


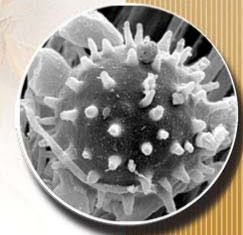


Agriculture and  
Agri-Food Canada

Agriculture et  
Agroalimentaire Canada



United States Department Of Agriculture  
Agricultural Research Service



## Separation of *Pythium* taxa using nuclear and mitochondrial DNA markers: Proposal of a new genus, *Phytopythium* gen. nov.

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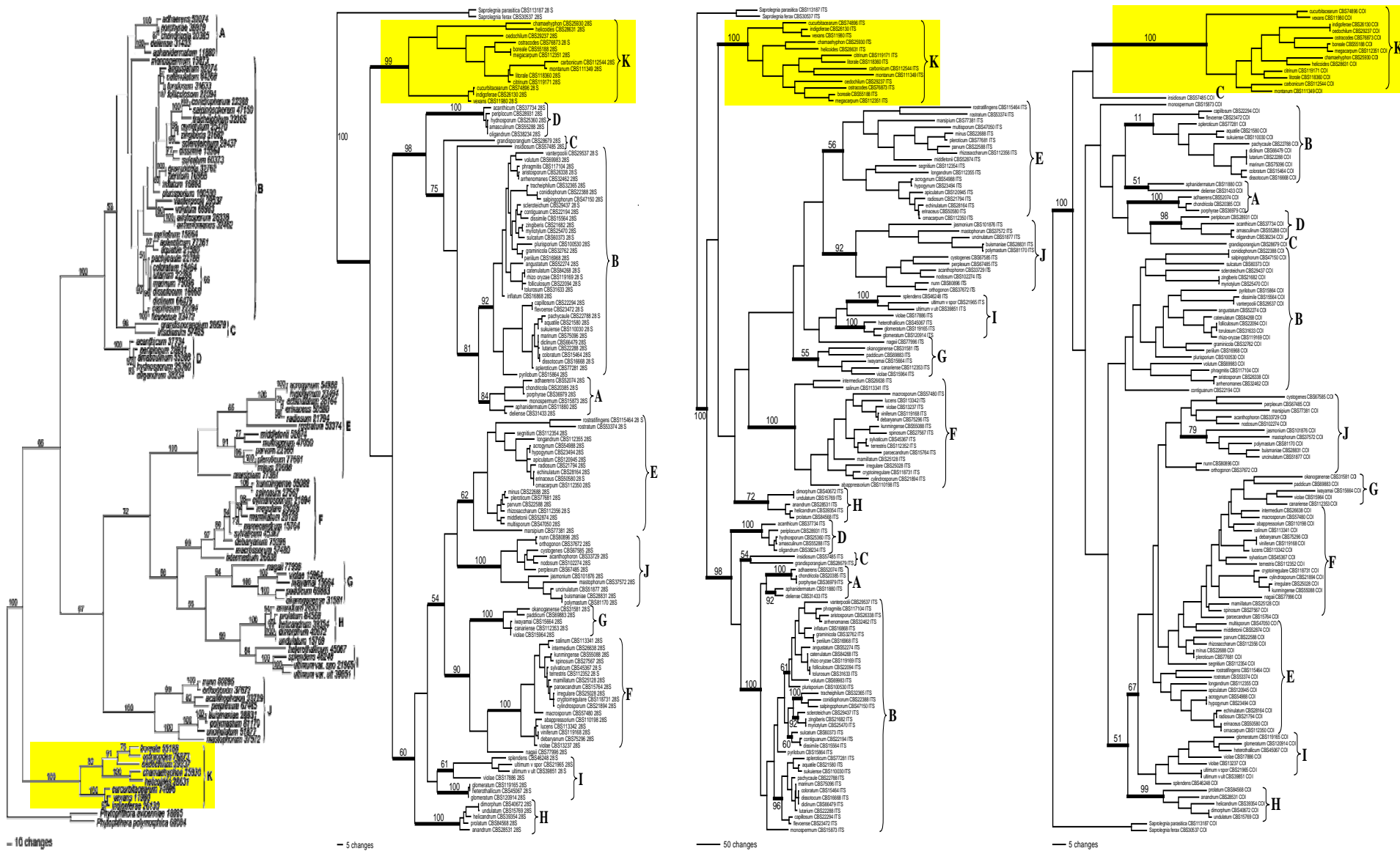
Z.G. Abad

