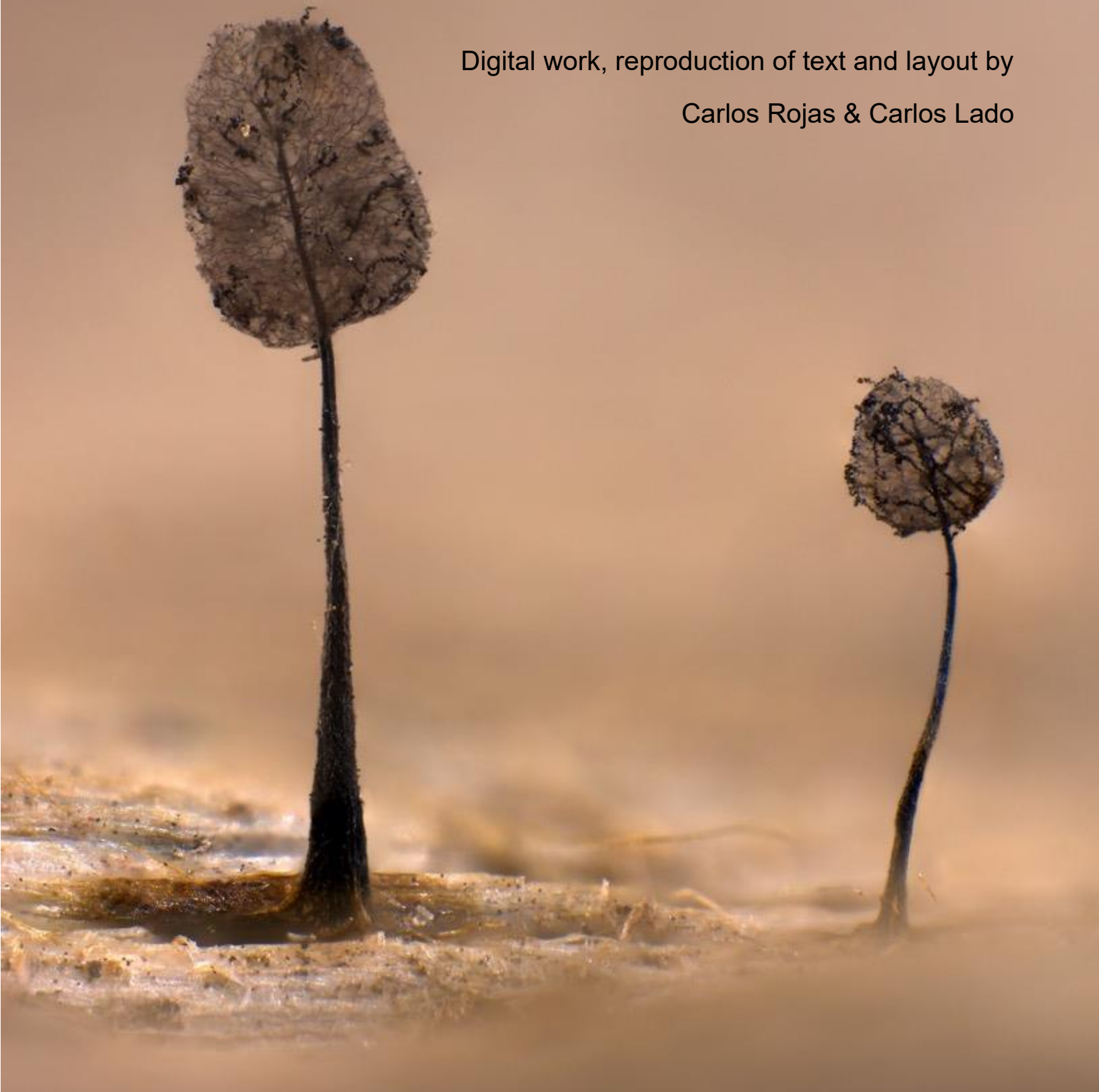


# Taxonomic Keys and Plates from *The Myxomycetes*

Book by George W. Martin and Constantine J. Alexopoulos

Digital work, reproduction of text and layout by

Carlos Rojas & Carlos Lado



# Taxonomic Keys and Plates

## from

# *The Myxomycetes*

Digital work, reproduction of text and layout by

Carlos Rojas & Carlos Lado

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REAL JARDÍN  
BOTÁNICO

MYXOTROPIC



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## About this document

In 1969, George W. Martin and Constantine J. Alexopoulos published a remarkable work on myxomycetes. Their monograph on this group of organisms became one of the references to the taxonomy and geographical distribution of the species in the world. The impact of this book was large, partially because they reviewed the previous works of Thomas Macbride (a large number of collections observed by Martin & Alexopoulos were collected by the former) and Arthur and Gulielma Lister (who sent European collections to the United States National Herbarium). In this manner, *The Myxomycetes* by Martin & Alexopoulos was in some ways, an update of the information already published in the books *North American Slime-Moulds* by Thomas Macbride (1922) and *Monograph of the Mycetozoa* by Arthur Lister (first edition in 1894).

The original Martin & Alexopoulos *The Myxomycetes* book is found today in bookshelves of myxomycete researchers and institutional libraries around the world. It is the last worldwide monograph on myxomycetes. Despite being widely used for research purposes, the book has been out of print for many years and the younger generation of people interested in the fascinating world of myxomycetes has limited access to it. Both Macbride's and Lister's books have been rescued by the Biodiversity Heritage Library and can be accessed in digital format today, but *The Myxomycetes* by Martin & Alexopoulos is not available on the internet yet.

Aware of that limitation, we obtained permission from the original publisher (University of Iowa Press) to create a digital version of the taxonomic keys and original plates contained in the book. Even though molecular techniques of myxomycete detection have been reshaping the nomenclature of the group in recent years and a number of binomials have changed over time, the original work published more than 50 years ago still offers important clues for taxonomic purposes. The drawings are much less detailed than those in Lister's book, for example, but they are still useful for identification. However, they keys are comprehensive, detailed, and easy to use.

We hope this digital compilation would contribute, even a little, to increase the access to scientific information in regions of the world where the original book has been difficult to read. We know it is not the same as having the actual book in your hands, but it is pretty close.

Carlos Rojas  
San José, Costa Rica

Carlos Lado  
Madrid, España  
April 5, 2021

## How to use it

This digital compilation was created with two types of embedded links. When the scientific names in the keys are clicked on, they link to the original plate where the illustration of the species is. When the figures on the plates are clicked on, they link back to the key, in the approximate position of the species name. The numbers after the scientific name in the keys, correspond to the drawing number and species in the respective plates. After each plate, there is one page showing the legends associated with it.

We highly recommend checking the scientific names with the current nomenclatural treatments (visit <https://eumycetozoa.com/>). A number of names have been updated since the publication of the book. In this guide, the current accepted names (at any level) have been annotated within square brackets [ ] after the original species name.

## Acknowledgements

You have access to the information in this document thanks to several people and institutions who were responsible for making it possible. Among these, we would like to recognize The University of Iowa Press for granting us permission to reproduce the material contained herein. The institutional support was facilitated by the Finca Experimental Interdisciplinaria de Modelos Agroecológicos from Universidad de Costa Rica (project 570-B9-7B4) and the Ministerio de Ciencia e Innovación de España (grant PGC2018-094660-B-I00). This document is a direct product of the Myxotropic Project ([www.myxotropic.org](http://www.myxotropic.org)) and the 10<sup>th</sup> International Congress on the Systematics and Ecology of Myxomycetes (ICSEM 10) held in Turrialba, Costa Rica. We express our gratitude to Carlos de Mier for the front cover image.

# Taxonomic Keys

## Taxonomic Index

### Class Myxomycetes

#### Subclass Ceratiomyxomycetidae

##### Order [Ceratiomyxales](#)

Family [Ceratiomyxaceae](#)

Genus [Ceratiomyxa](#)

#### Subclass Myxogastromycetidae

##### Order [Liceales](#) [Cribrariales]

Family [Liceaceae](#)

Genus [Licea](#)

Family [Reticulariaceae](#)

Genus [Tubifera](#)

Genus [Dictydiaethalium](#)

Genus [Lycogala](#)

Genus [Reticularia](#)

Family [Cribrariaceae](#)

Genus [Cribraria](#)

Genus [Lindbladia](#)

Genus [Dictydium](#)

##### Order [Echinosteliales](#)

Family [Echinosteliaceae](#)

Genus [Echinostelium](#)

##### Order [Trichiales](#)

Family [Dianemaceae](#)

[Dianemataceae]

Genus [Listerella](#)

Genus [Calomyxa](#)

Genus [Minakatella](#)

Genus [Dianema](#)

Family [Trichiaceae](#)

Genus [Perichaena](#)

Genus [Oligonema](#)

Genus [Calonema](#)

Genus [Arcyria](#)

Genus [Arcyodes](#)

Genus [Cornuvia](#)

Genus [Metatrichia](#)

Genus [Prototrichia](#)

Genus [Trichia](#)

Genus [Hemitrichia](#)

##### Order [Stemonitales](#) [Stemonitidales]

Family [Stemonitaceae](#)

[Stemonitidaceae]

Genus [Brefeldia](#)

Genus [Amaurochaete](#)

Genus [Elaeomyxa](#)

Genus [Diachea](#)

Genus [Schenella](#)

Genus [Colloderma](#)

Genus [Leptoderma](#)

Genus [Diacheopsis](#)

Genus [Enerthenema](#)

Genus [Stemonitis](#)

Genus [Clastoderma](#)

Genus [Barbeyella](#)

Genus [Macbrideola](#)

Genus [Lamproderma](#)

Genus [Comatricha](#)

##### Order [Physarales](#)

Family [Physaraceae](#)

Genus [Cienkowskia](#)

[Willkommangea]

Genus [Leocarpus](#)

Genus [Physarella](#)

Genus [Badhamia](#)

Genus [Fuligo](#)

Genus [Erionema](#)

Genus [Craterium](#)

Genus [Physarum](#)

Family [Didymiaceae](#)

Genus [Wilczekia](#)

Genus [Physarina](#)

Genus [Diderma](#)

Genus [Mucilago](#)

Genus [Didymium](#)

Genus [Lepidoderma](#)

## CLASS MYXOMYCETES

- a. Spores borne externally on individual stalks, each producing on germination a naked protoplast which develops into a cluster of eight swarm-cells; hypothallus always well developed, giving rise to erect, often branched, and sometimes anastomosing extensions, the sporophores.....Subclass CERATIOMYXOMYCETIDAE ([Ceratiomyxa](#))
- a. Spores borne internally in fructifications of characteristic form, each producing on germination one or two, rarely more, swarm-cells or myxamoebae; hypothallus occasionally prominent, usually inconspicuous, sometimes imperceptible.....Subclass MYXOGASTROMYCETIDAE (b)
- b. Spores in mass pallid or bright-colored, by transmitted light colorless to tinted or yellow-brown, less commonly dull black in mass and then smoky by transmitted light, never purple-brown; lime rarely secreted and then deposited on surface only.....c
- b. Spores in mass usually black or dark purplish brown, by transmitted light purple-brown or brown less commonly deep red, purple or ferruginous in mass, then often deeply tinted by transmitted light, rarely pale; lime, when present, secreted in characteristic fashion.....e
- c. True capillitium lacking; pseudocapillitium, when present, of tubules or perforated plates which sometimes fray out into threads.....[Order Liceales](#)
- c. True capillitium typically present, rarely lacking, but columella then present (rarely lacking in [Echinostelium](#)).....d
- d. Stalked, minute, pale or bright-colored; columella usually present, sometimes giving rise to a capillitium in the form of a loose, open, often incomplete net; peridium delicate, very early fugacious; spores white, pinkish, yellow or ochraceous in mass.....[Order Echinosteliales](#)
- d. Stalked or sessile, usually relatively large; columella lacking; capillitium usually abundant, of sculptured threads; peridium usually firm, often persisting below, at least to a late stage, spores light-colored in mass, tinted or brightly colored by transmitted light.....[Order Trichiales](#)
- e. Neither peridium nor capillitium calcareous; lime rarely present and then restricted to hypothallus, base of peridium, stalk or columella.....[Order Stemonitales](#)
- e. Peridium or capillitium, or both, calcareous in normal developments.....[Order Physarales](#)



## Subclass CERATIOMYXOMYCETIDAE

### Order Ceratiomyxales

#### Genus *Ceratiomyxa*

- a. Fructifications usually large, often extensive, the spores borne on erect, simple, branched or fruticose extensions, or sometimes arising directly from a resupinate or porose crust; spores smooth, sometimes globose but predominantly oval or elliptical in outline, 10-13 X 6-7  $\mu\text{m}$ .....[C. fruticulosa. \(1\)](#)
- a. Fructifications small or minute; spores somewhat smaller.
- b. Fructifications scattered, each consisting of a basal stalk bearing a cluster of branches at the tip, or branches rarely sessile; spore-bearing spicules at tips of branches notably long; spores subglobose, minutely roughened, (6-)-7-9(-10)  $\mu\text{m}$  .....[C. sphaerosperma \(3\)](#)
- b. Fructifications solitary or scattered, resembling *Morchella* in shape; spicules at tips not notably elongated; spores oval or elliptical, smooth, 9-10 x 6-8  $\mu\text{m}$  ...[C. morchella \(2\)](#)

## Subclass MYXOGASTROMYCETIDAE

### Order Liceales [Cribrariales]

- a. Fructification of small, often minute, sporangia, or small, simple or sparsely branched, rarely effused, plasmodiocarps; neither pseudocapillitium nor dictydine granules present; spores mostly dingy to blackish in mass, then smoky by transmitted light, sometimes bright-colored in mass, then tinted yellow or ochraceous by transmitted light.....[Liceaceae](#)
- a. Fructifications sporangiate to aethalioid, often large and conspicuous; spores pallid to variously colored but never smoky.....b
- b. Dictydine granules lacking; usually aethalioid or pseudoaethalioid, if plasmodiocarpous or sporangiate, portions of peridium not persisting as a preformed net; spores yellow-brown by transmitted light.....[Reticulariaceae](#)
- b. Dictydine granules present; mostly sporangiate, rarely united into a pseudoaethalium or an aethalium; portions of peridium in sporangiate forms persisting as a pre-formed net; spores pallid, ochraceous, pinkish or purplish, rarely yellow-brown by transmitted light.....[Cribrariaceae](#)

## Family Liceaceae [only Genus *Licea*]

### Genus *Licea*

- a. Fructifications sessile, sometimes with restricted base but never stalked.....b
- a. Fructifications typically stipitate, rarely sessile and then usually accompanied by stalked sporangia.....q
  - b. Dehiscence circumscissile by a preformed lid .....c
  - b. Dehiscence not circumscissile by a preformed lid .....e
- c. Sporangia bright coppery brown, with prominent tubules on inner portion of lid ..... [L. kleistobolus. \(7\)](#)
- c. Sporangia dark, not coppery, without tubules on inner portion of lid .....d
  - d. Sporangial wall dark gray or dingy black, gelatinous when moist, drying black and shrivelled; lid morphologically distinct ..... [L. parasitica \(10\)](#)
  - d. Sporangial wall dark brown, becoming black, not gelatinous; lid represented by upper plate, not morphologically distinct from lateral plates .....*L. belmontiana*
- e. Sporangia spindle-shaped, erect, about twice as high as wide; peridium black, shining, 2-lobed by a vertical suture; spores bearing prominent fugacious spines .....[L. fimicola \(6\)](#) [currently considered *Kelleromyxa fimicola* (Dearn. & Bisby) Eliasson]
- e. Sporangia not spindle-shaped, rarely higher than wide; spines or warts on spores not fugacious except in *L. chelonoides* .....f
  - f. Predominantly plasmodiocarpous, often branched, netted or effused, but varying to pulvinate; robust, the plasmodiocarps sometimes attaining 10 mm or more in extent .....[L. variabilis \(15\)](#)
  - f. Predominantly sporangiate or sometimes forming simple or sparsely branched plasmodiocarps rarely exceeding 1.5 mm in length .....g
- g. Dehiscence by a longitudinal, rarely forked, slit .....h
- g. Dehiscence not typically by a longitudinal slit .....j
  - h. Sporangia yellow-brown, darker below, elongate, 0.2-1.5 mm long, laterally compressed, sometimes sinuous, arcuate or slightly branched, forming simple plasmodiocarps; dehiscence by a preformed slit .....[L. biforis \(4\)](#)
  - h. Sporangia not laterally compressed, rarely attaining 0.4 mm in length; dehiscence by a longitudinal but not obviously preformed slit .....i

- i. Sporangia pulvinate, depressed, sessile on a broad base and surrounded by a dark rim; peridium thin, yellow-brown, coated by a slimy layer impregnated with dark granular material, drying black ..... [L. marginata](#)
- i. Sporangia pulvinate on a broad but restricted base, not notably depressed, shining yellow-brown, without slime and not surrounded by a dark rim ..... [L. pumila \(365\)](#)
  - j. Peridium marked by prominent ridges dividing it into angular platelets; dehiscence by separation of platelets, especially above ..... k
  - j. Ridges on peridium obscure or lacking; dehiscence usually irregular ..... o
- k. Chestnut to bright brown, tardily becoming dark; spores pale yellow-brown, smooth or nearly so, 9-11  $\mu\text{m}$  ..... [L. castanea \(5\)](#)
- k. Dark brown to umber, quickly darkening; spores distinctly sculptured ..... l
  - l. Platelets small, numerous; spores gray by transmitted light, with a conspicuous pale area, 11-13  $\mu\text{m}$  ..... [L. testudinacea](#)
  - l. Platelets large, relatively few; spores not gray ..... m
- m. Dull black, sessile on a restricted base; spores pale reddish by transmitted light, strongly warted, the warts somewhat fugacious, 15-18  $\mu\text{m}$  ..... [L. chelonoides](#)
- m. Dark brown, or, if black, then shining; spores minutely warted to nearly smooth, the warts not fugacious ..... n
  - n. Pulvinate on a broad base, umber to dark reddish brown; spores reddish brown to dull ochraceous in mass, sometimes paler on one side, 10-13  $\mu\text{m}$  ..... [L. minima \(8\)](#)
  - n. Pulvinate on a somewhat constricted base, dark purplish brown to blackish; spores dark olivaceous in mass, ochraceous under lens, not notably paler on one side, mostly 15-17  $\mu\text{m}$  (smaller in var. *pygmaea*) ..... [L. pusilla \(12\)](#)
- o. Platelets present, but obscure, rarely visible except in microscopic mount; ridges obscure; peridium black, tuberculate, shining ..... [L. tuberculata \(14\)](#)
- o. Platelets and ridges completely lacking; peridium not tuberculate nor shining ..... p
  - p. Sporangia bright yellow-brown at maturity, darkening only with age and deposition of material from substratum, mostly 0.1-0.3(-0.5) mm in diameter; spores 10-12  $\mu\text{m}$  ..... [L. tenera \(13\)](#)
  - p. Sporangia dark brown to dull black at maturity, very minute, mostly 0.08-0.15 mm in diameter; spores 8-10  $\mu\text{m}$  ..... [L. punctiformis](#)

- q. Sporangia urniform, usually operculate, 0.1-0.3 mm in diameter; stalk slender; total height 0.4-1 mm; spores 8-11  $\mu\text{m}$  ..... [L. operculata \(9\)](#)
- q. Sporangia globose to ovate, never operculate; stalk stout ..... r
  - r. Sporangia mostly 0.1-0.3 mm in diameter, stalked or rarely sessile on a constricted base; total height up to 0.6 mm; peridium composed of obscure platelets, but not netted nor ridged; spores 11-13  $\mu\text{m}$  ..... [L. pedicellata \(11\)](#)
  - r. Sporangia larger, 0.3-0.4 mm in diameter; total height up to 1.5 mm; peridium covered with a network of thickened ridges, but not divided into platelets; spores 14-15  $\mu\text{m}$ ..... [L. erecta](#)

### Family Reticulariaceae

- a. Fructification sporangiate, sporangia clustered or united into a pseudoaethalium.....b
- a. Fructification a true aethalium.....c
  - b. Sporangiate or pseudoaethalioid with persistent sporangial walls; hypothallus massive, fibrous or spongy.....[Tubifera](#)
  - b. Sporangia closely appressed into a pseudoaethalium; sporangial walls disappearing at maturity except for thickened strands at the angles which persist as pseudocapillitial threads depending from the lids; hypothallus not massive or spongy.....[Dictydiaethalium](#)
- c. Aethalium subglobose to conical or pulvinate, often on a restricted base; pseudocapillitium of colorless, branching tubes; spores pinkish, then pallid in mass.....[Lycogala](#)
- c. Aethalium pulvinate on a broad base; pseudocapillitium of frayed or perforated, membranes; spores brown, yellow or olivaceous in mass.....[Reticularia](#)

### Genus *Tubifera*

- a. Sporangia clustered in groups of 2-8 on a fibrous, branching hypothallus; pseudocapillitium composed of bristles arising from base and walls of sporangial cavity, sometimes lacking ..... [T. bombardata \(16\)](#)  
[currently considered *Alwisia bombardata* Berk. & Broome]
- a. Sporangia in large, dense clusters, often connate and forming a pseudoaethalium, pseudocapillitium rarely present and then appearing like branches from a columella; hypothallus spongy, massive ..... b

- b. Sporangia fusoid-cylindrical, mostly free, clustered on a stem-like hypothallus; spores appearing warted but showing a faint and coarse reticulation under oil ..... [T. papillata \(20\)](#)
- b. Sporangia cylindrical, densely clustered; spores clearly reticulate over most of surface ..... c
- c. Pseudocapillitium present, columella-like, sometimes with branches which may reach the sporangium wall ..... [T. casparyi \(17\)](#) [currently considered *Siphoptychium casparyi* Rostaf.]
- c. Pseudocapillitium lacking ..... d
  - d. Hypothallus contracted, forming a short, thick stalk; spores under 6 µm in diameter ..... [T. microsperma \(19\)](#)
  - d. Hypothallus expanded; spores 6-8 µm in diameter ..... [T. ferruginosa \(18\)](#)

## Genus *Dictydiaethalium*

- a. Spores banded-reticulate; pseudoaethalia olivaceous; peridial caps about 60 µm in diameter ..... *D. dictyosporum*
- a. Spores warted or spinulose; pseudoaethalia usually bright yellow-brown to umber, but sometimes olivaceous; peridial caps usually exceeding 100 µm in diameter .... [D. plumbeum \(21\)](#)

## Genus *Lycogala*

- a. Aethalia large, mostly 2-4 cm in extent, sometimes much larger; cortex hard, thick, brittle, nearly smooth or bearing minute, slightly darkened scale-like patches; pseudocapillitium robust, often exceeding 25 µm in diameter ..... [L. flavofuscum \(25\)](#)
- a. Aethalia rarely over 15 mm in diameter, often much smaller; cortex rather thin, fragile, usually bearing clearly defined scales or warts; pseudocapillitium rarely attaining 25 µm in diameter, usually much smaller ..... b
  - b. Aethalia conical or subcylindrical, taller than wide, usually 2 mm or less in diameter; cortex bearing prominent dark warts arranged in a more or less reticulate pattern ..... [L. conicum \(22\)](#)
  - b. Aethalia subglobose, not taller than wide except when compressed in clusters; cortex not markedly reticulate ..... c
- c. Pallid to yellow-brown, rarely blackish, mostly 3-12 mm in diameter; cortical scales neither strongly pustulate nor tessellate; pseudocapillitium strongly sculptured, 10-25 µm in diameter; spores clearly reticulate, mostly 6-7 µm in diameter ..... [L. epidendrum \(23\)](#)

c. Brownish ochraceous to dark brown or black, mostly 1-3 mm in diameter, rarely larger; cortical scales pulvinate, prominent, dark, at first pustulate, tending to become tessellate; pseudocapillitium not strongly sculptured, rarely exceeding 10 µm in diameter; spores faintly reticulate to nearly smooth, mostly under 6 µm in diameter ..... [L. exiguum \(24\)](#)

## Genus *Reticularia*

a. Pseudocapillitium dendroid, at least in major part ..... b

a. Pseudocapillitium of perforated plates, these often fraying out into threads, but not dendroid ..... c

b. Pseudocapillitium membranous but not perforated at base, fraying out into dendroid columns of flexuous threads; cortex silvery, persistent; aethalia often large, up to 9 cm or more in extent ..... [R. lycoperdon \(29\)](#)

b. Pseudocapillitium composed entirely of dendroid columns; cortex thin, brittle, evanescent; aethalia rarely exceeding 2 cm in extent ..... [R. intermedia \(26\)](#)

c. Aethalia robust, mostly 1-3 cm in extent, sometimes smaller, often larger, up to 6 cm, and 1 cm thick; cortex firm, persistent, smooth or wrinkled, glossy brown; pseudocapillitium firm, forming a persistent network with large, rounded perforations ..... [R. splendens \(31\)](#)

c. Aethalia usually smaller and thinner; pseudocapillitium more delicate, less persistent ..... d

d. Cortex firm, persistent, not bullate ..... e

d. Cortex bullate, translucent, often evanescent ..... f

e. Aethalia pulvinate, rusty brown, small, rarely over 1.1 mm in diameter but often massed in clusters, approaching pseudoaethalia in appearance; spores free, coarsely reticulate ..... [R. lobata \(28\)](#)

e. Aethalia depressed, olivaceous, usually small but sometimes attaining 5 cm and then very thin; spores usually clustered, warted or spiny on free surfaces ..... [R. olivacea \(30\)](#)

f. Aethalia very small, 4 mm or less, ochraceous orange; pseudocapillitium scanty; spores yellow, warted, 13 µm..... [R. aurea](#)

f. Aethalia larger, up to 25 mm, red-brown or coppery; pseudocapillitium abundant; spores brown, delicately reticulate, 6-8 µm ..... [R. jurana \(27\)](#)

## Family Cribrariaceae

a. Sporangia usually Closely aggregated on an extensive, often thick and spongy hypothallus, the walls often united or fused, forming a pseudoaethalium or an aethalium, rarely scattered; net lacking or scantily developed, and peridium rarely if ever dehiscent between meshes; dictydine granules few and concolorous with membranes.....[Lindbladia tubulina \(32\)](#)

a. Sporangia usually free, aggregated or scattered; net always present, usually well-developed; hypothallus delicate; dictydine granules numerous, darker than spores.....b

b. Threads of net short, meeting at thickened or expanded nodes.....[Cribraria](#)

b. Main threads of net stout, longitudinal, subparallel at least below, connected by very delicate transverse threads; peridium sometimes netted above.....[Dictydium](#)

### Genus *Cribraria*

a. Nodes distinctly pulvinate to hemispherical when viewed laterally ..... b

a. Nodes flat or only slightly thickened and then usually expanded, scarcely pulvinate ..... l

b. Lilac, rose-red or purple ..... c

b. Ochraceous to yellow or brown, sometimes with reddish or purplish tints, but never bright red or purple ..... d

c. Deep, clear, dark purple ..... [C. lepida \(41\)](#)

c. Deep maroon or rose-purple. (Nodes somewhat thickened, not expanded nor pulvinate, but might be looked for here) ..... [C. elegans](#)

d. Sporangia reddish ochraceous to hazel or coppery; stalk long, slender, usually more than 6/7 total height ..... e

d. Sporangia yellow, ochraceous or clay-colored to olivaceous or dusky; stalk shorter, thicker, never 6/7 total height ..... g

e. Hazel or coppery, usually over 0.3 mm in diameter; cup well-developed; stalk rarely exceeding 10 times diameter of sporangium ..... [C. languescens \(39\)](#)

e. Reddish ochraceous to hazel but not coppery; cup rudimentary or lacking; stalk 10-20 times diameter of sporangium ..... f

f. Nodes hemispherical, dark, strongly concave on inner side; threads of net slender, not rigid nor flattened; dictydine granules dark ..... [C. microcarpa \(43\)](#)

- f. Nodes pulvinate, pallid, slightly concave on inner side; threads of net coarse, rigid, somewhat flattened; dictydine granules pale ..... *C. pachydictyon*  
[currently considered *Cribraria microcarpa* (Schrad.) Pers.]
- g. Dark brown; stalk 1-2 times height of sporangium; net notably large-meshed; crowded, on leaves ..... [C. laxa \(40\)](#)
- g. Ochraceous to dusky; stalk usually longer; meshes of net not notably large; on wood ..... h
- h. Cup tending to be obconical; stalk expanded at apex ..... [C. piriformis \(46\)](#)
- h. Sporangia globose; stalk cylindrical or subulate, not expanded at apex ..... i
- i. Bright yellow to ochraceous or clay-colored ..... j
- i. Dingy olivaceous to dusky ..... k
- j. Bright yellow to ochraceous; nodes pulvinate throughout; cup ample, well-defined ..... [C. aurantiaca \(53\)](#)
- j. Dull ochraceous to clay-colored; nodes pulvinate only above; cup more or less replaced by flattened ribs, these merging gradually into net ..... *C. martinii*
- k. Sporangia 0.5-0.7 mm in diameter; nodes pulvinate but expanded and angular; net with numerous free ends ..... [C. intricata \(38\)](#)
- k. Sporangia 0.3-0.5 mm in diameter; nodes compact, rounded; net with few free ends ..... [C. tenella \(51\)](#)
- l. Bright red; crimson or purple ..... m
- l. Yellow, ochraceous, or olivaceous, to dull reddish brown ..... q
- m. Deep, clear purple, rarely over 0.3 mm in diameter; nodes large, expanded, irregular ..... [C. violacea \(52\)](#)
- m. Lilac or reddish purple to crimson or brick-red; rarely under 0.3 mm. in diameter ..... n
- n. Deep maroon to reddish purple, mostly 0.3-0.5 mm in diameter; nodes small, prominent, somewhat thickened but not pulvinate, scarcely expanded ..... [C. elegans \(36\)](#)
- n. Reddish purple to crimson or brick-red; larger; nodes scarcely or not at all thickened, usually large and irregular ..... o
- o. Reddish purple, darkening with age, mostly 0.6-1 mm in diameter; nodes irregular, widely expanded; cup well-developed, obscurely ribbed, sometimes plicate ..... [C. purpurea \(47\)](#)



- o. Crimson to brick-red, sometimes darkening with age, rarely under 1 mm in diameter; cup never plicate; nodes scarcely expanded ..... p
- p. Dull crimson, 1-2 mm in diameter; net small-meshed, merging into the deep, smooth cup ..... [C. rubiginosa \(48\)](#)
- p. Brick-red to reddish purple, tending to darken, 1-1.5 mm in diameter; net with large, open meshes, distinct from prominently ribbed cup ..... [C. ferruginea \(37\)](#)
- q. Clay-colored to olivaceous, densely crowded and then sessile or short-stipitate, or gregarious and then with longer stems; net weak, easily detached; cup deep in gregarious fruitings, not clearly defined when crowded ..... [C. argillacea \(33\)](#)
- q. Net well-developed, persistent; sporangia rarely if ever sessile ..... r
- r. Cup usually replaced by 8-15 firm ribs radiating from tip of stalk, these free or sometimes partially connected by delicate, fugacious membranes ..... [C. splendens \(50\)](#)
- r. Cup present or absent, when present, often ribbed, but ribs connected by persistent membranes .....s
- s. Sporangia minute, rarely over 0.2 mm in diameter, often smaller; cup often lacking ..... t
- s. Sporangia larger, rarely under 0.2 mm in diameter, often much larger; cup always present ..... u
- t. Bright yellow-brown to coppery; stalk 1-4 times height of sporangium; cup present or absent ..... [C. minutissima \(44\)](#)
- t. Hazel brown, not coppery; stalk 8-13 times height of sporangium; cup lacking ..... [C. pachydictyon](#)  
[currently considered *Cribraria microcarpa* (Schrad.) Pers.]
- u. Cup deep, strongly ribbed, perforated above, merging gradually into the coarsely meshed, irregular net; brown or bronze ..... [C. macrocarpa \(42\)](#)
- u. Cup not perforated, sharply distinguished from net ..... v
- v. Dull orange-brown to ferruginous, sometimes darker with age ..... w
- v. Hazel or bronze to purplish brown or blackish ..... x
- w. Sporangia mostly 0.2-0.4 mm in diameter; spores orange-brown in mass; nodes sometimes thickened, but not pulvinate ..... [C. oregana \(45\)](#)
- w. Sporangia mostly 0.6-0.7 mm in diameter; spores nut-brown in mass; net notably lax, with Hat, scarcely expanded nodes ..... [C. rufa \(49\)](#)

- x. Dark purplish brown to nearly black, shining; cup bearing concentric lines of granules inside and out; spores verrucose, sometimes bearing a delicate, broken reticulation on surface ..... [C. atrofusca \(34\)](#)
- x. Hazel to purplish brown, not shining; cup not bearing concentric lines of granules ..... y
- y. Spores 7-8  $\mu\text{m}$  in diameter, angular in outline, bearing reticulate lines of warts ..... [C. dictyospora \(35\)](#)
- y. Spores rarely exceeding 6  $\mu\text{m}$  in diameter, reticulate lines faint or lacking ..... *C. vulgaris*

**Genus *Dictydium*** [currently considered a synonym of *Cribraria*]

- a. Surface net strongly ribbed below, merging above into a coarse reticulum; transverse filaments sparse; peridium tending to persist as an irregular membrane ..... [D. mirabile \(55\)](#)  
[currently considered *Cribraria mirabilis* (Rostaf.) Masee]
- a. Ribs of surface net persisting nearly or quite to apex, connected by numerous delicate transverse filaments; reticulations, if present, restricted to tip ..... b
  - b. Reddish purple to deep purple or brown; sporangia usually nodding, often umbilicate above and below, with 30 or more ribs; stalk attenuated above, often tortuous ..... [D. cancellatum \(54\)](#)  
[currently considered *Cribraria cancellata* (Batsch) Nann.-Bremek.]
  - b. Bright carrot-red; sporangia usually erect, with 14-16 longitudinal ribs; stalk cylindrical ..... [D. rutilum \(56\)](#)  
[currently considered *Cribraria rutila* (G. Lister) Nann.-Bremek.]

**Orden Echinosteliales**

**Family Echinosteliaceae**

**Genus *Echinostelium***

- a. Capillitium present; fructifications 0.3 mm or more tall ..... b
- a. Capillitium lacking; fructifications under 0.2 mm tall ..... c
  - b. Pale pinkish or yellowish to white; capillitium scanty, with few or no meshes, the ends mostly free; spores 6-9  $\mu\text{m}$  ..... [E. minutum \(60\)](#)
  - b. Ochraceous; capillitium a complete net, with few or no free ends; spores 9-10  $\mu\text{m}$ ..... [E. cribrarioides \(57\)](#)

- c. Columella well-developed, brown, fragile; spores pink or gray, mostly 13-14  $\mu\text{m}$ .....[E. fragile \(59\)](#)
- c. Columella lacking or very small and inconspicuous; spores smaller .....d
  - d. Sporangia golden yellow, fading to white; spores yellow or white, 6.5-8  $\mu\text{m}$ .....[E. elachiston \(58\)](#)
  - d. Sporangia rosy, not fading; spores pinkish, 9-10  $\mu\text{m}$ ..... *E. roseum*  
[currently considered an invalid or doubtful name]

### Order Trichiales

- a. Capillitium of solid threads, attached to base and often to sporangial walls, never united into a net.....[Dianemaceae](#)
- a. Capillitium of tubular threads, free or attached to base of sporangium, often united into a net.....[Trichiaceae](#)

### Family Dianemaceae [Dianemataceae]

- a. Sporangia black, minute, dehiscent by preformed lobes; capillitium with angular thickenings, appearing moniliform; spores dusky.....[Listerella paradoxa \(61\)](#)
- a. Sporangia not black; dehiscence irregular; capillitium not annular; spores bright-colored.....b
  - b. Capillitial threads relatively stout, nearly straight, with many of the tips attached to the peridial walls.....[Dianema](#)
  - b. Capillitial threads slender, hair-like, coiled, with few attachments to the peridial walls.....c
- c. Capillitium minutely sculptured; spores free.....[Calomyxa metallica \(62\)](#)
- c. Capillitium smooth; spores clustered.....*Minakatella longifila*

### Genus *Dianema*

- a. Spores free.....b
- a. Spores clustered.....d

- b. Sporangia flattened-pulvinate, thin, expanded on a broad base, merging into small plasmodiocarps; capillitial threads united above and below; spores finely reticulate ..... [D. depressum \(64\)](#)
- b. Sporangia pulvinate, sessile on a constricted base or rarely short-stipitate ..... c
- c. Wall membranous, delicate, yellowish, iridescent, sometimes thickened with brown granular accretions; capillitium profusely branched and anastomosing; coarse at base, the slender extremities attached to wall..... [D. nivale](#)
- c. Wall membranous, rather firm, reddish ochraceous to dull red or brown, iridescent; capillitium sparsely branched with few anastomoses, not notably penicillate at tips when attached to wall..... [D. harveyi \(65\)](#)
- d. Plasmodiocarps robust; wall double, the outer layer opaque; capillitial threads 1.5-2.5  $\mu\text{m}$  in diameter, without marked expansions..... [D. corticatum \(63\)](#)
- d. Plasmodiocarps slender; wall membranous; capillitial threads 2-3  $\mu\text{m}$  or more in diameter, with wide membranous expansions..... [D. repens](#)

### Family Trichiaceae

- a. Capillitium bearing spines, cogs or rings, sometimes nearly smooth or more or less reticulate, or With faint, poorly defined spirals intermixed with other markings; spirals sometimes well-marked in one species of *Arcyria* .....b
- a. Capillitium bearing 2-6 well-defined spiral bands, the spirals bearing spines, or smooth.....g
  - b. Capillitium of free elaters, these usually short, simple or sparsely branched, if long, rarely forming a complete net.....c
  - b. Capillitium of long, profusely branched and anastomosing threads, typically united into a net.....d
- c. Elaters warted, spiny or nearly smooth or minutely annulate; sporangiate to plasmodiocarpous or, if densely clustered, not heaped; wall rather thick, usually impregnated with granular material, appearing double, rarely with excreted lime .....[Perichaena](#)
- c. Elaters bearing faint and irregular spirals or nearly smooth; sporangia densely aggregated, usually heaped; wall thin, membranous, often iridescent.....[Oligonema](#)
  - d. Capillitium marked as in *Oligonema*, but threads united into an incomplete net.....[Calonema aureum \(77\)](#)
  - d. Capillitium variously marked, but rarely with spirals and then with basal cup and fugacious peridium.....e

- e. Peridium usually early-fugacious above the usually shallow, persistent, cup-like base, sometimes, in closely aggregated clusters, persisting at base, but calyculus then distinguishable; net elastic, often strongly so.....[Arcyria](#)
- e. Peridium tending to be persistent, especially below, but not forming a morphologically distinct cup; capillitium somewhat elastic.....f
  - f. Capillitium bearing warts or spines; sporangia small, sessile, heaped.....[Arcyodes incarnata \(97\)](#)
  - f. Capillitium bearing prominent coarse rings.....[Cornuvia serpula \(98\)](#)
- g. Peridium cartilaginous, thick, shining, opening by a preformed lid; elaters notably spiny.....[Metatrichia](#)
- g. Peridium membranous or thickened by accretion and then dull, opening irregularly or in lobate fashion or, if by a lid, then both cup and lid membranous; elaters spiny or smooth.....h
  - h. Capillitium of thick-walled threads, the lumen often obscure or lacking, arising from the base and coiled about each other in spiral bundles, the penicillate tips attached to sporangial walls.....[Prototrichia metallica \(66\)](#)
  - h. Capillitium of thin-walled threads with evident lumen and with few or no attachments to sporangial walls.....i
- i. Threads of capillitium united into an intricate net, with few free ends.....[Hemitrichia](#)
- i. Threads of capillitium broken into relatively short, unbranched or sparsely branched elaters, hence free ends numerous.....[Trichia](#)

**Genus *Perichaena***

- a. Spores clustered in groups of 4-16, on leaves..... [P. syncarpon \(72\)](#)
- a. Spores free; usually occurring on wood or bark..... b
  - b. Fructifications predominantly plasmodiocarpous..... c
  - b. Fructifications predominantly sporangiate..... e
- c. Spores 10-14 µm in diameter; plasmodiocarps dull yellow-brown to dark red-brown, long, slender, curved or net-like..... [P. vermicularis \(73\)](#)
- c. Spores 10 µm or less in diameter; plasmodiocarps often shorter and usually accompanied by sessile, rarely stalked, sporangia..... d

- d. Dark reddish brown; plasmodiocarps often elongated or ring-like, varying to sporangiate, rarely stipitate; spores 7-10  $\mu\text{m}$  in diameter; capillitium rough to spiny..... [P. chrysosperma \(67\)](#)
- d. Salmon-pink to ochraceous buff; spores 6-7  $\mu\text{m}$  in diameter; capillitium very slender, appearing closely annulate..... [P. microspora \(70\)](#)
- e. Sporangia flattened on a broad, continuous base usually densely aggregated and angular from pressure; dehiscence circumscissile..... [P. depressa \(69\)](#)
- e. Sporangia not notably flattened, often clustered but not usually angular; dehiscence circumscissile or irregular..... f
  - f. Spores 15-17  $\mu\text{m}$  in diameter; sporangia stalked or sessile, purplish red..... [P. pulcherrima](#)
  - f. Spores under 15  $\mu\text{m}$  in diameter; sporangia yellow to reddish brown or purplish black..... g
- g. Sporangia mostly stalked; peridium bearing prominent warts; spores 9-11  $\mu\text{m}$ .... [P. minor \(71\)](#)  
[currently considered *Hemitrichia minor* G.Lister]
- g. Sporangia sessile; peridium not warted..... h
  - h. Spores 10-14  $\mu\text{m}$ , capillitium variable, up to 4  $\mu\text{m}$  in diameter..... [P. corticalis \(68\)](#)
  - h. Spores 9-10  $\mu\text{m}$ , capillitium slender, 1.5  $\mu\text{m}$  in diamete..... [P. tessellata](#)

## Genus *Oligonema*

- a. Dull olivaceous, spores warted ..... [O. fulvum \(75\)](#)
- a. Dull to shining yellow; spores reticulate ..... b
  - b. Peridium granular, tough; sporangia elongate, erect, tending to be crowded in a single layer; spores with a nearly complete reticulation, the bands narrow ..... [O. flavidum \(74\)](#)
  - b. Peridium scarcely granular, delicate; sporangia irregularly globose, tending to be heaped; spores with irregular reticulation, the bands often broad, pitted..... [O. schweinitzii \(76\)](#)

## Genus *Arcyria*

- a. Peridium fugacious except for base, which persists as a sharply defined calyculus ..... b

- a. Peridium tending to persist above base, which remains as a deep cup, with the true calyculus often poorly defined ..... s
- b. Capillitium loosely attached to center of calyculus, readily breaking away as a whole in mature sporangia..... c
- b. Capillitium firmly attached to calyculus, basal strands not readily separating ..... i
- c. Dull green, fading to greenish ochraceous; calyculus notably small, narrow, funnel-shaped ..... [A. virescens \(96\)](#)
- c. Yellow, rosaceous or gray, sometimes olivaceous with age; calyculus broader or wider..... d
- d. Yellow or buff..... e
- d. Red or reddish, sometimes smoky olivaceous..... f
- e. Sporangia cylindrical, clear yellow, becoming bright ochraceous or buff; capillitium extremely elastic, the threads 3-4  $\mu\text{m}$  in diameter, bearing spines, cogs and reticulations..... [A. nutans \(90\)](#)  
[currently considered *Arcyria obvelata* (Oeder) Onsberg]
- e. Sporangia ovate, buff; capillitium scarcely elastic, the threads 1-1.5  $\mu\text{m}$  in diameter, annulate..... [A. annulifera \(78\)](#)
- f. Spores 9-11  $\mu\text{m}$  in diameter; capillitium dense, slightly elastic, tending to fall away at maturity as a unit; reddish brown, fading to dull orange brown..... [A. ferruginea \(83\)](#)
- f. Spores under 9  $\mu\text{m}$ ; capillitium strongly elastic, not dense at maturity, readily breaking apart..... g
- g. Fully expanded net tending to be erect; bright crimson, tardily fading to brownish red..... [A. incarnata \(86\)](#)
- g. Fully expanded net drooping: colors usually dull and dingy, rarely bright..... h
- h. Dull crimson to reddish brown, rarely bright rose; capillitium bearing long spines; spores 7-9  $\mu\text{m}$ ; fragments of peridium tending to remain attached to expanded net..... [A. oerstedtii \(92\)](#)
- h. Dingy rosaceous to smoky olivaceous, capillitium bearing short spines, cogs and half-rings; spores 6-8  $\mu\text{m}$ ; peridial fragments rarely persisting..... [A. magna \(89\)](#)
- i. Dull green to bluish gray, becoming dingy or dark with age..... j
- i. Without greenish or bluish tints..... k
- j. Cylindrical, clustered; cup funnel shaped..... [A. glauca \(84\)](#)

- j. Globose to short-cylindrical, scattered or gregarious; cup wide, bowl-shaped..... *A. nigella*
- k. White to yellow or ochraceous..... l
- k. Salmon or pink to red or reddish brown..... o
- l. Sporangia mainly cylindrical; capillitium marked by weak spirals, at least in part..... [A. leiocarpa \(88\)](#)  
[currently considered *Hemitrichia leiocarpa* (Cooke) Lister]
- l. Capillitium without spiral bands..... m
- m. Cup usually deep, bowl-shaped; sporangia globose to short cylindrical; sporangia white or pale gray..... [A. globosa \(85\)](#)
- m. Cup shallow, saucer-shaped; sporangia white to ochraceous..... n
- n. Sporangia mostly cylindrical, but varying to ovate, white to gray or ochraceous; capillitium spiny; cup smooth or stippled within..... [A. cinerea \(80\)](#)
- n. Sporangia globose to ovate or short-cylindrical, always bright ochraceous; capillitium marked with spines, cogs and bands; cup papillate to subreticulate within..... [A. pomiformis \(93\)](#)
- o. Sporangia ovoid to short cylindrical, flesh colored; cogs on capillitium blunt or hammer-shaped in outline..... [A. carnea \(79\)](#)  
[currently considered an invalid or doubtful name]
- o. Sporangia cylindrical, usually brighter or darker in color; capillitium not bearing blunt cogs ..... p
- p. Spores 8-10  $\mu\text{m}$  in diameter..... q
- p Spores mostly under 8  $\mu\text{m}$  in diameter..... r
- q. Dull rose, 3-4 mm tall, united by stalks into clusters of 2-20; stalks one-half total height..... [A. corymbosa \(81\)](#)
- q. Bright rose, 1 mm tall, not clustered; stalks very short..... *A. minuta*
- r. Salmon to pink or bright rose; sporangia small, usually in small clusters..... [A. insignis \(87\)](#)
- r. Bright red to brick red, fading to reddish brown; sporangia robust, often in extensive fruitings..... [A. denudata \(82\)](#)
- s. Sporangia large, bright yellow, olivaceous or brown, often touched with red; spores 9-11  $\mu\text{m}$  ..... [A. versicolor \(95\)](#)



- s. Sporangia of small or medium size; dull metallic, but not bright; spores 6-8  $\mu\text{m}$  ..... t
  - t. Sporangia rosy to brown or fading to ochraceous, gregarious or crowded but rarely superimposed; capillitium marked with warts and cogs, sometimes simulating spirals, but not bearing true spirals..... [A. occidentalis \(91\)](#)
  - t. Sporangia copper-colored, turning dark brown or fading to ochraceous; sporangia often heaped and united into pseudoaethalia..... u
- u. Capillitium bearing at least some true spiral bands, these often faint and interspersed with spines and rings, attached at base but upper part often separating with persistent peridium..... [A. stipata \(94\)](#)
- u. Similar to *A. stipata* except that capillitium is marked by well developed spiral bands only ..... (*Hemitrichia imperialis*)  
[currently considered *Arcyria imperialis* (G.Lister) Q.Wang & Yu Li]

## Genus *Trichia*

- a. Typically sessile, sporangiate to plasmodiocarpous, sporangia rarely short-stalked..... b
  - a. Typically sporangiate and stalked, the stalks distinct, usually half or more of total height, rarely short-stalked or sessile..... h
    - b. Elaters with two, rarely three, spirals, these tending to be open and loose..... [T. varia \(111\)](#)
    - b. Elaters with at least three, usually more spirals, these tending to be close and tight.....c
- c. Spores coarsely and prominently reticulate..... [T. favoginea \(104\)](#)
- c. Spores spinulose or minutely warted, or, if reticulate, reticulations delicate, visible only under high magnification..... d
  - d. Spores large, 13-18  $\mu\text{m}$  in diameter; sporangia dark purple to black..... [T. alpina \(99\)](#)
  - d. Spores rarely exceeding 13  $\mu\text{m}$  in diameter.....e
- e. Fructifications umber brown to dark ochraceous; spores brown in mass.... [T. macbridei \(107\)](#)
- e. Fructifications yellow to reddish brown, sometimes darker with age; spores ochraceous in mass..... f
  - f. Dull yellowish or reddish brown becoming blackish when old; wall thickened with granular deposits..... [T. contorta \(101\)](#)

- f. Peridium olive or yellow, delicate, shining..... g
- g. Scattered or in small clusters; elaters smooth, 3-4.5  $\mu\text{m}$ ; spores warted..... [T. lutescens \(106\)](#)
- g. Crowded or in extensive fruitings; elaters spiny, 5-6  $\mu\text{m}$ ; spores delicately reticulate..... [T. scabra \(109\)](#)
- h. Spores coarsely and prominently reticulate; peridium papillose; elaters with short tips..... [T. verrucosa \(112\)](#)
- h. Spores warted or spinulose or very delicately reticulate..... i
- i. Elaters spinulose; sporangia brown, mottled; spore-mass yellow or orange..... [T. erecta \(103\)](#)
- i. Elaters spineless or nearly so..... j
- j. Elaters of uniform thickness except at the short, often blunt, tips; sporangia subglobose or somewhat pyriform..... [T. subfusca \(110\)](#)
- j. Elaters with long, slender, tapering tips; sporangia usually turbinate or pyriform..... k
- k. Sporangia top-shaped, dehiscent by a flat, membranous operculum; elaters 7-8  $\mu\text{m}$  in diameter, uniform at the center, but with long, tapering tips..... [T. crateriformis \(102\)](#)
- k. Sporangia dehiscent by lobes or irregularly above; elaters usually less than 6  $\mu\text{m}$  in diameter at center, tapering gradually from there to tips..... l
- l. Spore-mass ochraceous to brown; stalk brown, opaque..... [T. botrytis \(100\)](#)
- l. Spore-mass not ochraceous to brown; stalk translucent, at least above..... m
- m. Spore-mass olivaceous yellow; stalk dark brown below, paler above, filled with spore-like cells; dehiscence irregular, leaving a cup-like base..... [T. decipiens \(108\)](#)
- m. Spore-mass brick-red; stalk deep red, not filled with spore-like cells..... [T. floriformis \(105\)](#)  
[currently considered *Metatrichia floriformis* (Schwein.) Nann.-Bremek.]

