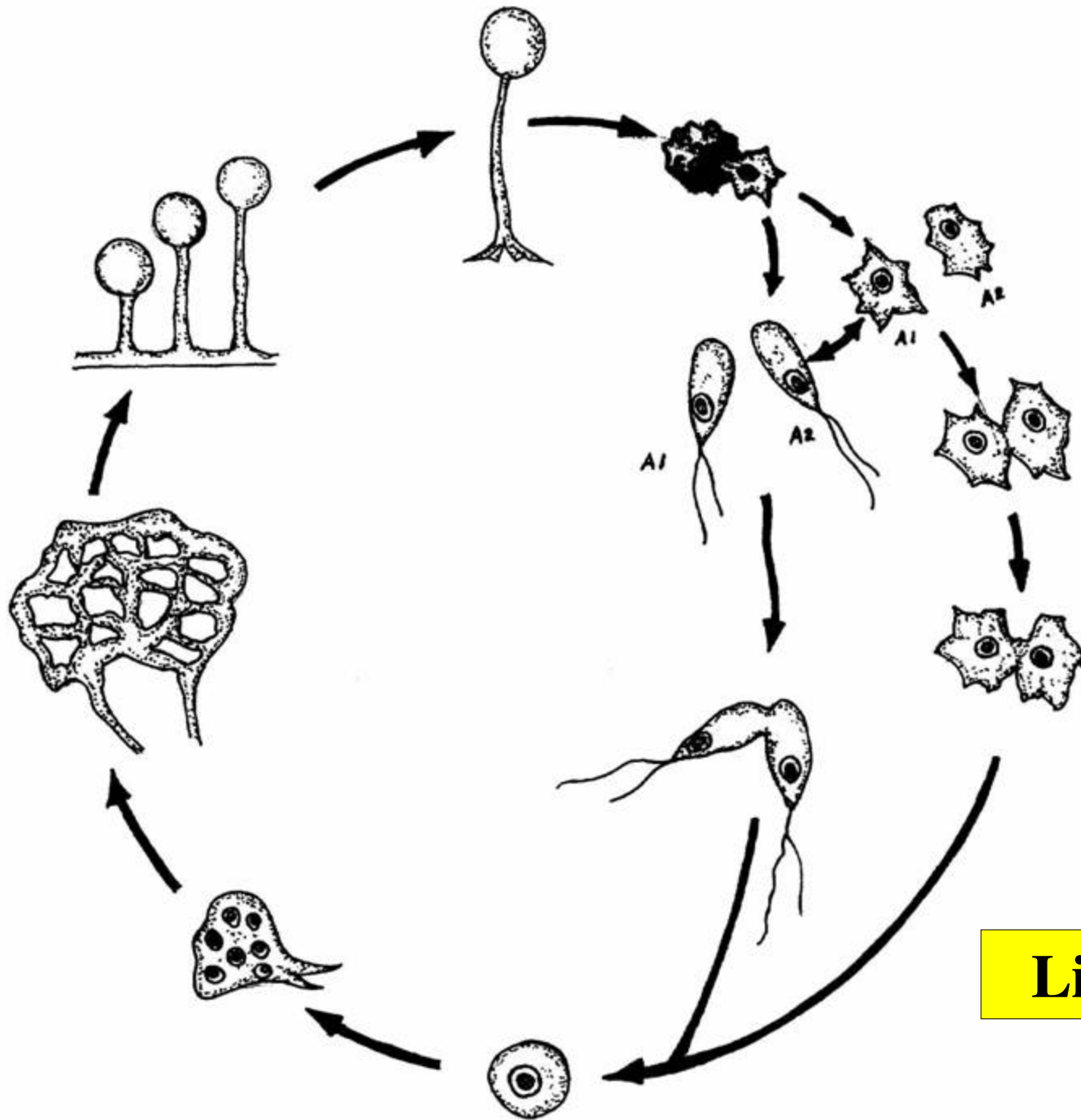


An Introduction to the Morphology and Taxonomy and of Myxomycetes

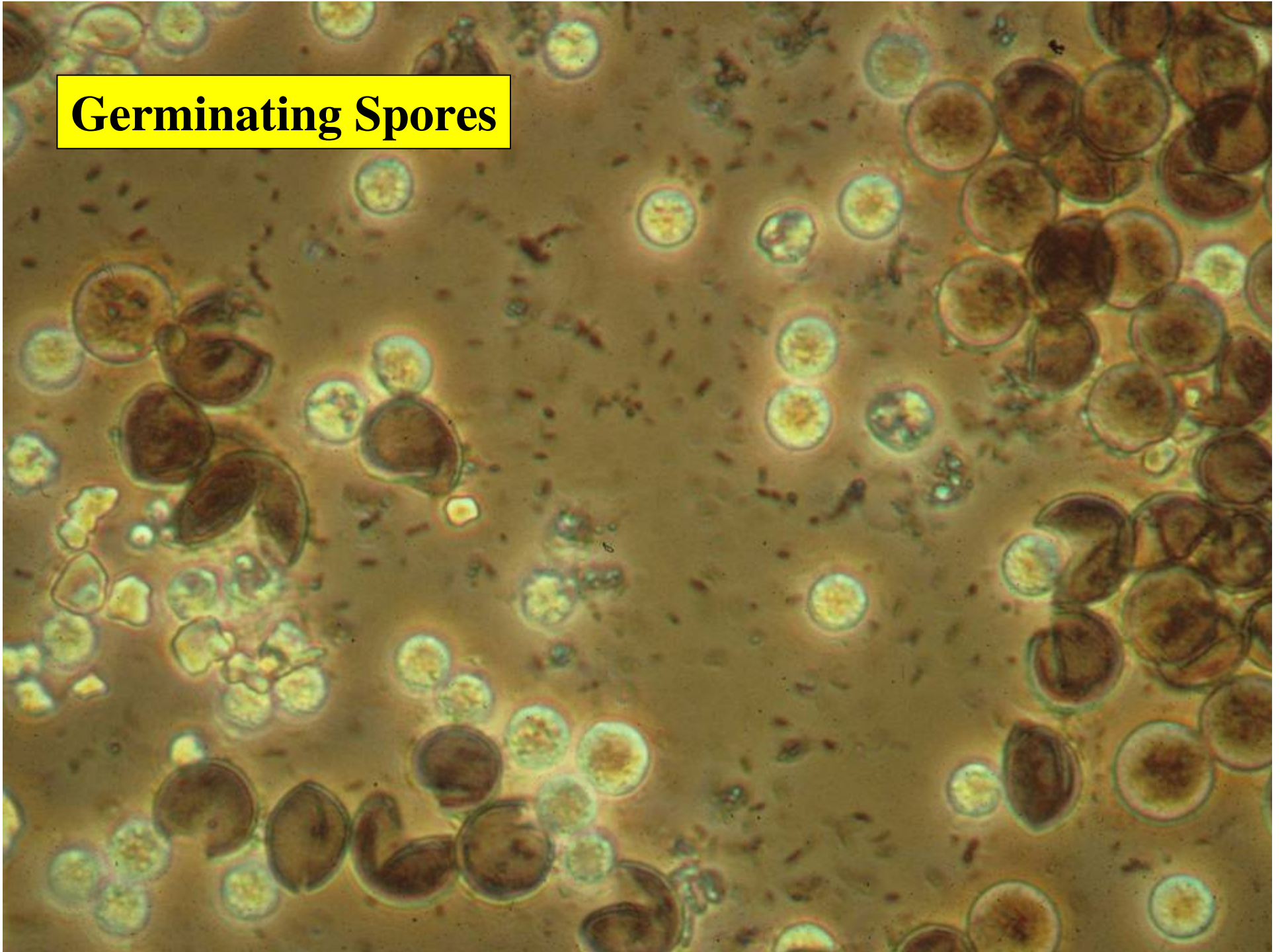
**Dr. Steven L. Stephenson
University of Arkansas
slsteph@uark.edu**

**Myxomycetes (also called
plasmodial slime molds) -
a group of fungus-like
organisms, with
approximately 875 species
known worldwide.**



