March 19, 2012

Marine Biology

Ref.: Ms. No MABI-D-12-00014

Dear Dr. Dupont,

Please find enclosed the revised manuscript entitled: ‘*Effects of elelvated* p*CO2 on early growth and calcification of the Pacific oyster,* Crassostrea gigas’, which we are re-submitting for consideration of publication in the Marine Biology special issue on ocean acidification. We appreciate the comments provided by the reviewers and yourself and feel that our revisions based on all of your comments have improved the manuscript.

Overall, both reviewers indicated that this work does contribute to the field with Reviewer #1 stating, “*This is an interesting manuscript and I feel with the appropriate modifications it will be an important addition to the current literature*.”

Reviewer #1 also states that, “*The manipulation and measurement of the seawater chemistry is excellent and well written*.” This is the first time a study using this particular seawater manipulation system has been published and its accurate and thorough description is also an important output of this research.

We would like to reiterate the point that this work helps to explain the Pacific oyster larval response to ocean acidification during early development in a population that has, until recently, been understudied in this regard. Additionally, we present some results that other researchers have not observed, such as the initial maintenance normal growth and calcification of oysters raised at about 1000 µatm of *p*CO2 during the first 24 hours of development as well as apparent tolerance to 800 µatm *p*CO2 through the first 72 hours of development. Our added analysis finding potential developmental delay at the highest *p*CO2 level (per your helpful suggestion) also greatly adds to the depth of analysis and conclusions that we are able to draw from these data. Even though our conclusions are mostly limited to findings within the first few days of oyster development, this is a crucial period that lays the foundation for the successful growth, development, and settlement of a cohort.

We understand the reasons for requesting a shorter version of this manuscript, but in its current form we have not shortened it to the four pages of a short communication. We maintain that our methods and results are interesting and novel enough to merit a full length manuscript. This is the first paper that explores the effects of elevated *p*CO2 on *C. gigas* from populations off the west coast of the U.S. There is increasing evidence that source population matters in an organism’s response to ocean acidification. Additionally, the previous study that looked at the effects of elevated *p*CO2 on the early development of *C. gigas* (Kurihara *et al*. 2007) used only one elevated *p*CO2 condition, which was not an environmentally relevant scenario. We use two elevated *p*CO2 levels in addition to ambient, all of which are environmentally relevant in terms of contemporary nearshore carbonate chemistry and in terms of projections through 2100. We also think that the added information in the introduction and discussion frames our work in a more relevant way and makes this a better manuscript. If the editor still feels that this manuscript does not merit the length of a full submission, we will be happy to revise it to the requisite four pages of a short communication.

Attached we address specific questions and recommended revisions of each reviewer in the order they were outlined. All author revisions and/or responses are indicated by “REPLY”.

Again, we appreciate the thorough reviews, and we believe that our revised version is responsive and clearer as a result.

Sincerely,

Emma Timmins-Schiffman