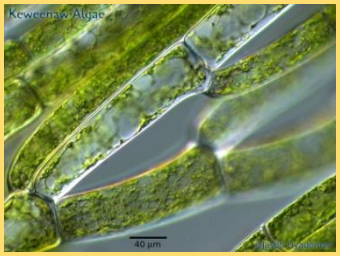
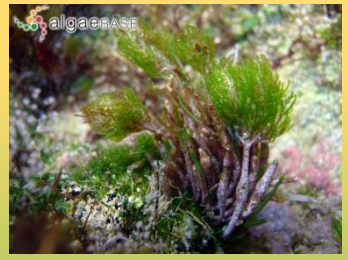
Ulvophyceae - Cladophorales





Základní charakteristika

Sifonokladální stélka

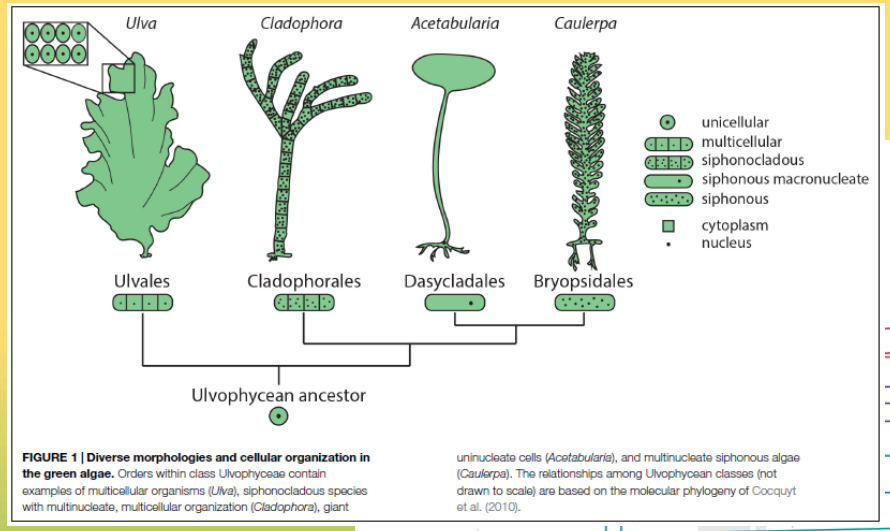
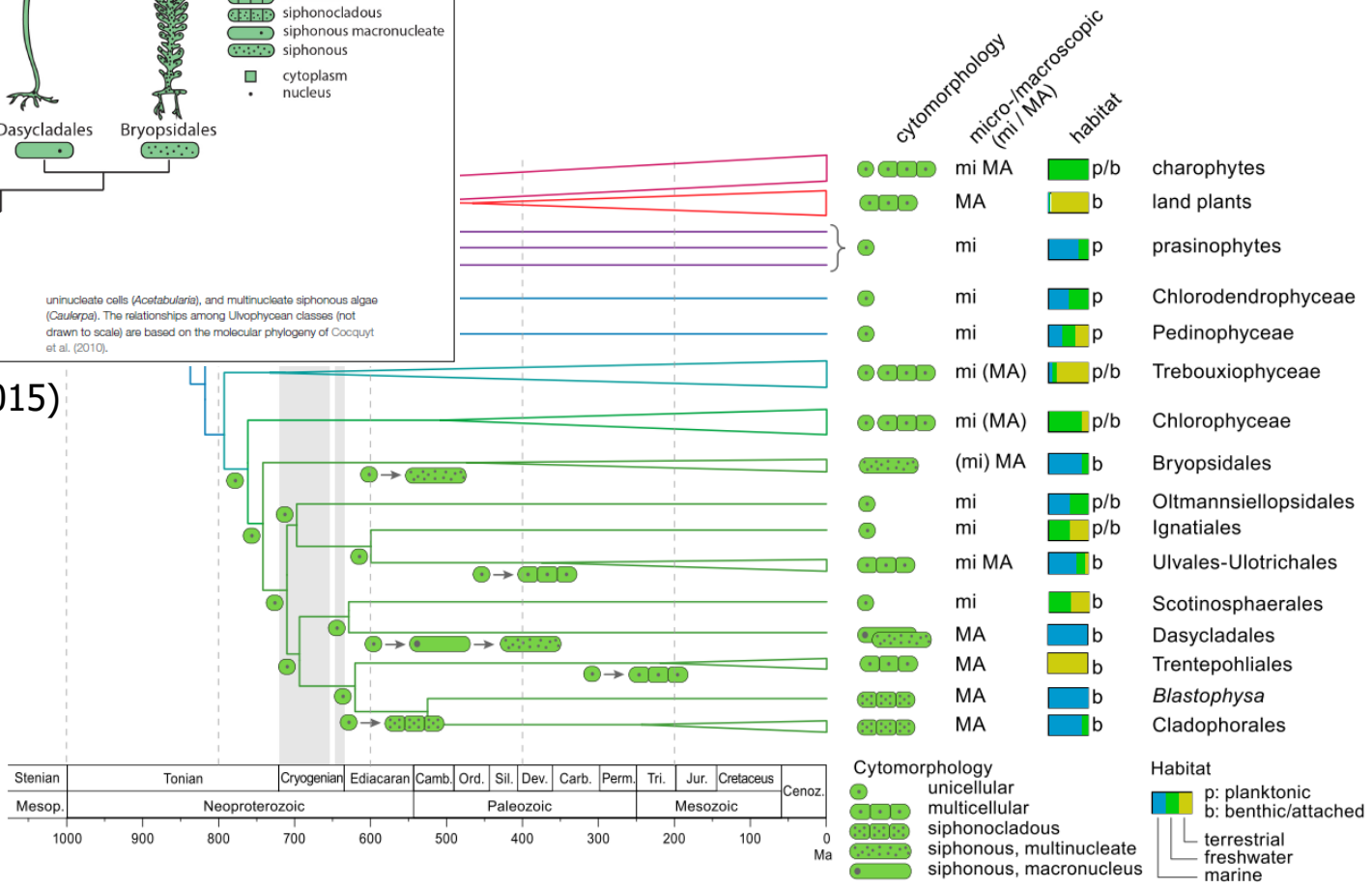


FIGURE 1 | Diverse morphologies and cellular organization in the green algae. Orders within class Ulvophyceae contain examples of multicellular organisms (*Ulva*), siphonocladous species with multinucleate, multicellular organization (*Cladophora*), giant uninucleate cells (*Acetabularia*), and multinucleate siphonous algae (*Caulerpa*). The relationships among Ulvophycean classes (not drawn to scale) are based on the molecular phylogeny of Cocquyt et al. (2010).

Coneva & Chitwood (2015)

Del Cortona et al. (2020)



Cockquyt et al. (2010)

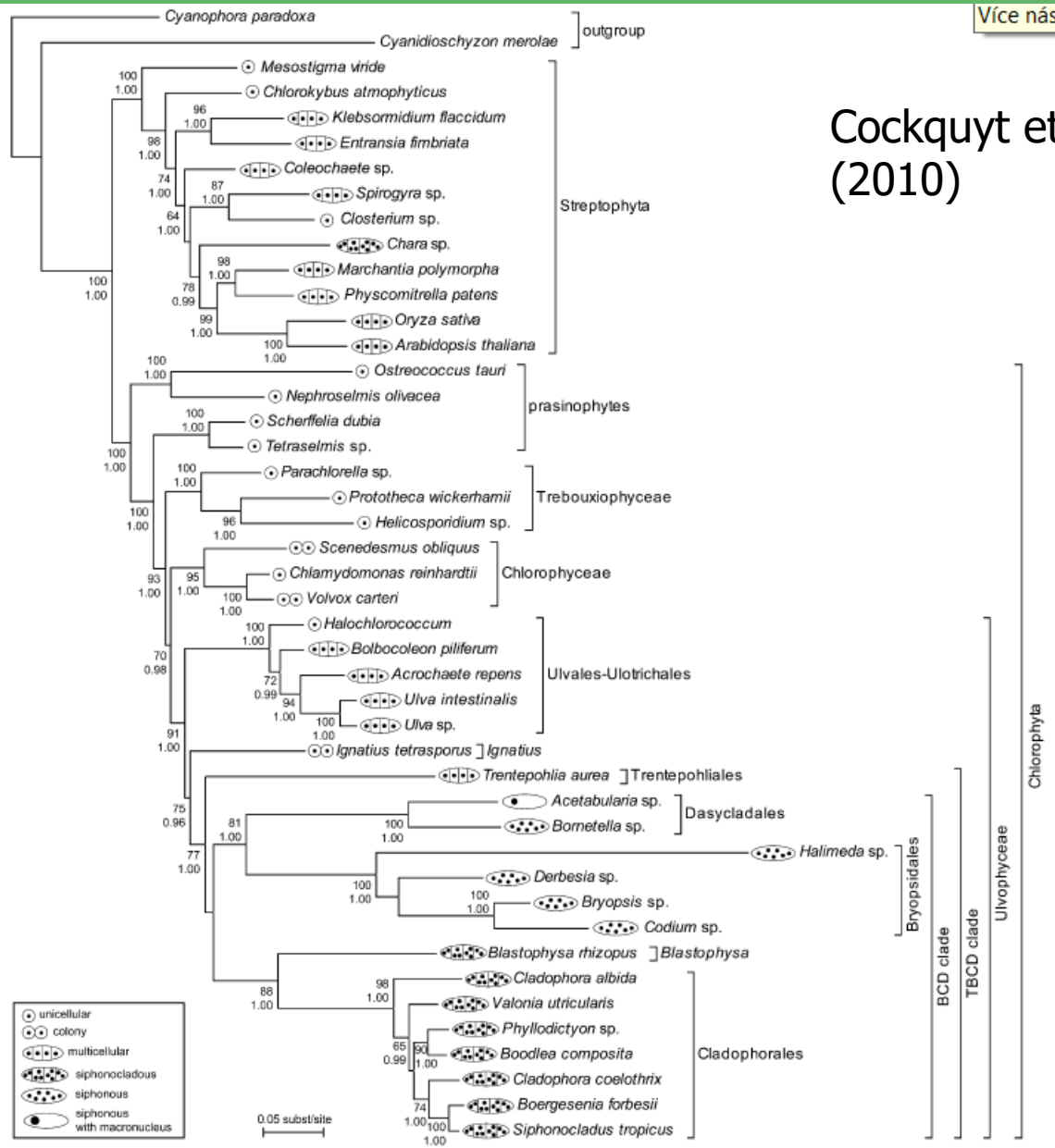
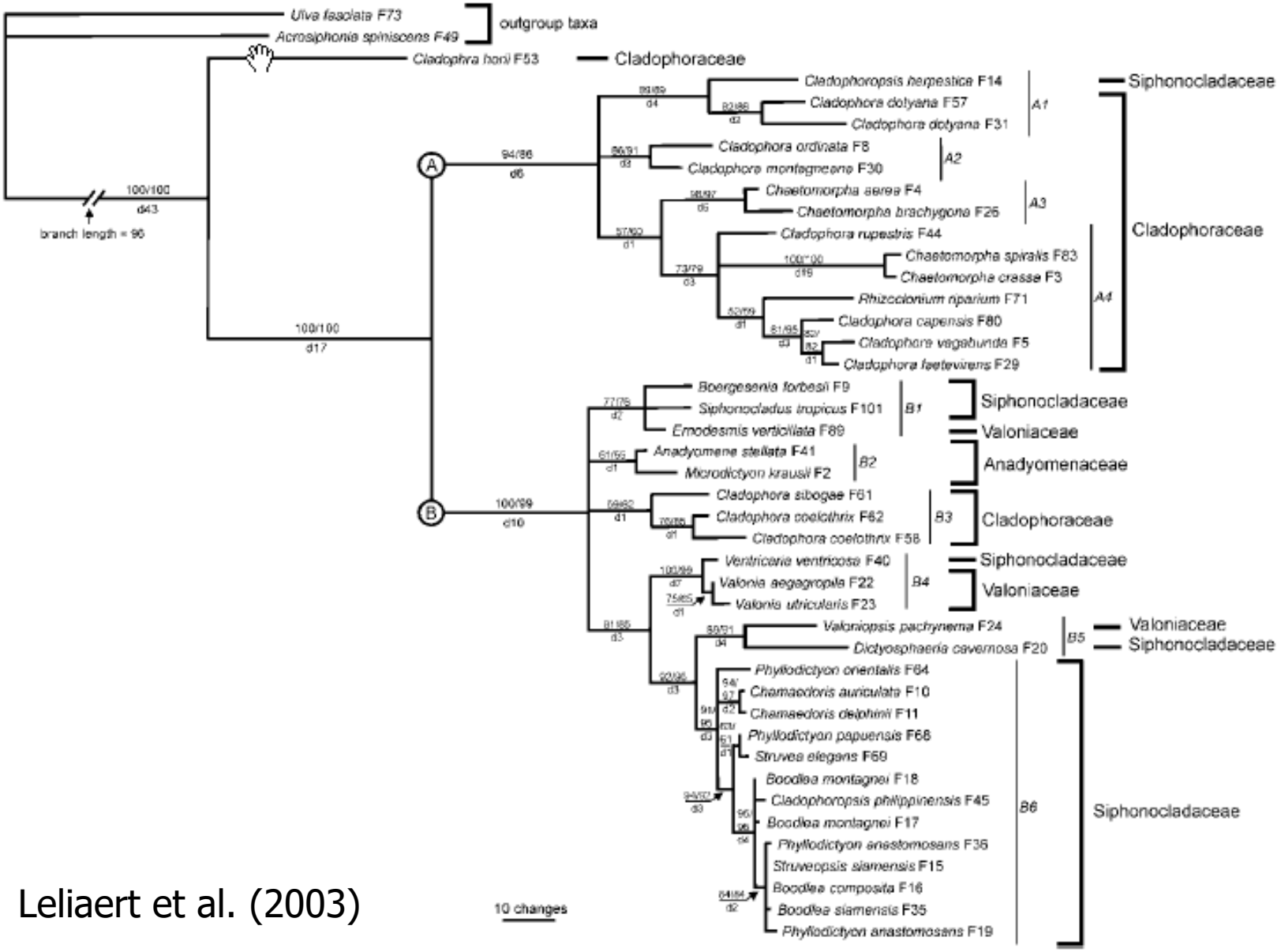


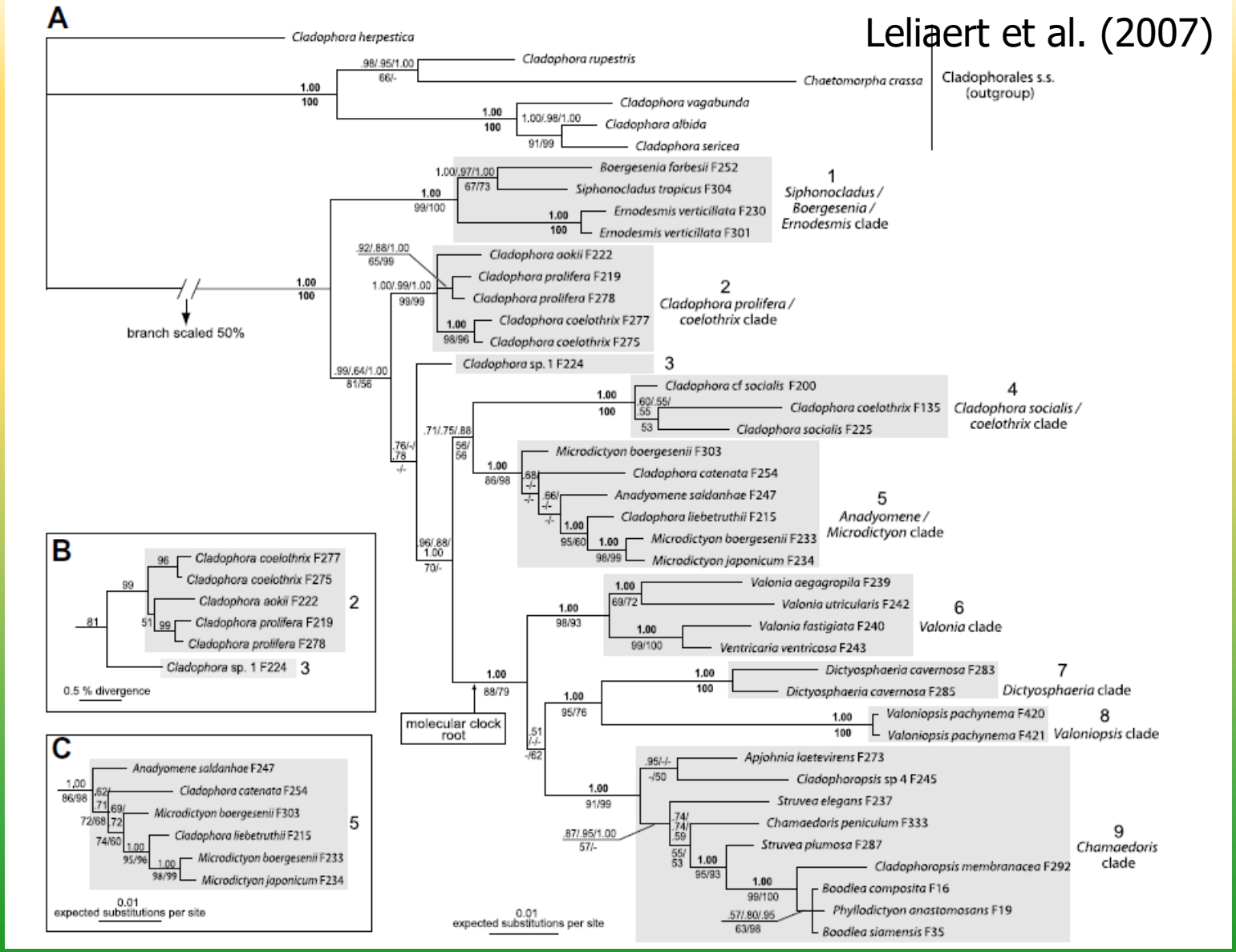
FIG. 1. Phylogeny of the green plant lineage obtained by ML inference of the 25% site-stripped data set containing seven nuclear genes, SSU nrDNA, and plastid genes *rbc*L and *atp*B. Numbers at nodes indicate ML BVs (top) and BI PP (bottom); values below, respectively, 50 and 0.9 are not shown. BCD clade stands for the orders Bryopsidales, Cladophorales, and Dasycladales, and TBCD clade stands for the orders Trentepohliales, Bryopsidales, Cladophorales, and Dasycladales.

Evoluce

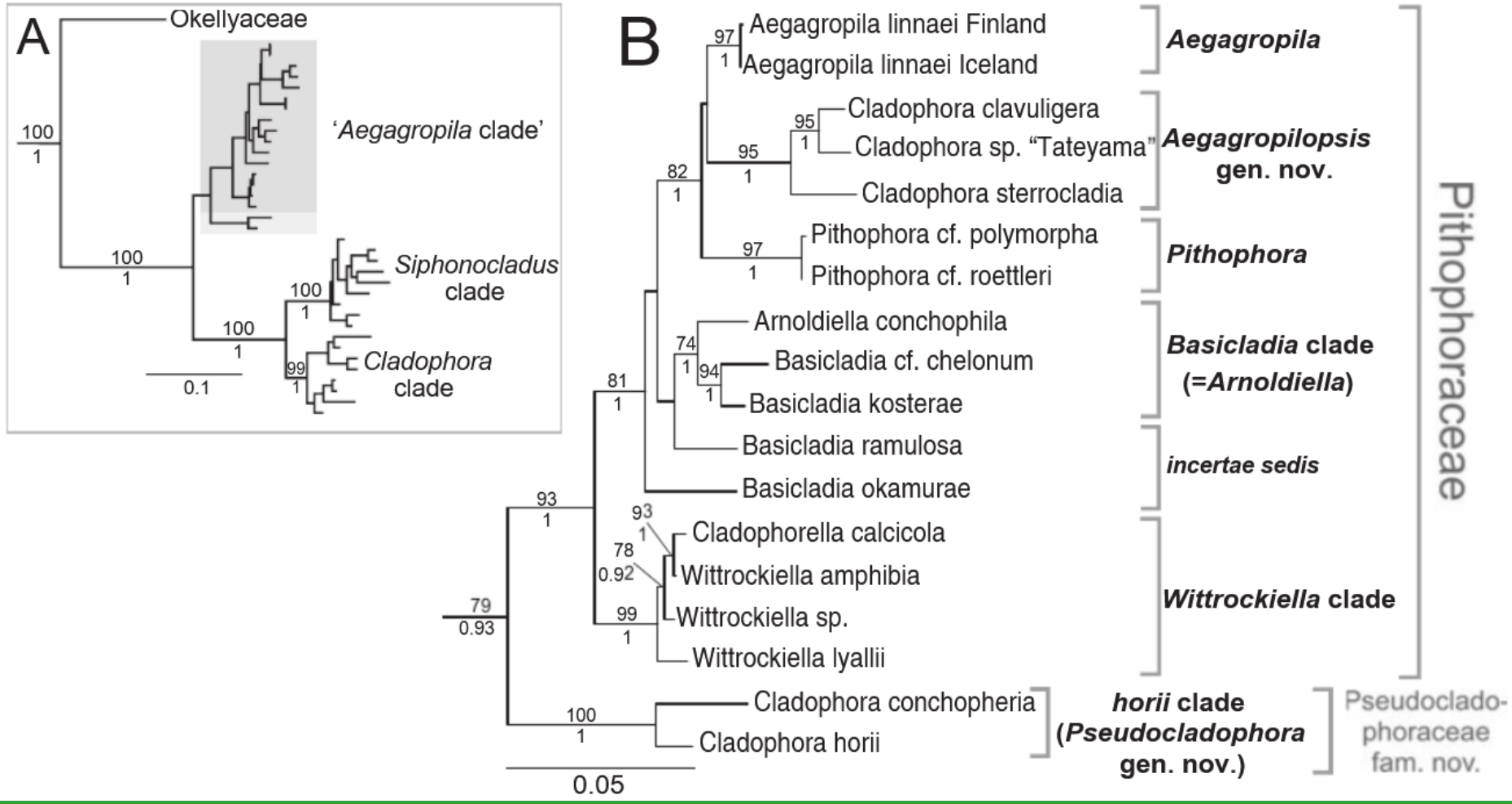


Leliaert et al. (2003)

Evoluce

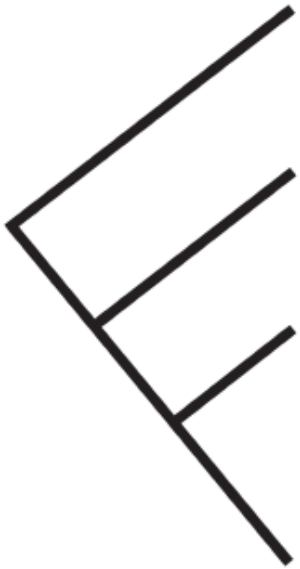

A
Leliaert et al. (2007)
Cladophora herpestica
Cladophora rupestris
Chaetomorpha crassa
Cladophora vagabunda
Cladophora albida
Cladophora sericea
Cladophorales s.s. (outgroup)
Boergesenia forbesii F252
Siphonocladus tropicus F304
Ernodesmis verticillata F230
Ernodesmis verticillata F301
1 Siphonocladus / Boergesenia / Ernodesmis clade
Cladophora aokii F222
Cladophora prolifera F219
Cladophora prolifera F278
Cladophora coelothrix F277
Cladophora coelothrix F275
2 Cladophora prolifera / coelothrix clade
branch scaled 50%
Cladophora sp. 1 F224
3
Cladophora cf socialis F200
Cladophora coelothrix F135
Cladophora socialis F225
4 Cladophora socialis / coelothrix clade
Microdictyon boergesenii F303
Cladophora catenata F254
Anadyomene saldanhae F247
Cladophora liebetruthii F215
Microdictyon boergesenii F233
Microdictyon japonicum F234
5 Anadyomene / Microdictyon clade
Valonia aegagropila F239
Valonia utricularis F242
Valonia fastigiata F240
Ventricaria ventricosa F243
6 Valonia clade
Dictyosphaeria cavernosa F283
Dictyosphaeria cavernosa F285
7 Dictyosphaeria clade
Valoniopsis pachynema F420
Valoniopsis pachynema F421
8 Valoniopsis clade
Apjohnia laetevirens F273
Cladophoropsis sp 4 F245
Struvea elegans F237
Chamaedoris peniculum F333
Struvea plumosa F287
Cladophoropsis membranacea F292
Boodlea composita F16
Phyllodictyon anastomosans F19
Boodlea siamensis F35
9 Chamaedoris clade
molecular clock root
0.01 expected substitutions per site
B
Cladophora coelothrix F277
Cladophora coelothrix F275
Cladophora aokii F222
Cladophora prolifera F219
Cladophora prolifera F278
2
Cladophora sp. 1 F224
3
0.5 % divergence
C
Anadyomene saldanhae F247
Cladophora catenata F254
Microdictyon boergesenii F303
Cladophora liebetruthii F215
Microdictyon boergesenii F233
Microdictyon japonicum F234
5
0.01 expected substitutions per site

Evoluce



Boedeker et al. (2012)

Systém

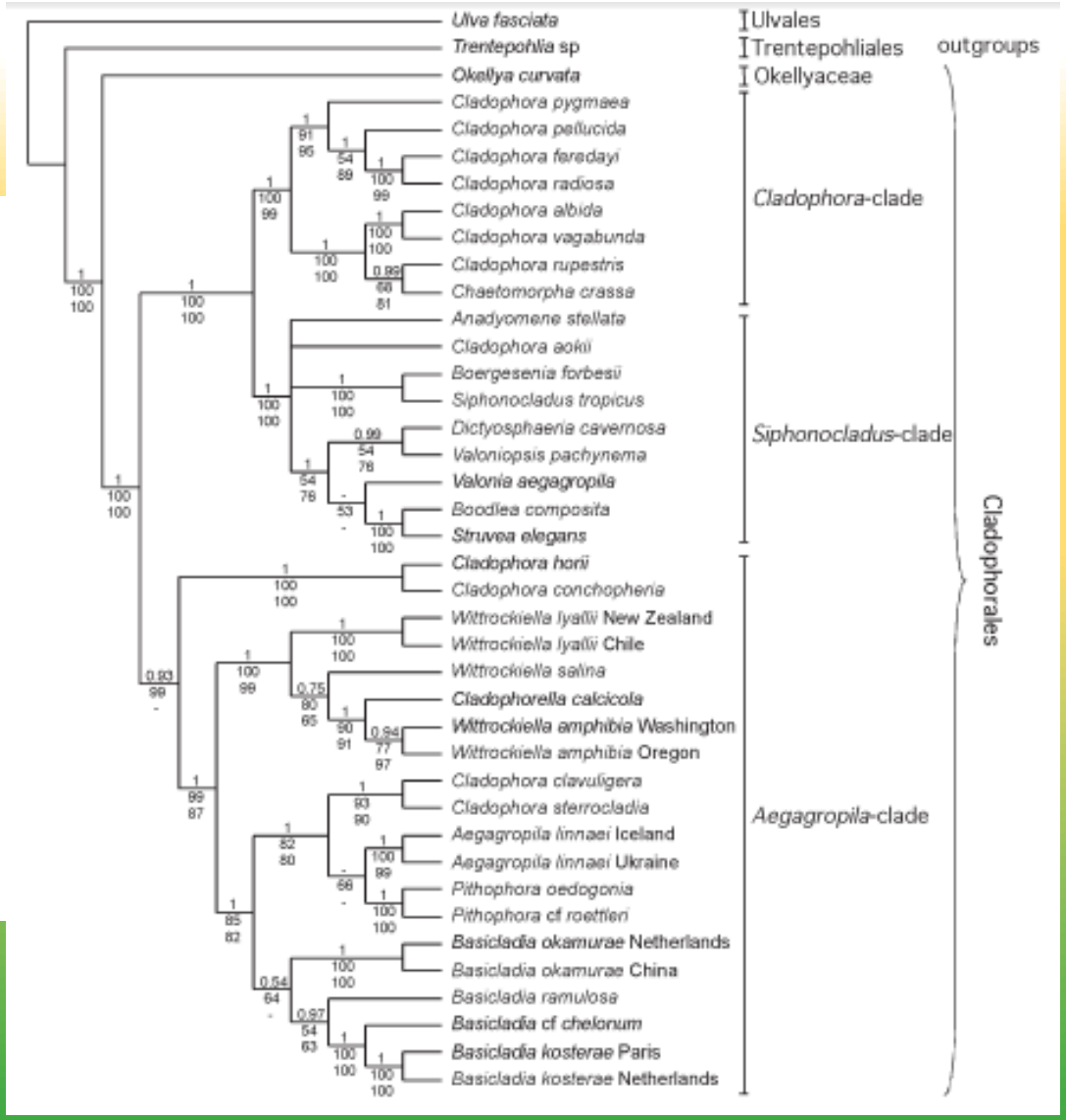


Okellyaceae
-marine
-temperate
-monotypic
-unbranched filaments

***Aegagropila*-clade**
-mainly brackish & freshwater
-temperate to tropical
-to date 10 species included
-branched filaments

