


Towards one scientific name for fungi


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The image shows three turtle shells, likely from a sea turtle, resting on a solid blue background. The shells are arranged in a row, with the central one being the most prominent and in focus. The shells have a characteristic pattern of scutes, which are the bony plates on the top and bottom of the shell. The scutes are a light brown or tan color, with darker, almost black, lines separating them. The texture of the shells appears slightly rough and matte. The lighting is even, highlighting the shape and structure of the shells without creating harsh shadows.

**Accurate scientific
names are the key to
unlocking and
using information!**

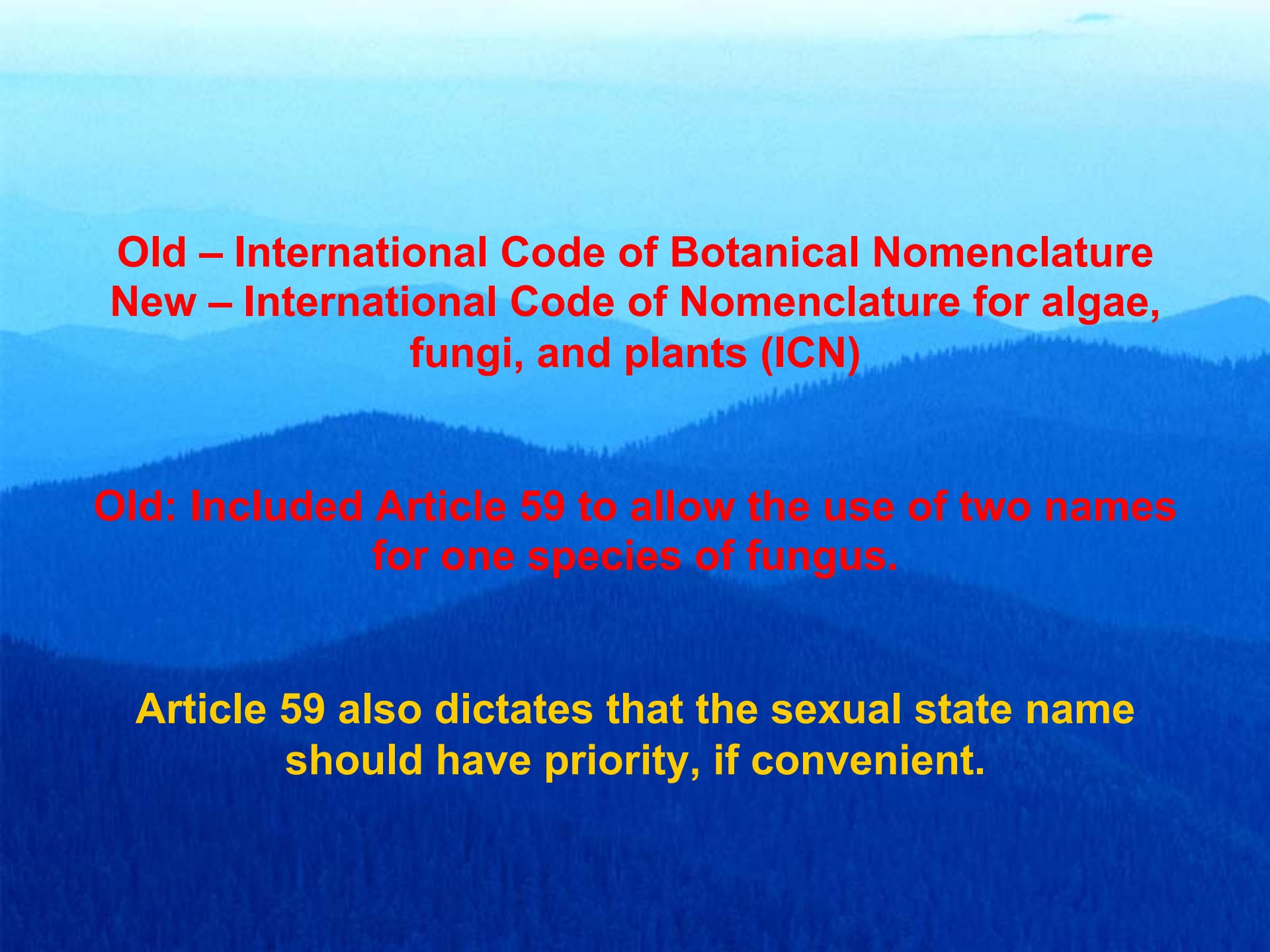


Accurate scientific names are based on systematic knowledge from RESEARCH. As knowledge increases, scientific names will change.