Life Cycle

Germinating Spores



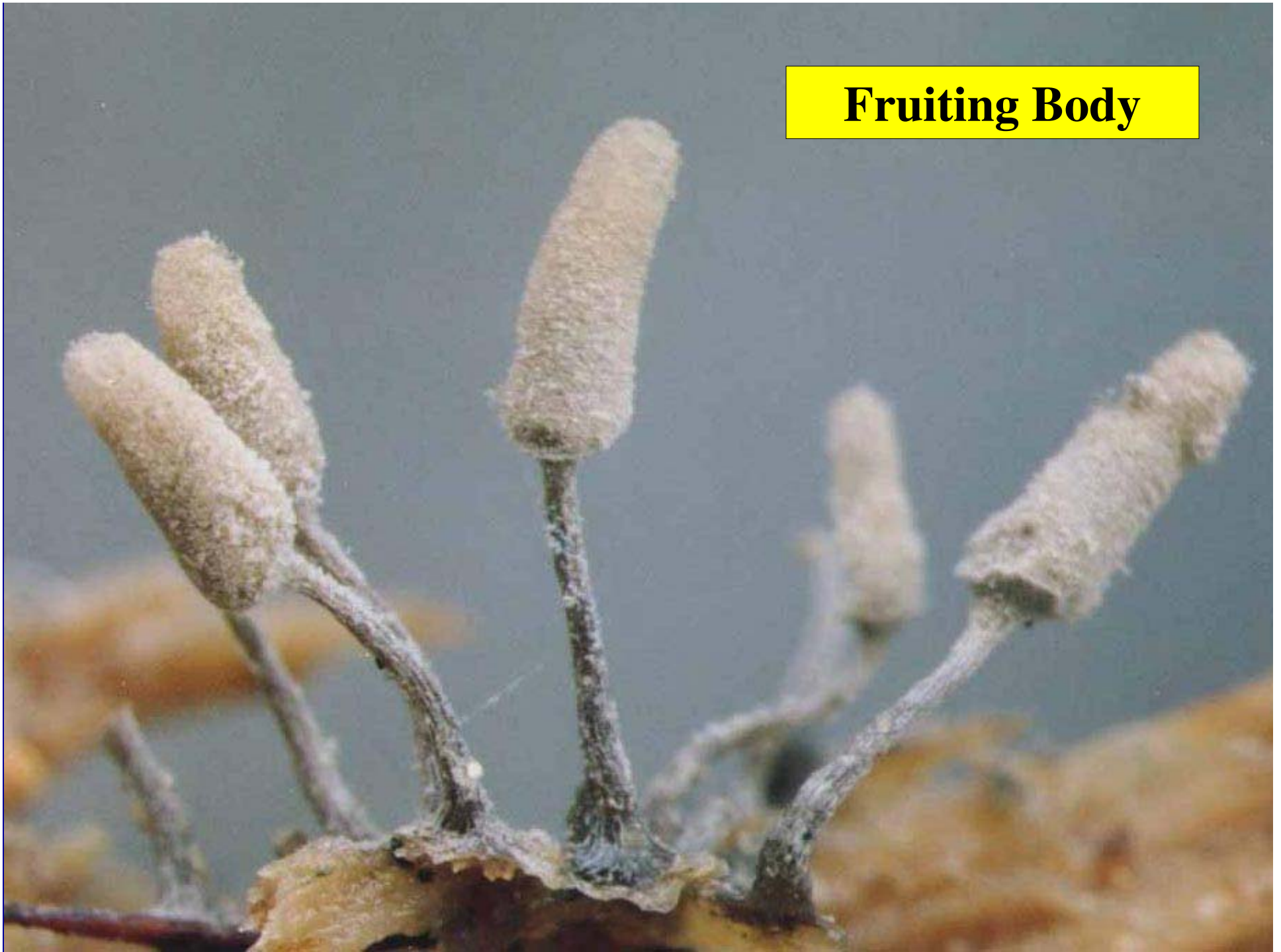


Amoeboflagellate Cell

Plasmodium



Fruiting Body

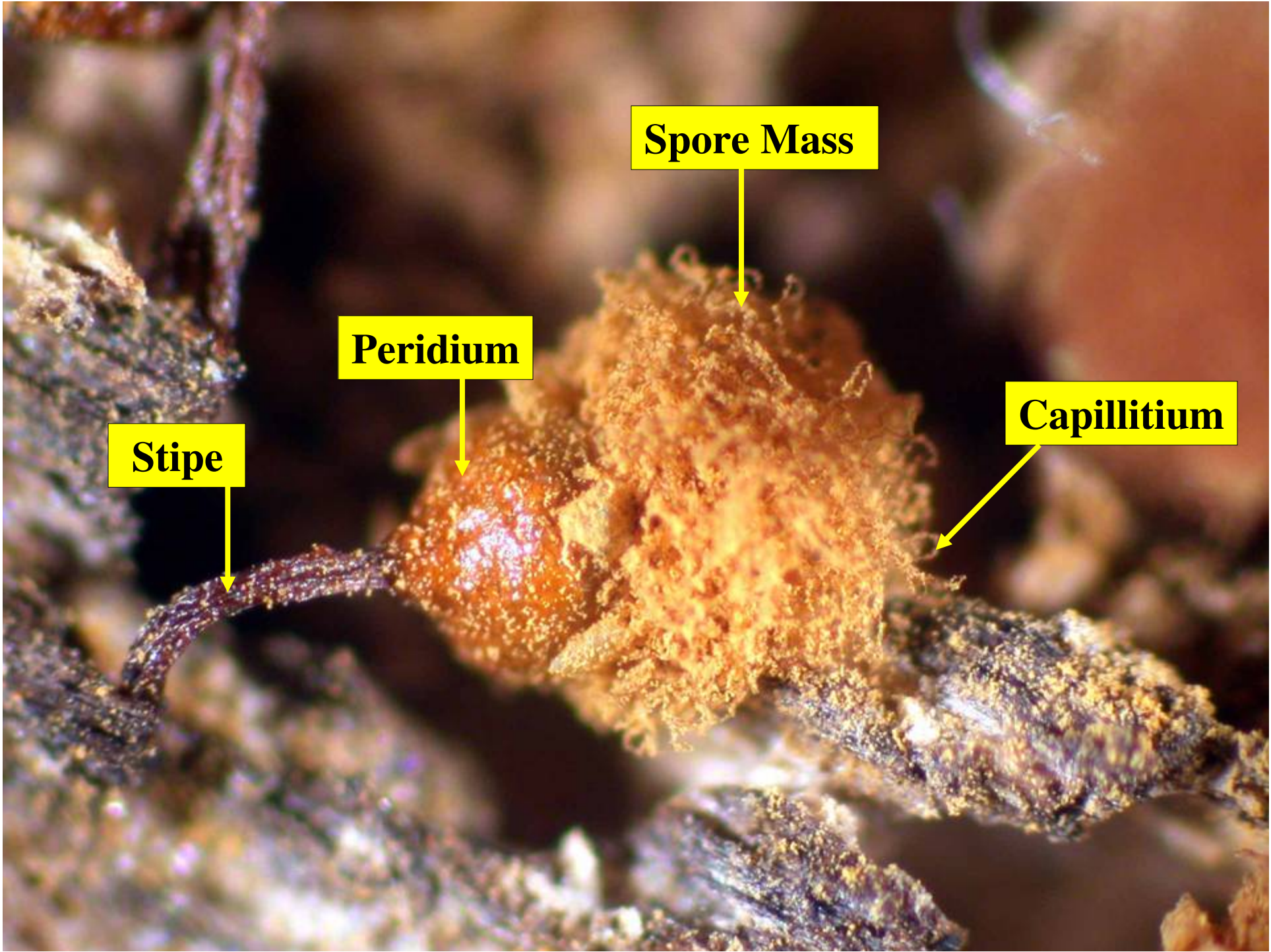


Spore Mass

Peridium

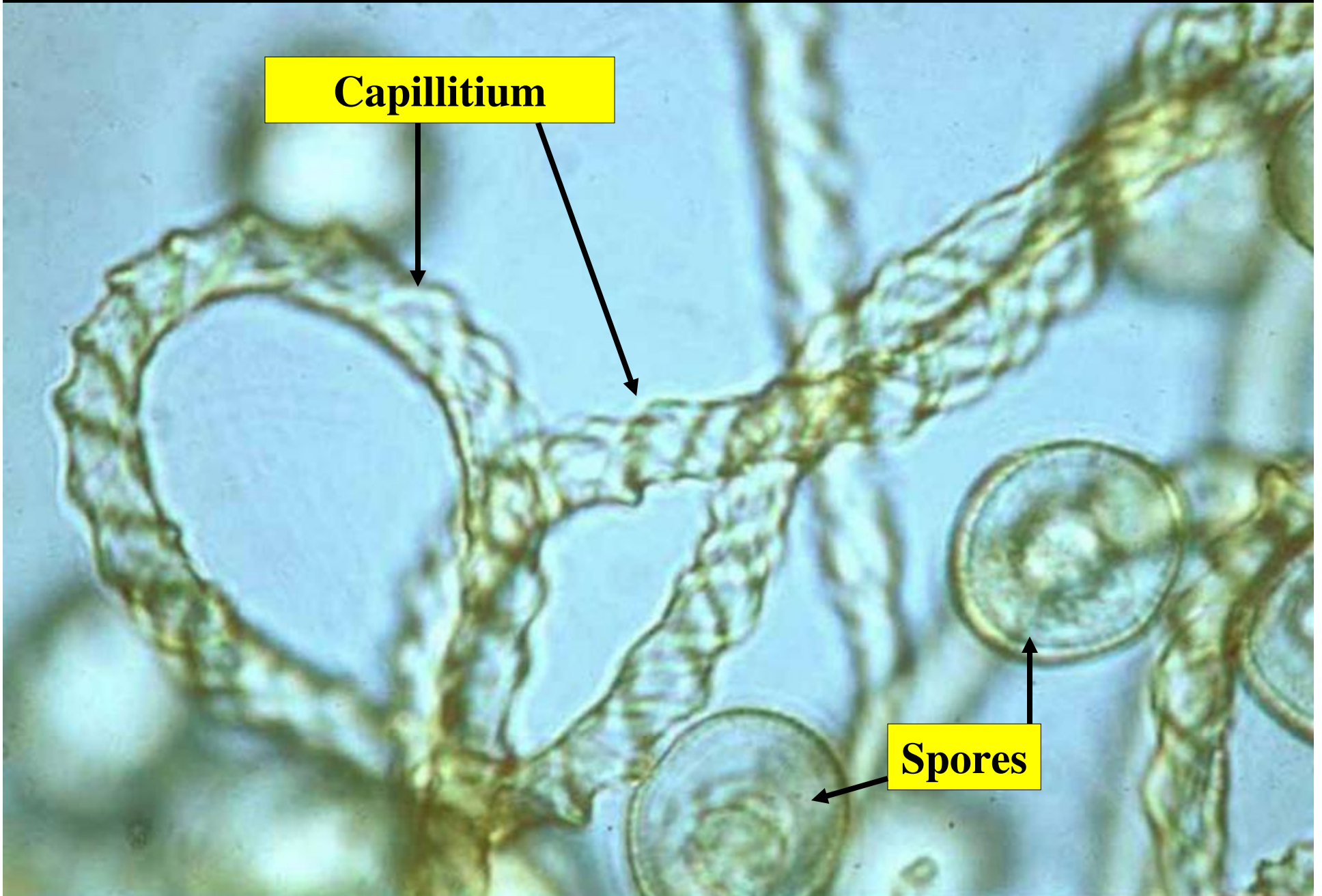
Stipe

Capillitium



Capillitium

Spores



Types of Fruiting Bodies

- **Sporangium**
- **Plasmodiocarp**
- **Aethalium**
- **Pseudoaethalium**





Plasmodiocarp

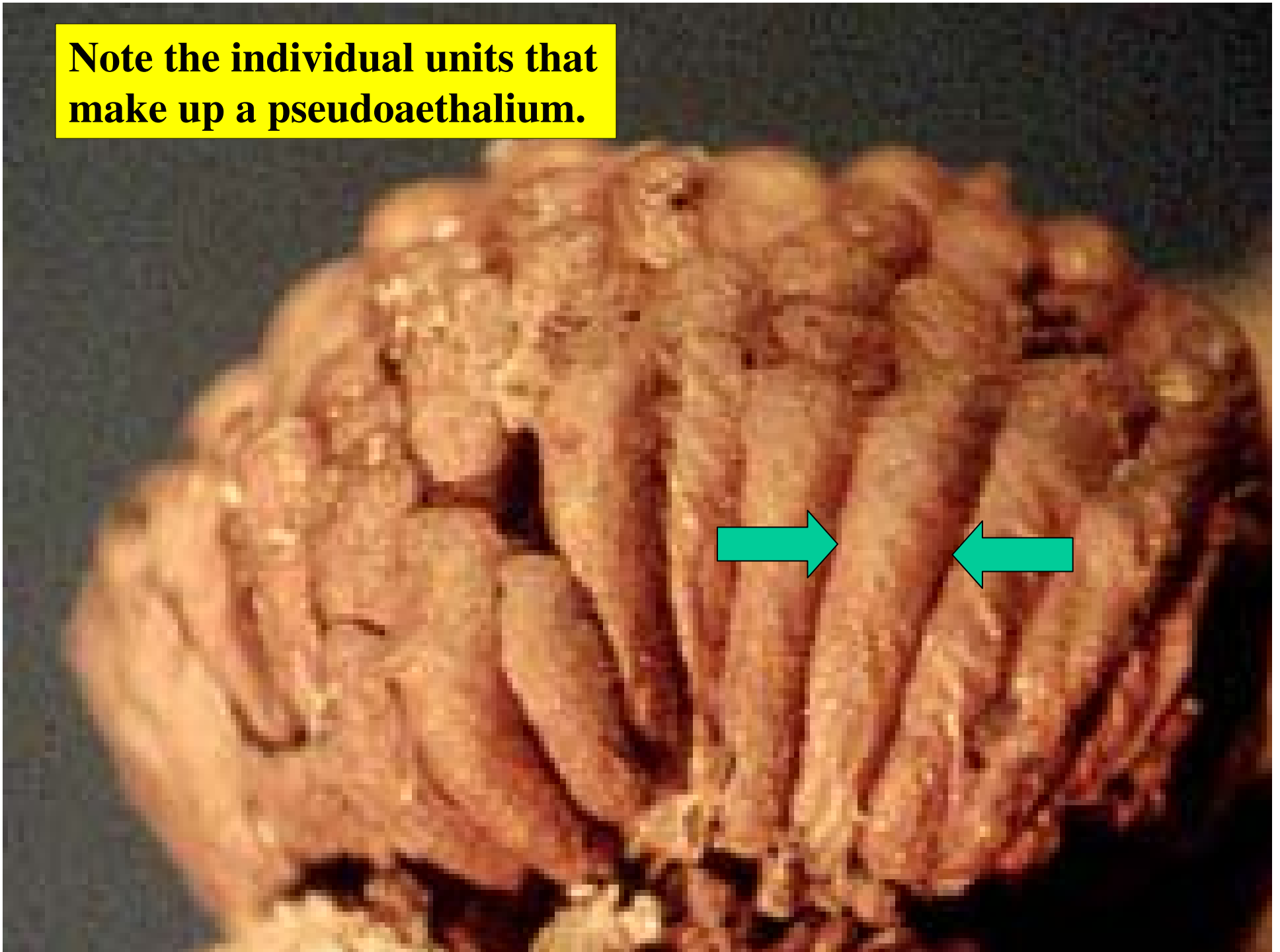
Aethalium



Pseudoaethalium



Note the individual units that make up a pseudoaethalium.



Key to Orders of Myxomycetes

1 Spores borne externally

Ceratiomyxales

1 Spores borne internally

2

2 True capillitium absent

Liceales

2 True capillitium present

3

3 Fruiting bodies small (<0.5 mm tall)

Echinosteliales

3 Fruiting bodies larger (>0.5 mm tall)

4

4 Spore mass more or less brightly colored

Trichiales

4 Spore mass usually purple-brown to black

5

5 Lime present in some part of fruiting body

Physarales

5 Lime absent from all parts of fruiting body

Stemonitales

Order Ceratiomyxales

- spores borne externally
- fruiting bodies unlike those of other myxomycetes
- each spore gives rise to eight swarm cells