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A.W.A.M. de Cock

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# Pythium Phylogeny



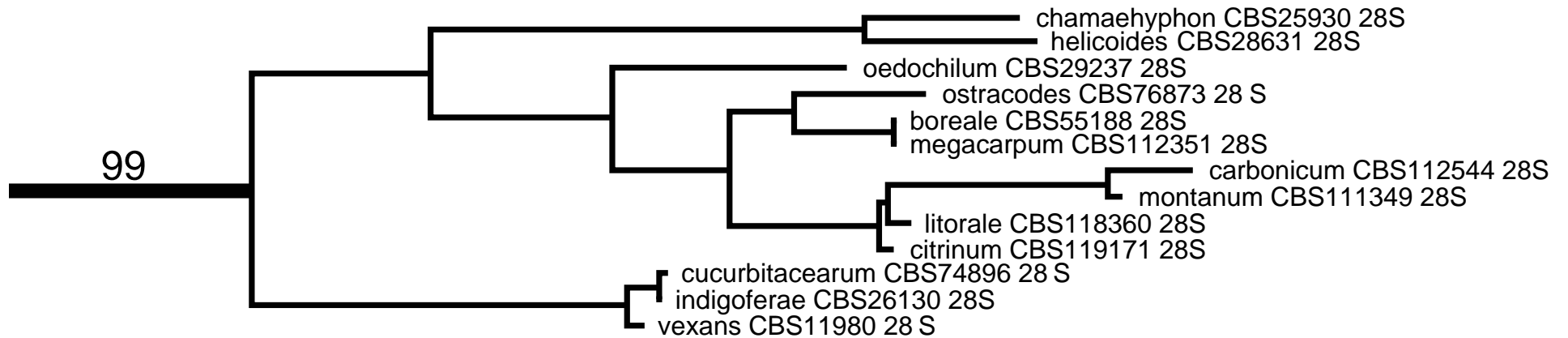
ITS (2004)

LSU (2008)

ITS (2008)

COI (2008)