***Siphonocladus*-clade**
[='Siphonocladales s.s.']
-exclusively marine
-mainly tropical
-species-rich (>100 species)
-morphologically most complex

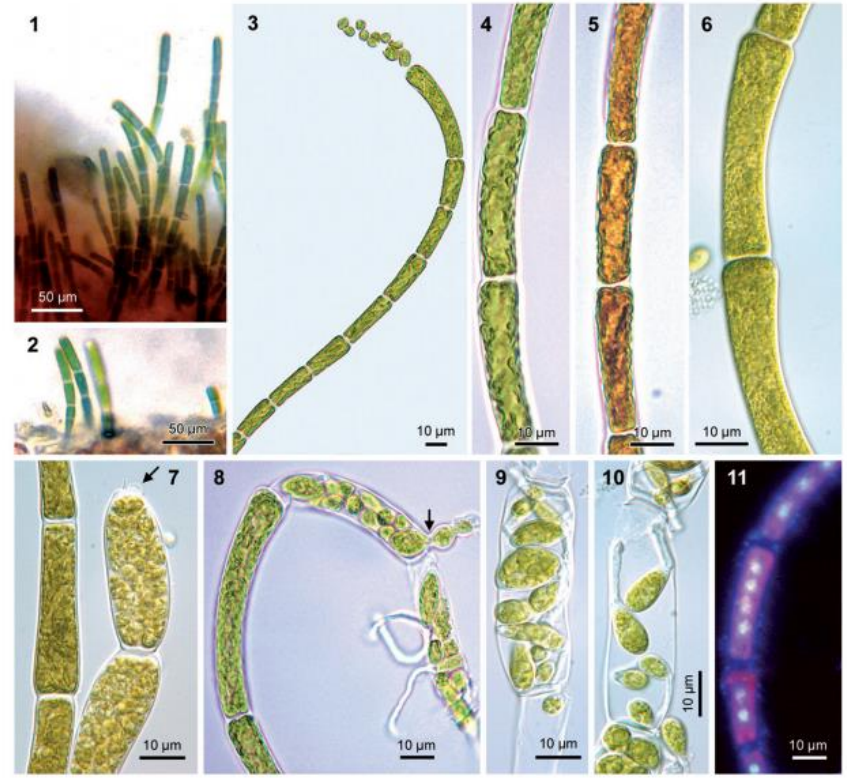
***Cladophora*-clade**
[='Cladophorales s.s.'; 'Cladophoraceae']
-mainly marine
-tropical-temperate-polar
-species-rich (>100 species)
-branched or unbranched filaments



Boedeker et al. (2012)

SSU+LSU

Cladophorales – *Okellya* clade



Figs 1–11. *Uronema curvatum* (=*Okellya curvata*, comb. nov.). Figs 1, 2. Field-collected sample, growing as an epiphyte on a red crust, on the haptera of *Laminaria hyperborea* (diameter of filaments 7–8 µm). Figs 3–11. Cultures. Fig. 3. Terminal sporangium with spores. Figs 4, 5. Vegetative filaments showing chloroplasts before and after staining with iodine solution (no pyrenoids are visible). Fig. 6. Irregular surface of chloroplast. Figs 7–10. Terminal sporangia with spores, some of which germinate *in situ*. Arrows indicate exit pore. Fig. 11. DAPI-stained vegetative cells with two to four nuclei.

Okellya curvata

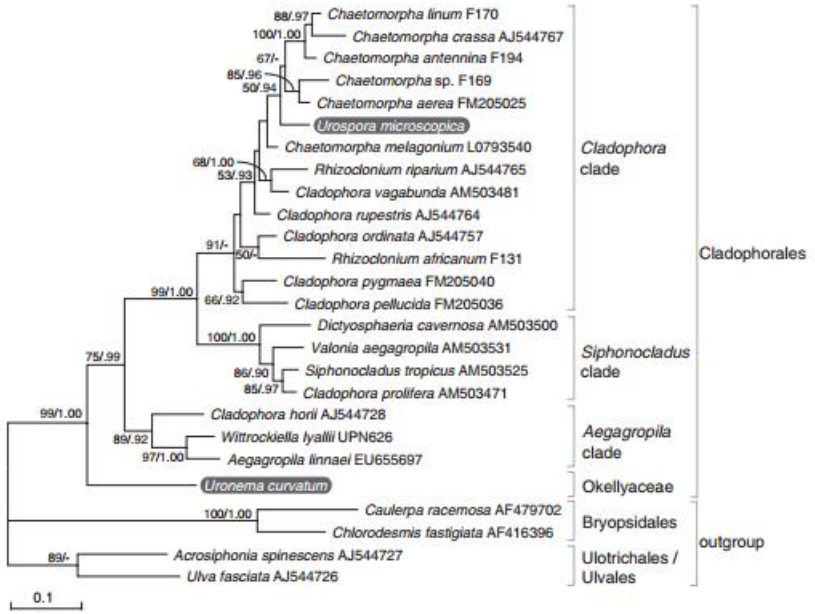


Fig. 23. Maximum likelihood (ML) tree of the Cladophorales inferred from partial large subunit nrDNA sequences, showing the phylogenetic position of *Uronema curvatum* (=*Okellya curvata*, comb. nov.) and *Urospora microscopica* (=*Chaetomorpha norvegica*, nom. nov.). ML bootstrap values (> 50) and Bayesian inference posterior probabilities (> 0.90) are indicated at branches.

Leliaert et al. (2009)

Cladophorales – *Cladophora* clade

Boedeker et al. (2016)

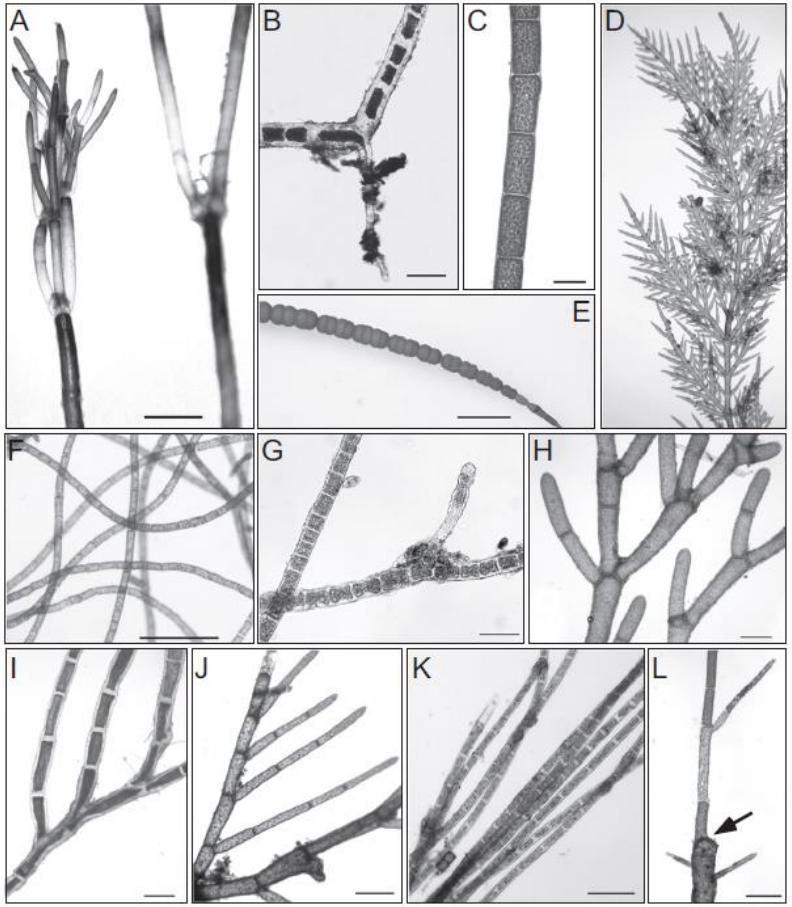
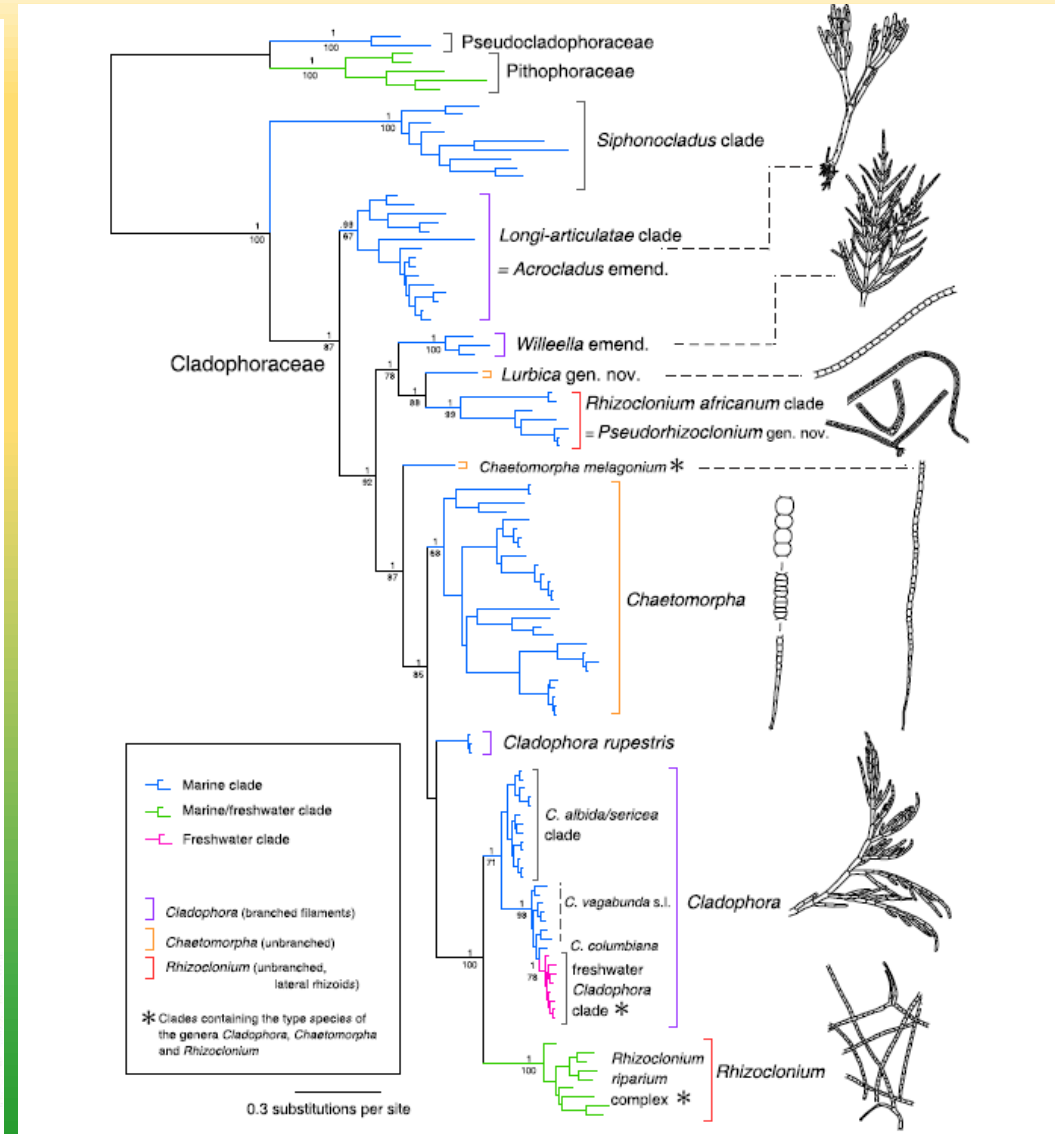
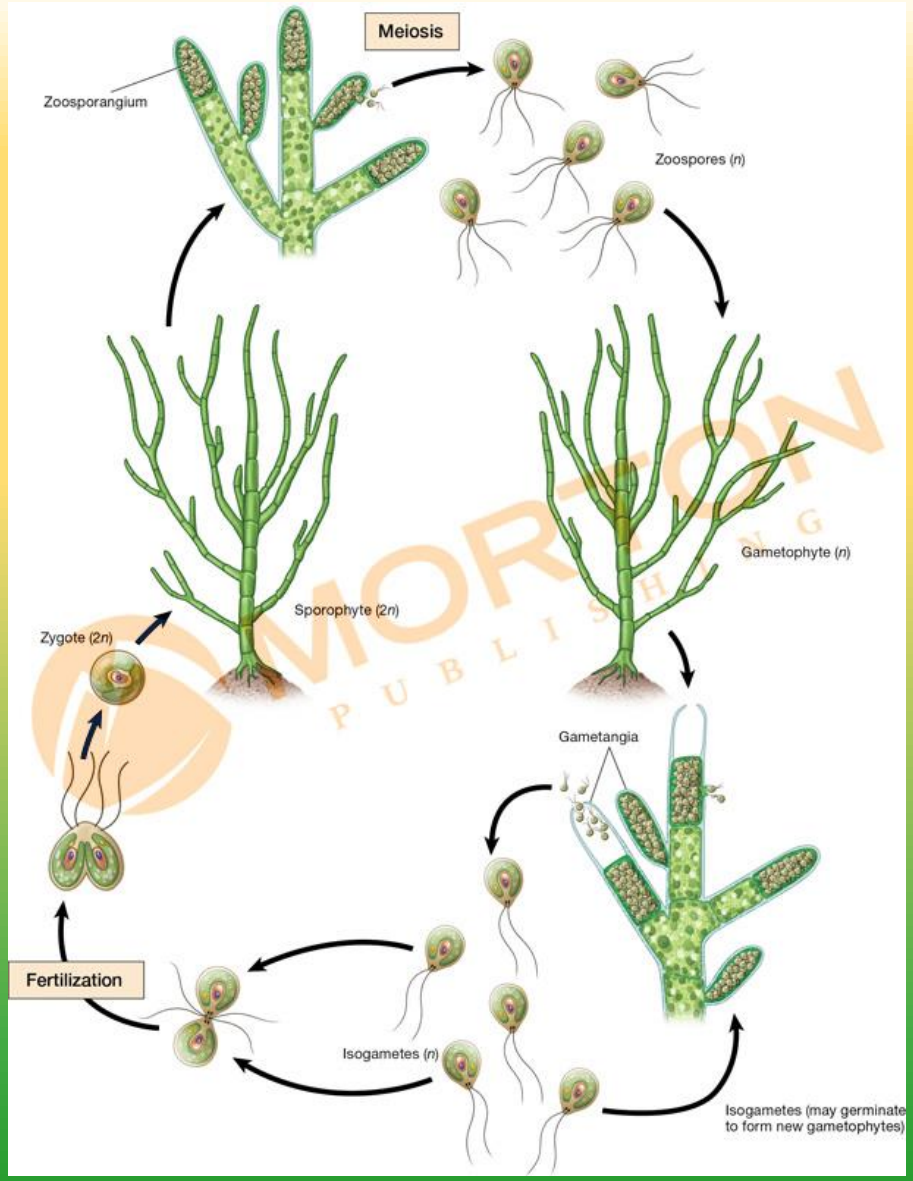
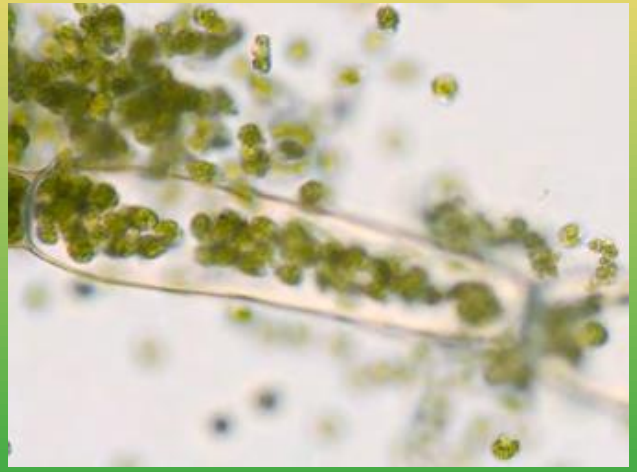


FIG. 1. Morphological diversity within the Cladophoraceae. (A) *Cladophora pellucida* (= *Acrocladus pellucidus*), apical part of thallus showing dense acropetal branching and long cells in main filaments, scale bar = 1 mm. (B) *Rhizoclonium africanum* (=*Pseudorhizoclonium africanum* comb. nov.), unbranched filament with lateral rhizoid showing characteristic thick cell walls, field material, scale bar = 100 µm. (C) *Rhizoclonium africanum* (=*Pseudorhizoclonium africanum* comb. nov.), culture of field material shown in (B), unbranched filament with thin cell walls, scale bar = 100 µm. (D) *Cladophora ordinata* (=*Willeella ordinata*), upper part of thallus showing characteristic opposite branching, scale bar = 500 µm. (E) *Chaetomorpha coliformis*, basal region of unbranched filament showing the characteristic giant cells organized in pairs, scale bar = 5 mm. (F) *Chaetomorpha ligustica*, thin unbranched filaments, scale bar = 500 µm. (G) *Rhizoclonium "riparium,"* unbranched filaments with lateral rhizoids, scale bar = 50 µm. (H) *Cladophora laetevirens*, branched thallus, scale bar = 200 µm. (I) *Cladophora glomerata*, basal part of thallus with thick cell walls and irregular insertion of branches, scale bar = 200 µm. (J) *Cladophora glomerata*, densely branched apical part of thallus showing acropetal growth, scale bar = 200 µm. (K) *Cladophora* cf. *fracta*, unbranched filaments, scale bar = 100 µm. (L) *Cladophora rivularis*, variability in culture, with drastically reduced filament width in culture (arrow indicates transition) compared to thicker diameter as encountered in the field, scale bar = 50 µm.



Cladophorales – *Cladophora* clade

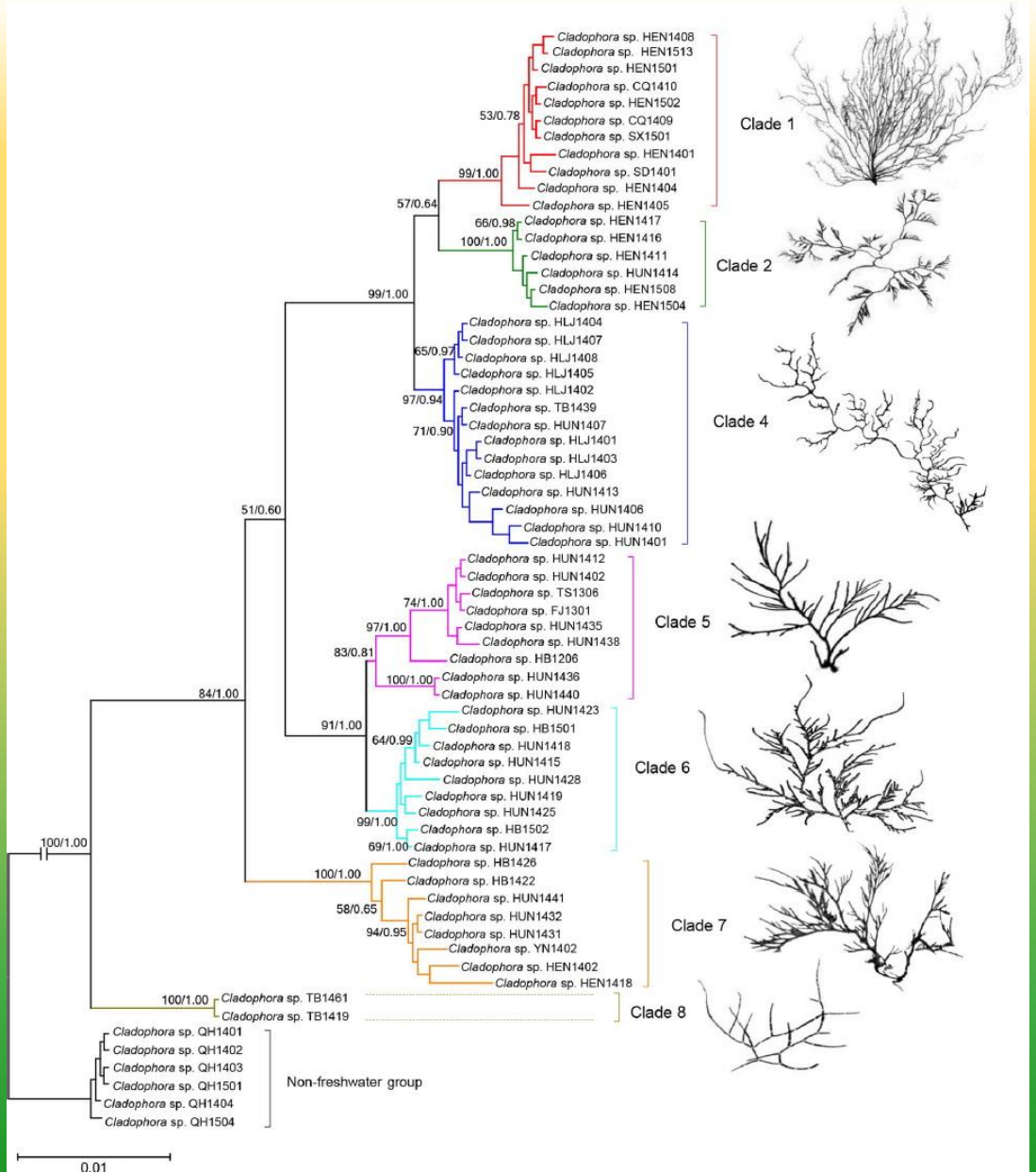




Graham et al. (2016)

Cladophorales – *Cladophora* clade

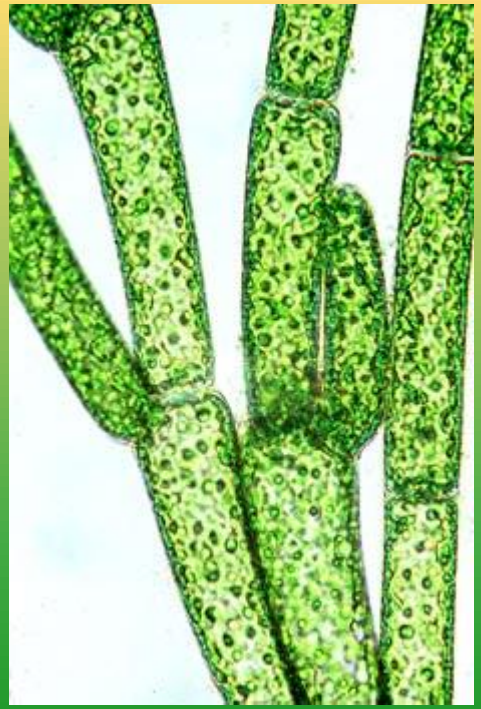
Cladophora

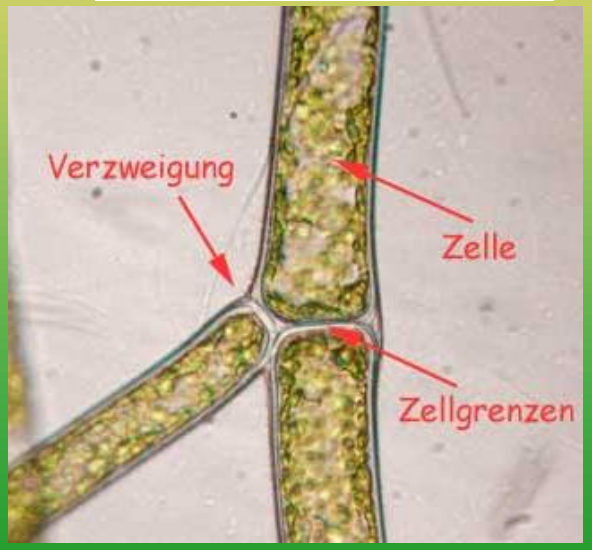


Zhu et al. (2019)

Cladophorales – *Cladophora* clade

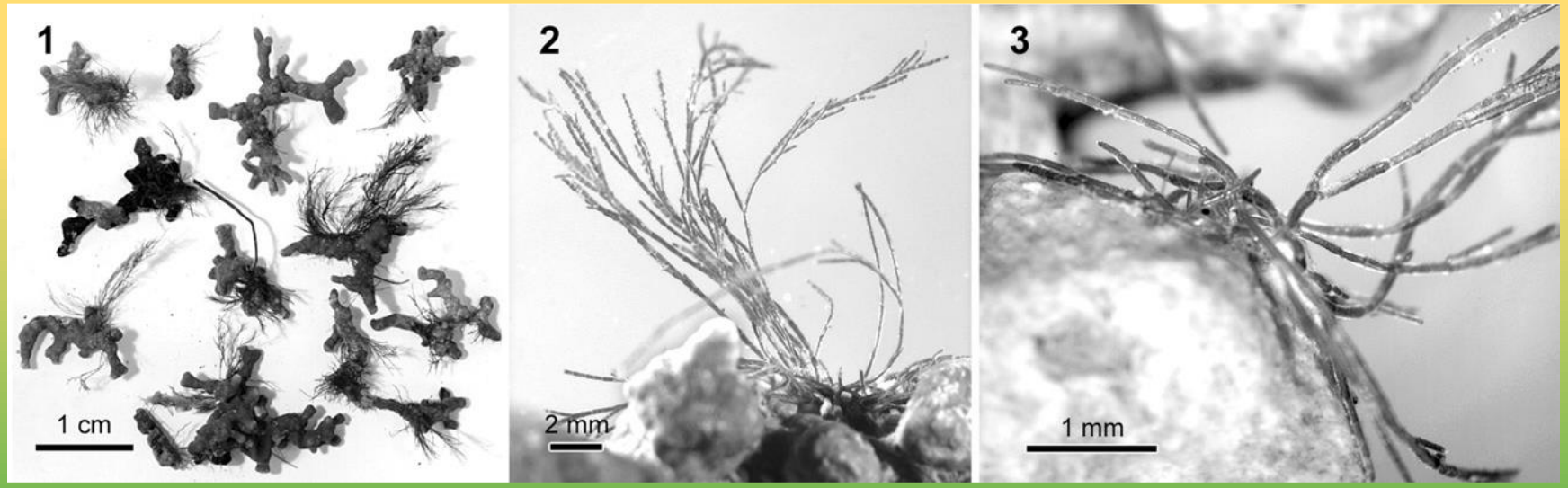
Cladophora





Cladophorales – *Cladophora* clade

Cladophora rhodolithicola



Leliaert et al. (2009)

Cladophora – význam:

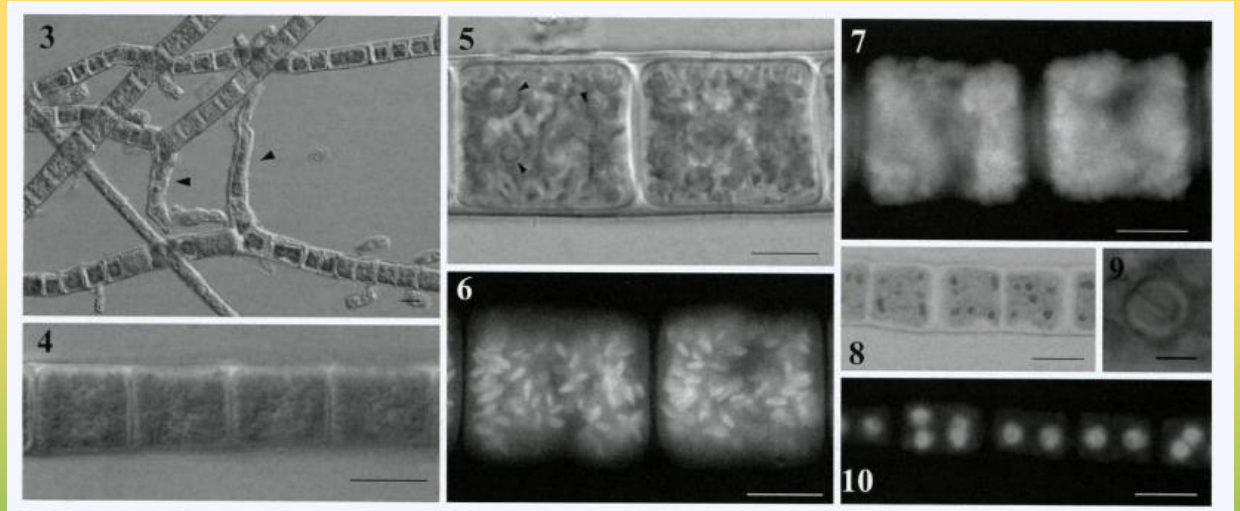
- Hnojivo, krmivo
- Látky pro farmaceutický průmysl a kosmetiku
- Stavebnictví (polyuretanové pěny)
- fytoremediace
- Potravina – v Thajsku „kai"
- Řada studií ohledně potenciálního antioxidačního, antibakteriálního a antirakovinného účinku nebo využití pro biofuels

- „habitat forming species" v estuáriích, řekách apod.

