Biogeosciences Discuss., 8, C3129–C3131, 2011
www.biogeosciences-discuss.net/8/C3129/2011/

Biogeosciences Discussions

Interactive comment on "Effect of ocean acidification on early life stages of Atlantic herring (Clupea harengus L.)" *by* A. Franke and C. Clemmesen

A. Franke and C. Clemmesen

afranke@ifm-geomar.de

Received and published: 16 September 2011

Dear Referee #2,

first of all we would like to thank you for your helpful comments!

Referees′ comment 1: " . . . I agree that the ratio RNA/DNA is a useful biochemical indicator of protein synthesis. Some authors, however, reported that this ratio is depended on the protein synthesis and breakdown and except of RNA/DNA ratio they use other index as well as DNA:dry weight and RNA:protein. Moreover, for metabolic patterns and impacts (e.g. negative as characterized by the authors), transcriptomic and proteomic methods may provide a more realistic picture regarding the rate of pro-

tein synthesis and even more the changes in the metabolic patterns."

We agree that a variety of indices, as described in Chícharo and Chícharo (2008), can be used as an indicator for condition and growth of marine organisms. Actually, DNA:dry weight was measured in this study and can be included in the revised version. Unfortunately, it will be not possible to apply transcriptomic or proteomic methods as suggested, because there are no more larvae left to perform any additional analysis. However, McNamara et al. (1999) estimated levels of total RNA, total DNA, 18S ribosomal RNA, poly(A) messenger RNA, and two mRNAs coding for abundant myofibrillar proteins in laboratory-reared Atlantic cod larvae and showed that total RNA responded within a similar time as 18S rRNA and the mRNAs to the experimental conditions. Thus, already the analysis of bulk nucleic acids provides valuable information on recent growth and condition of individual larvae.

Referees′ comment 2: ". . . the authors need to be more cautious when interpreting their data (even more when the ecological significance of them is concerned) and statements as that in page 7111, par 10 (The present study has shown that herring eggs can cope with increase in pCO2, exceeding future predictions of CO2-driven ocean acidification. . .) should be avoided. Besides, correctly the authors state below that the synergistic effects of stressful factors are needed further examination."

The authors will consider the referees′ concern in their revised version of the manuscript and agree that synergistic effects of CO2 and temperature should be studied in the future.

Literature:

Chícharo, M. A. and Chícharo, L.: RNA:DNA ratio and other nucleic acid derived indices in marine ecology, Int. J. Mol. Sci., 9(8), 1453-1471, 2008.

McNamara P. T., Caldarone E. M., and Buckley L. J.: RNA/DNA ratio and expression of 18S ribosomal RNA, actin and myosin heavy chain messenger RNAs in starved and

fed larval Atlantic cod (Gadus morhua), Mar. Biol., 135, 123-132, 1999.

Interactive comment on Biogeosciences Discuss., 8, 7097, 2011.