

[*CF Secretary note*: The following four letters outline concerns regarding status of the phylum name, *Ascomycota*. Please read file 'letter4_70222.pdf' first for background. —*Lorelei Norvell*]

Request for General Committee clarification under Art. 32.4, the phylum name Ascomycota

Redhead letter (25 January 2007) to Dr. Fred Barrie, Secretary, General Committee, IBC

Dear Fred:

Please consider this to be a formal request for a ruling by the General Committee as allowed by Art. 32.4, on the whether the Latin descriptive statement for the phylum name *Ascomycota* Cavalier-Smith, *Biol. Rev.* 73: 247 (1998) meets minimal standards for validation, or is even necessary.

It is assumed by us that even though *Ascomycota* is a name at a rank higher than family, and a descriptive name, rather than an automatically typified name (Art. 16), that in order to be valid and covered by the Code, that it must have a Latin description or diagnoses (Art. 32.1, 36.1) because it was proposed after 1935. It is also assumed that a type need not be designated for descriptive names at this level.

It is further noted that descriptive names (Art. 16.1b) may be used at different ranks unchanged, and it is presumed by us that when the rank is changed, the Latin terminations of descriptive names are not to be changed in contrast to those of automatically typified names (Art. 16.3). It is unclear to us whether ascribed authorship changes with the different ranks for the same name. Art. 49.2 implies each change in rank will lead to a different authorship.

The phylum name *Ascomycota* with this spelling was first coined by

Bold, H. C. 1957. *The Morphology of Plants*, New York (p. 7, 180) with English descriptions, in order to conform with the 1950 Code. The name was adopted by several authors subsequently but Latin was not provided until 1998.

Cavalier-Smith, *Biol. Rev.* 73: 247 (1998) published the following:

"Phylum 1. *Ascomycota* Berkeley 1857 stat. nov. (diagnosis: meiotic products or their daughters form endospores by subdividing the cytoplasm by membrane, not by budding: sporae intracellulares)."

This was in contrast to (p. 248)

"Phylum 2. *Basidiomycota* de Bary 1866 em. auct. stat. nov. Moore 1980. [meiotic products form four exospores (ancestrally ballistospores) by budding from the surface of the cell; meiotic endospores absent; dikarya with clamp connections]."

No type was indicated.

Firstly, it should be noted that reference to Berkeley 1857, is an indirect reference to the publication of the unranked name *Ascomycetes* (p. 270) by Berkeley (Berkeley, M.J. 1857. *Introduction to Cryptogamic botany*. H. Bailliere, London). Berkeley provided an English description. The rank was unclear. His classification was as follows:

Cryptogames (in the text indicated to be a "race") p. 69

Class I. Thallogens. Lindley (p. 69, 71)

Alliance II. Mycetales, Berk. (described, p. 235)

"families" Fungales, Lindl. (p. 235)

and Lichenales, Berk. (p. 372)

"principle divisions" Sporidiiferi

"second division" or "order" [unranked] *Ascomycetes*, Berk. (*Endotheques*, Lev.) (p. 270)

[rankless further subtaxa]

Onygenei Berk. (p. 272)

Perisporiacei, Fr. (p. 273)

Sphaeriacei, Fr. (p. 278)

Phacidiacei, Fr. (p. 283)

Tuberacei, Fr. (p. 285)

Elvellacei, Fr. (p. 288)

I have interpreted the rank of Alliance to be equal to that of order in accordance with Art. 17.2. Berkeley did not distinctly label the lower ranked names (outside of Class and Alliance) but informally referred to

them within the discussion as either families, principle and second divisions or orders, or nothing, rather loosely, hence I interpret them all to be unranked, and therefore valid and not involving Arts. 33.9 & 33.10.

Two questions arise from Cavalier-Smith's publication. The first was whether this 2-worded Latin diagnosis, " sporae intracellulares " meets minimal standards. We note that 2-worded diagnoses can be acceptable in some circumstances (Art. 32, Ex 5), and therefore the question is whether the diagnostic features were sufficiently clear. It has been argued that even basidiospores are produced internally (at the ultrastructural level) and that mitotic spores of other fungi are produced internally. Therefore, the two worded Latin diagnosis can be viewed as not meeting critical standards. Others overlook the subtle inaccuracy, accept the implied distinction, and believe the standard has been met. It is debatable and a recommendation is requested.

However, there is one other issue that may negate such a recommendation. Simultaneously with providing the Latin diagnosis, Cavalier-Smith indicated that it was a new status of something published by Berkeley in 1857. I have two problems with that. Firstly, the citation is not direct as required (Art. 32.5) coupled with the fact that Berkeley published his name as Ascomycetes, not Ascomycota. Assuming that Cavalier-Smith intended to change the status of Ascomycetes [unranked] to that of a phylum level name, Art. 16 would seem to indicate that the name be unchanged in spelling. Therefore, Cavalier-Smith was not merely changing the status, but was in fact publishing a new name. If it were accepted that it was a new name for the valid, but rankless Ascomycetes Berk., it would still need to be solely attributed to Cavalier-Smith (Art. 49.2) rather than (Berkeley) Cavalier-Smith or Berkeley.

We note that Ascomycetes was variously used at distinct ranks, such as class by various authors after 1857 and before 1935. The name Ascomycetes is used in the Code as is the name Ascomycota (Art. 16, Ex 2), presumably based on an assumption of validity.

Eliminating the argument for a change in status, the remaining question is the requirements for a Latin diagnosis or description.

If you or the committee require additional materials (original or explanatory), please do not hesitate to contact any of us directly.