# Clade K species



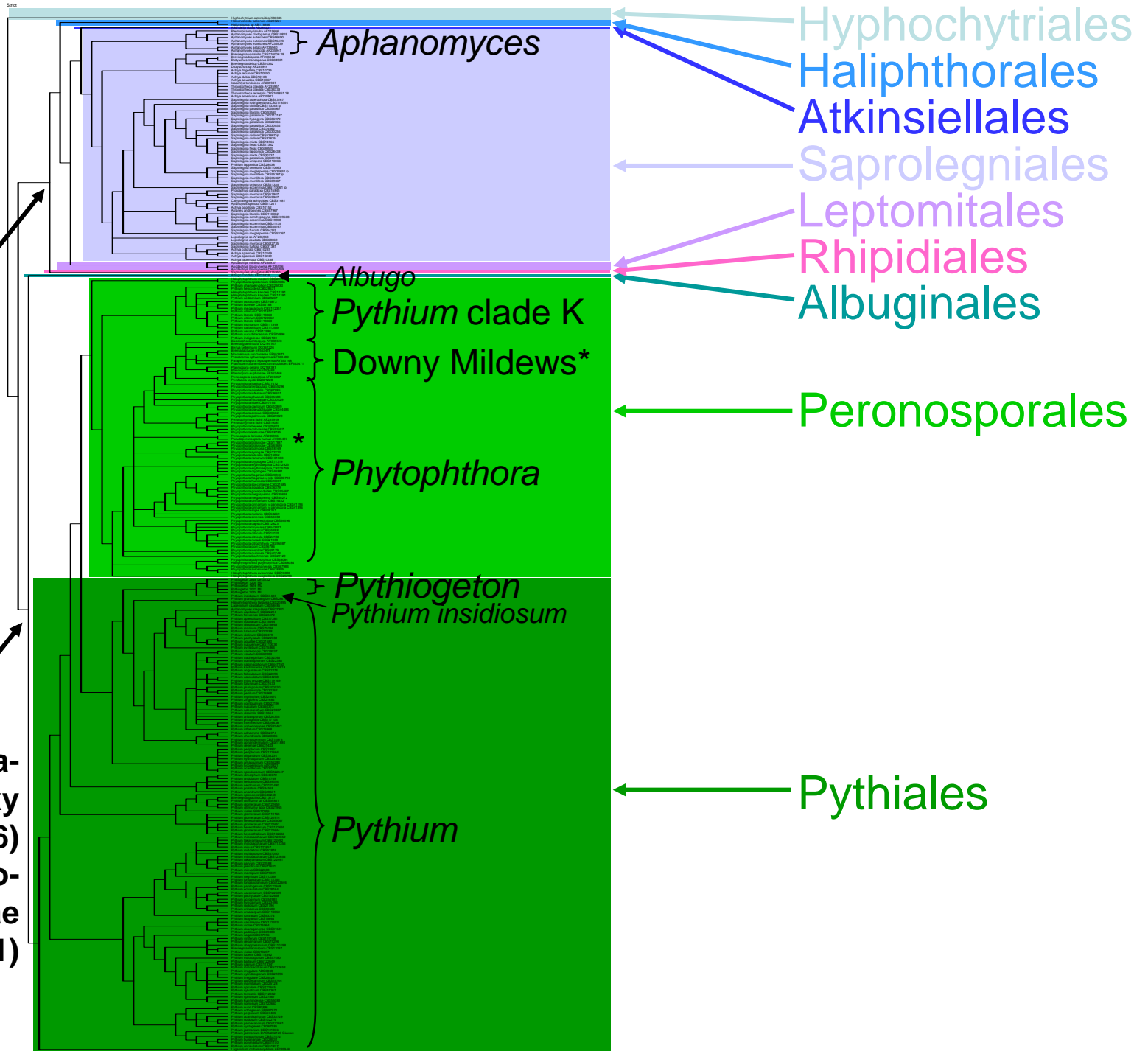
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# Phylogeny of all oomycetes

LSU (D1-D3)  
Max. Pars. tree  
314 sequences  
271 CBS  
42 GenBank

Saprolegnian  
galaxy  
(Sparrow 1976)  
Saprolegnio-  
mycetidae  
(Dick 2001)

Peronospora-  
leanan galaxy  
(Sparrow 1976)  
Peronosporo-  
mycetidae  
(Dick 2001)