## Genus *Hemitrichia*

- a. Spores coarsely and prominently reticulate..... b
- a. Spores nearly smooth to spiny or warted or, if reticulate, reticulations faint and visible only under high magnification..... c

- b. Fructifications plasmodiocarpous, usually large and netted; capillitium spiny..... [H. serpula \(119\)](#)
- b. Sporangiate or forming small a plasmodiocarps; capillitium not spiny..... [H. chrysospora \(367\)](#)
- c. Spores and capillitium in mass dull orange to brick-red; peridium bearing conspicuous dark warts..... [H. paragoga \(118\)](#)
- c. Spores and capillitium usually yellow, sometimes reddish brown but never brick-red; peridium not bearing conspicuous warts..... d
  - d. Primarily plasmodiocarpous, but often associated with pulvinate or globose sporangia..... [H. karstenii \(116\)](#)  
[[currently considered a variety of *Trichia contorta* (Ditmar) Rostaf.]
  - d. Primarily sporangiate, rarely approaching plasmodiocarpous..... e
- e. Sporangia cylindrical, often distorted, copper-colored to reddish brown, densely clustered, sometimes joined to form simple pseudoaethalia..... f
- e. Sporangia usually globose to pyriform, rarely cylindrical and then without coppery tints, usually free..... g
  - f. Spirals of capillitium poorly and irregularly developed, often associated with spines and rings..... (*Arcyria stipata*)
  - f. Spirals of capillitium strongly developed, without spines or rings, otherwise similar to *A. stipata*..... *H. imperialis*  
[currently considered *Arcyria imperialis* (G.Lister) Q.Wang & Yu Li]
- g. Sporangia sessile or with thick, short stalks..... h
- g. Sporangia usually with well-developed stalks, rarely short-stalked or sessile..... j
  - h. Sporangial wall typically hyaline, iridescent, sometimes encrusted; capillitium with 2-4 smooth spirals..... [H. abietina \(113\)](#)
  - h. Sporangial wall usually opaque; capillitium with 4-6 spirals..... i
- i. Sporangia large, wide in proportion to height; peridium pale yellow; capillitium with 5-6 spirals..... [H. montana \(117\)](#)
- i. Sporangia of medium size; peridium dull yellow or olivaceous; capillitium usually with 4-5 spirals..... *H. leiotricha*

- j. Stalk hollow, filled with spore-like cysts; sporangia grayish or ochraceous, closely resembling *Arcyria cinerea*..... (*A. leiocarpa*)  
[currently considered *Hemitrichia leiocarpa* (Cooke) Lister]
- j. Stalk solid or hollow; sporangia bright yellow to yellow-brown..... k
- k. Capillitium distinctly spiny..... [H. intorta \(115\)](#)
- k. Capillitium smooth or minutely roughened, not spiny..... l
  - l. Stalk expanding upward, merging gradually into the deep vase-like cup; capillitium minutely roughened..... [H. clavata \(114\)](#)
  - l. Stalk cylindrical to base of peridium, distinct from the rather shallow cup; capillitium nearly smooth..... [H. stipitata \(120\)](#)  
[[currently considered *Hemitrichia calyculata* (Speg.) M.L. Farr]

## Genus *Metatrichia*

- a. Sporangia sessile, dark purplish red, shining with metallic reflections; operculum sunken within a raised rim; spines on elaters 2-4  $\mu\text{m}$  ..... *M. horrida*
- a. Sporangia stalked, rarely sessile, deep maroon, nearly black to reddish brown or steel gray, shining with metallic reflections, operculum dome-shaped, without sunken rim, spines on elaters rarely over 2  $\mu\text{m}$  ..... [M. vesparium \(121\)](#)  
[the current accepted name is *Metatrichia vesparia* (Batsch) Nann.-Bremek. ex G.W. Martin & Alexop.]

## Order Stemonitales [Stemonitidales]

- a. Fructification an aethalium.....b
- a. Fructification sporangiate, the sporangia scattered, clustered or sometimes massed into a pseudoaethalium.....c
  - b. Capillitium a network of more or less horizontal, branching threads, the tips of the branches united by many chambered vesicles.....[Brefeldia maxima \(124\)](#)
  - b. Capillitium dendroid, the main stalks arising from the base, the tips of the branches free.....[Amaurochaete](#)
- c. Wax present in stalk and columella, sometimes in capillitium and sporangial wall...[Elaeomyxa](#)
- c. Wax not secreted.....d

- d. Columella, stalk when present, and usually hypothallus conspicuously limy....[Diachea](#)
- d. Lime lacking, or rarely present as inconspicuous clusters of crystals imbedded in base or hypothallus.....e
- e Columella usually lacking; rarely present in some sessile forms.....f
- e. Columella always present.....g
- f. Fructification a pseudoaethalium; sporangia closely ] packed, the peridium fugacious except for conical base and cap; capillitium of sparsely branched threads coiled as a mass and united in basal cups and apical caps, the whole covered by a continuous membrane.....[Schenella](#)  
[not a myxomycete, see Rammeloo, Icones Mycologicae 93-110, pl. 110. 1985 and Estrada et al., Mycologia 97(1):142-152. 2005]
- f. Fructification sporangiate, sporangia free or clustered, sometimes united into pseudoaethalium, but capillitium then not in coiled spirals united in basal and apical cups.....g
- g. Sporangia sessile on a broad or constricted base which is rarely contracted into a short, thick stalk.....h
- g. Sporangia mostly stalked, rarely sessile and then with a distinct columella from which the capillitium arises.....j
- h. Outer wall of peridium gelatinous when wet.....[Colloderma](#)
- h. Outer wall of peridium not gelatinous when wet.....i
- i. Peridium membranous above, thickened with granular deposits below and usually including scale-like masses of lime crystals in lower part and hypothallus.....[Leptoderma iridescens \(363\)](#)
- i. Peridium membranous, hyaline, iridescent throughout; lime crystals lacking.....[Diacheopsis](#)
- j. Columella enlarged at apex into a cupulate disk from which the capillitium depends.....[Enerthenema](#)
- j. Columella sometimes attaining apex, usually shorter, and not bearing a cupulate apical disk; capillitium usually arising from entire columella or from base of sporangium.....k
- k. Peridium evanescent, but typically replaced by a surface net developed under the periphery, remaining after the peridium has been shed, and united with the capillitium.....[Stemonitis](#)
- k. Peridium persistent or, if evanescent, without surface net; capillitium often scanty, sometimes abundant but then without surface net and usually with many terminal branchlets.....l

- l. Peridium ochraceous, delicate, persistent, but breaking up into small, scale-like fragments which remain attached to tips of capillitial branchlets.....[Clastoderma debaryanum \(184\)](#)
- l. Peridium not breaking up into small fragments which remain attached to tips of capillitium.....m
- m. Peridium dark, tough, persistent, early splitting above into petaloid lobes which remain attached at base as a cup.....[Barbeyella minutissima \(185\)](#)
- m. Peridium not splitting into petaloid lobes arising from a basal cup.....n
  - n. Stalk typically translucent, hollow, often yellow at the base.....[Macbrideola](#)
  - n. Stalk dark, opaque, not hollow.....o
- o. Peridium tough, metallic, shining, tending to be long-persistent as a whole...[Lamproderma](#)
- o. Peridium usually early evanescent or, if persistent, membranous, delicate.....[Comatricha](#)

## Genus *Amaurochaete*

- a. Capillitium and spores fuscous to bone brown in mass; spores pale, 7.5-10  $\mu\text{m}$  .....[A. ferruginea \(126\)](#)  
[currently considered *Symphytocarpus flaccidus* (Lister) Ing & Nann.-Bremek.]
- a. Capillitium and spores black in mass; spores dark, usually 11  $\mu\text{m}$  or more.....b
  - b. Capillitium soft, woolly, circinate.....c
  - b. Capillitium rigid, irregular.....d
- c. Capillitium entirely of slender threads, attached at top and bottom; spores prominently warted.....[A. comata \(125\)](#)
- c. Capillitium arising from stout basal stalks, branching and anastomosing toward slender upper threads; spores minutely roughened.....[A. tubulina \(129\)](#)
  - d. Spores warted or spinulose.....[A. atra \(127\)](#)
  - d. Spores strongly reticulate.....[A. trechispora \(128\)](#)

## Genus *Elaeomyxa*

- a. Wax secreted only in stalk, and collar when present, spores dark, over 10  $\mu\text{m}$  ..... [E. cerifera \(130\)](#)
- a. Wax secreted in stalk, capillitium and sporangial wall, spores pale, 7-10  $\mu\text{m}$  ..... [E. miyazakiensis \(131\)](#)

## Genus *Colloderma*

- a. Sporangia dark, shining, spores pale gray under lens, mostly 11-12  $\mu\text{m}$  ..... [C. oculatum \(122\)](#)
- a. Sporangia brown, duller, spores dark gray under lens, mostly 14-16  $\mu\text{m}$  ..... [C. robustum \(123\)](#)

## Genus *Diachea*

- a. Hypothallus, stalk and columella yellow or orange..... b
- a. Hypothallus, stalk and columella white..... c
  - b. Spores pale, minutely warted, 11-13  $\mu\text{m}$  ..... [D. thomasii \(137\)](#)
  - b. Spores dark, strongly and irregularly warted, 13-14  $\mu\text{m}$ ..... *D. megalospora*
- c. Sporangia typically cylindrical to ovate, rarely subglobose, spores pale under lens, minutely roughened, 8-11  $\mu\text{m}$  ..... [D. leucopodia \(133\)](#)
- c. Sporangia globose or nearly so..... d
  - d. Stalks usually half or more of total height; spores conspicuously marked..... e
  - d. Stalks usually short or lacking, rarely over half of total height; spores inconspicuously marked..... f
- e. Spores sparsely but prominently spiny or warted..... [D. bulbillosa \(132\)](#)
- e. Spores bearing prominent wart-like protuberances, these often forming a coarse and imperfect reticulation..... [D. splendens \(135\)](#)
  - f. Spores minutely spiny or warted, 7-11  $\mu\text{m}$  in diameter..... [D. radiata \(134\)](#)
  - f. Spores faintly reticulate, 10-13  $\mu\text{m}$  in diameter..... [D. subsessilis \(136\)](#)

## Genus *Schenella*

[not a genus of myxomycetes, see Rammeloo, Icones Mycologicae 93-110, pl. 110. 1985 and Estrada et al., Mycologia 97(1):142-152. 2005]

- a. Capillitium smooth, spores black in mass, distinctly verrucose, 5-6  $\mu\text{m}$  ..... [S. simplex \(139\)](#)
- a. Capillitium rough, spores fuscous in mass, minutely roughened, 3-4  $\mu\text{m}$  ... [S. microspora \(138\)](#)

## Genus *Diacheopsis*

- a. Spores sparsely papillose, 6-7  $\mu\text{m}$  in diameter ..... *D. pieninica*
- a. Spores 12  $\mu\text{m}$  or more in diameter, spinulose ..... b
  - b. Spores long spinulose, 12 -14  $\mu\text{m}$  in diameter ..... *D. metallica*
  - b. Spores minutely spinulose, (14-) 18-19  $\mu\text{m}$  in diameter ..... *D. insessa*

## Genus *Enerthenema*

- a. Spores clustered in groups of 4-12 ..... [E. berkleyanum \(140\)](#)
- a. Spores free ..... b
  - b. Spores minutely warted, 10-12  $\mu\text{m}$ , apical disk not exceeding 0.2 mm in diameter ..... [E. papillatum \(142\)](#)
  - b. Spores coarsely warted, 11-14  $\mu\text{m}$ , apical disk 0.3-0.5 mm in diameter ..... [E. melanospermum \(141\)](#)

## Genus *Stemonitis*

- a. Spores reticulate, the reticulations prominent or faint, rarely lacking ..... b
- a. Spores spiny to warted or smooth, not reticulate..... h
  - b. Spores prominently but often incompletely banded-reticulate..... c
  - b. Spores spiny-reticulate, verrucose-reticulate, or, if banded-reticulate, the bands faint..... d



- c. Sporangia 2-5 mm tall, nearly black, short-stalked or sessile, in dense, sometimes agglutinated clusters; spores 11-13  $\mu\text{m}$  ..... [S. trechispora \(154\)](#)  
[currently considered *Symphytocarpus trechispora* (Berk. ex Torrend) Nann.-Bremek.]
- c. Sporangia under 3 mm tall, brown, distinctly stalked, in small but not agglutinated clusters; spores 7-8  $\mu\text{m}$  ..... *S. inconspicua*
- d. Sporangia deep fuscous to black, usually fruiting in dense clusters..... e
- d. Sporangia vinaceous or lilac, usually fruiting in loose clusters..... f
- e. Clusters small, black; sporangia 2-5 mm tall; stalk usually less than one-fourth total height; spores distinctly spiny-reticulate, 8-9  $\mu\text{m}$  ..... [S. nigrescens \(150\)](#)  
[currently considered *Stemonitis fusca* Roth]
- e. Clusters large, conspicuous, fuscous to deep reddish brown; sporangia mostly 6-20 mm tall; stalk usually over one-fourth total height; spores prominently to delicately warted-reticulate, 7.5-9  $\mu\text{m}$  ..... [S. fusca var. fusca \(146\)](#)  
[currently considered *Stemonitis fusca* Roth]
- f. Sporangia lilaceous brown; surface net tending to be fugacious above; spores rather conspicuously verrucose-reticulate, mostly 7-8  $\mu\text{m}$  ..... [S. virginiensis \(156\)](#)
- f. Sporangia somewhat darker, spores usually under 6  $\mu\text{m}$  ..... g
- g. Sporangia purplish ferruginous, 2.5-5 mm tall; surface net often fugacious above; spores faintly and irregularly banded-reticulate, 5-6  $\mu\text{m}$  ..... [S. hyperopta \(148\)](#)  
[currently considered *Stemonitopsis hyperopta* (Meyl.) Nann.-Bremek.]
- g. Sporangia dark lilaceous brown, 1.7-3.2 mm tall; surface net persistent above; spores delicately reticulate, 3.2-4.5  $\mu\text{m}$  ..... *S. microsperma*  
[currently considered *Stemonitopsis microsperma* (Lister) Nann.-Bremek.]
- h. Spores united in clusters; sporangia always dark..... i
- h. Spores free, sporangia dark or pale..... j
- i. Sporangia free at bases and apices, connate between, with discoid platelets at junctions between adjacent sporangia; spores pale, 12-13  $\mu\text{m}$  ..... [S. confluens var. syncarpon \(144\)](#)  
[currently considered *Symphytocarpus syncarpon* (Yamash.) Y.Yamam.]
- i. Sporangia densely clustered, more or less united, sometimes into a pseudoaethalium but without discoid platelets at junctions of sporangia; spores dark, 8-10  $\mu\text{m}$  ..... [S. uvifera \(155\)](#)
- j. Deep fuscous to black..... k
- j. Brown to vinaceous or pallid..... n

- k. Sporangia free at bases and apices, elsewhere united by capillitial branches bearing discoid platelets at junctions; spores pale, spinulose, 11-12  $\mu\text{m}$  ..... [S. confluens var. confluens \(144\)](#)  
[currently considered *Symphytocarpus confluens* (Cooke & Ellis) Ing & Nann.-Bremek.]
- k. Sporangia gregarious or massed, but not united by branches bearing platelets..... l
- l. Capillitium dense, with many branches; meshes of surface net delicate, mostly 30  $\mu\text{m}$  or less; spores papillate to nearly smooth, 7.5-9  $\mu\text{m}$ ..... [S. fusca var. papillosa](#)  
[currently considered *Stemonitis fusca* Roth]
- l. Capillitium open, with few branches; meshes of surface net coarse, many 30-100  $\mu\text{m}$  ..... m
- m. Sporangia short, obtuse, short-stalked, up to 3.2 mm in total height; meshes of surface net brown, conspicuously broad and flattened; spores prominently spiny-warted, 10.5-12.5  $\mu\text{m}$  ..... [S. mussooriensis \(149\)](#)
- m. Sporangia, when well-developed, notably long, acuminate, 10-20 mm or more in total height; meshes of surface net reddish brown, often with metallic reflections; spores minutely warted, 7-9  $\mu\text{m}$  ..... [S. splendens \(153\)](#)
- n. Spores nearly smooth, rarely reaching 7  $\mu\text{m}$  ..... o
- n. Spores distinctly warted, usually over 7  $\mu\text{m}$  ..... p
- o. Sporangia bright ferruginous, often in large fruitings, usually 7-15 mm tall; spores 5-7  $\mu\text{m}$  ..... [S. axifera \(143\)](#)
- o. Sporangia pale ferruginous, in small tufts, 2-6 mm tall; spores 4-5  $\mu\text{m}$  ..... [S. smithii \(152\)](#)  
[currently considered *Stemonitis axifera* (Bull.) T.Macbr.]
- p. Bright brown; stalk rarely attaining one-third total height, often much shorter; surface net persistent above; often fruiting on living plants..... [S. herbatica \(147\)](#)
- p. Dull brown or pallid; stalk usually one-third or more of total height; surface net tending to be fugacious above; rarely fruiting on living plants..... q
- q. Wood-brown; columella giving rise to many coarse branches with expanded nodes and tending to expand into a cup-like enlargement at tip..... [S. flavogenita \(145\)](#)
- q. Drab or pale; columella may attain the apex, but often dispersed well below tip; capillitium delicate..... [S. pallida \(151\)](#)

## Genus *Comatricha*

- a. Peridium membranous, iridescent, persistent, especially below..... b

- a. Peridium typically evanescent, not rarely persistent in *C. typhoides*, rarely if ever in other species..... e
- b. Sporangia 0.2-0.3 mm in diameter, densely aggregated, sometimes forming a pseudoaethalium; peridium dark, iridescent brown; stalks slender, sometimes attaining half total height; capillitium scanty, irregular..... [C. aggregata \(159\)](#)
- b. Sporangia 0.3-0.5 mm in diameter, tufted but not united; peridium bluish, silvery or bronze; stalk lacking or very short and stout; capillitium profuse..... c
- c. Spores spiny, 10-13  $\mu\text{m}$ ; peridium silvery or bronze, with bluish tints..... [C. caespitosa \(160\)](#)  
[currently considered *Paradiachea caespitosa* (Sturgis) Hertel ex H.Neubert, Nowotny & K.Baumann]
- c. Spores reticulate; peridium rarely with bluish tints..... d
- d. Spores incompletely verrucose-reticulate, 12-14  $\mu\text{m}$ ; peridium silvery or bronze..... [C. cylindrica \(162\)](#)  
[currently considered *Paradiachea cylindrica* (Bilgram) Hertel ex H.Neubert, Nowotny & K.Baumann]
- d. Spores banded-reticulate, 10-11  $\mu\text{m}$ ; peridium violaceous brown..... [C. rispaudii \(175\)](#)  
[currently considered *Paradiachea rispaudii* (Hagelst.) Hertel ex H.Neubert, Nowotny & K.Baumann]
- e. Capillitium lax, open, with few or no anastomoses, forming at most a very open net with many prominent free ends..... f
- e. Capillitium intricate, with many anastomosing branches, forming a net, usually dense, with short or rarely no free ends..... k
- f. Sporangia long-cylindrical, fruiting in large, dark, densely aggregated clusters..... g
- f. Sporangia short-cylindrical to ovate or globose, scattered or clustered but not densely aggregated..... h
- g. Sporangia deep fuscous to black, very long and drooping, 10-50 mm; capillitium with very few anastomoses; spores conspicuously verrucose-reticulate..... [C. longa \(167\)](#)  
[currently considered *Stemonaria longa* (Peck) Nann.-Bremek., R.Sharma & Y. Yamam.]
- g. Sporangia dark brown to black, usually semi-erect, 2-8 mm in length; capillitium open, the few anastomoses forming a very open net toward the columella, with long, branching but rarely anastomosing ends; spores verrucose..... [C. irregularis \(165\)](#)  
[currently considered *Stemonaria irregularis* (Rex) Nann.-Bremek., R.Sharma & Y.Yamam.]
- h. Sporangia mostly short-cylindrical, sometimes varying to ovate or subglobose; columella attaining tip or nearly so, with numerous lateral branches..... i

- h. Sporangia globose or depressed, columella rarely exceeding center of sporangial cavity, dividing at tip or sometimes at or below base into two or more main branches..... j
- i. Capillitium open, rigid, branching toward ends and terminating in spinose tips which project beyond surface of spore-mass; spores prominently and coarsely reticulate, 10-13  $\mu\text{m}$  ..... [C. mirabilis \(171\)](#)
- i. Capillitium open, lax, delicate, the tips slender or somewhat enlarged but not projecting from spore-mass; spores spinulose, 6.5-7  $\mu\text{m}$  ..... [C. longipila \(168\)](#)
- j. Tips of capillitial branches notably enlarged; spores closely and minutely spinulose, mostly 11-13  $\mu\text{m}$  ..... [C. fimbriata \(164\)](#)  
    [currently considered *Paradiacheopsis fimbriata* (G.Lister & Cran) Hertel ex Nann.-Bremek.]
- j. Tips of capillitial branches not enlarged; spores prominently spiny, 12-13(-20)  $\mu\text{m}$  ..... [C. acanthodes \(157\)](#)  
    [currently considered *Paradiacheopsis acanthodes* (Alexop.) Nann.-Bremek.]
- k. Sporangia predominantly elongate, cylindrical, subcylindrical or fusiform to elongate-ovate..... l
- k. Sporangia predominantly globose or subglobose, varying to broadly ovate..... t
- l. Spores olivaceous brown to purplish brown or black in mass..... m
- l. Spores pale lilaceous brown to ferruginous or pinkish in mass..... r
- m. Robust, black; spores dark, coarsely warted, mostly 10-13  $\mu\text{m}$  ..... [C. suksdorfii \(178\)](#)
- m. Slender, dark brown to purplish brown; spores usually smaller and less prominently marked..... o
- n. Spores delicately reticulate..... [C. dictyospora \(174\)](#)  
[currently considered and invalid or doubtful name]
- n. Spores not reticulate..... o
- o. Spores minutely warted, with 2-4 prominent clusters of larger warts to the hemisphere; stalks usually long, black, with a silvery sheath; peridium tending to be persistent.... [C. typhoides \(181\)](#)  
[currently considered *Stemonitopsis typhina* (F.H.Wigg.) Nann.-Bremek.]
- o. Spores uniformly warted; stalks without silvery sheath; peridium not persistent..... p
- p. Sporangia deep brown or blackish, cylindric to ovate-cylindric or ovate; stalks long, usually much more than half total height..... [Cylindrical forms of C. nigra \(172\)](#)

- p. Sporangia dark brown or deep purplish brown, always cylindrical; stalks usually less than half total height..... q
- q. Sporangia slender, acuminate; stalks one-third to half total height..... [C. aequalis \(158\)](#)  
[currently considered *Stemonitopsis aequalis* (Peck) Y.Yamam.]
- q. Sporangia plump, obtuse, stalks one-fifth to one-fourth total height... [C. subcaespitosa \(177\)](#)  
[currently considered *Stemonitopsis subcaespitosa* (Peck) Nann.-Bremek.]
- r. Sporangia fusiform, pinkish brown; stalks usually much more than half total height; capillitium uniform, with no conspicuously large branches..... [C. tenerrima \(180\)](#)
- r. Sporangia cylindrical to cylindrical-ovate; stalk not exceeding half total height; capillitium with conspicuous large branches or forming a net with few free ends..... s
- s. Sporangia pale brown, cylindrical, acuminate; capillitium dense, with large basal branches, many anastomoses and few free ends..... [C. pulchella \(173\)](#)
- s. Sporangia reddish brown, ovate-cylindrical; capillitium rather open, with few anastomoses and many free ends..... [Elongate forms of C. laxa \(166\)](#)
- t. Sporangia dark brown to deep fuscous or blackish..... u
- t. Sporangia bright-colored..... x
- u. Sporangia deep fuscous or blackish; stalks long, often four-fifths or more of total height, without hyaline sheath; capillitium delicate, intricate, with many free ends; spores 9-10  $\mu\text{m}$  ..... [Usual forms of C. nigra \(172\)](#)
- u. Sporangia dark reddish brown, not fuscous; stalks rarely attaining two-thirds of total height..... v
- v. Sporangia broadly ovate; columella reaching almost to tip, giving rise to uniform branches throughout its length..... [Ovate forms of C. laxa \(166\)](#)
- v. Sporangia globose or nearly so; columella tending to divide into large branches below tip..... w
- w. Total height 0.6-1.5 mm; capillitium dark, rigid, with a nearly complete surface net; spores 11-13  $\mu\text{m}$  ..... *C. rigidireta*
- w. Total height 0.3-0.6 mm; capillitium more open, without conspicuous surface net, bearing nodular enlargements, spores 9.5-10.5  $\mu\text{m}$  ..... *C. nodulifera*
- x. Columella reaching about two-thirds of sporangial cavity, giving off many large branches throughout; peridium persisting at base of sporangium as a cup or collar with capillitium attached..... [C. rubens \(176\)](#)  
[currently considered *Collaria rubens* (Lister) Nann.-Bremek.]

- x. Columella not exceeding center of sporangium, often shorter, and dividing into a few stout main branches, or sometimes stem dividing below base of sporangium..... y
- y. Columella usually present, dividing from near base to middle of sporangium, rarely higher, into a few stout branches from which bulk of capillitium arises..... [C. lurida \(169\)](#)  
[currently considered *Collaria lurida* (Lister) Nann.-Bremek.]
- y. Columella very short or lacking, dividing at or near base, or stem dividing below base of sporangium into several stout branches..... [C. elegans \(163\)](#)

**Genus *Macbrideola***

- a. Peridium persistent..... [M. scintillans \(183\)](#)
- a. Peridium fugacious at an early stage..... b
  - b. Capillitium forming an open net with few or no free ends; spores united in clusters..... [M. synsporos \(179\)](#)
  - b. Capillitium consisting of simple or branched strands with few or no anastomoses, sometimes lacking; spores free..... c
- c. Capillitium of robust strands which remain stout to periphery; base of peridium tending to persist as a collar..... *M. cornea*
- c. Capillitium of more or less flexuous strands which become attenuated toward the periphery..... d
  - d. Spores minutely and uniformly warted, 8.5-9.5 µm; capillitium sometimes reduced to one or two short branches of the columella, or lacking..... [M. decapillata \(161, 182\)](#)
  - d. Spores minutely warted with scattered clusters of larger warts, 6.5-7 µm; capillitium of 3 or 4 branching threads..... [M. martinii \(170\)](#)

**Genus *Lamproderma***

- a. Spores strongly and completely banded-reticulate, 11-16 µm; short-stalked or sessile, rarely plasmodiocarpous..... [L. cribrarioides \(190\)](#)  
[currently considered *Meriderma cribrarioides* (Fr.) Mar.Mey. & Poulain]
- a. Spores not banded-reticulate; crested, warted or spiny to nearly smooth, the warts sometimes arranged in a usually imperfect reticulate pattern..... b
  - b. Spores bearing vesicular crests, these often forming a broken

- reticulation..... [L. cristatum \(191\)](#)
- b. Spores not bearing vesicular crests..... c
- c. Peridium silvery blue, marked with conspicuous depressed, dark areas; spores dark, echinulate, 12-15  $\mu\text{m}$  ..... [L. guilmae \(193\)](#)
- c. Peridium uniform, without depressed dark areas..... d
  - d. Stalks long, relatively slender, usually greatly exceeding half the total height.....e
  - d. Sessile or with relatively stout, short stalks rarely exceeding half the total height..... g
- e. Columella divided below center of sporangial cavity into several stout branches which give rise to the circinate capillitium; spores minutely punctate, 7-9  $\mu\text{m}$  ..... [L. arcyronema \(187\)](#)  
[currently considered *Collaria arcyronema* (Rostaf.) Nann.-Bremek. ex Lado]
- e. Columella not divided; capillitium rigid, the numerous branches arising mainly from the tip of the columella..... f
  - f. Sporangia globose, 0.5-1 mm in diameter, varying to elongate-ellipsoid or cylindrical, total height 2-4 mm or sometimes more; branches of capillitium dark at base; spores dark, 11-14  $\mu\text{m}$  ..... [L. columbinum \(189\)](#)
  - f. Sporangia globose, mostly 0.3-0.4 mm in diameter, sometimes smaller; main branches of capillitium pale at base, becoming abruptly darker; spores pale, 7-9  $\mu\text{m}$ ..... [L. scintillans \(198\)](#)
- g. Capillitium attached to peridium, especially below, by yellow funnel-shaped expansions of tips, these often bearing peridial fragments after dehiscence, dark throughout except for expansions; spores dark, bearing conspicuous warts or blunt spines often arranged in a subreticulate pattern, mostly 12-15  $\mu\text{m}$  ..... [L. atrosporum \(196\)](#)  
[currently considered *Meriderma cribrarioides* (Fr.) Mar.Mey. & Poulain]
- g. Capillitium without funnel-shaped expansions at tips, usually free from peridium, occasionally attached by slender tips..... h
  - h. Sporangia fusiform on short stalks, more than twice as tall as wide; peridium firm, black, shining, persistent; columella reaching apex, sometimes emerging; spores minutely warted, 12-14  $\mu\text{m}$  ..... [L. fusiforme](#)  
[currently considered *Comatricha fusiformis* (Kowalski) Kowalski]
  - h. Sporangia usually subglobose or ovate, rarely cylindrical but then not fusiform; peridium membranous; columella not emerging..... i
- i. Spores bearing both spines and tubercles..... [L. tuberculosporum](#)
- i. Spores not bearing both spines and tubercles..... j

- j. Spores strongly spinose, 15-20  $\mu\text{m}$ , sporangia globose to ovate-cylindrical..... [L. echinulatum \(192\)](#)
- j. Spores warted or spinulose, rarely attaining 15  $\mu\text{m}$ , usually much smaller; sporangia globose to ovate, rarely cylindrical..... k
- k. Columella pale brown capillitium pallid, with rosy tints; sessile or short-stalked; spores warted, mostly 11-12  $\mu\text{m}$  ..... [L. pulchellum \(195\)](#)
- k. Columella dark; capillitium dark except for tips which may be pale or colorless; usually stalked, the stalk often half the total height..... l
- l. Spores minutely verrucose, with small blunt spines or nearly smooth, mostly 11-14  $\mu\text{m}$ , sometimes larger..... [L. sauteri \(197\)](#)
- l. Spores rarely exceeding 13  $\mu\text{m}$  ..... m
- m. Sporangia small, mostly 0.2-0.4 mm in diameter; capillitium dark; spores strongly warted or spiny..... n
- m. Sporangia usually larger (0.3-)0.5-1.4 mm in a diameter; spores minutely warted or spinulose..... o
- n. Stalk black; spores bearing large, sharp, irregularly scattered spines, mostly 11-13  $\mu\text{m}$  ..... [L. muscorum \(194\)](#)
- n. Stalk pale dull orange, spores bearing blunt spines or warts, sometimes arranged in a reticulate pattern ..... [L. verrucosum \(199\)](#)
- o. Capillitium somewhat rigid at base, tending to become lax and flexuous, the main threads pale as they leave the columella, becoming darker, then fading toward the colorless tips; sporangia of moderate size, 0.3-1 mm in diameter; spores pale, minutely warted, 8-11  $\mu\text{m}$  ..... [L. arcyrioides \(186\)](#)
- o. Capillitium rigid and dark at base, becoming somewhat circinate and fading to the pale tips; sporangia robust 0.7-1.4 mm in diameter; spores dark, verrucose, 10-12  $\mu\text{m}$  .. [L. carestiae \(188\)](#)  
[currently considered *Meriderma carestiae* (Ces. & De Not.) Mar.Mey. & Poulain]

### Order Physarales

- a. Capillitium calcareous, usually intricate, entire fructification often limy, the lime in the form of non-crystalline granules.....Physaraceae
- a. Capillitium non-calcareous or rarely bearing aggregations of crystalline lime, peridium and often stipe limy, the lime frequently crystalline.....Didymiaceae



## Family Physaraceae

- a. Capillitium duplex, i.e., composed of two distinct systems.....b
- a. Capillitium essentially homogenous.....d
  - b. Primarily plasmodiocarpous, but sometimes fruiting as pulvinate sporangia or massed into a pseudoaethalium; capillitium of limy plates, massed transversely, connected with a nearly limeless network of slender tubes bearing numerous, often hooked spines.....[Cienkowskia reticulata \(200\)](#)  
[currently considered *Willkommlangea reticulata* (Alb. & Schwein.) Kuntze]
  - b. Primarily sporangiate, if plasmodiocarpous, then usually accompanied by sporangia; capillitium not spinose.....c
- c. Sporangia ovate; peridium Smooth, shining; capillitium a limy network, connected with and interpenetrating a limeless network of flattened tubules.....[Leocarpus fragilis \(201\)](#)
- c. Sporangia deeply introverted, thimble-like, rarely plasmodiocarpous; peridium rough; capillitium composed of stout calcareous spines arising from the inner wall and a network of slender threads bearing a few calcareous nodes.....[Physarella oblonga \(202\)](#)
  - d. Capillitium a network of calcareous tubes of nearly uniform diameter; limeless connecting tubules few or none.....[Badhamia](#)
  - d. Capillitium a network of hyaline limeless tubules with calcareous nodes at many or all of the junctions.....e
- e. Fructification an aethalium; pseudocapillitium present, often more conspicuous than capillitium.....[Fuligo](#)
- e. Fructification sporangiate or plasmodiocarpous, rarely approaching aethalioid; pseudocapillitium lacking.....f
  - f. Plasmodiocarpous, cylindrical, pendent, often anastomosing to form a 3-dimensional net.....[Erionema aureum \(224\)](#)  
[currently considered *Fuligo aurea* (Penz.) Y.Yamam.]
  - f. Sporangiate or plasmodiocarpous, rarely pendent; plasmodiocarps, when anastomosing, forming a 2-dimcnsonal net.....g
- g. Sporangiate; dehiscence circumscissile, often by a preformed lid, the lower portion persisting as a deep cup.....[Craterium](#)
- g. Sporangiate or plasmodiocarpous, rarely somewhat aethalioid; dehiscence irregular or lobate; lower portion of peridium remaining as at most a shallow, irregular cup.....[Physarum](#)

## Genus *Badhamia*

- a. Spores formed in clusters, these sometimes breaking apart at maturity; capillitium strongly badhamioid, lacking hyaline connecting threads..... b
- a. Spores free; capillitium varying from typical badhamioid to somewhat physaroid, with a few short, hyaline connecting threads..... g
  - b. Spore clusters very loose, readily falling apart; spores globose, uniformly warted or nearly so..... [B. utricularis \(216\)](#)
  - b. Spore clusters tending to persist; spores elliptical or ovate, with warts or spines on exposed outer surfaces, these scanty or lacking elsewhere..... c
- c. Spore clusters composed of 10-40 spores, the larger clusters hollow; sporangia flesh-colored to dingy white..... [B. versicolor \(217\)](#)
- c. Spore clusters usually smaller, not hollow..... d
  - d. Sporangia yellow, orange or greenish, fading to dingy ..... [B. nitens \(210\)](#)
  - d. Sporangia white, gray or iridescent, rarely with rosaceous tints..... e
- e. Sporangia borne on firm, dark, usually short stalks..... [B. papaveracea \(214\)](#)
- e. Sporangia sessile or on pale, weak, membranous stalks..... f
  - f. Walls thin, translucent, sometimes almost limeless; exposed area of spores uniformly warted..... [B. capsulifera \(204\)](#)
  - f. Walls calcareous, white or sometimes with purplish or rosaceous tints; exposed area of spores irregularly warted, the warts tending to be in lines; sporangia large, densely clustered or heaped, often resembling an aethalium..... [B. populina \(215\)](#)
- g. Capillitium represented by tubular calcareous columns, simple or forked, extending from base to peridium..... [B. ainoae \(366\)](#)  
[currently considered *Badhamiopsis ainoae* (Yamash.) T.E.Brooks & H.W.Keller]
- g. Capillitium netted, varying from typically badhamioid to somewhat physaroid..... h
  - h. Sporangia with bright green or yellow tints..... i
  - h. Sporangia without bright green or yellow tints..... j
- i. Sporangia stalked, yellowish green or gray with a yellow base; capillitium badhamioid..... [B. viridescens \(218\)](#)
- i. Sporangia pulvinate or plasmodiocarpous, rarely stalked; green, often quickly fading; capillitium physaroid..... see *Physarum decipiens*

- j. Spores elliptical with a low longitudinal ridge; sporangia pulvinate or plasmodiocarpous, dingy or somewhat ochraceous..... [B. ovispora \(212\)](#)
- j. Spores globose or subglobose, without longitudinal ridge..... k
- k. Columella or pseudocolumella cylindrical, rarely lacking; base of peridium tending to persist as a cup; stipitate or sessile on a constricted base; sporangia dark gray to purple-brown..... [B. obovata \(211\)](#)  
[currently considered *Craterium obovatum* Peck]
- k. Columella lacking or represented by a thickened base; rarely cupulate; sporangia paler to white..... l
- l. Lime scanty, peridium delicate, more or less iridescent; capillitium always badhamioid..... m
- l. Lime usually abundant, coating peridium thickly; capillitium often appearing physaroid..... n
- m. Sporangia usually stalked, the stalks hyaline, often long, slender, weak; peridium smooth..... [B. utricularis \(216\)](#)
- m. Sporangia usually sessile, rarely stalked, the stalks short, yellowish..... [B. foliicola \(206\)](#)
- n. Spores dark, somewhat oval, encircled by a pale band; sporangia sessile..... [B. dearnessii \(205\)](#)  
[currently considered *Badhamia goniospora* Meyl.]
- n. Spores globose, not encircled by a pale band, or very inconspicuously so..... o
- o. Spores warted, with very open overlying reticulation; usually stalked, the stalk often more than half the total height..... [B. gracilis \(207\)](#)  
[currently considered *Badhamia melanospora* Speg.]
- o. Spores rarely with overlying reticulation; usually sessile or, if stalked, stalks short, rarely attaining half total height..... p
- p. Sporangia subglobose, small, sessile on a broad base, usually under 0.5 mm in diameter, densely crowded, drab to lilaceous, pinkish or white; peridium porcelain-like, smooth or somewhat rugose..... [B. lilacina \(208\)](#)
- p. Sporangia usually larger, without drab or lilaceous tints; peridium not porcelain-like..... q
- q. Sporangia densely heaped, pure white or ashy-white, stalked or sessile; stalks, when present, weak, strand-like..... *B. cinerascens*
- q. Sporangia gregarious or sometimes crowded, but not heaped, often colored below..... r

- r. Spores lilaceous or violaceous by transmitted light, nearly smooth..... s
- r. Spores dark by transmitted light, distinctly warted or spinulose..... t
- s. Sessile or stalked; hypothallus prominent, red; stalk, when present, red; base of sporangium often reddish..... [B. panicea \(213\)](#)
- s. Always stalked; hypothallus inconspicuous, dark; stalk black or dark brown; base of sporangium brown..... [B. iowensis](#)
  - t. Spores densely and irregularly verrucose; stalk, when present, yellowish or brown except at darkened base; sporangia never orbiculate..... [B. macrocarpa \(209\)](#)
  - t. Spores densely spinulose; stalk, when present, black; sporangia often orbiculate..... [B. affinis \(203\)](#)

## Genus *Fuligo*

- a. Spores small, 6-9  $\mu\text{m}$  in diameter, aethalia often very large ..... [F. septica \(223\)](#)
- a. Spores large, over 10  $\mu\text{m}$  in diameter; aethalia usually of small or medium size..... b
  - b. Aethalia usually slender, often plasmodiocarpous in aspect, or thin and broadly effused ..... c
  - b. Aethalia compact, pulvinate..... d
- c. Spores often elliptical; crust white..... [F. cinerea \(219\)](#)
- c. Spores spherical; crust greenish gray or yellowish green..... [F. muscorum \(222\)](#)
  - d. Cortex thin, fragile, not strongly calcareous, early fugacious; spores nearly smooth, 11-13  $\mu\text{m}$  in diameter; sometimes appearing as densely massed sporangia..... [F. intermedia \(220\)](#)
  - d. Cortex thick, spongy, calcareous; spores dark, rough-tuberculate to subreticulate, 15-20  $\mu\text{m}$  in diameter..... [F. megaspora \(221\)](#)

## Genus *Craterium*

- a. Dehiscence circumscissile or by fragmentation of upper part of sporangium, which is often different in texture from lower portion, but rarely forming a distinct lid, and wall then mealy or rough..... b

- a. Dehiscence by a clearly defined, preformed lid, often sunken..... d
  - b. Sporangia pinkish to deep purple; cup deep, persistent..... [C. paraguayense \(229\)](#)
  - b. Sporangia without pinkish or clear purple colors..... c
- c. Sporangia pale or whitish above, ochraceous to brownish below, rarely entirely brown; capillitium white or ochraceous; cup deep, persistent..... [C. leucocephalum \(227\)](#)
- c. Sporangia bright yellow or greenish yellow, fading to ochraceous or dingy white; capillitium orange or yellow, fading; cup tending to be shallow, finally breaking into petaloid lobes..... [C. aureum \(225\)](#)
  - d. Sporangia gray with a reddish base; walls limy; nodes pinkish; spores sparsely but prominently spiny to subreticulate..... [C. rubronodum](#)
  - d. Sporangia brown; walls smooth, glossy, sometimes bearing lime granules, spores minutely spiny..... e
- e. Sporangia ochraceous brown to dark brown or reddish brown; nodes large, white..... [C. minutum \(228\)](#)
- e. Sporangia pinkish brown; nodes small, brown..... [C. concinnum \(226\)](#)

## Genus *Physarum*

- a. Primarily sessile; sporangiate to plasmodiocarpous or pseudoaethalioid, sometimes with a constricted base or attached to a weak, stalk-like extension of the hypothallus, rarely with true stalks..... b
- a. Primarily stalked and sporangiate; sessile or plasmodiocarpous fruitings often occur, but are usually accompanied by stalked sporangia..... c
  - b. Peridium single, or, if double, the inner layer firmly attached to the outer limy crust; lime sometimes in scales or patches, then readily flaking away..... [Key I](#)
  - b. Peridium double, rarely triple, the inner layer distant from the outer layer or layers, or, if appressed, readily separating; lime usually deposited as a persistent crust..... [Key II](#)
- c. Columella present..... [Key III](#)
- c. Columella lacking; pseudocolumella sometimes present ..... d

- d. Nodes massed in center to form a calcareous central body or pseudocolumella..... [Key IV](#)
- d. Calcareous central body or pseudocolumella usually lacking, rarely present..... e
- e. Sporangia strongly compressed laterally, annulate, saucer-shaped or lobed..... [Key V](#)
- e. Sporangia globose to oval or lenticular..... f
- f. Capillitium reticulate, not notably dichotomously branched and radiating from base of peridium; nodes angular or rounded, rarely fusiform..... [Key VI](#)
- f. Capillitium dichotomously branched, usually with many cross-connections, radiating from base of peridium; nodes mostly fusiform..... [Key VII](#)

## KEY I

- a. Predominantly sporangiate, but often forming, small, rarely branched or netted, plasmodiocarps..... b
- a. Predominantly plasmodiocarpous, often forming a net; often broken into small plasmodiocarps or sporangia..... p
  - b. Capillitium strongly elastic, expanding when wall is broken..... *P. famintzinii*
  - b. Capillitium not notably elastic..... c
- c. Spores tending to be elliptical in outline, encircled by a pale band..... [P. ovisporum \(278\)](#)
- c. Spores globose or nearly so, not encircled by a pale band..... d
  - d. White or ashy gray, without ochraceous tints. Some species keyed under following may at times be white..... e
  - d. Usually distinctly colored or dark, sometimes ochraceous or dingy yellowish white..... g
- e. Sporangiate on a constricted base; peridium thin, nearly translucent, except for a white, limy reticulum on surface..... *P. gilkeyanum*
- e. Sporangiate on a broad base; peridium not bearing a limy net..... f
  - f. Capillitium scanty, nearly limeless; peridium thin, delicate, with at most a scanty deposit of lime; plasmodiocarps rare, simple; plasmodium yellow..... see [P. nudum \(275\)](#)
  - f. Capillitium abundant, limy; peridium fragile but bearing abundant lime flakes; plasmodium white, or sometimes yellow before fruiting; spores pale..... [P. cinereum \(243\)](#)

- f. Capillitium abundant, limy; peridium thick, calcareous; plasmodiocarps often well-developed; plasmodia white; spores dark..... [P. vernum \(299\)](#)
- g. Sporangia in dense, heaped clusters..... h
- g. Sporangia scattered or crowded, but not heaped..... i
  - h. Green or yellow, sometimes ochraceous or pallid; sometimes on weak stalks..... [P. virescens \(300\)](#)
  - h. Dull, dark violaceous brown, varying to pallid or white; never stalked..... [P. confertum \(246\)](#)
- i. Sporangia crowded, cylindrical or irregular, often bluntly lobed, clay-colored to snuff brown..... [P. digitatum \(253\)](#)
- i. Sporangia scattered or gregarious, rarely crowded, not clay-colored nor snuff brown..... j.
  - j. Peridium nearly limeless, membranous, gray, iridescent; sessile on a constricted constricted base or sometimes with weak stalks..... [P. nudum \(275\)](#)
  - j. Peridium usually notably limy..... k
- k. Predominantly yellow..... l
- k. Predominantly red, brown or green..... m
  - l. Bright chrome yellow; when lime is continuous, wall may appear double..... [P. luteolum \(265\)](#)
  - l. Yellow-brown, often with white, yellow or reddish scales or patches; lime rarely continuous..... [P. decipiens \(249\)](#)
- m. Nodes rounded, yellow, with red centers; sporangia red, scarlet or orange, sometimes fading..... [P. lateritium \(261\)](#)
- m. Nodes angular, rarely with red centers..... n
  - n. Sporangia small, mostly 0.3-0.5 mm in diameter; peridium reddish brown or brown, with pale spots; nodes small, deep ochraceous or brown..... [P. braunianum \(240\)](#)
  - n. Sporangia larger, mostly 0.5-1.2 mm in diameter; nodes large, angular..... o
- o. Scarlet, red-brown or olive-brown; peridium thin, rugulose; nodes sometimes reddish internally..... [P. rubiginosum \(288\)](#)
- o. Reddish to orange or green, often fading to ochraceous or dingy white; peridium smooth but often with embedded scales..... [P. auriscalpium \(234\)](#)

- p. Capillitium elastic, duplex, of large white spikes borne on peridium and small yellowish fusiform nodes on a dichotomous net; fructification of rosette-like plasmodiocarps often fusing into a pseudoaethalium, varying to separate, sessile or stalked sporangia..... [P. gyrosum \(259\)](#)
- p. Capillitium neither duplex nor elastic..... q
- q. Dull yellow to ochraceous..... [P. serpula \(290\)](#)
- q. White or grayish white..... r
  - r. Spores pale violaceous, 6-8  $\mu\text{m}$  ..... *P. sessile*
  - r. Spores darker, larger..... s
- s. Spores medium brown, warted, (9-)10-12  $\mu\text{m}$ ; peridium limy, rugose; plasmodiocarps flattened..... [P. verum \(299\)](#)
- s. Spores dark, distinctly warted, 10-12.5  $\mu\text{m}$ ; plasmodiocarps terete or slightly compressed laterally..... [P. compressum \(245\)](#)

## KEY II

- a. Primarily sporangiate, often passing into pulvinate, rarely long, usually unbranched plasmodiocarps..... b
- a. Primarily plasmodiocarpous, often long, branched and reticulate, frequently accompanied by short plasmodiocarps or sporangia..... l
  - b. Fructifications white; peridial layers distant..... c
  - b. Fructifications white to ochraceous or darker; peridial layers close or in contact..... f
- c. Sporangia globose or ovate, gregarious or densely clustered but not notably depressed; pseudocolumella often present..... d
- c. Sporangia notably depressed, closely united; pseudocolumella usually lacking..... e
  - d. Sporangia cylindrical or ovoid, 0.4-0.6 mm in diameter, densely aggregated; spores spiny, 12-15  $\mu\text{m}$  ..... [P. didermoides \(252\)](#)
  - d. Sporangia globose, up to 1 mm in diameter, clustered, sessile on a constricted base; spores minutely spinulose, 10-12  $\mu\text{m}$  ..... [P. diderma \(251\)](#)



- e. Sporangia covered by a continuous tessellate limy crust; spores dark, warty..... [P. tessellatum \(297\)](#)
- e. Sporangia not covered by a tessellate crust; spores very dark, conspicuously spinulose..... [P. spinulosum \(291\)](#)  
[currently considered *Physarum tessellatum* G.W.Martin & M.L.Farr]
- f. Sporangia pulvinate, densely massed, sometimes pseudoaethalioid..... g
- f. Sporangia subglobose or pulvinate, gregarious or clustered but rarely pseudoaethalioid..... h
- g. Sporangia plane or sunken above; spores dark, strongly marked, 11-13  $\mu\text{m}$  ..... [P. contextum \(247\)](#)
- g. Sporangia rounded above; spores pale, nearly smooth, 8-10  $\mu\text{m}$  ..... [P. conglomeratum](#)
- h. Outer peridium mucilaginous when moist..... [P. mucosum](#)  
    [currently considered *Physarum contextum* (Pers.) Pers.]
- h. Outer peridium not mucilaginous when moist..... i
- i. Nodes white..... [P. mortoni \(269\)](#)
- i. Nodes yellow or red, sometimes fading to dingy..... j
- j. Capillitium dense, somewhat elastic, many of the threads flattened as in *Leocarpus*; sessile or borne on weak, stalk-like extensions of the hypothallus..... [P. albescens \(231\)](#)
- j. Capillitium typically physaroid, not elastic..... k
- k. Dull yellow to ochraceous brown; nodes yellow; sessile..... [P. alpinum \(232\)](#)
- k. Pinkish brown or dusky; nodes pink to scarlet; sessile or on weak stalks...[P. rubronodum \(289\)](#)  
[currently considered *Physarum albescens* Ellis ex T.Macbr.]
- l. Strongly compressed laterally..... m
- l. Terete, or only slightly compressed laterally..... p
- m. Capillitium elastic, duplex, of long spikes arising from peridium and small fusiform nodes on a dichotomously branched net; often massed in rosettes or pseudoaethalia; peridium appearing double when lime is abundant; dehiscence irregular..... [P. gyrosum \(259\)](#)
- m. Capillitium neither elastic nor duplex; not forming pseudoaethalia; dehiscence by a preformed apical fissure..... n
- n. Spores minutely spinulose, pale, 8-10  $\mu\text{m}$ ; plasmodiocarps white to drab or yellow..... [P. bivalve \(238\)](#)

- n. Spores strongly sculptured, dark, mostly larger, more or less reticulate..... o
- o. Peridium white, chalky; spores incompletely reticulate and spiny, 11-13  $\mu\text{m}$  ..... [P. echinosporum \(254\)](#)
- o. Peridium brown, glossy, fragile; spores strongly reticulate, 9-11  $\mu\text{m}$  ..... [P. retisporum \(286\)](#)
  - p. Plasmodiocarps white or pallid..... q
  - p. Plasmodiocarps distinctly colored..... s
- q. Spores strongly reticulate..... [P. dictyosporum \(250\)](#)
- q. Spores not reticulate..... r
  - r. Terete or slightly compressed; nodes not angular; spores coarsely spinulose, 10-13  $\mu\text{m}$  ..... [P. bitectum \(237\)](#)
  - r. Terete; nodes angular; spores smooth, 7-8  $\mu\text{m}$  ..... [P. laevisporum](#)
- s. Scarlet, nodes pale yellow with deep orange-red centers ..... [P. nasuense](#)
- s. Peridium not uniformly scarlet; nodes not with darker centers..... t
  - t. Outer peridium cartilaginous, bronze, wrinkled, with little or no lime; nodes brown..... [P. aeneum \(230\)](#)
  - t. Outer peridium limy; nodes not brown..... u
- u. Outer peridium variegated, deep reddish orange, but marked by paler lines and patches; nodes at first bright orange, tending to fade; spores dark, warted, sometimes in a reticulate pattern, 10-12  $\mu\text{m}$  ..... [P. variegatum](#)
- u. Outer peridium not variegated; nodes pallid or white; spores pale, minutely warted or punctate, under 10  $\mu\text{m}$  ..... v
  - v. Outer peridium smooth, dull yellow to brown, white inside, dehiscing by triangular lobes exposing the delicate, evanescent inner layer covering the spore-mass; nodes white..... [P. bogoriense \(239\)](#)
  - v. Outer peridium rough, yellow to orange; dehiscence apical, but not by a pre-formed fissure; nodes yellow to pallid..... [P. superbum \(295\)](#)

### KEY III

- a. Columella large, conspicuous..... b
- a. Columella small, usually a short, conical projection of the stalk..... f

- b. Spores reticulate; columella black, clavate or conical, rarely reduced or lacking; nodes fusiform, yellow..... [P. dictyospermum](#)
- b. Spores not reticulate..... c
- c. Columella reaching almost or quite to top of sporangial cavity..... d
- c. Columella rarely exceeding center of sporangial cavity..... e
  - d. Columella calcareous, dull, often dark, with large angular nodes clustered about it, often short or lacking..... [P. crateriforme \(248\)](#)
  - d. Columella not calcareous, slender, cylindrical, orange-brown to pallid; usually 94 or more of sporangial cavity; sporangia olivaceous, usually prolate..... [P. penetrale \(279\)](#)
- e. Columella subglobose or broadly clavate; capillitium dichotomous, with yellow, fusiform nodes..... [P. listeri \(264\)](#)  
[currently considered *Physarum schroeteri* Rostaf.]
- e. Columella bluntly conical; capillitium reticulate, with pale yellow rounded nodes..... [P. perfectum](#)
  - h. Sporangia yellow or orange..... f
  - h. Sporangia neither yellow nor orange..... i
- g. Nodes white; peridium honey-yellow; stalk white, yellow, or tawny..... [P. melleum \(267\)](#)
- g. Nodes yellow or red..... h
  - h. Sporangia bright yellow; columella and stalk yellow..... [P. citrinum \(244\)](#)
  - h. Sporangia orange to bronze-tawny; stalk orange-red..... [P. pulcherripes \(284\)](#)
- i. Sporangia white or pallid..... j
- i. Sporangia distinctly colored..... k
  - j. Sporangia white, rarely pale ochraceous or pinkish; capillitium dense, with numerous small rounded nodes; columella sometimes lacking..... [P. globuliferum \(258\)](#)
  - j. Sporangia white; capillitium open, with large angular nodes; columella when present, very short, broadly conical, often lacking..... [P. leucopus \(263\)](#)
- k. Bright lilac or blue throughout..... [P. bilgramii \(236\)](#)  
[currently considered *Physarum globuliferum* (Bull.) Pers.]
- k. Not bright lilac or blue..... l

- l. Sporangia and stalks deep maroon; nodes purple ..... [P. pulcherrimum \(283\)](#)
- l. Sporangia, stalks and nodes brown..... m
- m. Stalk limeless; columella often lacking..... [P. mennagae \(268\)](#)
- m. Stalk limy; columella usually present..... [P. murinum \(270\)](#)

KEY IV

- a. Lime mass subspherical, in center of b sporangial cavity, free from base; sporangia globose..... b
- a. Lime mass irregular, often attached to base and forming a pseudocolumella ..... c
  - b. Capillitium delicate; stalk calcareous; spores 8-10  $\mu\text{m}$  ..... [P. stellatum \(292\)](#)
  - b. Capillitium dense; stalk not calcareous; spores 6.6-7.5  $\mu\text{m}$  ..... [P. nucleatum \(274\)](#)
- c. Sporangia obconic, multilobed or distorted..... [P. nicaraguense \(272\)](#)
- c. Sporangia globose to cylindrical, or plasmodiocarpous, but not notably lobed or distorted..... d
  - d. Sporangiate to plasmodiocarpous; lime in central mass sometimes crystalline; spores spinulose, 8-10  $\mu\text{m}$ ..... [P. mutabile \(271\)](#)
  - d. Typically sporangiate; lime in center not crystalline; spores spiny, larger..... e
- e. Sporangia up to 1 mm in diameter, often clustered but rarely forming a pseudoaethalium; spores mostly 10-12  $\mu\text{m}$  ..... [P. diderma \(251\)](#)
- e. Sporangia 0.4-0.6 mm in diameter; densely massed, often pseudoaethalioid; spores mostly 12-15  $\mu\text{m}$  ..... [P. didermoides \(252\)](#)

There are other species in which the lime is sometimes massed in the center, but only in those keyed above does it seem to be common enough to be regarded as characteristic.