Zulkifly et al. (2013)

Cladophorales – *Cladophora* clade

Rhizoclonium

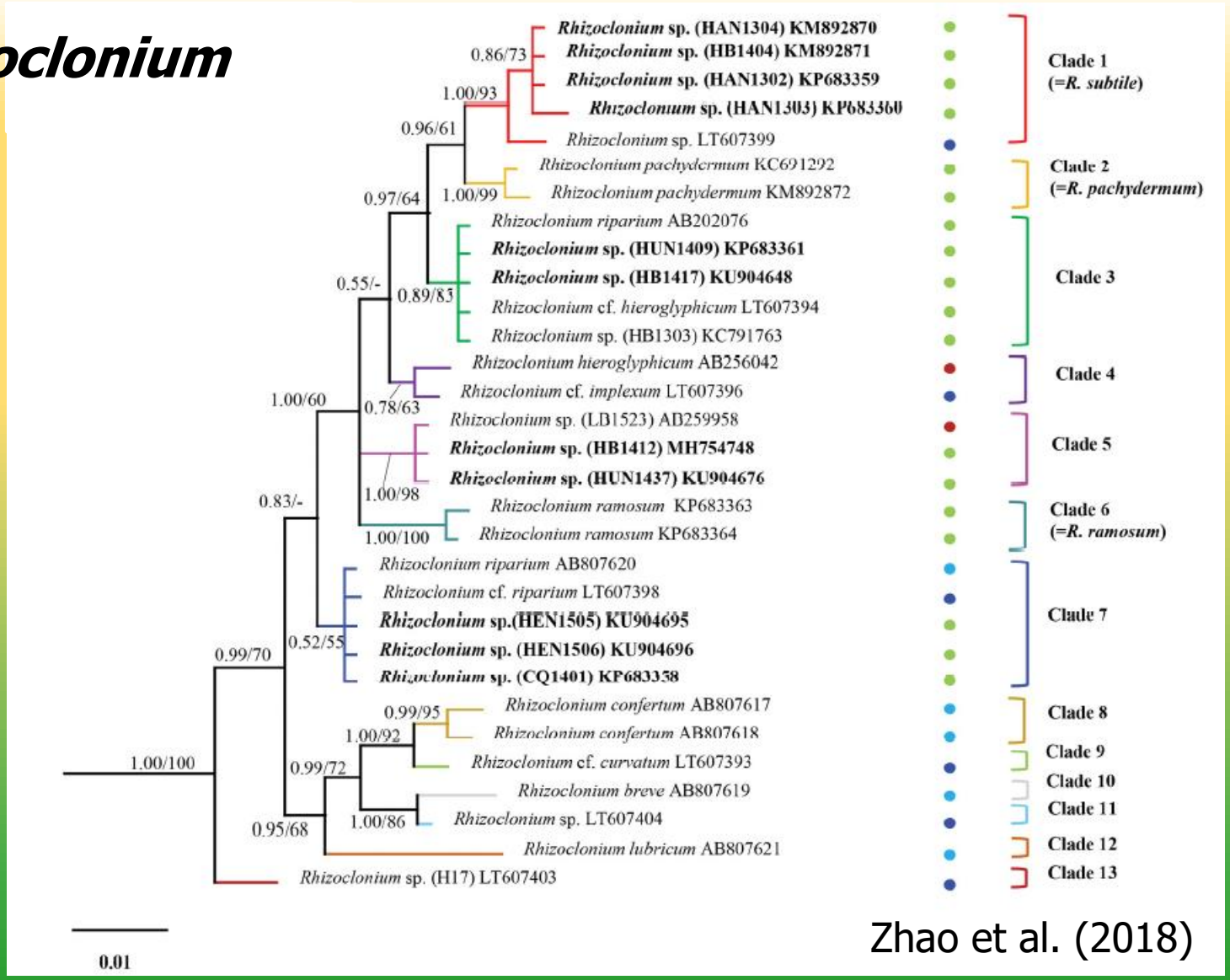


Figs 3–10. Field-collected materials of *Rhizoclonium riparium* (= *R.* sp. 1). Scale bar = 20 µm (Figs 3, 4, 8, 10); Scale bar = 10 µm (Figs 5–7); Scale bar = 2.5 µm (Fig. 9).
Fig. 3. Field collected material showing filaments that form rhizoids (arrowheads).
Figs 4, 5. Reticulate chloroplasts. Arrowheads indicate pyrenoids.
Figs 6, 7. Autofluorescent chloroplasts. Some chloroplasts are arranged in a reticulate pattern.
Fig. 8. Cells stained with Lugol's iodine, showing the pyrenoids.
Fig. 9. Bilenticular pyrenoid.
Fig. 10. Cells stained with DAPI, showing nuclei.

Ichihara et al. (2013)

Cladophorales – *Cladophora* clade

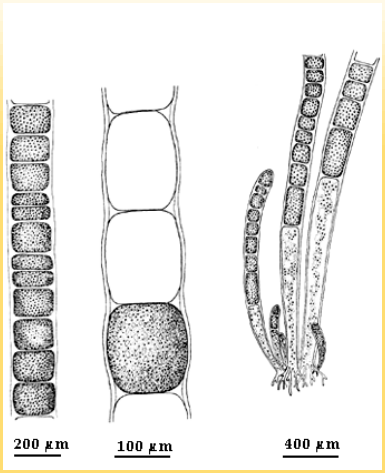
Rhizoclonium

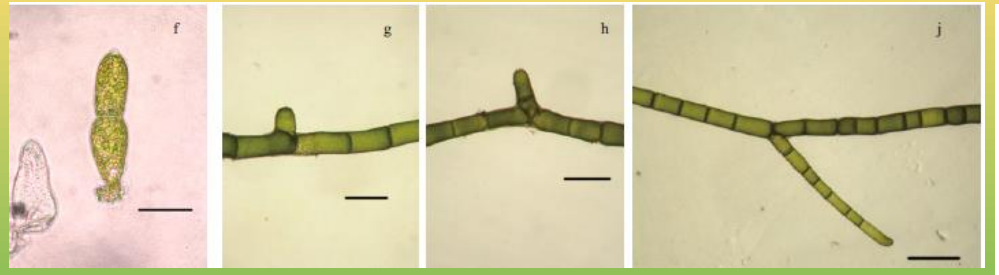


Zhao et al. (2018)

Cladophorales – *Cladophora* clade

Chaetomorpha





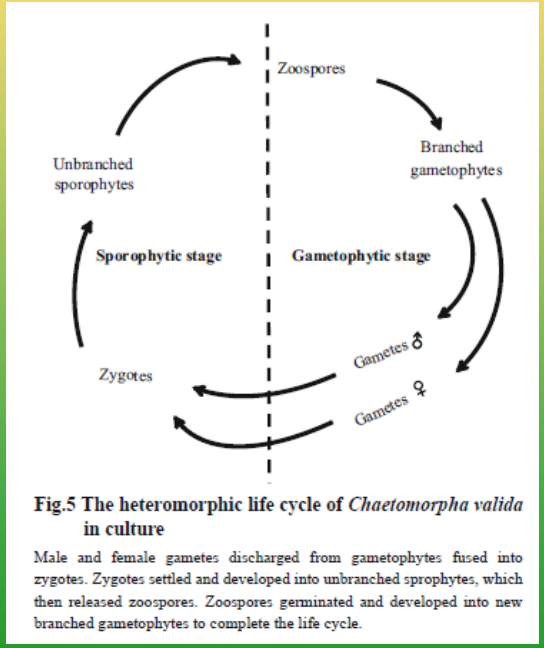


Fig.5 The heteromorphic life cycle of *Chaetomorpha valida* in culture

Male and female gametes discharged from gametophytes fused into zygotes. Zygotes settled and developed into unbranched sprophytes, which then released zoospores. Zoospores germinated and developed into new branched gametophytes to complete the life cycle.

Deng et al. (2013)

Cladophorales *Siphonocladus* clade

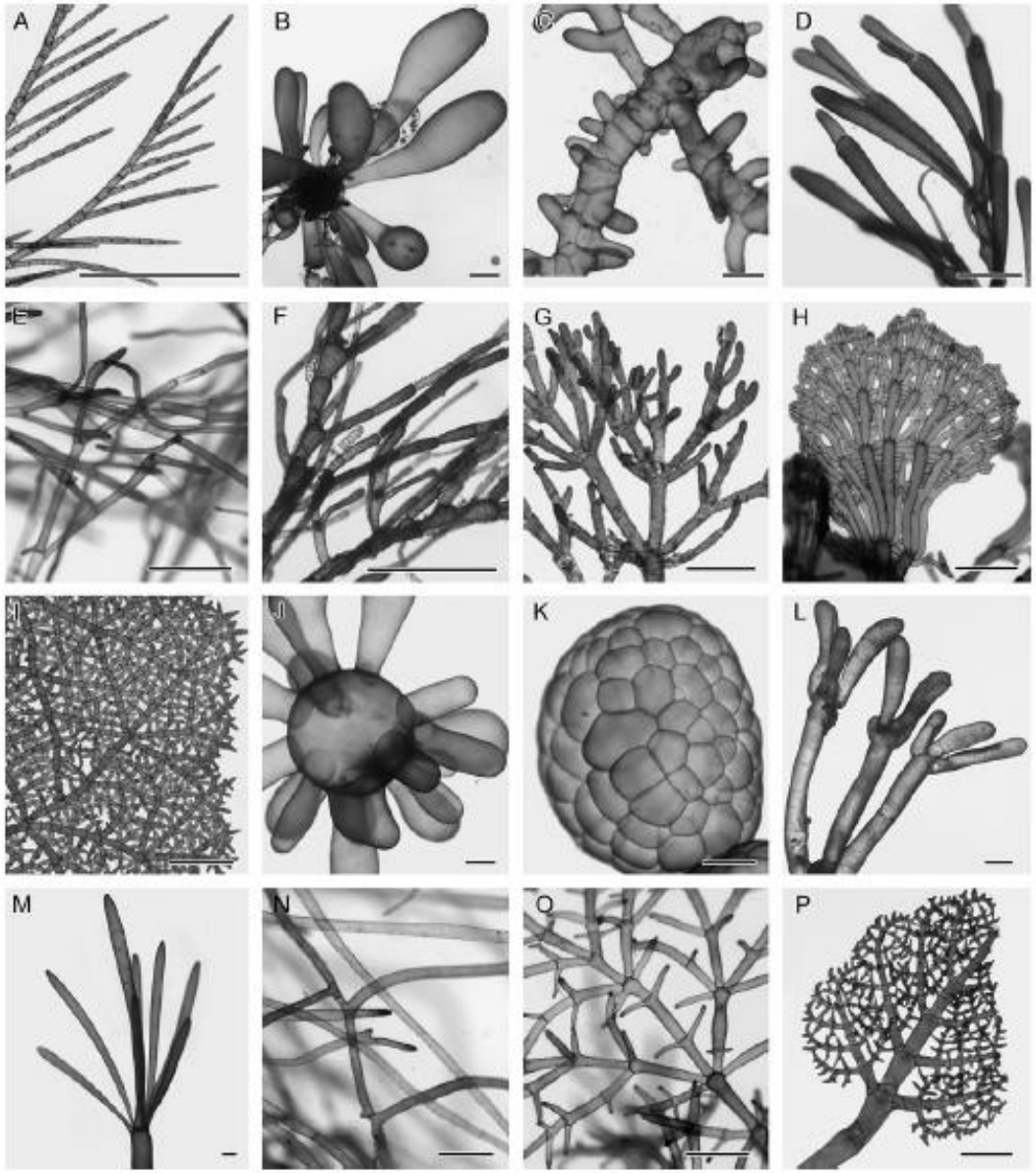
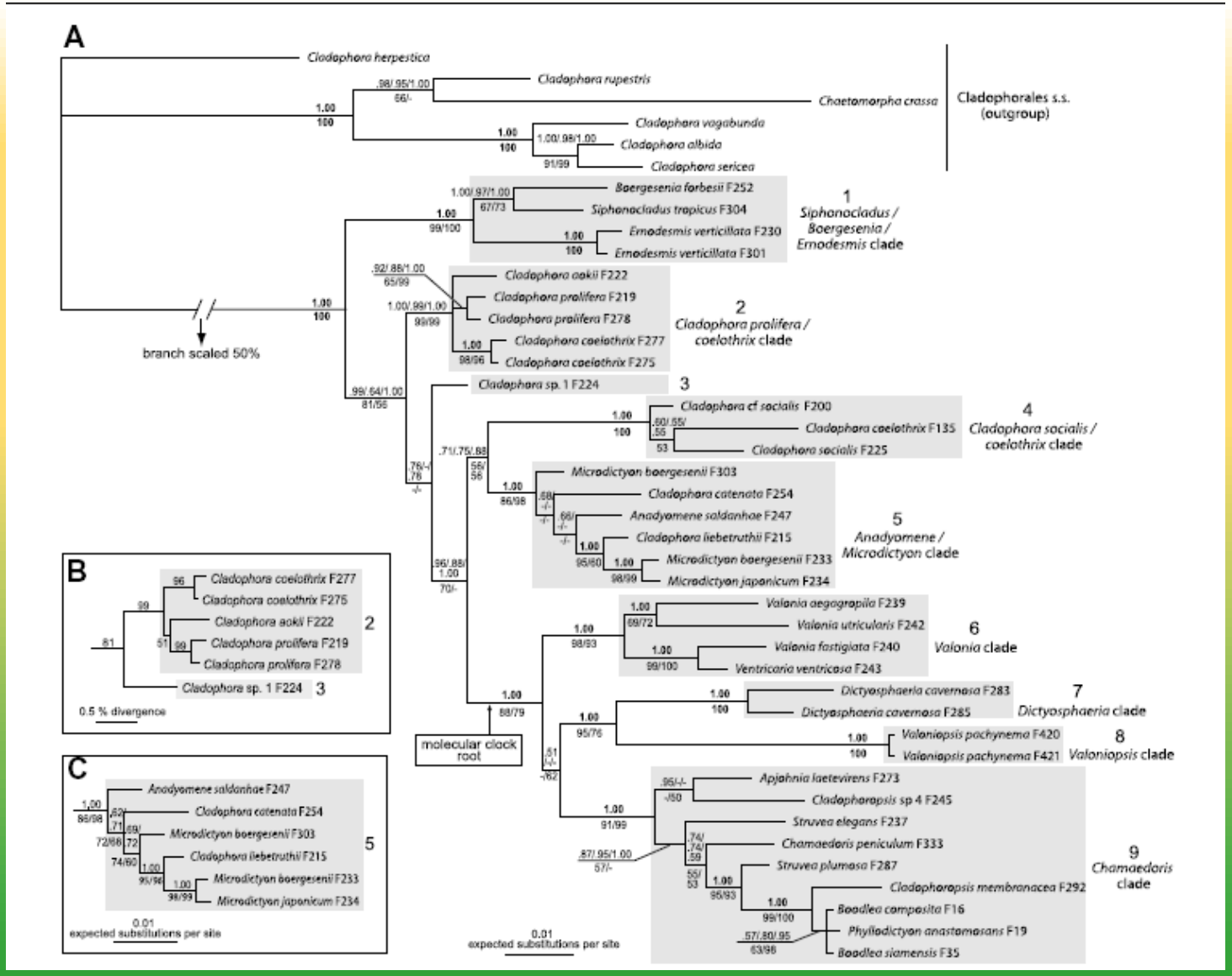
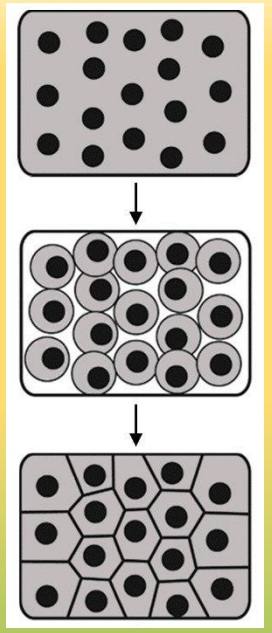


Fig. 1. Morphological variety in the Siphonocladales (A) *Cladophora sericea* (Cladophorales: outgroup), (B) *Boergesenia forbesii* (F252: clade 1), (C) *Siphonocladus pusillus* (F306: clade 1), (D) *Cladophora prolifera* (F280: grade 2), (E) *Cladophora coelothrix* (F275: grade 2), (F) *Cladophora* sp. 1 (F224: "clade" 3), (G) *Cladophora sibogae* (F61: clade 4), (H) *Anadyomene stellata* (F268, clade 5), (I) *Microdictyon krausii* (F2: clade 5), (J) *Valonia utricularis* (F242: clade 6), (K) *Dictyosphaeria cavernosa* (F283: clade 7), (L) *Valoniopsis pachynema* (F24: clade 8), (M) *Apjohnia laetevirens* (F273: clade 9), (N) *Cladophoropsis membranacea* (F295: clade 9), (O) *Phyllodictyon orientale* (F414: clade 9), (P) *Phyllodictyon anastomosans* (F36: clade 9). Scale bars, 1 mm.

Leliaert et al. (2007)

Cladophorales - *Siphonocladus* clade

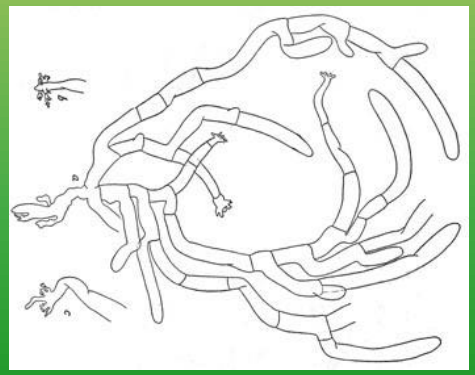


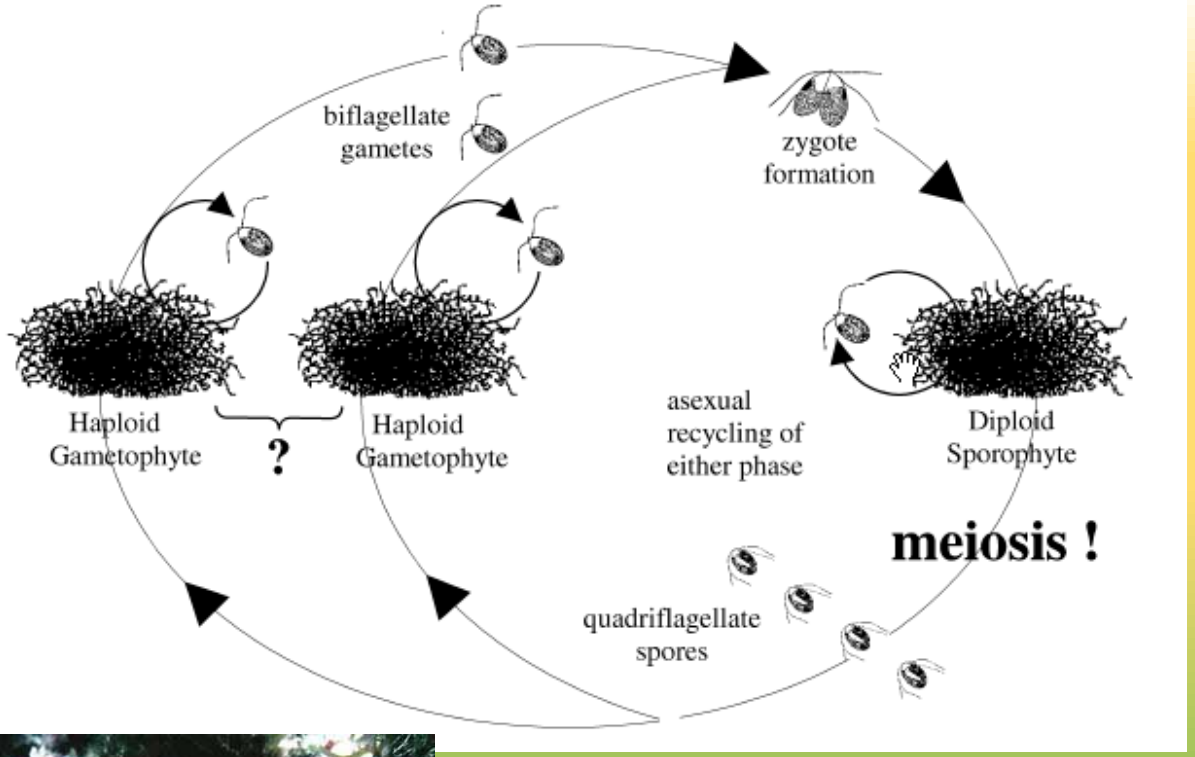


Segregative cell division

Cladophorales - *Siphonocladus* clade

Cladophoropsis





Cladophorales - *Siphonocladus* clade

Microdictyon

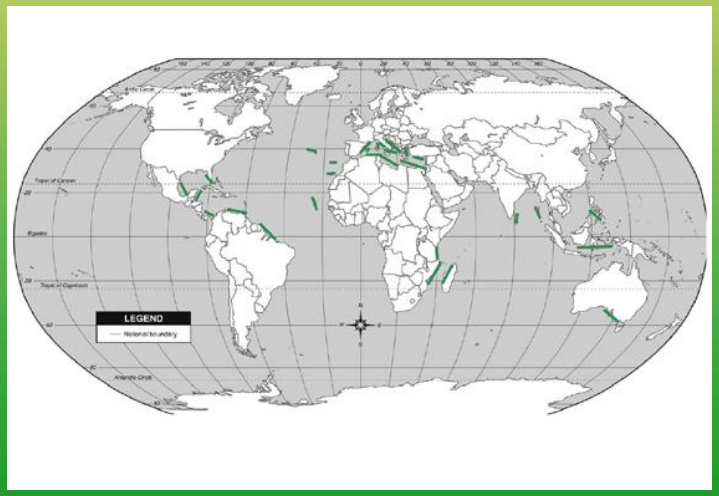
Cladophorales - *Siphonocladus* clade

Anadyomene

A. stellata – mediterán

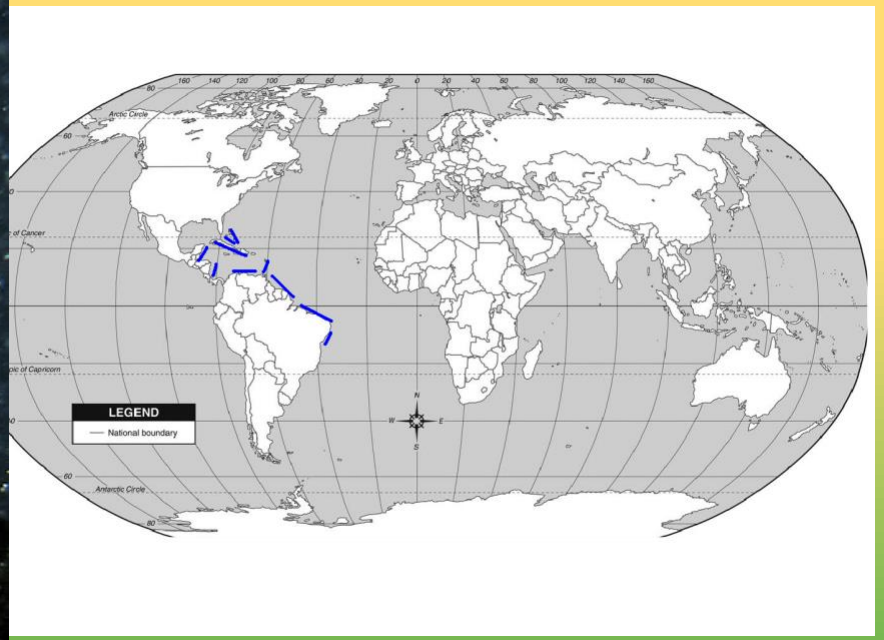
Bouguereau (1879)