Systematic knowledge of fungi and accurate scientific names are needed:

- **To identify plant-associated fungi discovered at ports of entry**
- **To prevent inadvertent entry of invasive fungi through accurate pest risk analyses**
- **To determine if a plant pathogen has been purposely introduced**





Old – International Code of Botanical Nomenclature
**New – International Code of Nomenclature for algae,
fungi, and plants (ICN)**

**Old: Included Article 59 to allow the use of two names
for one species of fungus.**

**Article 59 also dictates that the sexual state name
should have priority, if convenient.**

Changes in the new International Code of Nomenclature

- As of 1 Jan 2012, Latin diagnosis no longer required; English diagnosis is sufficient.
- As of 1 Jan 2012, new taxa can be published electronically. A number of requirements still in place.
- As of 1 Jan 2013, new names of fungi must be registered in MycoBank

Also:

As of 1 Jan 2013, only one name will be used for fungi. The correct name will be based on the Principle of Priority i.e. whatever name was described first has priority. Sounds simple but.....

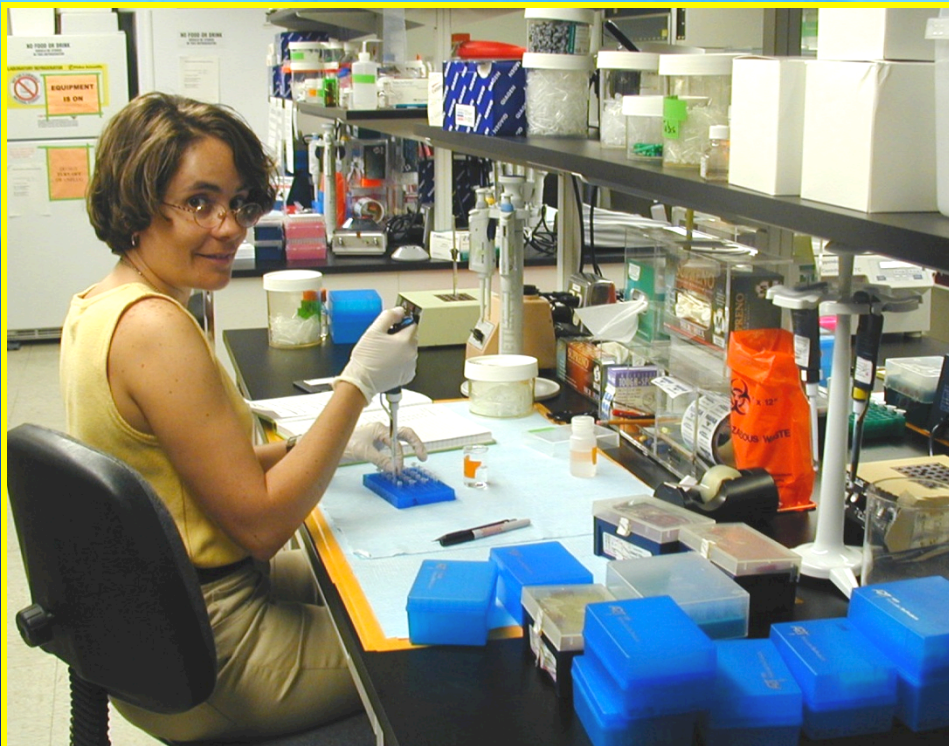
Your favorite name may bite the dust.

All scientific names for genera and species would be equal in determining the priority of a name. Priority will not longer be given to the sexual state name.



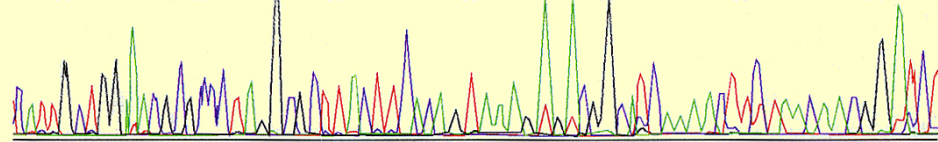
Why the change?