KEY V

- a. Fructifications flattened laterally..... b
- a. Fructifications not flattened laterally..... f
  - b. Primarily sporangiate..... c

- b. Primarily plasmodiocarpous..... d
- c. Fructifications ovoid to reniform or flabellate, stalked or sessile, varying to plasmodiocarpous; stalks when present, stout, opaque or frosted with lime..... [P. compressum \(245\)](#)
- c. Usually sporangiate and stalked; sporangia obovoid or cuneate; stalks weak, pallid, translucent, often branched..... [P. straminipes \(293\)](#)
  - d. Plasmodiocarps intricate, aggregated into rosettes or pseudoaethalia; dehiscence irregular; capillitium elastic..... [P. gyrosum \(259\)](#)
  - d. Plasmodiocarps rarely densely aggregated; dehiscence by a preformed apical fissure; capillitium not elastic..... e
- e. Spores strongly reticulate, by ridges..... [P. retisporum \(286\)](#)
- e. Spores strongly spinose, the spines sometimes forming a broken reticulate pattern, 10-12  $\mu\text{m}$  ..... [P. echinosporum \(254\)](#)
- e. Spores minutely spinulose, 8-10  $\mu\text{m}$  ..... [P. bivalve \(238\)](#)
  - f. Sporangia depressed above, patellate, cupulate or annulate..... g
  - f. Sporangia convex above, lobate or distorted, often appearing compound..... j
- g. Discoid, umbilicate above, often annular; stalk, when present, short, dark; spores dark..... h
- g. Cupulate or patellate; stalk slender; spores pale..... i
  - h. Capillitium distinctly physaroid..... [P. megalosporum \(266\)](#)
  - h. Capillitium approaching badhamioid..... Some orbiculate forms of *Badhamia affinis*
- i. Sporangia saucer-shaped, on long, slender, reddish brown translucent stalks; peridium delicate, membranous, persistent..... [P. pezizoideum \(280\)](#)
- i. Sporangia obconic or turbinate; stalk white above, dark and opaque below; peridium dehiscent above, often persistent below ..... [P. javanicum \(260\)](#)
  - j. Capillitium of large, angular, white nodes, massed in center, sometimes forming a pseudocolumella; stalk short, stout ..... [P. nicaraquense \(272\)](#)
  - j. Capillitium delicate, the nodes small, fusiform, on a dichotomous net; stalk long, slender, translucent..... [P. polycephalum \(281\)](#)

## KEY VI

- a. Stalks, when present, weak, flaccid, as obvious extensions of hypothallus..... b
- a. Stalks, when present, morphologically distinct from hypothallus..... c
  - b. Sporangia ovoid to cylindrical, densely massed; outer peridium white, calcareous, tending to break away, exposing plumbeous inner peridium; capillitium physaroid..... [P. didermoides \(252\)](#)
  - b. Sporangia subglobose to obovoid, clustered but not massed; outer peridium white to pale yellow or fulvous, closely attached to membranous inner peridium; capillitium tending to be flattened with many limeless junctions..... [P. albescens \(231\)](#)
- c. Sporangia white or ashy gray; nodes white..... d
- c. Sporangia not white, rarely pale gray and nodes then usually yellow..... h
  - d. Stalks white or pallid, fragile, calcareous throughout..... e
  - d. Stalks dark or externally frosted with lime, but not calcareous within, varying to pale, translucent..... f
- e. Capillitium dense, the nodes small, rounded, columella usually present..... [P. globuliferum \(258\)](#)
- e. Capillitium open, the nodes angular, columella rarely present; with aspect of *Didymium*..... [P. leucopus \(263\)](#)
  - f. Sporangia small, 0.4-0.6 mm in diameter, white, often with a persistent brownish base; stalks usually long, slender, cylindrical, brown, sometimes subulate and shorter..... [P. pusillum \(285\)](#)
  - f. Sporangia usually larger; stalks short, stout, dark or frosted..... g
- g. Depressed-globose, very calcareous, often clustered on stalks..... [P. notabile \(273\)](#)
- g. Globose to subdepressed or ovate, with darker base; peridium not notably calcareous, sometimes nearly limeless and then somewhat iridescent..... [P. leucophaeum \(262\)](#)
  - h. Sporangia markedly iridescent..... i
  - h. Sporangia not iridescent or at most slightly so..... j
- i. Sporangia iridescent blue or bronze with subcrystalline orange deposits; stalk bright orange or yellow..... [P. psittacinum \(282\)](#)
- i. Sporangia dark gray, the upper part iridescent, lightly sprinkled with white lime flakes, sharply separated from dark, cup-like base; stalk black..... [P. tropicale \(298\)](#)

- j. Sporangia rose-purple or purplish red throughout..... k
- j. Sporangia yellow, orange, flesh-colored or brown, or, if pallid, with yellow nodes..... l
- k. Scarlet; stalks rather long, slender, translucent; spores pale under lens..... [P. roseum \(287\)](#)
- k. Rose-purple; stalks thick, opaque; sporangia sometimes sessile; spores dark under lens..... [P. newtonii](#)
- l. Peridium smooth, crustose, varnished, yellow-brown..... [P. brunneolum \(241\)](#)
- l. Peridium neither crustose nor varnished..... m
- m. Peridium dull yellow or ochraceous to olivaceous or dusky, rarely green; sometimes fading to dingy white..... n
- m. Peridium bright yellow or orange or, if dingy white, nodes usually yellow..... s
- n. Stalk and base of peridium flesh-colored, fading to ochraceous above..... [P. carneum \(242\)](#)
- n. Stalk and base of peridium not flesh-colored..... o
- o. Peridium scaly, dull yellow to orange-brown, rarely green; stalks very short; mainly sessile or plasmodiocarpous..... [P. auriscalpium \(234\)](#)
- o. Peridium not conspicuously scaly; stalks usually well-developed; rarely sessile or plasmodiocarpous..... p
- p. Stalks calcareous, opaque, white or dull brown; peridium double, the outer layer brown, smooth, the inner layer membranous..... [P. flavidum \(256\)](#)
- p. Stalks translucent, not calcareous; peridium single..... q
- q. Stalks long, slender, usually 3 times diameter of sporangium or more, rarely less; peridium yellowish, with little lime, or membranous, appearing sooty; nodes often fusiform..... [P. flavicomum \(255\)](#)
- q. Stalks shorter and stouter, rarely more than twice the diameter of the sporangium; nodes rarely fusiform..... r
- r. Sporangium dull brown, sooty; stalk sometimes prolonged as a columella..... [P. menagae \(268\)](#)
- r. Sporangia dingy yellow to ochraceous, yellow-brown or olivaceous; never columellate..... [P. sulphureum \(294\)](#)
- s. Stalks calcareous; sporangia bright yellow or ochraceous to gray; nodes yellow or yellowish, rarely white..... [P. tenerum \(296\)](#)

- s. Stalks not calcareous, usually translucent..... t
  - t. Base of peridium thickened, tending to persist as a cup; nodes large, angular..... [P. oblatum \(277\)](#)
  - t. Base of peridium not notably thickened nor tending to persist as a cup; nodes small; sporangia golden yellow to chrome..... u
- u. Stalk short, thick, red, rarely attaining half the diameter of the sporangium; nodes small, rounded, abundant..... [P. auripigmentum \(233\)](#)
- u. Stalk long, slender, orange below, fading to yellow above, 1-3 times diameter of sporangium; nodes small, angular, sparse ..... [P. galbeum \(257\)](#)

KEY VII

- a. Capillitium robust, strongly calcareous, orange, the nodes often angular or rod-like, varying to long-fusoid; sporangia lenticular, often depressed above..... *P. rigidum*
- a. Capillitium delicate, dense, with small nodes..... b
  - b. Sporangia ovate, yellow, gray or pallid; stems weak, more or less recumbent; usually lobate or compound..... simple forms of *P. polycephalum*
  - b. Sporangia globose or oblate, rarely compound; stems erect..... c
- c. Dusky yellow or sooty, often nearly limeless; capillitium sometimes reticulate with angular nodes..... [P. flavicomum \(255\)](#)
- c. Not dusky or sooty; capillitium consistently dichotomous with fusiform nodes..... d
  - d. Peridium iridescent blue, with scanty yellow lime deposits; erect on a short, thick stem..... [P. bethelii \(235\)](#)
  - d. Peridium usually distinctly limy, rarely iridescent; stalks usually long and sporangia then nodding..... e
- e. Cray or white; nodes white..... [P. nutans \(276\)](#)  
[currently considered *Physarum album* (Bull.) Chevall.]
- e. Yellow, greenish yellow or orange, often fading; nodes yellow or orange..... [P. viride \(301\)](#)

**Family Didymiaceae**

- a. Peridial lime amorphous, granular.....b



- a. Peridial lime crystalline, the crystals powdering the surface, united into scales or forming a continuous crust.....d
  - b. Peridial lime scanty, merely powdering surface; capillitium netted, the basal nodes flattened; columella rarely present.....[Wilczekia evelinae \(302\)](#)  
[currently considered *Diderma evelinae* (Meyl.) Kowalski]
  - b. Peridial lime usually abundant; capillitium usually radiating from a columella or thickened base, rarely replaced by limy columns.....c
- c. Outer peridium bearing numerous blunt, limy peg-like protuberances.....[Physarina](#)
- c. Outer peridium without peg-like protuberances; middle crystalline layer sometimes present.....[Diderma](#)
  - d. Fructification an aethalium.....[Mucilago crustacea \(331\)](#)
  - d. Sporangiate or plasmodiocarpous.....e
- e. Crystals scattered on peridium or forming a crust, but not united into scales.....[Didymium](#)
- e. Crystals united into distinct scales, scattered or massed on peridium.....[Lepidoderma](#)

### **Genus *Physarina***

- a. Pink to flesh-colored or darker, spores pale, nearly smooth, without encircling ridge, (?7-) 8.5-10.5  $\mu\text{m}$  in diameter.....[P. echinocephala](#)
- a. White or ashy, spores dark, angular, prominently and irregularly spiny, with conspicuous encircling ridge, 11-14  $\mu\text{m}$  in diameter.....[P. echinospora \(303\)](#)

### **Genus *Diderma***

- a. Outer wall of peridium calcareous, fragile, rough or smooth, free or attached to membranous inner wall, but in the latter case breaking away readily; inner wall sometimes apparently lacking; sporangiate, plasmodiocarpous or pseudoaethalioid; dehiscence rarely stellate..... [Subgenus \*Diderma\*](#)
- a. Outer wall of peridium cartilaginous, tough, shining, usually firmly attached to adjacent wall, if present; dehiscence frequently more or less stellate..... [Subgenus \*Leangium\*](#)

## Subgenus Diderma

- a. Wall single or appearing so; dehiscence irregular..... b
- a. Wall clearly double; dehiscence irregular, operculate or stellate..... e
  - b. Orange-brown to brick red, varying to ochraceous or yellow; sporangiate, sessile, often heaped..... [D. simplex \(326\)](#)
  - b. Flesh colored to white, without orange or reddish tints..... c
- c. Peridium thick, rough, white or tinged with lilaceous above; pulvinate on a broad base to plasmodiocarpous..... [D. indicum \(316\)](#)
- c. Peridium thin, smooth or nearly so, fragile, shining; sporangiate..... d
  - d. Grayish white to pearl gray, subglobose on a restricted base..... [D. cinereum \(307\)](#)
  - d. Flesh colored to white; short-stalked to sessile on a constricted base; peridium usually double..... [D. montanum \(319\)](#)
- e. Sporangiate, sessile, rarely with a constricted stem-like base, varying to subplasmodiocarpous or broadly expanded..... f
- e. Sporangiate, stalked, or, if sessile, usually associated with stalked sporangia..... t
  - f. Sporangia subglobose to pulvinate, usually closely aggregated or densely massed on and sometimes more or less immersed in a conspicuous white or pale ochraceous hypothallus, which is sometimes reduced or almost lacking..... g
  - f. Sporangia not massed on a conspicuous pale hypothallus; sporangiate to plasmodiocarpous, often depressed and expanded..... m
- g. Sporangia densely clustered, often massed and superimposed, tending to be more or less immersed in hypothallus..... h
- g. Sporangia aggregated or gregarious, never immersed in hypothallus..... j
  - h. Hypothallus profuse; sporangia deeply imbedded, the outer peridium chalky, rough, usually closely attached to the dull inner peridium; columella subglobose to pulvinate, usually ochraceous; spores pale, minutely warted, mostly 8-11  $\mu\text{m}$  ..... [D. spumarioides \(327\)](#)
  - h. Hypothallus profuse to scanty; sporangia not deeply imbedded, sometimes superficial, the outer peridium smooth, crustose, the inner peridium free, often distant; spores dark, strongly marked..... i
- i. Spores dark, strongly warted or spinose, sometimes subreticulate, mostly 12-15  $\mu\text{m}$ ; inner peridium iridescent blue, distant; sporangia often superimposed..... [D. crustaceum \(309\)](#)

- i. Spores moderately dark, distinctly but sparsely warted, mostly 9-10  $\mu\text{m}$ ; inner peridium gray, slightly iridescent; sporangia usually in a single plane, sometimes only aggregated..... [D. globosum \(314\)](#)
- j. Sporangia large, 1-1.5 mm in diameter, subglobose, not depressed; spores dark, prominently spiny to subreticulate, 14-17  $\mu\text{m}$  ..... [Sessile forms of D. lyallii \(318\)](#)  
    [currently considered *Diderma fallax* (Rostaf.) E. Sheld.]
- j. Sporangia smaller, rarely exceeding 1 mm, often depressed; spores smaller..... k
- k. Spores more or less reticulate, 10-12  $\mu\text{m}$ , columella white..... [D. subdictyospermum \(328\)](#)
- k. Spores not reticulate; columella ochraceous to brown..... l
- l. Sporangia pulvinate to subplasmodiocarpous; dehiscence irregular; columella depressed-pulvinate, ochraceous to brown; spores spinulose, 11-12  $\mu\text{m}$  ..... [D. alpinum \(304\)](#)
- l. Sporangia patelliform; dehiscence by a preformed lid; columella globose to hemispherical, brown; spores punctate, 7-10  $\mu\text{m}$  ..... [D. mussooriense \(320\)](#)
- m. Fructifications depressed, sporangiate and pulvinate varying to plasmodiocarpous or pseudoaethalioid..... n
- m. Fructifications not as a rule notably depressed..... q
- n. Outer peridium smooth, polished, porcelain-like; sporangia flat-pulvinate, lilaceous to pinkish, fading to white..... [D. testaceum \(329\)](#)
- n. Outer peridium not porcelain-like..... o
- o. Sporangiate, sessile, pulvinate to depressed-pulvinate, varying to plasmodiocarpous, but not reticulate nor broadly effused; capillitium coarse; spores 12-13  $\mu\text{m}$  ..... [D. chondrioderma \(306\)](#)
- o. Sporangiate, then strongly flattened, varying to plasmodiocarpous, often closely appressed and widely effused; capillitium delicate..... p
- p. Sporangia usually distinct, but often closely appressed and forming a reticulate pattern, varying to broadly effused; spores 7-9  $\mu\text{m}$  ..... [D. effusum \(312\)](#)
- p. Always plasmodiocarpous, very thin; spores 10-11  $\mu\text{m}$  (6-7  $\mu\text{m}$ . in var. *berkeleyanum*)..... [D. platycarpum](#)  
    [currently considered *Diderma saundersii* (Berk. & Broome ex Masee) E. Sheld.]
- q. Sporangiate, subglobose, sessile or short-stalked; outer peridium smooth, appearing cartilaginous but composed of closely aggregated lime granules; columella clavate, pale purplish to purplish red..... [D. cor-rubrum \(308\)](#)

- q. Sporangiate to plasmodiocarpous; columella not purplish..... r
  - r. Pulvinate to annulate or plasmodiocarpous; columella reduced to a thickened orange base; sporangia white to pale cream-colored or lilaceous..... [D. deplanatum \(311\)](#)
  - r. Subglobose on a restricted base to hemisphaerical; columella well-developed ..... s
- s. Sporangia white to pale pinkish buff; spores under 12  $\mu\text{m}$ ..... [D. niveum \(321\)](#)
- s. Sporangia flesh-colored to dark pinkish brown; spores 13-15  $\mu\text{m}$  ..... *D. subincarnatum*
  - t. Sporangia white, flattened, discoid, umbilicate below; stalk stout, furrowed, white to brown, rarely lacking ..... [D. hemisphaericum \(315\)](#)
  - t. Sporangia subglobose to ovate, not umbilicate ..... u
- u. White or pinkish, always stalked; hypothallus not prominent; spores 8-10  $\mu\text{m}$  ..... *D. montanum*
  - u. Dull white or flesh-colored; stalks sometimes short, frequently lacking: hypothallus usually prominent; spores 14-17  $\mu\text{m}$  ..... [D. lyallii \(318\)](#)  
[currently considered *Diderma fallax* (Rostaf.) E. Sheld.]

Subgenus Leangium

- a. Peridium of three layers, a middle calcareous layer firmly united with outer cartilaginous wall; inner wall usually free..... b
- a. Peridium without a middle calcareous layer..... c
  - b. Middle calcareous layer of closely compacted crystalline lime nodules..... [D. trevelyani \(330\)](#)  
[currently considered *Lepidoderma trevelyanii* (Grev.) Poulain & Mar.Mey.]
  - b. Middle calcareous layer not crystalline..... [D. asteroides \(305\)](#)
- c. Peridium single or appearing so..... d
- c. Peridium clearly double..... f
  - d. Stalked, globose, white or pallid above, rarely sessile; peridium reticulately rugose, breaking up into preformed platelets; columella prominent..... [D. rugosum \(325\)](#)
  - d. Sessile or with very short stalks; distinctly colored; peridium not breaking up into preformed platelets; columella pulvinate or lacking..... e

- e. Dull gray; subglobose or depressed, sessile on a restricted base or with very short stalk and then umbilicate..... *D. imperialis*
- e. Bright yellow-brown; pulvinate on a broad base..... [D. darjeelingense \(310\)](#)
  - f. Sessile or with a short, thick stem..... g
  - f. Usually stalked, rarely sessile..... i
- g. Dark reddish brown; spores dark, encircled by a pale band..... *D. antarcticum*
- g. Olivaceous, ochraceous or white; spores not encircled by a pale band..... h
  - h. Dark ochraceous to olivaceous, wrinkled; capillitium purplish; spores pale, 9-11  $\mu\text{m}$  ..... [D. ochraceum \(322\)](#)
  - h. Pale ochraceous to white; capillitium pale or colorless; spores dark, 12-13  $\mu\text{m}$  ..... *D. sauteri*
- i. Sporangia discoid, red-brown with pale lines marking areas of dehiscence into plate-like fragments..... [D. roanense \(324\)](#)
- i. Sporangia globose or pyriform; dehiscence stellate..... j
  - j. Orange or vermilion; spores spinulose, 13-15  $\mu\text{m}$  ..... [D. lucidum \(317\)](#)
  - j. Gray to reddish brown; spores not exceeding 12  $\mu\text{m}$  ..... k
- k. Sporangia mottled; dehiscence stellate to base..... [D. radiatum \(323\)](#)
- k. Sporangia not mottled; upper part of peridium dehiscence in stellate lobes, the lower part tending to persist as a cup..... [D. floriforme \(313\)](#)

## Genus *Didymium*

- a. Peridial wall cartilaginous, brown glossy, more or less covered with lime crystals, resembling *Lepidoderma*, but crystals not united into scales..... [Subgenus Lepidodermopsis](#)
- a. Peridial wall membranous, more or less covered with lime crystals, these loosely scattered or united into a limy crust ..... [Subgenus Didymium](#)

Subgenus *Lepidodermopsis*

With a single species ..... [D. leoninum \(344\)](#)

## Subgenus Didymium

- a. Lime crystals agglutinated to form a firm, often smooth, shell-like outer crust ..... [KEY I](#)
- a. Lime crystals loosely scattered on surface of peridium or, if somewhat compacted, with rough surface layer readily crumbling ..... [KEY II](#)

### KEY I

- a. Sporangiate, pulvinate, sessile or with a short, thick stalk; columella large, dome-like, the peridium attached to its margin..... [D. vaccinum \(357\)](#)
- a. Sessile to plasmodiocarpous, often effused; columella not large nor bearing peridium at its margin, often inconspicuous or lacking..... b
  - b. Spores minutely warted or nearly smooth.....c
  - b. Spores coarsely warted, the warts often arranged in a subreticulate pattern..... d
- c. Pulvinate to thin and broadly effused; capillitium often rigid, the threads joined by prominent transverse bars; spores 9-11  $\mu\text{m}$  ..... [D. listeri \(345\)](#)
- c. Pulvinate to plasmodiocarpous; capillitium not notably rigid; spores 11-14  $\mu\text{m}$  ..... [D. difforme \(336\)](#)
  - d. Large, 0.4-1 mm in diameter; spores 13-14  $\mu\text{m}$  ..... [D. quitense \(352\)](#)
  - d. Usually small, 0.1-0.6 mm in diameter; spores 9-10  $\mu\text{m}$  ..... [D. trachysporum \(356\)](#)

### KEY II

- a. Primarily sessile or plasmodiocarpous; stalks, if present, short and weak..... b
- a. Primarily sporangiate and stalked; when associated with sessile or plasmodiocarpous fruitings, stalked sporangia usually present..... k
  - b. Capillitial threads marked by spiral bands; lime often only partly crystalline..... [D. decipiens \(335\)](#)
  - b. Capillitial threads not spirally banded; lime usually entirely crystalline..... c

- c. Fructification ochraceous to brown..... d
- c. Fructification gray or while (occasionally stained brownish by substratum)..... e
  - d. Yellowish brown to tawny; spores dark, tuberculate, often subreticulate, 12-14  $\mu\text{m}$  ..... [D. fulvum \(341\)](#)  
[currently considered *Didymium obducens* P.Karst.]
  - d. Pale ochraceous to ochraceous brown; spores pale, nearly smooth, 7-8  $\mu\text{m}$  ..... [D. ochroideum \(349\)](#)
- e. With prominent vesicles intermixed with spores and capillitium..... f
- e. Vesicles not present..... g
  - f. Plasmodiocarpous, branched and anastomosing, more or less flattened laterally; columella wall-like; vesicles pale grayish brown, free from capillitium..... [D. flexuosum \(339\)](#)
  - f. Plasmodiocarpous, broadly effused, depressed, thin, without columella; vesicles yellow, attached to capillitium..... [D. serpula \(353\)](#)
- g. White or pale gray, broadly effused, depressed, thin, with numerous limy trabeculae connecting base and peridium; capillitium dark, often scanty or lacking..... [D. sturgisii \(355\)](#)
- g. Trabeculae lacking; capillitium usually abundant..... h
  - h. Dark gray; plasmodiocarp intricately labyrinthiform, the strands often flattened and fused into a nearly continuous perforated layer..... [D. perforatum \(351\)](#)
  - h. White or, when lime is scanty, gray, dingy or metallic; sporangiate to plasmodiocarpous, but never intricately labyrinthiform..... i
- i. Sporangiate, sessile or on weak stalk-like extensions of hypothallus, often densely aggregated and covered by a common, fragile, limy crust; spores dark, minutely warted, 10-14  $\mu\text{m}$ ..... [D. crustaceum \(334\)](#)
- i. Sporangiate or plasmodiocarpous, rarely stalked; never densely aggregated and covered by a common limy crust..... j
  - j. Sporangiate, sessile on a restricted base, varying to plasmodiocarpous, often more or less annulate; capillitium slightly elastic; spores not dark, minutely warted, 7.5-11  $\mu\text{m}$  ..... [D. anellus \(332\)](#)
  - j. Sessile on a broad base, pulvinate or often widely effused; capillitium strongly elastic; spores dark, prominently warted, 10-15  $\mu\text{m}$  ..... [D. dubium \(337\)](#)

- k. Stalks calcareous..... l
- k. Stalks not calcareous, sometimes lightly sprinkled on surface with lime..... p
  - l. Stalks, when present, not morphologically distinct from branches of limy hypothallus; sporangia often densely clustered and covered by a common limy crust..... [D. crustaceum \(334\)](#)
  - l. Stalks, when present, morphologically distinct from hypothallus; sporangia, when grouped, not covered by a common limy crust..... m
- m. Stalks ochraceous, slender, smooth, packed internally with lime; peridium floccose, breaking up into scaly flakes; spores dark, densely verrucose to subreticulate, 8-10  $\mu\text{m}$ ..... [D. floccosum \(340\)](#)
- m. Stalks white or pallid; peridium not breaking up into scales..... n
  - n. Hypothallus prominent, branched, giving rise to clusters of deeply umbilicate sporangia with morphologically distinct stalks; lime duplex, of stellate crystals on peridium, coarse rhomboid crystals in stalk, spores spiny, subreticulate, 10-12  $\mu\text{m}$  ..... [D. intermedium \(342\)](#)
  - n. Hypothallus not producing branches; stalks usually stout and fluted; sporangia often sessile or nearly so ..... o
- o. Sporangial wall appearing double, the outer limy crust remote from inner membranous wall; stalks short, never half total height, often lacking; spores spinulose, bearing one or more ridges sometimes forming a very lax reticulum, 10-12  $\mu\text{m}$  ..... *D. karstensis*
- o. Sporangial wall not appearing double, the limy coat borne on peridium; stalks commonly present, attaining two-thirds of total height, but often short or lacking; spores minutely warted, 8-11  $\mu\text{m}$  ..... [D. squamulosum \(354\)](#)
- p. Stalks dark, opaque, often somewhat translucent above..... q
- p. Stalks pale, yellowish to brownish orange, translucent throughout.....v
- q. Sporangia flattened, discoid, erect, often umbilicate above; spores pale, nearly smooth, 6-7  $\mu\text{m}$  ..... [D. clavus \(333\)](#)
- q. Sporangia globose or subglobose but varying from prolate to oblate, or, if discoid, so deeply umbilicate and incurved as to appear globose; spores darker and larger, distinctly warted or spiny..... r
  - r. Sporangia deeply umbilicate below, discoid but so strongly reflexed as to appear globose; stalks opaque, more or less immersed in umbilicus..... s
  - r. Sporangia globose or subglobose, only slightly umbilicate below; stalks dark,



- especially below, often paler and translucent above..... t
- s. Spores violaceous brown, densely warted, 8-11  $\mu\text{m}$  ..... [D. minus \(347\)](#)
- s. Spores dark purplish brown, strongly warted or spinulose, 10-14  $\mu\text{m}$ ..... [D. melanospermum \(346\)](#)
- t. Columella and peridium dark..... [D. nigripes \(348\)](#)
- t. Columella pale, orange to white; peridium pale or colorless..... u
- u. Sporangia globose or slightly prolate, erect; columella yellow, stalked; spores pale, minutely warted..... [D. ovoideum \(350\)](#)  
[currently considered *Didymium proximum* Berk. & M.A.Curtis]
- u. Sporangia globose to flattened or lobed..... v
- v. Sporangia usually ochraceous to fawn, sometimes white, globose to saddle-shaped or lobed, usually erect, columella prominent, stalked, conspicuously roughened or spiny..... [D. megalosporum \(338\)](#)
- Sporangia white or appearing gray when lime is scanty, globose or if discoid, then appearing globose, usually nodding; columella white, not notably rough and never spiny..... w
- w. Spores dark, strongly warted, with notably clustered warts..... [D. verrucosporum \(358\)](#)
- w. Spores moderately dark to pale, minutely warted, without conspicuous clusters of warts.....x
- x. Stalk long, slender, three-fourths or more of total height; capillitium delicate, pale..... [D. iridis \(343\)](#)
- x. Stalk short, rarely half total height, usually much less or lacking; capillitium coarse and, at least in part, dark..... y
- y. Stalk golden yellow; capillitium dark, firm, forming a close-meshed, persistent, more or less globose reticulum, with many free, spiny tips..... [D. aurantipes](#)  
[currently considered *Didymium laxifilum* G.Lister & J.Ross]
- y. Stalk pale, dull yellow; capillitium moderately dark, the threads lax, with few anastomoses, paler toward tips, where most are attached to the peridium..... [D. laxifila \(364\)](#)

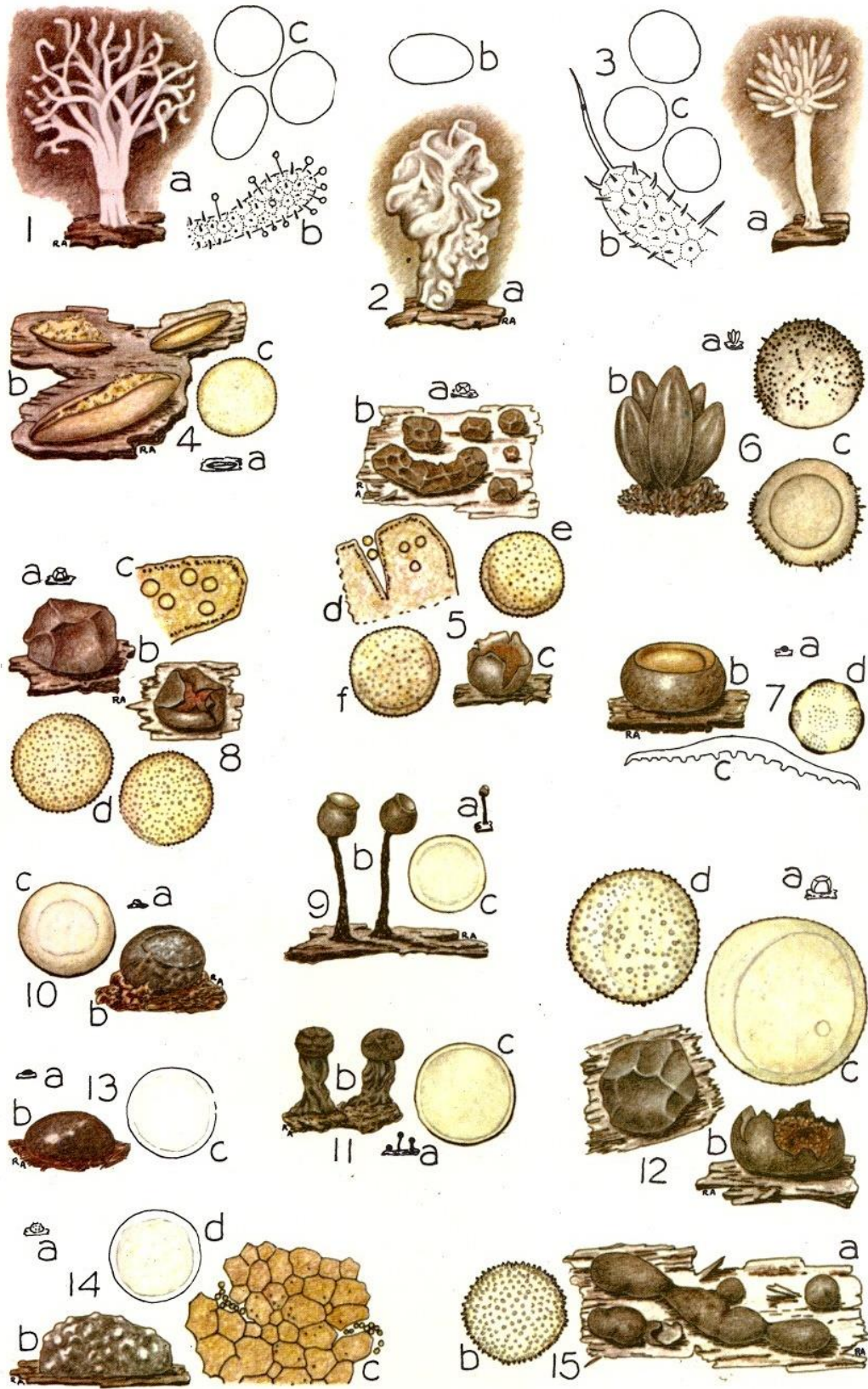
## Genus *Lepidoderma*

- a. Sporangiate, usually stipitate, rarely sessile, the stalk bright orange-brown; wall cartilaginous,

- bearing relatively few large scales..... [L. tigrinum \(362\)](#)
- a. Sporangiate to plasmodiocarpous, rarely stipitate, the stalk, when present, never bright orange-brown; wall cartilaginous to membranous, usually bearing numerous medium sized to small scales..... b
- b. Capillitium pale yellow-brown, the threads coarse, flattened, fanning a net expanding at the nodes, which frequently become vesicular and enclose clusters of lime crystals; spores 15-20  $\mu\text{m}$  ..... [L. granuliferum \(361\)](#)
- b. Capillitium dark, not notably net-like nor bearing vesicular enlargements which may enclose lime crystals; spores rarely over 15  $\mu\text{m}$  ..... c
- c. Primarily plasmodiocarpous, less commonly sporangiate and then sometimes with a short, thick, dark stalk; peridium white to brownish gray, subcartilaginous to membranous; spores 13-15  $\mu\text{m}$  ..... [L. carestianum \(359\)](#)
- c. Primarily sporangiate, the sporangia sometimes elongated and subplasmodiocarpous; rarely stalked..... d
- d. Dull gray or drab; peridium subcartilaginous, bearing small, white, limy scales; stalk, when present, dark, weak..... [L. chailletii \(360\)](#)
- d. Flesh-colored to cinnamon-brown; peridium tough, membranous, bearing an outer layer of minute vinaceous scales united into a crust; stalk, when present, hyaline, concolorous..... [L. crustaceum](#)

# Plates

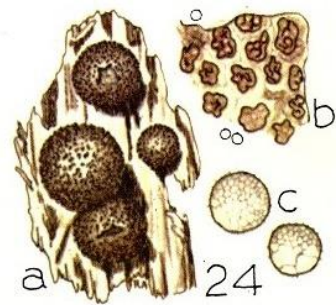
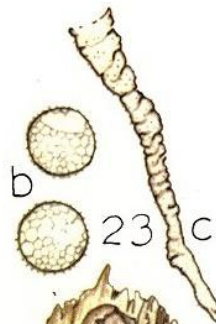
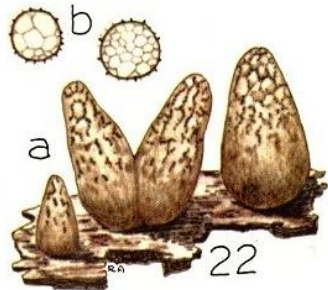
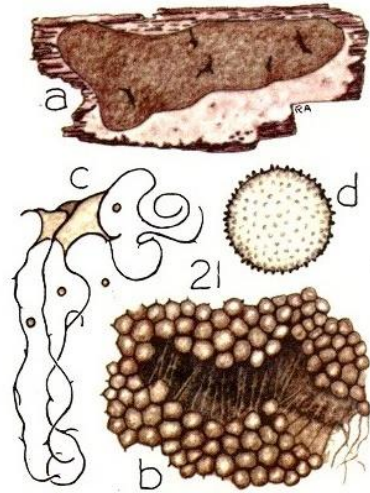
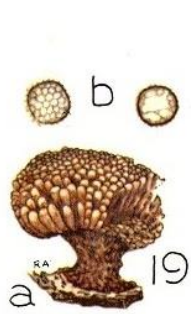
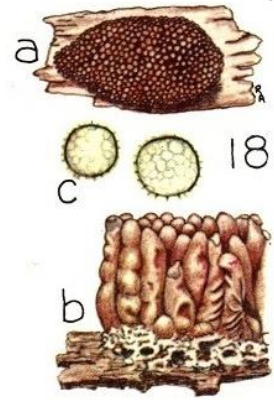
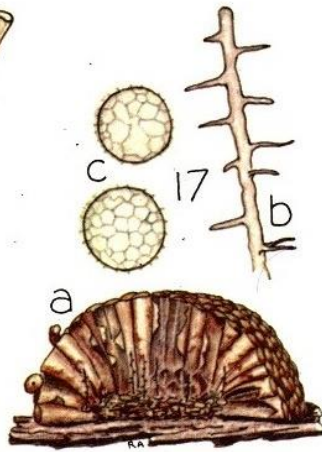
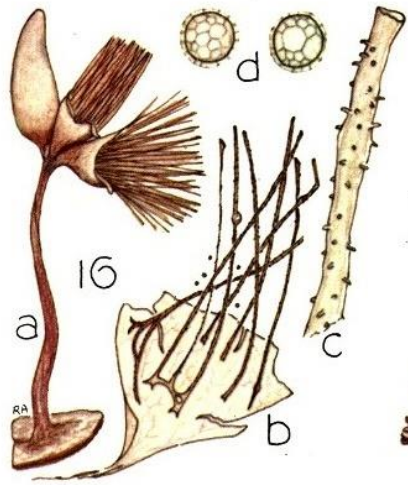
Plate 1



## Plate 1 Captions

1. *Ceratiomyxa fruticulosa* (Miill.) Macbr. a Stalked sporophore, from large group, X20; b Tip of branch, X100; c. Spore, X1000
2. *Ceratiomyxa morchella* Welden. a. Fructification, X15; b Spore, X1000
3. *Ceratiomyxa sphaerosperma* Boedijn. a. Fructification, X15; b Tip of branch, after Boedijn, X100; c. Spore, X1000.
4. *Licea biforis* Morgan. a Sporangium, X5; b Cluster of three sporangia, X50; c. Spore, X1000
5. *Licea castanea* G. Lister. a Sporangium, X5; b. Cluster of sporangia, X20; c. Open sporangium, X40; d. Sporangial lobes, X 100; e/f Spores, X1000
6. *Licea fimicola* Dearn. & Bisby. a. Cluster of sporangia, X5; b. Cluster of sporangia, X50; c. Spores, X1000
7. *Licea kleistobolus* Martin. a Sporangium, X5 b; Sporangium, X100 c. Diagram of lid in section, X300; d. Spore, X1000
8. *Licea minima* Fries. a. Sporangium, X5; b. Two sporangia, X40; c. Spores. X1000
9. *Licea operculata* (Wingate) Martin. a. Sporangium, X10; b. Two sporangia, X25; c. Spore, X1000
10. *Licea parasitica* (Zukal) Martin. a. Sporangium, X5; b. Sporangium, X50; c. Spore, X1000
11. *Licea pedicellata* (H. C. Gilbert) H. C. Gilbert. a. Sporangium, X5; b. Two sporangia, X50; c. Spore; X1000
12. *Licea pusilla* Schrad. a. Sporangium, X5; b. Two sporangia, X25; c. Spore in optical section, X1000; d. Spore from different fruiting, surface view, X1000
13. *Licea tenera* Jahn. a. Sporangium, X5; b. Sporangium, X50; c. Spore, X1000
14. *Licea tuberculata* Martin. a. Sporangium, X5; b. Sporangium, X50; c. Portion of wall, by transmitted light, flattened and showing plates, X250; d Spore, X1000
15. *Licea variabilis* Schrad. a. Sporangia and plasmodiocarp formed by union of sporangia, X5; b. Spore. X1000

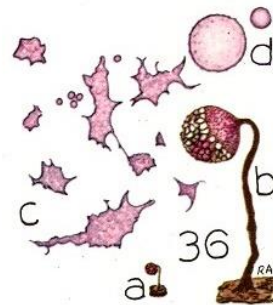
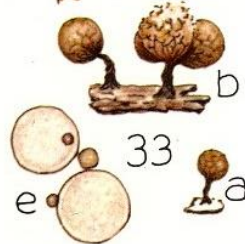
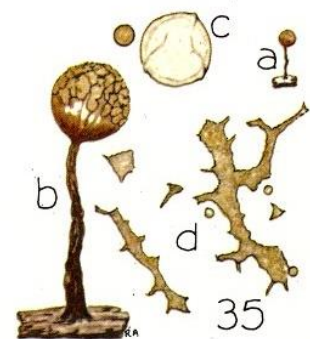
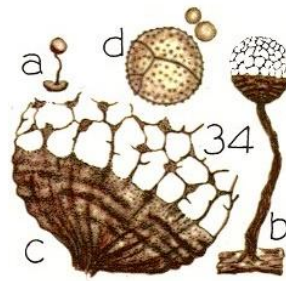
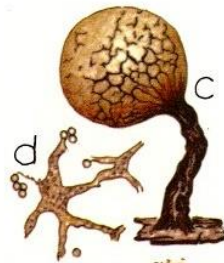
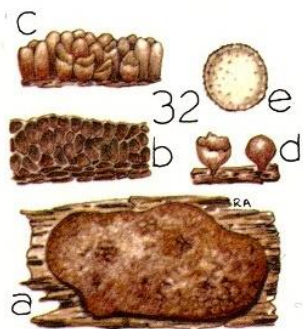
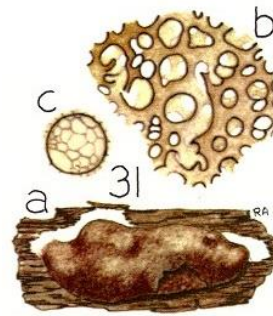
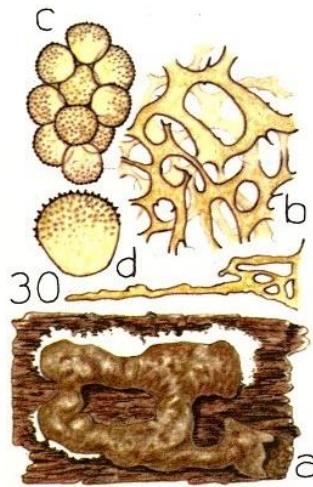
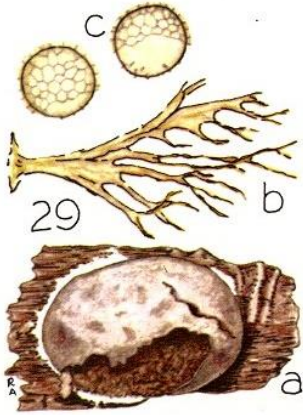
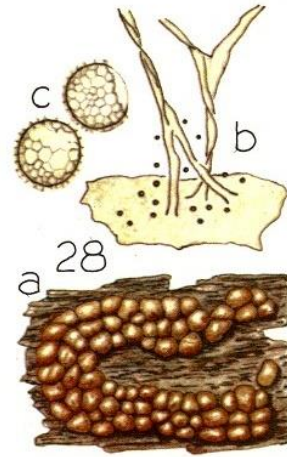
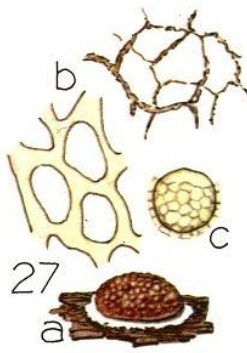
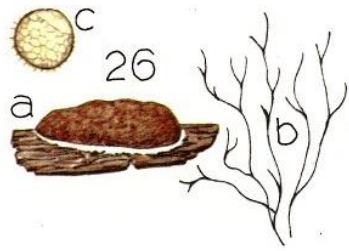
Plate 2



## Plate 2 Captions

16. *Tubifera bombardata* (Berk. & Br.) Martin. a. Three sporangia on common stalk, X10; b. Detail of capillitium, showing attachment stalk, X25; c. Enlarged thread of capillitium, X500; d. Spores, X1000
17. *Tubifera casparyi* (Rost.) Macbr. a. Pseudoaethalium, in section, X5; b. Columella with branches, X50; c. Spores, X1000
18. *Tubifera ferruginosa* (Batsch) J.F. Gmel. a. Pseudoaethalium, X1; b. Portion in section, X10; c. Spores, X1000
19. *Tubifera microsperma* (Berk. & Curt.) Martin. a. Pseudoaethalium, X2; b. Spores, X1000
20. *Tubifera papillata* Martin, Thind and Sohi. a. Clustered sporangia on stalk, X4; b. Spores. X1000
21. *Dictydiaethalium plumbeum* (Schum) Rost. a. Pseudoaethalium, X1; b. Detail, showing caps and threads, X2; c. Detail of cap with attached threads, X50; d. Spore, X1000
22. *Lycogala conicum* Pers. a. Four aethalia, X10; b. Spores, X1000
23. *Lycogala epidendrum* (L.) Fries. a. Cluster of aethalia, X1; b. Spores, X1000; c. Thread of pseudocapillitium, X100
24. *Lycogala exiguum* Morgan. a. Cluster of aethalia, X3; b. Detail of peridium, X200; c. Spores, X1000
25. *Lycogala flavofuscum* (Ehrenb.) Host. a. Pseudoaethalium, X1; b. Detail of pseudocapillitium, X100; c. Spores. X1000