A. lacerata – Karibik



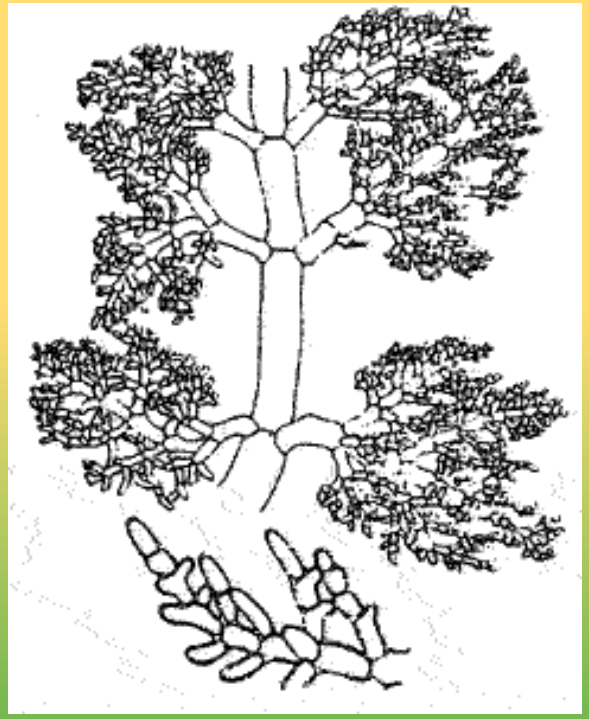
Cladophorales - *Siphonocladus* clade

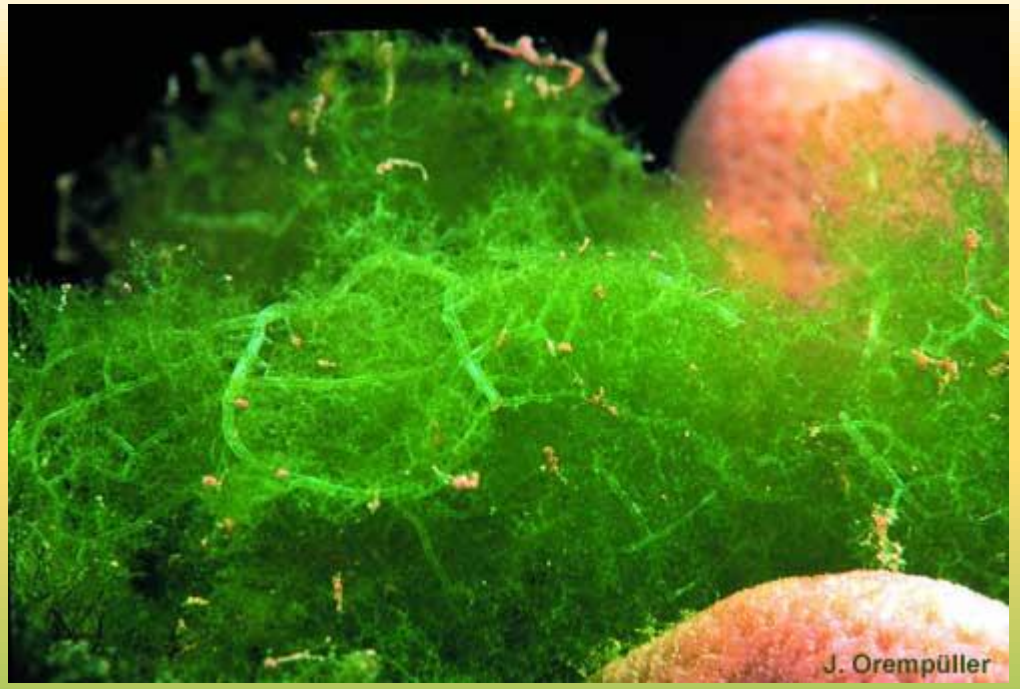
Chamaedoris



Cladophorales - *Siphonocladus* clade

Boodlea



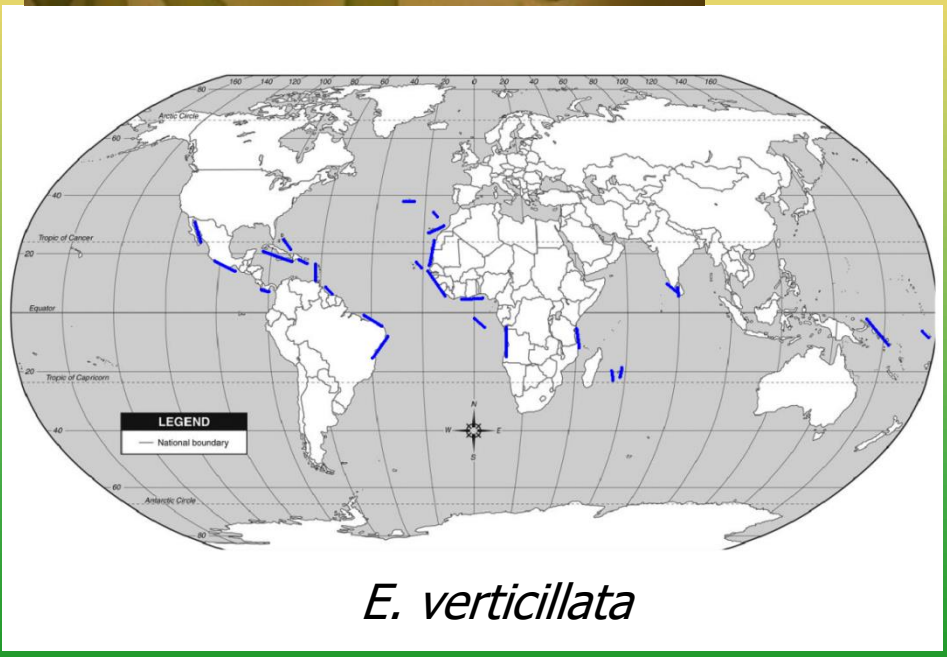


Cladophorales - *Siphonocladus* clade

Siphonocladus

Cladophorales - *Siphonocladus* clade

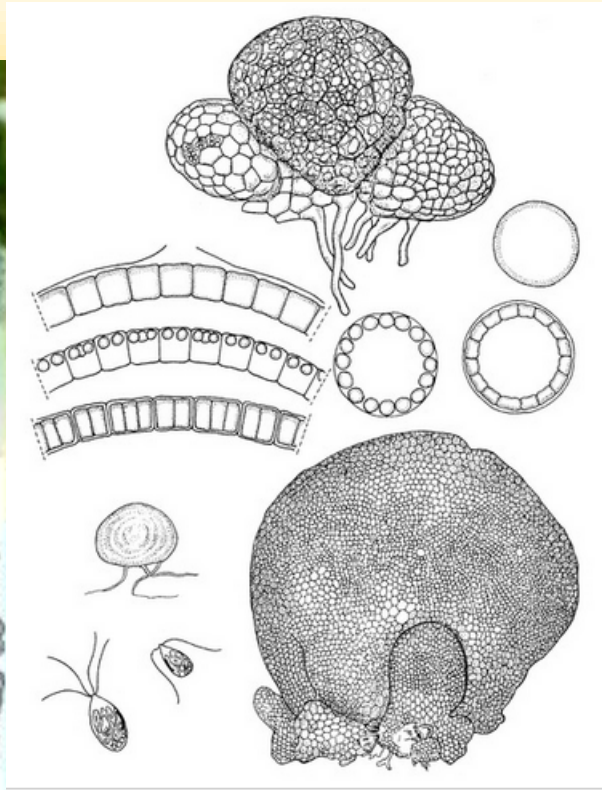
Ernodesmis



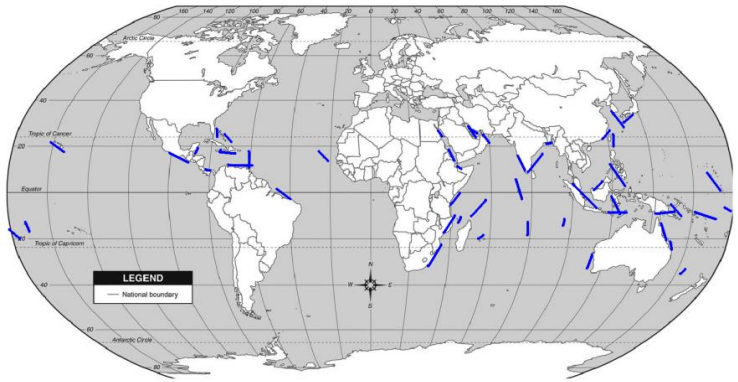
E. verticillata

Cladophorales - *Siphonocladus* clade

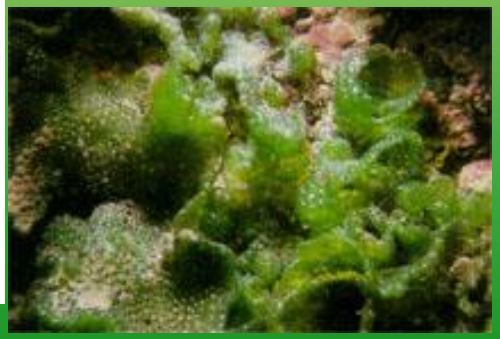
Dictyosphaeria



1, habit of a young specimen; 2, habit of a mature specimen; 3, cross-section of an undivided unicellular primary vesicle (diagrammatic); 4,5, formation of secondary vesicles inside the primary vesicle (cross-sections, diagrammatic); 6, the original wall of the primary vesicle has burst; 7, spherical protoplasmatic bodies are formed; 8, tertiairy vesicles have been formed (6,7,8 diagrammatic cross-sections to show formation of tertiairy vesicles); 9, habit of unicellular germling; 10, gamete with 2 flagella and an eyespot; 11, zoospore with 4 flagella and an eyespot.

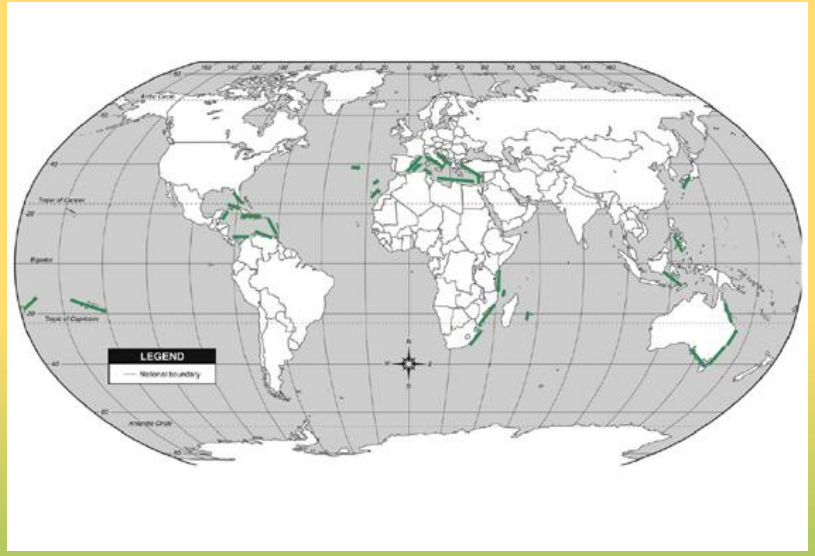


D. cavernosa



Cladophorales - *Siphonocladus* clade

Valonia

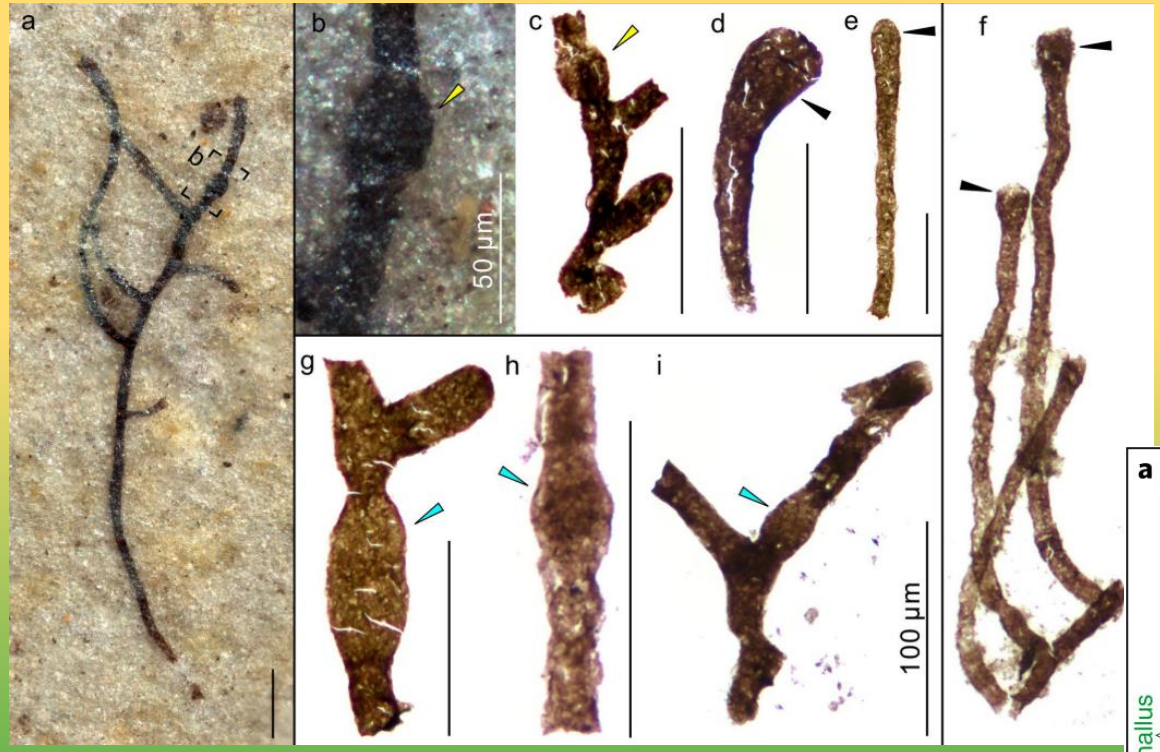


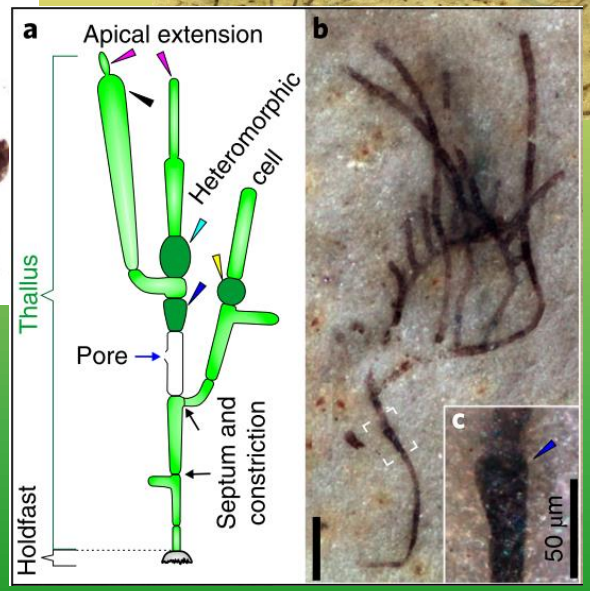
Valonia macrophysa

Valonia utricularis – Středozemní moře

Cladophorales - *Siphonocladus* clade

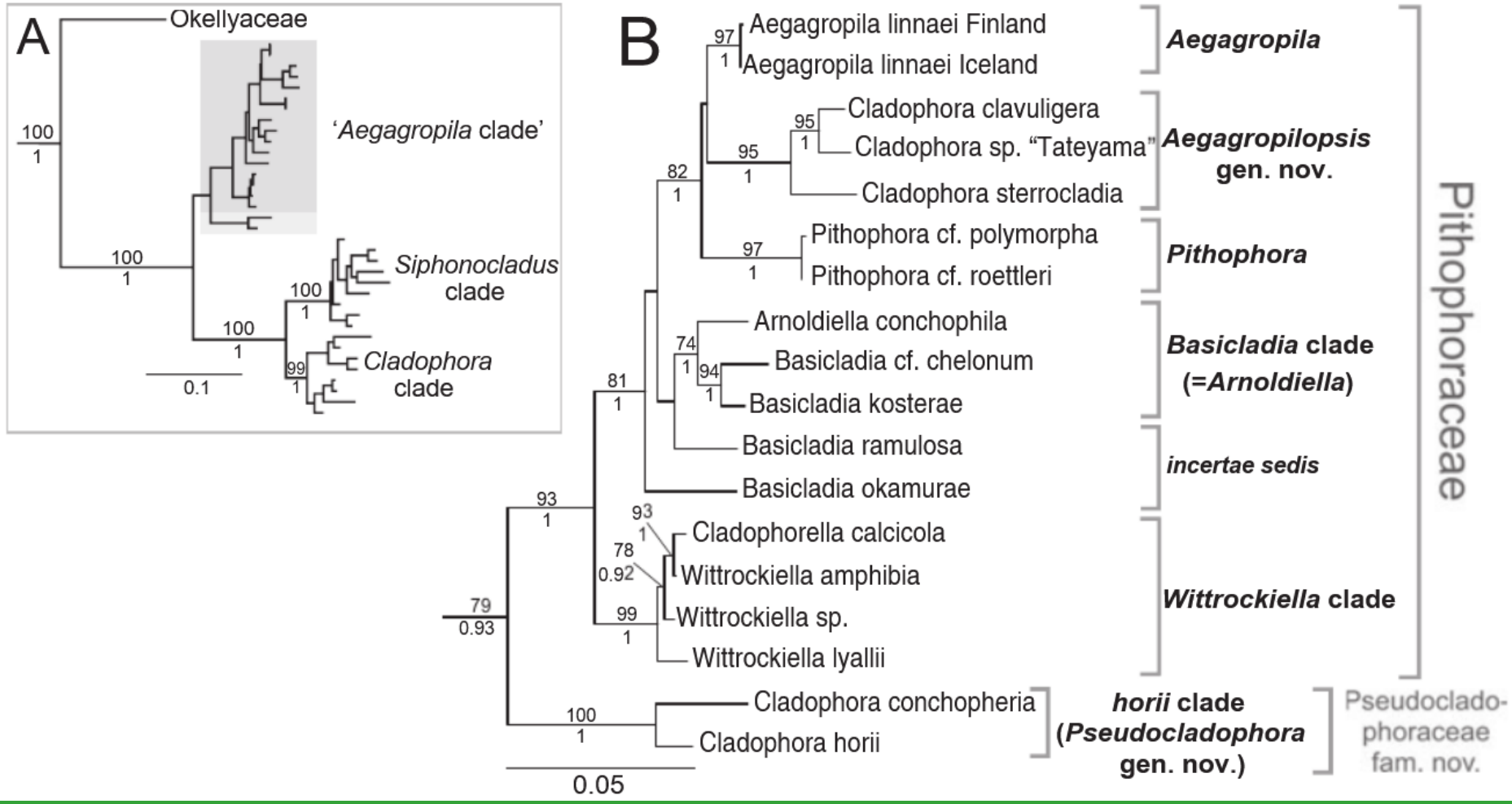
Proterocladus antiquus





Tang et al. (2020)

Cladophorales - *Aegagropila* clade



Boedeker et al. (2012)

Cladophorales - *Aegagropila* clade

Aegagropila

Cladophorales - *Aegagropila* clade

Boedekker et al. (2012)

Cladophorales *Aegagropila* clade

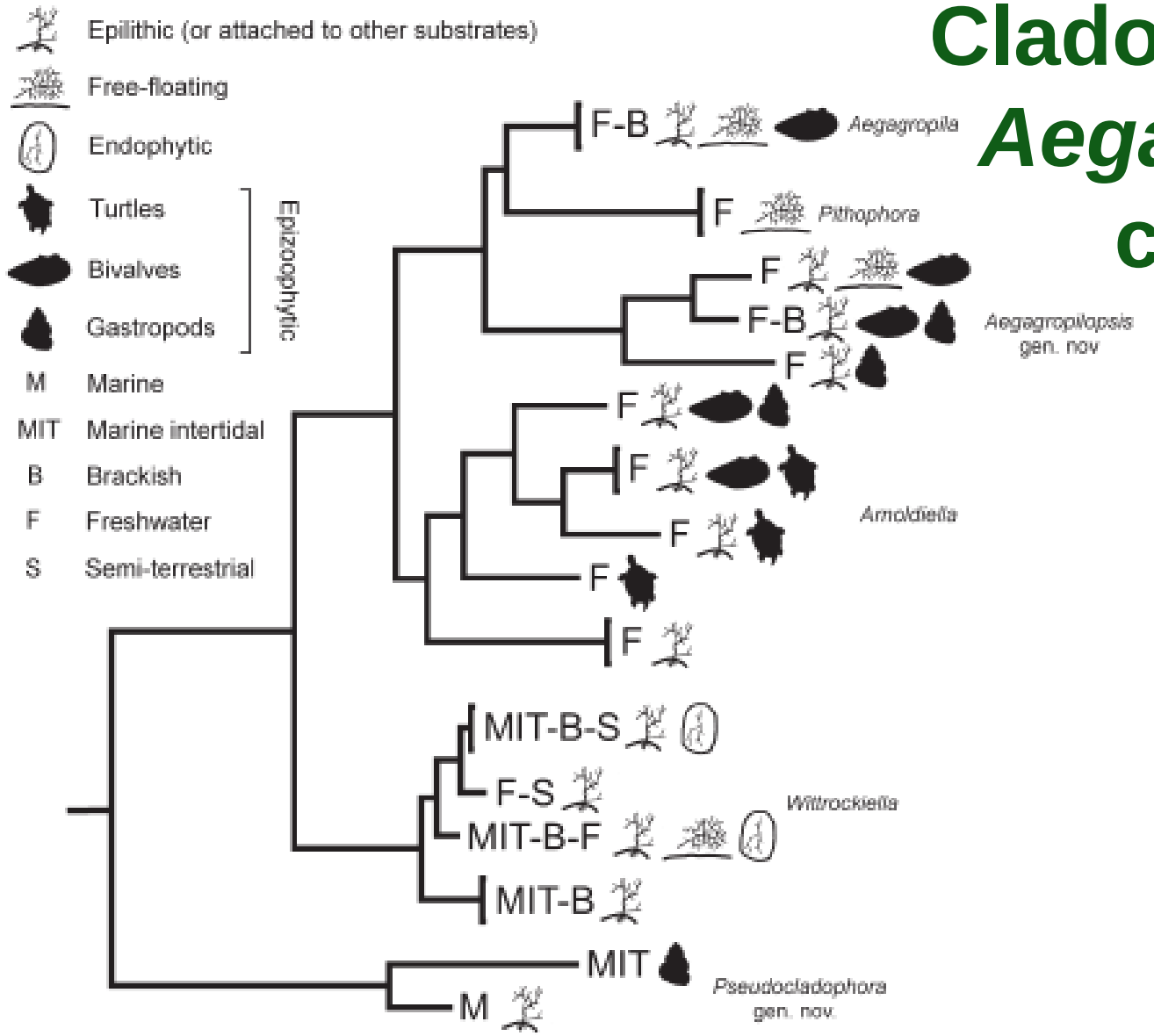
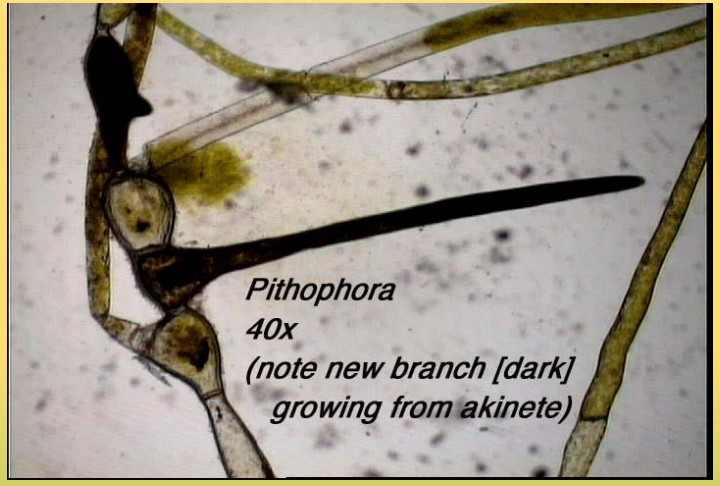


Figure 7. Phylogenetic tree of the *Aegagropila*-lineage (same as Fig. 4B), with letters indicating environment types in which the taxa occur, and stylised symbols indicating known host animals of epizoophytic taxa and growth forms.

Boedekker et al. (2012)

Cladophorales - *Aegagropila* clade

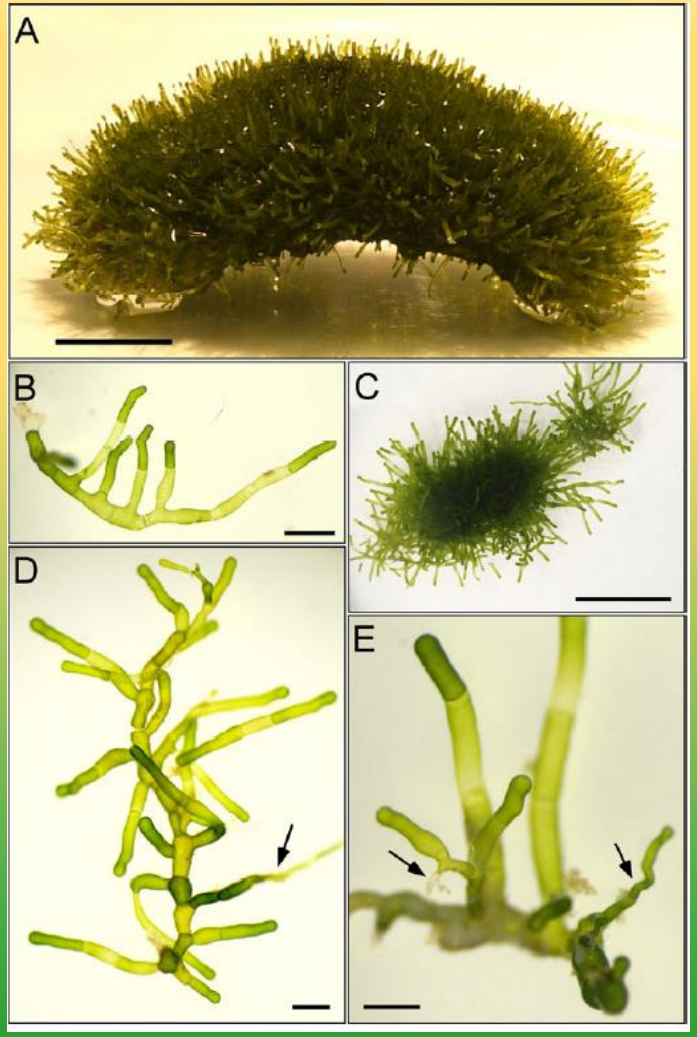
Pithophora



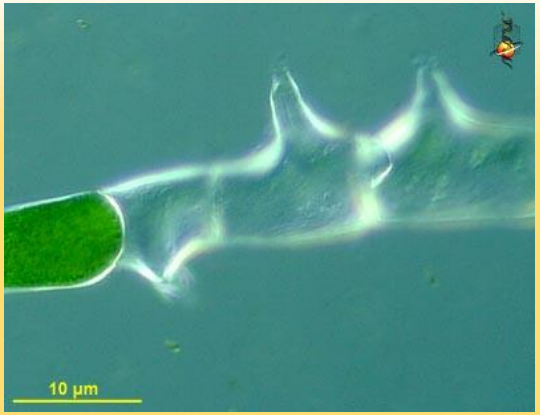
Florida – freshwater metaphyton

Cladophorales - *Aegagropila* clade

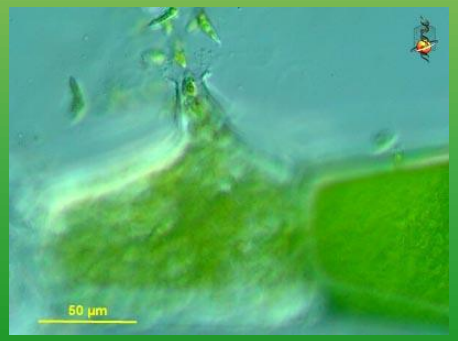
Wittrockiella

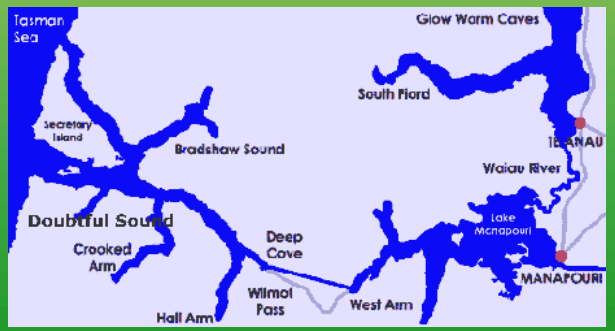


Boedeker et al. (2017)