Most mycologists agree that the use of two names for one species is no longer necessary because, using DNA sequence analyses, we can determine the phylogeny of asexual fungi.



This is equivalent to knowing the sexual state.

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What was wrong with Article 59?

One problem was that it has resulted in a proliferation of names when they are not needed.

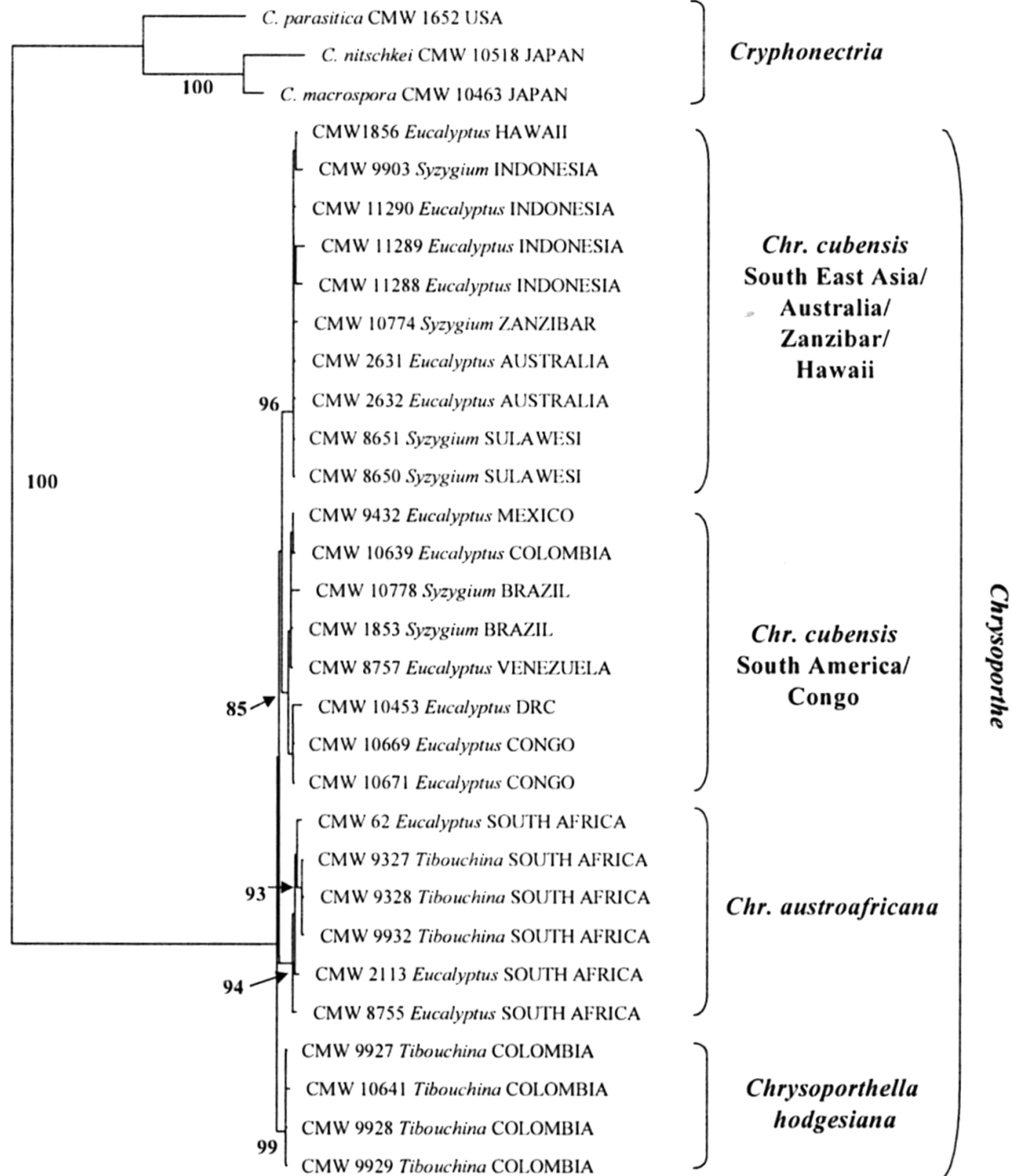
Especially among non-mycologists, confusion exists when two or more different scientific names are used for the same genus or species.

