Biogeosciences Discuss., 12, C3898–C3900, 2015
www.biogeosciences-discuss.net/12/C3898/2015/


Biogeosciences
Discussions
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# *Interactive comment on* "Reconsidering the role of carbonate ion concentration in calcification by marine organisms" *by* L. T. Bach

**L.T. Bach**

lbach@geomar.de

Received and published: 29 July 2015

I would like to thank Lennart de Nooijer for his comment concerning the importance of CO2 as incorganic carbon substrate for calcification in some taxa. His thoughts are considered in the revised version of the manuscript.

I changed the headline of section 3.6.5 from "Inorganic carbon from respiratory sources" to "CO2 as inorganic carbon source for calcification". The section itself was expanded and addresses Lennart's comments. I wrote:

"Some organisms receive significant amounts of inorganic carbon used for calcification from respiratory sources (Erez, 1978; Furla et al., 2000; Pearse, 1970; Sikes et al., 1981; Tanaka et al., 1986). Here, organisms do not exclusively rely on direct inorganic



carbon utilization from seawater but supplement calcification to a variable degree with CO2 gained intracellularly from respired biomass. This CO2 utilization may be further strengthened (1) when metabolic CO2 is 'trapped' inside the organisms through the establishment of pH gradients which limit the diffusive loss of CO2 passively (Bentov et al., 2009; Glas et al., 2012) or (2) when CO2 is transported actively towards the site of calcification (de Nooijer et al., 2014). CO2 which can subsequently react with H2O to form HCO3- and H+ (catalyzed by the enzyme carbonic anhydrase) could therefore be an alternative inorganic carbon source for calcification in particular taxa. Thus, the potential control of seawater [HCO3-]/[H+] on calcification may be weakened by the degree to which calcifiers utilize CO2 as inorganic carbon source."

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Interactive comment on Biogeosciences Discuss., 12, 6689, 2015.