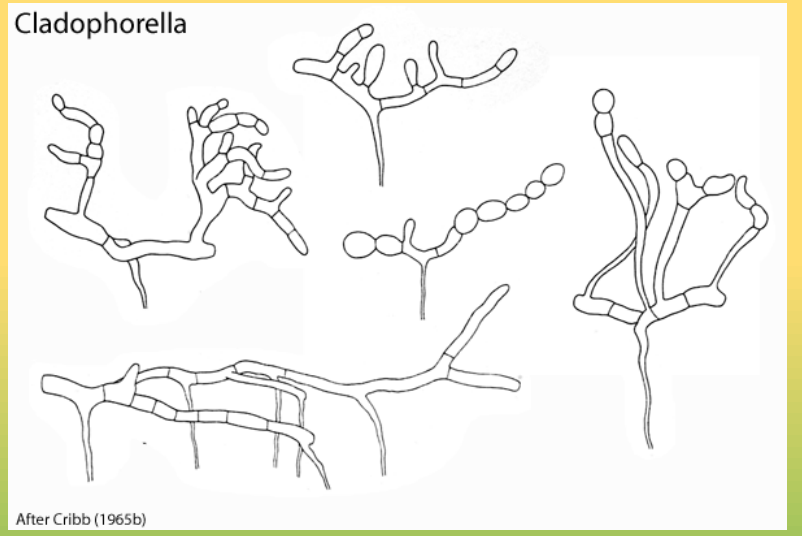
Doubtful Sound, NZ

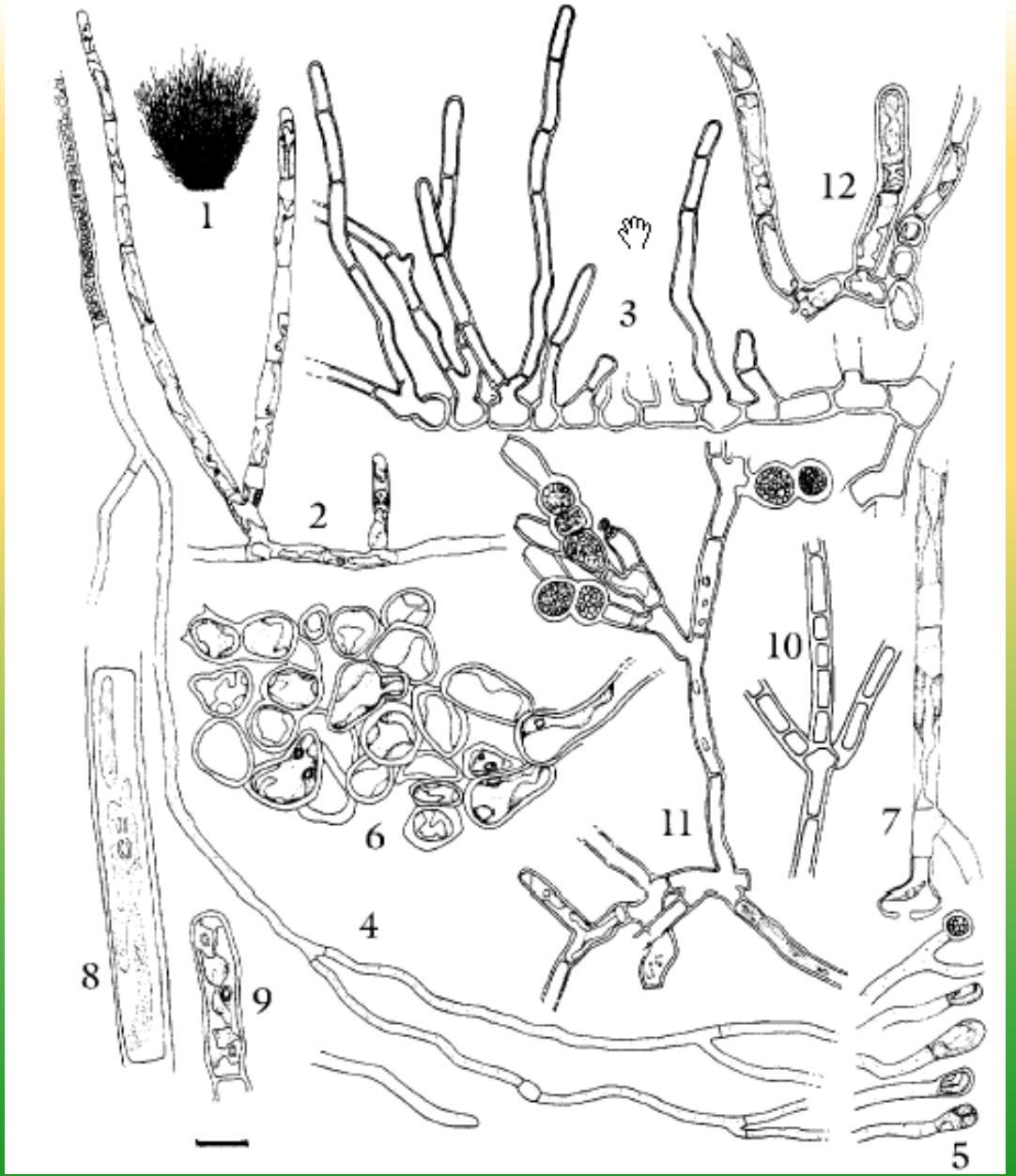




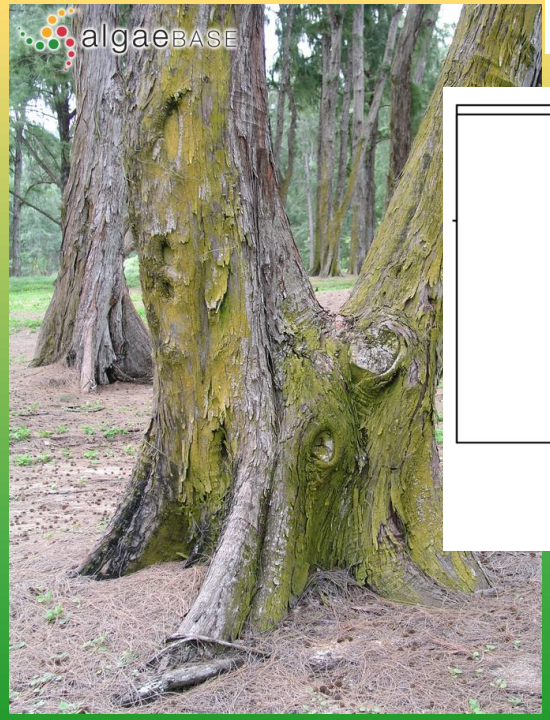
Cladophorales - *Aegagropila* clade

Cladophorella





Spongiochrysis hawaiiensis



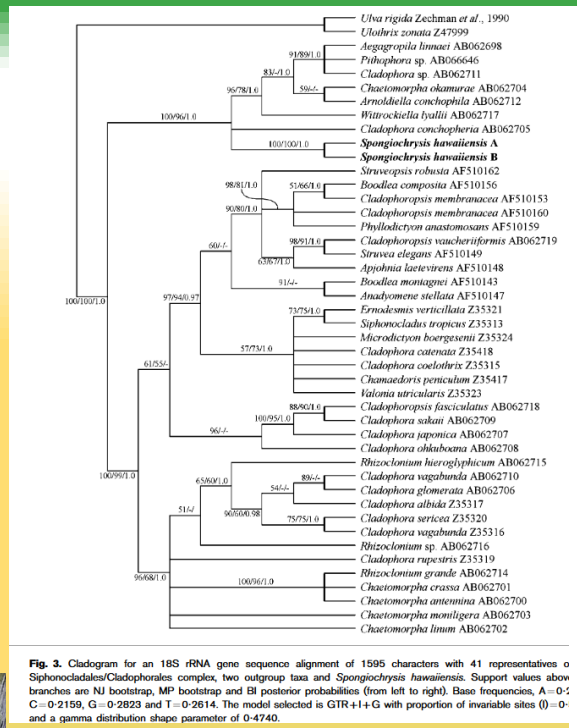
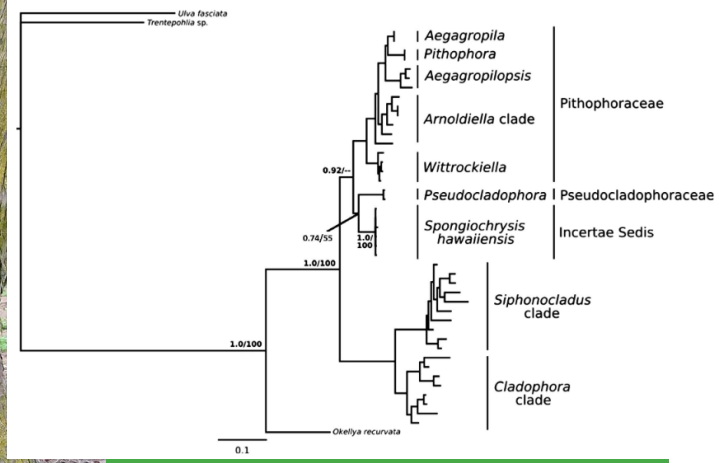


Fig. 3. Cladogram for an 18S rRNA gene sequence alignment of 1595 characters with 41 representatives o Siphonocladales/Cladophorales complex, two outgroup taxa and *Spongiochrysis hawaiiensis*. Support values abov branches are NJ bootstrap, MP bootstrap and BI posterior probabilities (from left to right). Base frequencies, A=0·: C=0·2159, G=0·2823 and T=0·2614. The model selected is GTR+I+G with proportion of invariable sites (I)=0· and a gamma distribution shape parameter of 0·4740.

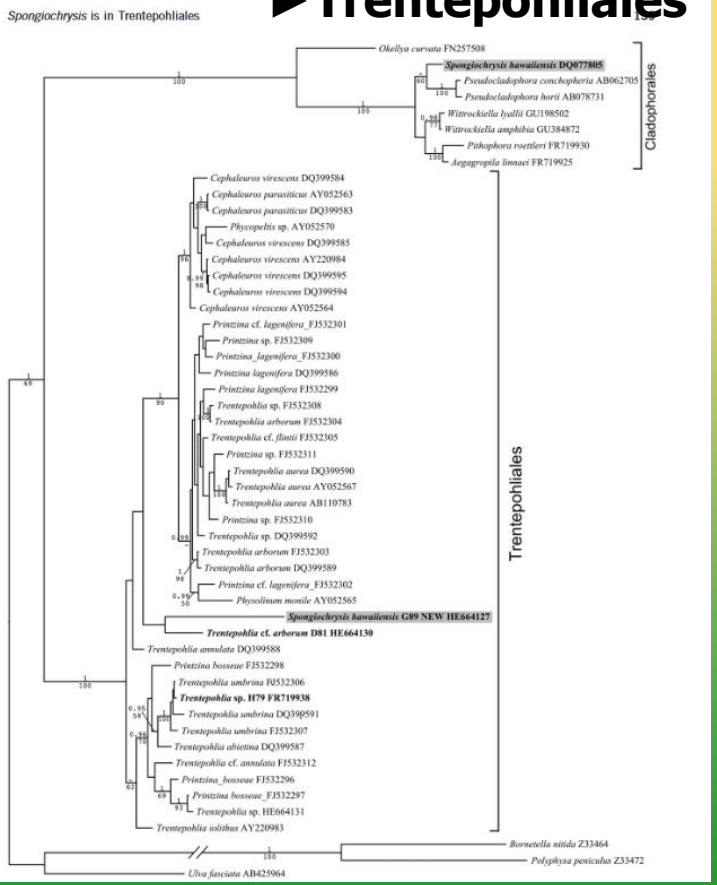


Rindi et al. (2006)

►Cladophorales

Boedekker et al. (2013)

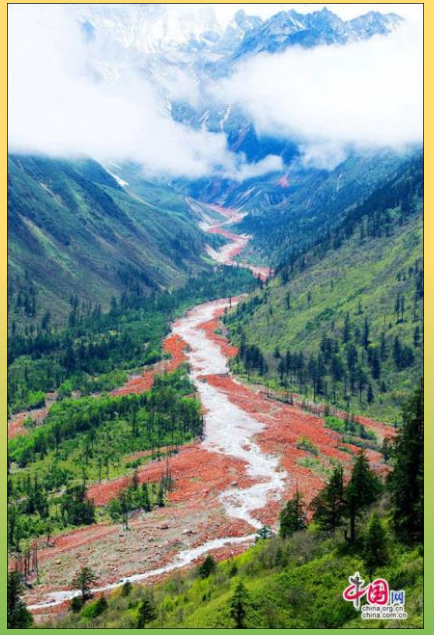
►Trentepohliales



Johnston et al. (2018)

►Cladophorales !!

Ulvophyceae - Trentepohliales



Základní charakteristika

Terestrické

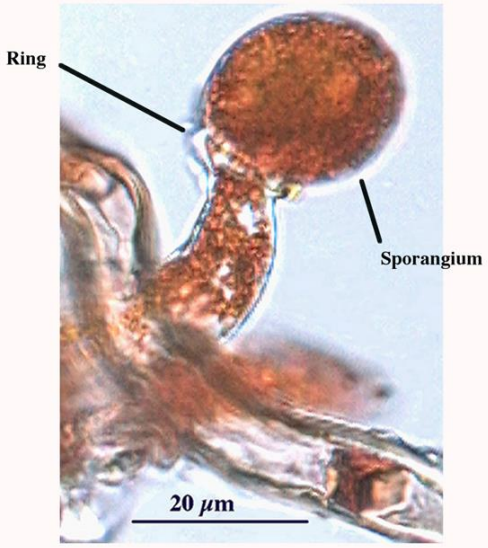
Fig. 2. Genera of the Trentepohliales are widely distributed and grow on living and nonliving substrates. **A,** Sinnamary, French Guiana: Species of *Trentepohlia* stain numerous porous surfaces reddish orange. **B,** American Samoa: *Trentepohlia* even lives on nonporous plastics. **C,** Devil's Punchbowl, Oregon: *Trentepohlia flava* growing on the inner rim of a rocky bowl carved by the sea. **D,** Moycullen, Ireland: *Phycopeltis* is a common epiphyte, often with beautifully symmetrical thalli. **E,** Heavy yellowish epiphytic growth of *Printzina lagenifera*. **F,** American Samoa: *Cephaleuros virescens* is one of several species that cause plant damage, like this algal spot of guava (*Psidium guajava*) fruit.

Brooks et al. (2015)

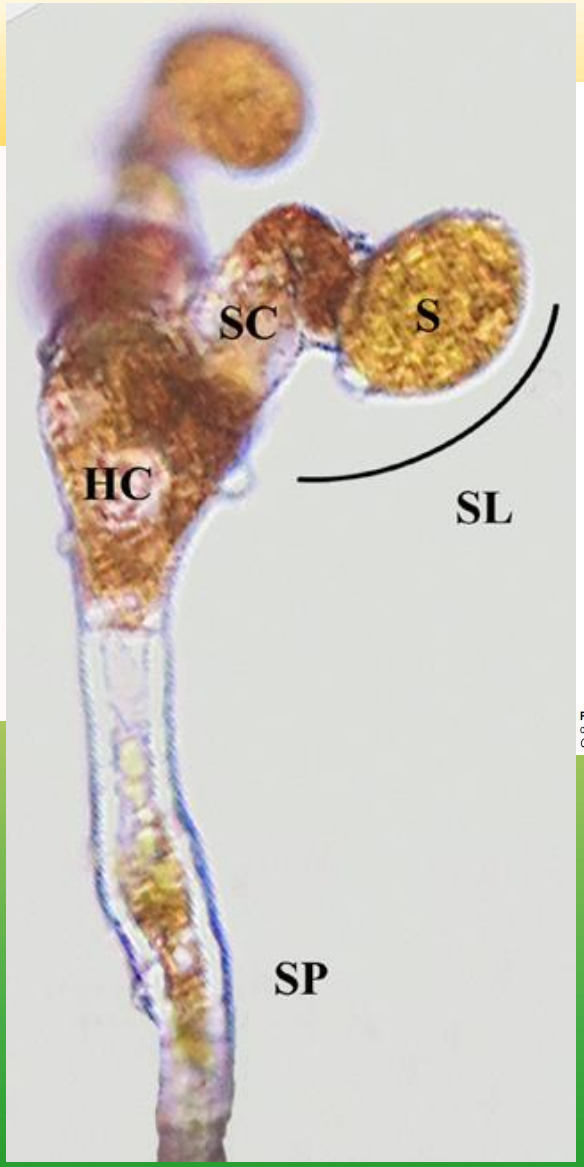
Sekundární karotenoidy

Základní charakteristika

Typická sporangia



López-Bautista et al. (2002)



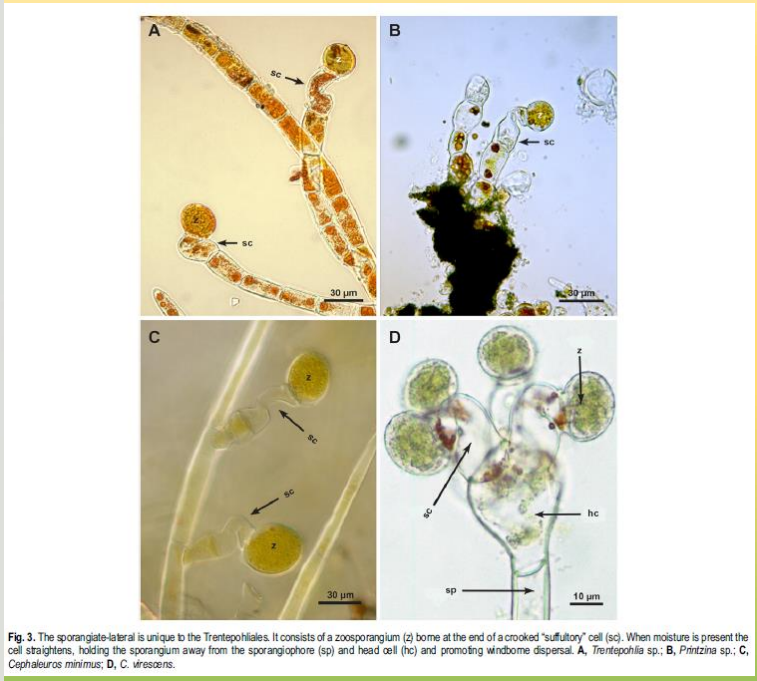


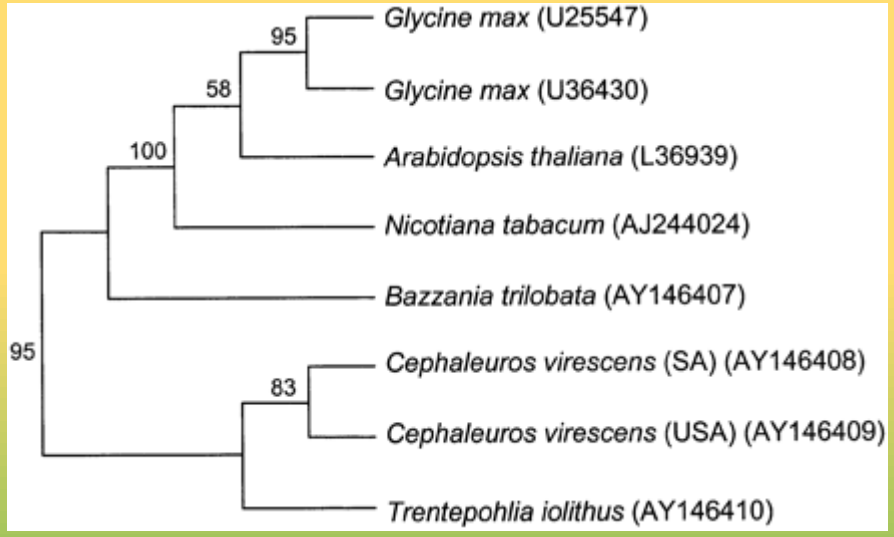
Fig. 3. The sporangiate-lateral is unique to the Trentepohliales. It consists of a zoosporangium (z) borne at the end of a crooked "suffultory" cell (sc). When moisture is present the cell straightens, holding the sporangium away from the sporangiophore (sp) and head cell (hc) and promoting windborne dispersal. **A**, *Trentepohlia* sp.; **B**, *Printzina* sp.; **C**, *Cephaleuros minimus*; **D**, *C. virescens*.

Izomorní i heteromorfní rodozměna

Základní charakteristika

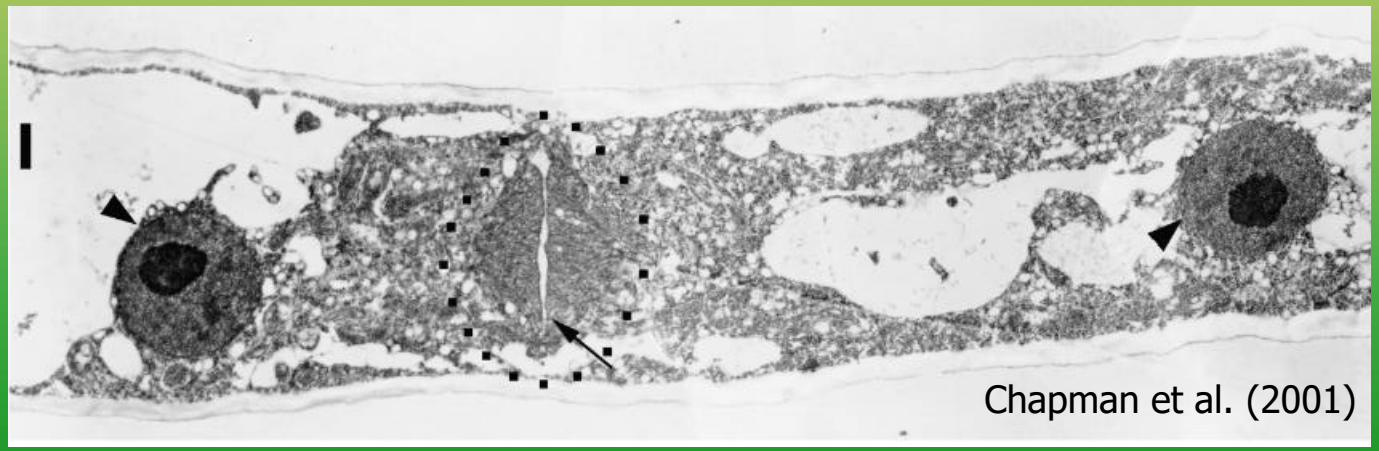
Plasmodesmy

Bičíkatá stadia nemají stigma a mají strukturu připomínající MLS, nemají pyrenoidy



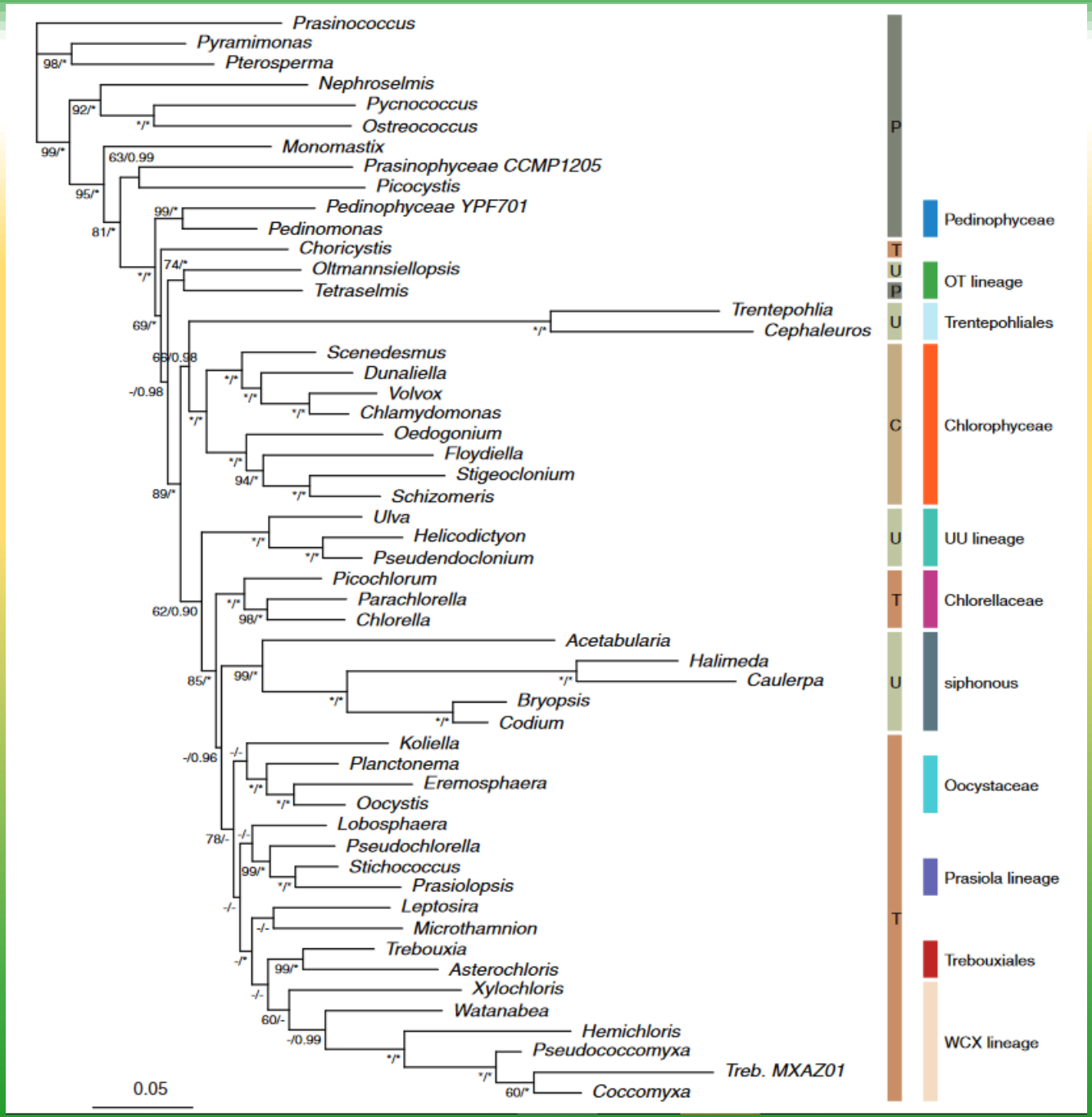
Fragmoplast

López-Bautista et al. (2003)



Chapman et al. (2001)

Evoluce



Fučíková et al. (2014)

Evoluce

Tradiční rody:

