

Interactive comment on “Precambrian palaeontology in the light of molecular phylogeny – an example: the radiation of the green algae” by B. Teyssèdre

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Author’s answer to Anonymous Referee # 4

I entirely agree with Anonymous Referee # 4 and I am grateful to him for reminding us that we need to add many “perhaps” or “maybes” when we deal with “the sparse and sometimes contentious fossil record” of the mid-Proterozoic. Almost any paragraph could be concluded with a question mark.

P. 3128, lines 12-15: O.K. Certainly there is no proof that the last common ancestor of the green and the red algae was two billion years old. I only said that it was a possibility, and not an unrealistic one (“perhaps”). This ancestor was unquestionably older than 1200 Ma, but how much older, whether it was nearer 1200 Ma or 1500 Ma or 2000 Ma,

we cannot say. As for grounds for preferring an early date, see below.

P.3130, lines 1-8: If Tasmanites is really akin to recent Pachysphaera and Pterospermella is really akin to recent Pterosperma, and if both were really found at Thule (ca. 1200 Ma), then the last common ancestor of Tasmanites and Pterospermella, representing one of the two main lines of evolution of the Pyramimonadales, is necessarily older than 1200 Ma; and the last common ancestor of this first line and the second line (exemplified by Halosphaera and Cymbomonas) is necessarily even older.

P.3130, lines 11-13: Anonymous Referee # 4 asks for some references about the forerunners of Tasmanites and Pterospermella. See Mendelson, C.V., and Schopf, J.W., in Schopf, J.W., and Klein, C. (eds), *The Proterozoic Biosphere*, Cambridge Univ. Press 1992, p. 865-951. *Trematosphaeridium holtedahlii*, from Zigazino-Komarovsk (ca 1350 Ma), is a possible forerunner of Tasmanites and *Pterospermopsimorpha capsulata*, from Zigazino-Komarovsk (ca 1350 Ma), is a possible forerunner of Pterospermella. An older *Trematosphaeridium holtedahlii* was found at Bakal (1500 Ma). However these fossils are dubious, they may be badly preserved Sphaeromorph Acritarchs and not genuine Pyramimonadales, so I wrote: Tasmanites and Pterospermella “may have had (perhaps!) forerunners going back to 1350 or even 1500 Ma”. See also Yan (1982) and Huntley and al. (2006) about the phycoma-like splitting of *Schizofusa* at Chuanlinggou (ca 1730 Ma).

P.3134, lines 7-8: Anonymous Referee # 4 asks for “some kind of justification” for my “claim” (“an assertion of this magnitude” as he says) that the Pyramimonadales found at Thule and the Zygnematales found at Ruyang, “albeit unicellular, are beyond any doubt genuine green algae”. Here are my reasons: 1) The Pyramimonadales are beyond any doubt unicellular Chlorophyta. 2) The Zygnematales are beyond any doubt unicellular Streptophyta. 3) So, if Tasmanites and Pterospermella are really Pyramimonadales, and if Spiromorpha is really a Zygnematale, then these three fossils, albeit unicellular, are beyond any doubt genuine green algae. Q.E.D.

BGD

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