What was wrong with Article 59?

Because of Article 59, many unnecessary names had to be established; it was often not obvious that they refer to that same monophyletic group.

Example: *Chysoportbella* was described for an asexual species that belongs in *Chrysoporthe* for which no sexual state was known. A new genus was required just for the asexual species.

Fungal species in the same monophyletic genus should all have the same generic name.



Gryzenhout, et al. 2004.

What was wrong with Article 59?

Another problem:

We tend to think of the separately named sexual and asexual states as two distinct species, when they are actually referring to the same species.

What was wrong with Article 59?

In the ideal world,

A group of related species, i.e. a genus and its species, would form a monophyletic group regardless of whether the species represented are sexual and/or asexual states.

Similarly, there would be a one-to-one correlation between sexual and asexual genera.

Thus, only one generic and one species name is needed!

Moving to one name for fungi
Sounds simple but....

Truly the devil is in the details



Examples of what will happen when we move to one name:

Fungus causing boxwood blight

Teleomorph: *Calonectria* sp. (unknown)

Anamorph: *Cylindrocladium pseudonaviculatum* (= *Cyl. buxicola*)

1. Which genus has priority?

Calonectria 1867 = *Cylindrocladium* 1892

2. Which species has priority?

Cylindrocladium pseudonaviculatum Jan. 2002 (= *Cyl. buxicola* Oct. 2002)

Correct scientific name for boxwood blight is:

Calonectria pseudonaviculata (Crous et al.) L. Lombard et al.

Examples of what will happen when we move to one name:

Apple scab

T *Venturia inaequalis* A *Fusicladium pomi*

1. Which genus has priority?

Venturia 1882 = *Fusicladium* 1851

Should the genus *Venturia* be conserved?

2. All names being equal, the oldest species epithet has priority. Must look for the oldest basionym.

***Venturia inaequalis* (Cooke) G. Winter 1875 (Ascomycetes, Pleosporales). Type of the genus *Venturia*.**

≡ *Sphaerella inaequalis* Cooke 1866

≡ *Didymosphaeria inaequalis* (Cooke) Niessl 1881

≡ *Endostigme inaequalis* (Cooke) Syd. 1923

≡ *Spilosticta inaequalis* (Cooke) Petr. 1940

Anamorph:

***Fusicladium pomi* (Fr. : Fr.) Lind 1913**

≡ *Spilocaea pomi* Fr. : Fr. 1819

= *Actinonema crataegi* Pers. 1822

≡ *Capillaria crataegi* (Pers.) Link 1824

What is the oldest species epithet?

Without conserving the genus or species, the correct name is *Fusicladium pomi* (Fr. : Fr.) Lind 1913

If *Venturia* conserved: *Venturia pomi* (Fr.: Fr.) Rossman comb nov.

If *Venturia* conserved and *Sphaerella inaequalis* conserved, then *V. inaequalis* would stay the same.

Without conservation, correct scientific name and synonyms:

***Fusicladium pomi* (Fr. : Fr.) Lind 1913 (Ascomycetes, Pleosporales)**

≡ *Spilocaea pomi* Fr. : Fr. 1819

= *Actinonema crataegi* Pers. 1822

≡ *Capillaria crataegi* (Pers.) Link 1824

= *Sphaerella inaequalis* Cooke 1866

≡ *Venturia inaequalis* (Cooke) G. Winter 1875

≡ *Didymosphaeria inaequalis* (Cooke) Niessl 1881

≡ *Endostigme inaequalis* (Cooke) Syd. 1923

≡ *Spilosticta inaequalis* (Cooke) Petr. 1940

**With conservation of both the genus and species,
correct scientific name and synonyms:**

***Venturia inaequalis* (Cooke) G. Winter 1875
(Ascomycetes, Pleosporales).**

≡ *Sphaerella inaequalis* Cooke 1866, nom. cons.