Trentepohlia
Phycopeltis
Cephaleuros
Stomatochroon
Printzina

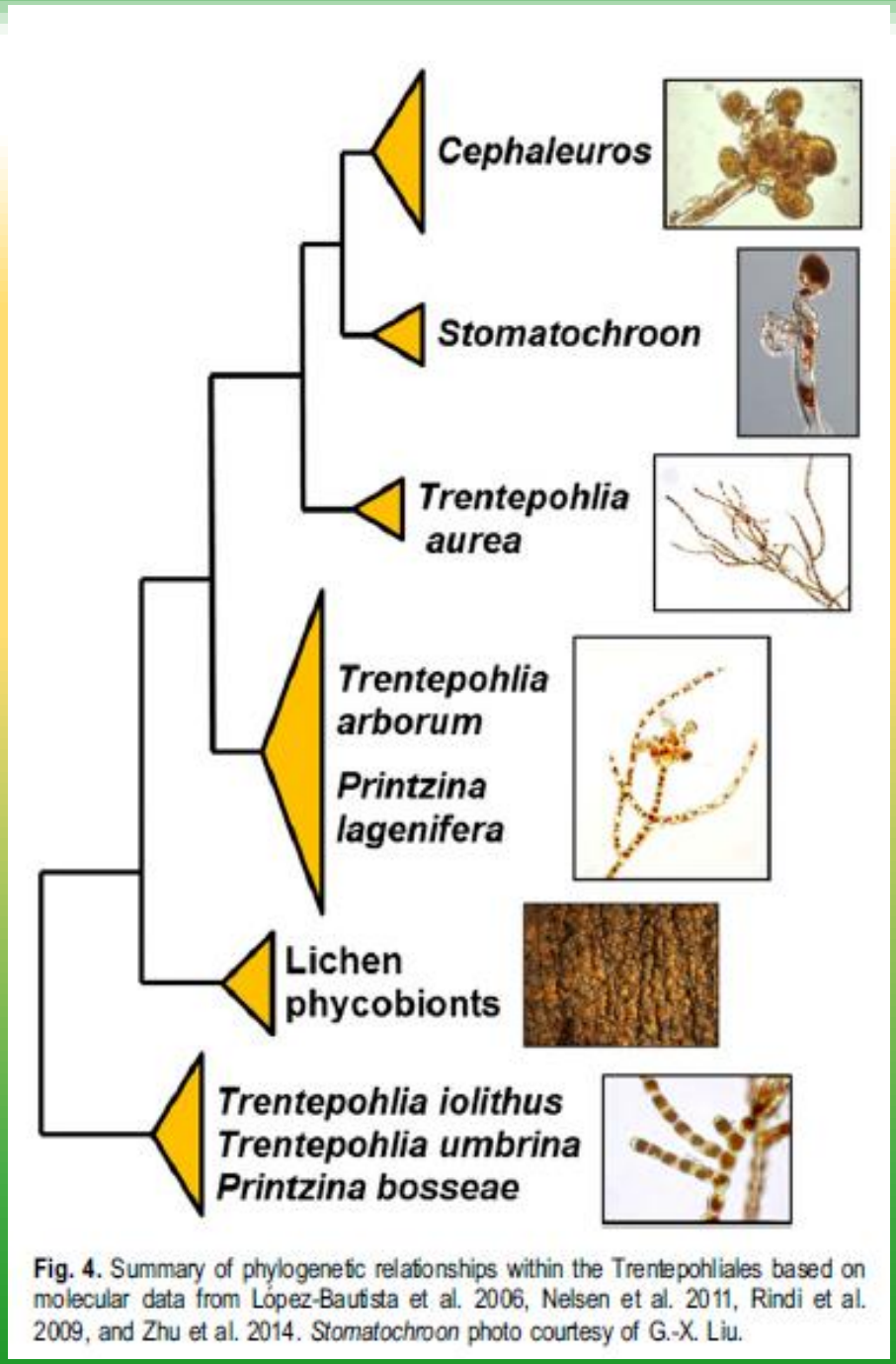
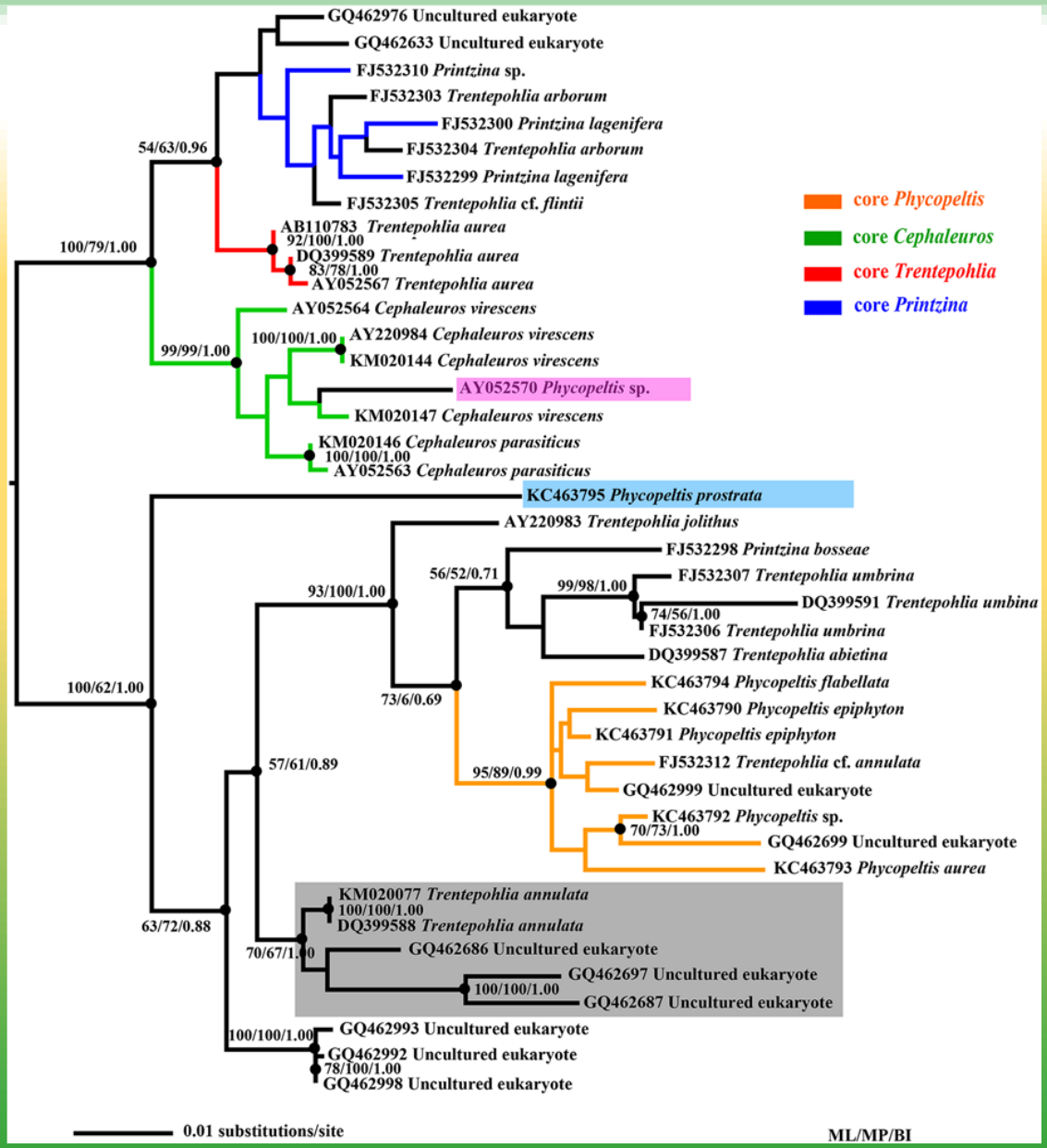


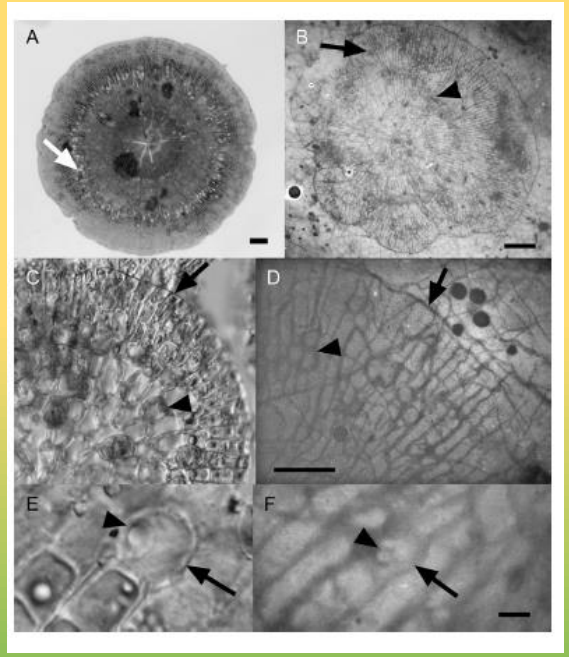
Fig. 4. Summary of phylogenetic relationships within the Trentepohliales based on molecular data from López-Bautista et al. 2006, Nelsen et al. 2011, Rindi et al. 2009, and Zhu et al. 2014. *Stomatochroon* photo courtesy of G.-X. Liu.

Brooks et al. (2015)

Evoluce



SSU rDNA Zhu et al. (2015)



Novis et al. (2015)

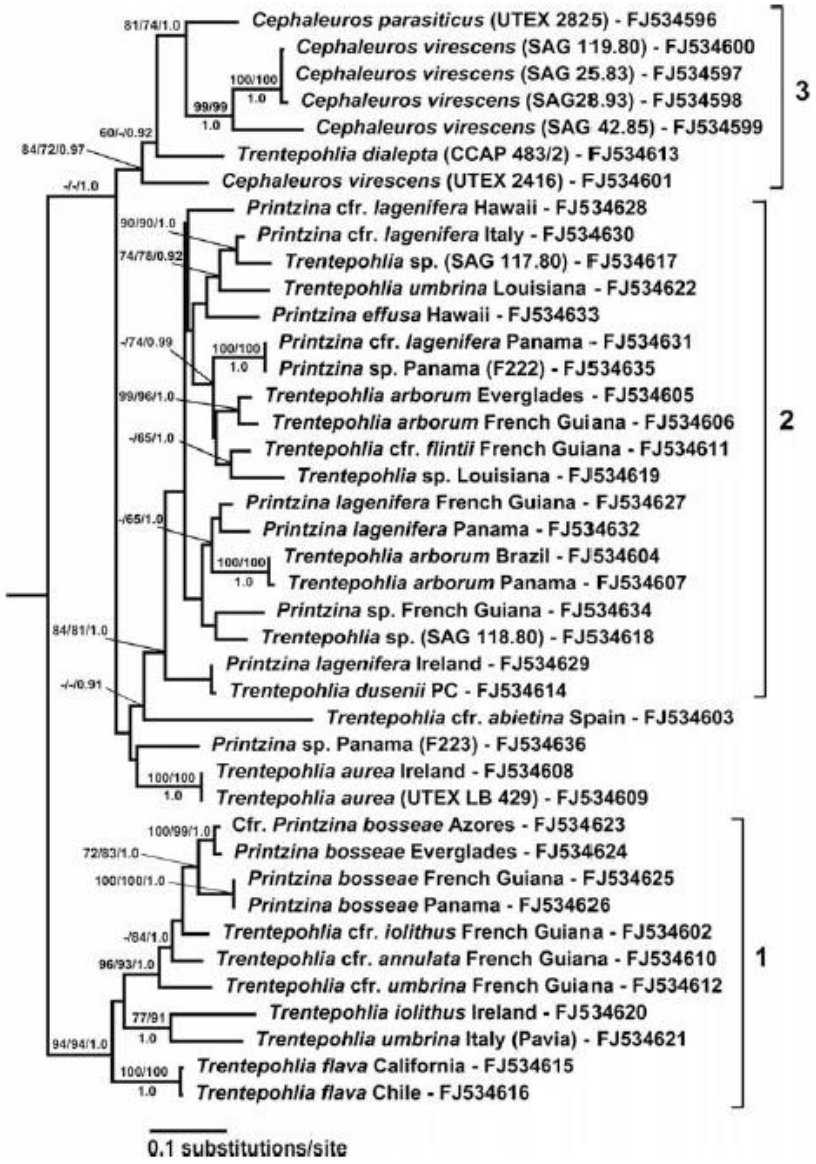


Fig. 2. Phylogram inferred from Maximum Likelihood analysis of the *rbc*L gene in *Trentepohlia*, *Printzina* and related taxa, with bootstrap support (BP) and Bayesian posterior probabilities (PP) indicated at the nodes. From left to right (or from top to bottom, above and below branches), support values at nodes correspond to Maximum Parsimony BP, Maximum Likelihood BP and Bayesian PP. BP values lower than 60% and PP lower than 0.85 are not reported. The tree was rooted using outgroup sequences of Dasycladales and Bryopsidales (not shown) specified in Section 2.

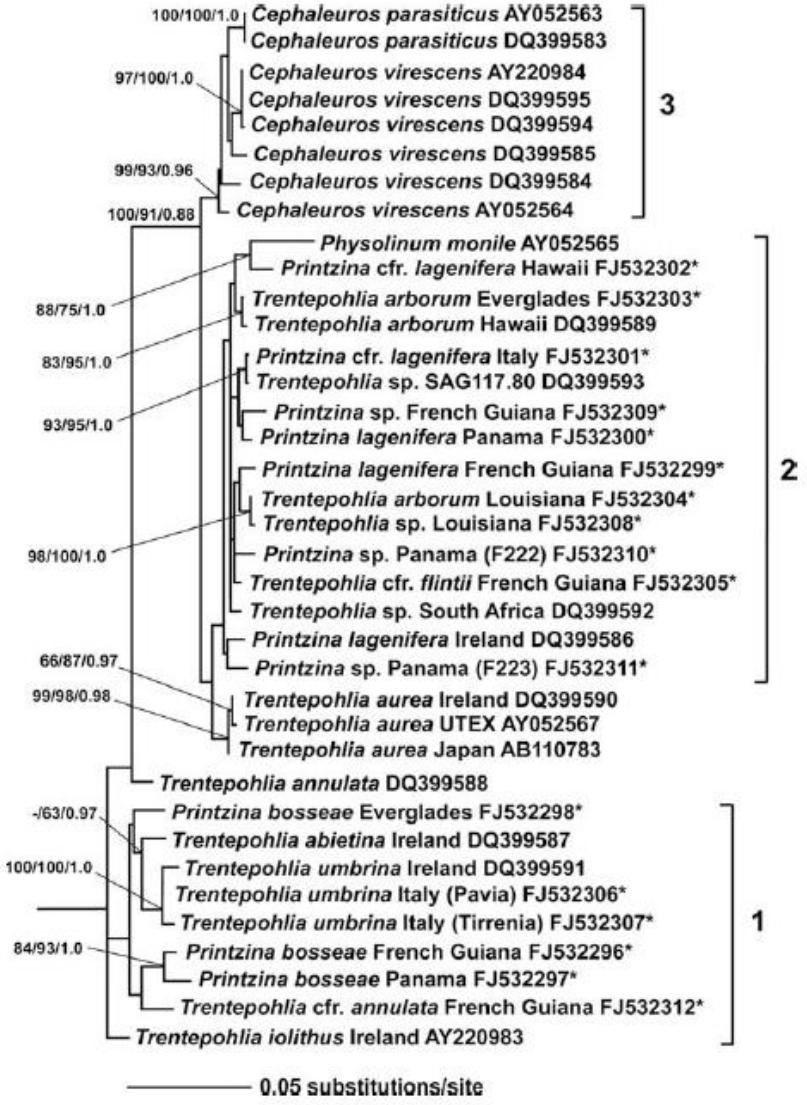
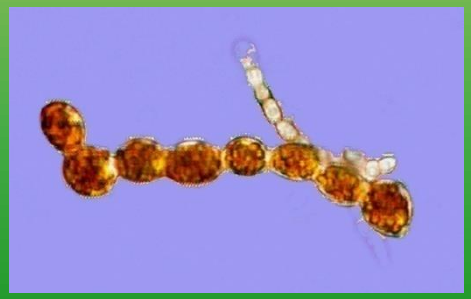


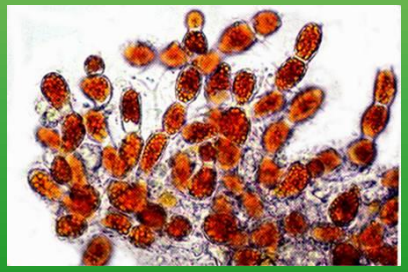
Fig. 3. Phylogram inferred from Maximum Likelihood analysis of the 18S rRNA gene in *Trentepohlia*, *Printzina* and related taxa, with bootstrap support (BP) and Bayesian posterior probabilities (PP) indicated at the nodes. From left to right support values at nodes correspond to Maximum Parsimony BP, Maximum Likelihood BP and Bayesian PP. BP values lower than 60% and PP lower than 0.85 are not reported. The tree was rooted using outgroup sequences of Cladophorales and Dasycladales (not shown) specified in Section 2. New sequences produced in the present study are marked with an asterisk.

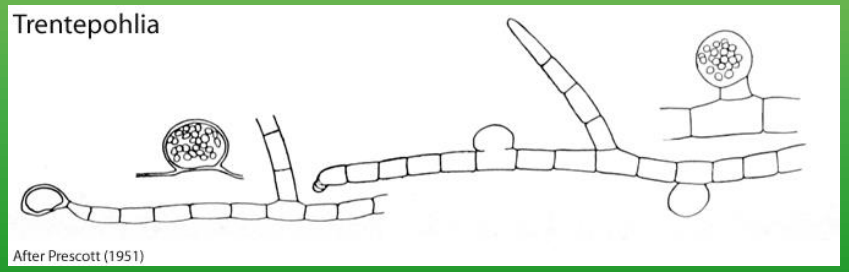
Rindi et al. (2009)

Trentepohliales – přehled rodů

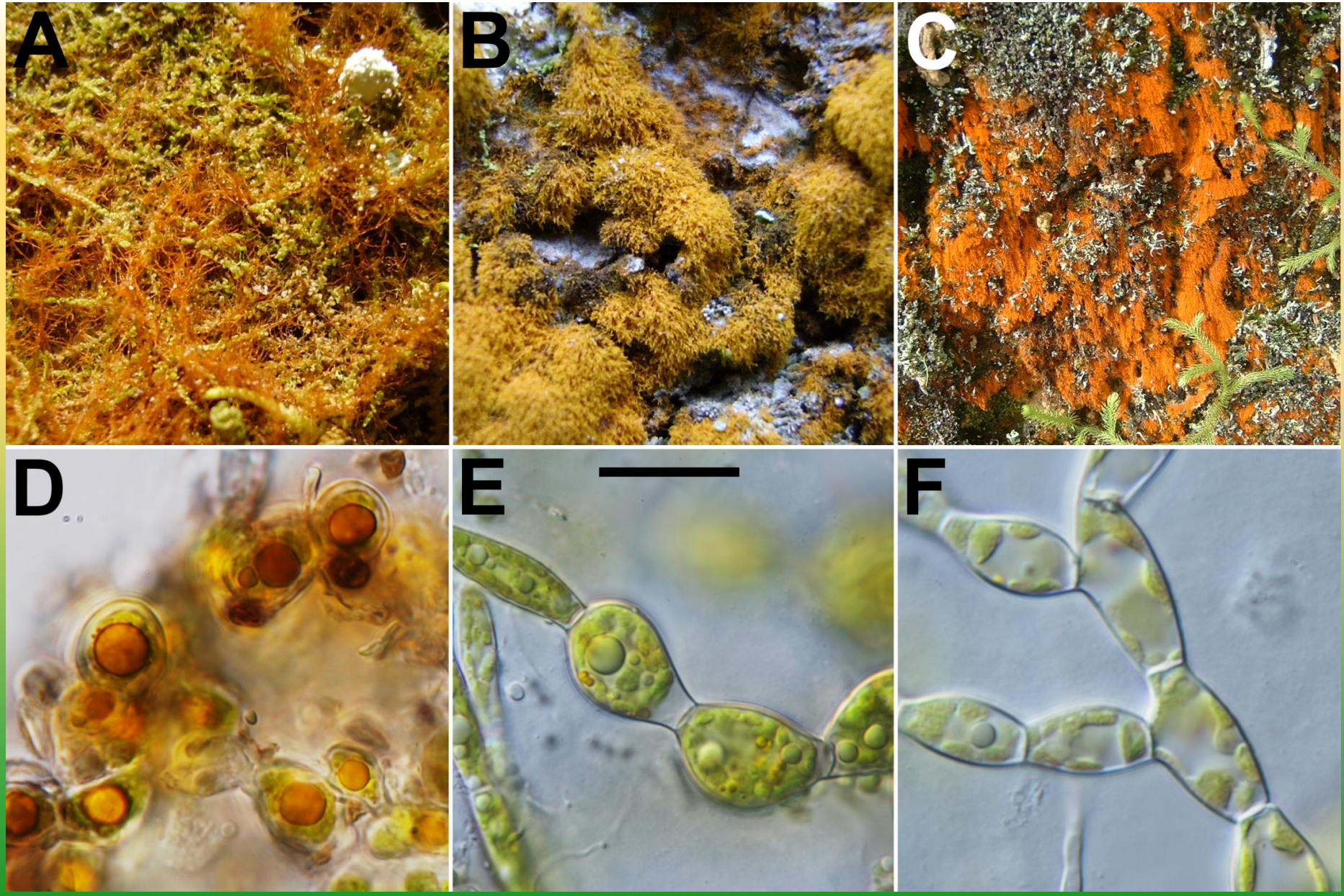
Trentepohlia







Trentepohlia



Trentepohliales – přehled rodů

***Trentepohlia* –** folikolní lišejníky

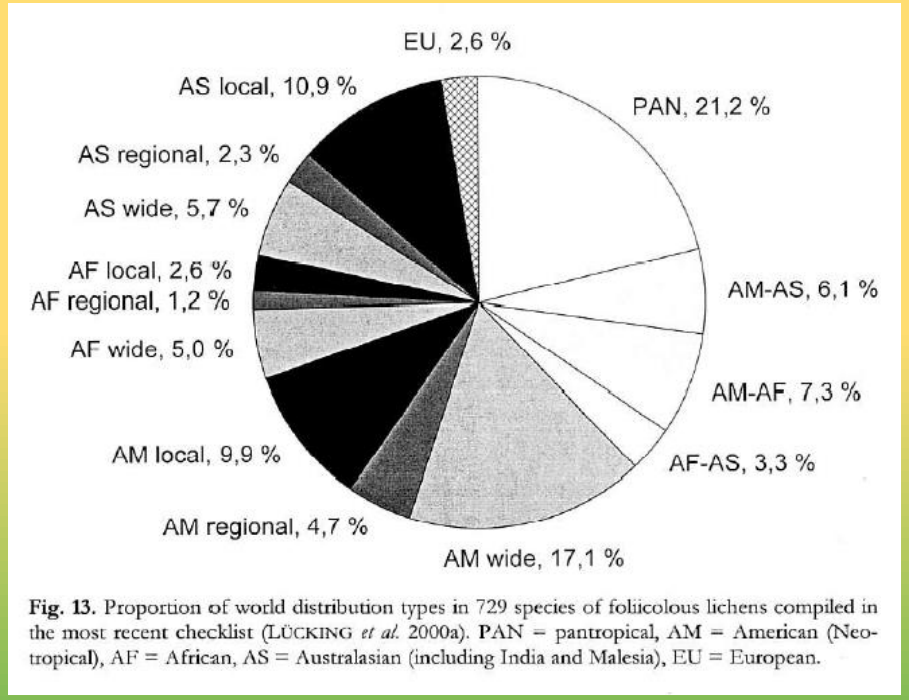


Fig. 13. Proportion of world distribution types in 729 species of folicolous lichens compiled in the most recent checklist (LÜCKING *et al.* 2000a). PAN = pantropical, AM = American (Neotropical), AF = African, AS = Australasian (including India and Malesia), EU = European.

Trentepohliales přehled rodů

Trentepohlia

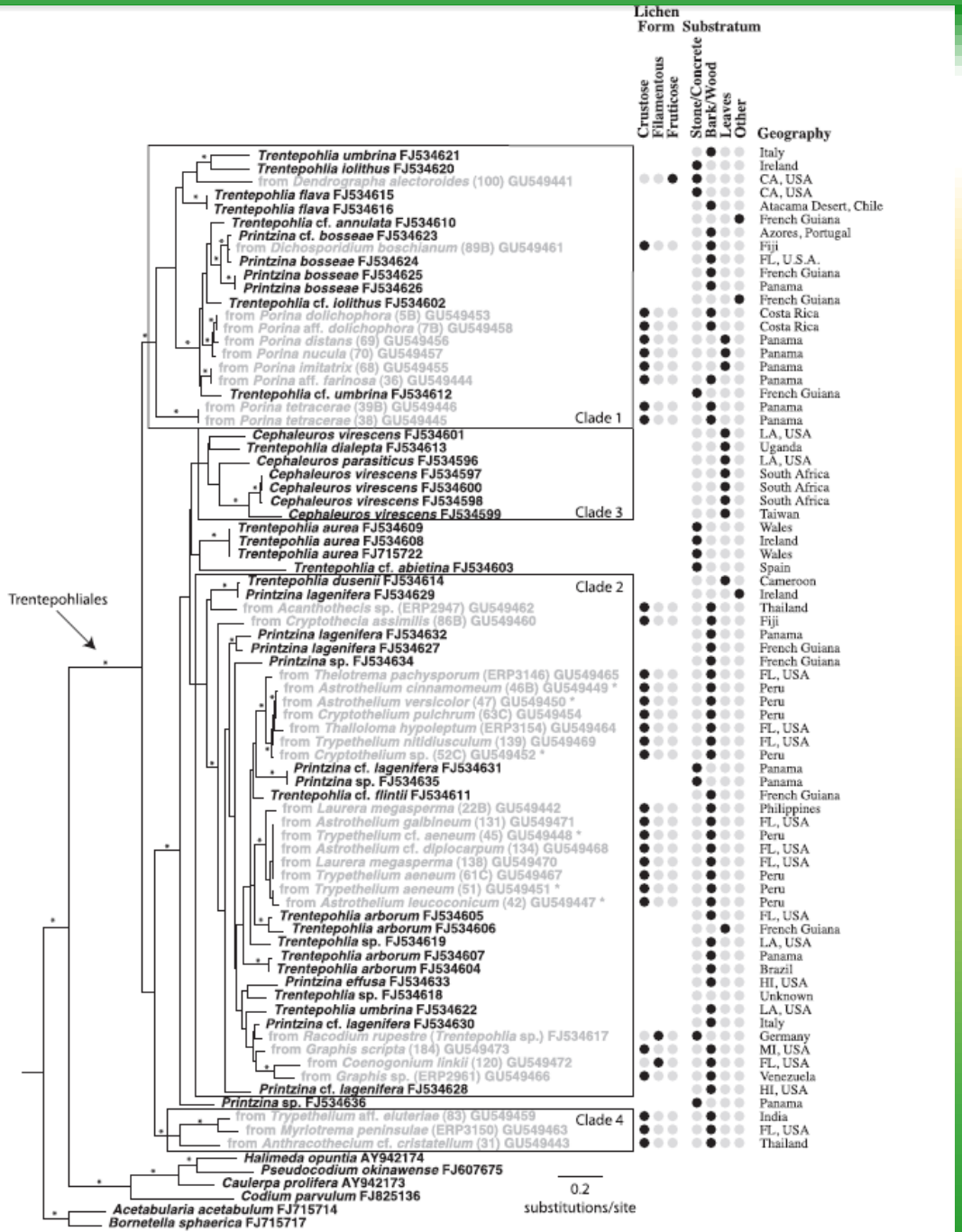
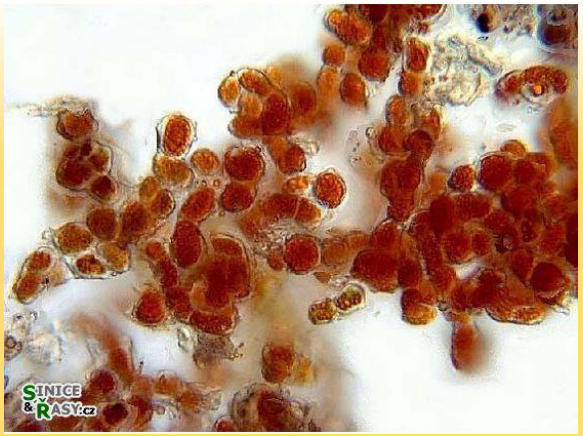


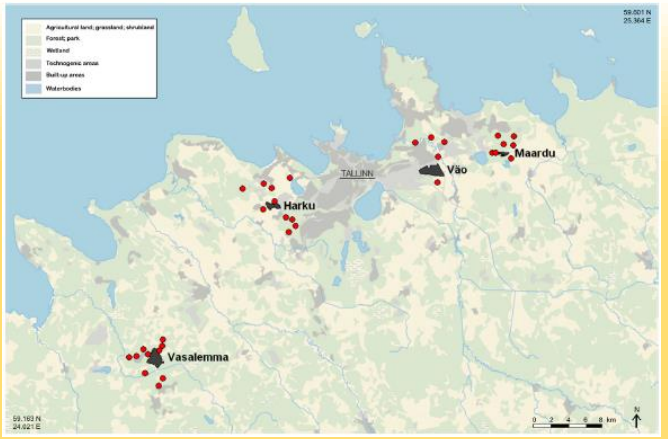
FIG. 1. Maximum-likelihood (ML) phylogeny of Trentepohliales algae based on *rbc*L sequence data. *Acetabularia acetabulum* and *Bornetella sphaerica* were used to root the tree. Black asterisks above or below branches indicate strong support (ML bootstrap ≥70 and BI posterior probability ≥0.95) for that clade. Non-lichenized basal strains are listed in black, while lichenized basal strains are in gray. Gray asterisks follow