Order Ceratiomyxales

Ceratiomyxa



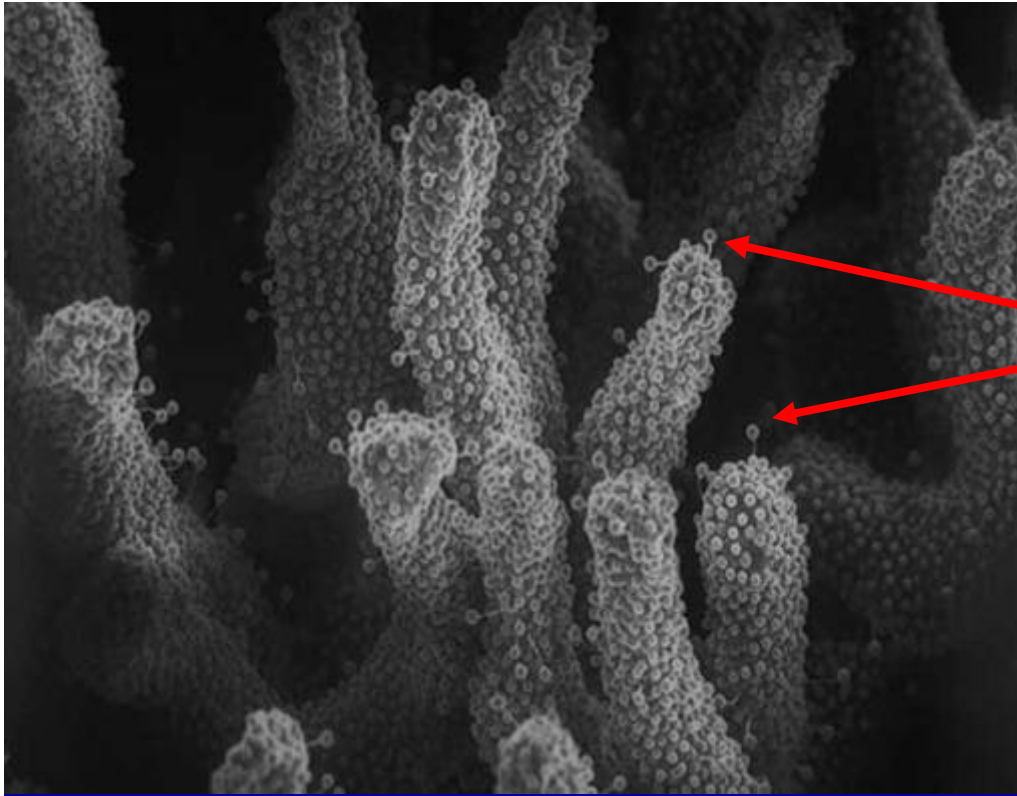
Ceratiomyxa fruticulosa



Ceratiomyxa fruticulosa

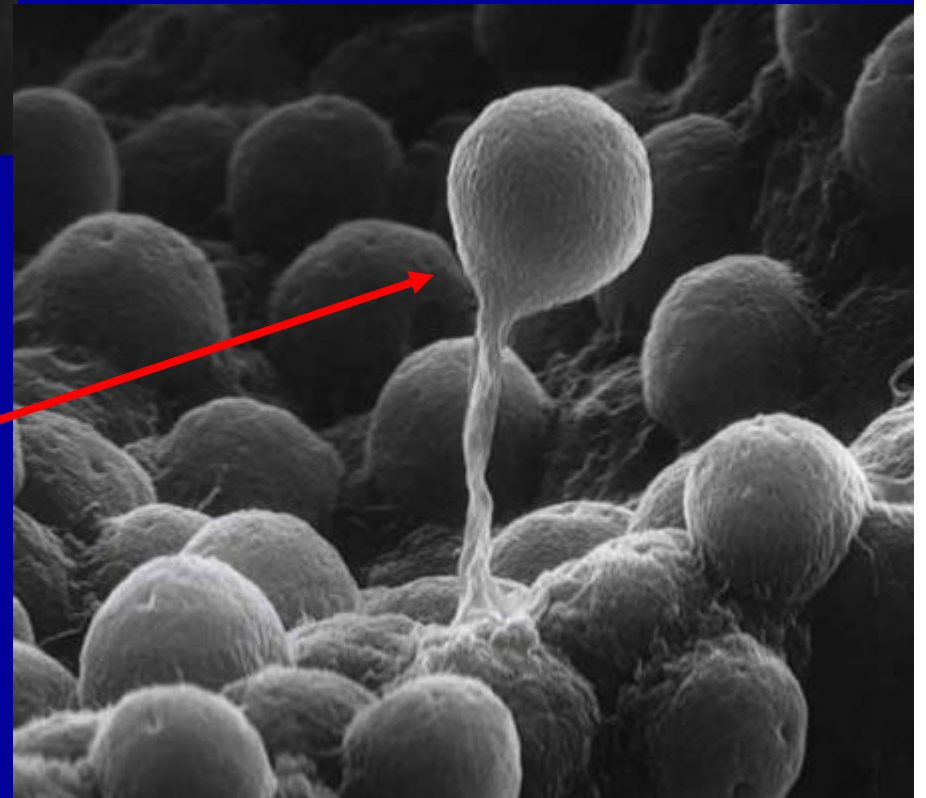


Ceratiomyxa fruticulosa



**Spores of
Ceratiomyxa
*fruticulosa***

A single spore



Ceratiomyxa fruticulosa is common throughout much of the world, but two other species in the genus *Ceratiomyxa* have a more restricted distribution and are found only in the tropics. These two species are *Ceratiomyxa morchella* and *C. sphaerosperma*.



Ceratiomyxa morchella



Ceratiomyxa sphaerosperma

Order Echinosteliales

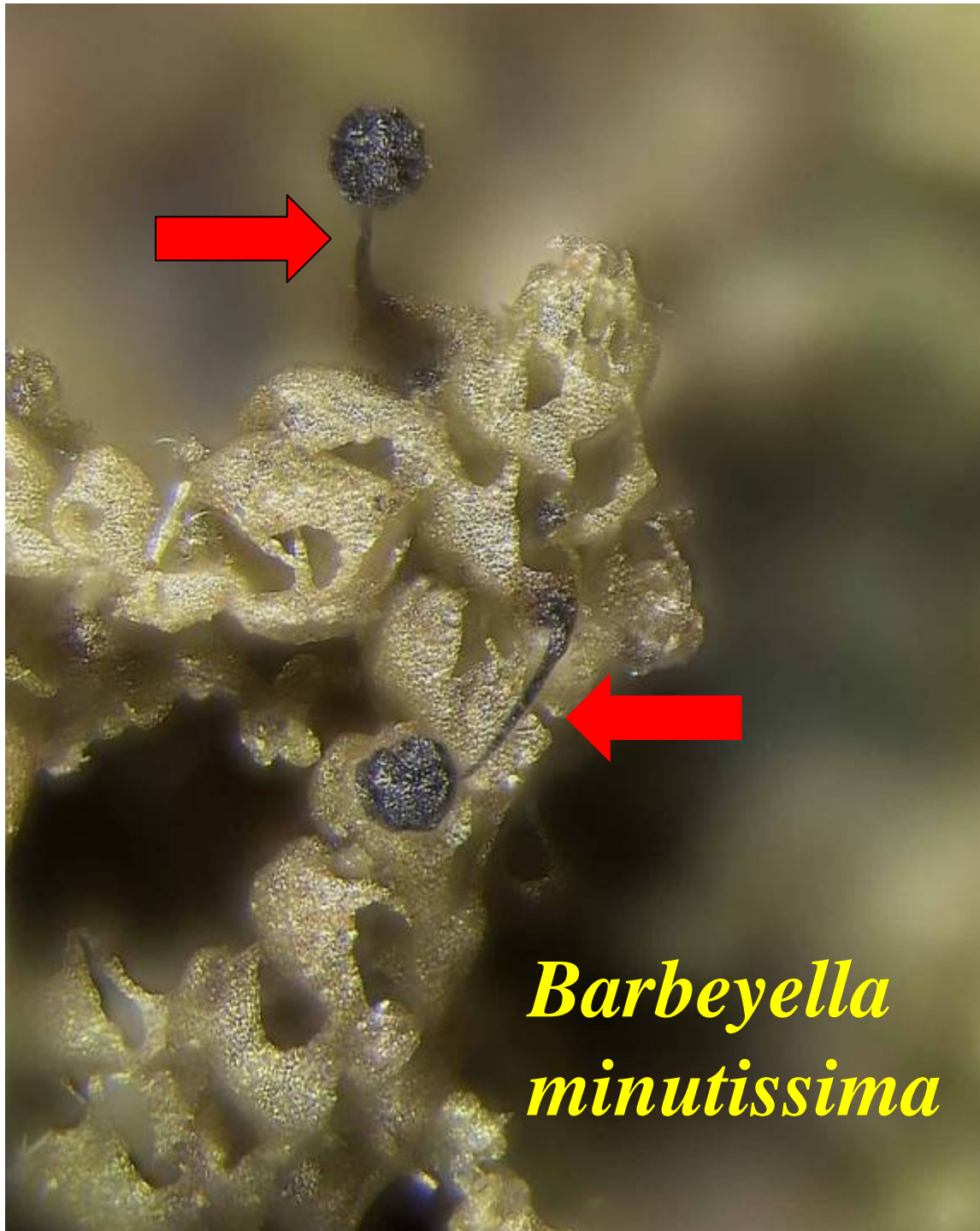
- minute to very small fruiting bodies
- true capillitium present
- fruiting bodies are stalked sporangia

Order Echinosteliales

Barbeyella

Clastoderma

Echinostelium



*Barbeyella
minutissima*
appears to have
an ecological
distribution that is
limited to a
substrate complex
consisting of leafy
liverworts growing
over the surface
of a decorticated
spruce log in
montane forests.

Clastoderma debaryanum

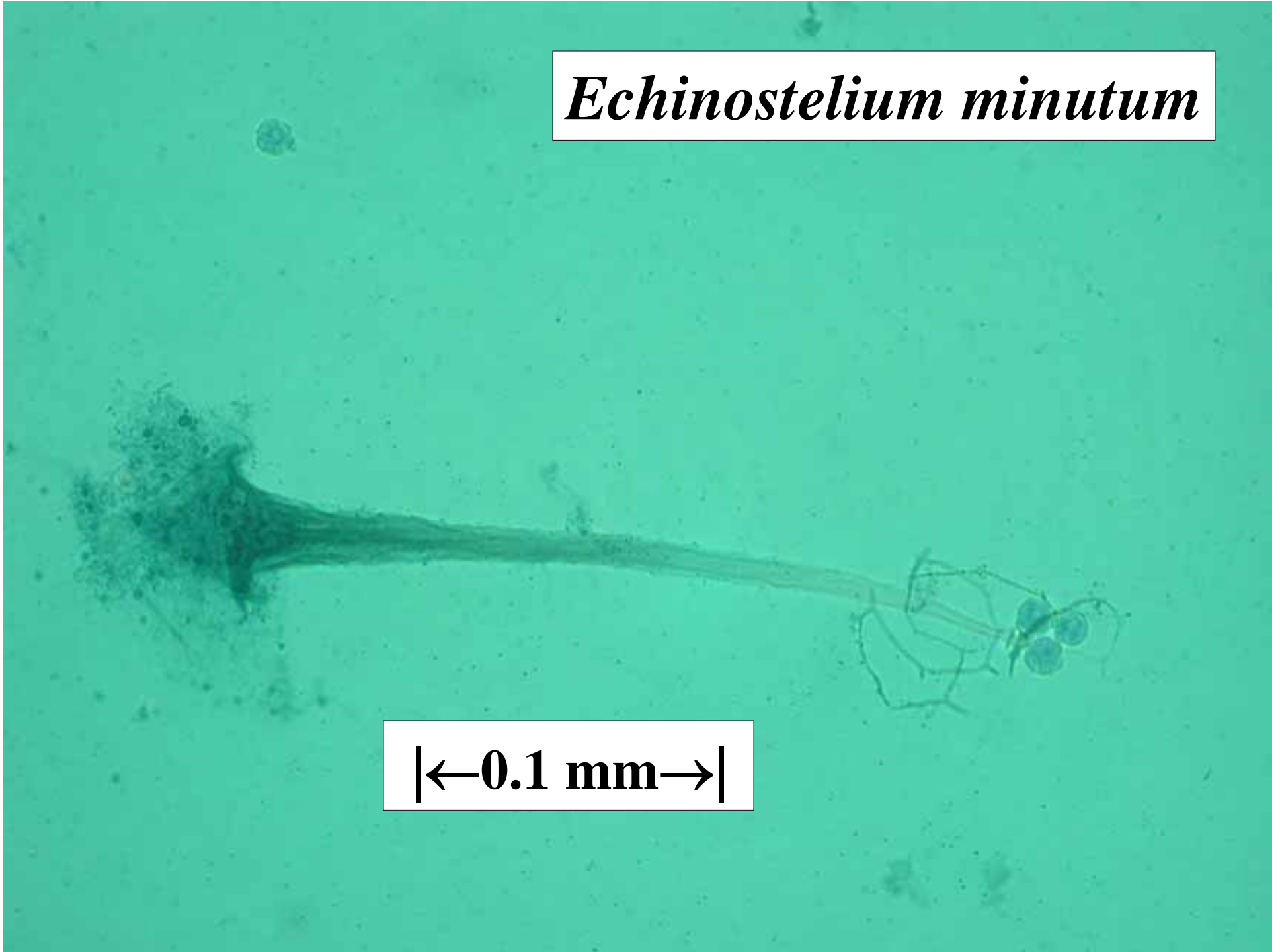




Echinostelium minutum

Echinostelium minutum

|←0.1 mm→|



Order Stemonitales

- capillitium thread-like, usually dark and smooth
- spores black or at least dark
- fruiting bodies are mostly sporangia