Hyphochytriales  
Haliphthorales  
Atkinsiellales

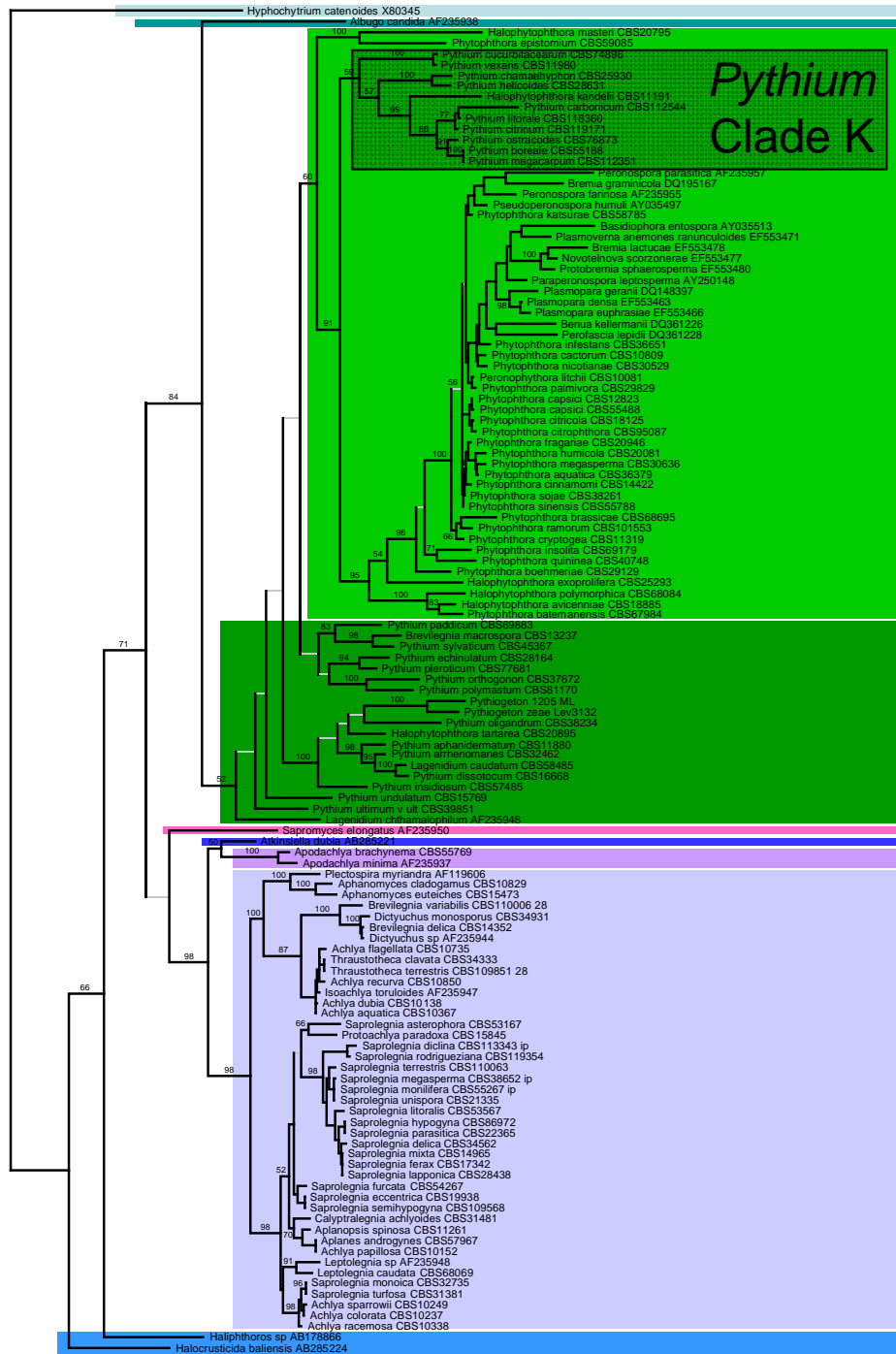
Saprolegniales  
Leptomitales  
Rhipidiales