Nelsen et al. (2011)

Trentepohliales – přehled rodů

Trentepohlia





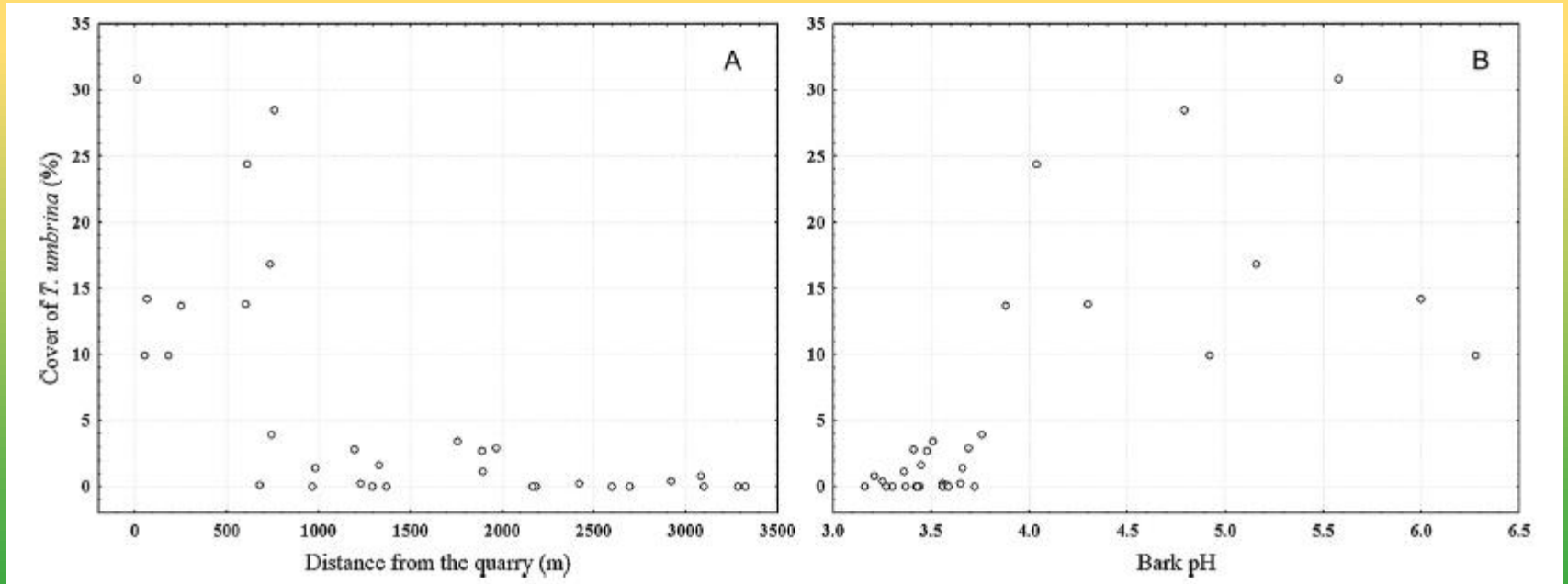
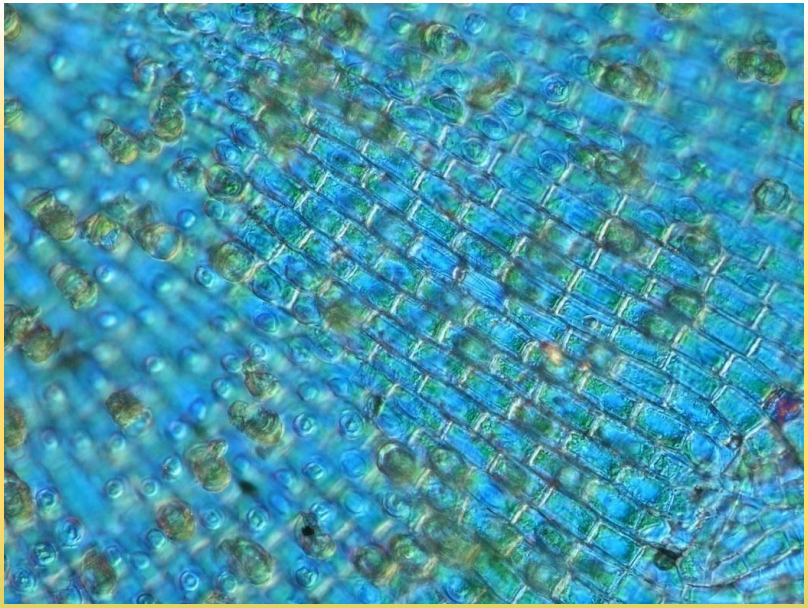


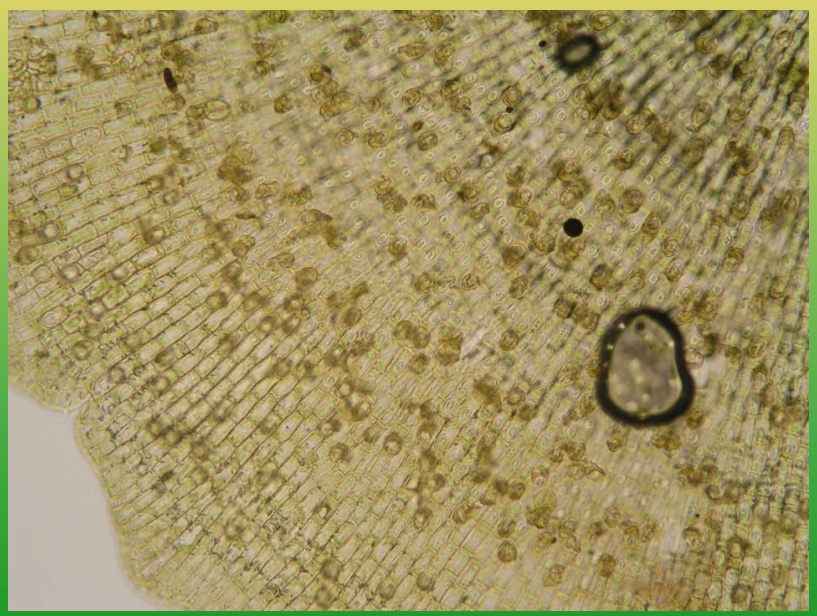
Fig. 2. Correlation of *Trentepohlia umbrina* cover on pine trunks with (A) distance from the quarry ($R_s = -0.74$; $n = 32$; $p < 0.00001$), and (B) bark pH ($R_s = 0.72$; $n = 32$; $p < 0.00001$).

Marmor & Degtjarenko (2014)

Trentepohliales – přehled rodů

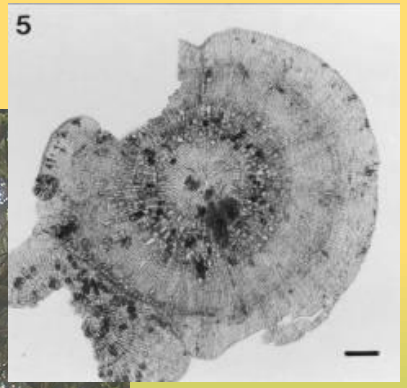
Phycopeltis

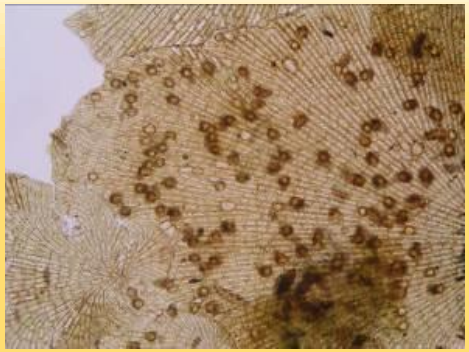




Trentepohliales – přehled rodů

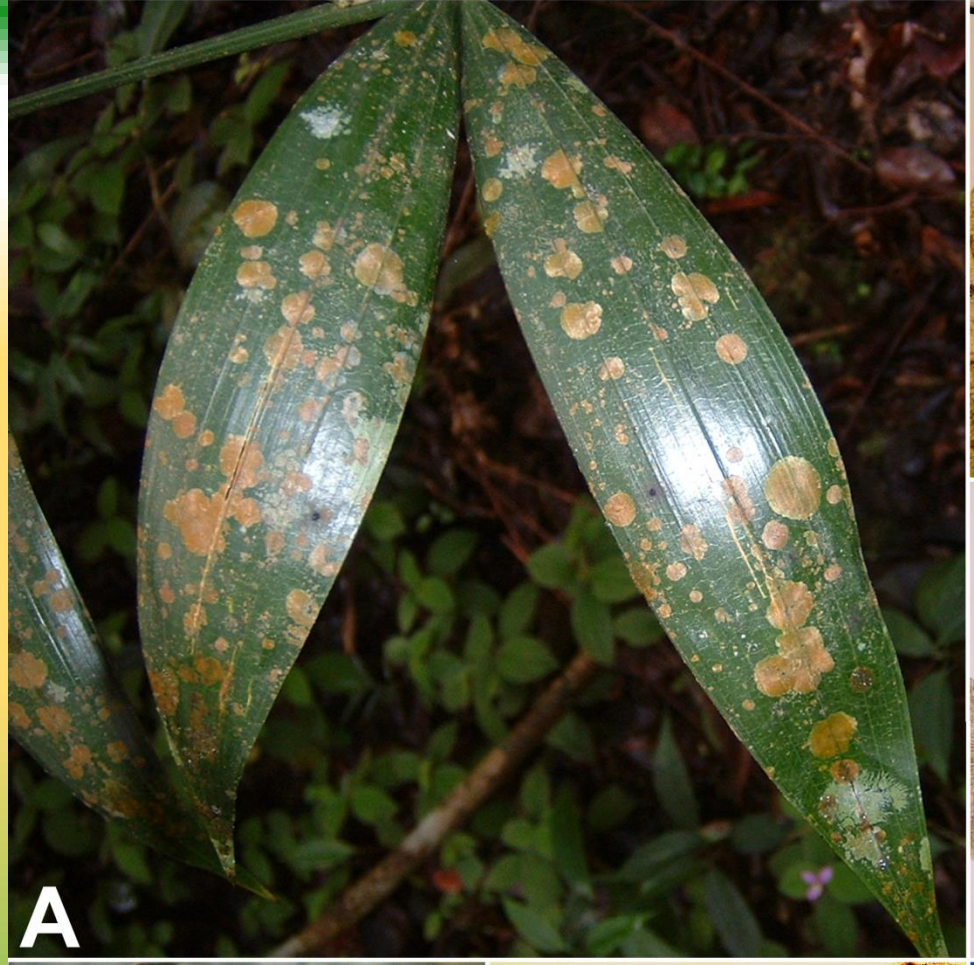
Phycopeltis

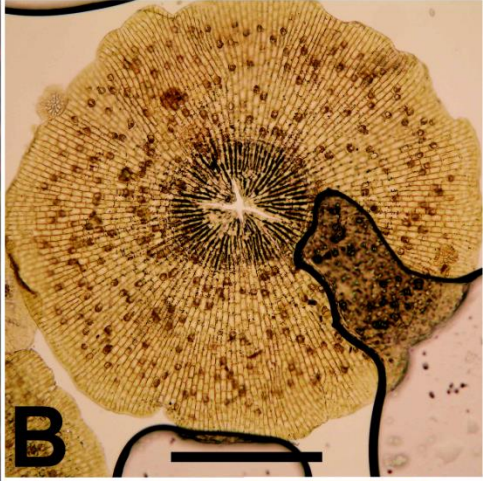


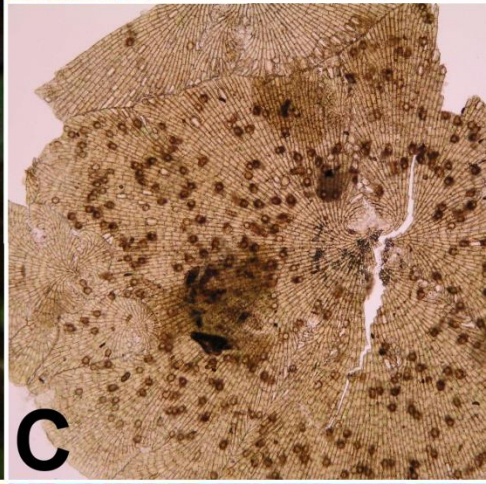


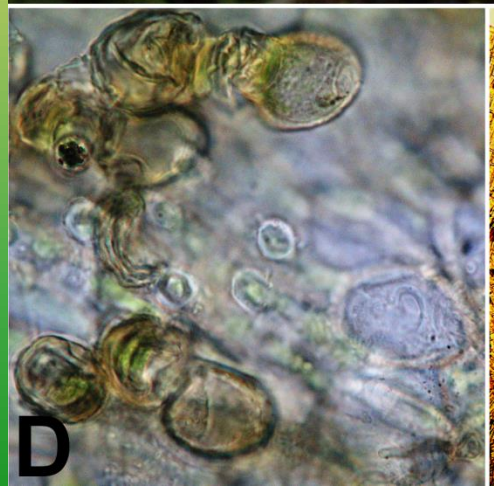
Neustupa (2003)

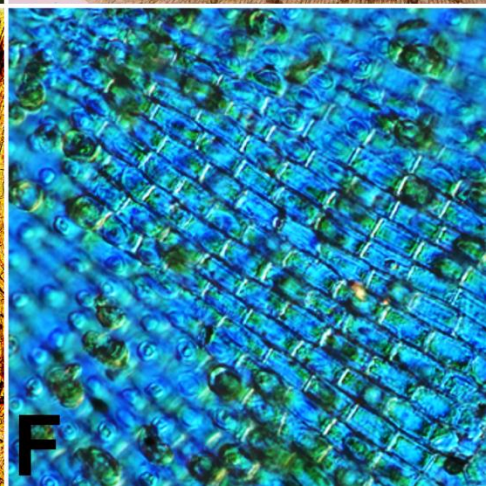
Phycopeltis





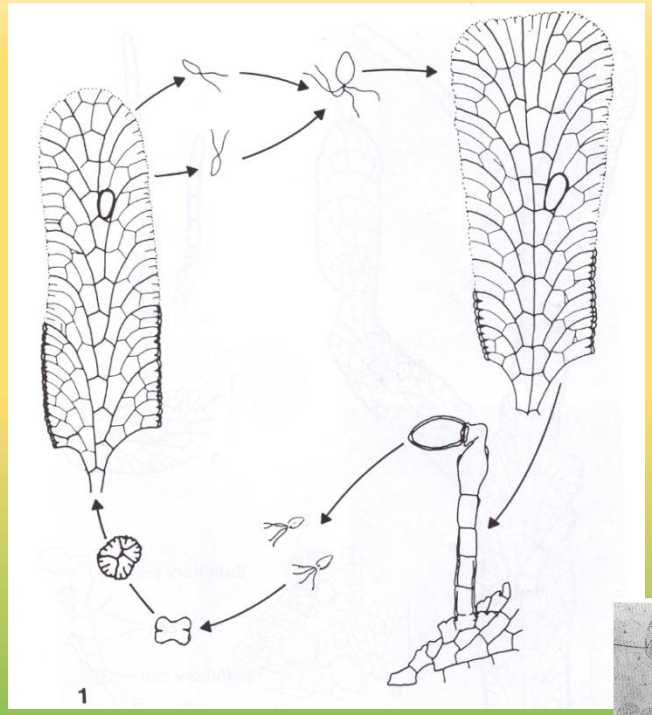


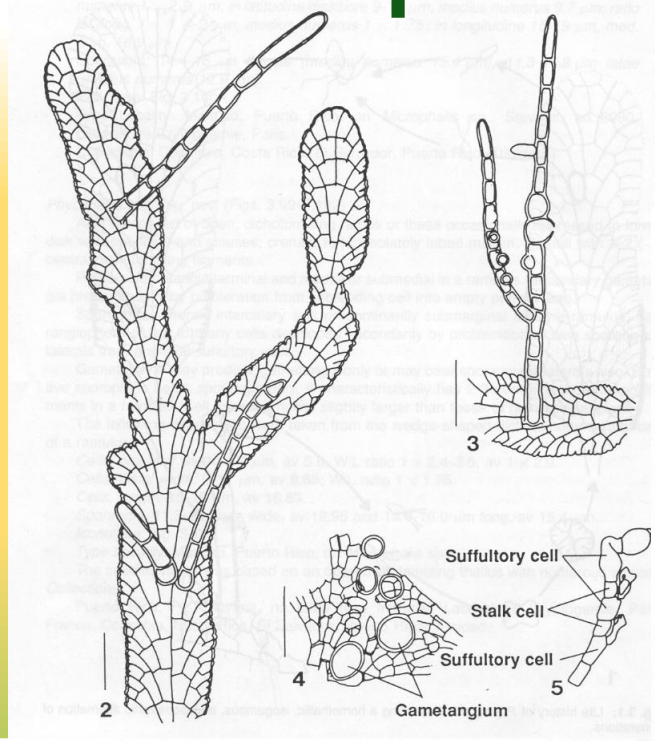


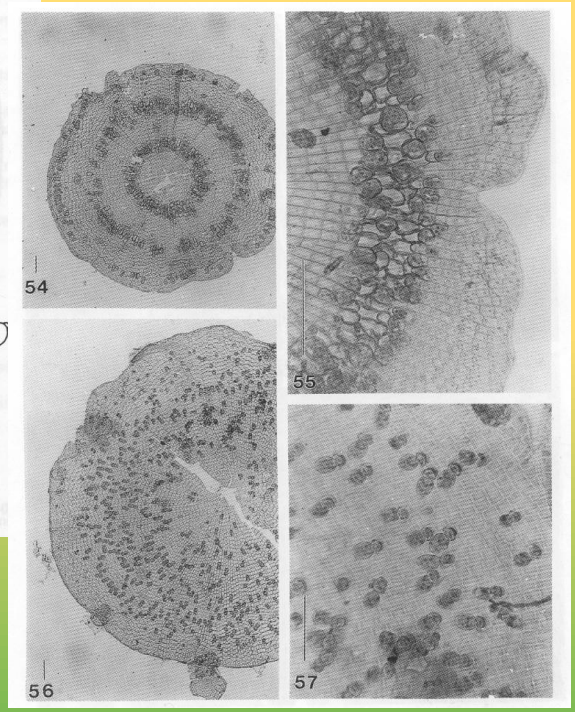


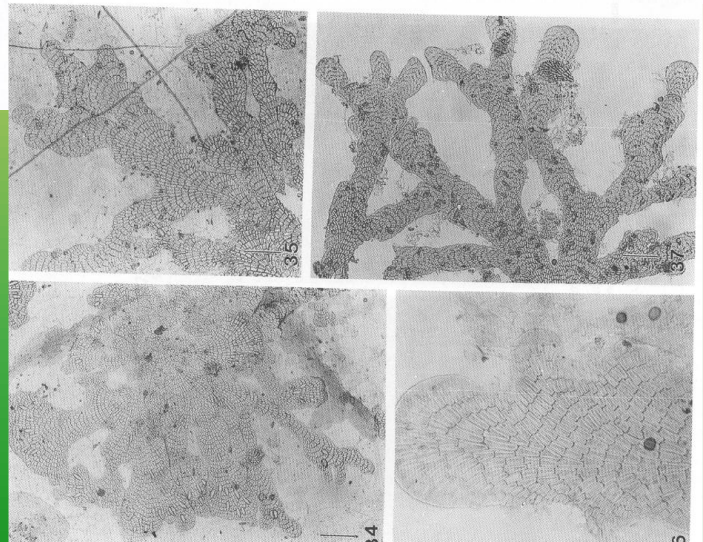
Trentepohliales – přehled rodů

Phycopeltis



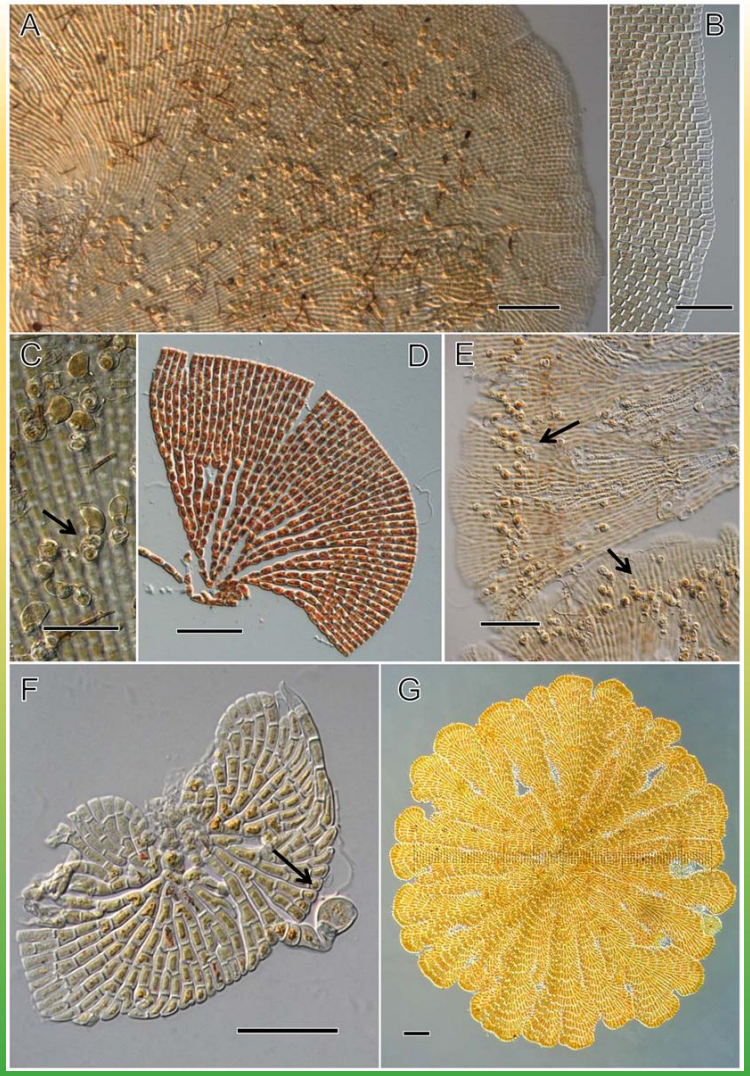


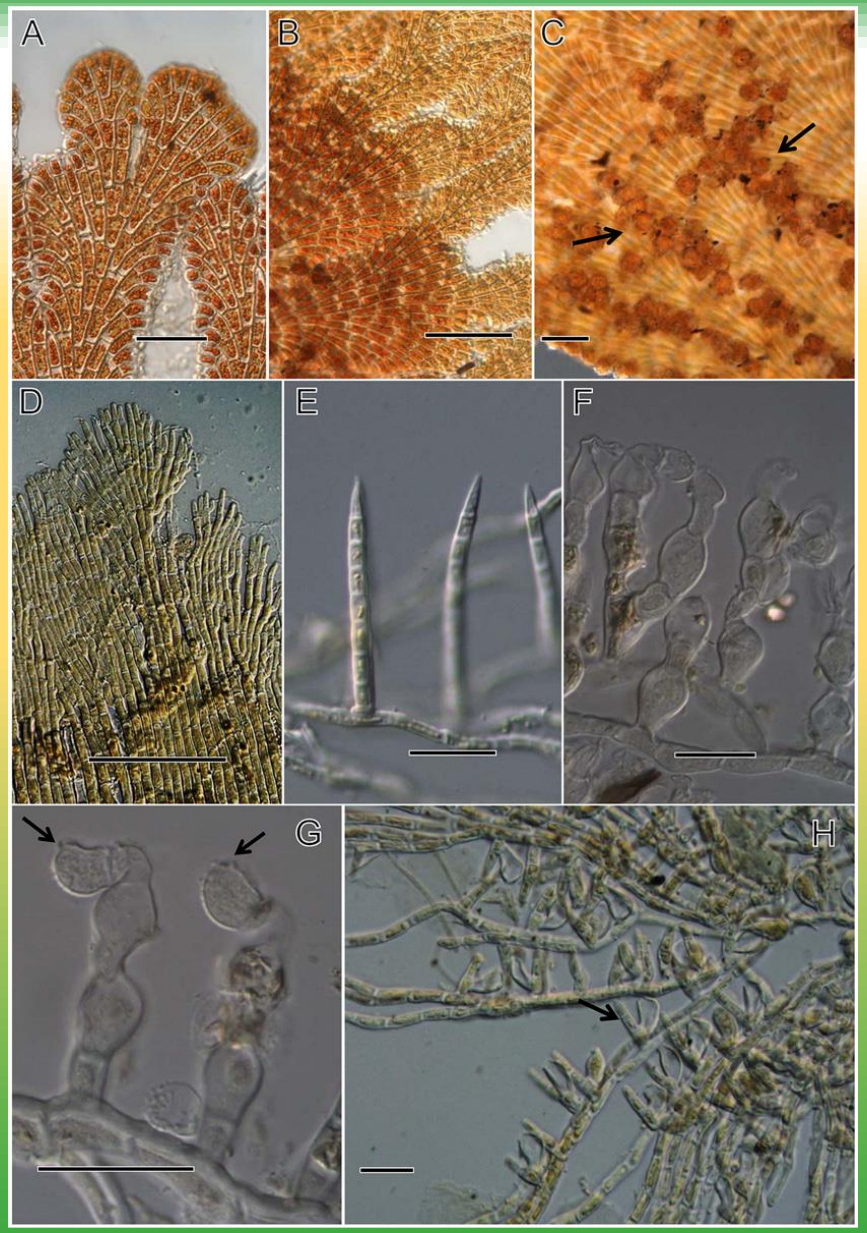




Thompson & Wujek (1997)

Phycopeltis





Zhu et al. (2015)

Fig 2. Microscopic features of *Phycopeltis flabellata* and *Phycopeltis prostrata*. Fig. 2A–2C. Microscopic features of *Phycopeltis flabellata*. Bars = 50 μm. Fig. 2A. The fan-like ramuli of *P. flabellata*. Fig. 2B. New growth starting from the margins of the older ramuli. Fig. 2C. Sporangia of *P. flabellata* on the margins of fan-like ramuli. Fig. 2D–2H. Microscopic features of *Phycopeltis prostrata*. Bars for Fig. 2D, 50 μm; others, 20 μm. Fig. 2D. Disjunct margin with dichotomous filaments of *T. prostrata*. Fig. 2E. Attenuate erect hair composed of eight cells. Fig. 2F–2G. Few-celled (usually two) stalked sporangia with a terminal papilla (arrows) developing from the prostrate filaments. Fig. 2H. Sessile gametangia (arrows) on the base of erect filaments.

Trentepohliales - přehled rodů

Cephaleuros

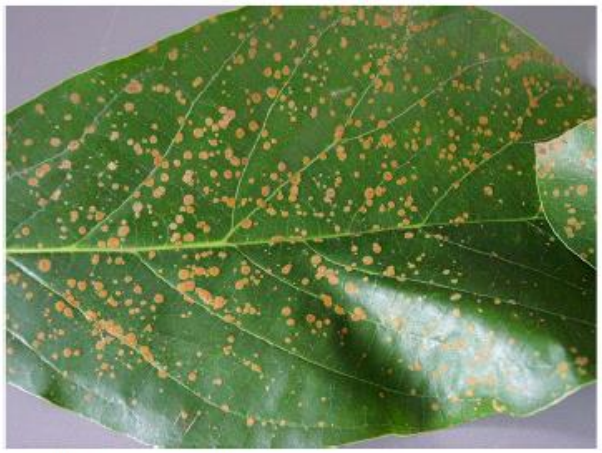


Fig. 1. Algal spot on avocado (*Persea americana*) caused by *Cephaleuros virescens*. Commonly called "red rust," identifying *Cephaleuros* species has confused observers for decades. Even microscopic examination of the lesions reveals hyphae-like filaments, setae, sporangiophores, and swimming spores similar to fungi and the oomycetes.