Order Stemonitales

Brefeldia

Colloderma

Comatricha

Enerthenema

Lamproderma

Macbrideola

Stemonitis



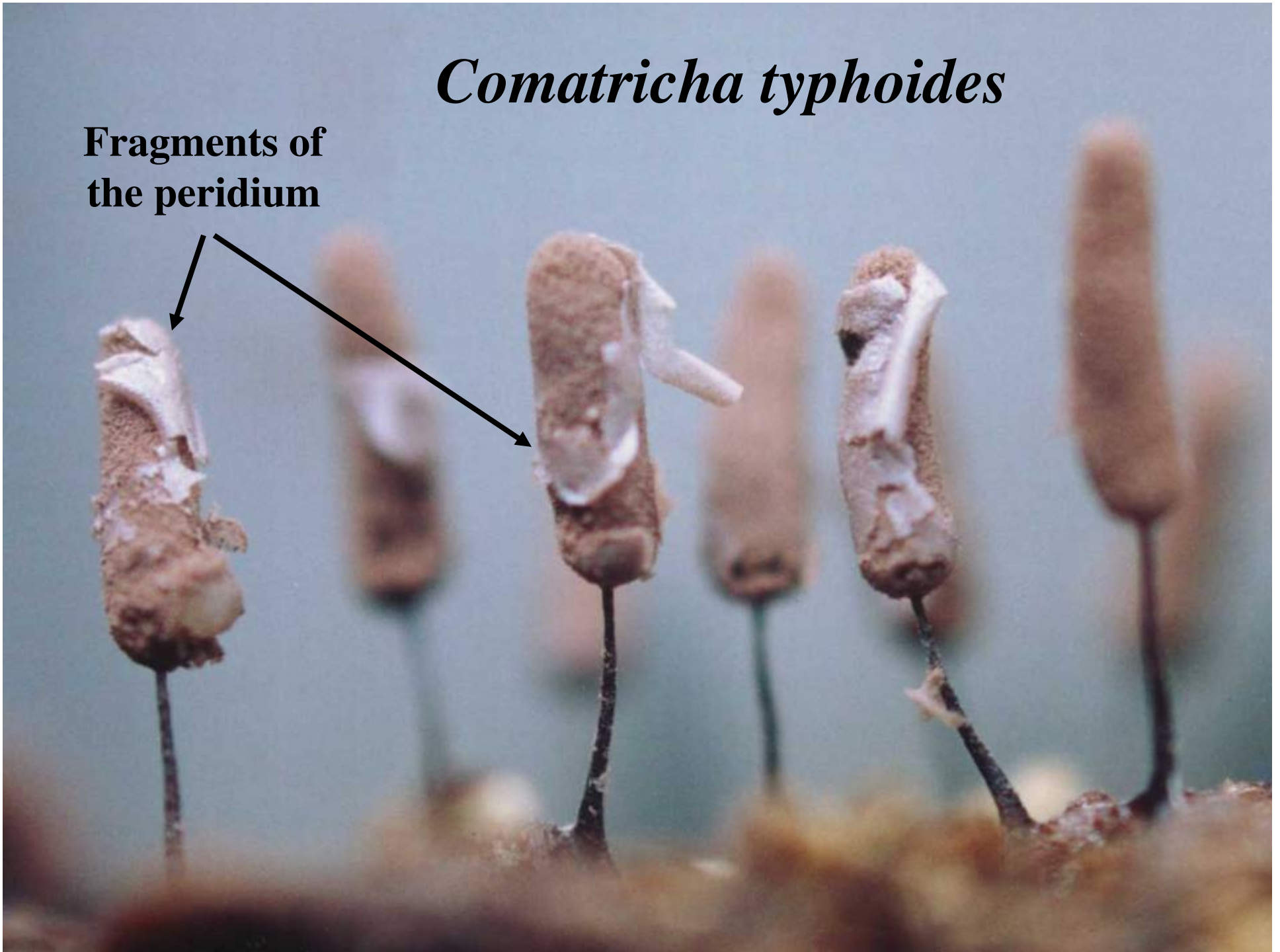
Brefeldia maxima

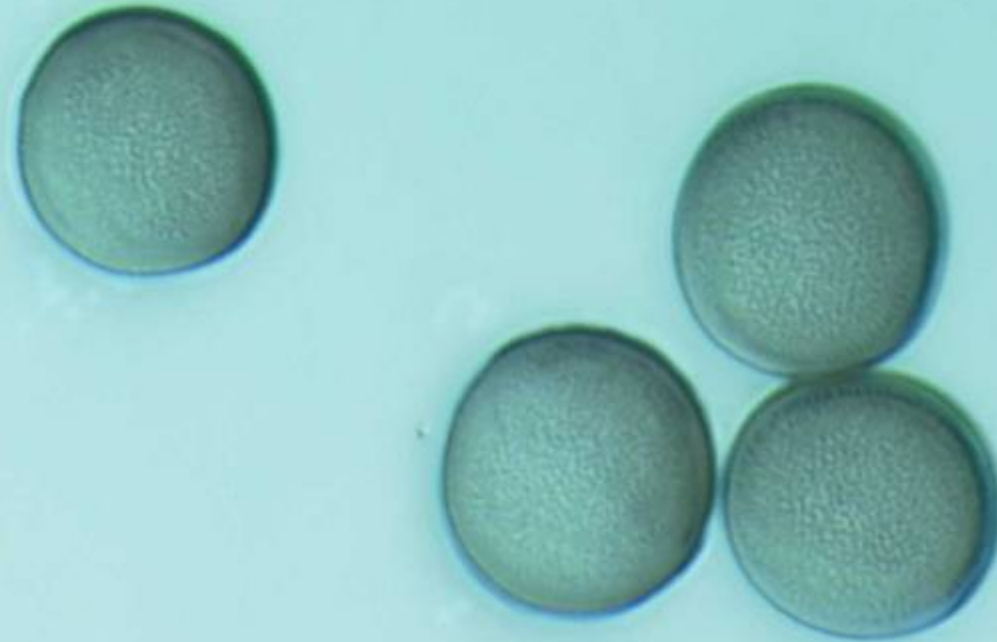


Colloderma oculatum

Comatricha typhoides

Fragments of
the peridium





Spores of *Comatricha fimbriata*



Enerthenema papillatum

*Lamproderma
arcyrionema*





*Lamproderma
columbinum*



Stemonitis axifera

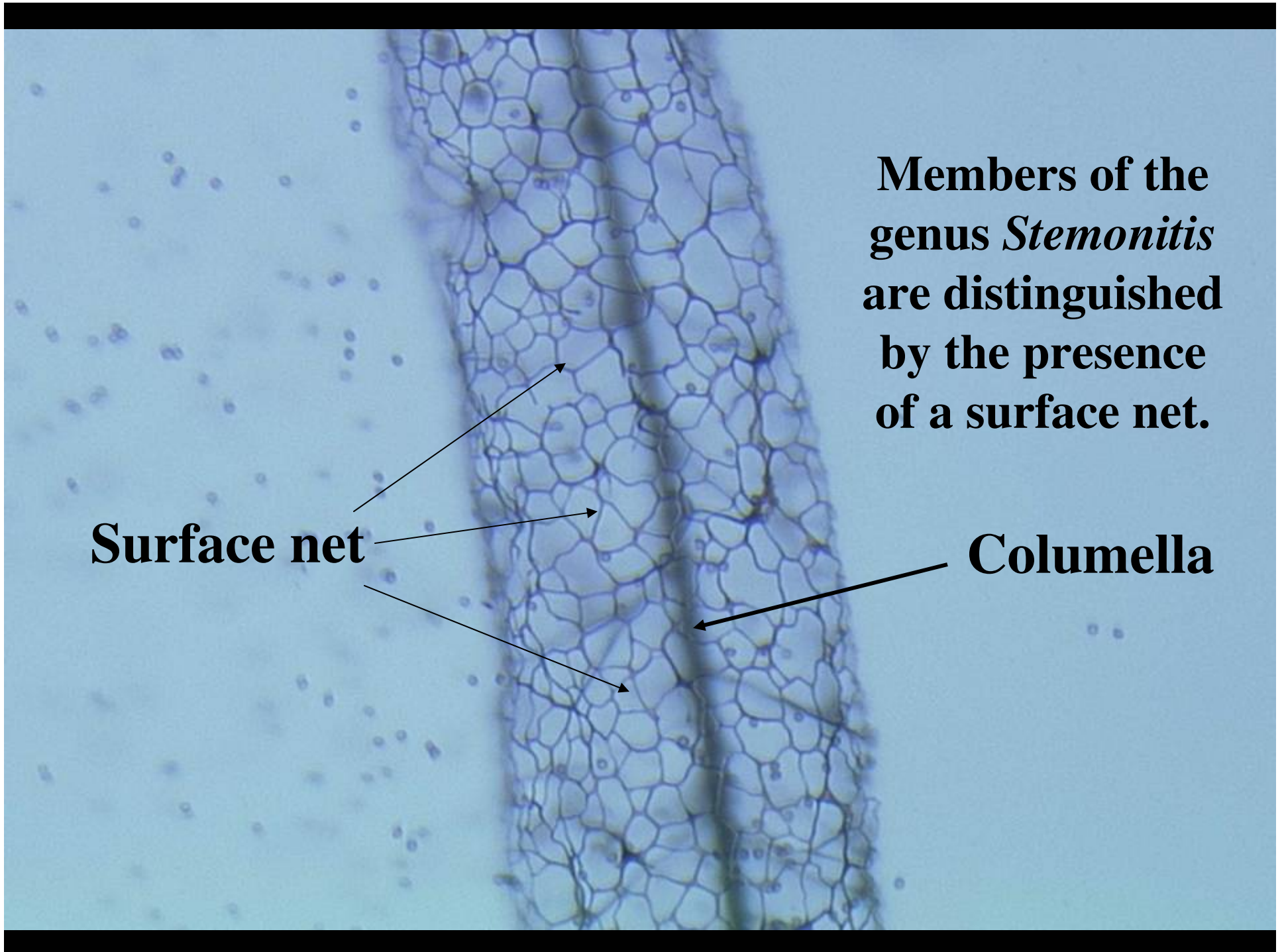
Stemonitis splendens



**Members of the
genus *Stemonitis*
are distinguished
by the presence
of a surface net.**

Surface net

Columella



Stemonitis fusca





Spores of
Stemonitis fusca

Spores of
Stemonitis axifera





Macbrideola decapillata

Clustered spores of *Macbrideola synsporos*



Order Liceales

- no true capillitium
- pseudocapillitium sometimes present
- spores usually light colored