Albuginales

Peronosporales

Pythiales

LSU (D1-D3)  
 Max. Pars. tree  
 125 sequences  
 96 CBS  
 29 GenBank



Hyphochytriales  
 Albuginales

Peronosporales

Pythiales

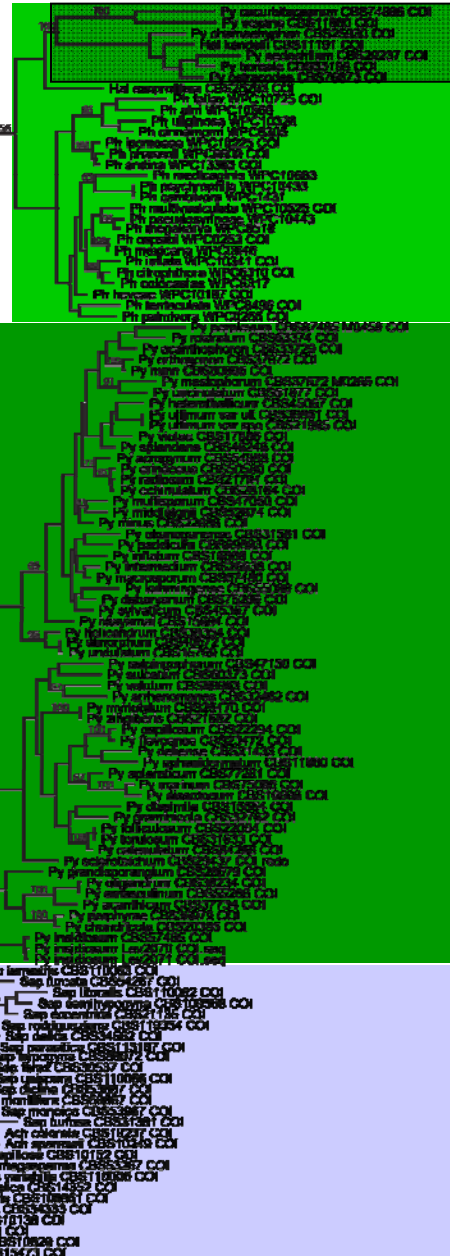
Rhipidiales  
 Atkinsiellales  
 Leptomitales

Saprolegniales

Haliphthorales

— 10 changes

# COI - Cytochrome oxydase I



Pythium Clade K

← Peronosporales

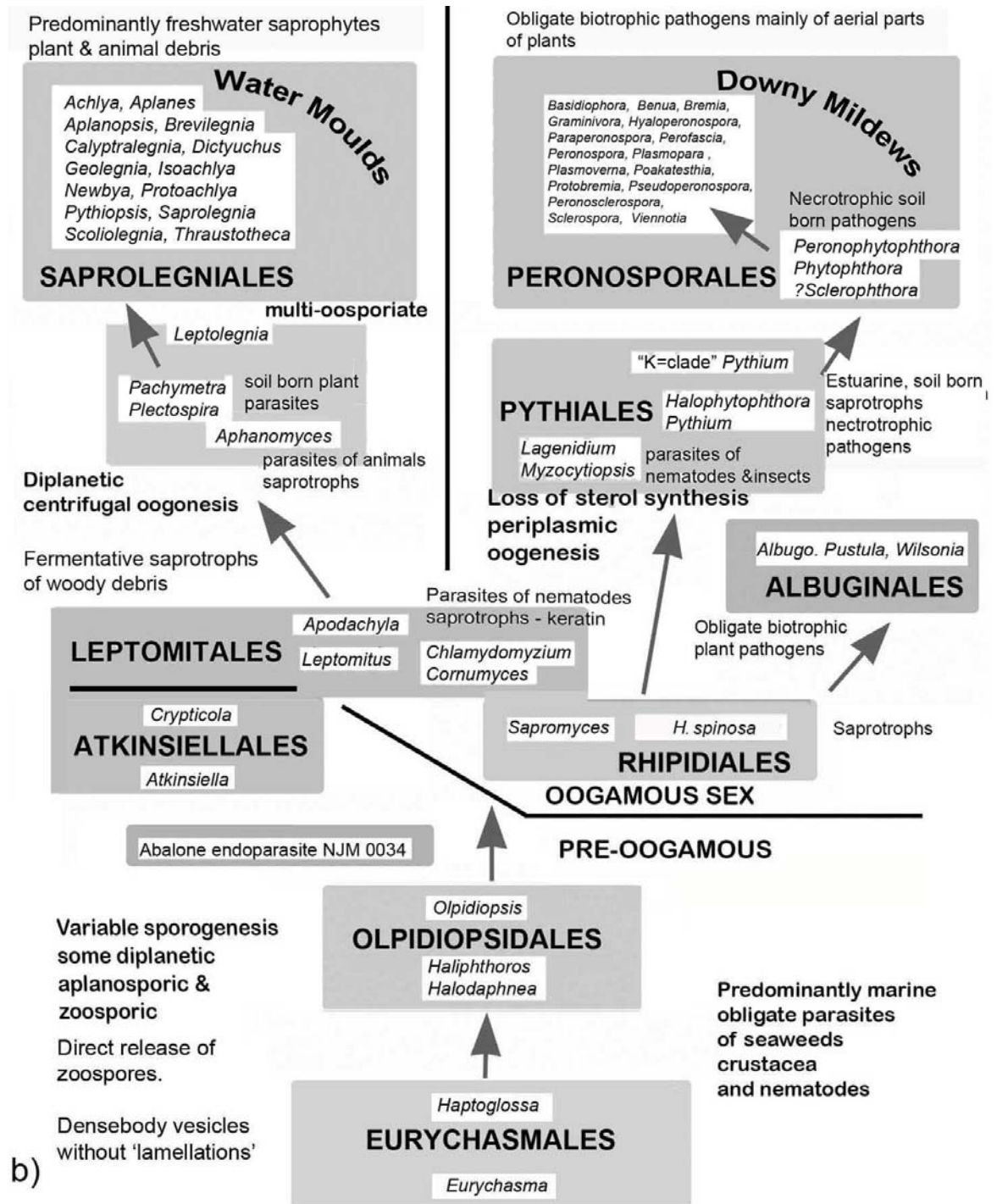
More  
*Phytophthora*  
coming from M.  
Coffey