Plate 3





### Plate 3 Captions

26. *Reticularia intermedia* Nann.-Brem. a. Aethalium, x1; b. Pseudocapillitium, X2.5; c. Spore, X1000

27. *Reticularia jurana* Meylan. a. Aethalium, X1/2; b. Pseudocapillitium, basal portion at left, outer portion at right, X50; c. Spore, X1000

28. *Reticularia lobata* A. Lister. a. Cluster of aethalia, X2; b. Portion of peridium with attached capillitium, X50; c. Spore, X1000

29. *Reticularia lycoperdon* Bull. a. Aethalium, X1/2 b Pseudocapillitium, X3; c. Spores, X1000

30. *Reticularia olivacea* (Ehrenb.) Fries. a. Aethalium, X2; b. Pseudocapillitium, X75; c. Cluster of spores, X500; d. Isolated spore, X1000

31. *Reticularia splendens* Morgan. a. Aethalium, X1; b. Pseudocapillitium, X25; c. Spore. X1000

32. *Lindbladia tubulina* Fries. a. Pseudoaethalium, X1/2; b. Section through pseudoaethalium with sporangium superimposed, X5; c. Group of massed sporangia, X5; d. Two isolated, stipitate sporangia, X5; e. Spore, with dictydine granules, X1000

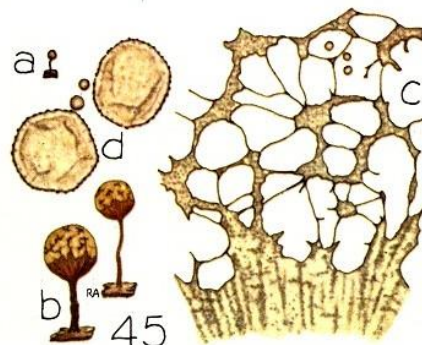
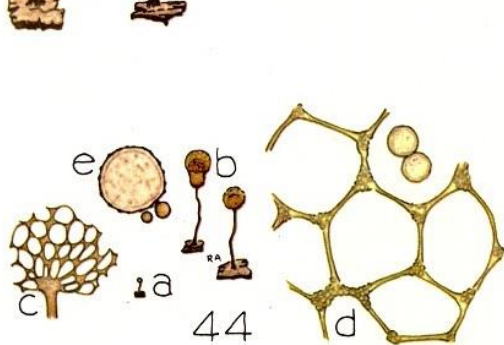
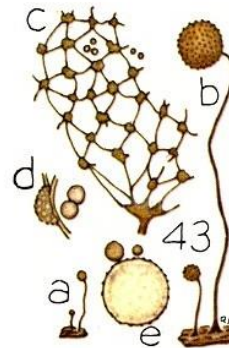
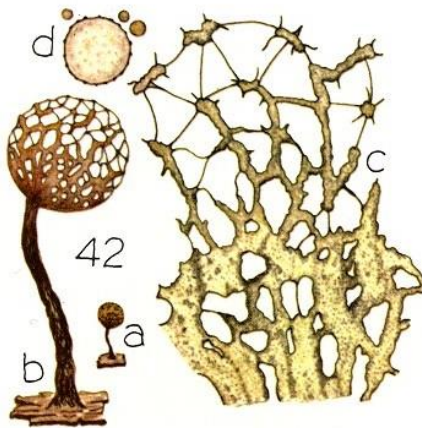
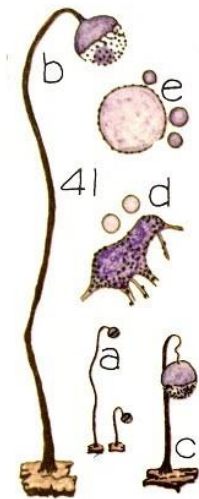
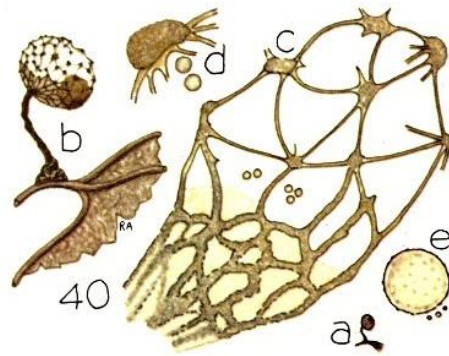
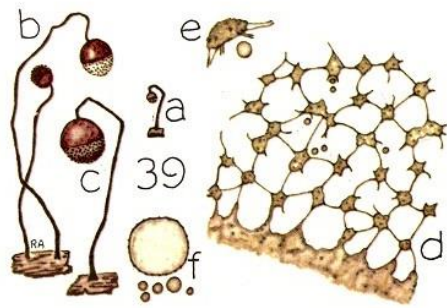
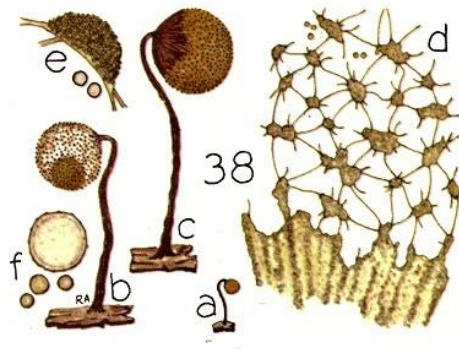
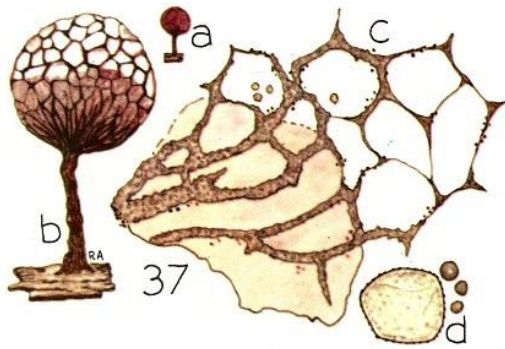
33. *Cribraria argillacea* (Pers.) Pers. a. Sporangium, X3; b. Group of sporangia, X5; c. Sporangium, X15; d. Detail of surface net, with spores, X100; e. Spores, with dictydine granules, X1000

34. *Cribraria atrofusca* Martin & Lovejoy. a. Sporangium, X3; b. Same, X15; c. Detail of cup and net, X50; d. Spore and dictydine granules, X1000

35. *Cribraria dictyospora* Martin & Lovejoy. a. Sporangium, X3; b. Same, X15; c. Spore and dictydine granule, X1000; d. Portion of surface net, with spores, X100

36. *Cribraria elegans* Berk. & Curt. a. Sporangium, X3; b. Same, X15; c. Detail of net, with spores, X100; d. Spore and dictydine granule. X1000

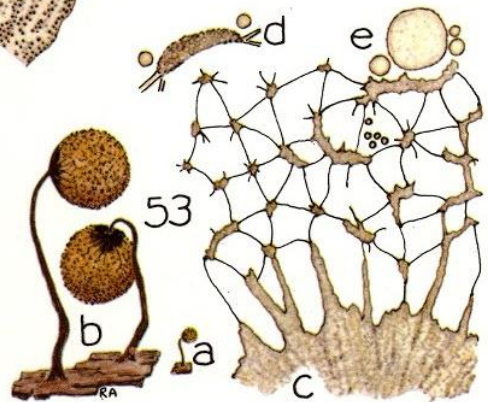
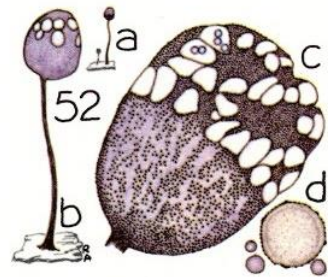
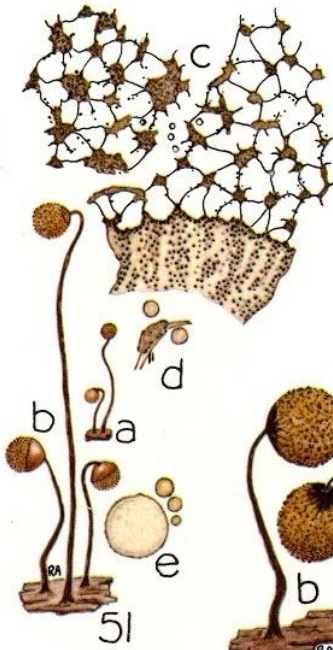
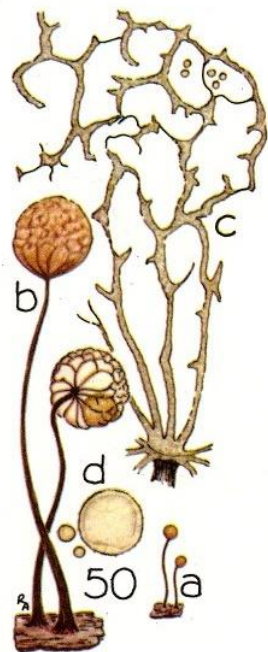
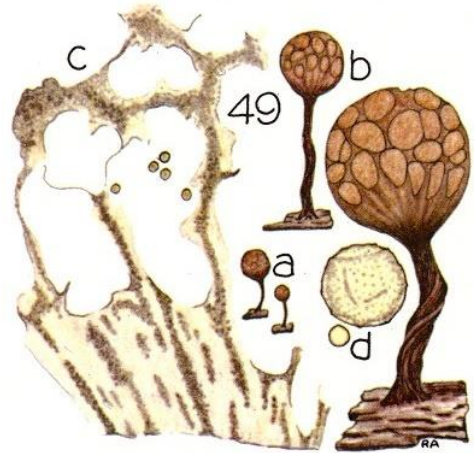
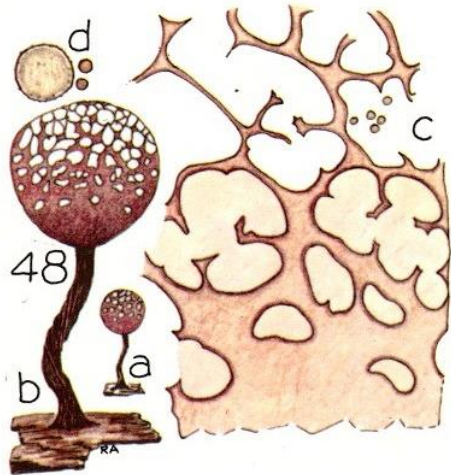
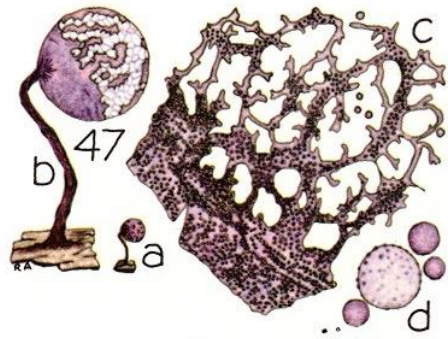
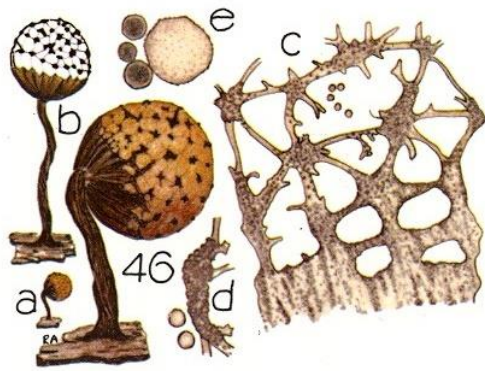
Plate 4



## Plate 4 Captions

37. *Cribraria ferruginea* Meylan. a. Sporangium, X3; b. Same, X15; c. Detail of cup and net, with spores, X100; d. Spore and dictydine granules, X1000
38. *Cribraria intricata* Schrad. a. Sporangium, X3; b. Same, with rudimentary cup, X15; c. Same, with developed cup, X15; d. Detail of cup and net, with spores, X100; e. Node, X250; f. Spore and dictydine granules, X1000
39. *Cribraria languescens* Rex. a. Sporangium, X3; b/c Three sporangia, X15; d. Margin of cup and net, with spores, X100; e. Node, with spore, X250; f. Spore and dictydine granules, X1000
40. *Cribraria laxa* Hagelst. a. Sporangium, X3; b. Same, X15; c. Net, with spores, X100; d. Node, with spore, X250; e. Spore and dictydine granules, X1000
41. *Cribraria lepida* Meylan. a. Two sporangia, X3; b/c. Two sporangia, X10; d. Node, with spores, X250; e. Spore and dictydine granules, X1000
42. *Cribraria macrocarpa* Schrad. a. Sporangium, X3; b. Same, X15; c. Detail of net, with spores, X100; d. Spore and dictydine granules, X1000
43. *Cribraria microcarpa* (Schrad.) Pers. a. Two sporangia, X3; b. Same, X15; c. Detail of net, with spores, X100; d. Node, with spores, X250; e. Spore and dictydine granules, X1000
44. *Cribraria minutissima* Schw. a. Sporangium, X3; b. Two sporangia, X15; c. Net, with spores, X100; d. Detail of net, with spores, X500; e. Spore and dictydine granules, X1000
45. *Cribraria oregana* H. C. Gilbert. a. Sporangia, X3; b Two sporangia, X15; c. Detail showing margin of cup and net spores, X100; d. Spores and dictydine granules. X1000

Plate 5



## Plate 5 Captions

46. *Cribraria piriformis* Schrad. a. Sporangium, X3; b. Two sporangia, the larger containing spores, X15; c. Detail of net, X100; d. Node, X250; e. Spore and dictydine granules, X1000

47. *Cribraria purpurea* Schrad. a. Sporangium, X3; b. Same, X15; c. Detail of net, X100; d. Spore and dictydine granules, X1000

48. *Cribraria rubiginosa* Fries. a. Sporangium, X3; b. Same, X10; c. Detail of net, X100; d. Spore and dictydine granules, X1000

49. *Cribraria rufa* (Roth) Host. a. Two sporangia, X3; b. Same, X15; c. Detail of net, X100; d. Spore and dictydine granule, X1000

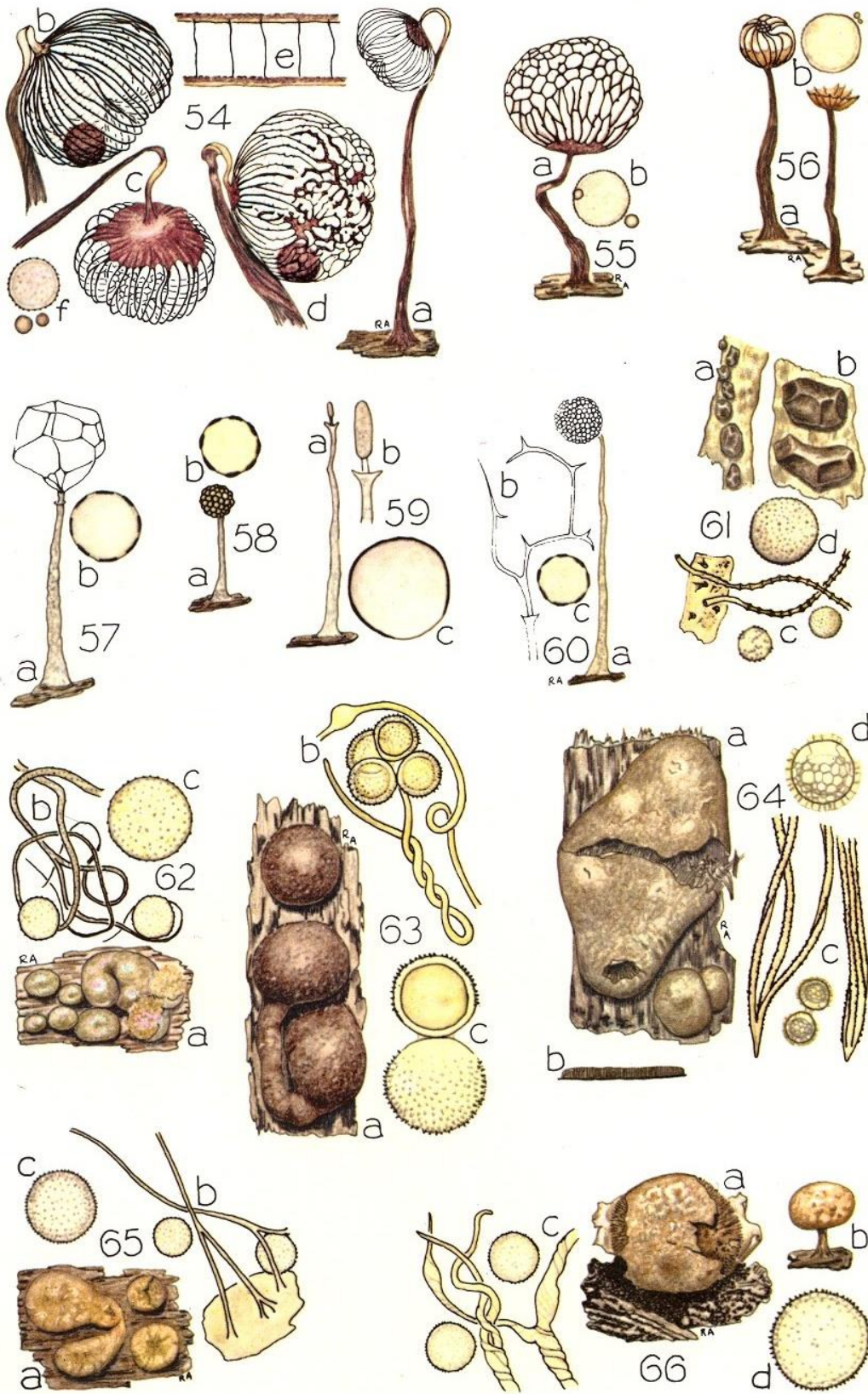
50. *Cribraria splendens* (Schrad.) Pers. a. Two sporangia, X3; b. Same, X15; c. Apex of stipe and net, X100; d. Spore and dictydine granules, X1000.

51. *Cribraria tenella* Schrad. a. Two sporangia, X3; b. Three sporangia, showing variation in stalks and cups, X10; c. Margin of cup with net attached, and portion of net from another sporangium, X100; d. Node, X250; e. Spore and dictydine granules, X1000

52. *Cribraria violacea* Rex. a. Two sporangia, showing variation in size X3; b. Sporangium, X25; c. Sporangium, X100; d. Spore and dictydine granules, X1000

53. *Cribraria aurantiaca* Schrad. a. Sporangium, X3; b. Two sporangia, X15; c. Margin of cup and net, X100; d. Node, X250; e. Spore and dictydine granules, X1000

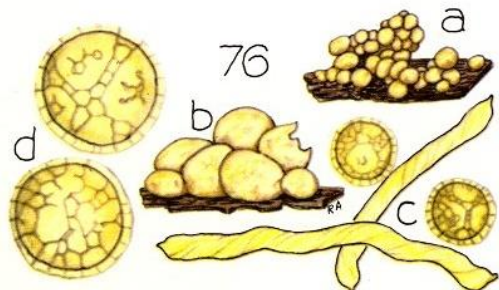
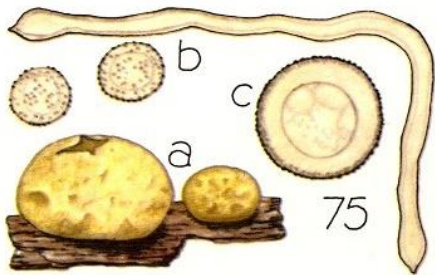
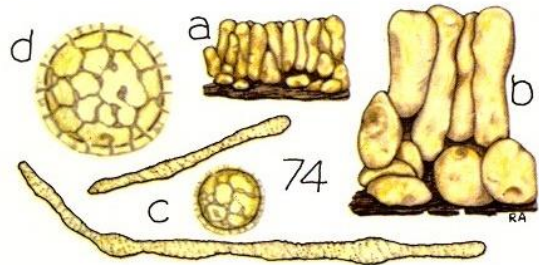
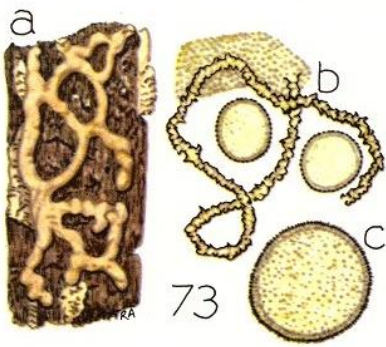
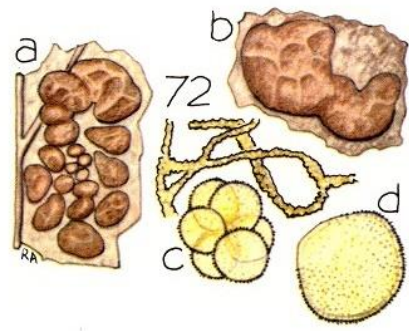
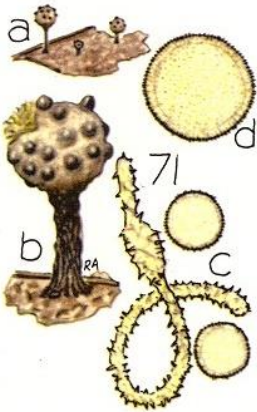
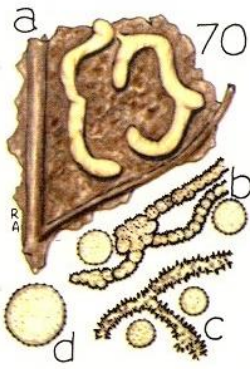
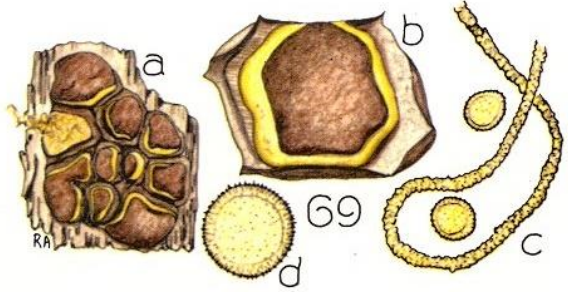
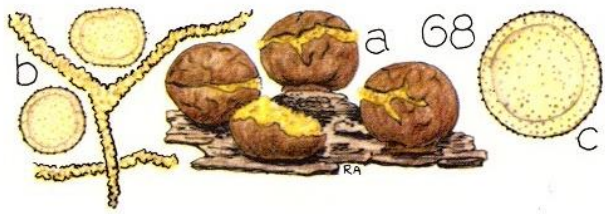
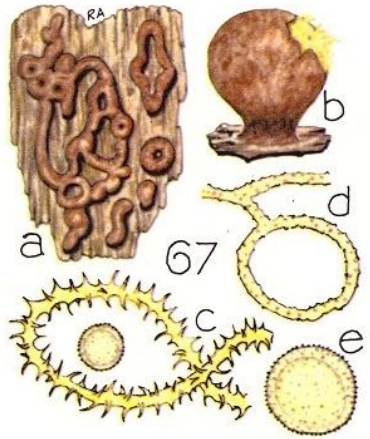
Plate 6



## Plate 6 Captions

54. *Dictydium cancellatum* (Batsch) Macbr. a. Sporangium, X20; b. Same, without cup, X40; c. Same, with cup, X40; d. Same, with cribrarioid net above, X4; e. Detail of net, X250; f. Spore and dictydine granules, X1000
55. *Dictydium mirabile* (Rest) Meylan. a. Sporangium, X20; b. Spore and dictydine granule, X1000
56. *Dictydium rutilum* C. Lister. a. Two sporangia, X20; b. Spore and dictydine granules, X1000
57. *Echinostelium cribrarioides* Alexop. a. Sporangium with net only, X100; b. Spore, X1000
58. *Echinostelium elachiston* Alexop. a. Sporangium with spores clustered at stalk, X100; b. Spore, X1000
59. *Echinostelium fragile* Nann.-Brem. a. Stalk with basal disk and columella, b. Tip of same, enlarged, X500; c. Spore, X1000
60. *Echinostelium minutum* de Bary. a. Sporangium with spores clustered at tip; X100; b. Capillitium, X250; c. Spore, X1000
61. *Listerella paradoxa* Jahn. a. Cluster of sporangia, X10; b. Two sporangia, X50; c. Capillitium, peridial lobe and spores, X500; d. Spore, X1000
62. *Calomyxa metallica* (Berk) Nieuwl. a. Cluster of fructifications, X10; b. Detail of capillitium, and spores, X50; c. Spore, X1000
63. *Dianema corticatum* A. Lister. a. Sporangium and plasmodiocarp, X10; b. Detail of capillitium, and spores, X500; c. Spore, X1000
64. *Dianema depressa* (A. Lister) A. Lister. a. Sporangia and plasmodiocarp, X5; b. Section through plasmodiocarp, X5; c. Detail of capillitium, and spores, X500; d. Spore, X1000
65. *Dianema harveyi* Rex. a. Sporangia and plasmodiocarp, X5; b. Detail of capillitium, showing attachment to peridium, and spores, X5; d. Spore, X1000
66. *Prototrichia metallica* (Berk) Masee. a. Sporangium, X10; b. Small stalked sporangium, X10; c. Detail of capillitium, and spores, X500; d. Spore. X1000

Plate 7

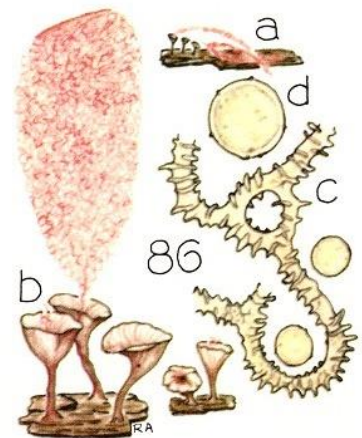
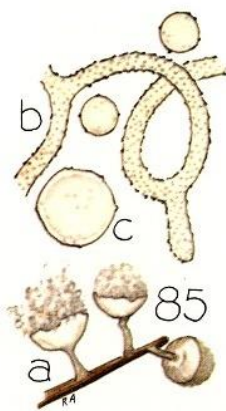
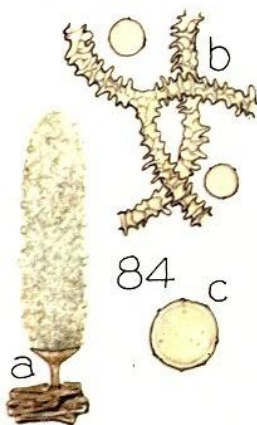
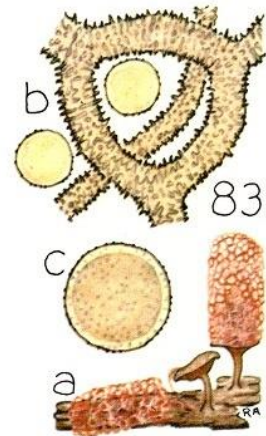
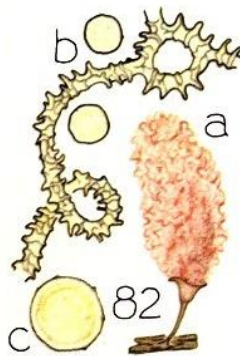
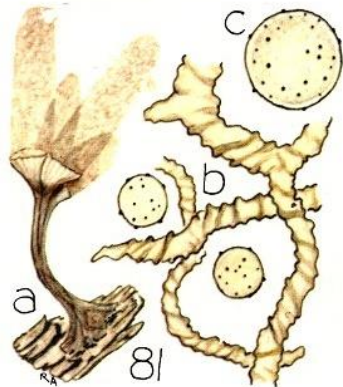
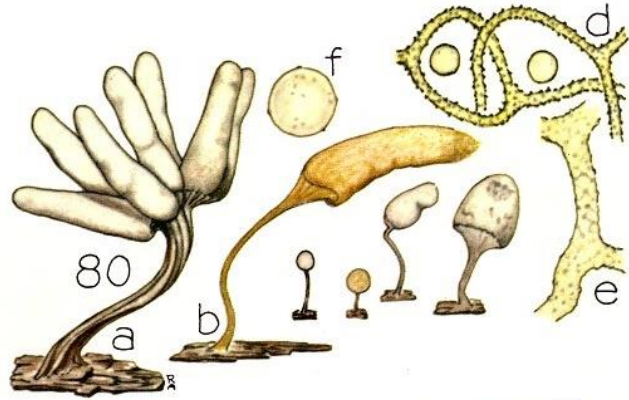
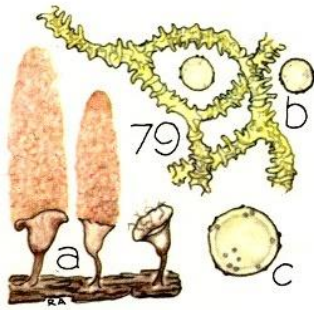
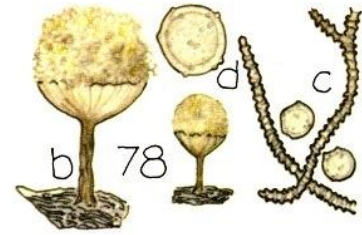
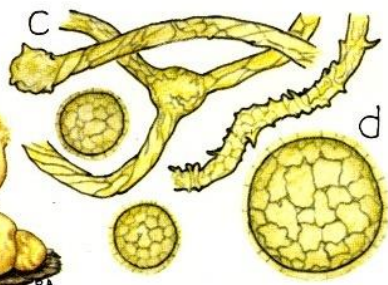




## Plate 7 Captions

67. *Perichaena chrysosperma* (Currey) A. Lister. a. Cluster of fructifications showing variation, X3; b. Semistipitate sporangium, X10; c. Detail of long-spined capillitium, and spore X500; d. Detail of short-spined capillitium, X500; e. Spore, X1000
68. *Perichaena corticalis* (Batsch) Host. a. Cluster of sporangia, X20; b. Detail of capillitium, and spores, X500; c. Spore, X1000
69. *Perichaena depressa* Libert. a. Cluster of sporangia, X5; b. Single sporangium with lid raised by expanding spore-mass, X20; c. Detail of capillitium, and spores, X500; d. Spore, X100
70. *Perichaena microspora* Penzig & G. Lister. a. Plasmodiocarp, X5; b. Detail of torulose capillitium and spores, X500; c. Detail of spiny capillitium, and spores, X50; d. Spore, X1000
71. *Perichaena minor* (G. Lister) Hagelst. a. Three sporangia, X5; b. Sporangium, X30; c. Detail of capillitium, and spores, X500; d. Spore, X1000.
72. *Perichaena syncarpon* T. E. Brooks. a. Cluster of sporangia, X10; b. Plasmodiocarp, X20; c. Detail of capillitium and cluster of spores, X500; d. Isolated spore, X1000
73. *Perichaena vermicularis* (Schw.) Host. a. Plasmodiocarp, X5; b. Detail of capillitium attached to fragment of peridium, and spores; c. Spore, X1000
74. *Oligonema flavidum* (Peck) Peck. a. Cluster of sporangia, X4; b. Same, X10; c. Capillitial threads, and spore, X500; d. Spore, X1000
75. *Oligonema fulvum* Morgan. a. Two sporangia, X20; b. Capillitial thread, and spores, X500; c. Spore in optical section, X1000
76. *Oligonema schweinitzii* (Berk) Martin. a. Heap of sporangia, X5; b. Portion of same, X20; c. Capillitial thread, and spores, X500; d. Spore, X1000

Plate 8



## Plate 8 Captions

77. *Calonema aureum* Morgan. a. Cluster of sporangia, X5; b. Portion of same, X20; c. Detail of capillitium, and spores, X500; d. Spore, X1000

78. *Arcyria annulifera* Torrend. a. Sporangium, X10 (in center); b. Same, X20; c. Detail of capillitium, and spores. X500; d. Spore, X1000

79. *Arcyria carnea* (G. Lister) G. Lister. a. Two sporangia and cup of a third, X10; b. Detail of capillitium, and spores, X500; c. Spore, X1000

80. *Arcyria cinerea* (Bull.) Pers. a. Cluster of digitate gray sporangia, X10; b. Single isolated ochraceous sporangium, X10; c. Four small sporangia, to illustrate variation in size and color, X10; d. Detail of capillitium, and spores, X500; e. Smoother and stouter basal capillitium, X500; f. Spore, X1000

81. *Arcyria corymbosa* Farr & Martin. a. Cluster of sporangia, X10; b. Detail of capillitium, and spores, X500; c. Spore, X1000

82. *Arcyria denudata* (L.) Wettst. a. Sporangium, X10; b. Detail of capillitium, and spores, X500; c. Spore, X1000

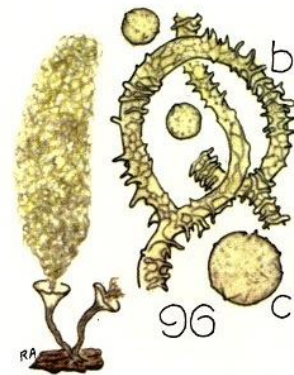
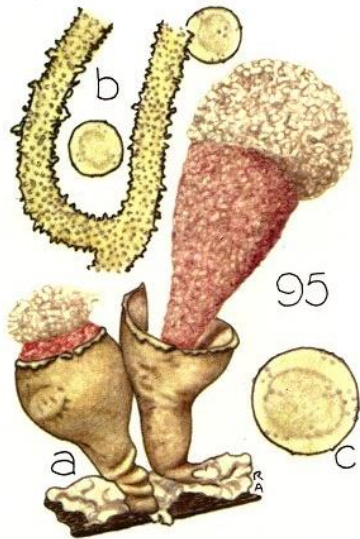
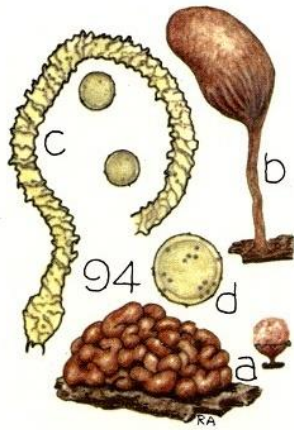
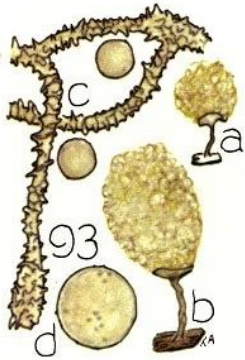
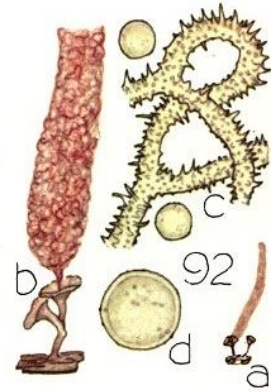
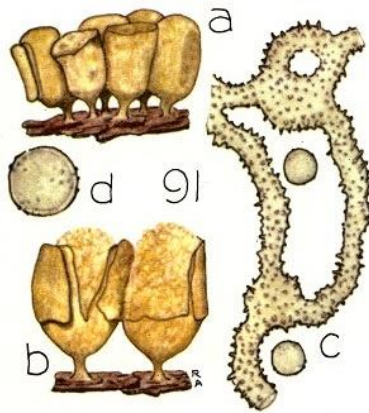
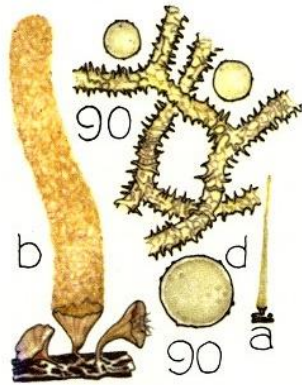
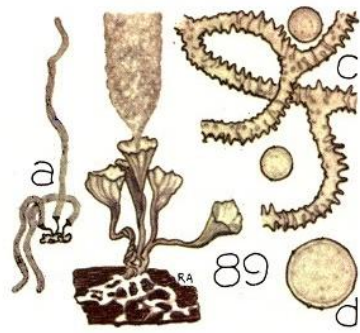
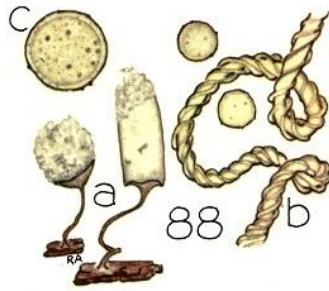
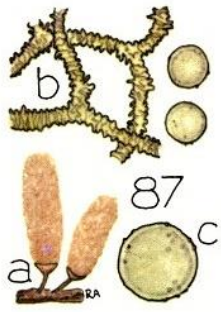
83. *Arcyria ferruginea* Sauter. a. Two sporangia, one with capillitium detached, X10; b. Detail of capillitium, and spores, X500; c. Spore, X1000

84. *Arcyria glauca* A. Lister. a. Sporangium, X10; b. Detail of capillitium, and spores, X500; c. Spore, X1000

85. *Arcyria globosa* Schw. a. Three sporangia on spine of chestnut bur, X10; b. Detail of capillitium, and spores, X500; c. Spore, X1000

86. *Arcyria incarnata* (Pers.) Pers. a. Group of sporangia, X2; b. Sporangium, with empty cups, X10; c. Detail of capillitium, and spores, X500; d. Spore. X1000

Plate 9



## Plate 9 Captions

87. *Arcyria insignis* Kalchbr. & Cooke. a. Two sporangia, X10; b. Detail of capillitium, and spores, X500; c. Spore, X1000

88. *Arcyria leiocarpa* (Cooke) Martin & Alexop. a. Two sporangia, X10; b. Detail of capillitium and spores, X500; c. Spore, X1000

89. *Arcyria magna* Rex. a. Cluster of sporangia, X2; b. Base of sporangium, with three empty cups, X10; c. Detail of capillitium, and spores, X500; d. Spore, X1000

90. *Arcyria nutans* (Bull.) Crev. a. Sporangium, X2; b. Same, with two empty cups, X10; c. Detail of capillitium, and spores, X500; d. Spore, X1000

91. *Arcyria occidentalis* (Macbr.) G. Lister. a. Cluster of sporangia, X10; b. Two sporangia, X20; c. Detail of capillitium, and spores, X500; d. Spore, X1000

92. *Arcyria oerstedtii* Rost. a. Sporangium, X2; b. Base of sporangium, X10; c. Detail of capillitium, and spores, X500; d. Spore, X1000

93. *Arcyria pomiformis* (Leers) Host. a. Sporangium, X10; b. Same, X20; c. Detail of capillitium, and spores, X500; d. Spore, X1000

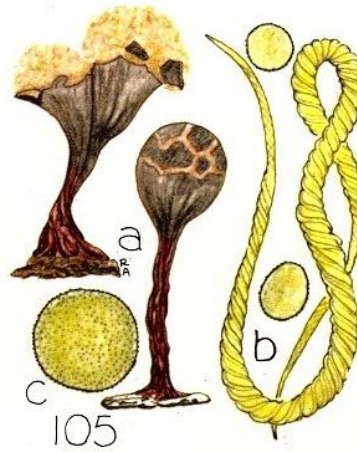
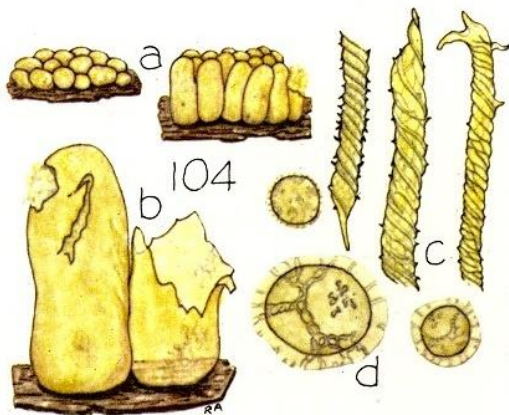
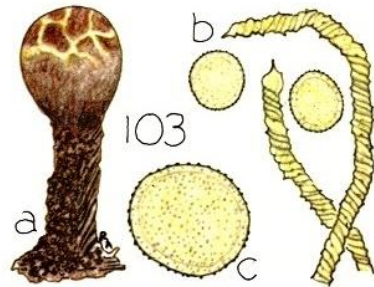
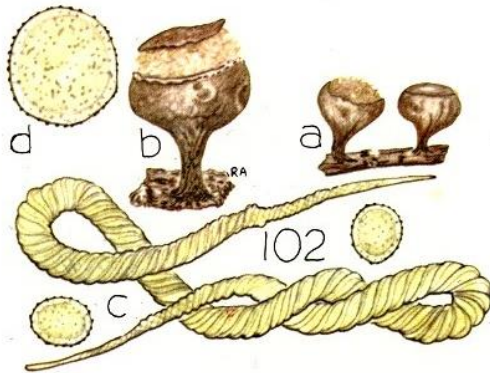
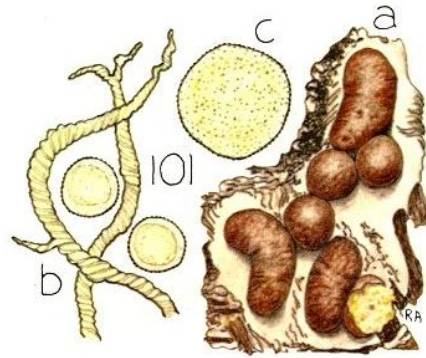
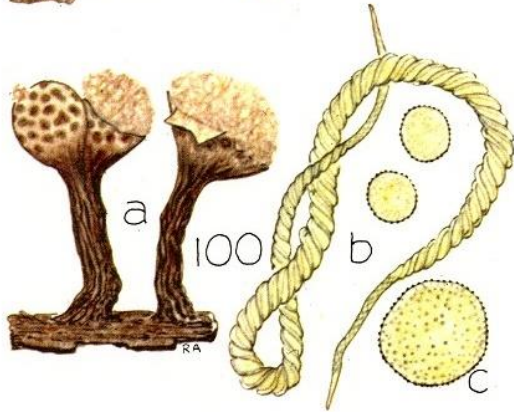
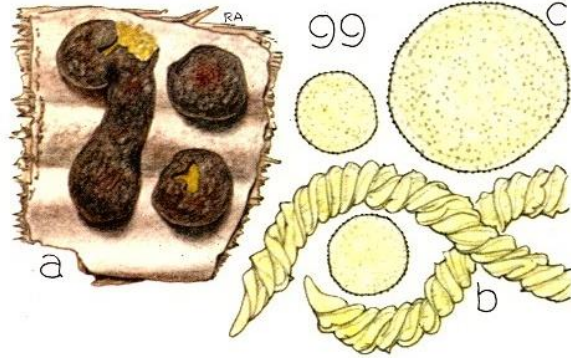
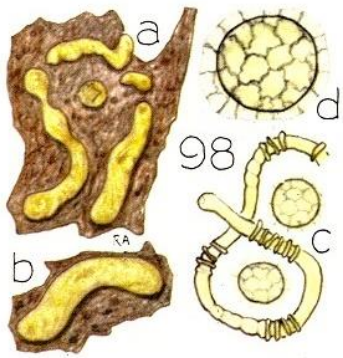
94. *Arcyria stipata* (Schw.) G. Lister. a. Cluster of sporangia, X5; b. Sporangium, X5; c. Isolated sporangium, X10; d. Detail of capillitium, and spores, X500; e. Spore, X1000

95. *Arcyria versicolor* Phill. a. Two sporangia, at left, capillitium beginning emergence, at right, completely emergent, but still compressed below, X10; b. Detail of capillitium, and spores, X500; c. Spore, X1000

96. *Arcyria virescens* G. Lister. a. Sporangium, with empty Cup, X10; b. Detail of capillitium, and spores, X500; c. Spore, X1000

97. *Arcyodes incarnata* (Alb. & Schw.) O. F. Cook. a. Cluster of sporangia, X5; b. Portion of cluster, X20; c. Detail of capillitium showing attachment to peridium, and spores, X500; d. Spore, X1000

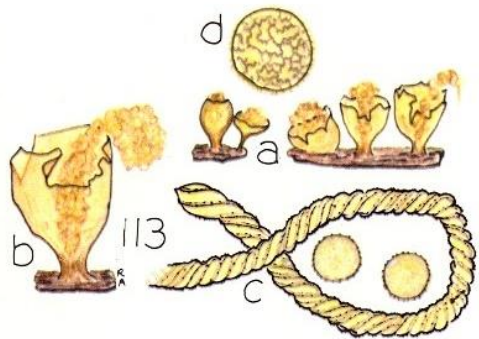
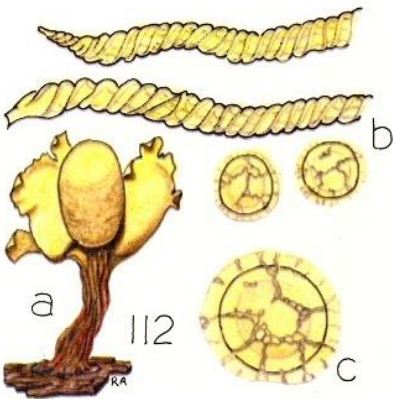
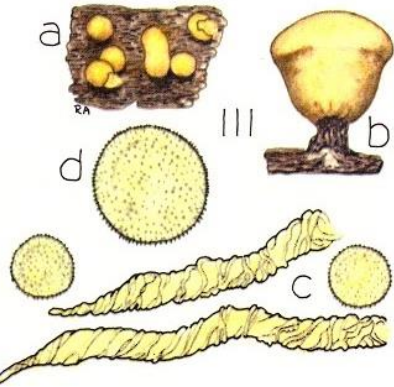
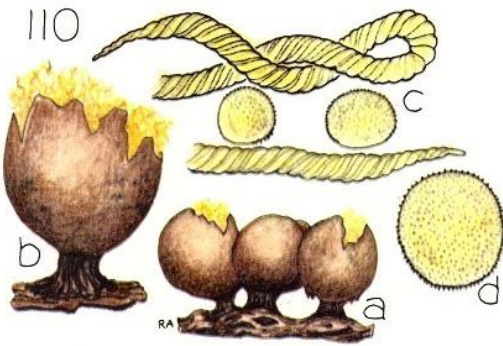
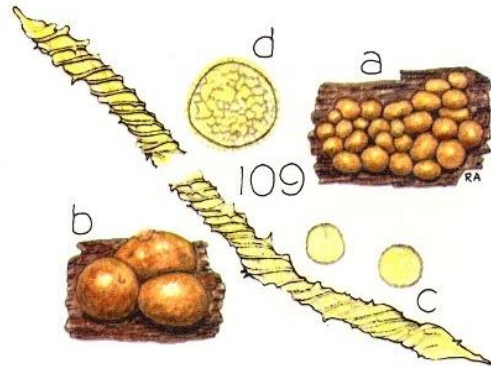
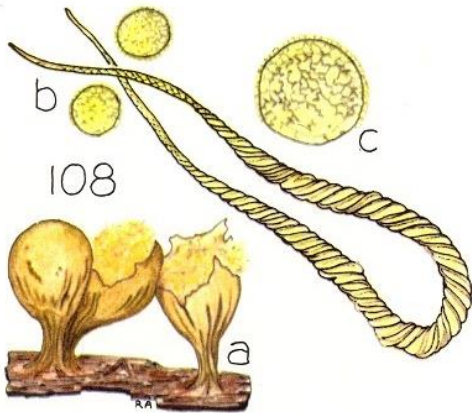
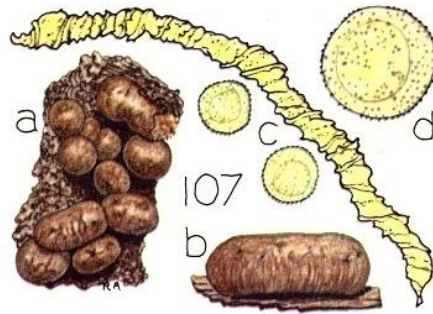
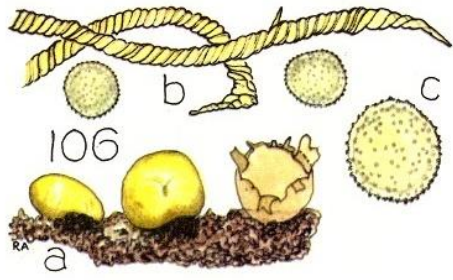
Plate 10



## Plate 10 Captions

98. *Cornuvia serpula* (Wigand) Rost. a. Cluster of fructifications, X10; b. Plasmodiocarp, X20; c. Detail of capillitium, and spores, X500; d. Spore, X1000
99. *Trichia alpina* (R.E. Fries) Meylan. a. Cluster of fructifications, X10; b. Tips of elaters, and spores, X500; c. Spore, X1000
100. *Trichia botrytis* (J F. Gmel.) Pers. a. Cluster of sporangia, X10; b. Elater and spores, X500; c. Spore, X1000
101. *Trichia contorta* (Ditmar) Rost. a. Cluster of fructifications, X10; b. Tips of elaters and spores, X500; c. Spore, X1000
102. *Trichia crateriformis* Martin. a. Two sporangia, X5; b. Sporangium, X10; c. Elater and spores, X500; d. Spore, X1000
103. *Trichia erecta* Rex. a. Sporangium, X20; b. Tips of elaters and spores, X500; c. Spore, X1000
104. *Trichia favoginea* (Batsch) Pers. a. Two clusters of sporangia, X5; b. Two sporangia from group, X20; c. Tips of elaters and spores, X500; d. Spore, X1000
105. *Trichia floriformis* (Schw.) G. Lister. a. Sporangia, X10; b. Elater and spores, X500; c. Spore, X1000

Plate 11





## Plate 11 Captions

106. *Trichia lutescens* (A. Lister). a. Three sporangia, X10; b. Tips of elaters and spores, X500; Spore, X1000

107. *Trichia macbridei* M.E. Peck. a. Cluster of sporangia, X5; b. Pulvinate sporangium, X 10; c. Elater and spores, X500; d. Spore, X1000

108. *Trichia decipiens* (Pers.) Macbride. a. Three sporangia, X10; b. Elater and spores, X500; c. Spore, X1000

109. *Trichia scabra* Rost. a. Cluster of sporangia, X5; b. Three sporangia, X10; c. Elater and spores, X500; d. Spore, X1000