Brooks et al. (2015)

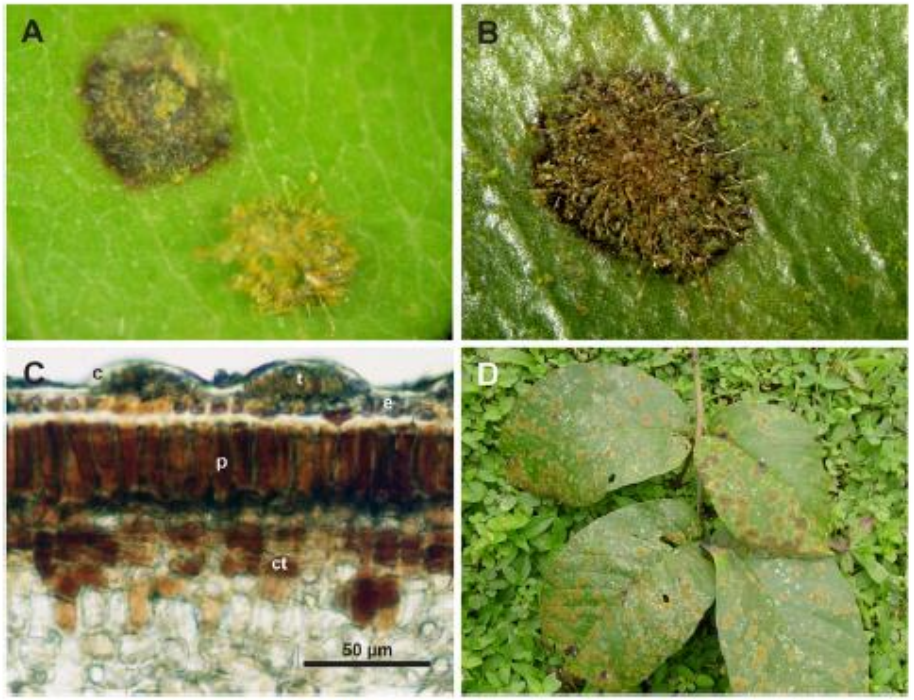


Fig. 7. A, Tissue necrosis caused by *Cephaleuros* species is usually limited to cells beneath the thallus. The thallus of *C. virescens* and most of the plant cuticle have been removed from the upper lesion to show necrosis. **B,** On some hosts, *Cephaleuros* causes hyperplasia of the epidermis and palisade parenchyma, raising the thallus above the leaf surface. **C,** An infection of *Camellia japonica* by the subcutaneous alga *Cephaleuros japonicus*: cutide (c), thallus (t), epidermis (e), palisade parenchyma (p), and corky tissue (ct) formation among spongy mesophyll cells in response to infection. **D,** These yellowish orange, fuzzy thalli on guava leaves are a typical sign of *C. virescens*.

Cephaleuros

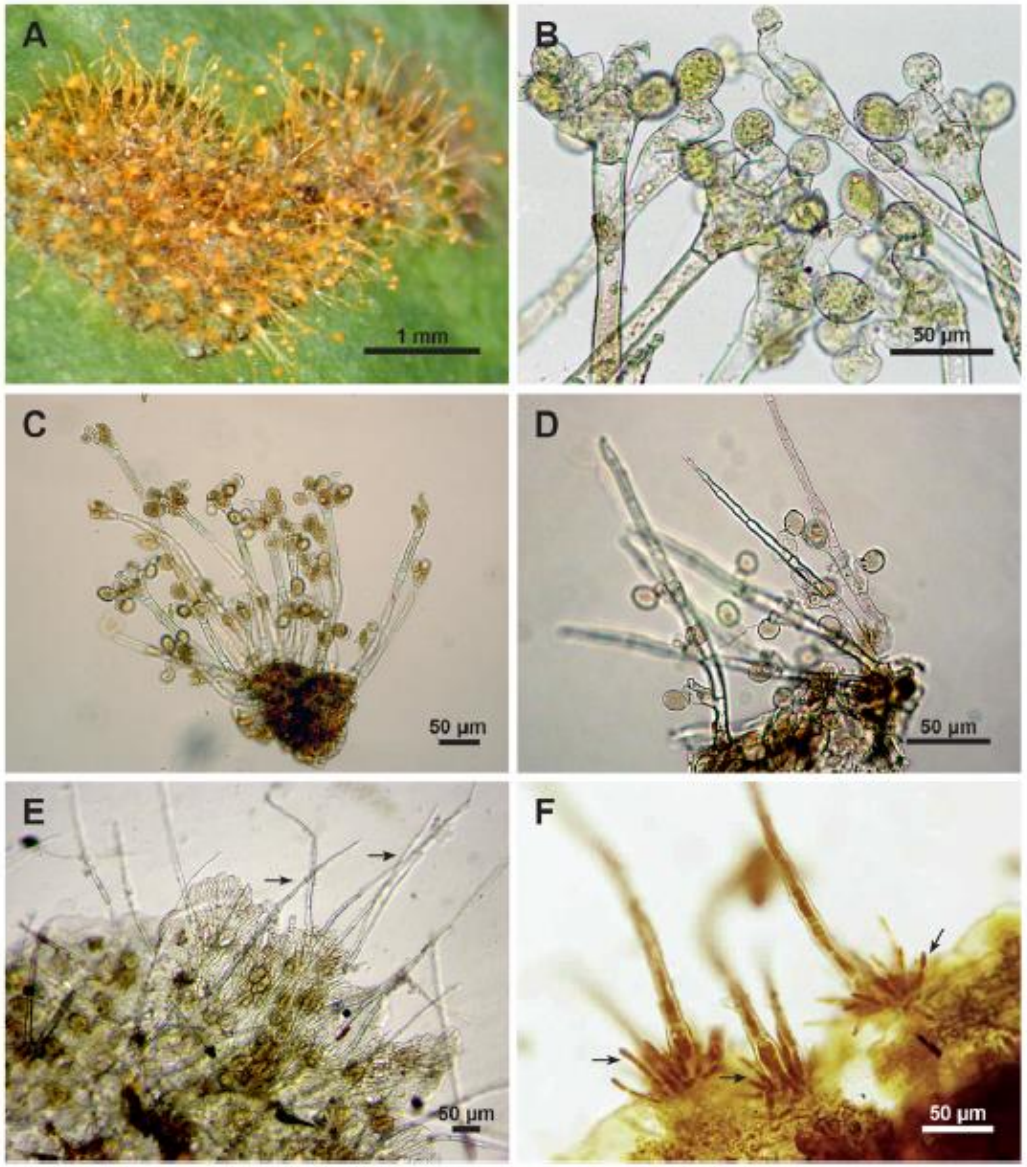
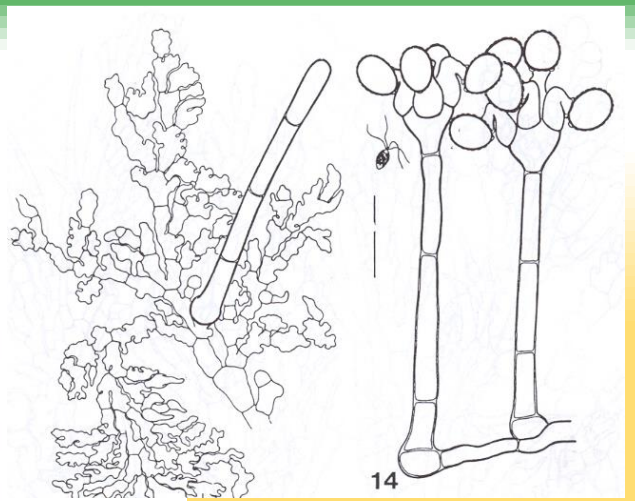


Fig. 9. A, Typical lesion on an upper leaf surface caused by *Cephaleuros virescens*. The erect portion of the alga consists of sporangiophores with head cells and sporangiate-laterals, and setae. **B,** Head cells and sporangiate-laterals of *C. japonicus*. **C,** Cluster of *C. parasiticus* sporangiophores emerging from the lower leaf surface. **D,** Sporangiate-laterals of *C. minimus* form on one side of sporangiophores; the pointed, three-celled apex is sterile. **E,** Multicellular setae (arrows) of *C. karstenii*. **F,** Short setae (arrows) of *C. henningsii*.



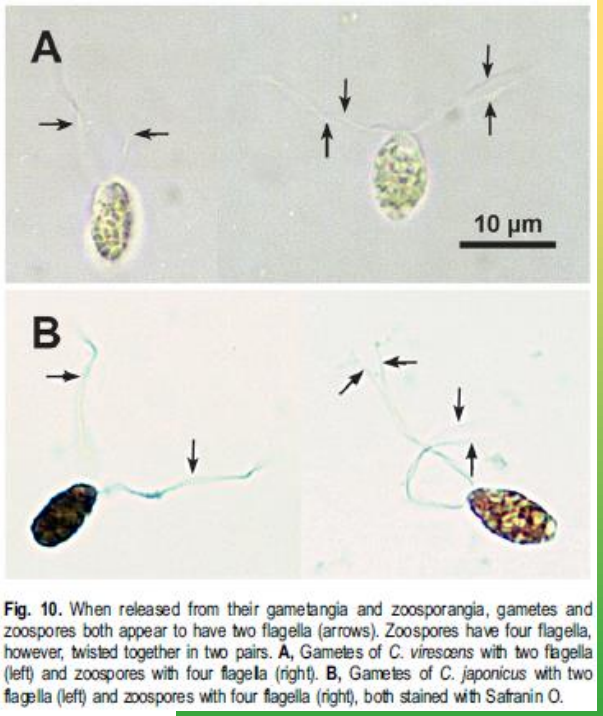
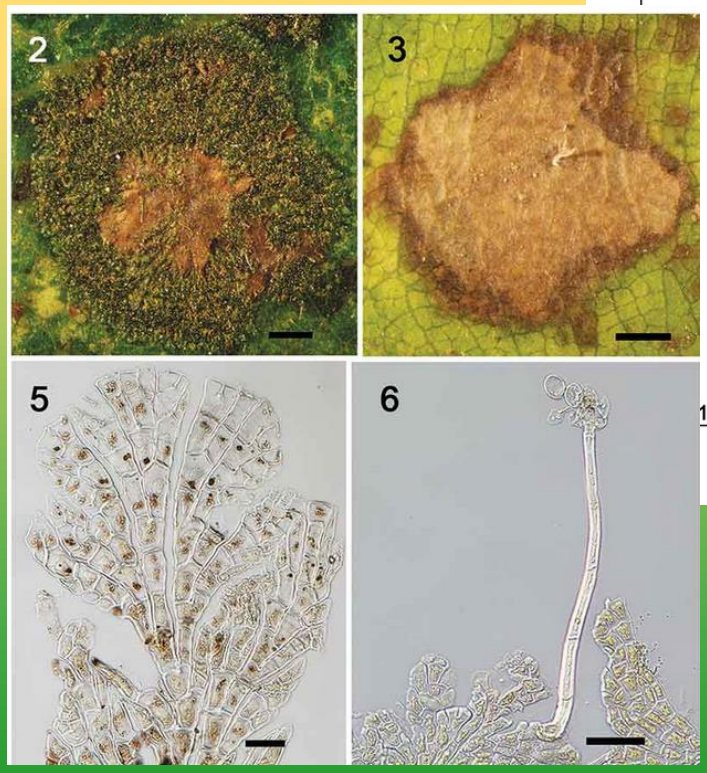


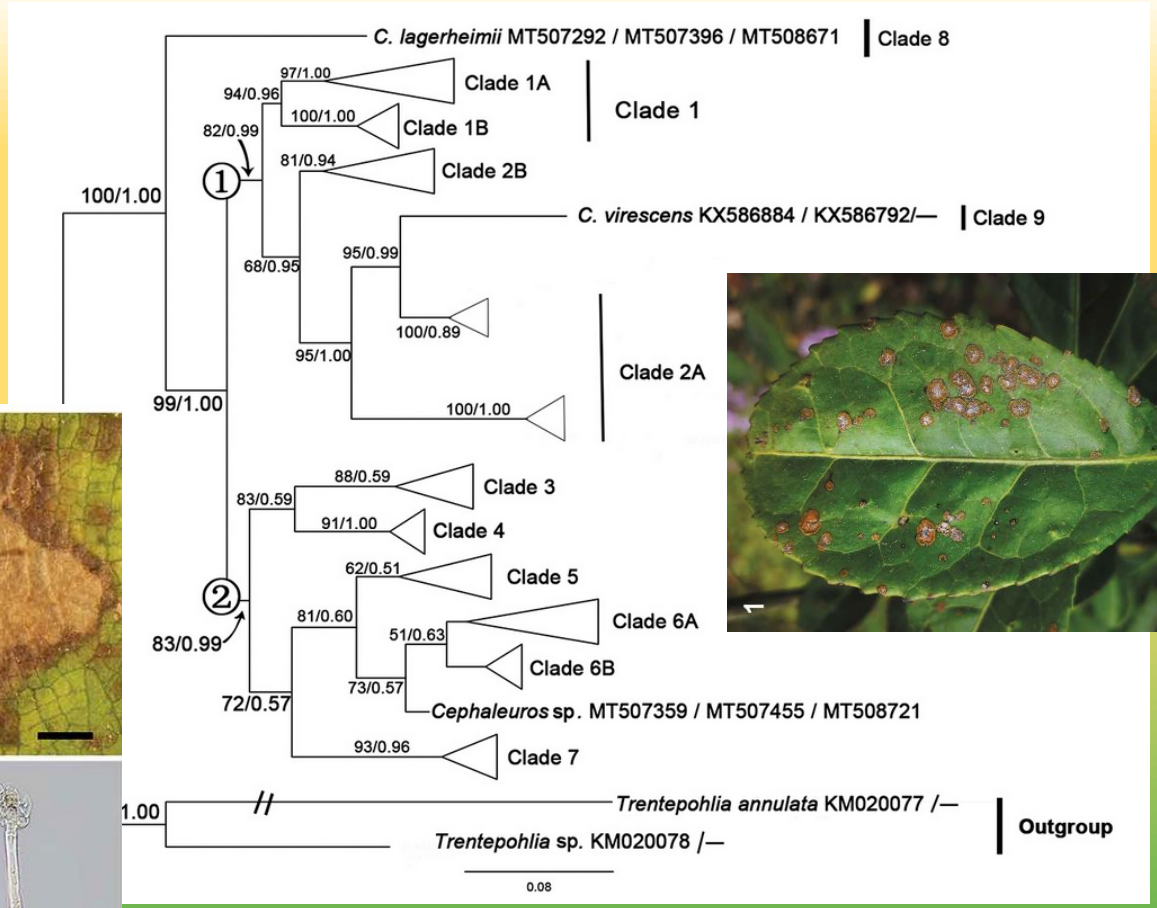
Fig. 10. When released from their gametangia and zoosporangia, gametes and zoospores both appear to have two flagella (arrows). Zoospores have four flagella, however, twisted together in two pairs. **A,** Gametes of *C. virescens* with two flagella (left) and zoospores with four flagella (right). **B,** Gametes of *C. japonicus* with two flagella (left) and zoospores with four flagella (right), both stained with Safranin O.

Brooks et al. (2015)

Trentepohliales - přehled rodů

Cephaleuros

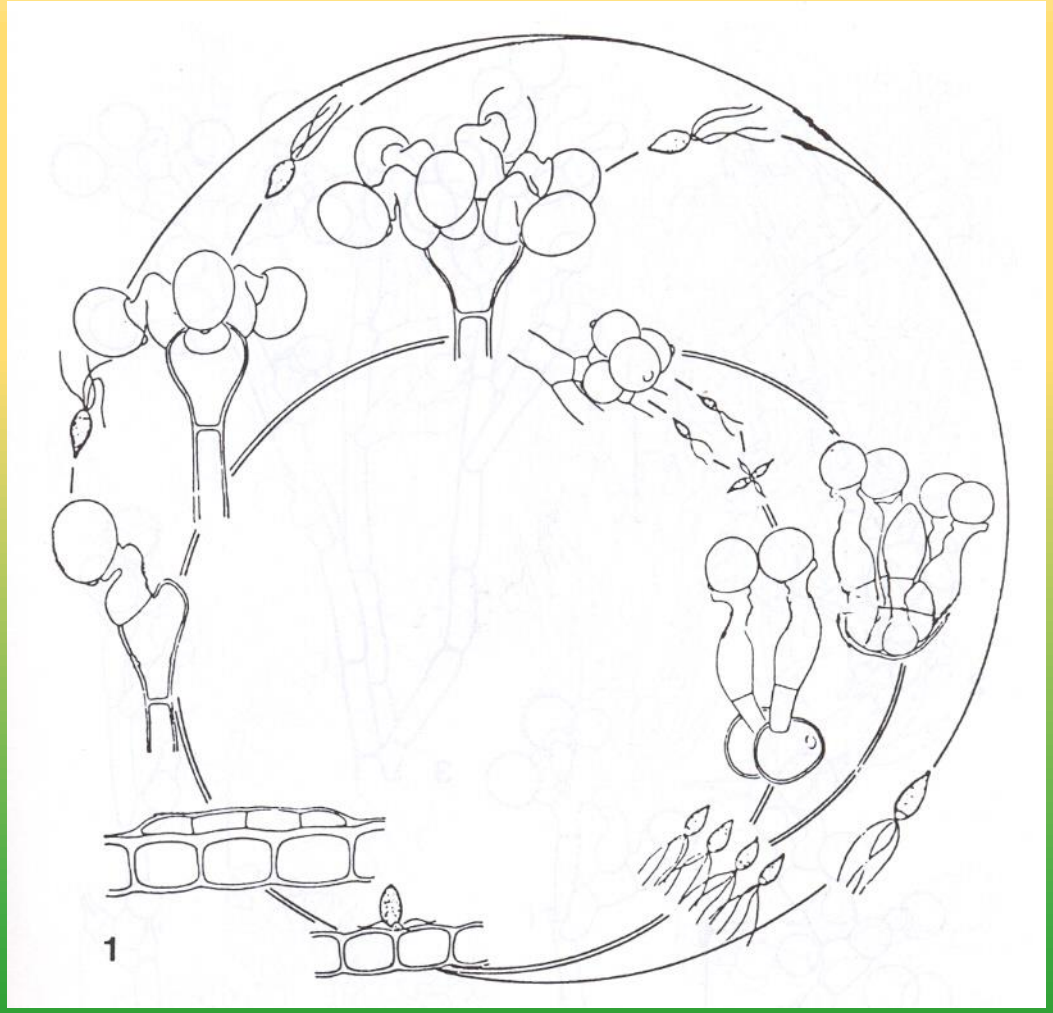


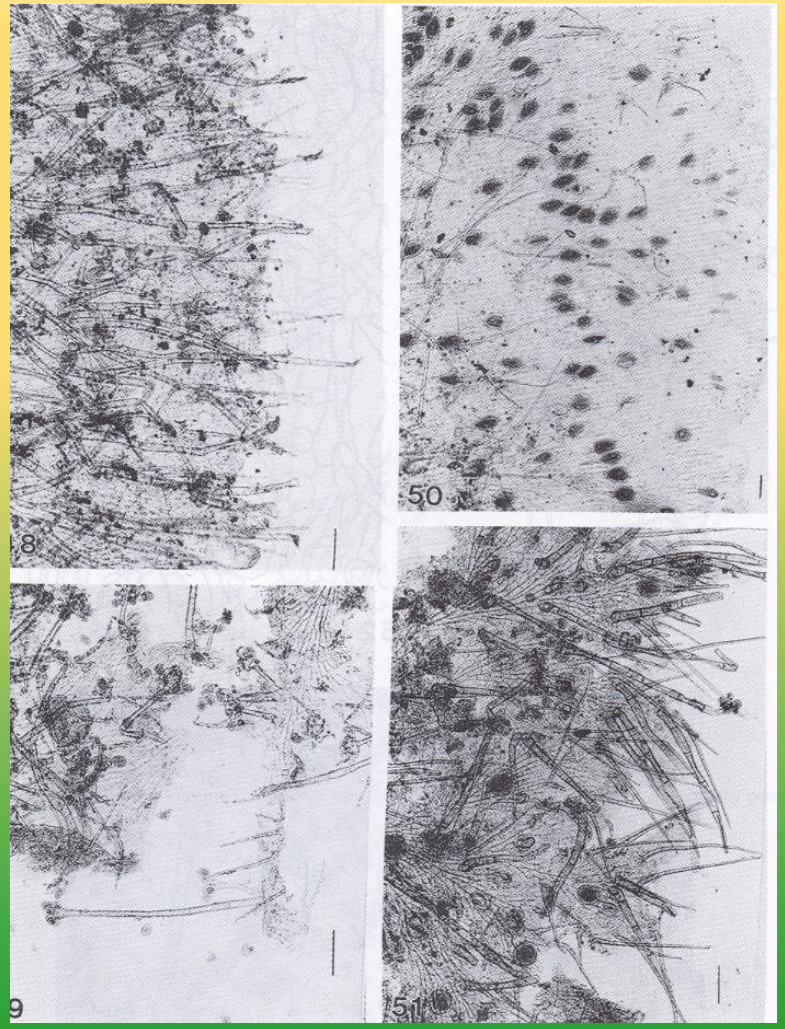


Fang et al. (2021)

Trentepohliales - přehled rodů

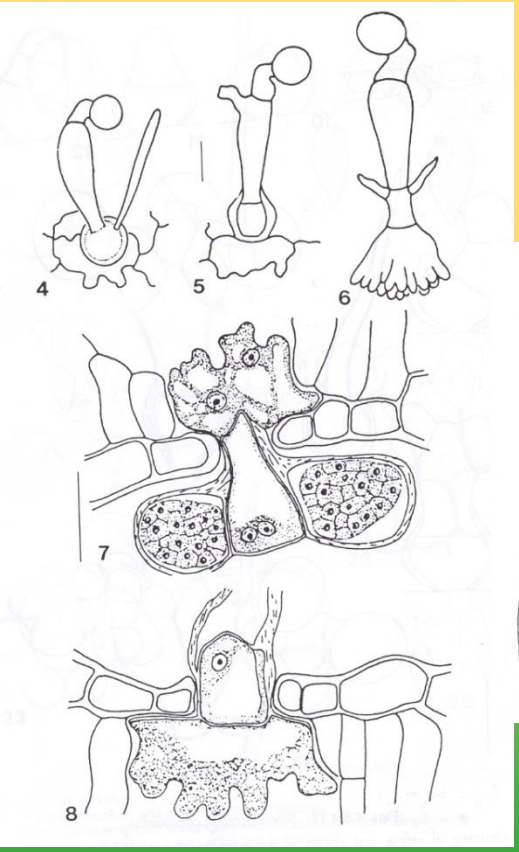
Cephaleuros

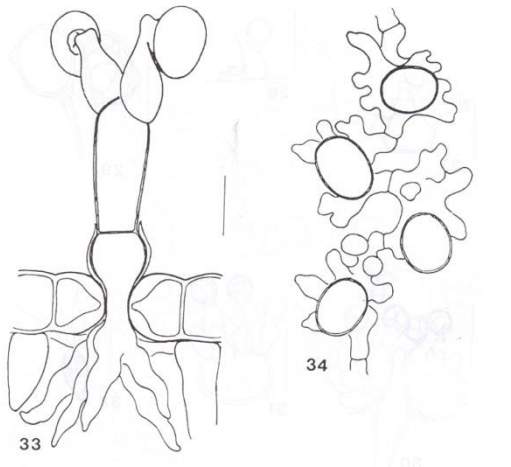




Trentepohliales - přehled rodů

Stomatochroon





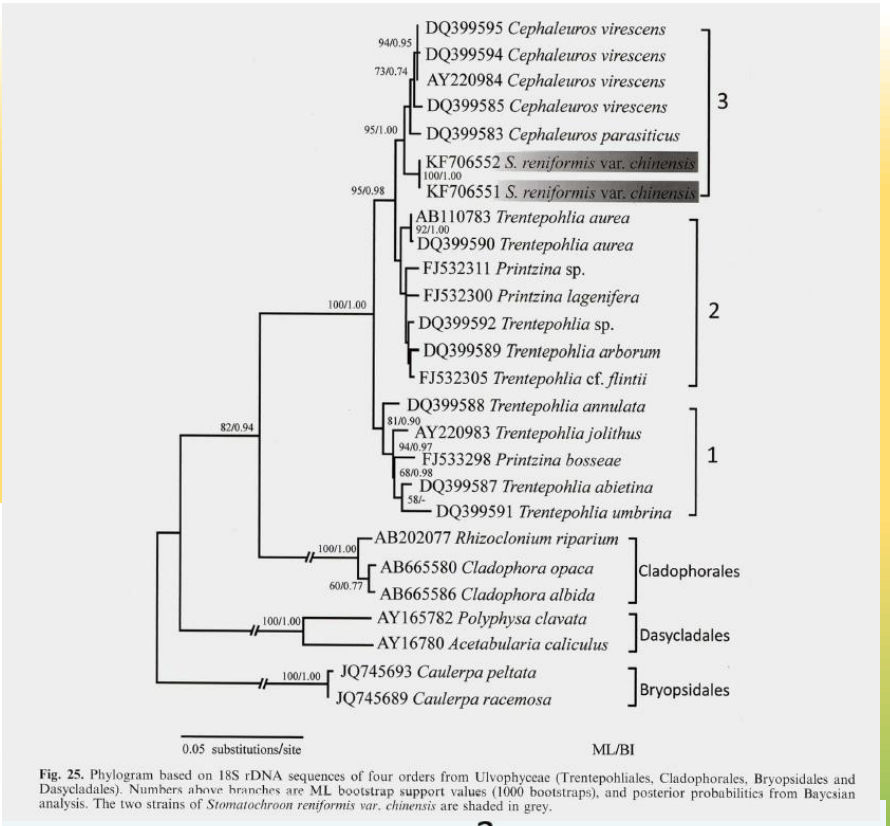
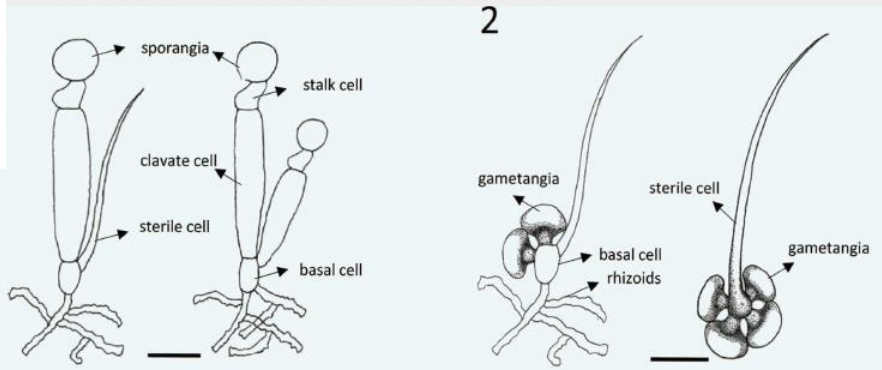


Fig. 25. Phylogram based on 18S rDNA sequences of four orders from Ulvophyceae (Trentepohliales, Cladophorales, Bryopsidales and Dasycladales). Numbers above branches are ML bootstrap support values (1000 bootstraps), and posterior probabilities from Baycsian analysis. The two strains of *Stomatochroon reniformis var. chinensis* are shaded in grey.



Figs 1–2. *Stomatochroon reniformis var. chinensis var. nov.*
Fig. 1. Line drawing showing the structure of sporophyte thalli. Scale bar = 30 μm.
Fig. 2. Line drawing showing the structure of gametophyte thalli. Scale bar = 30 μm.

Zhu et al. (2014)