

## Accepted Manuscript

Multigene eukaryote phylogeny reveals the likely protozoan ancestors of opisthokonts (animals, fungi, choanozoans) and Amoebozoa

Thomas Cavalier-Smith, Ema E. Chao, Elizabeth A. Snell, Cédric Berney, Anna Maria Fiore-Donno, Rhodri Lewis

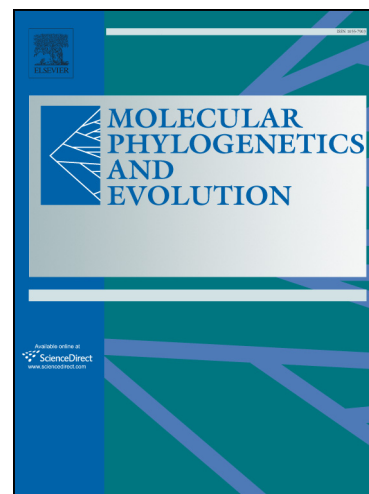
PII: S1055-7903(14)00279-6  
DOI: <http://dx.doi.org/10.1016/j.ympev.2014.08.012>  
Reference: YMPEV 4996

To appear in: *Molecular Phylogenetics and Evolution*

Received Date: 24 January 2014  
Revised Date: 2 August 2014  
Accepted Date: 11 August 2014

Please cite this article as: Cavalier-Smith, T., Chao, E.E., Snell, E.A., Berney, C., Fiore-Donno, A.M., Lewis, R., Multigene eukaryote phylogeny reveals the likely protozoan ancestors of opisthokonts (animals, fungi, choanozoans) and Amoebozoa, *Molecular Phylogenetics and Evolution* (2014), doi: <http://dx.doi.org/10.1016/j.ympev.2014.08.012>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.



1 **Multigene eukaryote phylogeny reveals the likely protozoan ancestors of opisthokonts**  
2 **(animals, fungi, choanozoans) and Amoebozoa**

3  
4 **Thomas Cavalier-Smith<sup>1</sup>, Ema E. Chao<sup>1</sup>, Elizabeth A. Snell<sup>1</sup>, Cédric Berney<sup>1,2</sup>, Anna Maria**  
5 **Fiore-Donno<sup>1,3</sup>, and Rhodri Lewis<sup>1</sup>**

6  
7 <sup>1</sup>*Department of Zoology, University of Oxford, South Parks Road, Oxford OX1 3PS, UK.*

8 <sup>2</sup>*Present address: Department of Life Sciences, The Natural History Museum, Cromwell Road,*  
9 *London SW7 5BD, UK. <sup>3</sup>Present address: Zoology Institute, Terrestrial Ecology Group, Faculty*  
10 *of Mathematics and Natural Sciences, University of Cologne, Biozentrum Köln, Zùlpicher Str. 47*  
11 *b, D-50674 KÖLN, Germany.*

12  
13 **Author for correspondence:** Thomas Cavalier-Smith, email: [tom.cavalier-smith@zoo.ox.ac.uk](mailto:tom.cavalier-smith@zoo.ox.ac.uk).

14  
15 **ABSTRACT**

16 Animals and fungi independently evolved from the protozoan phylum Choanozoa, these three  
17 groups constituting a major branch of the eukaryotic evolutionary tree known as opisthokonts.  
18 Opisthokonts and the protozoan phylum Amoebozoa (amoebae plus slime moulds) were  
19 previously argued to have evolved independently from the little-studied, largely flagellate,  
20 protozoan phylum, Sulcozoa. Sulcozoa are a likely evolutionary link between opisthokonts and  
21 the more primitive excavate flagellates that have ventral feeding grooves and the most primitive  
22 known mitochondria. To extend earlier sparse evidence for the ancestral (paraphyletic) nature of  
23 Sulcozoa, we sequenced transcriptomes from six gliding flagellates (two apusomonads; three  
24 planomonads; *Mantamonas*). Phylogenetic analyses of 173-192 genes and 73-122 eukaryote-  
25 wide taxa show Sulcozoa as deeply paraphyletic, confirming that opisthokonts and Amoebozoa  
26 independently evolved from sulcozoans by losing their ancestral ventral groove and dorsal  
27 pellicle: Apusozoa (apusomonads plus anaerobic breviate amoebae) are robustly sisters to  
28 opisthokonts and probably paraphyletic, breviate diverging before apusomonads; Varisulca  
29 (planomonads, *Mantamonas*, and non-gliding flagellate *Collodictyon*) are sisters to opisthokonts  
30 plus Apusozoa and Amoebozoa, and possibly holophyletic; Glissodiscea (planomonads,  
31 *Mantamonas*) may be holophyletic, but *Mantamonas* sometimes groups with *Collodictyon*  
32 instead. Taxon and gene sampling slightly affects tree topology; for the closest branches in  
33 Sulcozoa and opisthokonts, proportionally reducing missing data eliminates conflicts between  
34 homogeneous-model maximum-likelihood trees and evolutionarily more realistic site-  
35 heterogeneous trees. Sulcozoa, opisthokonts, and Amoebozoa constitute an often-pseudopodial

Download English Version:

<https://daneshyari.com/en/article/5919145>

Download Persian Version:

<https://daneshyari.com/article/5919145>

[Daneshyari.com](https://daneshyari.com)