

Review of the manuscript entitle “Ocean acidification increases the sensitivity and variability of physiological responses of an intertidal limpet to thermal stress”

This manuscript is an interesting study looking at the impact of warming and ocean acidification on the variability of physiological responses on an intertidal limpet species. The interesting idea in the manuscript is the impact of multiple stressors on the variability of the response. However, since the focus is on inter-individual variability, the sample size should be bigger than 10. 100 individuals were acclimated for each 4 treatments and only about 60 individuals are used for the different experiments.

The material and methods is not clear. 100 individuals are placed in each acclimated treatment. Then 10 are used as a control for genes expression at the end of the acclimation before putting them on the wall. This is not really a control. The 10 individuals for control should have been put on the wall and kept at the control parameters for the same amount of time than the other individuals on the wall. The procedure for the cardiac performance measurement is unclear. How the temperature was heated? There is no control for this procedure. This is also unclear when the limpets are in the water or in the air. Since the individuals are exposed to tidal cycle of 6 hours immersion and 6 hours emersion, is the air temperature of the air the same than the water? Is the wall experiment realized under water or in the air?

The discussion is interesting however, as mentioned by the authors, the sample size limits the scope of the results.

Before publication, the methods have to be clearer so it is easier to interpret the results.

Specific comments:

- Line 37: Widdicombe and Spicer, 2008 missing in the reference list
- Line 43: unclear
- Line 54: Pörtner et al., 2012 missing in the reference list
- Line 64: re-ordered the references
- Line 76: only on the associated biofilm?
- Line 98: when the samples were collected in the field? What was the *in situ* temperature?
- Lines 116-117: unclear
- Line 120:  $\text{HSO}_4^-$ ?
- Line 121: Dickson et al. (1990)
- Line 178: Fig. A3
- Line 185: Fig. A3
- Lines 191-192:  $R_1$  and  $R_2$  were average heart rate?
- Line 278: Fangue et al., 2006 missing in the reference list
- Line 279: Chuang et al., 2007 and Teixeira et al., 2013 missing in the reference list
- Line 456: Year 2010 and not 2012.
- Figure 1: (a) Heart rates of all limpets acclimated at 20°C?
- Lines 554-555: the heart rate of limpets from the warm-acclimated...
- Table A1: change all the  $\mu\text{mol}$  by  $\mu\text{mol}$  and change  $\mu\text{atm}$  by  $\mu\text{atm}$