Biogeosciences Discuss., 8, C778–C779, 2011
www.biogeosciences-discuss.net/8/C778/2011/

Biogeosciences Discussions

Interactive comment on "Experimental fossilisation of viruses from extremophilic Archaea" *by* F. Orange et al.

N. Hinman (Referee)

nancy.hinman@umontana.edu

Received and published: 2 May 2011

Francois Orange and co-workers present a carefully crafted study of fossilization of three viruses under laboratory conditions; among the first of its kind. The experiments are designed using SIRV2 (an unenveloped virus infecting chrenarcheaota) and two viruses TPV1 and PAV1 (enveloped viruses infecting euryarcheaota) exposed to solutions of 160 or 320 ppm Si at starting pH of about 8. As noted in the other comment, neither pH nor Si concentration were measured at the end of the experiment. The authors commented on that in their response.

My first comment has to do with the "controls" shown in Figures 2a and 2b; neither one of the images is a control. Both have viruses and both have silica. Controls should have either viruses or silica, not both. Images of those should be shown for comparison.

Full Screen / Esc

Printer-friendly Version

Interactive Discussion

Discussion Paper

Next the designation of some structures as DNA needs further justification. The authors should discuss other possibilities for the structures if only to eliminate them from consideration. Could they be other polymers, proteins, or artifacts? Is there other evidence that they are DNA? Have other authors identified DNA by this or other means?

For the sake of clarity, the authors should indicate the source of the Cu, Cl, and Cs in all captions for all figures where these foreign elements are observed; this is mentioned in the manuscript. Figure captions should reflect inferences on composition, e.g. that some structures are possibly DNA unless that can be definitively known.

In explaining the observations on particle size, the authors refer to the presence of EDTA in the PAV-1 buffer solution. If the presence of EDTA is responsible for the differences in particle size then the authors should explain the mechanism for this in the discussion. Alternatively, the buffers had different ionic strength (TPV-1 – 100 mM NaCl and 5 mM CaCl2, PAV-1 – no salts, SIRV-2 – no salts). Could there be some effect of the different ionic strengths on the particle size?

The authors observe “silica binding to the virions outer surface” as a consequence of “direct nucleation of silica . . . followed by polymerization”. The authors should describe the evidence that supports this observation. The statement, p. 11, line 22 and onwards, indicates that there are actually several possibilities. How would one tell the difference between these possibilities? What evidence supports or would support one possibility over the others?

Interactive comment on Biogeosciences Discuss., 8, 2235, 2011.