I am copying here John McNeill (Rapporteur-général) and Lorelei Norvell (Secretary Committee for Fungi).

The select group of concerned authors (out of a larger pool of authors) are copied also and are:

Robert Luecking
Paul Kirk
David Hawksworth
David Hibbett
Manfred Binder
Ove Eriksson
P. Brandon Matheny

Sincerely yours,
Scott A. Redhead, Ph.D.

Barrie letter (29 January 2007) to Dr. Lorelei Norvell, Secretary, Nomenclature Committee for Fungi, IBC

Barrie letter
29 January 2007

Dear Lorelei,

The Committee for Fungi (Nomenclature Committee for Fungi?) has been accorded the honor of evaluating the first proposal submitted under Art. 32.4. Scott Redhead's letter of 25 January requests a decision on the validity of the name *Ascomycota* Cavalier-Smith. I believe Scott sent a copy of the letter to you. If you haven't received it, let me know and I'll forward one. Scott's description of the issue seems adequate to me, but I'm sure he would be happy to answer any further questions. And if there is any category of information not included that the committee believes should be included, please let me know.

As we're still in the process of establishing the criteria for proposals under Art. 32.4, any feedback will be welcomed.

Attached is copy of the Cavalier-Smith paper, sent to me by Robert Luecking. The protologue is on page 247.

Article 32.4 refers specifically to the requirements of Art. 32.1(d). Note that this brings Art. 32.2 into play as well. That is, the author's opinion must be taken into account and even if the diagnostic statement would be considered by many to be technically incorrect, the statement may fulfill the requirements of Art. 32.1(d). Where to draw the line is what the committee is being asked to do.

Regards, FRED

Redhead letter (29 January 2007) to Lorelei Norvell, CF Secretary

Dear Lorelei:

For now the authors have agreed to use Ascomycota Cavalier-Smith but still would like to see how the General Committee reacts. As secretaries of the permanent committees are on the General Committee you will have a firsthand view of the discussion. I'll be interested to know how long that process takes and when it will even be sent to the General Committee for discussion....

Scott

Eriksson letter (5 February 2007) to Lorelei Norvell, CF Secretary

Dear Lorelei,

We have discussed the problem with the name "Ascomycota Cavalier-Smith" in the AFTOL group. Scott Redhead suggested that I should send a synopsis of our discussions to you to be distributed to and discussed by the Committee for Fungi.

1. History of the name Ascomycota:

Bold (1957) seems to be the first one who used the name Ascomycota for a division (=phylum), but it was a *nomen nudum*

Bold Harold C. 1957. *The Morphology of Plants*. In: Harper and Row, first edition, New York, 669pp.

Whittaker (1959) also used the name, again as a *nomen nudum*

Whittaker R.H. 1959. On the broad classifications of organisms. *The Quarterly Review of Biology*, Vol. 34, No. 3., pp. 210-226.

Eriksson & Winka (1997: 4) listed 31 signature nucleotide sites in the SSU rRNA in Basidiomycota "that showed differences between Basidiomycota and Ascomycota" but they did not suggest that any of the taxa was a new phylum.

Eriksson O.E. & Winka K. 1997. Supraordinal taxa of Ascomycota. *Myconet* 1: 1-16.

Cavalier-Smith (1998: 247) wrote "Phylum 1. Ascomycota Berkeley 1857 stat. nov." and gave a short description in English and a still shorter in Latin ("spores intracellulares")

Berkeley M.J. 1857. *Introduction to Cryptogamic Botany*. London, H. Baillière.

Cavalier-Smith T. 1998. A revised six-kingdom system of life. - *Biological Reviews* 73: 203-266.

2. **Cavalier-Smith** did not give a reference to the page in Berkeley 1857 and that work was not listed under "References". To confirm what work is considered you have to search in, for instance, Lindau & Sydow's *Thesaurus Litteraturae Mycologicae et Lichenologicae* (1908).

3. **Cavalier-Smith's Latin description** of "Ascomycota" consisted of only two words "Sporae intracellulares". No one in our group has argued that the length of description in itself is a problem. What is important is whether it defines the Ascomycota versus Basidiomycota.

In his English descriptions Cavalier-Smith stated for Ascomycota that "meiotic products form by subdividing the cytoplasm by membrane, not by budding", which is correct and for the Basidiomycota "meiotic products form four exospores (ancestrally ballistospores) by budding from the surface of the cell;

meiotic endospores absent; ...". I have not seen the term budding used in this sense before. It is in any case different from the budding of the vegetative cells in budding yeasts (*Saccharomyces*, etc.). We teach the students that in basidiomycetes the sporangium forms pockets to which nuclei migrate and each pocket transforms with hilar formation into an usually uninucleate basidiospore (good TEM graphs in Alexopoulos et al.). Even if no membrane is (ever?) formed around the nucleus in the basidiospore initial there is no fundamental difference between asci and basidia. They are sporangia with different shapes and spores are formed inside these sporangia. A Latin description should be so informative and correct that further explanations in other languages should not be absolutely necessary, although recommendable. But ICBN does not seem to specify any rules for correctness of Latin descriptions. There is a myth that an apple expert erected a new *Malus* species with the bad Latin description "Fructus delicatus". Sufficient for a valid description?

The questions are:

1. Did Cavalier-Smith give a sufficiently detailed reference to Berkeley 1857, which would make his Latin description redundant?
2. Does his Latin description distinguish the Ascomycota from the Basidiomycota and should the descriptions in English be considered when we evaluate that?

Sincerely,

Ove Eriksson