Major Comments:

Title: I do not find this title representative of the authors results/discussion. Please describe which aspects of the phenotype are considered plastic, since there is no change in mechanical strength and authors discuss less crystallographic control and magnesium regulation under hypoxic conditions.

Lines 34-38: Authors seem to go around a point here. Please state exactly what drives calcification instead of pH and seawater chemistry.

Line 54: Energy costs can increase rather than reduce, if organic content is modified such that it increases.

Line 76: Mean size of polychaetes?

Line 102: Diameter of hole drilled?

Line 103: Tubes were glued using what?

Line 114: How was the shell fragment acquired and cleaned of organic tissue?

Line 116: Was the same surface (e.g: inner shell surface) always used for indentation?

Line 122: Organic content of shell or whole polychaete? It is of the shell I assume, but is unclear.

Line 126: How was the shell powder acquired?

Line 130: Please provide information on how these polymorphs are typically distributed in the organism. Are the polymorphs specific to the outer/inner layer of the shell?

Line 139: Were ACC, aragonite and calcite standards measured? Please explain why, if not.

Line 140: Diameter of the KBR-shell powder disc?

FTIR: FTIR is a bulk measurement and ideally should not be used to infer "relative" proportions of carbonate polymorphs. Typically, the presence of a 713 cm^{-1} peak is indicative of crystalline calcium carbonate comprising the bulk of shell carbonates. However, I am aware that this interpretation has been used before and if authors proceed with the analyses, could they please clarify if the spectra were scaled so that 713 cm^{-1} peaks had the same heights as described in Weiss et al (2002)? In addition, please specify the typical size of crystallites in shell since such ratios have been demonstrated to be influenced by particle size (Kristova et al 2015).

Line 148: What were the syringes made to of?

Line 156: Hunger is only standardised if individuals were at the same start point.

Lines156-166: This doesn't represent clearance rates during the experiment.

Line 170-180: Please provide full FTIR spectra as a supplementary figure.

Lines 267-268: Can inferences be made regarding whether inner/outer layers were calcified if the polymorphs are specific to a layer of the polychaete shell?

Line 233-234: This is a strong statement. Regulation of Mg may be interpreted but the authors results do not **signify** that it is relaxed under hypoxia.

Line 256-257: Please delete this final sentence. It is a very strong statement and the whole paragraph does not explain why hypoxia the key stressor in the future (which is debatable anyway).

Minor Comments:

Line 10-11: Sentence like this needs a reference.
Line 25: change "shells" to skeletons.
Line 32: Delete "however".
Line 368: Please provide full reference.

Figure 5 (SEM): Are these images of the aragonite or calcitic parts of the shell? The legend needs more descriptive text. It is not obvious to me how these images indicate shell integrity.

Table A1: Please include other calculated parameters such as HCO_3^-, CO_3^{2-} and C_T.

References used for review:

Weiss et al (2002) Mollusc larval shell formation: amorphous calcium carbonate is a precursor phase for aragonite. DOI: 10.1002/jez.90004

Kristova et al (2015) The effect of the particle size on the fundamental vibrations of the [CO3(2-)] anion in calcite. DOI: 10.1021/acs.jpca.5b02942.