≡ *Didymosphaeria inaequalis* (Cooke) Niessl 1881

≡ *Endostigme inaequalis* (Cooke) Syd. 1923

≡ *Spilosticta inaequalis* (Cooke) Petr. 1940

= *Spilocaea pomi* Fr. : Fr. 1819

≡ *Fusicladium pomi* (Fr. : Fr.) Lind 1913

= *Actinonema crataegi* Pers. 1822

≡ *Capillaria crataegi* (Pers.) Link 1824

What about chestnut blight?

***Cryphonectria parasitica* (Murrill) M.E. Barr 1978 (Ascomycetes, Diaporthales)**

≡ ***Diaporthe parasitica* Murrill 1906**

≡ ***Endothia gyrosa* var. *parasitica* (Murrill) Clinton 1912**

≡ ***Endothia parasitica* (Murrill) P.J. Anderson & H.W. Anderson 1912**

≡ ***Valsonectria parasitica* (Murrill) Rehm 1907**

Alternate State (Anamorph): *Endothiella parasitica* Roane 1986

Distribution: Asia, Europe, North America.

Substrate: Stems, twigs.

Disease Note: Chestnut blight. Cankers.

Host: *Castanea* spp., *Fagus sylvatica*, *Quercus* spp. (Fagaceae). Also reported from other hosts with some in other families, but these are not verified.

Supporting Literature:

Gryzenhout, M. , Wingfield, B.D., and Wingfield, M.J. 2009. Taxonomy, Phylogeny, and Ecology of Bark-Inhabiting and Tree-Pathogenic Fungi in the Cryphonectriaceae. APS Press, St. Paul, Minnesota, 119 pages.

Updated on Apr 04, 2008

1. Generic level: *Cryphonectria* 1905 vs. *Endothiella* 1906

2. Species level basionym: *Diaporthe parasitica* 1906
vs. *Endothiella parasitica* 1986

Cryphonectria parasitica is fine!

Summary of examples of name changes required if Article 59 eliminated:

Genera involved	Strict principle of priority: number of name changes	Priority to name already in genus: number of name changes
<i>Cochliobolus</i> 1934 vs <i>Bipolaris</i> 1959	17/23 or 74% (five epithets have equal priority) plus more changes for species without names in <i>Cochliobolus</i>	0/23 or 0%
** <i>Bipolaris</i> 1959 conserved over <i>Cochliobolus</i> 1934	0/23 or 0% (five epithets have equal priority)	1/23 or 4%
<i>Pyrenophora</i> 1849 vs. <i>Drechslera</i> 1930	10/11 or 90% (one set of epithets with equal priority)	1/11 or 9%
** <i>Drechslera</i> 1930 conserved over <i>Pyrenophora</i> 1849	0/11 or 0%	1/11 or 9x%
<i>Fusicoccum</i> 1829 vs. <i>Botryosphaeria</i> 1863	2/12 or 17%	0/12 or 0%
<i>Calonectria</i> 1878 vs. <i>Cylindrocladium</i> 1892	19/39 or 49%	11/39 or 28%
<i>Trichoderma</i> 1801 vs. <i>Hypocrea</i> 1825	30/40 or 75%	15/40 or 37%
<i>Tubercularia</i> 1790 vs. <i>Nectria</i> 1849	5/10 or 50% plus 16 species of <i>Nectria</i> with no <i>Tubercularia</i> name	3/10 or 30% plus 16 species of <i>Nectria</i> with no <i>Tubercularia</i> name
** <i>Nectria</i> 1849 conserved over <i>Tubercularia</i> 1790	3/10 or 30%	0/10 or 0%
<i>Phacidium</i> 1815 vs. <i>Apostrasseria</i> 1983	0/3 or 0%	0/3 or 0%
Total without conserved genera	86/138 or 62% plus 16	30/138 or 22% plus 16
** Total with conserved genera	54/138 or 39%	20/138 or 14%

In summary

Changes are ahead in naming fungi that hopefully will result in more meaningful scientific names and less confusion.

All new names must be registered in MycoBank.

Meeting in April, 2012, to work out the issues of conserving commonly used scientific names.

Twenty years from now we will be pleased that the scientific names of fungi are simplified.