Order Liceales

Cribraria

Dictydiaethalium

Dictydium

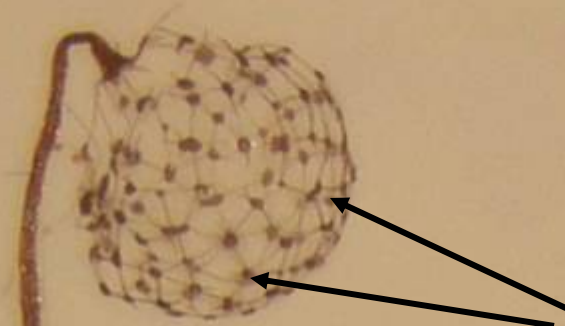
Enteridium

Licea

Lycogala

Tubifera

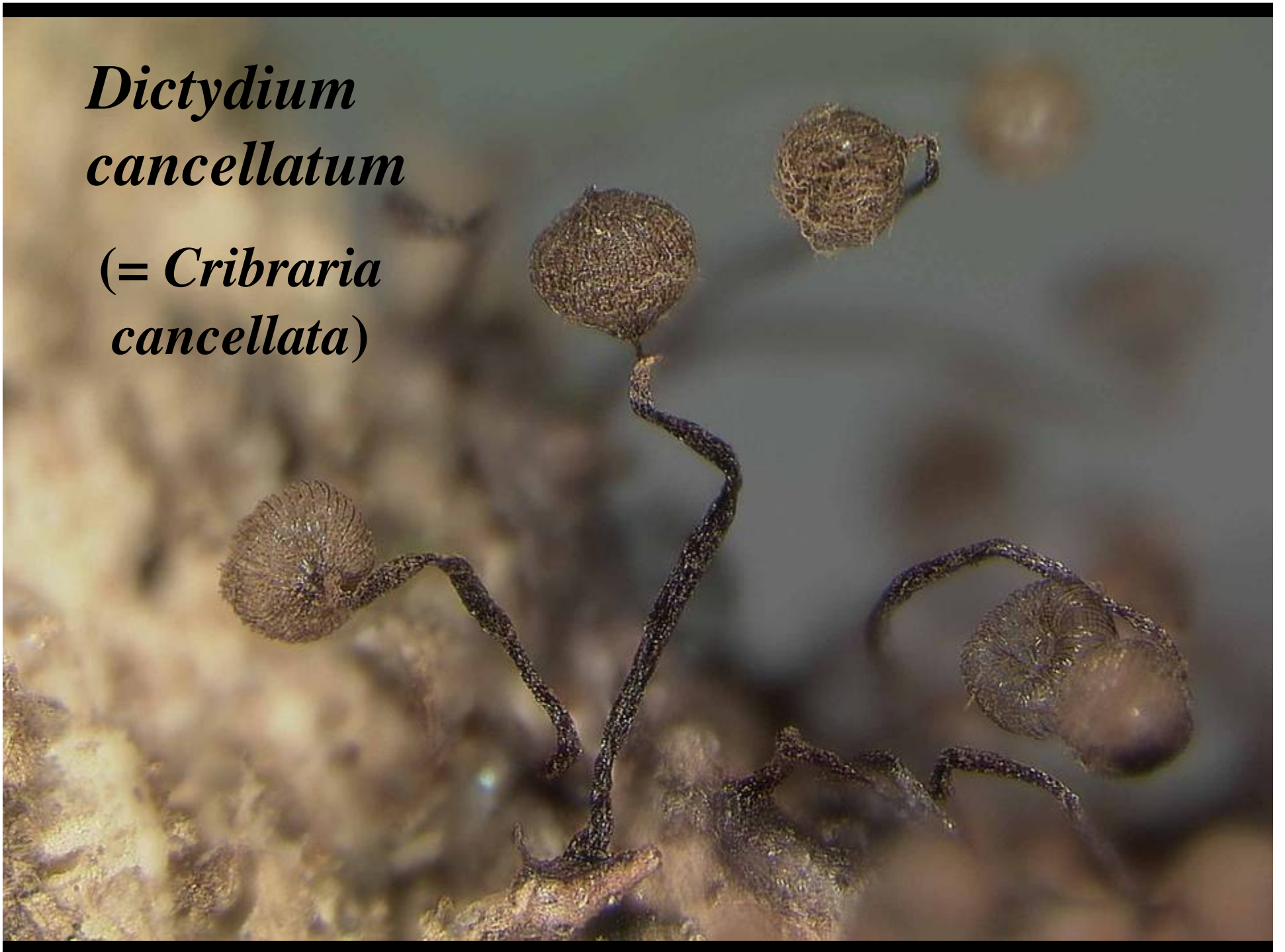
*Cribraria
microcarpa*



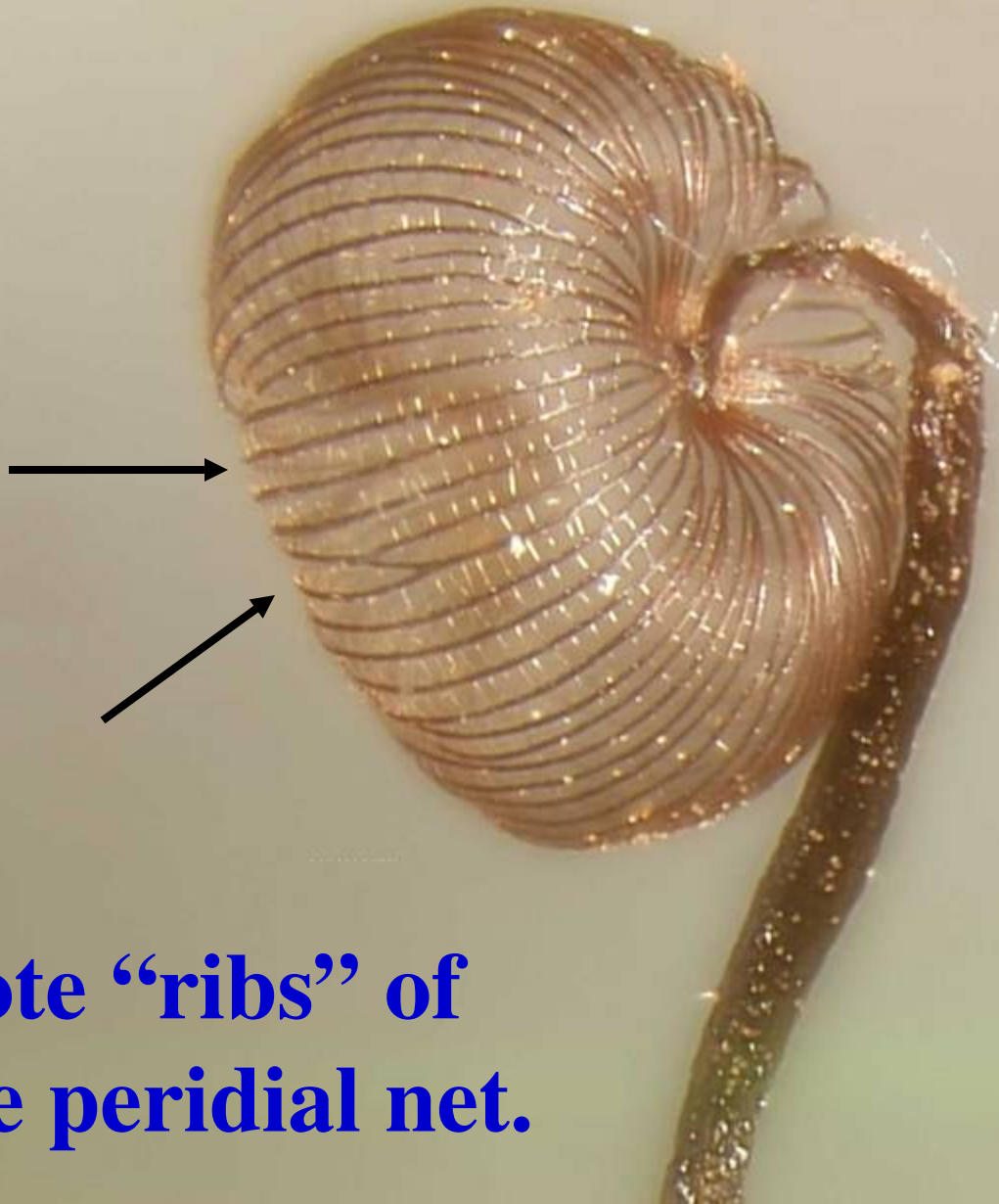
Nodes of peridial net

*Dictydium
cancellatum*

(= *Cribraria
cancellata*)



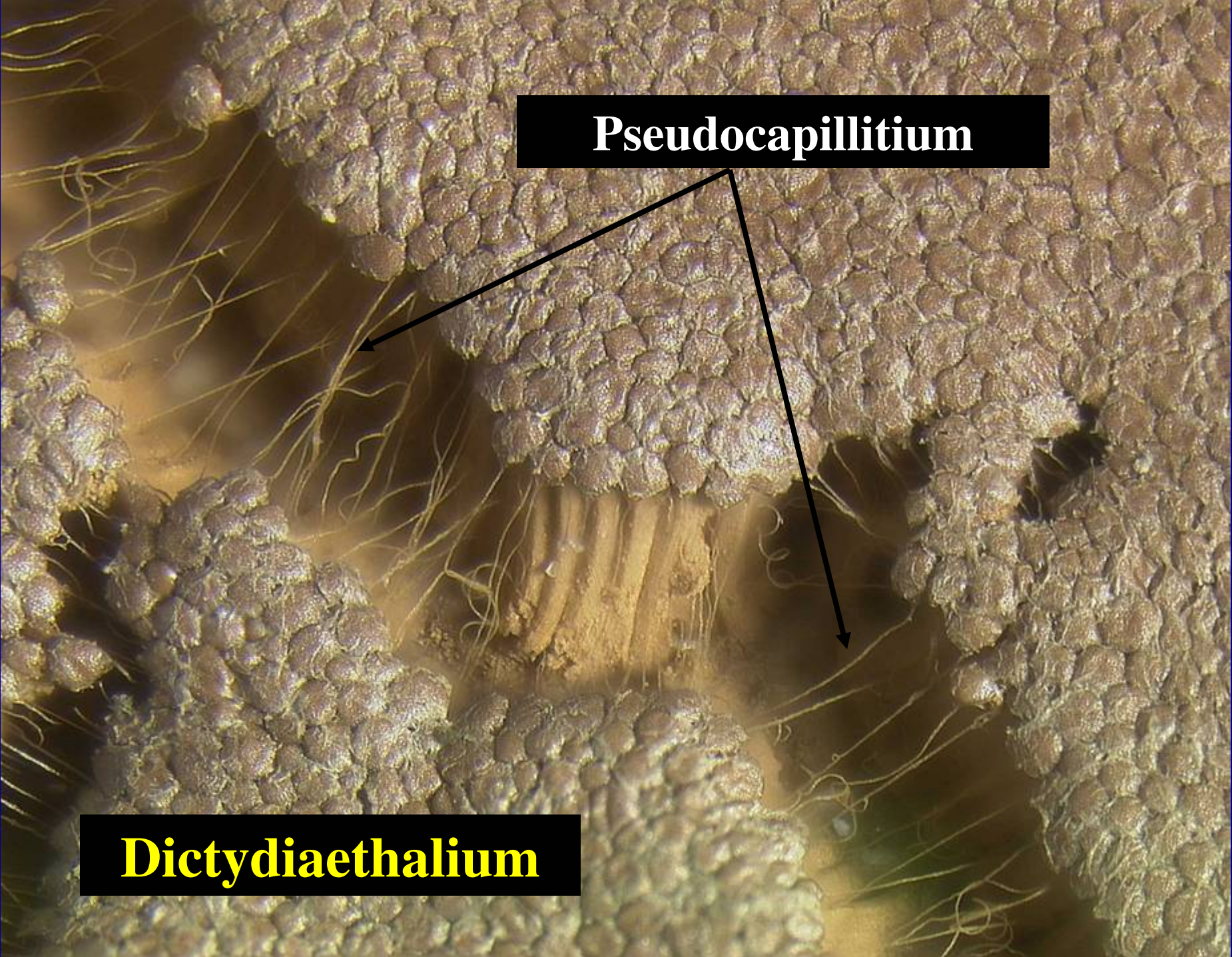
Sporotheca of *Dictydium cancellatum*



Note “ribs” of
the peridial net.



Dictydiaethalium plumbeum



Pseudocapillitium

This is a high-magnification light micrograph of a biological specimen, identified as Dictydiaethalium. The image shows a central, vertically oriented, ribbed structure. Surrounding this central part are several large, rounded, lobed structures with a highly textured, almost crystalline or granular surface. Fine, thread-like structures (pseudocapillitium) are visible extending from the central structure and branching out into the surrounding lobes. Two black arrows originate from the label 'Pseudocapillitium' and point to these fine, thread-like structures. The entire image is framed by a blue border.

Dictydiaethalium

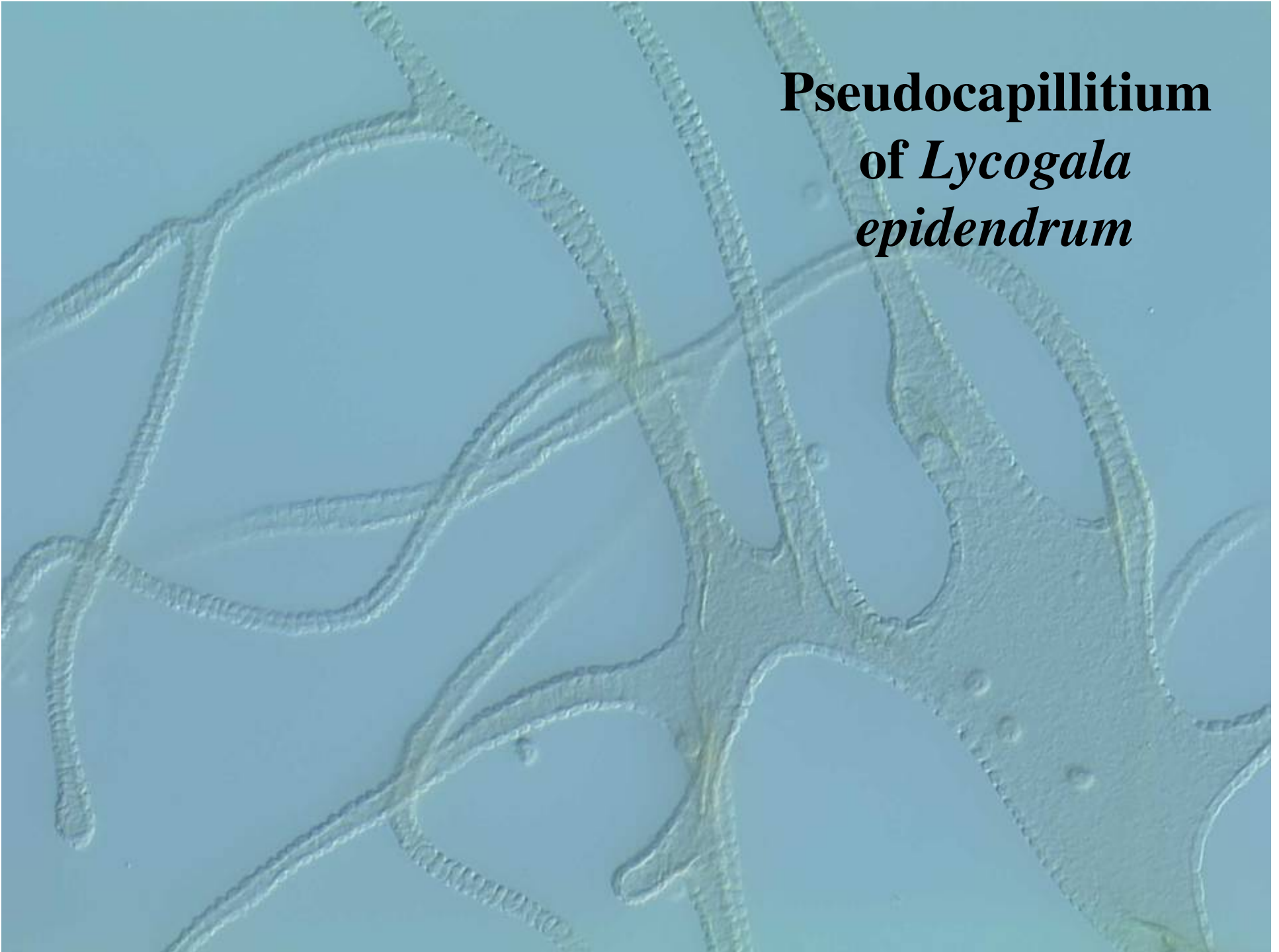


Licea biforis



Lycogala epidendrum

**Pseudocapillitium
of *Lycogala
epidendrum***



Lycogala conicum



*Tubifera
ferruginosa*





Tubifera bombarde

Order Trichiales

- **columella never present**
- **spores more or less brightly colored**
- **capillitium thread-like, often sculptured**