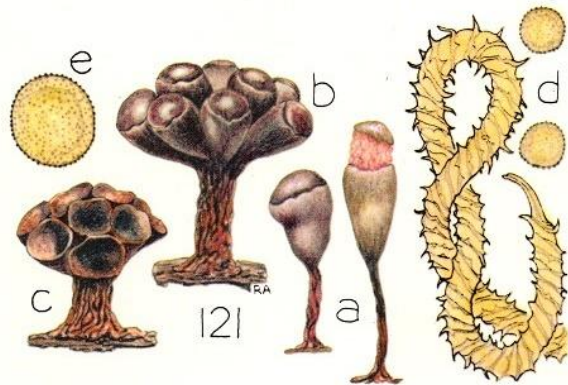
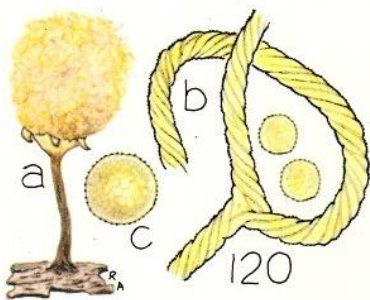
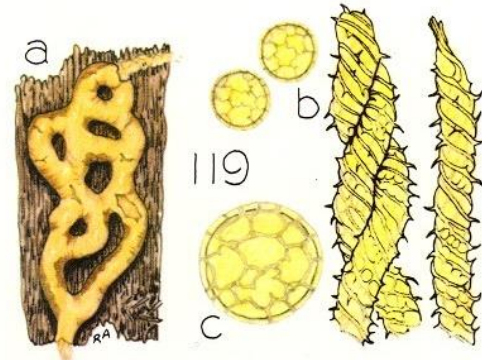
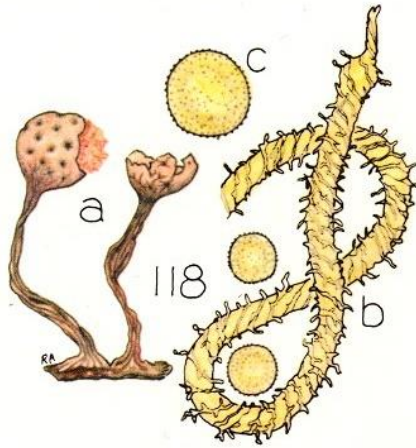
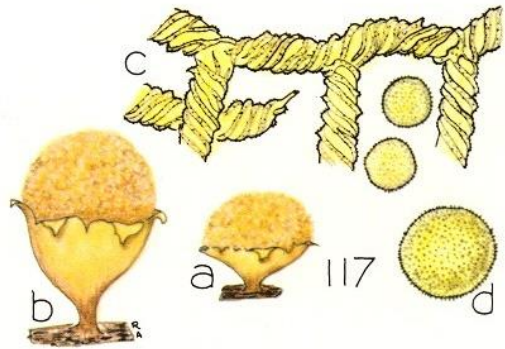
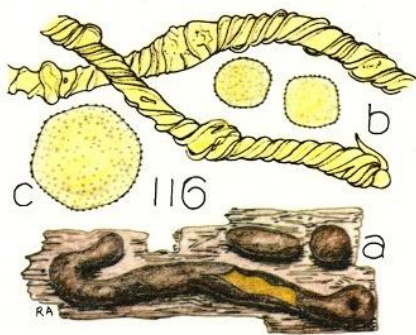
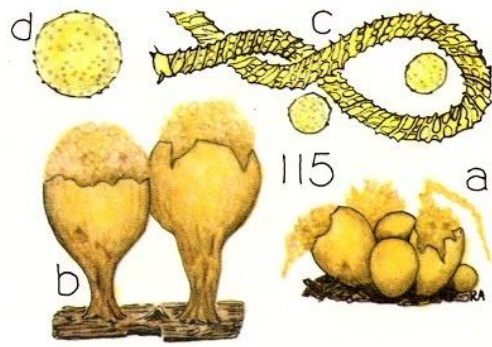
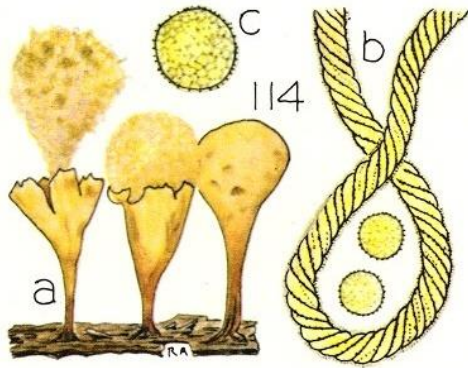
110. *Trichia subfusca* Rex. a. Four sporangia, on three stalks, X10; b. Sporangium, X20; c. Tips of elaters and spores, X500; d. Spore, X1000

111. *Trichia varia* (Pers.) Pers. a. Cluster of sporangia, X5; b. Stalked sporangium, X20; c. Tips of elaters and spores, X500; d. Spore, X1000

112. *Trichia verrucosa* Berk. a. Cluster of sporangia on united stalks, X10; b. Tips of elaters and spores, X500; Spore, X1000

113. *Hemitrichia abietina* (Wigand) G. Lister. a. Five sporangia, X10; b. Sporangium, X20; c. Free tip of capillitium and spores, X500; d. Spore. X1000

Plate 12



## Plate 12 Captions

114. *Hemitrichia clavata* (Pers.) Rost. a. Three sporangia, X10; b. Detail of capillitium, and spore, X500; c. Spore, X1000

115. *Hemitrichia intorta* (A. Lister) A. Lister. a. Cluster of sessile sporangia, X10; b. Two sporangia, X25; c. Detail of capillitium, and spores, X500; d. Spore, X1000

116. *Hemitrichia karstenii* (Rost.) A. Lister. a. Cluster of fructifications, X10; b. Details of capillitium, and spores, X500; c. Spore, X1000

117. *Hemitrichia montana* (Morgan) Macbr. a/b. Two sporangia, X10; c. Detail of capillitium including free tip spores, X500; d. Spore, X1000

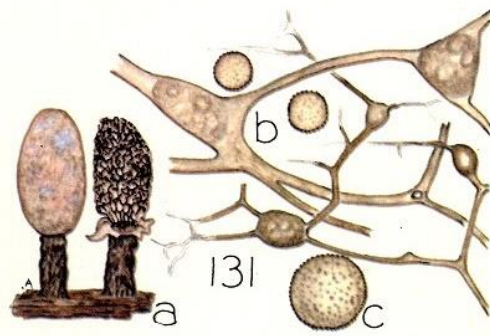
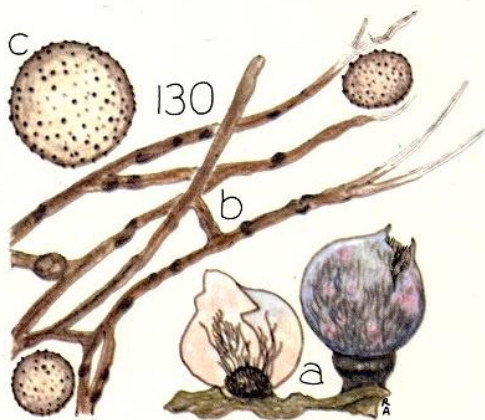
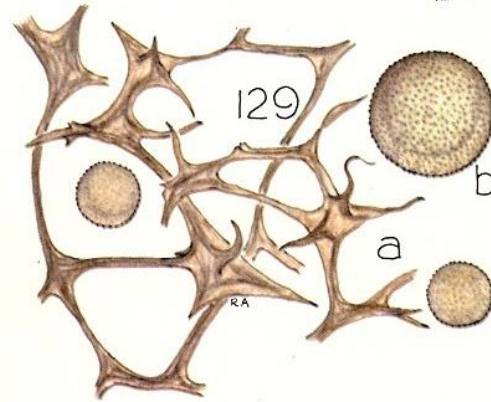
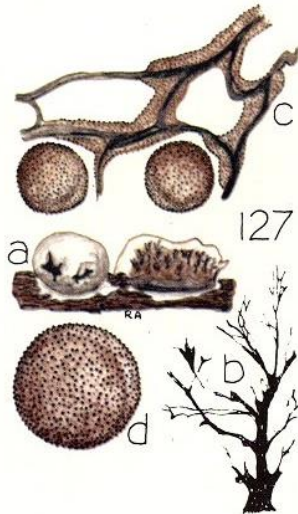
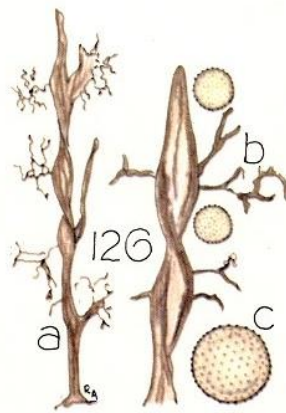
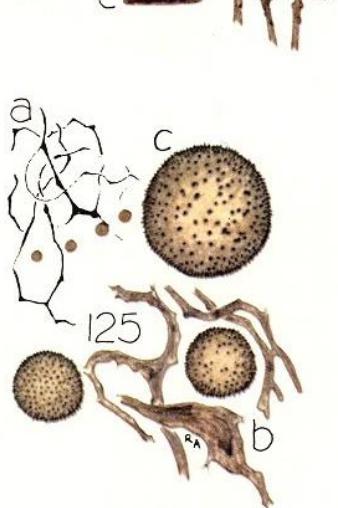
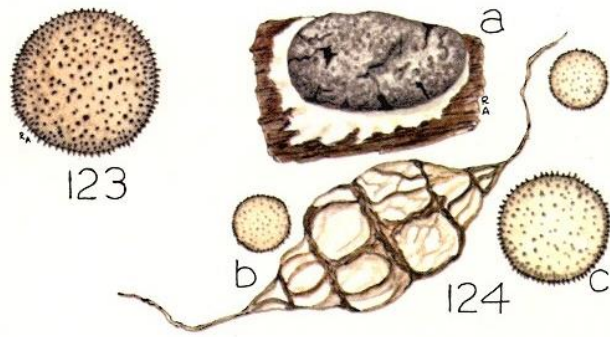
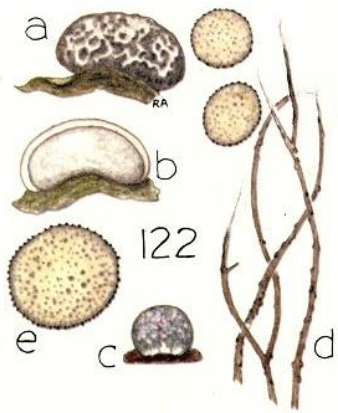
118. *Hemitrichia paragoga* Farr. a. Two sporangia, X20; b. Detail of capillitium, and spores, X500; c. Spore, X1000

119. *Hemitrichia serpula* (Scop.) Rost. a. Plasmodiocarp, X10; b. Detail of capillitium, and spores, X500; c. Spore, X1000

120. *Hemitrichia stipitata* (Masse) Macbr. a. Sporangium, X10; b. Detail of capillitium, and spores, X500; c. Spore, X1000

121. *Metatrichia vesparium* (Batsch) Nann.-Brem. a. Two free sporangia, X10; b. Group of sporangia clustered on united stalks, X10; c. Group of empty sporangia on united stalks, X10; d. Detail of capillitium, and spores, X500; e. Spore, X1000

Plate 13



## Plate 13 Captions

122. *Colloderma oculatum* (Lippert) G. Lister. a. Sporangium, dry, X20; b. Sporangium, wet, showing gelatinous outer wall, X20; c. Small sporangium, X20; showing inner layer of peridium; d. Detail of capillitium, and spores, X500; e. Spore, X1000

123. *Colloderma robustum* Meylan. a. Spore, X1000

124. *Brefeldia maxima* (Fries) Host. a. Small aethalium, X1; b. Vesicle and spores, X500; c. Spore, X1000

125. *Amaurochaete comata* C. Lister & Brândză. A. Capillitium and spores, X100; b. Detail of capillitium, and spore, X500; c. Spore, X1000

126. *Amaurochaete ferruginea* Macbr. & Martin. a. Stalk-like branch, from base, X100; b. Tip of same, and spores, X500; c. Spore, X1000

127. *Amaurochaete atra* (Alb. & Schw.) Rost. a. Two small aethalia, X1; b. Stalk from base giving rise to capillitium; X10; c. Detail of capillitium, and spores, X500; d. Spore, X1000

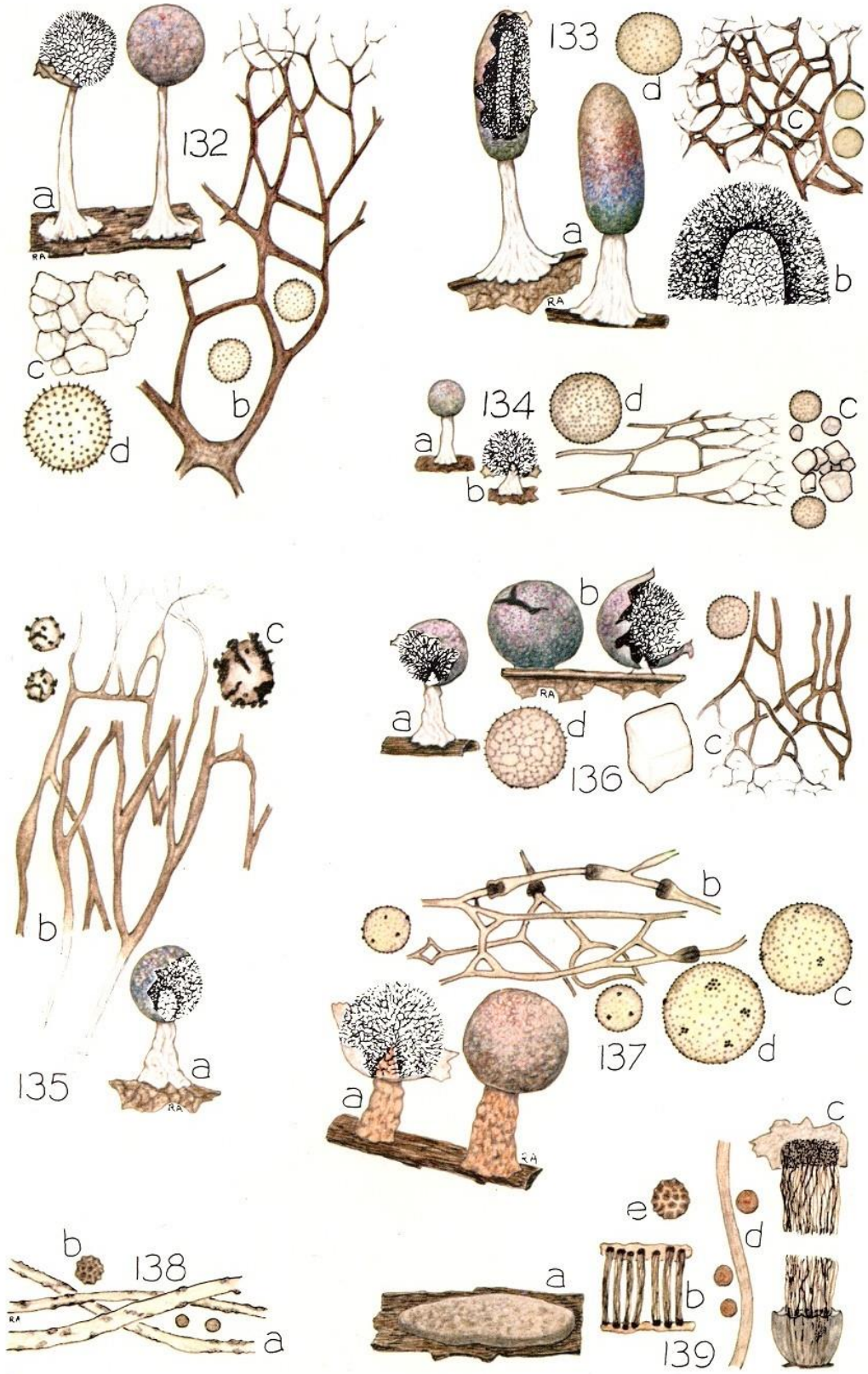
128. *Amaurochaete trechispora* Macbr. & Martin a. Capillitium and spores, X500; b. Spore, X1000

129. *Amaurochaete tubulina* (Alb. & Schw.) Macbr. a. Capillitium and spores, X500; b. Spore, X1000

130. *Elaeomyxa cerifera* (C. Lister) Hagelst. a. Two sporangia, X15; b. Capillitium and spores, X500; c. Spore, X1000

131. *Elaeomyxa miyazakiensis* (Emoto) Hagelst. a. Two sporangia, X15; b. Capillitium and spores, X500; c. Spore, X1000

Plate 14



## Plate 14 Captions

132. *Diachea bulbilosa* (Berk. & Br.) A. Lister. a. Two sporangia, X20; b. Detail of capillitium, and spores, X500; c. Lime crystals from interior of stalk, X500; d. Spore, X1000

133. *Diachea leucopodia* (Bull.) Host. a. Two sporangia, X20; b. Tip of columella surrounded by capillitium X50; c. Detail of capillitium, and spores, X500; d. Spore, X1000

134. *Diachea radiata* G. Lister & Petch. a. Long-stalked sporangium, X20; b. Short-stalked sporangium, X20; c. Detail of capillitium, with lime crystals from stalk, and spores, X500; d. Spore, X1000

135. *Diachea splendens* Peck. a. Sporangium, X20; b. Detail of capillitium, and spores, X500; c. Spore, X1000

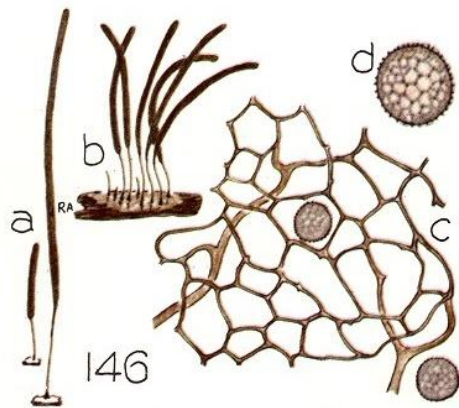
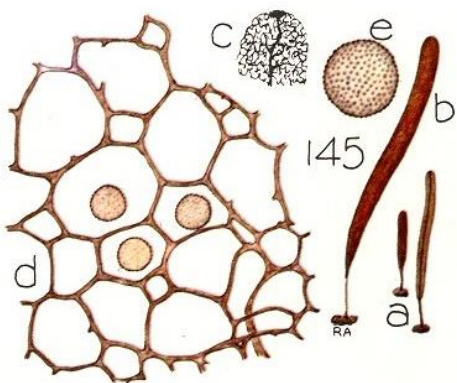
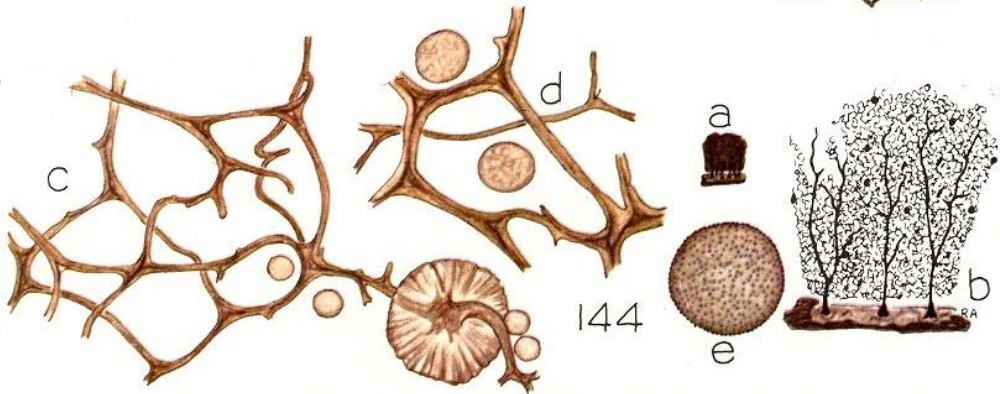
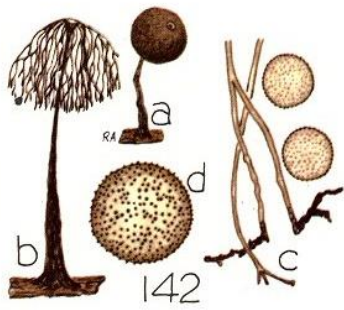
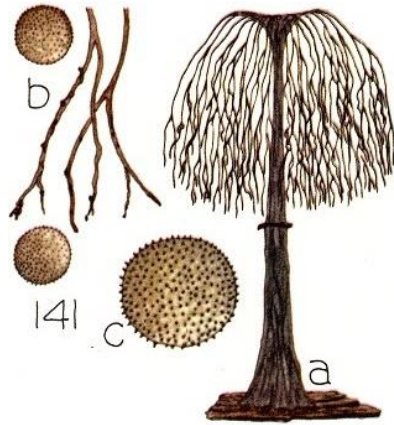
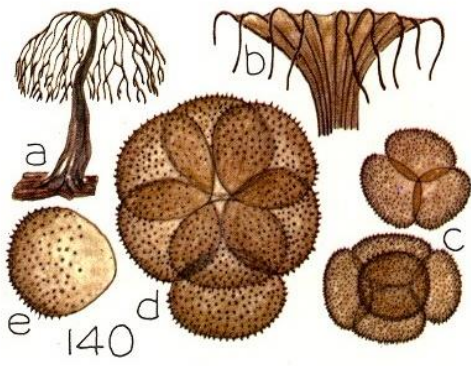
136. *Diachea subsessilis* Peck. a. Long-stalked sporangium, X20; b. Short-stalked and sessile sporangia, X20; c. Detail of capillitium, with spore, and lime crystal from stalk, X500; d. Spore, X1000

137. *Diachea thomasii* Rex a Two sporangia, X 20 b Detail of capillitium, and spores, X 500 c/d Spore, X 1000

138. *Schenella microspora* Martin. a. Detail of capillitium, and spores, X500; b. Spore, X1000

139. *Schenella simplex* Macbride. a. Pseudoaethalium, X4; b. Diagrammatic longitudinal section, .showing sporangia attached to base and cortex, X3 (a and b after Macbride); c. Cap and base of sporangium, X20; d. Detail of capillitium, and spores, X500; d. Spore. X1000

Plate 15





## Plate 15 Captions

140. *Enerthenema berkeleyanum* Rost. a. Sporangium, spores shed, X20; b. Tip of same, showing apical cup, X250; c. Two spore clusters, X500; d. Spore cluster, X1000; e. Isolated spore, X1000

141. *Enerthenema melanospermum* Macbr. a. Sporangium, spores shed, X20; b. Detail of capillitium, and spores, X 500; c. Spore, X1000

142. *Enerthenema papillatum* (Pers.) Rost. a. Sporangium, X10; b. Same, spores shed, X20; c. Tips of capillitium, and spores, X5, d. Spore, X1000

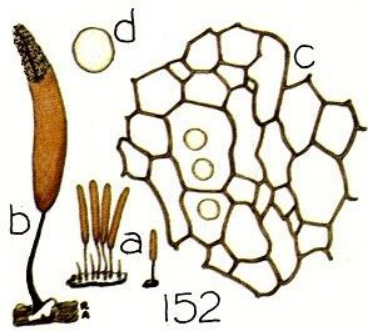
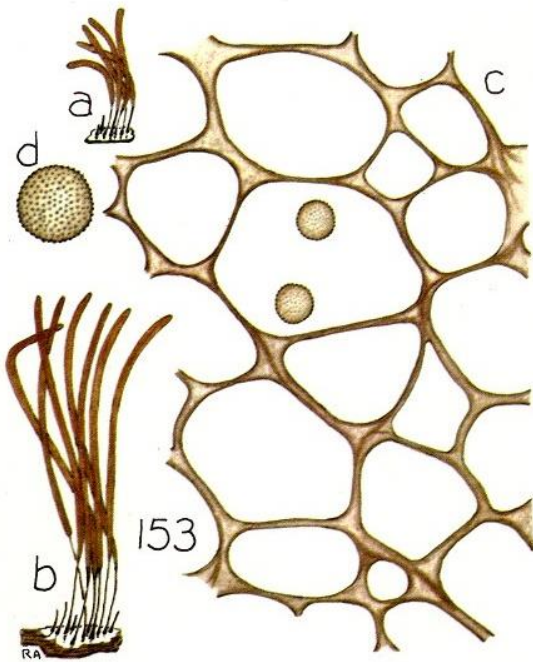
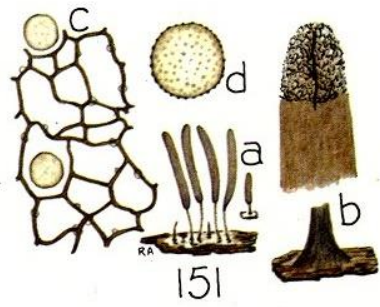
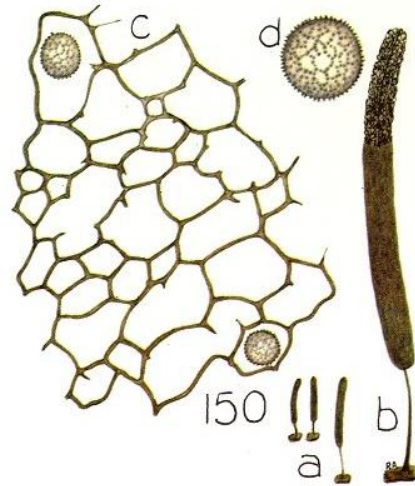
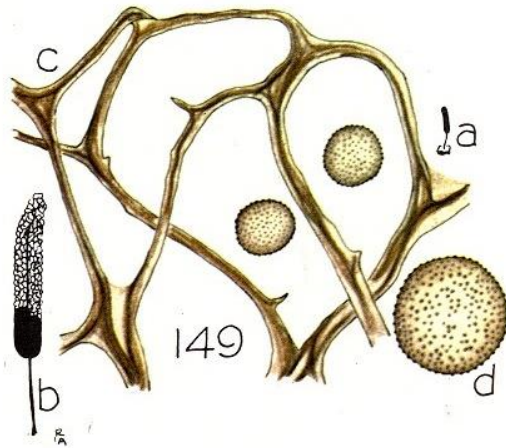
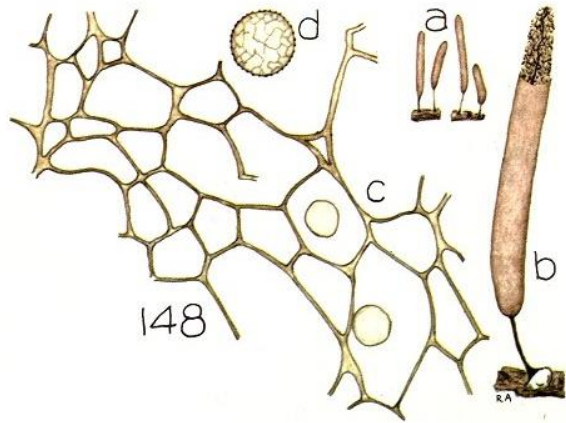
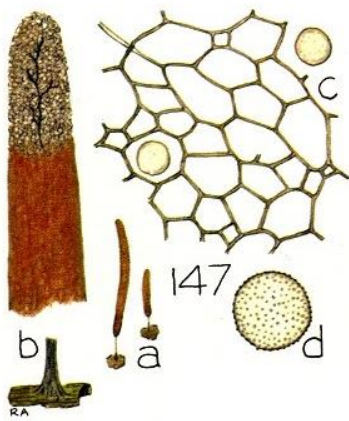
143. *Stemonitis axifera* (Bull.) Macbride. a. Cluster of sporangia, X2; b. Detail of capillitium, with spores, X500; c. Spore, X1000

144 *Stemonitis confluens* Cooke & Ellis. a. Part of cluster of sporangia, X2; b. Group of united sporangia, X10; c. Detail of capillitium, with spores and membrane, X250; d. Detail of capillitium, with spores, X500; e. Spore, X1000

145. *Stemonitis flavogenita* Jahn. a. Two sporangia, X2; b. Sporangium, X5; c. Tip of sporangium, X25; d. Detail of surface net, and spores, X500; e. Spore, X1000

146. *Stemonitis fusca* Roth. a. Two sporangia, to show range in size, X2; b. Part of a tuft of sporangia, X2; c. Detail of capillitium, with surface net, and spores, X500; d. Spore, X1000

Plate 16



## Plate 16 Captions

147. *Stemonitis herbatica* Peck. a. Two sporangia, X2; b. Base and upper portion of sporangium; c. Detail of surface net, with spores, X500; d. Spore, X1000

148. *Stemonitis hyperopta* Meylan. a. Four sporangia, X2; b. Sporangium, X10; c. Detail of surface net, and spores, X500; d. Spore, X1000

149. *Stemonitis mussooriensis* Martin, Thind & Sohi. a. Sporangium, X2; b. Same, X10; c. Detail of surface net, with spores, X500; d. Spore, X1000

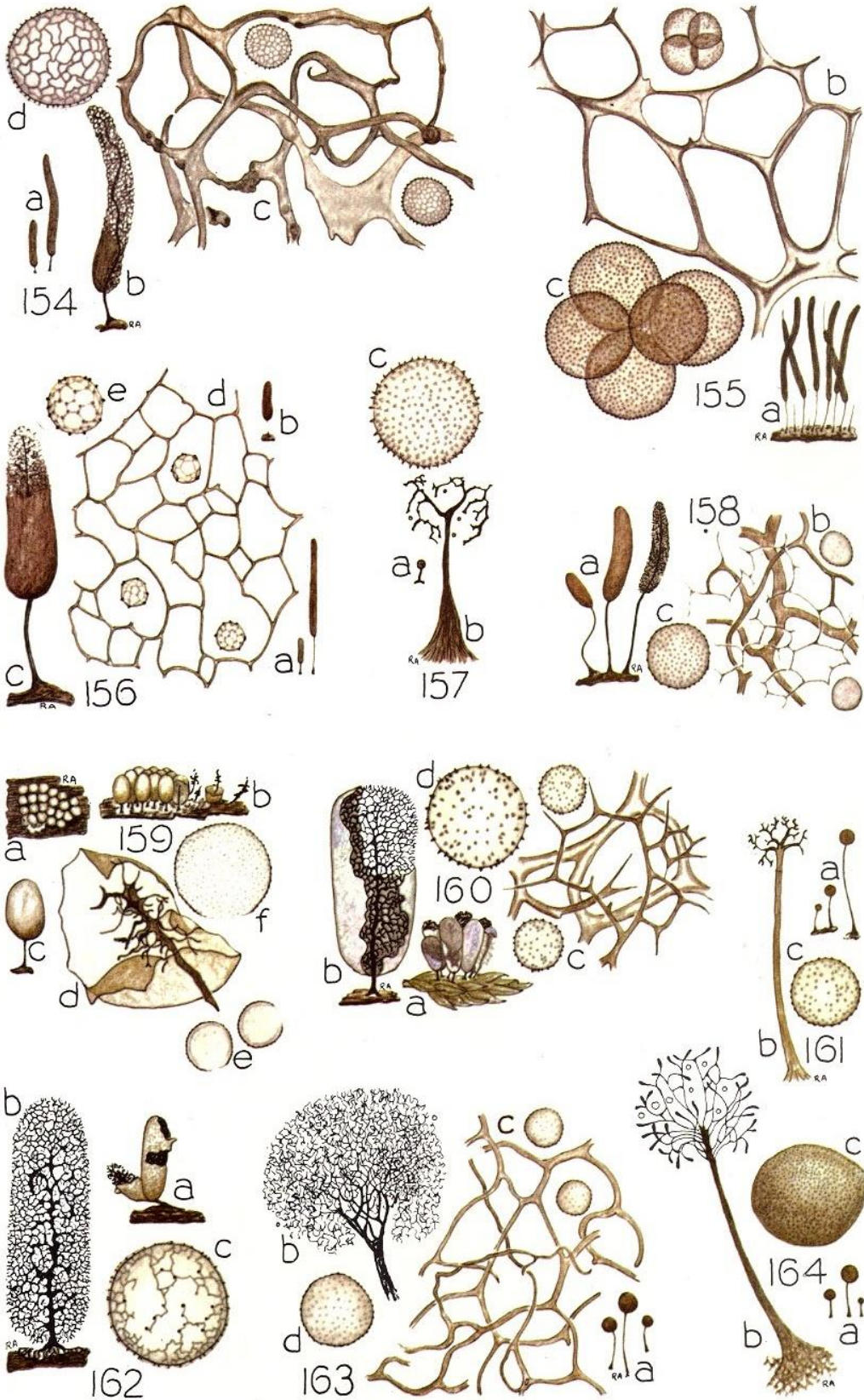
150. *Stemonitis nigrescens* Rex. a. Three sporangia, X2; b. Sporangium, X10; c. Detail of surface net, with spores, X500; d. Spore, X1000

151. *Stemonitis pallida* Wingate. a. Part of a cluster of sporangia and an isolated sporangium, to show range in size, X2; b. Base and upper portion of sporangium, X25; c. Detail of surface net, and spores, X500; d. Spore, X1000

152. *Stemonitis smithii* Macbr. a. Sporangia, X2; b. Same, X10; c. Detail of surface net, and spores, X500; d. Spore, X1000

153. *Stemonitis splendens* Host. a. Tuft of short sporangia, X2; b. Same, of large sporangia, X2, c. Detail of surface net, with spores, X500; d. Spore, X1000

Plate 17



## Plate 17 Captions

154. *Stemonitis trechispora* ( Berk.) Macbr. a. Two sporangia, X2; b. Sporangium, X10; c. Detail of surface net, and spores, X500; d. Spore, X1000

155. *Stemonitis uvifera* Macbr. a. Group of sporangia, X2; b. Detail of surface net, and spores, X50; c. Cluster of spores, X1000

156. *Stemonitis virginiensis* Rex. a. Two sporangia, X2; b. Sporangium from type, X2; c. Same, X10; d. Detail of surface net, and spores, X500; e. Spore, X1000

157. *Comatricha acanthodes* Alexop. a. Sporangium, X5; b. Same, spores fallen, X50; c. Spore, X1000

158. *Comatricha aequalis* Peck. a. Three sporangia, X5; b. Detail of capillitium, and spores, X500; c. Spore, X1000

159. *Comatricha aggregata* Farr. a. Cluster of sporangia, X5; b. Portion of same, lateral view, X10; c. Isolated sporangium, X20; d. Columella, showing enlarged tip, and attached capillitial threads and peridial fragments, X50; e. Two spores, X500; f. Spore, X1000

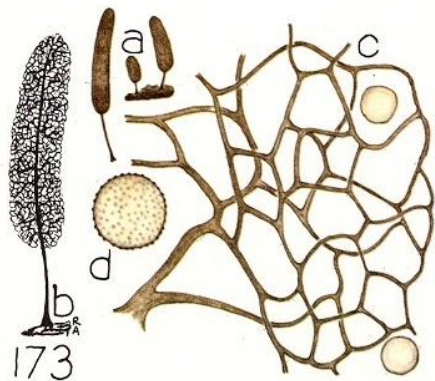
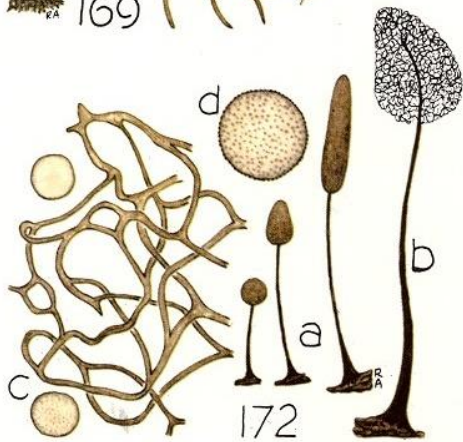
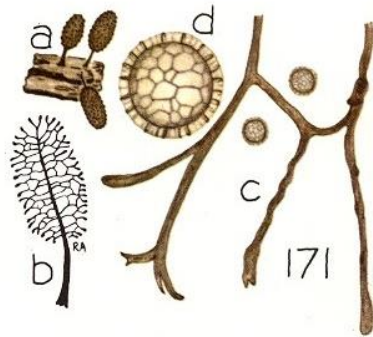
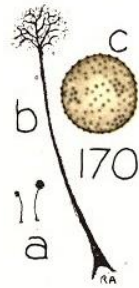
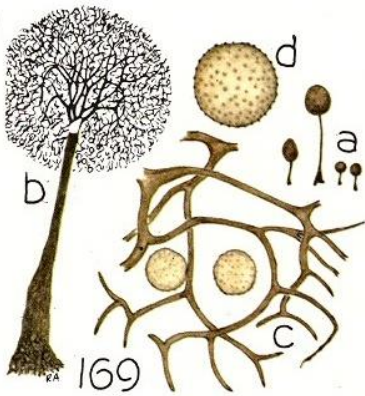
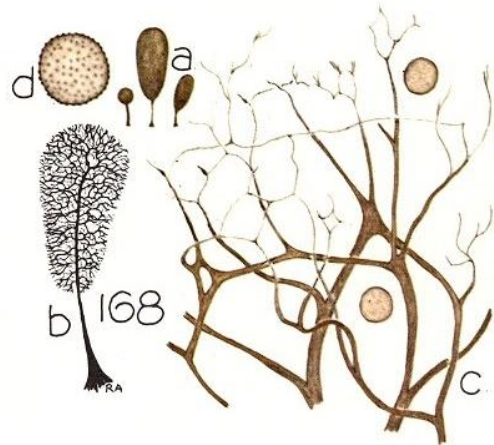
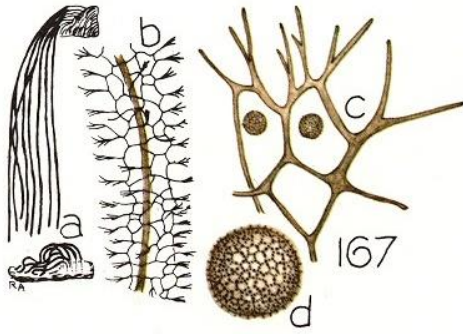
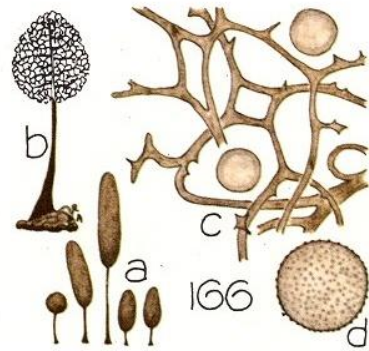
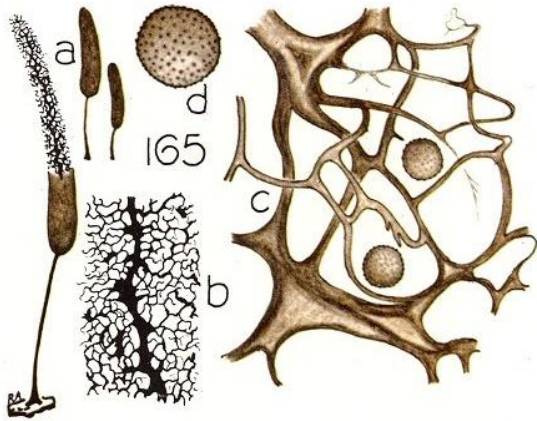
160. *Comatricha caespitosa* Sturgis. a. Tuft of sporangia, X5; b. Sporangium, X20; c. Spore, X1000

161. *Macbrideola decapillata* H. C. Gilbert. a. Three sporangia, X5; b. Sporangium, spores fallen, X50; c. Spore, X1000. At the time this was drawn it was believed to be *Comatricha cornea* G. Lister.

162. *Comatricha cylindrica* (Bilgram) Macbr. a. Two sporangia, X5; b. Sporangium, X20; c. Spore, X1000

163. *Comatricha elegans* (Radix) G. Lister. a. Three sporangia, X5; b. Blown sporangium, showing tip of stalk and characteristic branching leading to capillitium, X50; c. Detail of capillitium, and spores, X500; d. Spore, X1000

164. *Comatricha fimbriata* G. Lister & Cran. a. Three sporangia, X5; b. Sporangium, spores shed, X50; c. Spore, X1000



## Plate 18 Captions

165. *Comatricha irregularis* Rex. a. Three sporangia, showing range in size, X5; b. Median portion of sporangium, showing columella and capillitium, X50; c. Detail of capillitium, and spores, X500; d. Spore, X1000

166. *Comatricha laxa* Rost. a. Five sporangia, X5; b. Sporangium, spores shed, X20, c. Details of capillitium, and spores, X500; d. Spore, X1000

167. *Comatricha longa* Peck. a. Groups of sporangia from large fruitings, X5; b. Section of sporangium, showing columella and capillitium, X50; c. Detail of capillitium, and spores, X250; d. Spore, X1000

168. *Comatricha longipila* Nann.-Brem. a. Three sporangia, X5; b. Sporangium, X20; c. Detail of outer portion of capillitium, with spores, X500; d. Spore, X1000

169. *Comatricha lurida* A. Lister. a. Four sporangia, X5; b. Sporangium, showing stalk and capillitium, spores shed, X50; c. Outer portion of capillitium, with spores, X500; d. Spore. X1000

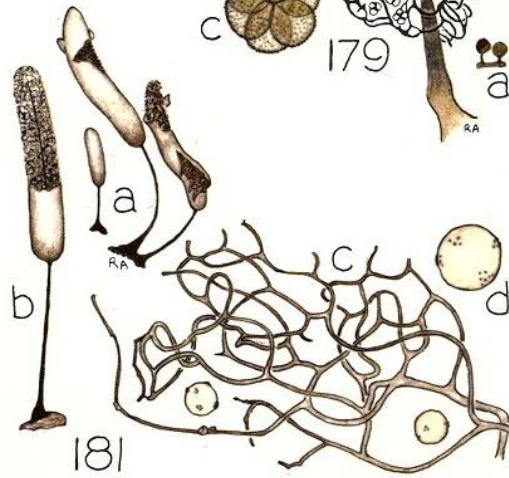
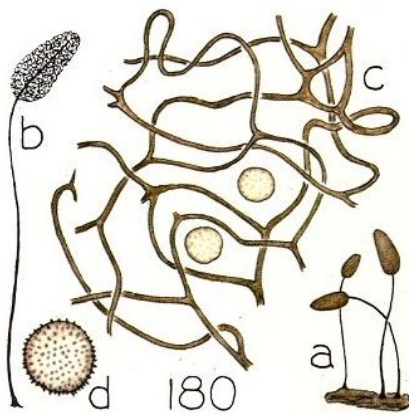
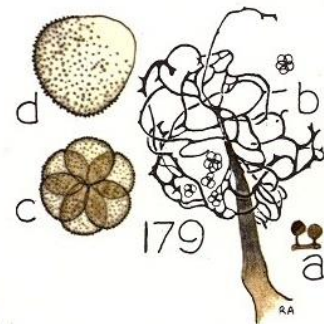
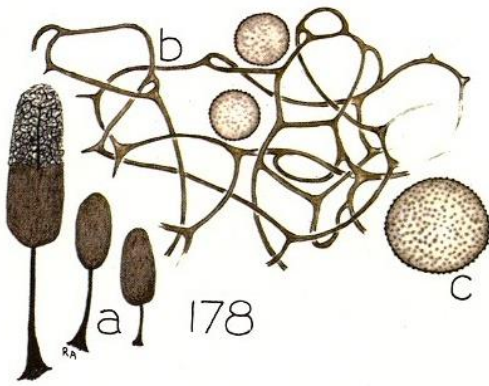
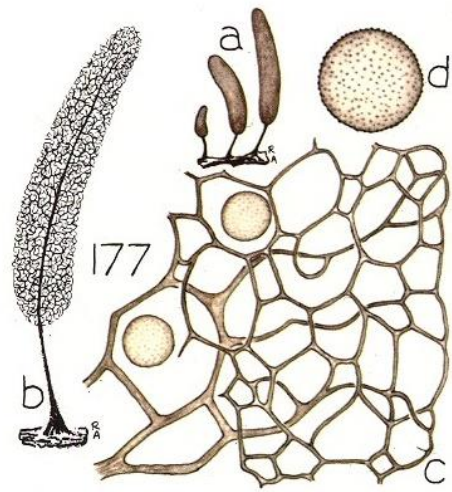
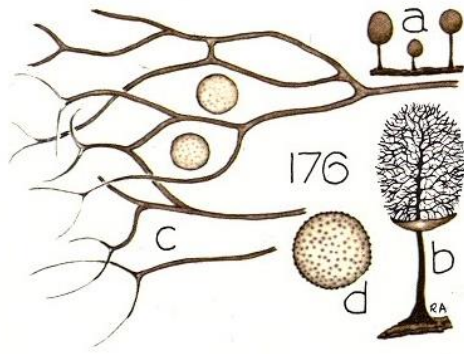
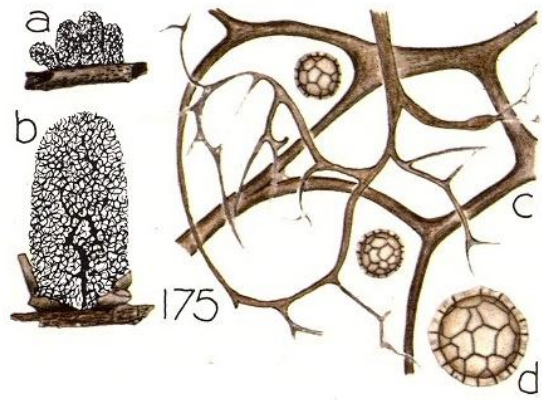
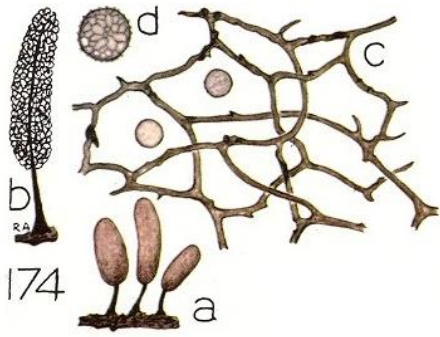
170. *Macbrideola martinii* (Alexop. & Beneke) Alexop. a. Two sporangia, X5; b. Sporangium, showing stalk and capillitium, spores shed, X50; c. Spore, X1000

171. *Comatricha mirabilis* Benj. & Poit. a. Three sporangia, X5; b. Sporangium, showing stalk and capillitium X20; c. Tips of capillitium and spores, X250; d. Spore, X1000

172. *Comatricha nigra* (Pers.) Schroet. a. Three sporangia, X5; b. Sporangium, spores shed, X20; c. Capillitium and spores, X500; d. Spore, X1000

173. *Comatricha pulchella* (C. Bab.) Rost. a. Three sporangia, X5; b. Sporangium, spores shed, X20; c. Capillitium at margin, and spores, X500; d. Spore, X1000

Plate 19





## Plate 19 Captions

174. *Comatricha dictyospora* Celak. a. Three sporangia, X5; b. Sporangium, X10; c. Detail of capillitium, and spores, X500; d. Spore, X1000. Drawn from type of *C. reticulata* H. C. Gilbert

175. *Comatricha rispaudii* Hagelst. a. Tuft of sporangia, X5; b. Sporangium, showing persistent peridium base, X20; c. Detail of capillitium, and spores, X500; d. Spore, X1000

176. *Comatricha rubens* A. Lister. a. Three sporangia, X5; b. Sporangium, X20; c. Tips of capillitium, and spores, X500, d. Spore, X1000

177 *Comatricha subcaespitosa* Peck. a. Three sporangia, X5; b. Sporangium, X20; c. Margin of capillitium, and spores, X500; d. Spore, X1000

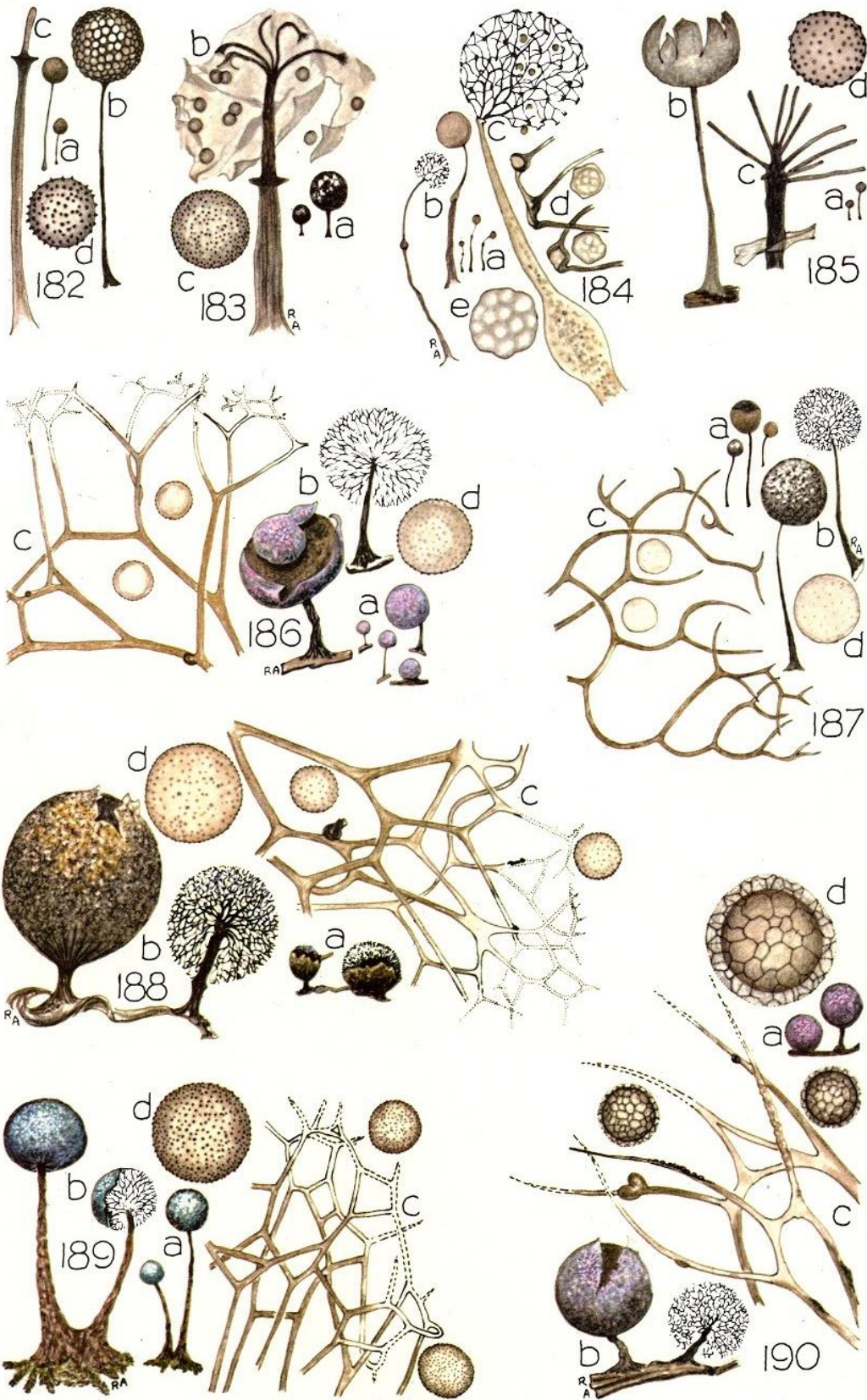
178. *Comatricha suksdorfii* Ell. & Ev. a. Three sporangia, X5; b. Detail of capillitium, and spores, X500; c. Spore, X1000

