Reviewer's report

Title: Large serological survey showing cocirculation of Ebola and Marburg viruses in Gabonese bat populations, and a high seroprevalence of both viruses in Rousettus aegyptiacus

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Reviewer: Charles Calisher

Reviewer's report:

This manuscript summarizes a remarkable and well-focused amount of work by a team of experts. The manuscript, however, leaves a great deal to be desired, most likely because of language difficulties but partially because of carelessness in writing. Specifically –

1. Throughout this manuscript the authors confuse bats and the taxonomic species to which they belong. For example, they write of bat species that migrate and which express other characteristics. Species cannot do anything, as they are simply names on lists. It is the bats themselves that do things and have characteristics. I will point these errors out as I go along but, because there are so many misuses of the term species, I will not point out all of them. The authors should very carefully revise the manuscript to correct these many errors.

2. Throughout the manuscript, the authors speak of “Ebola virus”. There is no such virus as “Ebola virus”. There are “ebolaviruses”, “an ebolavirus” and specific (named, such as Zaire ebolavirus) members of the genus _Ebolavirus_ (In this review, I replace italics with _ before and after _ a word), but no “Ebolavirus”. In addition, there is no “Marburg virus”. There are “marburgviruses” and “Lake Victoria marburgvirus” and “a marburgvirus”, but no “Marburg virus”. All these nomenclatural errors should be corrected.

3. Also, the authors write of “Ebola virus-specific” IgG antibody and of “Marburgvirus-specific” IgG antibody. First, as noted above, there is no such thing as “Ebola virus” or “Marburg virus”, so that there can be no such antibody. Second, I doubt that the specificity of the tests used. The ELISA IgG assay, as described, used only ZEBOV antigen to detect antibody to ebolaviruses as well as Marburg virus (or viruses?). No antigen of MARV was included in the assays. The authors themselves (page 12) speculate that antibody detected to both viruses in bats may be reflective of “cross-reactions between Ebola (sic) and Marburg (sic) antigens”. These descriptions and poor writing create a nightmare for the reader.

4. Is there evidence that antibody to an ebolavirus reacts with antigen of a marburgvirus, and vice versa? These are viruses of different genera within the family _Filoviridae_.

5. Page 2, Background: Replace “both” with “each can” because otherwise the reader is led to believe that it takes both viruses to cause these fevers.
6. “Recently, multiple bat species…” (see comment 1 above. Change to “Recently, bats of multiple species…”)

7. The species to which Zaire ebolavirus (ZEBOV) belongs is _Zaire ebolavirus_. The name of the virus itself is not italicized because it is a concrete entity, not a species.

8. Results: “Bats of six species” (One cannot detect antibody in species, only in members of the species).

9. Page 3, Background: Whereas the family and genus names should be italicized, the names of the viruses in the respective species should not be italicized. Yes, the name of the species should be italicized (they are taxa) but the names of the viruses (the real things) should not. As Bundibugyo virus has not been formally recognized as a species, it certainly should not be italicized.

10. “… indicated that bats of these species…”

11. Page 4, line 1: “… survey of bats of these three species…”

12. lines 6-7: “… supporting the hypothesis that they may play a role as reservoirs.” [The findings do not support a role, it supports a hypothesis.]

13. last sentence in paragraph: “We present a detailed analysis of serologic results of tests of 2147 bats belonging to nine species sampled between 2003 and 2008.

14. Page 5, last line: “humanely killed” sounds to me like an oxymoron.

15. Do the authors mean “immediately”, rather than “direct”? 

16. When presenting sources for commercial products, the city name should be included (throughout manuscript).

17. Page 7, Cut-off determination: Replace “animals” with “bats” for clarity and simplicity.

18. Page 8, Bat collections: Number collected, then percent given for all but one, for which percent, then number collected is given. Line 6: “Bats of six species…”

19. Overall seroprevalence rate: (a) seroprevalence is a rate, (b) Only one of these samples titered as high as 1600. These titers seem to be relatively low for ELISAs.

20. It is confusing to me to read about “EBOV-specific” (sic) when the authors mean either ZEBOV-specific (sic) or “ebolavirus-specific” (sic).

21. Page 9, line 6: “… than in bats of other species”.

22. line 8: Here, again, the authors use “species” and “bats” interchangeably. Makes it difficult to determine what “other species” means.


24. Page 10, lines 8-9: “… and in 16 (7%) of 220 members of this species…” This is correctly written.

25. line 12: Please include percentages for all ratios. Later in the paragraph percentages are given but not numerators. Uniformity of style is necessary.
26. Virus genetic analysis: Percents needed here also. More importantly, the authors do not indicate whether some or all or none of the PCR-positive bats had antibody. These data are important and should be included.

27. Page 11, lines 8-9: “… that bats of these three species …”

28. line 17: Replace “a” with “the”.

29. line 18: There can be no outbreak of a river (Ebola). Do the authors mean to say “Ebola hemorrhagic fever” (and “Marburg hemorrhagic fever”)? Same comment for page 13, line 2.

30. line 20: “Interestingly, of bats of the nine species reported here, …” [Similar corrections of species vs. bats needed throughout.]

31. Page 12, lines 1-3: Do the authors consider titers of 400 in most seropositive bats to be “elevated”? They use this “elevated titers” as suggesting (“tending to confirm”) this as evidence, or possible evidence”, for continuous or frequent contact with these viruses. This seems to me to be very weak extrapolative evidence.

32. line 13: The same holds for fruits as for bats. “Consume the same fruits”. Bats cannot eat species.

33. line 17: What about Nipah virus as well?

34. Page 13, line 15: Movements are not a part of the ecology of bats.

35. Did the authors obtain permission to do all this trapping, in Gabon and elsewhere?

36. Page 15, Authors’ contributions: Author MS (i.e., Marc Souris) is not mentioned as to having made a contribution to this manuscript.

37. The table and figure legends and incorrect and unclear. The same problem of “bats” vs “species” is present; virus names should not be italicized; use of the word “versus” is incorrect; I have no idea what “(row)” indicates; there can be no status of a population, only of bats in a population; table 2—add “period of collection”; table 4—What does “No” mean (I know it is obvious but it should be spelled out); table 5—“(MARV)” missing; Figure 2—“for bats”, not for “bat populations”; “for both Ebola and Marburg” is laboratory patois (slang).

38. Tables should be on separate pages, so that they could be readable.

39. Figure 1: All species names should be italicized.

40. Figure 2a and 2b are essentially unreadable. Can they be omitted or can the authors make them larger, with a smaller abscissa scale?

**Level of interest:** An article of importance in its field

**Quality of written English:** Needs some language corrections before being published

**Statistical review:** No, the manuscript does not need to be seen by a statistician.
Declaration of competing interests:

I declare that I have no competing interests.