Order Trichiales

Arcyria

Calomyxa

Dianema

Hemitrichia

Metatrichia

Perichaena

Prototrichia



Arcyria cinerea

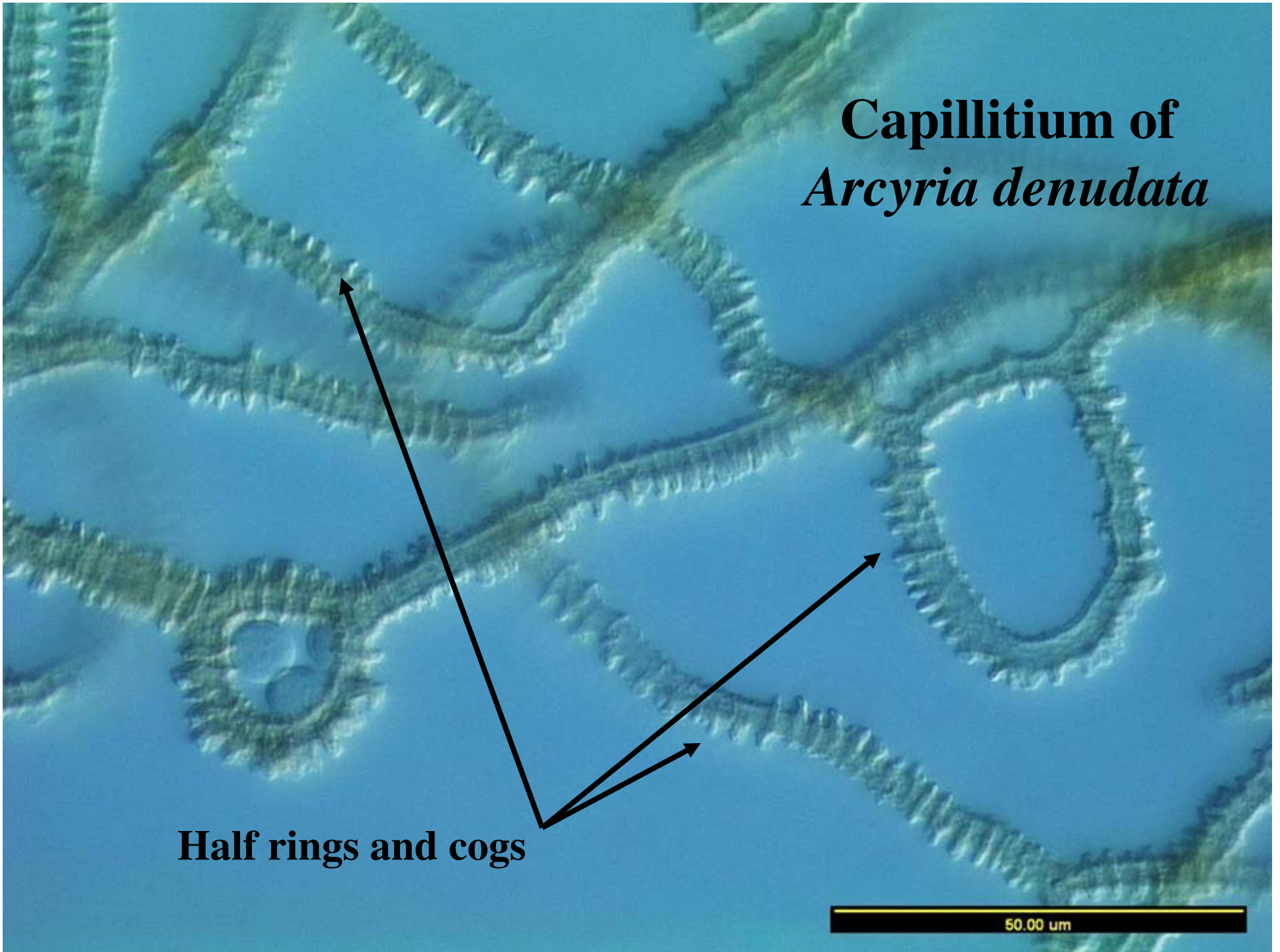


Arcyria denudata

**Capillitium of
*Arcyria denudata***

Half rings and cogs

50.00 um





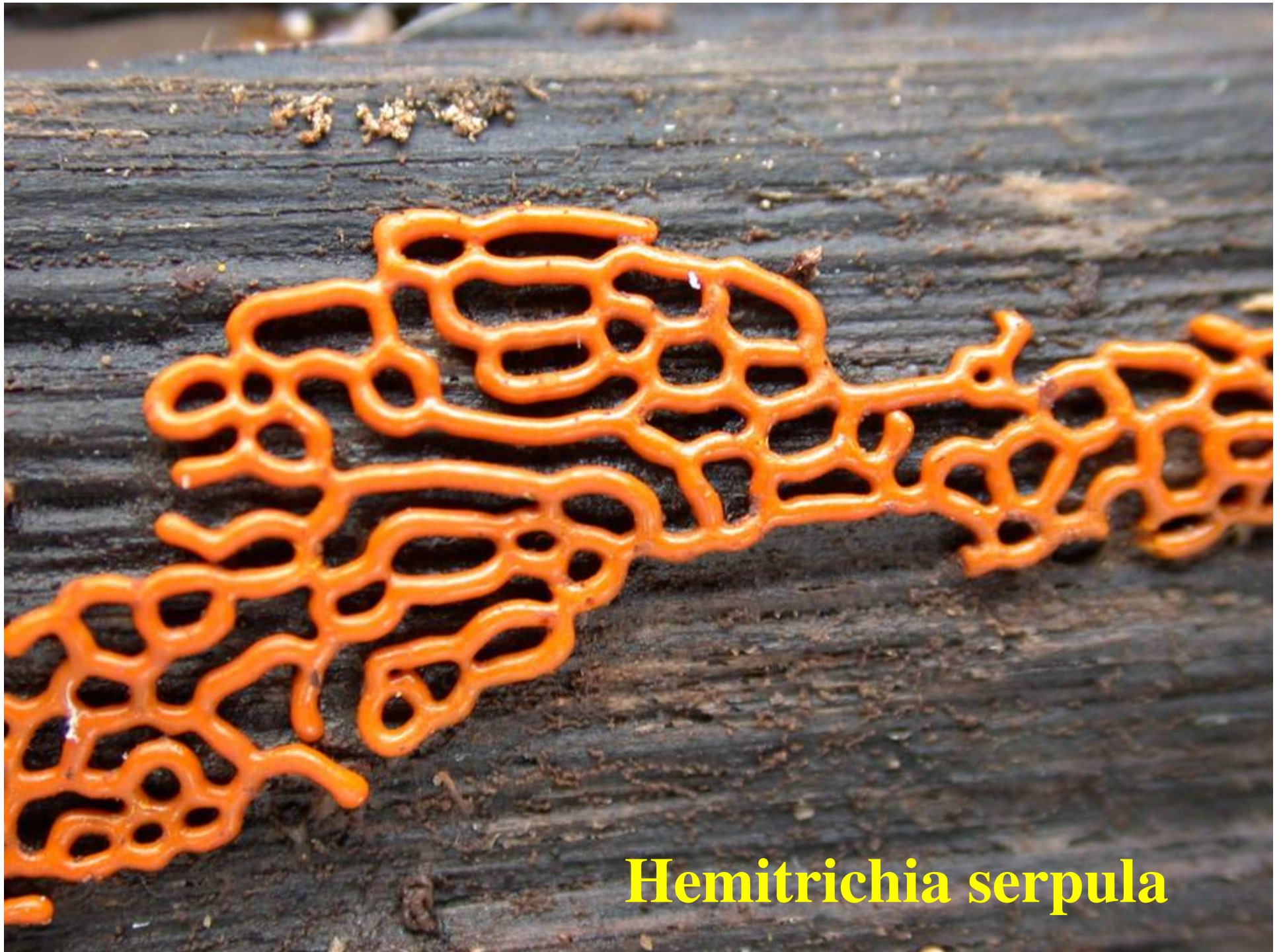
Arcyria nutans



Dianema corticatum

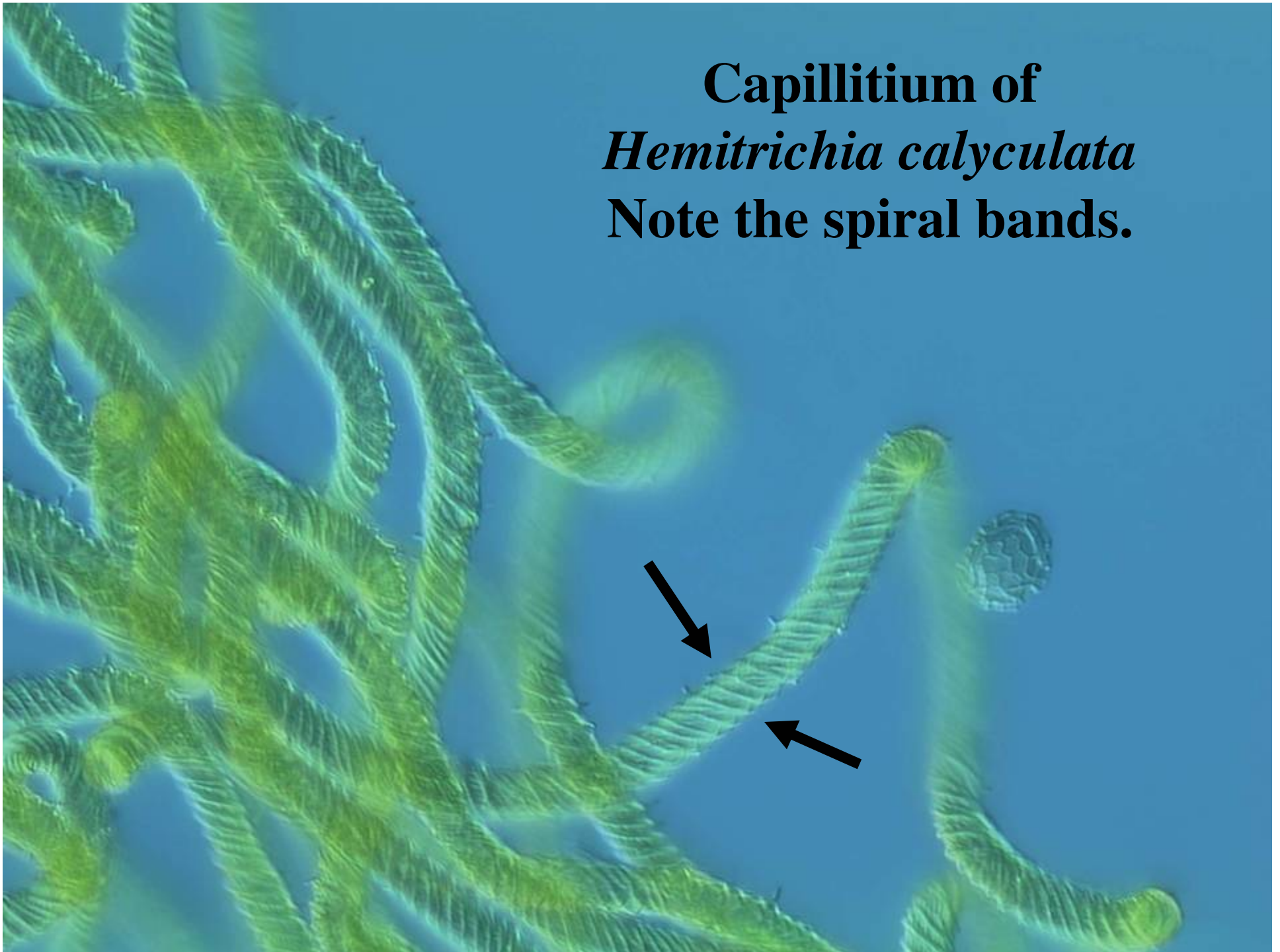


Hemitrichia calyculata



Hemitrichia serpula

Capillitium of
Hemitrichia calyculata
Note the spiral bands.



Metatrachia vesparium



*Metatrachia
vesparium*



Perichaena chrysosperma





Capillitium and
spores of
*Perichaena
chrysosperma*
Note the
spines on the
capillitium.