179. *Macbrideola synsporos* (Alexop.) Alexop. a. Two sporangia, X5; b. Sporangium, with spore clusters, seen in mounted specimen, X100; c. Cluster of spores, X500; d. Isolated spore, X1000

180. *Comatricha tenerrima* (M. A. Curt.) G. Lister. a. Three sporangia, X5; b. Sporangium, X10; c. Detail of capillitium, and spores, X500; d. Spore, X1000

181. *Comatricha typhoides* (Bull.) Host. a. Three sporangia, X5; b. Sporangium, X10; c. Detail of capillitium, and spores, X500; d. Spore, X1000

Plate 20



## Plate 20 Captions

182. *Macbrideola decapillata* H. C. Gilbert. a. Two sporangia, X30; b. Sporangium bearing spores, X150; c. Same, showing columella, X150; d. Spore, X1000

183. *Macbrideola scintillans* H. C. Gilbert. a. Two sporangia, X30; b. Sporangium, showing capillitium, spores and persistent peridium, X150; c. Spore, X1000

184. *Clastoderma debaryanum* Blytt. a. Three sporangia, X5; b. Two sporangia, one with spores shed, X30; c. Sporangium, with capillitium, spores and upper part of stalk, X100; d. Tips of capillitium, with attached scales, and spores, X500; e. Spore, X1000

185. *Barbeyella minutissima* Meylan. a. Two sporangia, X5; b. Sporangium, X50; c. Capillitium arising from columella, and collar at base of sporangium, X200; d. Spore, X1000

186. *Lamproderma arcyrioides* (Sommerf.) Host. a. Four sporangia, illustrating variation, X5; b. Two sporangia, showing peridium and capillitium, X20; c. Tips of capillitium, and spores, X500; d. Spore, X1000

187. *Lamproderma arcyrionema* Rost. a. Three sporangia, showing variation, X5; b. Two sporangia, X20; c. Tips of capillitium, and spores, X500; d. Spore, X1000

188. *Lamproderma carestiae* (Ces. & de Not.) Meylan. a. Stalked and sessile sporangium, X5; b. Two sporangia, X15; c. Tips of capillitium, and spores, X500; d. Spore, X1000

189. *Lamproderma columbinum* (Pers.) Rost. a. Two sporangia, X5; b. Two sporangia, X10; c. Tips of capillitium, and spores, X500; d. Spore, X1000

190. *Lamproderma cribrarioides* (Fries) R.E. Fries. a. Two sporangia, X5; b. Two sporangia, X10; c. Tips of capillitium, and spores, X500; d. Spore, X1000

Plate 21



## Plate 21 Captions

191. *Lamproderma cristatum* Meylan. a. Two sporangia, X5; b. Sporangium, showing columella, capillitium and persistent peridium at base, X10; c. Spore, X1000

192. *Lamproderma echinulatum* (Berk) Rost. a. Two sporangia, X5; b. Obovate sporangium, X10; c. Spore, X1000

193. *Lamproderma gulielmae* Meylan. a. Two sporangia, X5; b. Two sporangia, X20; c. Spore, X1000

194. *Lamproderma muscorum* (Lév.) Hagelst. a. Two sporangia, X5; b. Sporangium, X50; c. Spore, X1000

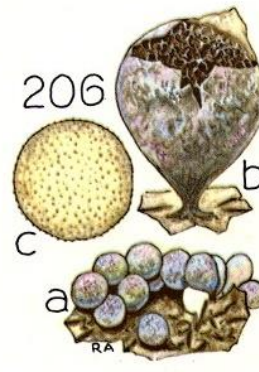
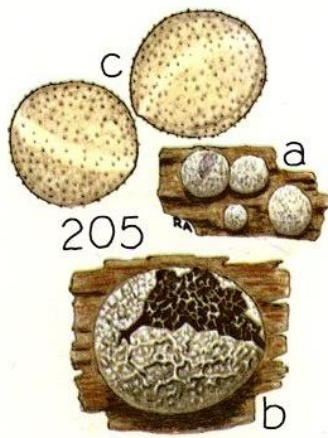
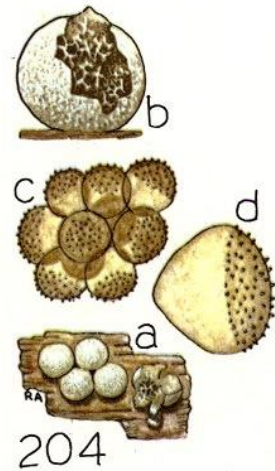
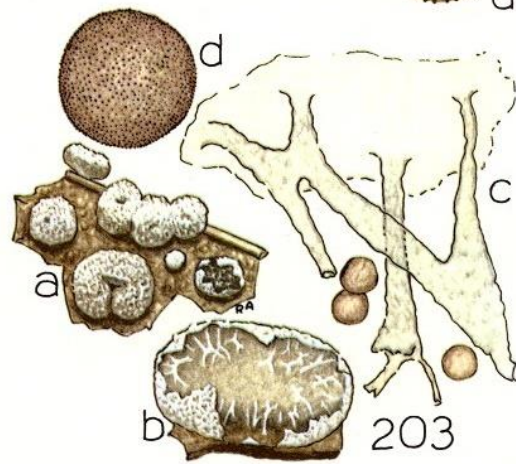
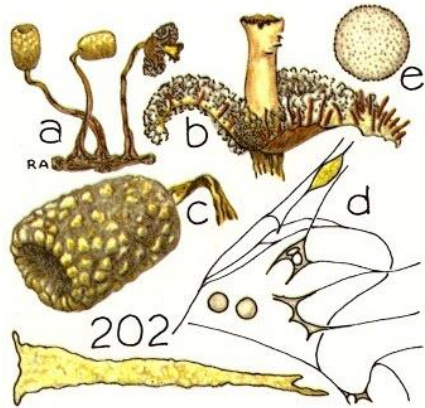
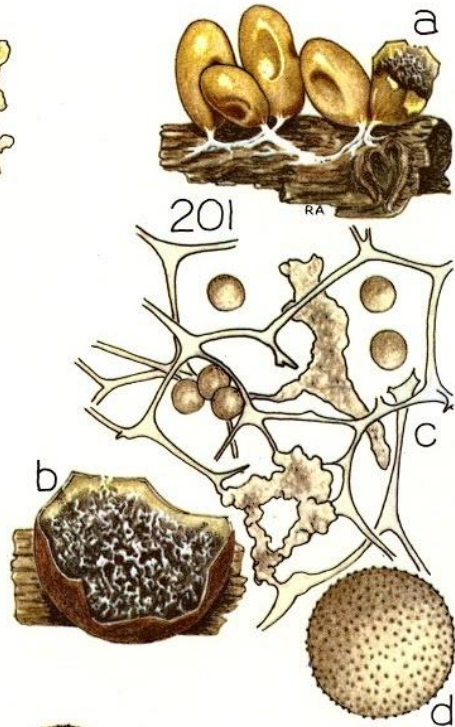
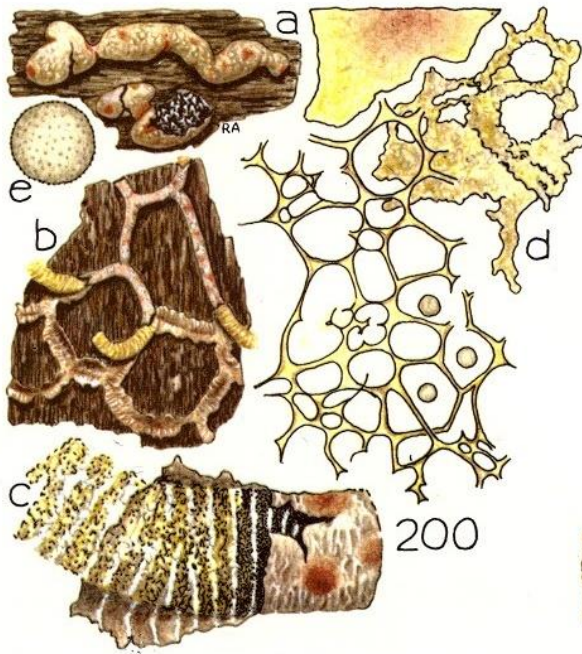
195. *Lamproderma pulchellum* Meylan. a. Cluster of sporangia, X5; b. Two sporangia, X20; c. Denuded sporangium, X20; d. Detail of capillitium, and spores, X500; e. Spore, X1000

196. *Lamproderma atrosporum* Meylan. a. Four sporangia, X5; b. Denuded sporangium, X20; c. Detail of capillitium showing tips attached to fragments of peridium, and spores, X500; d. Spore, X1000

197. *Lamproderma sauteri* Rost. a. Group of sporangia, X5; b. Sporangium, X15; c. Tips of capillitium, and spores, X500; d. Spore, X1000

198. *Lamproderma scintillans* (Berk. & Br.) Morgan. a. Three sporangia, X5; b. Sporangium, X40; c. Capillitium, columella, and tip of stalk, X40; d. Capillitium arising from tip of columella, showing pale bases of threads, X100; e. Spore, X1000

199 *Lamproderma verrucosum* Martin, Thind & Sohi. a. Two sporangia, X5; b. Two sporangia, X50; c. Tips of capillitium, and spores, X500, d. Spore, X1000



## Plate 22 Captions

200. *Cienkowskia reticulata* (Alb. & Schw.) Rost. a. Plasmodiocarp, X10; b. Portion of slender plasmodiocarp, X5; c. Detail of plasmodiocarp, showing limy plates, X50; d. Detail of capillitium, and spores, X250; e. Spore, X1000

201. *Leocarpus fragilis* (Dicks.) Rost. a Sporangia, X5; b Broken sporangium, X20; c. Detail of capillitium, and spores, X250; d. Spore, X1000

202. *Physarella oblonga* (Berk. & Curt.) Morgan. a. Three sporangia, X5; b. Open sporangium, showing spikes and pseudo-columella, X20; c. Sporangium before dehiscence, X20; d. Capillitium, spike, and spores, X250; e. Spore. X1000

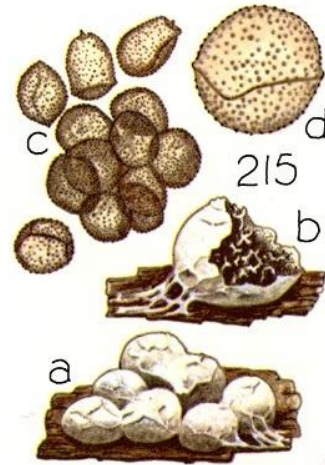
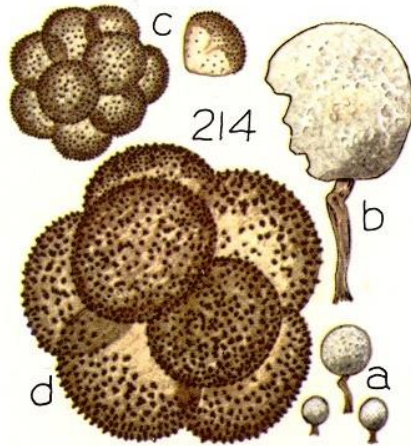
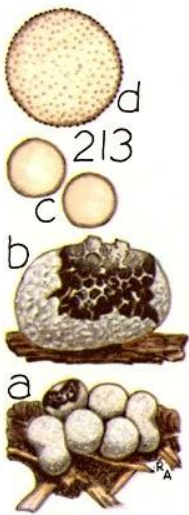
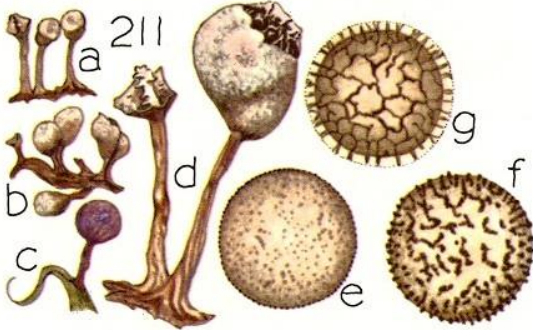
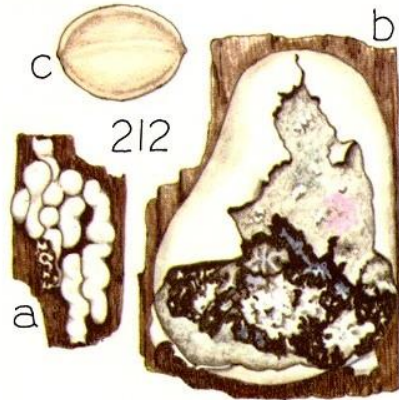
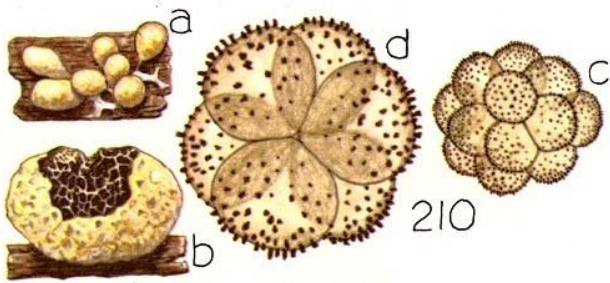
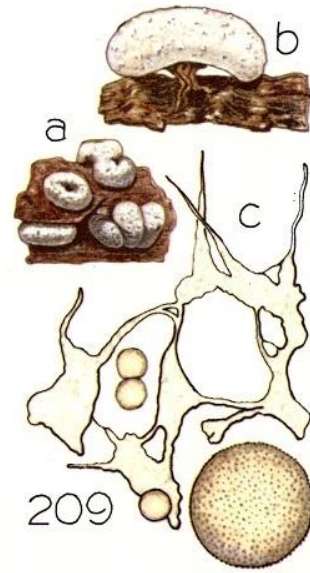
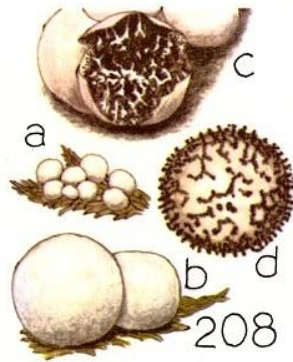
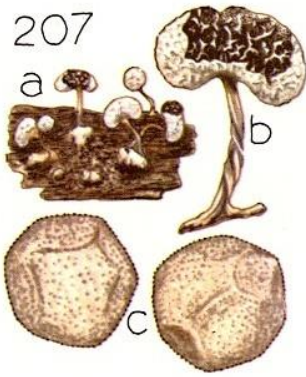
203. *Badhamia affinis* Rost. a. Cluster of sporangia, X5; b. Open sporangium, X20; c. Capillitium attached to peridium, X250; d. Spore, X1000

204. *Badhamia capsulifera* (Bull) Berk. a. Group of sporangia, X5; b. Single sporangium, X20; c. Cluster of spores, X500; d. Isolated spore, X1000

205. *Badhamia dearnessii* Hagelst. a. Group of sporangia, X5; b. Single sporangium, X20; c. Two spores, X1000

206. *Badhamia foliicola* A. Lister. a. Cluster of sporangia, X5; b. Sporangium, X20; c. Spore, X1000

Plate 23





## Plate 23 Captions

207. *Badhamia gracilis* (Macbr.) Macbr. a. Group of sporangia, X5; b. Sporangium, X20; c. Two spores, X1000

208. *Badhamia lilacina* (Fries) Rost. a. Group of sporangia, X5; b. Two sporangia, X20; c. Open sporangium, X20; d. Spore, X1000

209. *Badhamia macrocarpa* (Ces.) Rost. a. Group of sporangia, X5; b. Stalked sporangium, X20; c. Detail of capillitium, and spores, X250; d. Spore, X1000

210. *Badhamia nitens* Berk. a. Cluster of sporangia (after Lister), X5; b. Sporangium, X20; c. Cluster of spores, X500; d. Same, X1000

211. *Badhamia obovata* (Peck) S.J. Smith. a. Cluster of sporangia (Iowa), X5; b. Same (Massachusetts), X5; c. Sporangium of *B. rubiginosa* var. *globosa* (Wales), X5; d. Two sporangia (Iowa), one showing columella, X20; e. Spore (Iowa), X1000; f. Same of var. *dictyospora*, X1000; g. Same of var. *globosa* (Wales), X1000

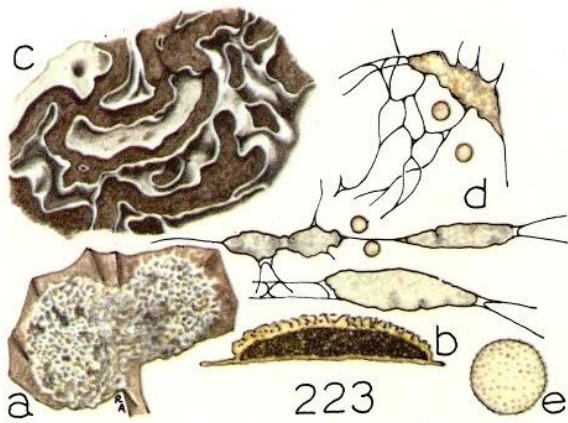
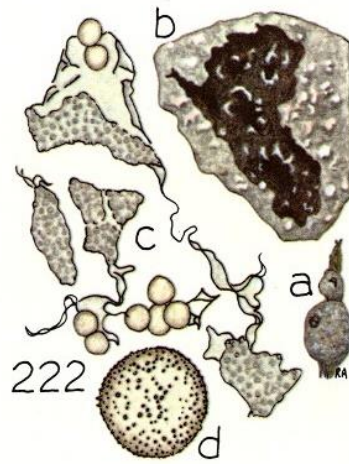
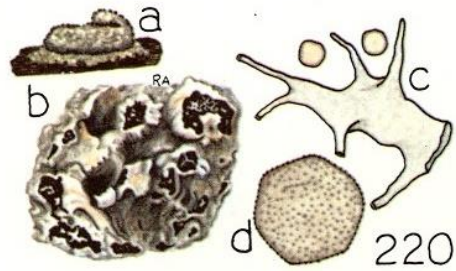
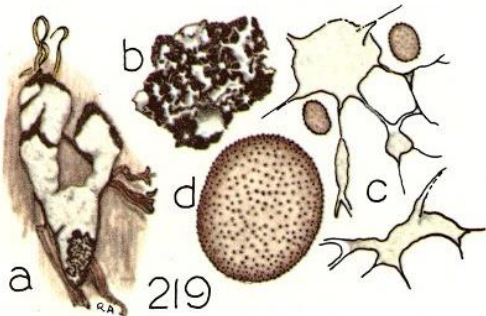
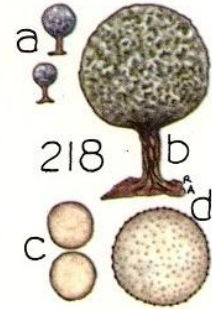
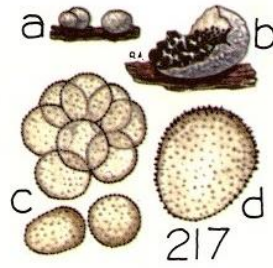
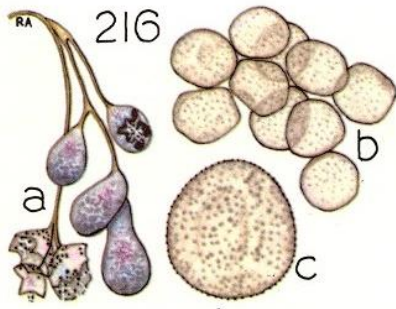
212. *Badhamia ovispora* Racib. a. Cluster of sporangia and plasmodiocarp, X5; b. Subplasmodiocarpous sporangium, X50; c. Spore, X1000

213. *Badhamia panicea* (Fries) Rost. a. Group of sporangia, X5; b. Sporangium, X20; c. Two spores, X500; d. Spore, X1000

214. *Badhamia papaveracea* Berk. & Rav. a. Three sporangia, X5; b. Sporangium, X20; c. Cluster of spores, with free spore, X500; d. Spore ball, X1000

215. *Badhamia populina* A. & G. Lister. a. Cluster of sporangia, X5; b. Sporangium, X10; c. Spores, partly clustered, X500; d. Spore, X1000

Plate 24



## Plate 24 Captions

216. *Badhamia utricularis* (Bull.) Berk. a. Cluster of pendent sporangia, X5; b. Loose cluster of spores, X500; c. Spore, X1000

217. *Badhamia versicolor* A. Lister. a. Three sporangia, X5; b. Sporangium, peridium partly shed, X2; c. Cluster of spores and two free spores, X500; d. Spore, X1000

218. *Badhamia viridescens* Meylan. a. Two sporangia, X5; b. Sporangium, X20; c. Two spores, X500; d. Spore, X1000

219. *Fuligo cinerea* (Schw.) Morgan. a. Fragment of reticulate aethalium, X1; b. Detail of same, showing capillitium imbedded in spore-mass, X20; c. Detail of capillitium, and spores, X250; d. Spore, X1000

220. *Fuligo intermedia* Macbr. a. Small aethalium, X1; b. Detail of broken aethalium, X20; c. Detail of capillitium, and spores, X250; d. Spore, X1000

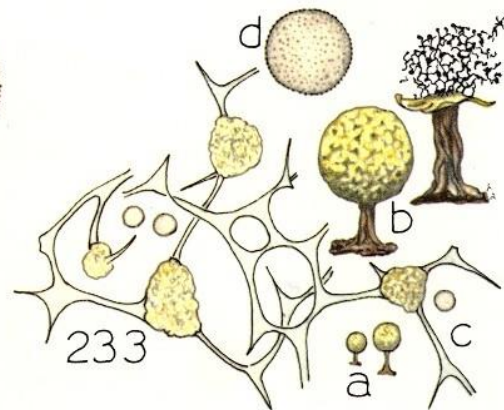
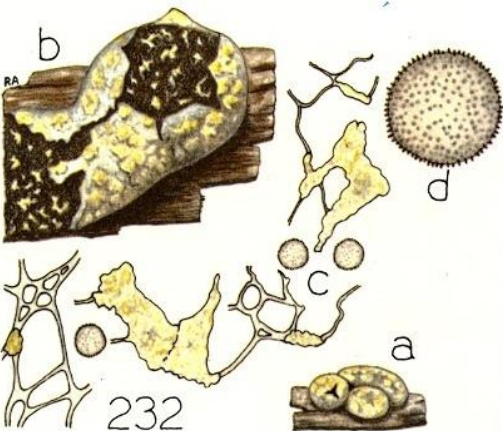
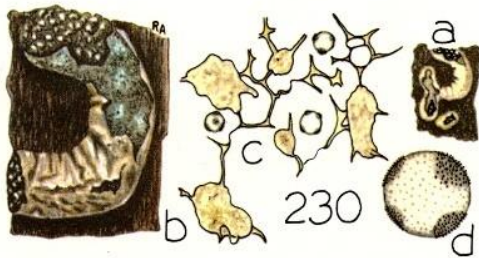
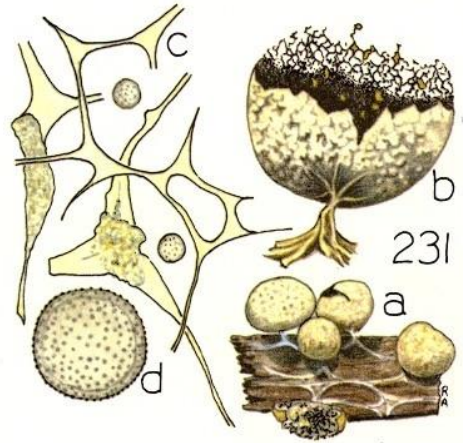
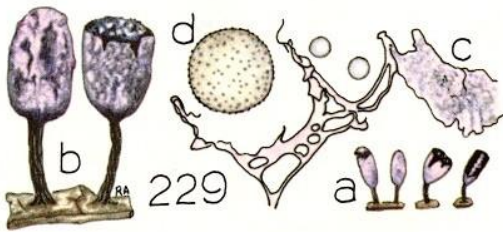
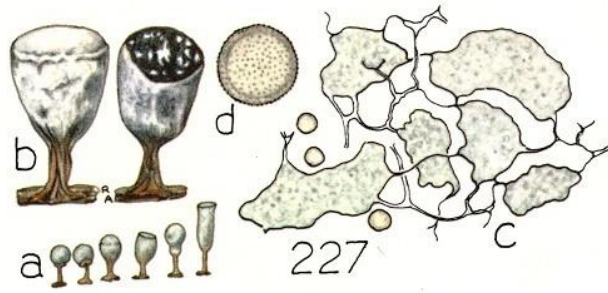
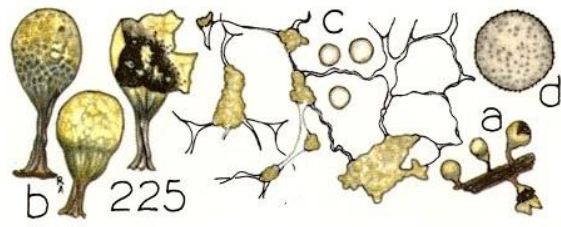
221. *Fuligo megaspora* Sturgis. a. Aethalium, X1; b. Detail of broken aethalium, X2; c. Detail of capillitium, and spores, X250; d. Spore, X1000

222. *Fuligo muscorum* Alb. & Schw. a. Aethalium, X1; b. Detail of same, X20; c. Capillitium and spores, X250; d. Spore, X1000

223. *Fuligo septica* (L.) Wiggers. a. Small aethalium, X1; b. Same, in section, X1; c. Detail with cortex removed, X2; d. Detail of capillitium, and spores, X250; d. Spore, X1000

224. *Erionema aureum* Penzig. a. Pendent plasmodiocarps, X10; b. Detail, X25; c. Detail of capillitium, and spores, X250; d. Spore. X1000

Plate 25



## Plate 25 Captions

225. *Craterium aureum* (Schum.) Rost. a. Four sporangia, X5; b. Three sporangia, X20; c. Detail of capillitium, and spores, X250; d. Spore, X1000

226. *Craterium concinnum* Rex. a. Three sporangia, X5; b. Two sporangia, X20; c. Sporangium, X50; d. Detail of capillitium, and spores, X250; e. Spore, X1000

227. *Craterium leucocephalum* (Pers.) Ditmar. a. Six sporangia, to show variation, X5; b. Two sporangia, X20; c. Detail of capillitium, and spores, X250; d. Spore, X1000

228. *Craterium minutum* (Leers) Fries. a. Four sporangia, X5; b. Two sporangia, X20; c. Detail of capillitium, and spores, X250; d. Spore, X1000

229. *Craterium paraguayense* (Speg.) G. Lister. a. Four sporangia, X5; b. Two sporangia, X20; c. Detail of capillitium, and spores, X250; d. Spore, X1000

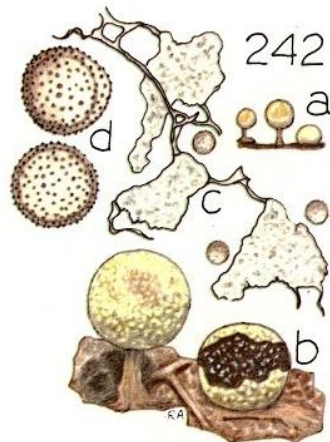
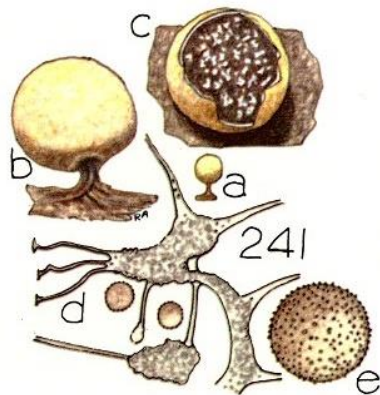
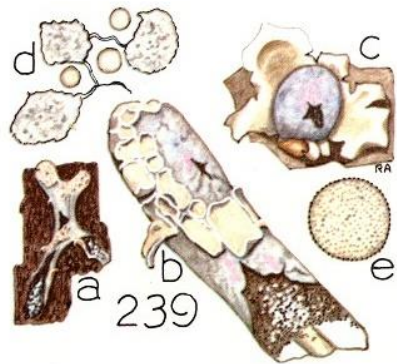
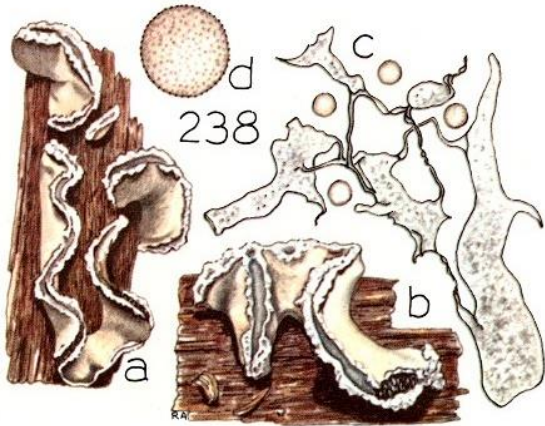
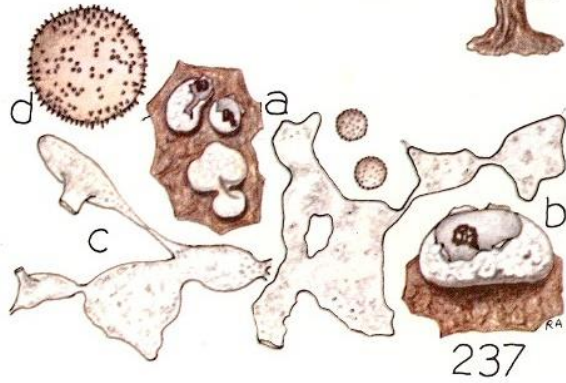
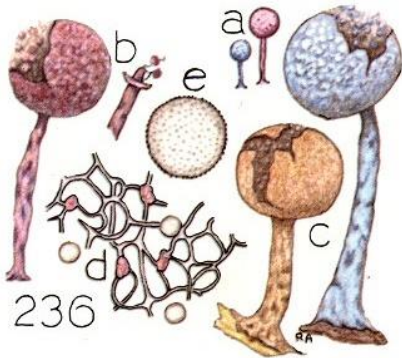
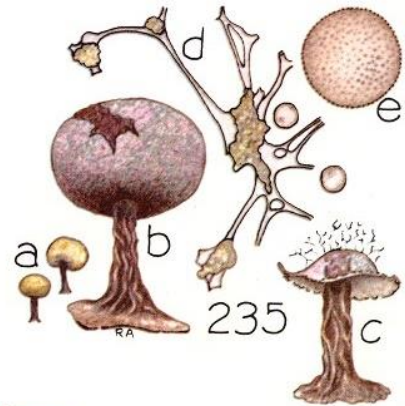
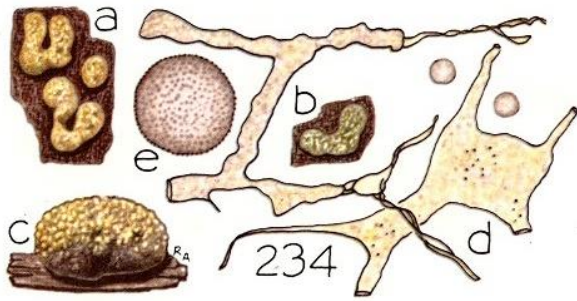
230. *Physarum aeneum* (A. Lister) R.E. Fries. a. Sporangium and small plasmodiocarp, X5; b. Portion of plasmodiocarp, X20; c. Detail of capillitium, and spores, X250; d. Spore, X1000

231. *Physarum albescens* Ellis. a. Group of sporangia, X5; b. Sporangium, X20; c. Detail of capillitium, and spores, X250; d. Spore, X1000

232. *Physarum alpinum* (A. & G. Lister) G. Lister. a. Cluster of fructifications, X5; b. Portion of same, X20; c. Detail of capillitium, and spores, X250; d. Spore, X1000

233. *Physarum auripigmentum* Martin. a. Two sporangia, X5; b. Two sporangia, X20; c. Detail of capillitium, and spores, X250; d. Spore, X1000

Plate 26



## Plate 26 Captions

234. *Physarum auriscalpium* Cooke. a. Two plasmodiocarps and pulvinate sporangium, yellow phase, X5; b. Plasmodiocarp, green phase, X5; c. Pulvinate sporangium, with limeless base, X20; d. Detail of capillitium, and spores, X250; e. Spore, X1000

235. *Physarum bethelii* Macbr. a. Two sporangia, X5; b. Sporangium, X20; c. Nearly empty sporangium (type), X20; d. Detail of capillitium, and spores, X250; e. Spore, X1000

236. *Physarum bilgramii* Hagelst. a. Two sporangia, different collections, X5; b. Sporangium, and tip of stalk, showing columella, X20; c. Two sporangia, from other fruitings, X20; d. Detail of capillitium, and spores, X250; e. Spore, X1000

237. *Physarum bitectum* G. Lister. a. Cluster of fructifications, X5; b. Sporangium, X20; c. Detail of capillitium, and spores, X250; d. Spore, X1000

238. *Physarum bivalve* Pers. a. Cluster of fructifications, X5; b. Plasmodiocarp, X10; c. Detail of capillitium, and spores, X25; d. Spore, X1000

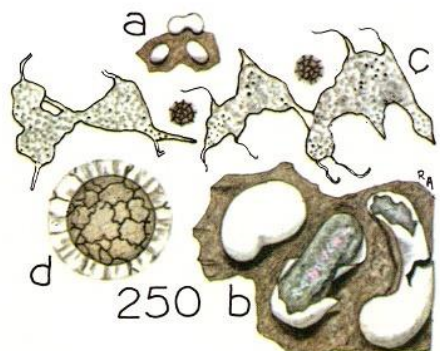
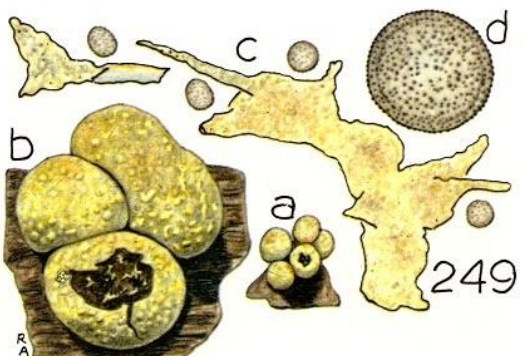
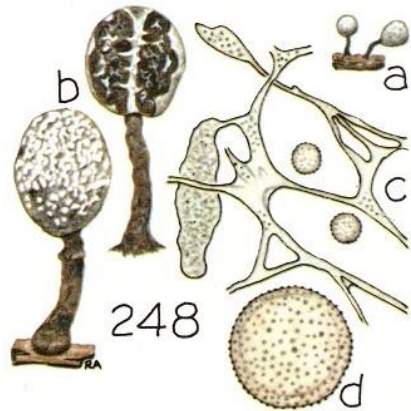
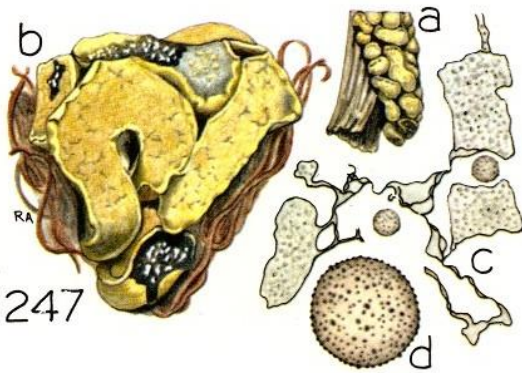
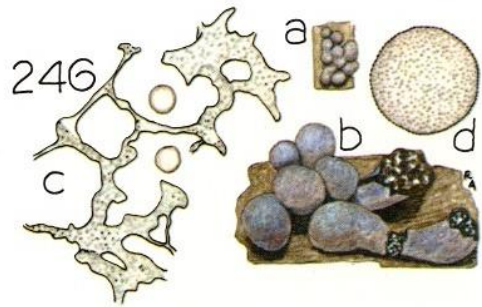
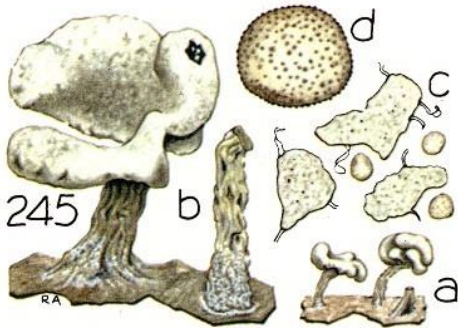
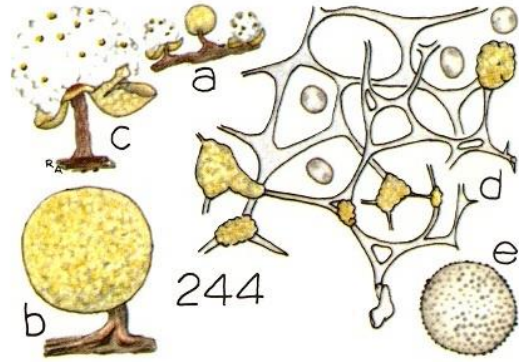
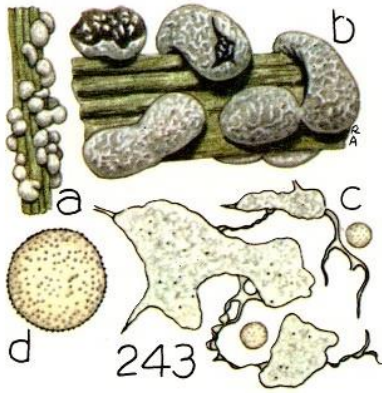
239. *Physarum bogoriense* Racib. a. Portion of plasmodiocarp, X5; b. Same, X20; c. Sporangiate fruiting, X20; d. Detail of capillitium, and spores, X250; e. Spore, X1000

240. *Physarum braunianum* de Bary. a. Five sporangia, X5; b. Sporangium, X50; c. Detail of capillitium, and spores, X250; d. Spore, X1000

241. *Physarum brunneolum* (Phill.) Masee. a. Sporangium, X5; b. Sporangium, X20; c. Same, from above showing double wall, X20; d. Detail of capillitium, and spores, X250; e. Spore, X1000

242. *Physarum carneum* G. Lister & Sturgis. a. Three sporangia, X5; b. Two sporangia, X20; c. Detail of capillitium, and spores, X250; d. Two spores, X1000

Plate 27





## Plate 27 Captions

243. *Physarum cinereum* (Batsch) Pers. a. Cluster of sporangia, X5; b. Smaller cluster, showing subplasmodiocarpous fruitings, X20; c. Detail of capillitium, and spores, X250; d. Spore, X1000

244. *Physarum citrinum* Schum. a. Three sporangia, X5; b/c Two sporangia, X20; d. Detail of capillitium, and spores, X250; e. Spore, X1000

245. *Physarum compressum* Alb. & Schw. a. Two sporangia, X5; b. Sporangium and stalk of another, X20; c. Detail of capillitium, and spores, X250; d. Spore, X1000

246. *Physarum confertum* Macbr. a. Cluster of sporangia, X5; b. Same, X20; c. Detail of capillitium, and spores, X250; d. Spore X1000

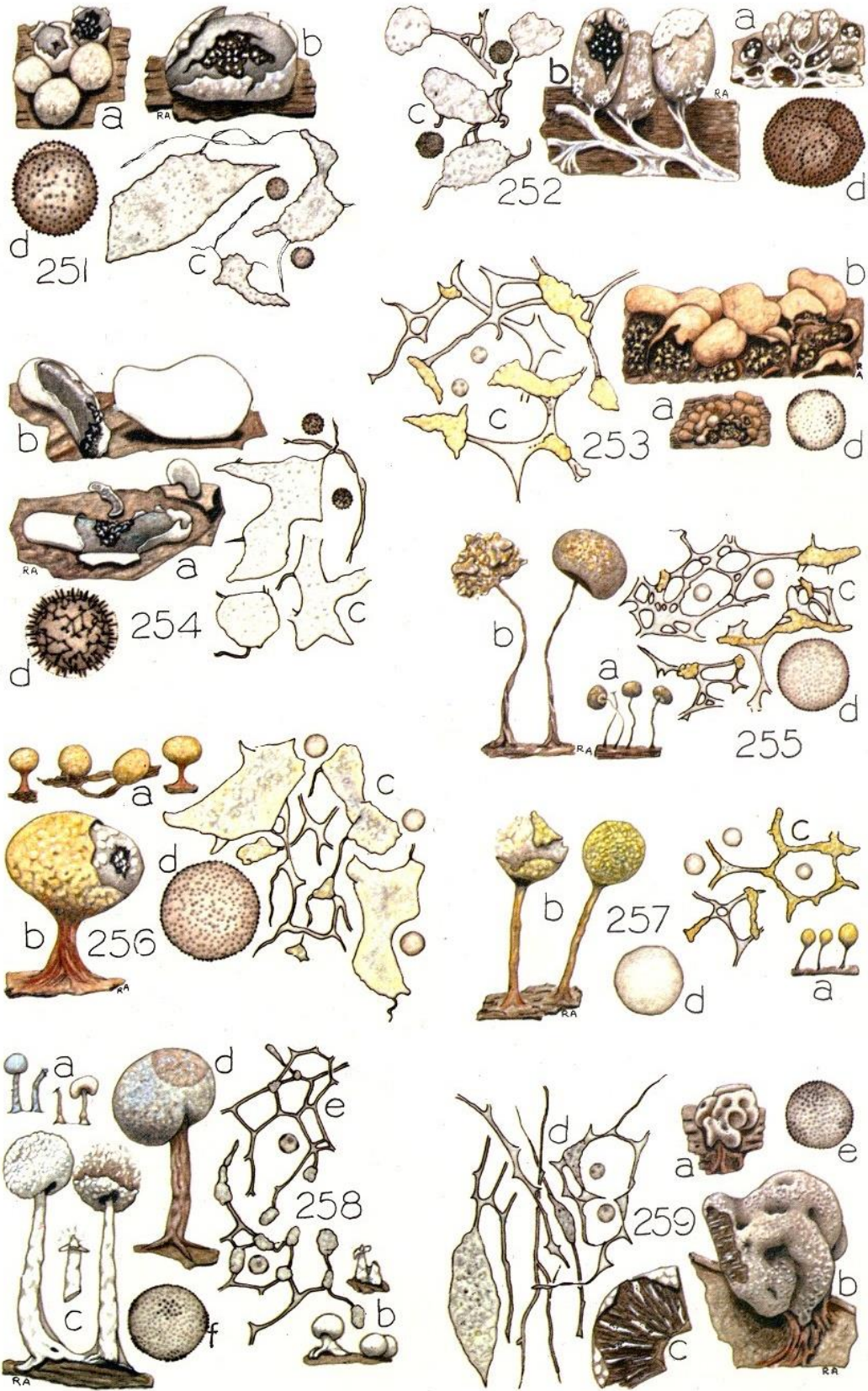
247. *Physarum contextum* (Pers.) Pers. a. Portion of an extensive fruiting, X5; b. Same, X20 c. Detail of capillitium, and spores, X250; d. Spore, X1000

248. *Physarum crateriforme* Petch. a. Two sporangia, X5; b. Two sporangia, the one at right showing columella, X20; c. Detail of capillitium, and spores, X250; d. Spore, X1000

249. *Physarum decipiens* Curtis. a. Cluster of sporangia, X5; b. Same, X20; c. Detail of capillitium and spores, X250; d. Spore, X1000

250. *Physarum dictyosporum* Martin. a. Three sporangia, X5; b. Three fructifications approaching plasmodiocarp type, X20; c. Detail of capillitium, and spores, X250; d. Spore, X1000

Plate 28



## Plate 28 Captions

251. *Physarum diderma* Rost. a. Cluster of sporangia, X5; b. Sporangium, X20; c. Detail of capillitium, and spores, X250; d. Spore, X1000

252. *Physarum didermoides* (Pers.) Rost. a. Portion of large fruiting, X5; b. Three sporangia, X20; c. Detail of capillitium, and spores, X250; d. Spore, X1000

253. *Physarum digitatum* G. Lister & Farq. a. Cluster of Sporangia, X5; b. Detail of same, X20; c. Detail of capillitium, and spores, X250; d. Spore, X1000

254. *Physarum echinosporum* C. Lister. a. Cluster of plasmodiocarps, X5; b. Two plasmodiocarps, X10; c. Detail of capillitium, and spores, X250; d. Spore, X1000

255. *Physarum flavicomum* Berk. a. Three sporangia with stalk of another, X5; b. Two sporangia, X20, c. Detail of capillitium, and spores, X250; d. Spore, X1000

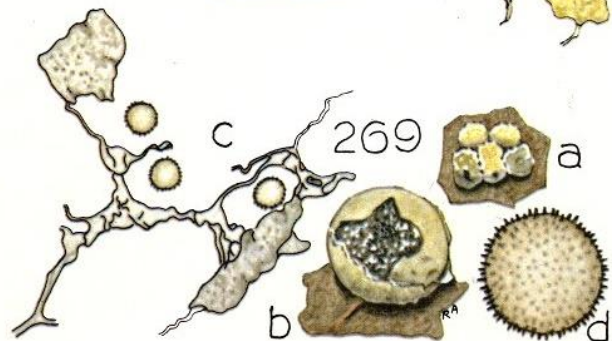
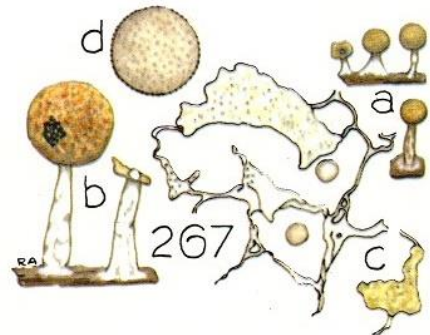
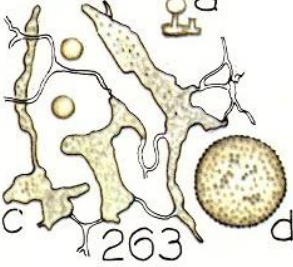
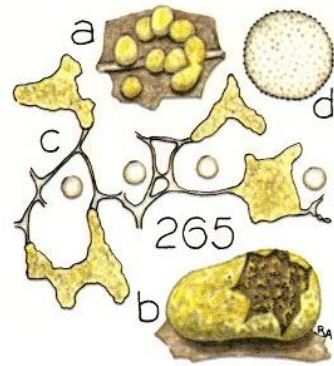
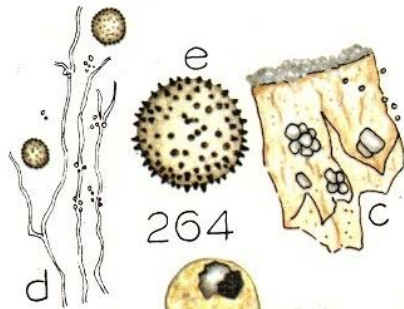
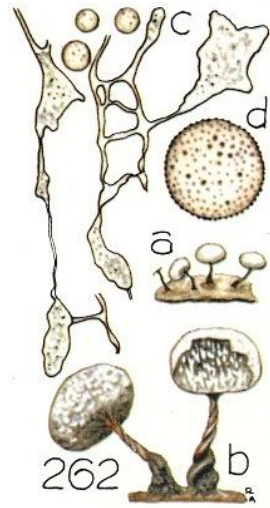
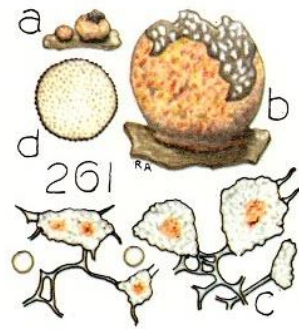
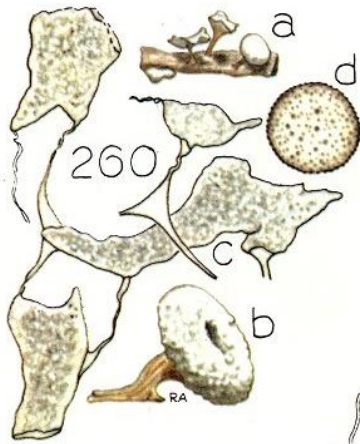
256. *Physarum flavidum* (Peck) Peck. a. Four sporangia, X5; b. Sporangium, X20; c. Detail of capillitium, and spores, X250; d. Spore, X1000

257. *Physarum galbeum* Wingate. a. Three sporangia, X5; b. Two sporangia, X20; c. Detail of capillitium, and spores, X250; d. Spore, X1000

258. *Physarum globuliferum* (Bull.) Pers. a. Two sporangia, with stalks of two others, one showing columella, X5; b. Other sporangia and stalks, to show variation, X5; c. Two sporangia, with tip of another showing columella, X20; d. Sporangium, pinkish phase with scanty lime, X20; e. Detail of capillitium, and spores, X250; f. Spore, X1000

259. *Physarum gyrosum* Rost. a. Small plasmodiocarp, X5; b. Same, X20; c. Detail of same, showing spike-like nodes, X50; d. Detail of capillitium, and spores, X250; e. Spore, X1000

Plate 29



## Plate 29 Captions

260. *Physarum javanicum* Racib. a. Cluster of sporangia, X5; b. Sporangium, X20; c. Detail of capillitium, and spores, X25; d. Spore, X1000

261. *Physarum lateritium* (Berk. & Rav.) Morgan. a. Two sporangia, X5; b. Sporangium, X20; c. Detail of capillitium, and spores, X25; d. Spore, X1000

262. *Physarum leucophaeum* Fries. a. Three sporangia, X5; b. Two sporangia, X20; c. Detail of capillitium, and spores, X250; d. Spore, X1000

263. *Physarum leucopus* Link. a. Sporangium, X5; b. Two sporangia, X20; c. Detail of capillitium, and spores, X250; d. Spore, X1000

264. *Physarum listeri* Macbr. a. Two sporangia, X5; b. Two sporangia, X10; c. Portion of stem, showing crystalline inclusions, X50; d. Detail of capillitium, and spores, X250; e. Spore, X1000