← Pythiales

← Saprolegniales

*Eurychasma* (Euryd) COI  
— 10 changes

Beakes, G.W.  
and Sekimoto, S.  
2008. (in press)



b)

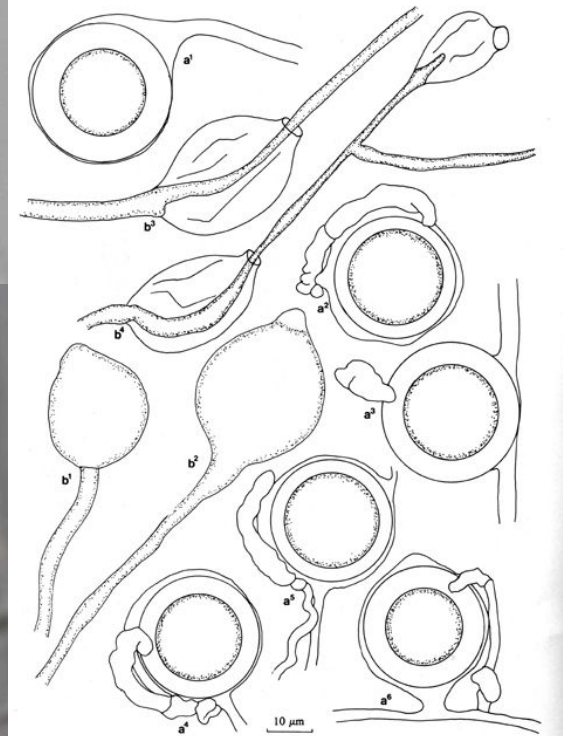
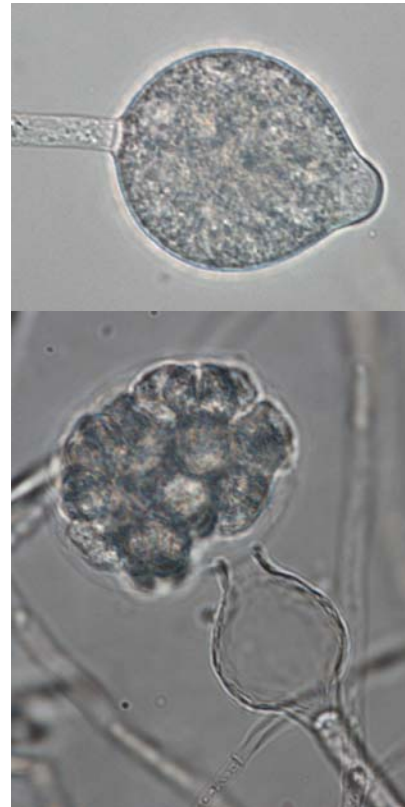