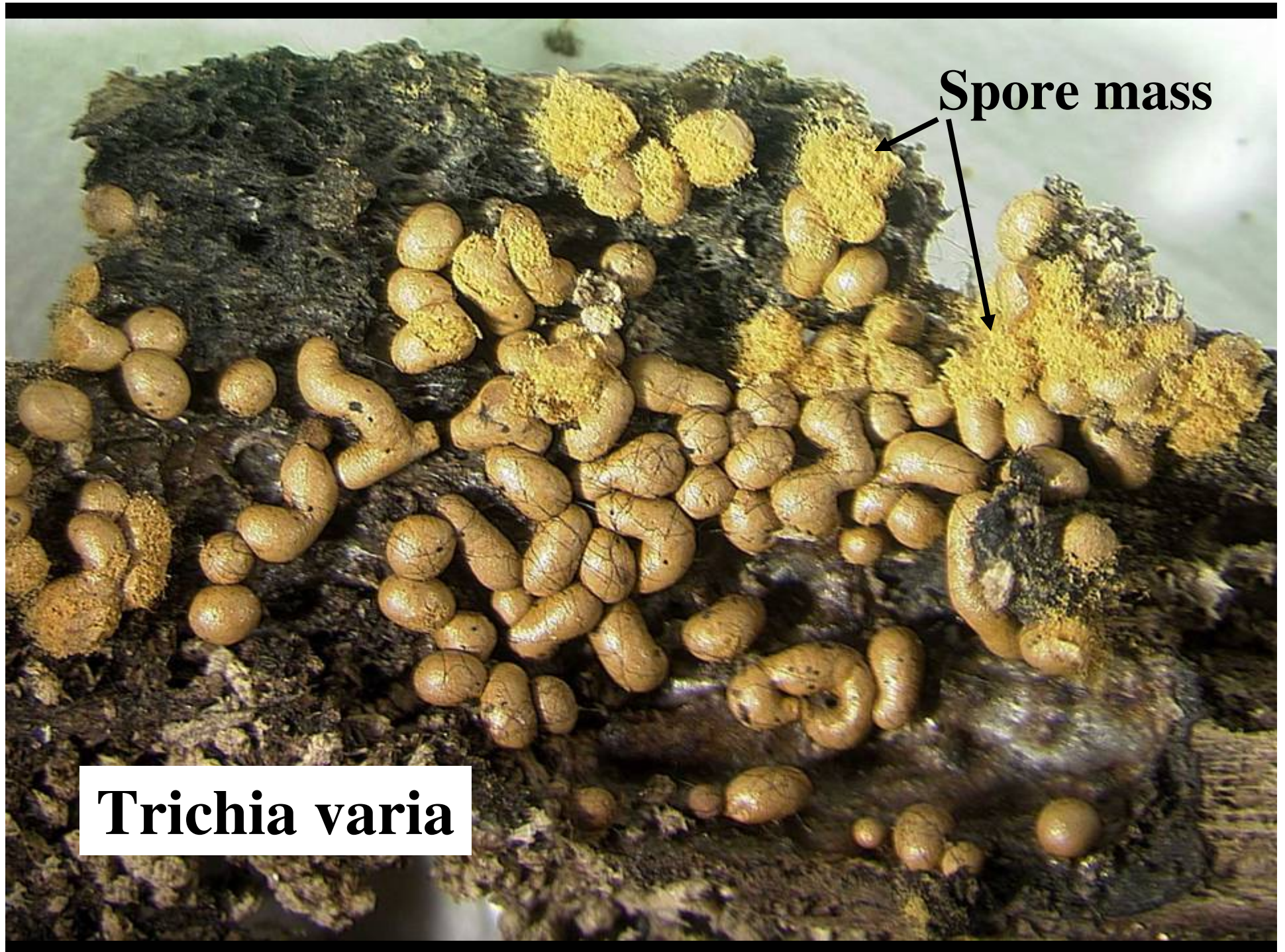
Perichaena depressa

Perichaena minor





Prototrichia metallica

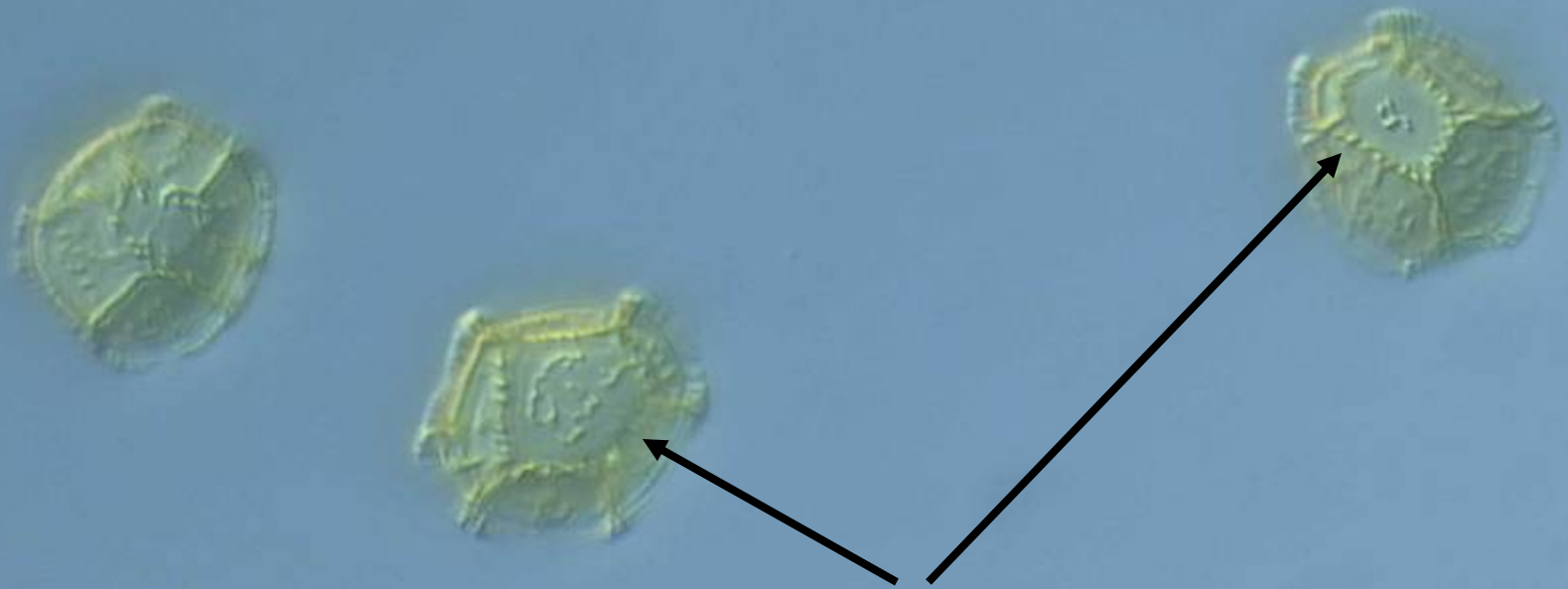


Trichia varia

Trichia decipiens



Spores of *Trichia favoginea*



Note the reticulations

Order Physarales

- lime present in some part of the fruiting body
- spores always dark in mass
- phaneroplasmodium

