

Interactive comment on “Factors controlling shell carbon isotopic composition of land snail *Acusta despecta sieboldiana* estimated from lab culturing experiment” by N. Zhang et al.

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Dear Editor, I have now completed my review of Zhang et al. “Factors controlling shell carbon isotopic composition of land snail”. I think this is a very useful paper especially for the growing interest on the matter for reconstructing past environment using land snail shells isotopic composition. In general the manuscript is easy to follow and relatively well written (but I'm not mother tongue). I have very few general comments and some very specific. Overall the manuscript needs little modifications. General comments -Section 4.1 for the calculation of the different carbon source the authors used isotopic composition of body tissues, the reason of that becomes clear later in

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section 4.2.2. I think a link should be found. -It seems to me that isotopic composition of atmospheric CO₂ is assumed instead to be measured directly in-situ. This can give some concerns, because in a closed environment respired CO₂ would be important (or other sources) component. This may also occur in nature (e.g. canopy conditions). I think a comment on this is necessary. -Along the manuscript there are interesting points for paleoenvironmental researchers. I think it should be more stressed the relation found between shell weight and isotopic composition. This could be methodologically important: if in past populations we found differences this may depends on carbonate ingestions and not only depending on metabolic rate (both can depends on environmental stress, too). So methodologically would be important to stress that shells need to be well preserved and it is necessary to weight them. -Snail shells usually show a very large variability both in experimental conditions and in nature. Do they authors argue that values dispersion can be used as a measure of environmental stress?

Specific comments Pag. 6557 line 26 laboratory Pag. 6559 please can you give the species of the cabbage? Pag. 6562 lines 15-18. Here are reported preliminary results. Why preliminary? You use only here the t test, why? Pag. 6566 lines 21-26. In these sentences is not clear when are used “no-carbonate” and “carbonate” conditions. Pag. 6567 line18 Balakrishanan and Yapp, 2004. Pag. 6569 lines 12-15. I think it would be very useful to use “natural” examples”: e.g. litter compared to shells and not only experimental conditions. Snails can eat a mixture of organic matter (e.g. fungi), which is difficult to be simulated in laboratory. This is quite different from simulating different condition using C3/C4 food, for the evident (now very clear!) selection of food by snails. In this respect along the discussion would be useful also to quote and consider the recent published paper by Colonese et al., 2014 P3, 394, 119-127. Pag. 6570 line 4. Heaver???? Pag. 6571 Lines 1-5. Be honest not very clear, please specify about Yanes et al., 2011 and make more clear the subject. Pag. 6571 lines 6-12. The sentences are not very clear. For instance why radiocarbon is intended paleoenvironmental parameter. Please restructure all the sentences in a more simple

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and clear form. Pag. 6572 depletion: please be more specific e.g. ^{13}C -depletion. Please check carefully the references. Zanchetta et al. 2005 is not reported in the list, some journals are not quoted correctly (e.g. P3 etc).

Overall I like this paper. I agree that there are still a lot of work to do for a better use of carbon isotopic composition in paleoenvironmental reconstruction from shells. Don't be pessimistic a good step is done. Sincerely

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