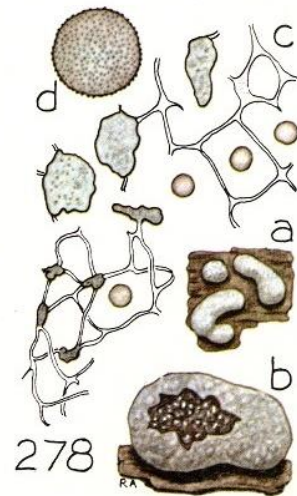
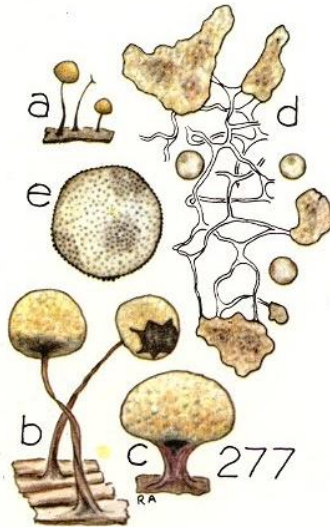
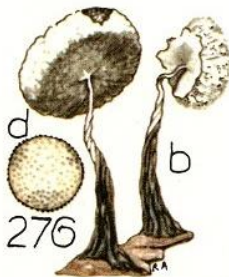
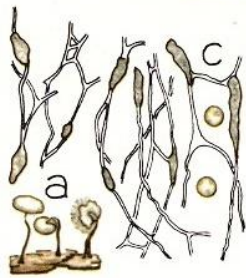
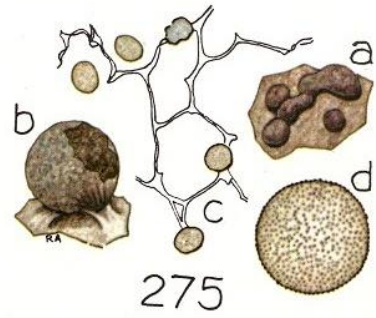
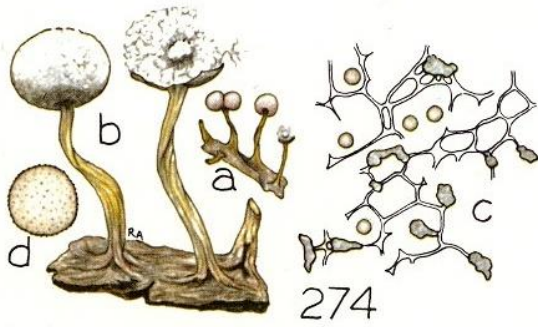
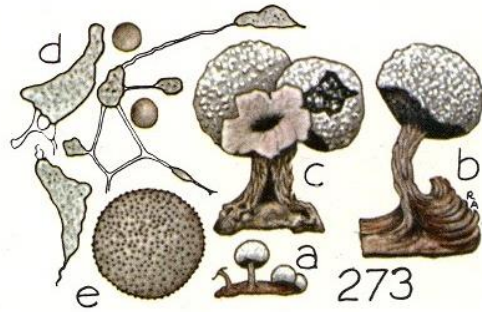
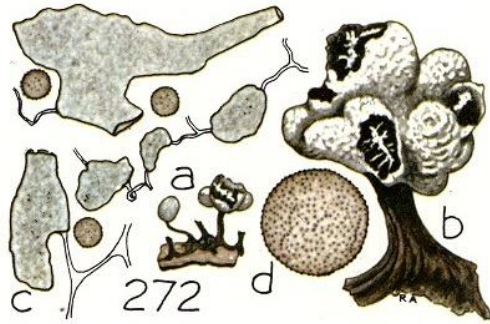
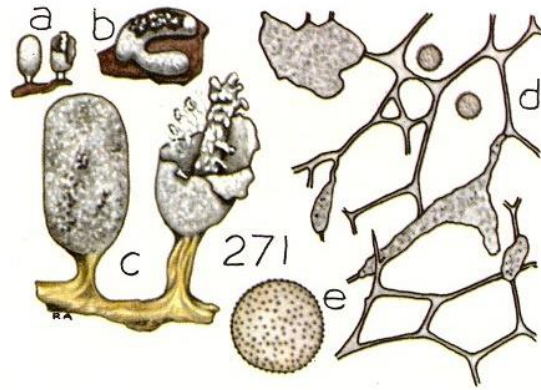
265. *Physarum lutescens* Peck. a. Cluster of sporangia, X5; b. Sporangium, X20; c. Detail of capillitium, and spores, X250; d. Spore, X1000

266. *Physarum megalosporum* Macbr. a. Three sporangia, X5; b. Two sporangia, X20; c. Detail of capillitium, and spores, X250; d. Spore, X1000

267. *Physarum melleum* (Berk. & Br.) Masee. a. Four sporangia, X5; b. Sporangium, and base of another, showing columella, X20; c. Detail of capillitium, and spores, X250; d. Spore, X1000

268. *Physarum mennegae* Nann.-Brem. a. Sporangium, X5; b. Same, with stalk showing columella, X20; c. Detail of capillitium, and spores, X250; d. Spore, X1000

269. *Physarum mortoni* Macbr. a. Cluster of sporangia, X5; b. Sporangium, with weak, prostrate stalk, 5X; c. Detail of capillitium, and spores, X250; d. Spore, X1000



## Plate 30 Captions

270. *Physarum murinum* A. Lister. a. Two sporangia, X5; b. Two sporangia, one showing columella, X20; c. Detail of capillitium, and spores, X250; d. Spore, X1000

271. *Physarum mutabile* (Rost) G. Lister. a. Two sporangia, X5; b. Plasmodiocarp (after Lister), X5; c. Two sporangia, one showing columella, X20; d. Detail of capillitium, and spores, X250; e. Spore, X1000

272. *Physarum nicaraguense* Macbr. a. Two sporangia, with stalks of others, X1; b. Sporangium, X20; c. Detail of capillitium, and spores, X250; d. Spore, X1000

273. *Physarum notabile* Macbr. a. Cluster of sporangia, X5; b. Isolated sporangium, X20; c. Cluster of sporangia, X20; d. Detail of capillitium, and spores, X250; e. Spore, X1000

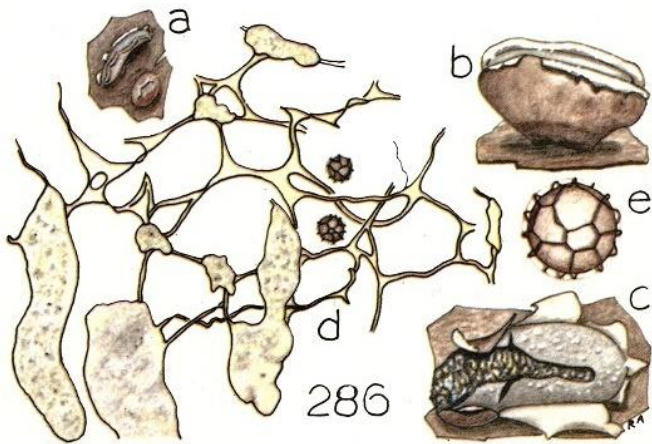
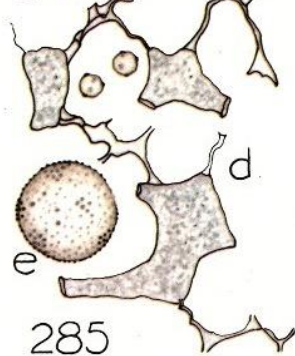
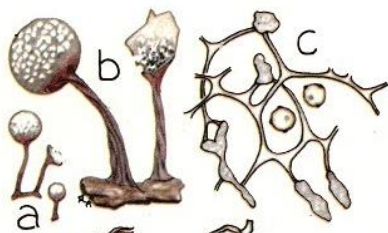
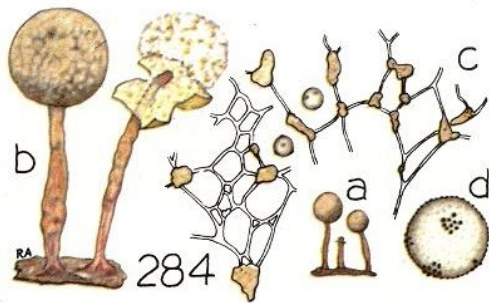
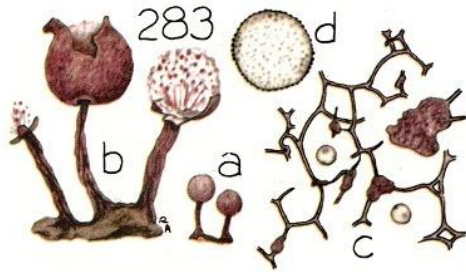
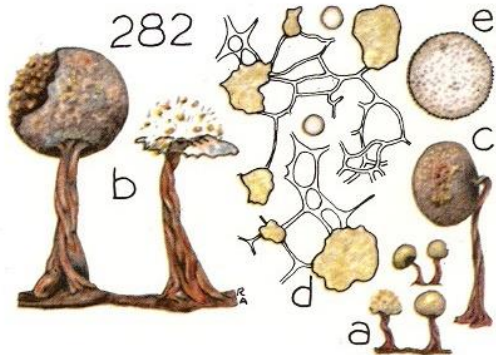
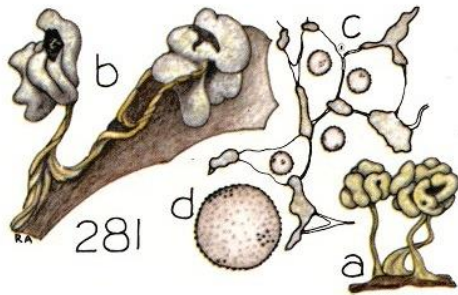
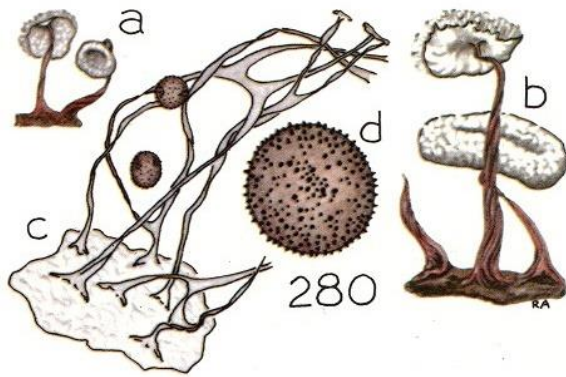
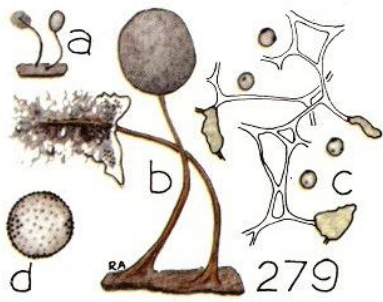
274. *Physarum nucleatum* Rex. a. Cluster of sporangia, X5; b. Two sporangia, X20; c. Detail of capillitium, and spores, X250; d. Spore, X1000

275. *Physarum nudum* Macbr. a. Cluster of sporangia, X5; b. Sporangium, X40; c. Detail of capillitium, and spores, X250; d. Spore, X1000

276. *Physarum nutans* Pers. a. Three sporangia, X5; b. Two sporangia, X20; c. Detail of capillitium, and spores, X250; d. Spore, X1000

277. *Physarum oblatum* Macbr. a. Two sporangia, with stalk of another, X5; b. Two sporangia, X20; c. Flabellate sporangium with short stem from same fruiting as b, X20; d. Detail of capillitium, and spores, X250; e. Spore, X1000

278. *Physarum ovisporum* G. Lister. a. Sporangium and small plasmodiocarps, X5; b. Sporangium, X20; c. Detail of capillitium, and spores, X250; d. Spore, X1000





## Plate 31 Captions

279. *Physarum penetrale* Rex. a. Two sporangia, X5; b. Same, X20; c. Detail of capillitium, and spores, X250; d. Spore, X1000

280. *Physarum pezizoideum* (Jungh.) Pav. & Lag. var. *pezizoideum*. A. Two sporangia, X5; b. Same, X20; c. Detail of capillitium, showing attachment to base of peridium, and spores, X250; d. Spore, X1000

281. *Physarum polycephalum* Schw. a. Two sporangia, X5; b. Same, X20; c. Detail of capillitium, and spores, X250; d. Spore, X1000

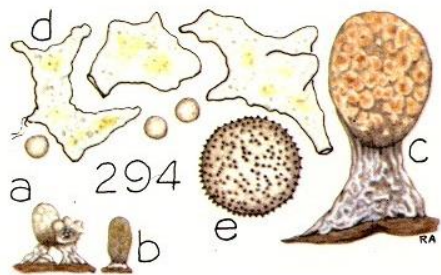
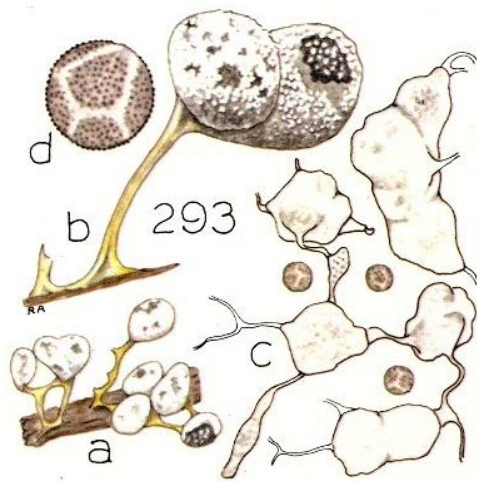
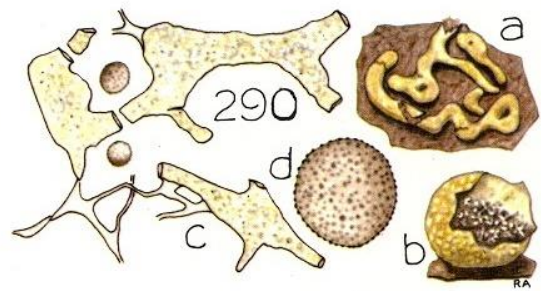
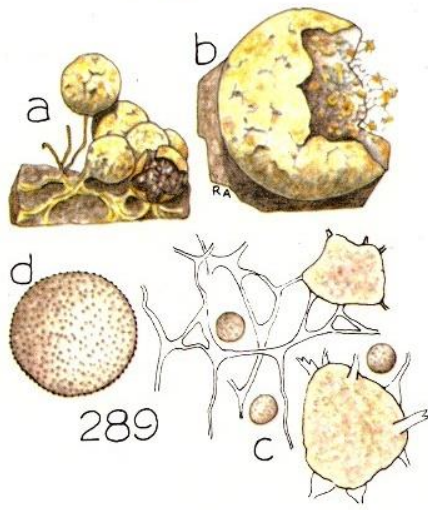
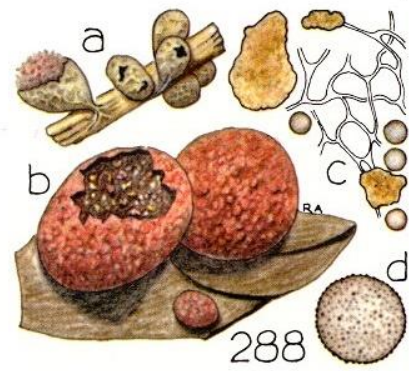
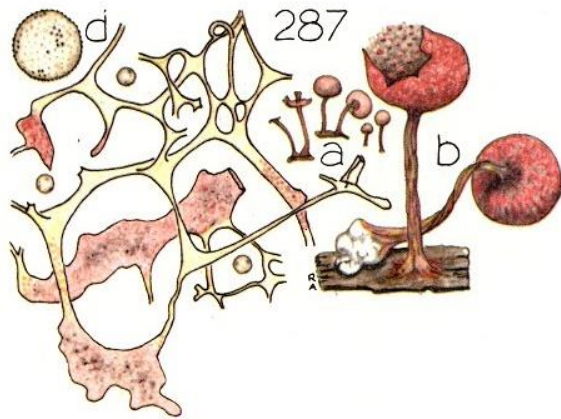
282. *Physarum psittacinum* Ditmar. a. Four sporangia, X5; b/c. Three sporangia, X20; d. Detail of capillitium, and spores, X250; e. Spore, X1000

283. *Physarum pulcherrimum* Berk. & Rav. a. Two sporangia, X5; b. Two sporangia and remains of third, showing columella, X20; c. Detail of capillitium, and spores, X250, d. Spore, X1000

284. *Physarum pulcherripes* Peck. a. Two sporangia and remnant of third, showing columella, X5; b. Two sporangia, X20, c. Detail of capillitium, and spores, X250; d. Spore, X1000

285. *Physarum pusillum* (Berk. & Curt.) G. Lister. a. Three sporangia, X5; b. Two sporangia, X20; c. Detail of capillitium, and spores from collection with physaroid capillitium, X250; d. Same, from collection with somewhat badhamioid capillitium, X250; e. Spore, X1000

286. *Physarum retisporum* Martin, Thind & Rehill. a. Two fructifications, X5; b. Sporangiate fruiting, X20; c. Plasmodiocarpous fruiting, X20; d. Detail of capillitium, and spores, X250; e. Spore, X1000



## Plate 32 Captions

287. *Physarum roseum* Berk. & Br. a. Six sporangia, X5; b. Two sporangia, X20; c. Detail of capillitium, and spores, X250; d. Spore, X1000

288. *Physarum rubiginosum* Fries. a. Cluster of brown sporangia, X5; b. Two red sporangia, X20; c. Detail of capillitium, and spores, X250; d. Spore, X1000

289. *Physarum rubronodum* Martin. a. Part of a cluster of sporangia, X5; b. Sporangium, X20; c. Detail of capillitium, and spores, X250; d. Spore, X1000

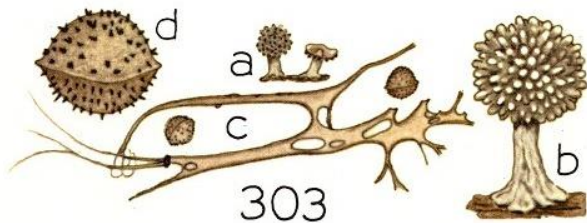
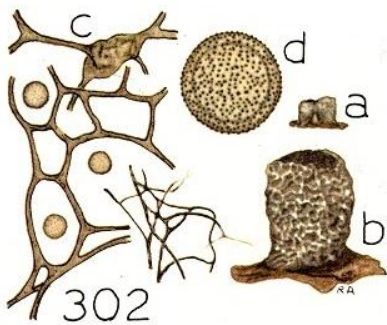
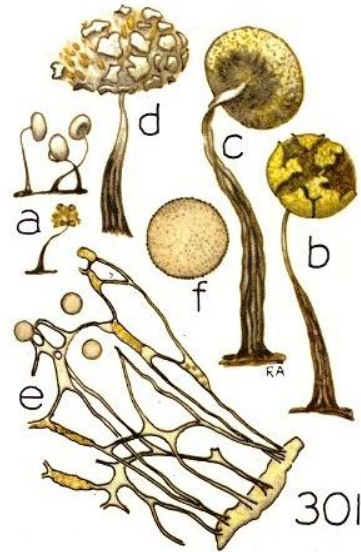
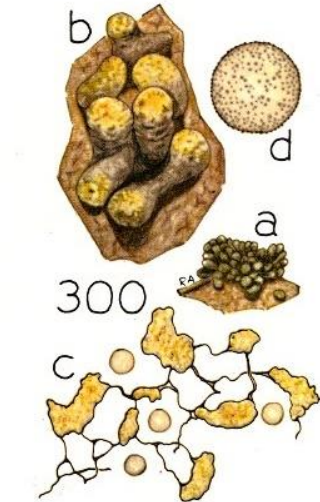
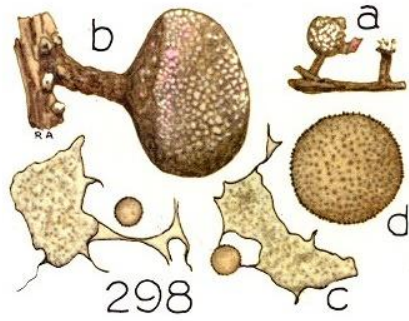
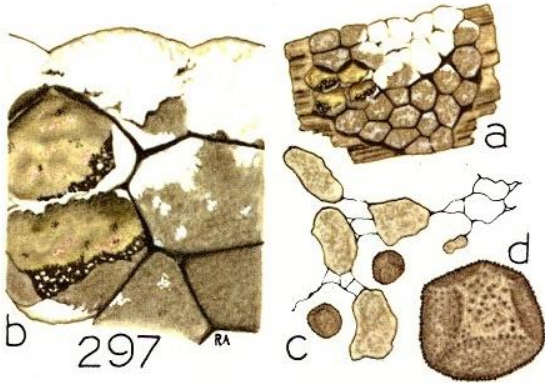
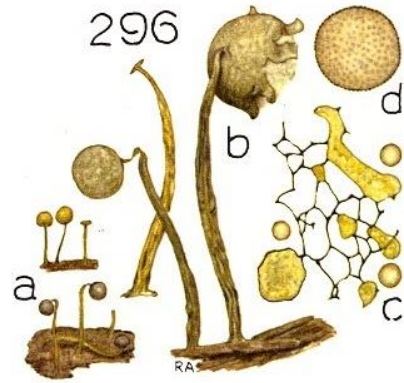
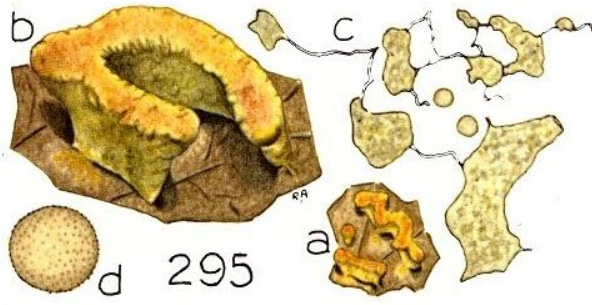
290. *Physarum serpula* Morgan. a. Plasmodicarps, X5; b. Sporangiate fruiting, X20; c. Detail of capillitium, and spores, X250; d. Spore, X1000

291. *Physarum spinulosum* Thind & Sehgal. a. Cluster of sporangia, X5; b. Same, X10; c. Detail of capillitium, and spores, X250; d. Spore, X1000

292. *Physarum stellatum* (Masse) Martin. a. Cluster of sporangia (after Lister), X5; b. Two sporangia, X20; c. Detail of capillitium, and spores, X250; d. Spore, X1000

293. *Physarum straminipes* A. Lister. a. Cluster of sporangia, X5; b. Two sporangia, the stalks fused, X20; c. Detail of capillitium, and Spores, X250; d. Spore, X1000

294. *Physarum sulphureum* Alb. & Schw. a. Two stalked sporangia, X5; b. Sessile sporangium, X5; c. Sporangium, X20; d. Detail of capillitium, and spores, X250; e. Spore, X1000



## Plate 33 Captions

295. *Physarum superbum* Hagelst. a. Sporangium and plasmodiocarps, X5; b. Plasmodiocarp, X20; c. Detail of capillitium, and spores, X250; d. Spore, X1000

296. *Physarum tenerum* Rex. a. Sporangia, X5; b. Two sporangia, X20; c. Detail of capillitium, and spores, X250; d. Spore, X1000

297. *Physarum tessellatum* Martin & Farr. a. Cluster of sporangia, X5; b. Portion of same, X20; c. Detail of capillitium, and spores, X250; d. Spore, X1000

298. *Physarum tropicale* Macbr. a. Sporangium and stalk of another, X5; b. Sporangium, X20; c. Detail of capillitium, and spores, X250; d. Spore, X1000

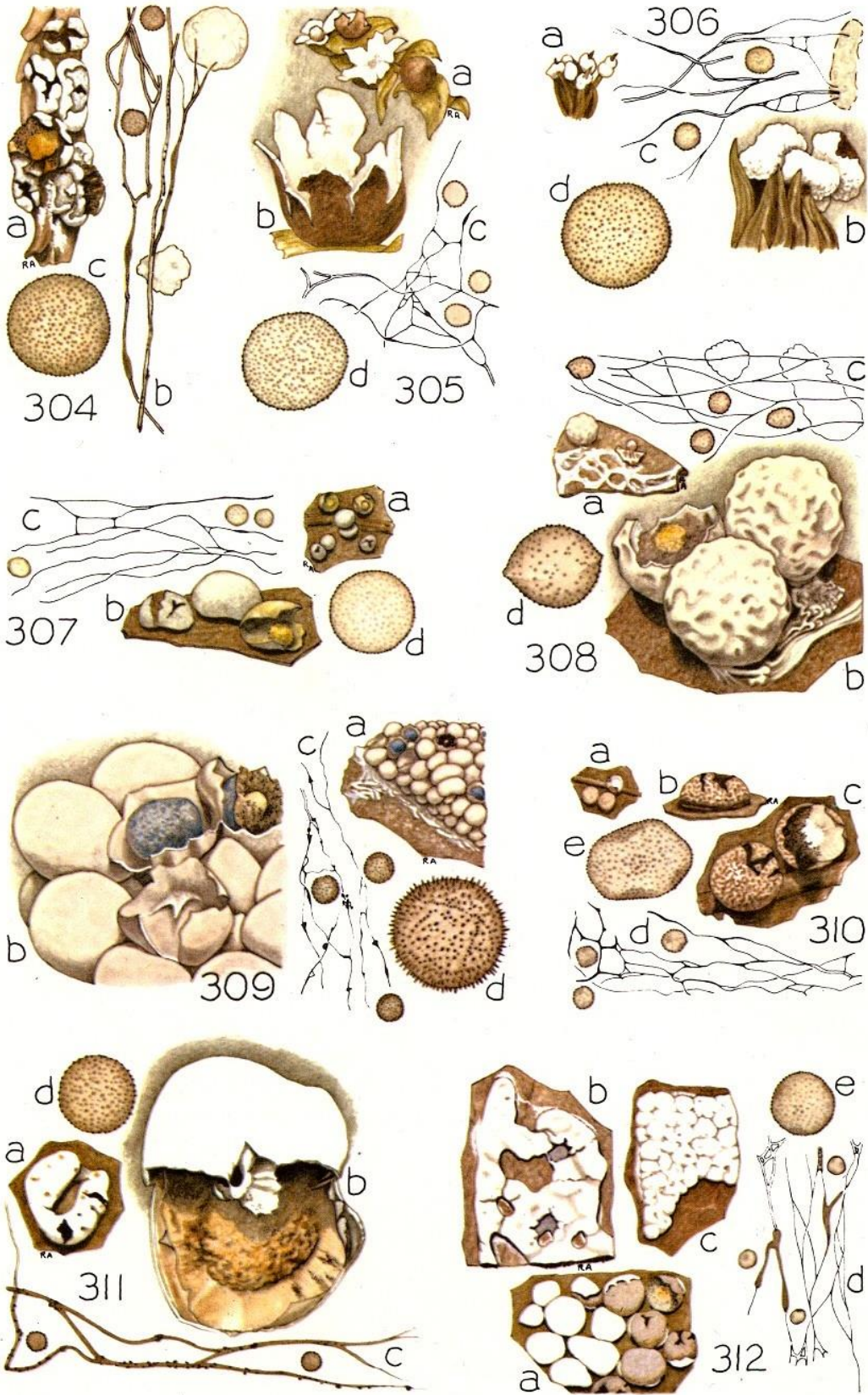
299. *Physarum vernum* Somm. a. Two clustered fructifications, X5; b. Detail of capillitium, and spores, X250; c. Spore, X1000

300. *Physarum virescens* Ditmar. a. Cluster of sporangia, X5; b. Same, X20; c. Detail of capillitium and spores, X250; d. Spore, X1000

301. *Physarum viride* (Bull.) Pers. a. Four sporangia, X5; b. Yellow sporangium with broken peridium X20; c. Paler sporangium, X20; d. White sporangium showing yellow nodes; e. Detail of capillitium, and spores, X250; f. Spore, X1000

302. *Wilczekia evelinae* Meylan. a. Two sporangia, X5; b. Sporangium, X20; c. Detail of capillitium, and spores, X250; d. Spore, X1000

303. *Physarina echinospora* Thind & Maocha. A. Two sporangia, X5; b. Sporangium, X20; c. Detail of capillitium, and spores, X250; d. Spore, X1000



## Plate 34 Captions

304. *Diderma alpinum* Meylan. a. Part of a large cluster of fruitings, X5; b. Detail of capillitium, calcareous body, and spores, X250; c. Spore, X1000

305. *Diderma asteroides* (A. & G. Lister) G. Lister. a. Group of sporangia, X5; b. Open sporangium, X20; c. Detail of capillitium, with spores, X250; d. Spore, X1000

306. *Diderma chondrioderma* (de Bary & Rost.) G. Lister. a. Cluster of sporangia, X5; b. Same, X20; c. Detail of capillitium, with tips attached to peridium, and spores, X250; d. Spore, X1000

307. *Diderma cinereum* Morgan. a. Cluster of sporangia, X5; b. Same, X20; c. Detail of capillitium, and spores, X250; d. Spore, X1000

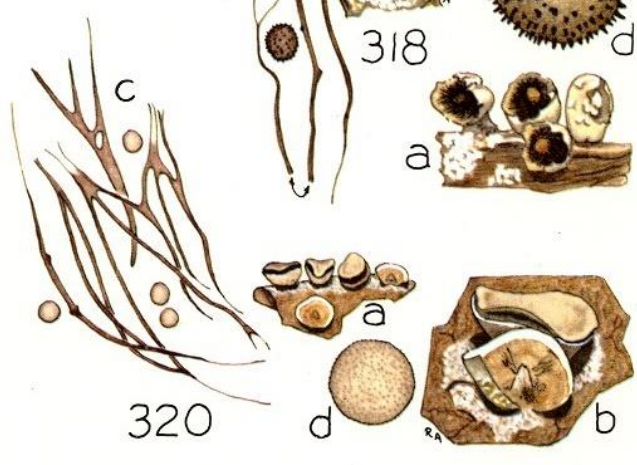
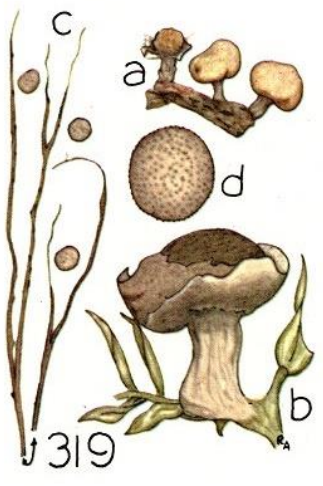
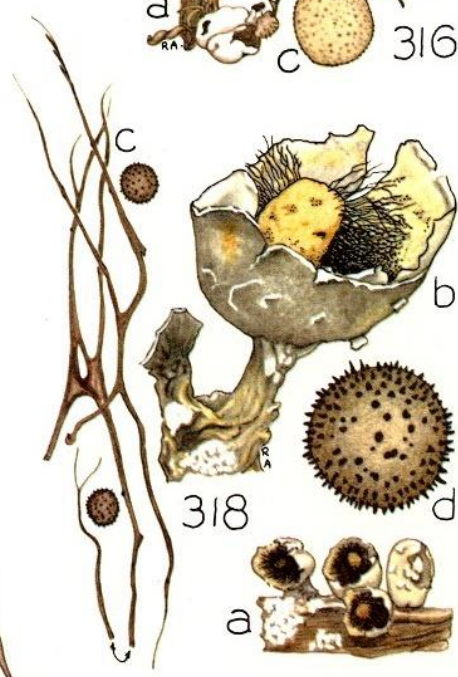
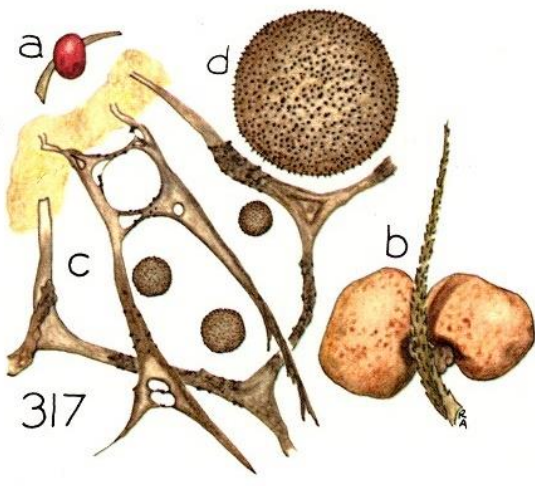
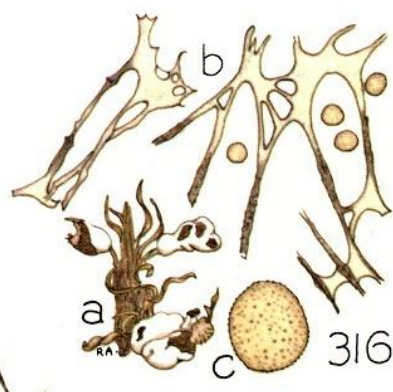
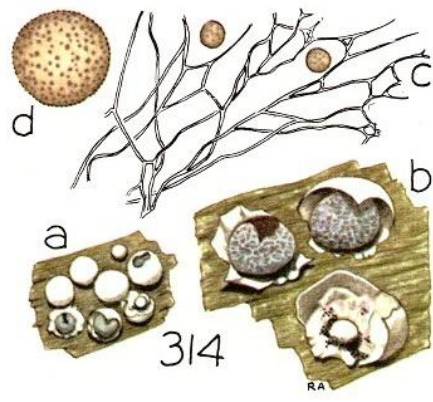
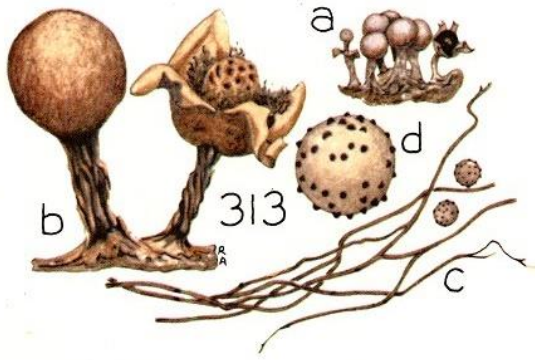
308. *Diderma cor-rubrum* Macbr. a. Two sporangia, with hypothallus, X5; b. Three sporangia, one showing columella, X20; c. Detail of capillitium, with spores and crystalline bodies, X250; d. Spore, X1000

309. *Diderma crustaceum* Peck. a. Part of an extensive fruiting, X5; b. Portion of same, X20; c. Detail of capillitium, and spores, X250; d. Spore, X1000

310. *Diderma darjeelingense* Thind and Sehgal. a. Three sporangia, X5; b/c. Three sporangia, X20; d. Detail of capillitium, and spores, X250; e. Spore, X1000

311. *Diderma deplanatum* Fries. a. Plasmodiocarp, X5; b. Annulate plasmodiocarp, showing inner wall, X20; c. Detail of capillitium, and spores, X250; d. Spore, X1000

312. *Diderma effusum* (Schw.) Morgan. a. Part of a large sporangiate fruiting, X5; b. Plasmodiocarp, X5; c. Mass of small, almost merged sporangia, X5; d. Detail of capillitium, and spores, X250; e. Spore, X1000





## Plate 35 Captions

313. *Diderma floriforme* (Bull.) Pers. a. Cluster of sporangia, X5; b. Two sporangia, X20; c. Detail of capillitium, and spores, X250; d. Spore, X1000

314. *Diderma globosum* Pers. a. Group of sporangia, X5; b. Three sporangia, X20; c. Detail of capillitium, and spores, X250; d. Spore, X1000

315. *Diderma hemisphaericum* (Bull.) Hornem. a. Group of sporangia, X5; b. Sporangium, X20; c. Detail of capillitium, and spores, X250, d. Spore, X1000

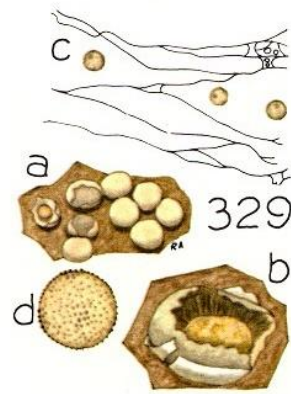
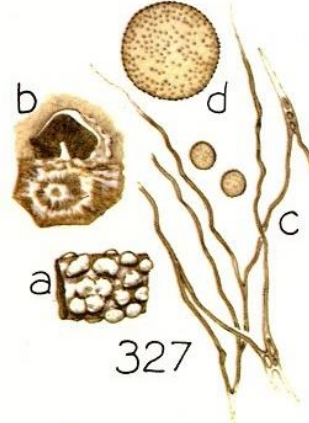
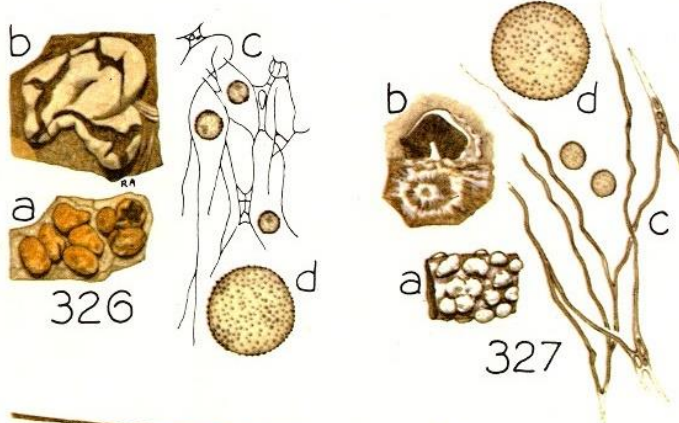
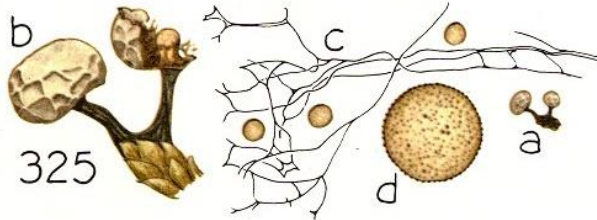
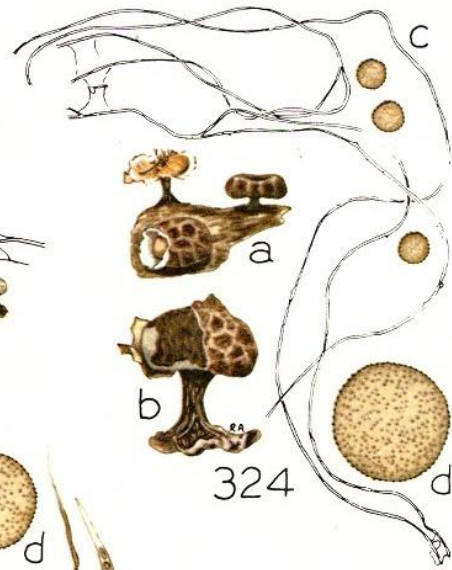
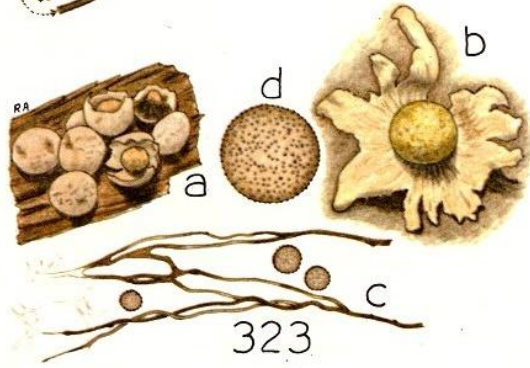
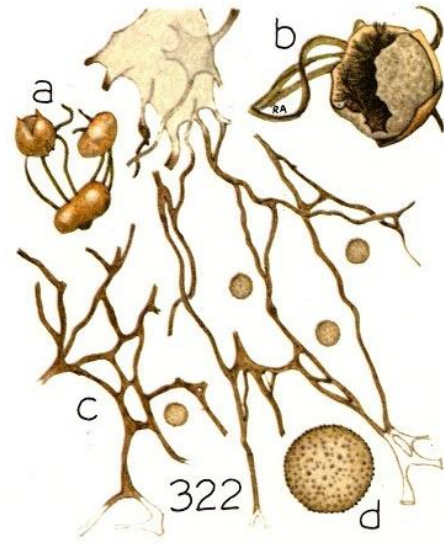
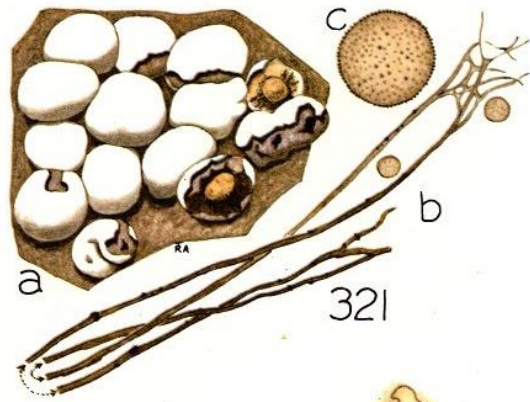
316. *Diderma indicum* Thind & Sehgal. a. Cluster of sporangia, X5; b. Detail of capillitium, and spores, X250; c. Spore, X1000

317. *Diderma lucidum* Berk. & Br. a. Sporangium, X5; b. Two sporangia, X20; c. Detail of capillitium showing attachment t fragment of peridium, and spores, X250; d. Spore, X1000

318. *Diderma lyallii* (Masse) Macbr. a. Group of sporangia, X5; b. Sporangium, X20; c. Detail of capillitium, and spores, X250; d. Spore, X1000

319. *Diderma montanum* (Meylan) Meylan. a. Three sporangia, X5; b. Sporangium, X20; c. Detail of capillitium, and spores, X250; d. Spore, X1000

320. *Diderma mussooriense* Thind & Manocha. a. Cluster of sporangia, X5; b. Two sporangia, X20; c. Detail of capillitium, and spores, X250, d. Spore, X1000



## Plate 36 Captions

321. *Diderma niveum* (Rost) Macbr. a. Cluster of sporangia, X5; b. Detail of capillitium, and spores, X250; c. Spore, X1000

322. *Diderma ochraceum* Hoffm. a. Three sporangia, X5; b. Sporangium, X20; c. Details of capillitium, and spores, X250; d. Spore, X1000

323. *Diderma radiatum* (L.) Morgan. a. Cluster of sporangia, X5; b. Weathered sporangium, X10; c. Detail of capillitium, and spores, X250; d. Spore, X1000

324. *Diderma roanense* (Rex) Macbr. a. Three sporangia, X5; b. Sporangium, X10; c. Detail of capillitium, and spores, X250; d. Spore, X1000

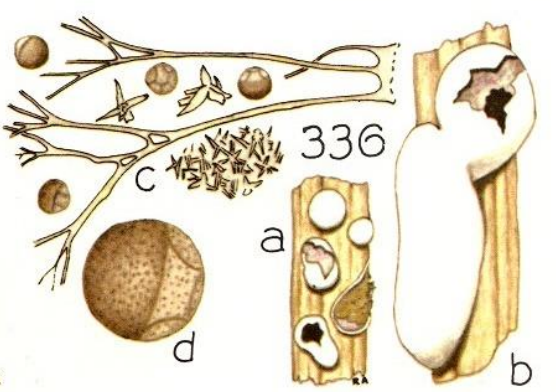
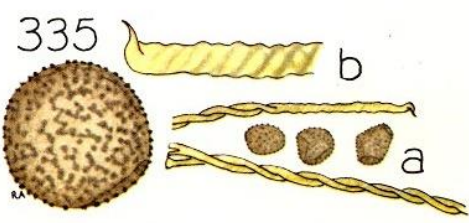
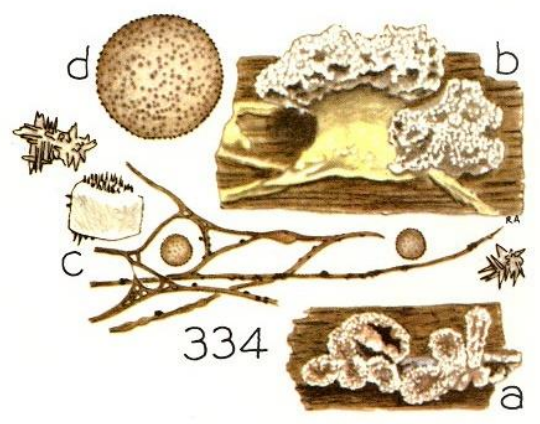
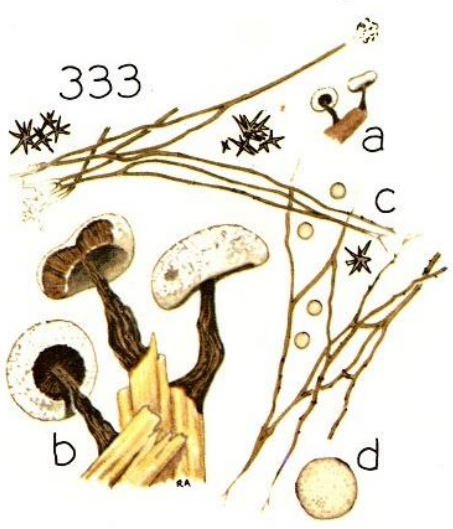
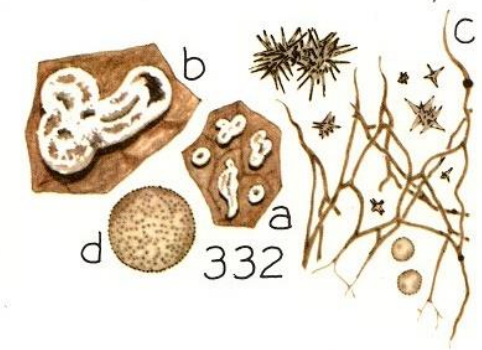
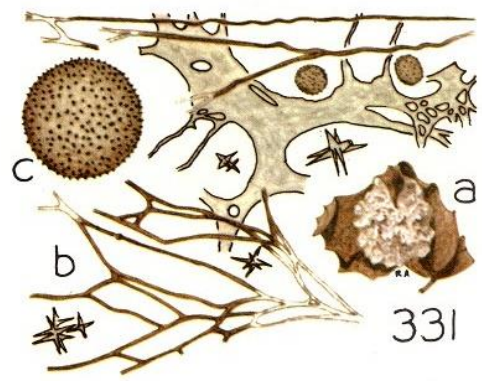
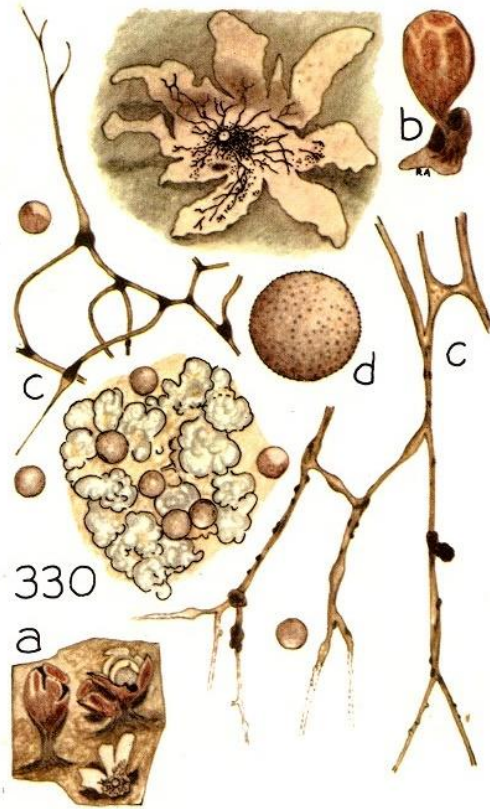
325. *Diderma rugosum* (Rex) Macbr. a. Two sporangia, X5; b. Two sporangia, X20; c. Detail of capillitium, and spores, X250; d. Spore, X1000

326. *Diderma simplex* (Schroet.) G. Lister. a. Group of sporangia, X5; b. Sporangium, X20; c. Detail of capillitium, and spores, X250; d. Spore, X1000

327. *Diderma spumarioides* (Fries) Fries. a. Part of a large cluster of sporangia, X5; b. Sporangium cut through center to show columella, with base of old sporangium, X20; c. Detail of capillitium, and spores, X250; d. Spore, X1000

328. *Diderma subdictyosporum* (Bosh) G. Lister. a. Details of capillitium, and spores, X250; b. Spore, X1000

329. *Diderma testaceum* (Schrad.) Pers. a. Group of sporangia, X5; b. Sporangium, X20; c. Detail of capillitium, and spores, X250; d. Spore, X1000



## Plate 37 Captions

330. *Diderma traveyani* (Grev.) Fries. a. Cluster of sporangia, X5; b. Two sporangia, one before opening, the other after spore discharge, X10; c. Details of capillitium, portion of peridium with imbedded lime crystals, and spores, X250; d. Spore, X1000

331 *Mucilago crustacea* Wiggers. a. Small aethalium, X1/2; b. Detail, showing portions of capillitium and pseudocapillitium, with crystals and spores, X250; c. Spore, X1000