# *Phytophthium*

Sporangia globose to ovoid with papilla and often proliferating internally (*Phytophthora-like*)

Zoospore discharge is *Pythium-like*

Most species have large, smooth oogonia, thick-walled oospores, and 1–2 elongate antheridia, laterally applied to the oogonium



# Acknowledgements

- Gordon Beakes and Satoshi Sekimoto
- The Barcode of Life Initiative

# The issue of name (in)consistency

## Google Hits

straminipila	1860
straminopile	121
straminipile	87
stramenopile	8010
stremenopile	1
stramenopilous	2
straminopilous	1760
straminopilous	16
stramenopilous	17

Oomycota	129,000
oomycetes	161,000
oomycete	60,800
oomycetous	2,810
peronosporomycetes	5,120
Peronosporomycota	2,240
peronosporomycete	498
peronosporomycetous	9



A more coordinated approach for  
assembling the oomycete tree of life is needed

“AOTOL”?

# Assembling the mycologists of oomycete for the tree of life "AMOOTOL"

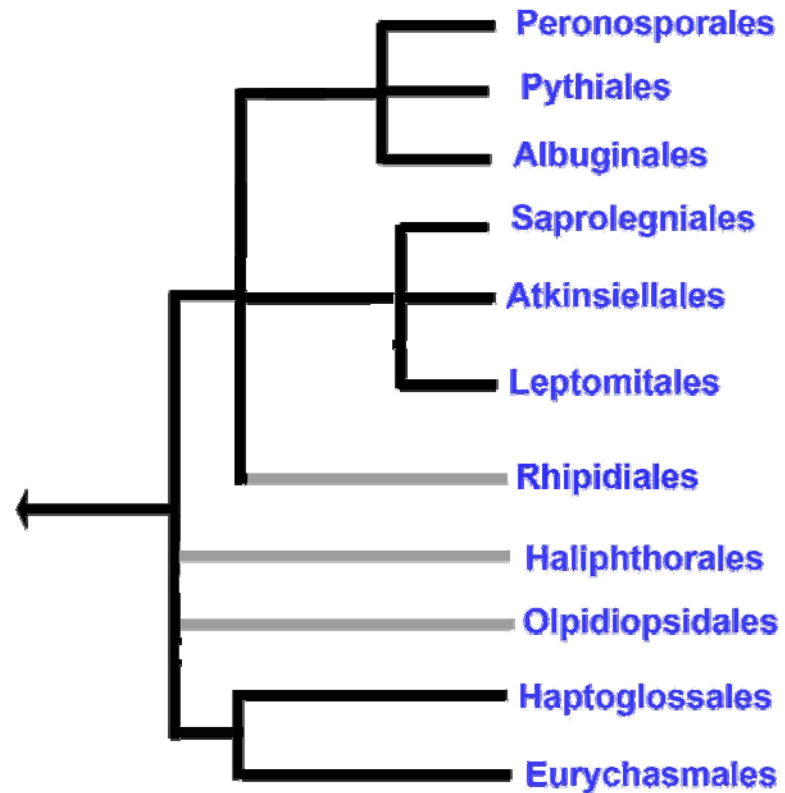


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Protists Tree of Life -  
Patrick Keeling



*Draft – Order Tree*

— These branches may not be monophyletic