Order Physarales

Family Didymiaceae

Diachea

Diderma

Didymium

Lepidoderma

Mucilago



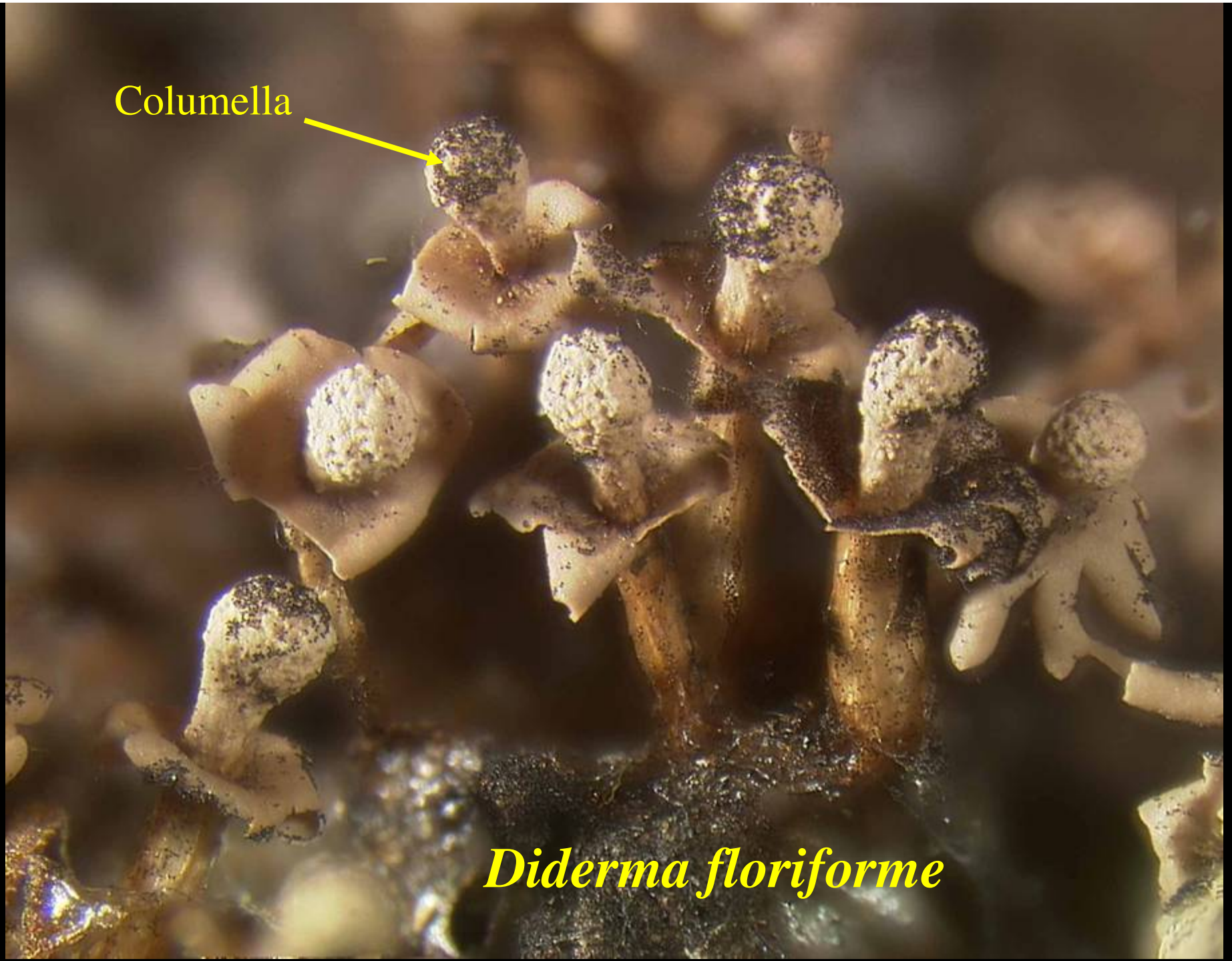
Diachea leucopodia



Diderma effusum

Columella

Diderma floriforme





Capillitium and spores of *Diderma floriforme*



Didyma niveum



Didymium nigripes



Lime crystals

Didymium bahiense



Lepidoderma tigrinum



Mucilago crustacea

Order Physarales

Family Physaraceae

Badhamia

Craterium

Fuligo

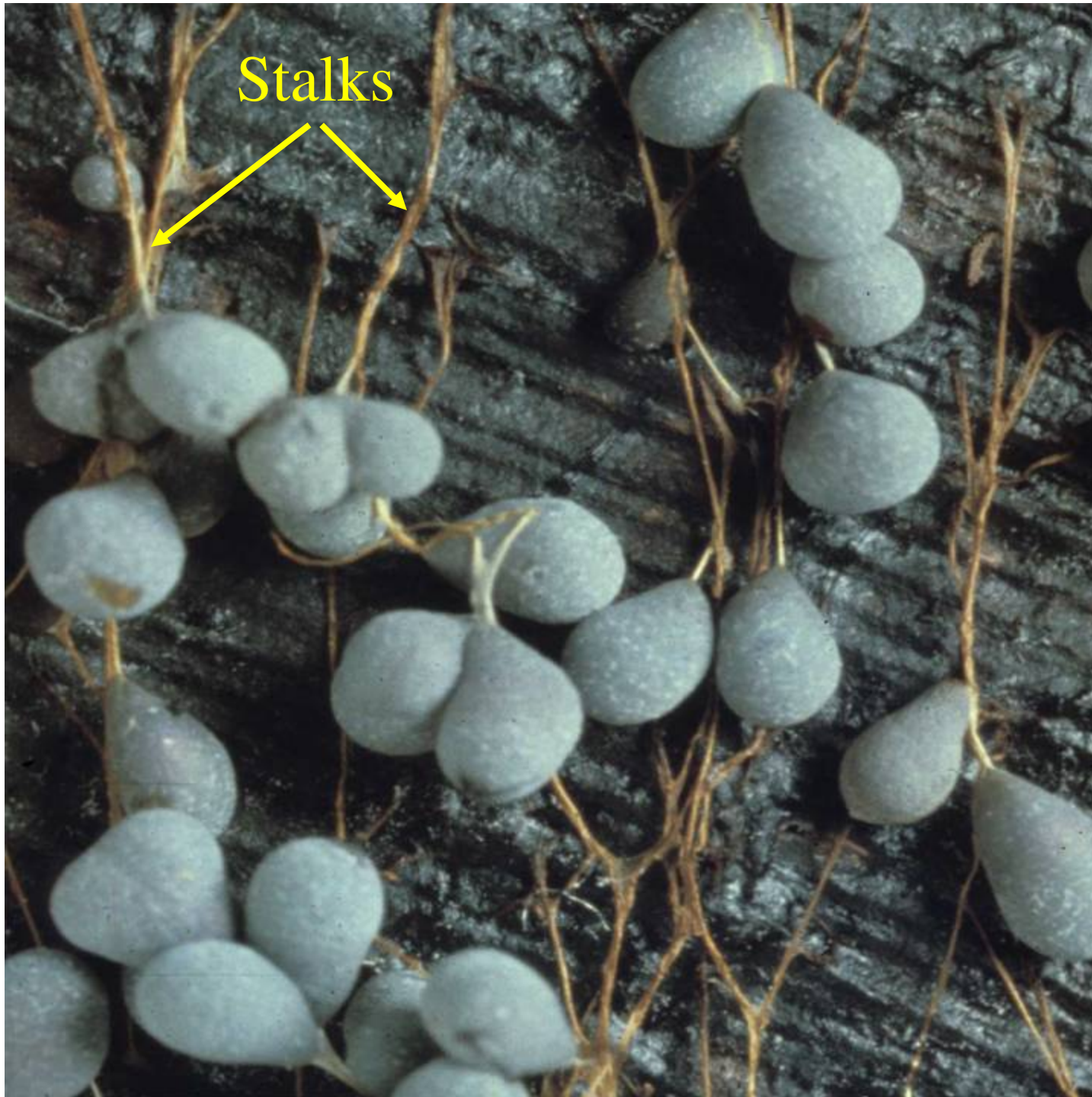
Leocarpus

Physarella

Physarum



Badhamia utricularis

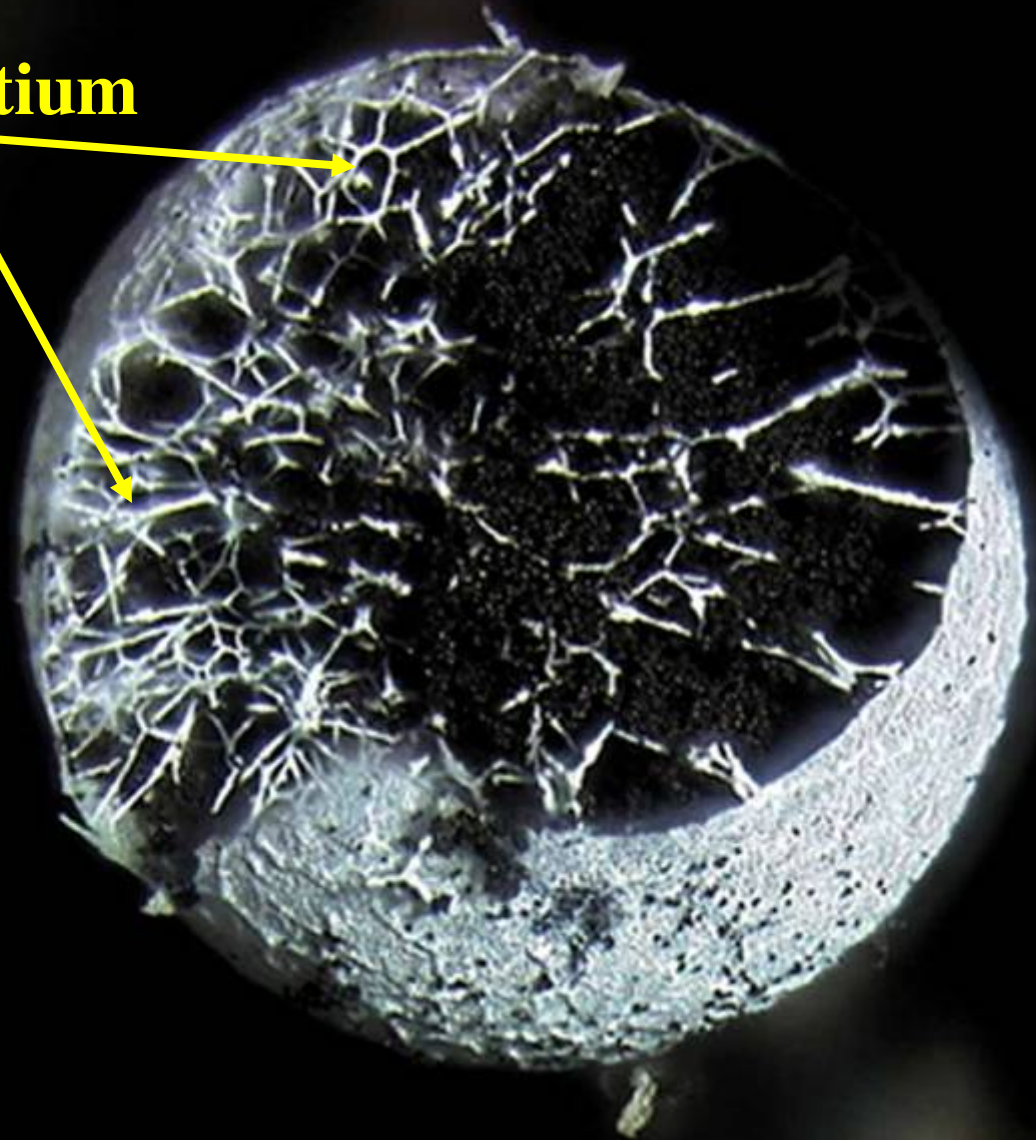
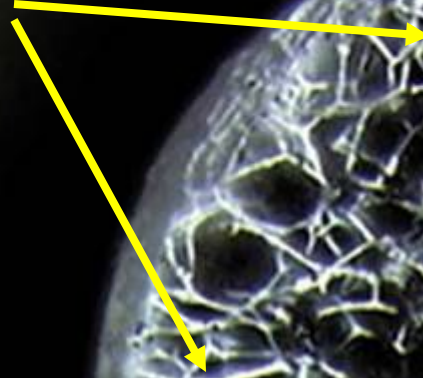


***Badhamia
utricularis***

**Note the
long, thin,
weak
stalks.**

**In this
genus the
capillitium
consists of a
system of
calcareous
tubes.**

Capillitium



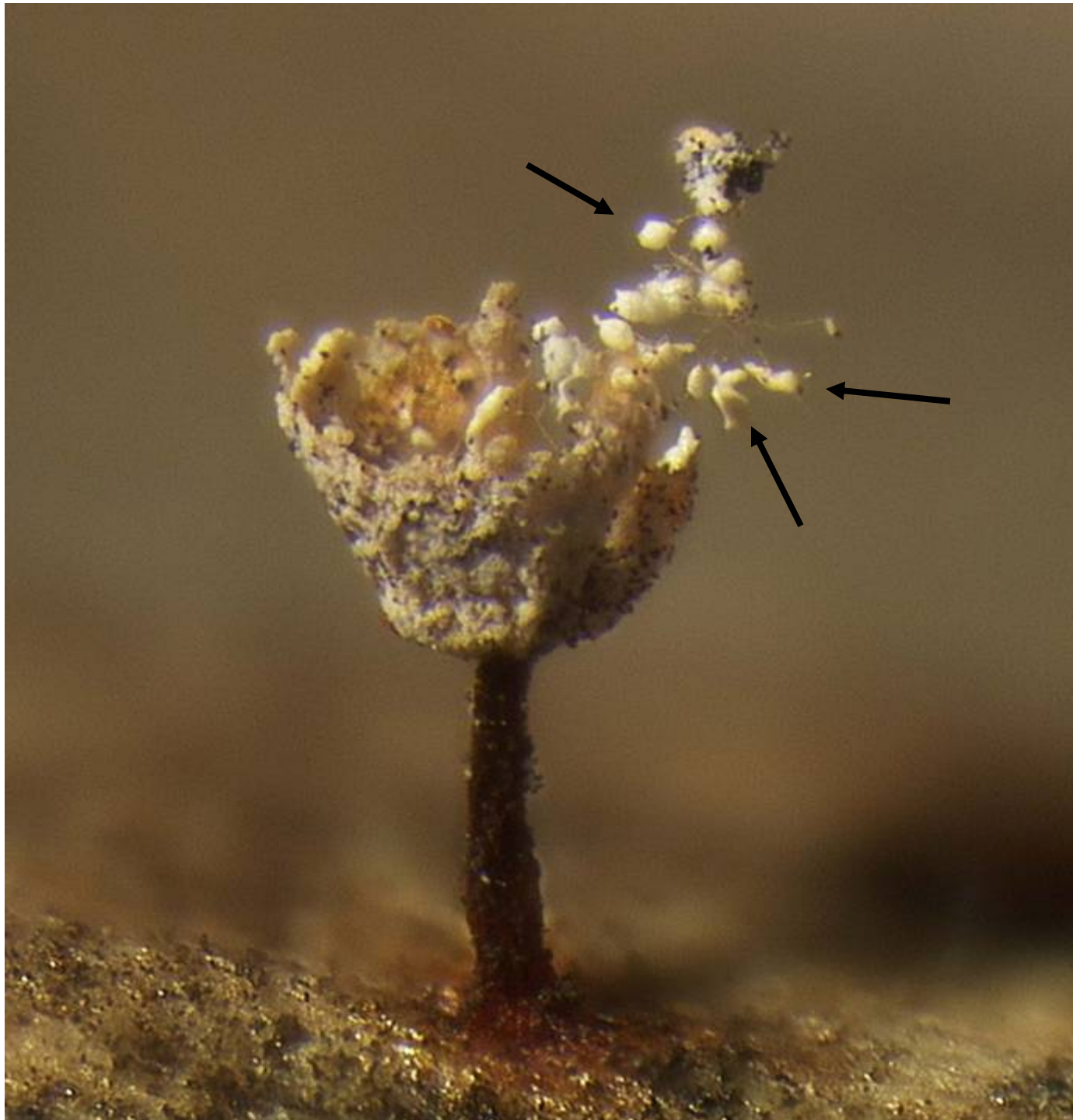
Capillitium of *Badhamia utricularis*



Spores of *Badhamia gracilis*



Craterium minutum



**Note the lime
nodes (arrows)
in the
capillitium
of
*Craterium
leucocephalum*.**



Fuligo septica

Leocarpus fragilis

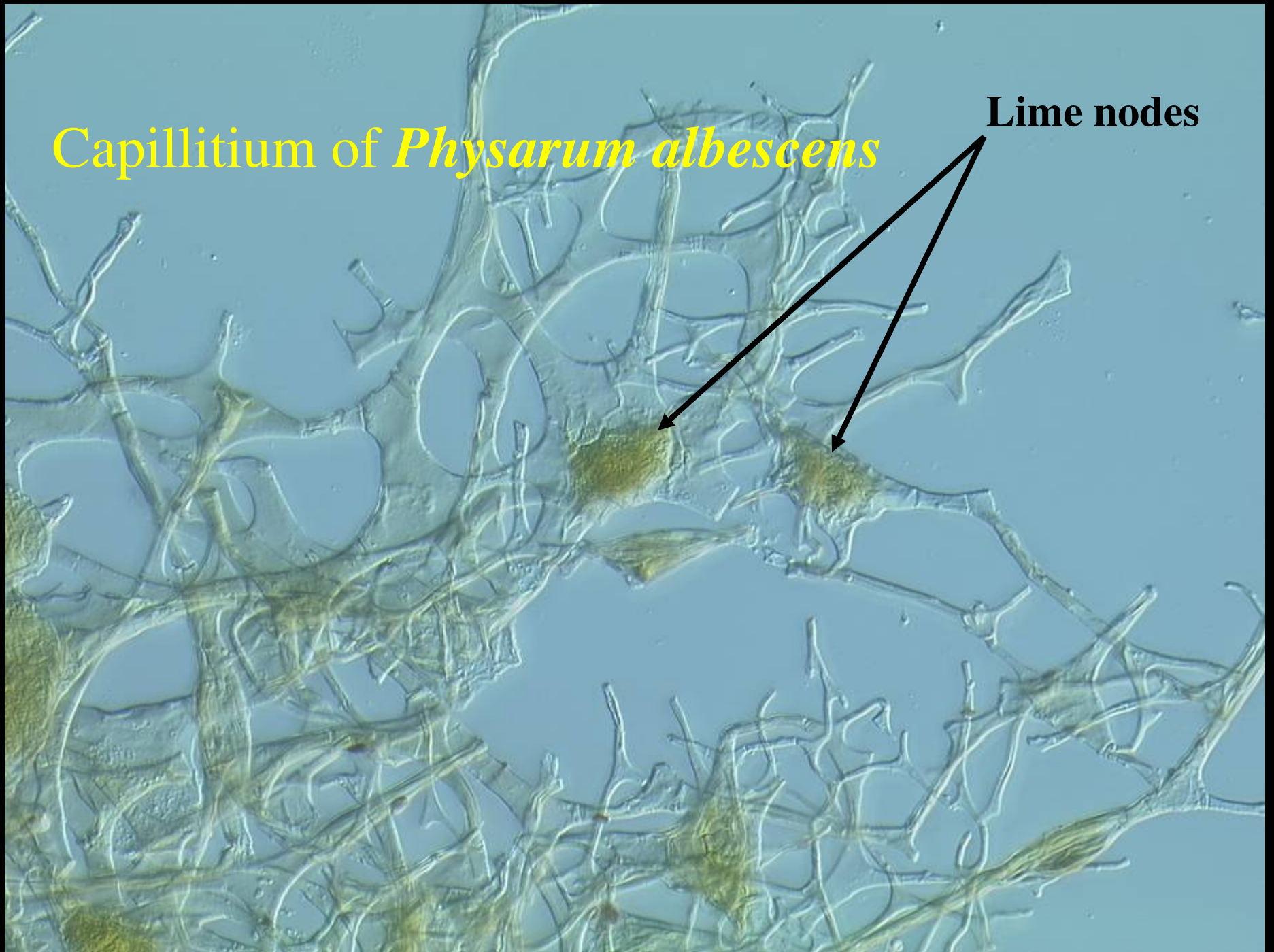




Physarum melleum

Capillitium of *Physarum albescens*

Lime nodes



Physarum
viride





Physarum cinereum

Physarum hongkongense



Physarum compressum



Appreciation is extended to George Barron, Carlos Rojas, Randy Darrah, Emily Johnson, Peter Katsaros, Heino Lepp, Lora Lindley, Rod Nelson, Satyendra Rajguru, Martin Schnittler, Clive Shirley, Orson K. Miller, Jr. and Bev Wigney for contributing images that were used to prepare this presentation.