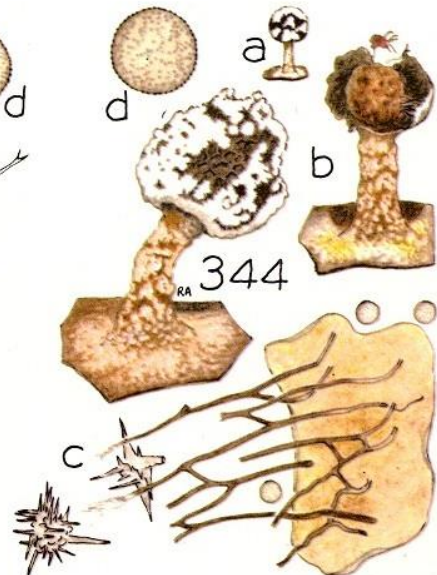
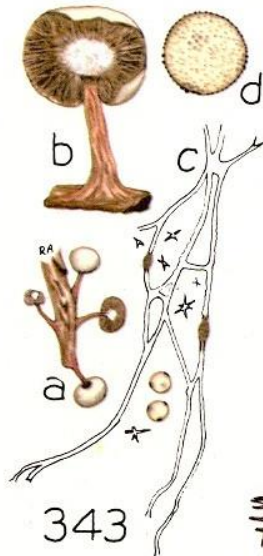
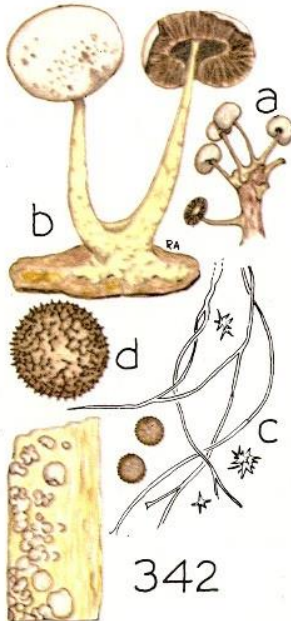
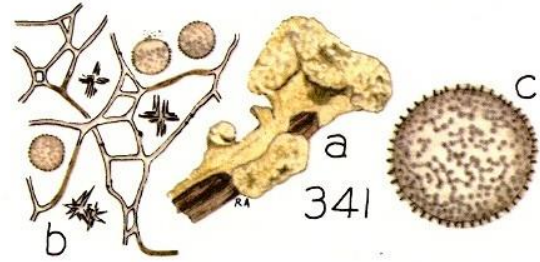
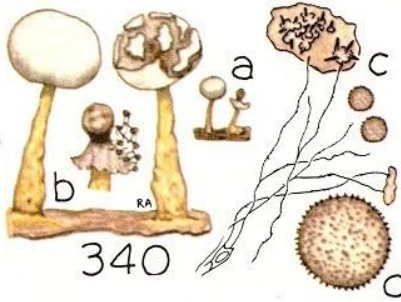
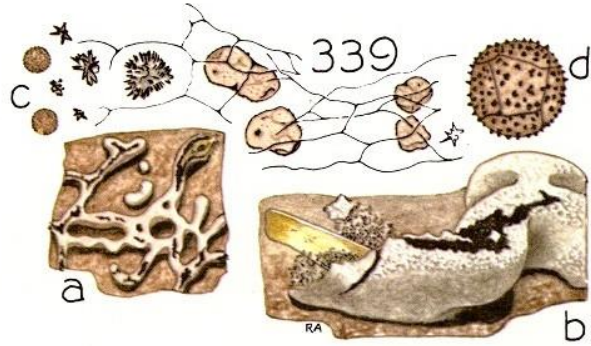
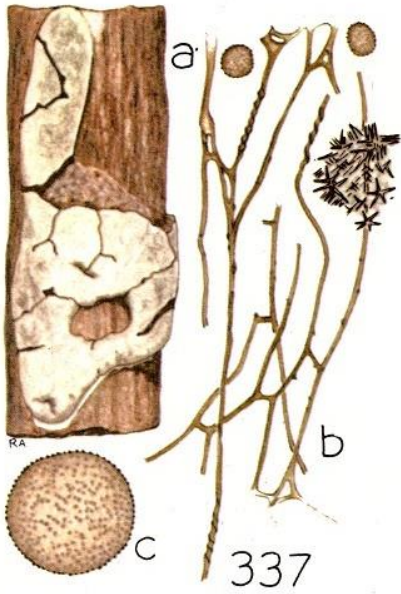
332. *Didymium anellus* Morgan. a. Cluster of fructifications, X5; b. Plasmodiocarp, X20; c. Detail of capillitium, with crystals and spores, X250; d. Spore, X1000

333. *Didymium clavus* (Alb. & Schw.) Rab. a. Two sporangia, X5; b. Three sporangia, X20; c. Detail of capillitium, with crystals and spores, X250; d. Spore, X1000

334. *Didymium crustaceum* Fries. a. Massed sporangia, X5; b. Sporangia, one with stalk-like hypothallus, X10; c. Detail of capillitium, with crystals and spores, X250; d. Spore, X1000

335. *Didymium decipiens* Meylan a. Portions of capillitium, and spores, X250; b. Spore, X1000

336. *Didymium difforme* (Pers.) S.F. Gray. a. Cluster of fruitings, X5; b. Plasmodiocarp, X20; c. Detail of capillitium, with crystals and spores, X250; d. Spore, X1000



## Plate 38 Captions

337. *Didymium dubium* Rost. a. Plasmodiocarp, X5; b. Detail of capillitium, with spores and crystals, X250; c. Spore, X1000

338. *Didymium megalosporum* Berk. & Curt. a. Three sporangia, X5; b. Two sporangia, one showing internal structure, X20, c. Detail of capillitium showing attachment to peridium, with spores and crystals, X250, d. Spore, X1000

339. *Didymium flexuosum* Yamashiro. a. Portion of plasmodiocarp, X5; b. Enlarged detail of same, X20; c. Detail of capillitium, with vesicular bodies, spores and crystals, X250; d. Spore, X1000

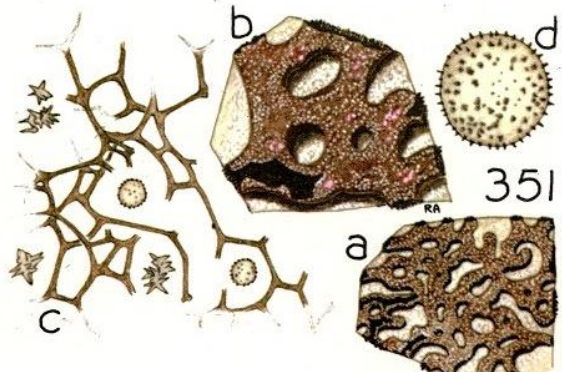
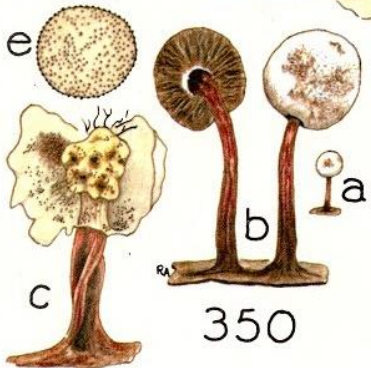
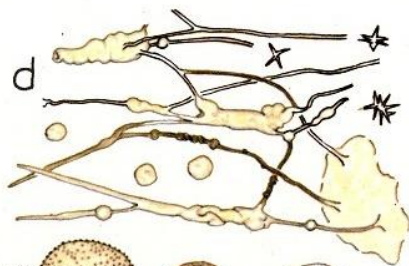
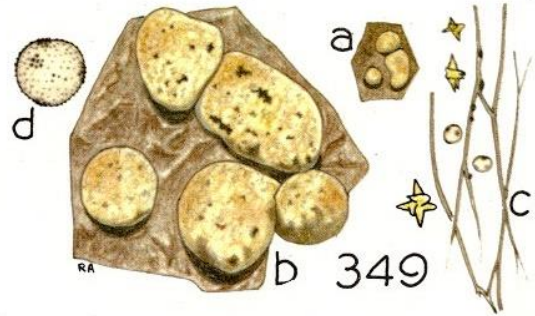
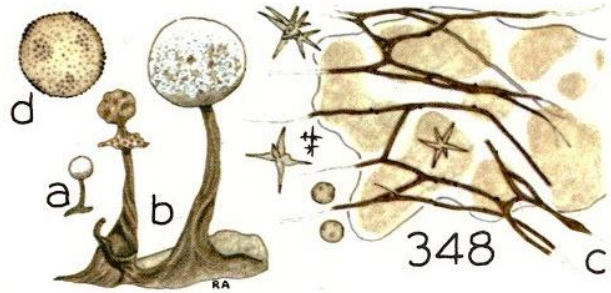
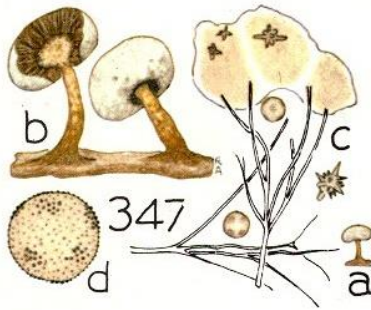
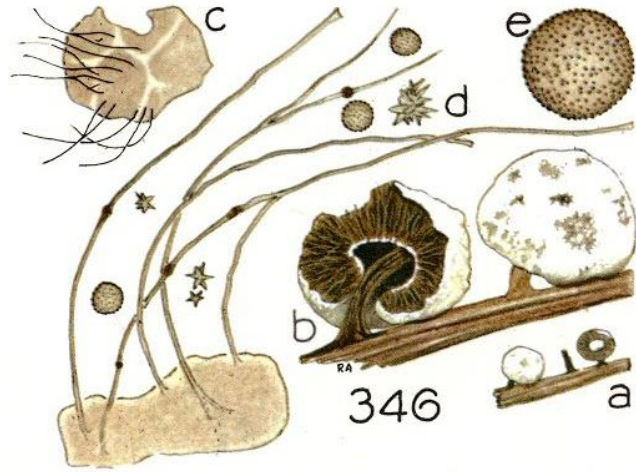
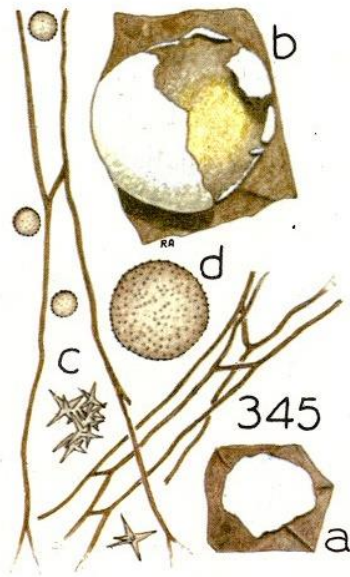
340. *Didymium floccosum* Martin, Thind & Rehill. a. Two sporangia, X5, b. Two sporangia with columella of a third, X20; c. Detail of capillitium showing attachment to peridium, with crystals and spores, X250; d. Spore, X1000

341. *Didymium fulvum* Sturgis. a. Plasmodiocarp, X5; b. Detail of capillitium, with spores and crystals, X250; c. Spore, X1000

342. *Didymium intermedium* Schroet. a. Group of sporangia, X5; b. Two sporangia, that on right showing deep umbilicus, X20; c. Detail of capillitium, with spores, crystals, and part of stalk with included crystals, X250; d. Spore, X1000

343. *Didymium iridis* (Ditmar) Fries. a. Group of sporangia, X5; b. Sporangium, X20; c. Detail of capillitium, with spores and crystals, X250; d. Spore, X1000

344. *Didymium leoninum* Berk. & Br. a. Sporangium, X5; b. Two sporangia, X20; c. Detail of capillitium, showing attachment to peridium, with spores and crystals, X250; d. Spore, X1000





## Plate 39 Captions

345. *Didymium listeri* Masee. a. Small plasmodiocarp, X5; b. Sporangium, X20; c. Details of capillitium, with spores and crystals, X250; d. Spore, X1000

346. *Didymium melanospermum* (Pers.) Macbr. a. Two sporangia, X5; b. Same, X20; c. Portion of peridium, showing attached capillitium, X50; d. Detail of same, with spores and crystals, X250; e. Spore, X1000

347. *Didymium minus* (A. Lister) Morgan. a. Sporangium, X5; b. Two sporangia, X20; c. Details of capillitium, showing attachment to peridium, with crystals and spores, X250; d. Spore, X1000

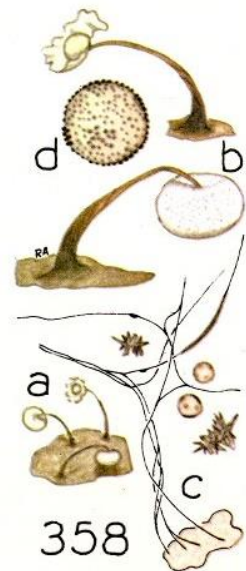
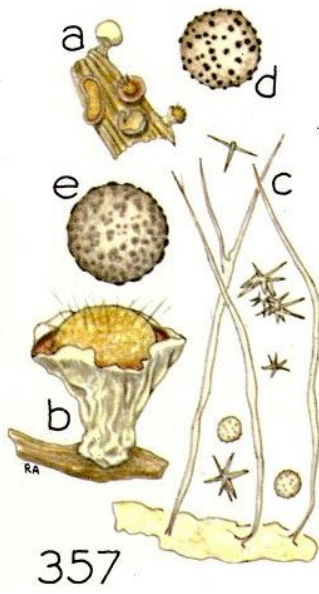
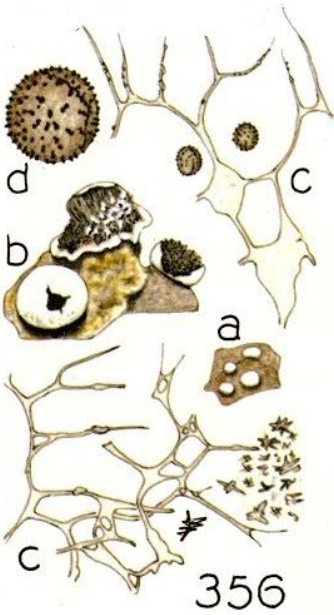
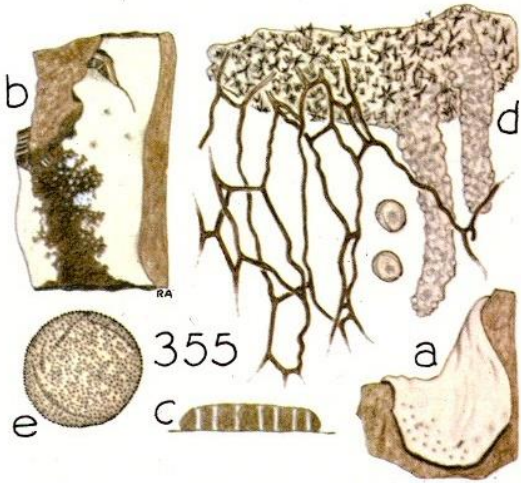
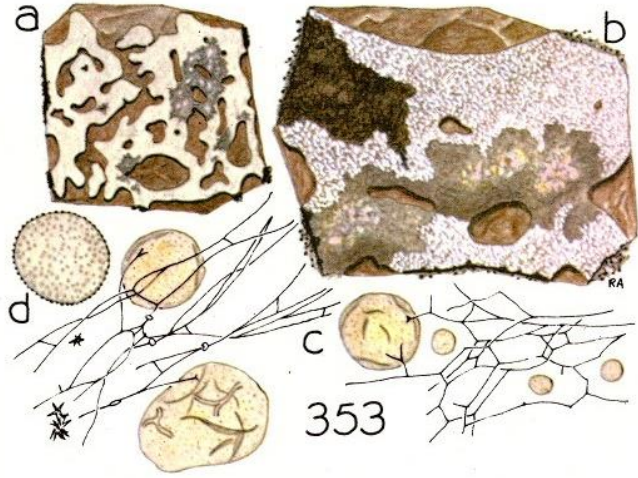
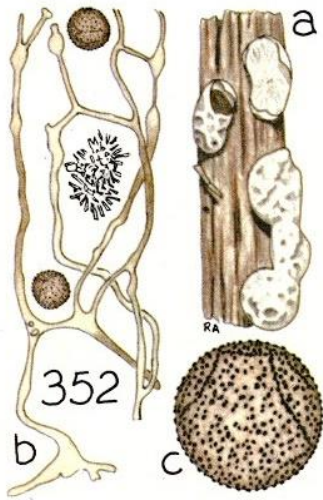
348. *Didymium nigripes* (Link) Fries. a. Sporangium, X5; b. Two sporangia, X20; c. Details of capillitium, showing attachment to peridium, with crystals and spores, X250; d. Spore, X1000

349. *Didymium ochroideum* C. Lister. a. Three sporangia, X5; b. Five sporangia, X20; c. Detail of capillitium, with spores and crystals, X250; d. Spore, X1000

350. *Didymium ovoideum* Nann.-Brem. a. Sporangium, X5; b. Two sporangia, X20; c. Empty sporangium showing rugose columella, X20; d. Detail of capillitium, showing enlargements and attachment to peridium, with crystals and spores, X250; e. Spore, X1000

351. *Didymium perforatum* Yamashiro. a. Portion of plasmodiocarp, X5; b. Detail of same, X20; c. Detail of capillitium, with crystals and spores, X250; d. Spore, X1000

Plate 40



## Plate 40 Captions

352. *Didymium quitense* (Pat) Torrend. a. Three fructifications, X5; b. Detail of capillitium, with or spores, X250; c. Spore, X1000

353. *Didymium serpula* Fries. a. Plasmodiocarps, X5; b. Detail of plasmodiocarp, X20; c. Details of capillitium, with vesicles, and spores, X250; d. Spore, X1000

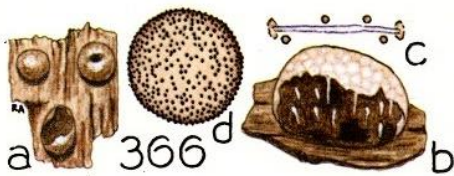
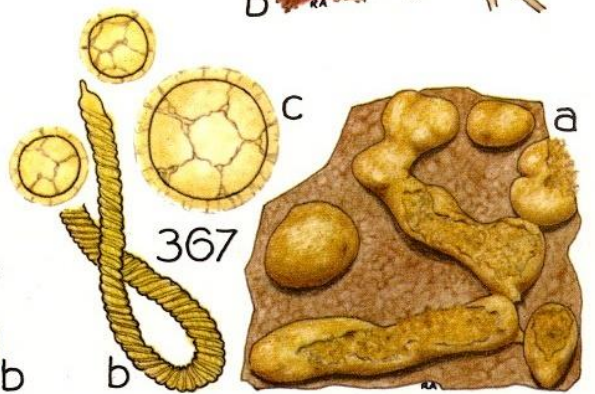
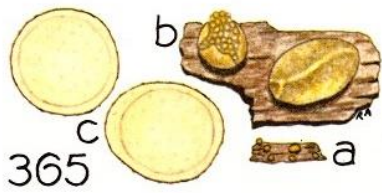
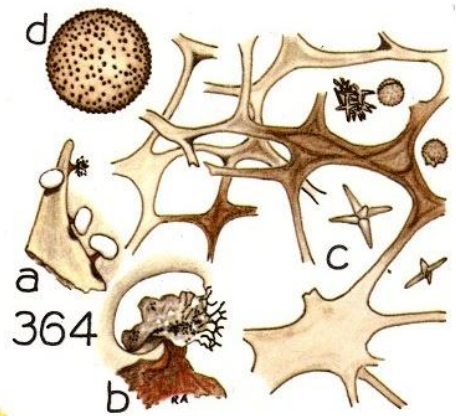
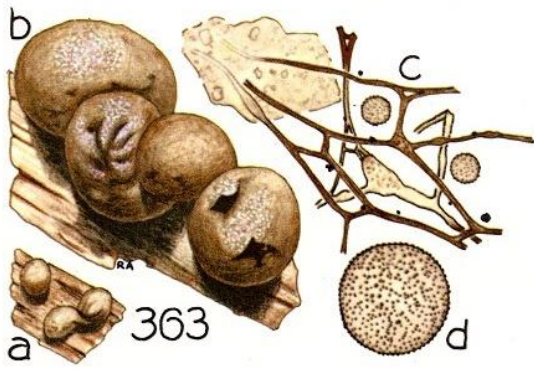
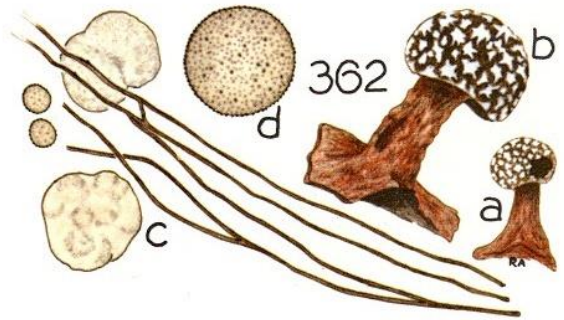
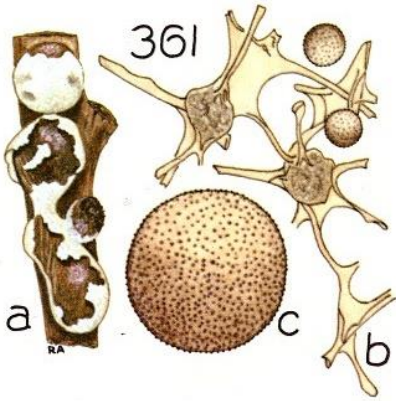
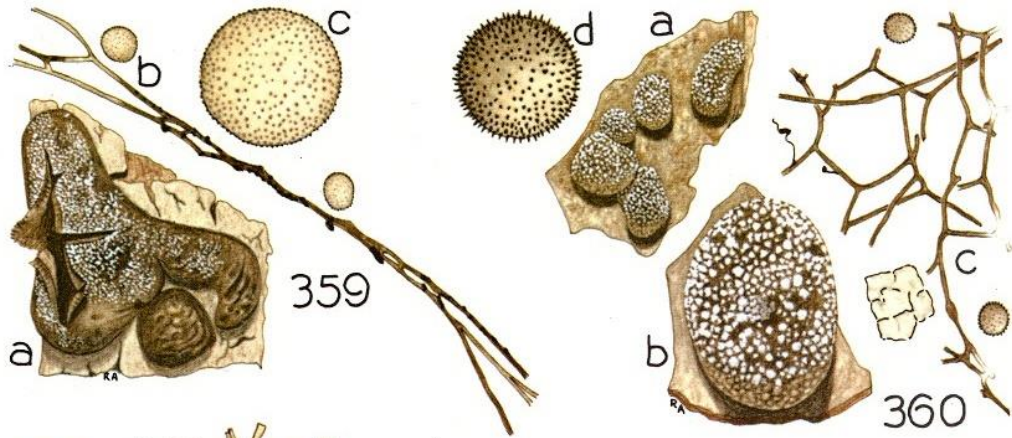
354. *Didymium squamulosum* (Alb. 6: Schw.) Fries. a. Sporangia, X5; b/c. Sporangia, X20; d. Detail of capillitium showing attachment peridium, with crystals and spores, X250; e. Spore, X1000

355. *Didymium sturgisii* Hagelst. a. Plasmodiocarp, X5; b. Detail of same, X20; c. Diagram of same, showing trabeculae, X20; d. Detail of capillitium showing attachment to peridium, with trabeculae, crystals and spores, X250; e. Spore, X1000

356. *Didymium trachysporum* G. Lister. a. Cluster of sporangia, X5; b. Three sporangia, X20; c. Details of capillitium, with fragment of peridium, crystals and spores, X250, d. Spore, X1000

357. *Didymium vaccinum* (Dur. & Mont.) Buchet. a. Cluster of fructifications, X5; b. Sporangium, X20; c. Detail of capillitium, showing attachment to columella, with crystals and spores, X250; d. Spore, X1000 (California); e. Spore, X1000 (England)

358. *Didymium verrucosporum* Welden. a. Sporangia, X5; b. Two sporangia, X20; c. Detail of capillitium, with attached peridial fragment, and crystals and spores, X250; d. Spore, X1000



## Plate 41 Captions

359. *Lepidoderma carestianum* (Rah) Rost. a. Sporangiate and plasmodiocarpous fructifications, X5; b. Capillitium and spores, X250; c. Spore, X1000
360. *Lepidoderma chaillatii* Rost. a. Cluster of sporangia, X5; b. Sporangium, X20; c. Capillitium, cluster of crystals from scale and spores, X250; d. Spore, X1000
361. *Lepidoderma granuliferum* (Phill.) R.E. Fries. a. Fructifications, X5; b. Capillitium, with vesicles containing crystals, and spores, X250; c. Spore, X1000
362. *Lepidoderma tigrinum* (Schrad.) Rost. a. Sporangium, X5; b. Sporangium, X10; c. Capillitium, scales, and spores, X250; d. Spore, X1000
363. *Leptoderma iridescens* G. Lister. a. Three sporangia, two partly fused, X5; b. Four sporangia, X20; c. Capillitium, showing attachment to peridium, and spores, X250; d. Spore, X1000
364. *Didymium laxifila* C. Lister & Rose. a. Cluster of sporangia, X5; b. Sporangium, X20; c. Capillitium, crystals, and spores, X25; d. Spore, X1000
365. *Licea pumila* Martin & Allen. a. Cluster of sporangia, X5; b. Two sporangia, X50; c. Spore, X1000
366. *Badhamia ainoae* Yamashiro. a. Three sporangia, X5; b. Sporangium, partly open, to show limy columns, X20; c. Single column, with fragments of base and peridium attached, and spores, X50; d. Spore, X1000
367. *Hemitrichia chrysospora* (A. Lister) A. Lister. a. Sporangia and plasmodiocarps, X10; b. Capillitium and spores, X500; c. Spore, X1000

**Index of species, as they appeared in the original text [see comments for current names in the keys]**

[\*Amaurochaete atra\*](#) (Alb. & Schw.) Rost.  
[\*Amaurochaete comata\*](#) C. Lister & Brândză.  
[\*Amaurochaete ferruginea\*](#) Macbr. & Martin.  
[\*Amaurochaete trechispora\*](#) Macbr. & Martin  
[\*Amaurochaete tubulina\*](#) (Alb. & Schw.) Macbr.  
[\*Arcyodes incarnata\*](#) (Alb. & Schw.) O. F. Cook.  
[\*Arcyria annulifera\*](#) Torrend.  
[\*Arcyria carnea\*](#) (G. Lister) G. Lister.  
[\*Arcyria cinerea\*](#) (Bull.) Pers.  
[\*Arcyria corymbosa\*](#) Farr & Martin.  
[\*Arcyria denudata\*](#) (L.) Wettst.  
[\*Arcyria ferruginea\*](#) Sauter.  
[\*Arcyria glauca\*](#) A. Lister.  
[\*Arcyria globosa\*](#) Schw.  
[\*Arcyria incarnata\*](#) (Pers.) Pers.  
[\*Arcyria insignis\*](#) Kalchbr. & Cooke.  
[\*Arcyria leiocarpa\*](#) (Cooke) Martin & Alexop.  
[\*Arcyria magna\*](#) Rex.  
[\*Arcyria minuta\*](#) Buchet  
[\*Arcyria nigella\*](#) Emoto  
[\*Arcyria nutans\*](#) (Bull.) Crev.  
[\*Arcyria occidentalis\*](#) (Macbr.) G. Lister.  
[\*Arcyria oerstedtii\*](#) Rost.  
[\*Arcyria pomiformis\*](#) (Leers) Host.  
[\*Arcyria stipata\*](#) (Schw.) G. Lister.  
[\*Arcyria versicolor\*](#) Phill.  
[\*Arcyria virescens\*](#) G. Lister.  
[\*Badhamia affinis\*](#) Rost.  
[\*Badhamia ainoae\*](#) Yamashiro.  
[\*Badhamia capsulifera\*](#) (Bull) Berk.  
[\*Badhamia cinerascens\*](#) G.W. Martin  
[\*Badhamia dearnessii\*](#) Hagelst.  
[\*Badhamia foliicola\*](#) A. Lister.  
[\*Badhamia gracilis\*](#) (Macbr.) Macbr.  
[\*Badhamia iowensis\*](#) T. Macbr.  
[\*Badhamia lilacina\*](#) (Fries) Rost.  
[\*Badhamia macrocarpa\*](#) (Ces.) Rost.  
[\*Badhamia nitens\*](#) Berk.  
[\*Badhamia obovata\*](#) (Peck) S.J. Smith.  
[\*Badhamia ovispora\*](#) Racib.

[\*Badhamia panicea\*](#) (Fries) Rost.  
[\*Badhamia papaveracea\*](#) Berk. & Rav.  
[\*Badhamia populina\*](#) A. & G. Lister.  
[\*Badhamia utricularis\*](#) (Bull.) Berk.  
[\*Badhamia versicolor\*](#) A. Lister.  
[\*Badhamia viridescens\*](#) Meylan.  
[\*Barbeyella minutissima\*](#) Meylan.  
[\*Brefeldia maxima\*](#) (Fries) Host.  
[\*Calomyxa metallica\*](#) (Berk) Nieuwl.  
[\*Calonema aureum\*](#) Morgan.  
[\*Ceratiomyxa fruticulosa\*](#) (Mill.) Macbr.  
[\*Ceratiomyxa morchella\*](#) Welden.  
[\*Ceratiomyxa sphaerosperma\*](#) Boedijn.  
[\*Cienkowskia reticulata\*](#) (Alb. & Schw.) Rost.  
[\*Clastoderma debaryanum\*](#) Blytt.  
[\*Colloderma oculatum\*](#) (Lippert) G. Lister.  
[\*Colloderma robustum\*](#) Meylan.  
[\*Comatricha acanthodes\*](#) Alexop.  
[\*Comatricha aequalis\*](#) Peck.  
[\*Comatricha aggregata\*](#) Farr.  
[\*Comatricha caespitosa\*](#) Sturgis.  
[\*Comatricha cylindrica\*](#) (Bilgram) Macbr.  
[\*Comatricha dictyospora\*](#) Celak.  
[\*Comatricha elegans\*](#) (Radix) G. Lister.  
[\*Comatricha fimbriata\*](#) G. Lister & Cran.  
[\*Comatricha irregularis\*](#) Rex.  
[\*Comatricha laxa\*](#) Rost.  
[\*Comatricha longa\*](#) Peck.  
[\*Comatricha longipila\*](#) Nann.-Brem.  
[\*Comatricha lurida\*](#) A. Lister.  
[\*Comatricha mirabilis\*](#) Benj. & Poit.  
[\*Comatricha nigra\*](#) (Pers.) Schroet.  
[\*Comatricha nodulifera\*](#) Wollman & Alexop.  
[\*Comatricha pulchella\*](#) (C. Bab.) Rost.  
[\*Comatricha rigidireta\*](#) Nann.-Bremek.  
[\*Comatricha rispaudii\*](#) Hagelst.  
[\*Comatricha rubens\*](#) A. Lister.  
[\*Comatricha subcaespitosa\*](#) Peck.  
[\*Comatricha suksdorfii\*](#) Ell. & Ev.  
[\*Comatricha tenerrima\*](#) (M. A. Curt.) G. Lister.  
[\*Comatricha typhoides\*](#) (Bull.) Host.  
[\*Cornuvia serpula\*](#) (Wigand) Rost.  
[\*Craterium aureum\*](#) (Schum.) Rost.  
[\*Craterium concinnum\*](#) Rex.  
[\*Craterium leucocephalum\*](#) (Pers.) Ditmar.

[Craterium minutum](#) (Leers) Fries.  
[Craterium paraguayense](#) (Speg.) G. Lister.  
[Craterium rubronodum](#) G. Lister  
[Cribraria argillacea](#) (Pers.) Pers.  
[Cribraria atrofusca](#) Martin & Lovejoy.  
[Cribraria aurantiaca](#) Schrad.  
[Cribraria dictyospora](#) Martin & Lovejoy.  
[Cribraria elegans](#) Berk. & Curt.  
[Cribraria ferruginea](#) Meylan.  
[Cribraria intricata](#) Schrad.  
[Cribraria languescens](#) Rex.  
[Cribraria laxa](#) Hagelst.  
[Cribraria lepida](#) Meylan.  
[Cribraria macrocarpa](#) Schrad.  
[Cribraria martinii](#) Nann.-Bremek.  
[Cribraria microcarpa](#) (Schrad.) Pers.  
[Cribraria minutissima](#) Schw.  
[Cribraria oregana](#) H. C. Gilbert.  
[Cribraria pachydictyon](#) Nann.-Bremek.  
[Cribraria piriformis](#) Schrad.  
[Cribraria purpurea](#) Schrad.  
[Cribraria rubiginosa](#) Fries.  
[Cribraria rufa](#) (Roth) Host.  
[Cribraria splendens](#) (Schrad.) Pers.  
[Cribraria tenella](#) Schrad.  
[Cribraria violacea](#) Rex.  
[Cribraria vulgaris](#) Schrad.  
[Diachea bulbillosa](#) (Berk. & Br.) A. Lister.  
[Diachea leucopodia](#) (Bull.) Host.  
[Diachea megalospora](#) K.S. Thind & Manocha  
[Diachea radiata](#) G. Lister & Petch.  
[Diachea splendens](#) Peck.  
[Diachea subsessilis](#) Peck.  
[Diachea thomasii](#) Rex  
[Diacheopsis insessa](#) (G. Lister) Ing  
[Diacheopsis metallica](#) Meyl.  
[Diacheopsis pieninica](#) Krzemien.  
[Dianema corticatum](#) A. Lister.  
[Dianema depressa](#) (A. Lister) A. Lister.  
[Dianema harveyi](#) Rex.  
[Dianema nivale](#) (Meyl.) G. Lister  
[Dianema repens](#) G. Lister & Cran  
[Dictydiaethalium dictyosporum](#) Nann.-Bremek.  
[Dictydiaethalium plumbeum](#) (Schum) Rost.  
[Dictydium cancellatum](#) (Batsch) Macbr.



[\*Dictydium mirabile\*](#) (Rest) Meylan.  
[\*Dictydium rutilum\*](#) C. Lister.  
[\*Diderma alpinum\*](#) Meylan.  
[\*Diderma antarcticum\*](#) (Speg.) Sturgis  
[\*Diderma asteroides\*](#) (A. & G. Lister) G. Lister.  
[\*Diderma chondrioderma\*](#) (de Bary & Rost.) G. Lister.  
[\*Diderma cinereum\*](#) Morgan.  
[\*Diderma cor-rubrum\*](#) Macbr.  
[\*Diderma crustaceum\*](#) Peck.  
[\*Diderma darjeelingense\*](#) Thind and Sehgal.  
[\*Diderma deplanatum\*](#) Fries.  
[\*Diderma effusum\*](#) (Schw.) Morgan.  
[\*Diderma floriforme\*](#) (Bull.) Pers.  
[\*Diderma globosum\*](#) Pers.  
[\*Diderma hemisphaericum\*](#) (Bull.) Hornem.  
[\*Diderma imperialis\*](#) Emoto  
[\*Diderma indicum\*](#) Thind & Sehgal.  
[\*Diderma lucidum\*](#) Berk. & Br.  
[\*Diderma lyallii\*](#) (Masse) Macbr.  
[\*Diderma montanum\*](#) (Meylan) Meylan.  
[\*Diderma mussooriense\*](#) Thind & Manocha.  
[\*Diderma niveum\*](#) (Rost) Macbr.  
[\*Diderma ochraceum\*](#) Hoffm.  
[\*Diderma platycarpum\*](#) Nann.-Bremek.  
[\*Diderma radiatum\*](#) (L.) Morgan.  
[\*Diderma roanense\*](#) (Rex) Macbr.  
[\*Diderma rugosum\*](#) (Rex) Macbr.  
[\*Diderma sauteri\*](#) (Rostaf.) E. Sheld.  
[\*Diderma simplex\*](#) (Schroet.) G. Lister.  
[\*Diderma spumarioides\*](#) (Fries) Fries.  
[\*Diderma subdictyosporum\*](#) (Bosh) G. Lister.  
[\*Diderma subincarnatum\*](#) Kowalski  
[\*Diderma testaceum\*](#) (Schrad.) Pers.  
[\*Diderma travelyani\*](#) (Grev.) Fries.  
[\*Didymium anellus\*](#) Morgan.  
[\*Didymium aurantipes\*](#) T.E. Brooks & Kowalski  
[\*Didymium clavus\*](#) (Alb. & Schw.) Rab.  
[\*Didymium crustaceum\*](#) Fries.  
[\*Didymium decipiens\*](#) Meylan  
[\*Didymium difforme\*](#) (Pers.) S.F. Gray.  
[\*Didymium dubium\*](#) Rost.  
[\*Didymium flexuosum\*](#) Yamashiro.  
[\*Didymium floccosum\*](#) Martin, Thind & Rehill.  
[\*Didymium fulvum\*](#) Sturgis.  
[\*Didymium laxifila\*](#) C. Lister & Rose.

[\*Didymium intermedium\*](#) Schroet.  
[\*Didymium iridis\*](#) (Ditmar) Fries.  
[\*Didymium karstensis\*](#) Nann.-Bremek.  
[\*Didymium leoninum\*](#) Berk. & Br  
[\*Didymium listeri\*](#) Masee.  
[\*Didymium megalosporum\*](#) Berk. & Curt.  
[\*Didymium melanospermum\*](#) (Pers.) Macbr.  
[\*Didymium minus\*](#) (A. Lister) Morgan.  
[\*Didymium nigripes\*](#) (Link) Fries.  
[\*Didymium ochroideum\*](#) C. Lister.  
[\*Didymium ovoideum\*](#) Nann.-Brem.  
[\*Didymium perforatum\*](#) Yamashiro.  
[\*Didymium quitense\*](#) (Pat) Torrend.  
[\*Didymium serpula\*](#) Fries.  
[\*Didymium squamulosum\*](#) (Alb. 6: Schw.) Fries.  
[\*Didymium sturgisii\*](#) Hagelst.  
[\*Didymium trachysporum\*](#) G. Lister.  
[\*Didymium vaccinum\*](#) (Dur. & Mont.) Buchet.  
[\*Didymium verrucosporum\*](#) Welden.  
[\*Echinostelium cribrarioides\*](#) Alexop.  
[\*Echinostelium elachiston\*](#) Alexop.  
[\*Echinostelium fragile\*](#) Nann.-Brem.  
[\*Echinostelium minutum\*](#) de Bary.  
[\*Echinostelium roseum\*](#) Ing  
[\*Elaeomyxa cerifera\*](#) (C. Lister) Hagelst.  
[\*Elaeomyxa miyazakiensis\*](#) (Emoto) Hagelst.  
[\*Enerthenema berkeleyanum\*](#) Rost.  
[\*Enerthenema melanospermum\*](#) Macbr.  
[\*Enerthenema papillatum\*](#) (Pers.) Rost.  
[\*Erionema aureum\*](#) Penzig.  
[\*Fuligo cinerea\*](#) (Schw.) Morgan.  
[\*Fuligo intermedia\*](#) Macbr.  
[\*Fuligo megaspora\*](#) Sturgis.  
[\*Fuligo muscorum\*](#) Alb. & Schw.  
[\*Fuligo septica\*](#) (L.) Wiggers.  
[\*Hemitrichia imperialis\*](#) G. Lister  
[\*Hemitrichia abietina\*](#) (Wigand) G. Lister.  
[\*Hemitrichia chrysospora\*](#) (A. Lister) A. Lister.  
[\*Hemitrichia clavata\*](#) (Pers.) Rost.  
[\*Hemitrichia intorta\*](#) (A. Lister) A. Lister.  
[\*Hemitrichia karstenii\*](#) (Rost.) A. Lister.  
[\*Hemitrichia leiotricha\*](#) (Lister) G. Lister  
[\*Hemitrichia montana\*](#) (Morgan) Macbr.  
[\*Hemitrichia paragoga\*](#) Farr.  
[\*Hemitrichia serpula\*](#) (Scop.) Rost.

[\*Hemitrichia stipitata\*](#) (Masse) Macbr.  
[\*Lamproderma arcyrioides\*](#) (Sommerf.) Host.  
[\*Lamproderma arcyronema\*](#) Rost.  
[\*Lamproderma atrosporum\*](#) Meylan.  
[\*Lamproderma carestiae\*](#) (Ces. & de Not.) Meylan.  
[\*Lamproderma columbinum\*](#) (Pers.) Rost.  
[\*Lamproderma cribrarioides\*](#) (Fries) R.E. Fries.  
[\*Lamproderma cristatum\*](#) Meylan.  
[\*Lamproderma echinulatum\*](#) (Berk) Rost.  
[\*Lamproderma fusiforme\*](#) Kowalski  
[\*Lamproderma gulielmae\*](#) Meylan.  
[\*Lamproderma muscorum\*](#) (Lév.) Hagelst.  
[\*Lamproderma pulchellum\*](#) Meylan.  
[\*Lamproderma sauteri\*](#) Rost.  
[\*Lamproderma scintillans\*](#) (Berk. & Br.) Morgan.  
[\*Lamproderma tuberculosporum\*](#) M.L. Farr  
[\*Lamproderma verrucosum\*](#) Martin, Thind & Sohi.  
[\*Leocarpus fragilis\*](#) (Dicks.) Rost.  
[\*Lepidoderma carestianum\*](#) (Rah) Rost.  
[\*Lepidoderma chailletii\*](#) Rost.  
[\*Lepidoderma crustaceum\*](#) Kowalski  
[\*Lepidoderma granuliferum\*](#) (Phill.) R.E. Fries.  
[\*Lepidoderma tigrinum\*](#) (Schrad.) Rost.  
[\*Leptoderma iridescens\*](#) G. Lister.  
[\*Licea belmontiana\*](#) Nann.-Bremek.  
[\*Licea biforis\*](#) Morgan.  
[\*Licea castanea\*](#) G. Lister.  
[\*Licea chelonoides\*](#) Nann.-Bremek.  
[\*Licea erecta\*](#) K.S. Thind & Dhillon  
[\*Licea fimicola\*](#) Dearn. & Bisby.  
[\*Licea kleistobolus\*](#) Martin.  
[\*Licea marginata\*](#) Nann.-Bremek.  
[\*Licea minima\*](#) Fries.  
[\*Licea operculata\*](#) (Wingate) Martin.  
[\*Licea parasitica\*](#) (Zukal) Martin.  
[\*Licea pedicellata\*](#) (H. C. Gilbert) H. C. Gilbert.  
[\*Licea pumila\*](#) Martin & Allen.  
[\*Licea punctiformis\*](#) G.W. Martin  
[\*Licea pusilla\*](#) Schrad.  
[\*Licea tenera\*](#) Jahn.  
[\*Licea testudinacea\*](#) Nann.-Bremek.  
[\*Licea tuberculata\*](#) Martin.  
[\*Licea variabilis\*](#) Schrad.  
[\*Lindbladia tubulina\*](#) Fries.  
[\*Listerella paradoxa\*](#) Jahn.

[\*Lycogala conicum\*](#) Pers.  
[\*Lycogala epidendrum\*](#) (L.) Fries.  
[\*Lycogala exiguum\*](#) Morgan.  
[\*Lycogala flavofuscum\*](#) (Ehrenb.) Host.  
[\*Macbrideola cornea\*](#) (G. Lister & Cran) Alexop.  
[\*Macbrideola decapillata\*](#) H. C. Gilbert.  
[\*Macbrideola martinii\*](#) (Alexop. & Beneke) Alexop.  
[\*Macbrideola scintillans\*](#) H. C. Gilbert.  
[\*Macbrideola synsporos\*](#) (Alexop.) Alexop.  
[\*Metatrachia vesparium\*](#) (Batsch) Nann.-Brem.  
[\*Metatrachia horrida\*](#) Ing  
[\*Minakatella longifila\*](#) G. Lister  
[\*Mucilago crustacea\*](#) Wiggers.  
[\*Oligonema flavidum\*](#) (Peck) Peck.  
[\*Oligonema fulvum\*](#) Morgan.  
[\*Oligonema schweinitzii\*](#) (Berk) Martin.  
[\*Perichaena chrysosperma\*](#) (Currey) A. Lister.  
[\*Perichaena corticalis\*](#) (Batsch) Host.  
[\*Perichaena depressa\*](#) Libert.  
[\*Perichaena microspora\*](#) Penzig & G. Lister.  
[\*Perichaena minor\*](#) (G. Lister) Hagelst.  
[\*Perichaena pulcherrima\*](#) Petch  
[\*Perichaena syncarpon\*](#) T. E. Brooks.  
[\*Perichaena tessellata\*](#) G. Lister  
[\*Perichaena vermicularis\*](#) (Schw.) Host.  
[\*Physarella oblonga\*](#) (Berk. & Curt.) Morgan.  
[\*Physarina echinocephala\*](#) Höhn.  
[\*Physarina echinospora\*](#) Thind & Maocha.  
[\*Physarum aeneum\*](#) (A. Lister) R.E. Fries.  
[\*Physarum albescens\*](#) Ellis.  
[\*Physarum alpinum\*](#) (A. & G. Lister) G. Lister.  
[\*Physarum auripigmentum\*](#) Martin.  
[\*Physarum auriscalpium\*](#) Cooke.  
[\*Physarum bethelii\*](#) Macbr.  
[\*Physarum bilgramii\*](#) Hagelst.  
[\*Physarum bitectum\*](#) G. Lister.  
[\*Physarum bivalve\*](#) Pers.  
[\*Physarum bogoriense\*](#) Racib.  
[\*Physarum braunianum\*](#) de Bary.  
[\*Physarum brunneolum\*](#) (Phill.) Masee.  
[\*Physarum carneum\*](#) G. Lister & Sturgis.  
[\*Physarum cinereum\*](#) (Batsch) Pers.  
[\*Physarum citrinum\*](#) Schum.  
[\*Physarum compressum\*](#) Alb. & Schw.  
[\*Physarum confertum\*](#) Macbr.

[\*Physarum conglomeratum\*](#) (Fr.) Rostaf.  
[\*Physarum contextum\*](#) (Pers.) Pets.  
[\*Physarum crateriforme\*](#) Petch.  
[\*Physarum decipiens\*](#) Curtis.  
[\*Physarum dictyospermum\*](#) Lister & G. Lister  
[\*Physarum dictyosporum\*](#) Martin.  
[\*Physarum diderma\*](#) Rost.  
[\*Physarum didermoides\*](#) (Pers.) Rost.  
[\*Physarum digitatum\*](#) G. Lister & Farq.  
[\*Physarum echinosporum\*](#) C. Lister.  
[\*Physarum famintzinii\*](#) Rostaf.  
[\*Physarum flavicomum\*](#) Berk.  
[\*Physarum flavidum\*](#) (Peck) Peck.  
[\*Physarum galbeum\*](#) Wingate.  
[\*Physarum gilkeyanum\*](#) H.C. Gilbert  
[\*Physarum globuliferum\*](#) (Bull.) Pers.  
[\*Physarum gyrosum\*](#) Rost.  
[\*Physarum javanicum\*](#) Racib.  
[\*Physarum laevisporum\*](#) Agnihothr.  
[\*Physarum lateritium\*](#) (Berk. & Rav.) Morgan.  
[\*Physarum leucophaeum\*](#) Fries.  
[\*Physarum leucopus\*](#) Link.  
[\*Physarum listeri\*](#) Macbr.  
[\*Physarum lutescens\*](#) Peck.  
[\*Physarum megalosporum\*](#) Macbr.  
[\*Physarum melleum\*](#) (Berk. & Br.) Masee.  
[\*Physarum mennegae\*](#) Nann.-Brem.  
[\*Physarum mortoni\*](#) Macbr.  
[\*Physarum mucosum\*](#) Nann.-Bremek.  
[\*Physarum murinum\*](#) A. Lister.  
[\*Physarum mutabile\*](#) (Rost) G. Lister.  
[\*Physarum nasuense\*](#) Emoto  
[\*Physarum newtonii\*](#) T. Macbr.  
[\*Physarum nicaraguense\*](#) Macbr.  
[\*Physarum notabile\*](#) Macbr.  
[\*Physarum nucleatum\*](#) Rex.  
[\*Physarum nudum\*](#) Macbr.  
[\*Physarum nutans\*](#) Pers.  
[\*Physarum oblatum\*](#) Macbr.  
[\*Physarum ovisporum\*](#) G. Lister.  
[\*Physarum penetrale\*](#) Rex.  
[\*Physarum perfectum\*](#) M. Peck  
[\*Physarum pezizoideum\*](#) (Jungh.) Pav. & Lag.  
[\*Physarum polycephalum\*](#) Schw.  
[\*Physarum psittacinum\*](#) Ditmar.

[\*Physarum pulcherrimum\*](#) Berk. & Rav.  
[\*Physarum pulcherripes\*](#) Peck.  
[\*Physarum pusillum\*](#) (Berk. & Curt.) G. Lister.  
[\*Physarum retisporum\*](#) Martin, Thind & Rehill.  
[\*Physarum rigidum\*](#) (G. Lister) G. Lister  
[\*Physarum roseum\*](#) Berk. & Br.  
[\*Physarum rubiginosum\*](#) Fries.  
[\*Physarum rubronodum\*](#) Martin.  
[\*Physarum serpula\*](#) Morgan.  
[\*Physarum sessile\*](#) Brândza  
[\*Physarum spinulosum\*](#) Thind & Sehgal.  
[\*Physarum stellatum\*](#) (Massee) Martin.  
[\*Physarum straminipes\*](#) A. Lister.  
[\*Physarum sulphureum\*](#) Alb. & Schw.  
[\*Physarum superbum\*](#) Hagelst.  
[\*Physarum tenerum\*](#) Rex.  
[\*Physarum tessellatum\*](#) Martin & Farr.  
[\*Physarum tropicale\*](#) Macbr.  
[\*Physarum variegatum\*](#) K.S. Thind & Dhillon  
[\*Physarum verum\*](#) Somm.  
[\*Physarum virescens\*](#) Ditmar.  
[\*Physarum viride\*](#) (Bull.) Pers.  
[\*Prototrichia metallica\*](#) (Berk) Massee.  
[\*Reticularia aurea\*](#) Nann.-Bremek.  
[\*Reticularia intermedia\*](#) Nann.-Brem.  
[\*Reticularia jurana\*](#) Meylan.  
[\*Reticularia lobata\*](#) A. Lister.  
[\*Reticularia lycoperdon\*](#) Bull.  
[\*Reticularia olivacea\*](#) (Ehrenb.) Fries.  
[\*Reticularia splendens\*](#) Morgan.  
[\*Schenella microspora\*](#) Martin.  
[\*Schenella simplex\*](#) Macbride.  
[\*Stemonitis axifera\*](#) (Bull.) Macbride.  
[\*Stemonitis confluens\*](#) Cooke & Ellis.  
[\*Stemonitis flavogenita\*](#) Jahn.  
[\*Stemonitis fusca\*](#) Roth.  
[\*Stemonitis herbatica\*](#) Peck.  
[\*Stemonitis hyperopta\*](#) Meylan.  
[\*Stemonitis inconspicua\*](#) Nann.-Bremek.  
[\*Stemonitis microsperma\*](#) Ing  
[\*Stemonitis mussooriensis\*](#) Martin, Thind & Sohi.  
[\*Stemonitis nigrescens\*](#) Rex.  
[\*Stemonitis pallida\*](#) Wingate.  
[\*Stemonitis smithii\*](#) Macbr.  
[\*Stemonitis splendens\*](#) Host.

[Stemonitis trechispora](#) ( Berk.) Macbr.  
[Stemonitis uvifera](#) Macbr.  
[Stemonitis virginiensis](#) Rex.  
[Trichia alpina](#) (R.E. Fries) Meylan.  
[Trichia botrytis](#) (J F. Gmel.) Pers.  
[Trichia contorta](#) (Ditmar) Rost.  
[Trichia crateriformis](#) Martin.  
[Trichia decipiens](#) (Pers.) Macbride.  
[Trichia erecta](#) Rex.  
[Trichia favoginea](#) (Batsch) Pers.  
[Trichia floriformis](#) (Schw.) G. Lister.  
[Trichia lutescens](#) (A. Lister).  
[Trichia macbridei](#) M.E. Peck.  
[Trichia scabra](#) Rost.  
[Trichia subfusca](#) Rex.  
[Trichia varia](#) (Pers.) Pers.  
[Trichia verrucosa](#) Berk.  
[Tubifera bombardia](#) (Berk. & Br.) Martin.  
[Tubifera casparyi](#) (Rost.) Macbr. a.  
[Tubifera ferruginosa](#) (Batsch) J.F. Gmel. a  
[Tubifera microsperma](#) (Berk. & Curt.) Martin.  
[Tubifera papillata](#) Martin, Thind and Sohi.  
[Wilczekia evelinae](#) Meylan.