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Interactive comment on "Effects of low pH stress on shell traits and proteomes of the dove snail, *Anachis misera* inhabiting shallow vent environments off Kueishan Islet, Taiwan" *by* Y. J. Chen et al.

K. S. Tan (Referee)

tmstanks@nus.edu.sg

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This interesting paper examines shell characteristics and gross protein expression in populations of subtidal columbellid gastropods living in habitats influenced by shallow hydrothermal vent discharge. My main concern is that the authors have not identified a control site at the onset with a population that is not affected (at least relatively speaking) by the vent discharge. If we do not know how the population parameter varies at a control site, it would be difficult to determine if differences seen of the same parameter measured in another population at another site are caused by the conditions there.

Based on pH data in Table 1, the two sites S and SW might be suitable control sites, and the two other affected sites should then be compared with the control sites. The authors in fact might want to consider pooling the data from S and SW.

Other issues:

1. Figure 1 is lacking in detail and would suggest the collecting localities (N, E, S, SW and NW as stated in the M & M section) and the locations of white and yellow vents be indicated clearly on a large-scale map of Kueishan Island. It would also help to indicate the prevalent current (Kuroshio) direction affecting the snail populations. What does the asterisk shown in the inset represent? 2. It is not stated how the pH of the environment given in Table 1 was measured at the different localities. How many readings were taken for each location over how long a time? Provide the sample size and period of sampling. 3. The shapes of the two shells shown in Figure 2 appear to be sufficiently different to represent different species. How did the authors confirm that they are indeed one species? 4. The authors seem to refer to the extent of erosion of the shell apex as a criterion (Results section, section 3.1 2nd paragraph) but it is not explicitly stated how this was ascertained. The number of individuals whose apices of the shells were eroded and the extent of erosion of the apex could be another parameter used to determine the effect of pH on the columbellid population. 5. Figure 6: what does the letters A and B represent? I would suggest that the authors compare the thickness and total animal weight of the shells of each size class separately, instead of standardizing the data, which has the effect of compressing the differences. Given that the mean shell lengths are between 9.0 and 9.2, comparing all shells between 8 and 10 mm in length might provide a cleaner conclusion. 6. The Discussion section would benefit from re-organization of the paragraphs (which I find to be rather disconnected from each other), focusing on the implications of the results obtained, i.e., the change in shell morphometry caused by low pH, and the possible reasons behind the protein patterns obtained (this is presently not addressed in the Discussion), in relation to the known ecology of Kueishan Island. The discussion can then be extended to

the greater realm of ocean acidification and how the results here contribute towards the existing understanding of this phenomenon. The paragraphs in the Discussion are rather unconnected in thought and does not read well. For instance, in section 4.1, the first paragraph reviews the evidence for reduction in shell growth in acidic conditions, but the results of the Kueishan Island study are not discussed. In the second paragraph, shell shape is suddenly brought into the picture, and the authors assert that a rounded shell shape is less vulnerable to crab predation, but it is unclear how this is related to the authors' results, when there is no data presented on crab predation of Anachis at the study site. The next paragraph jumps to conditions in the deep sea, and the last paragraph finally refers to the results from this paper, which should really be moved to the first paragraph. Similarly, the second section (comparison with other Anachis studies) would be more appropriately positioned earlier in the Discussion section. 7. The authors should also address the question of whether columbellids are particularly adapted to acidic environments compared to other gastropods or molluscs in the Discussion.

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