

Interactive comment on “Identification of two organic bands showing different chemical composition within the skeleton of *Porites lutea*: a confocal Raman microscopy study” by M. Wall and G. Nehrke

M. Wall and G. Nehrke

marlene.wall@awi.de

Received and published: 2 October 2012

We would like to thank the Anonymous Referee #2 for the positive and constructive review.

General comment of the referee #2: The Manuscript describes a very interesting insight into the distribution of organic matrix within the skeleton of the coral *Porites lutea*. The findings are of substantial interest to other researches in the field and are extremely important from the technical point of view.

C4440

Specific comment of the referee #2:

Referee #2: (p C3716, line 13-15) The authors should add a plausible suggestion for the function of the low Mg ORGL2 identified in the work.

Answer: At this point it would be very speculative to address a function to the observed growth line we termed ORGL 2. Therefore we prefer not hypothesize more than already done by stating that this growth line “represent the outer skeletal surface before another growth cycle of elongation, infilling and thickening of skeletal components continues”. Following the suggestion by referee #1 (Jean-Pierre Cuif) the chemical characterization and interpretation will be addressed in a second paper and is kept to a minimum in this one.

Referee #2: (p C3716, line 15-17) Considering the title of the paper itself, authors should discuss more in depth spectral features reported in Fig. 11. Several characteristic peaks of organic compounds can be found and, in my opinion, should be assigned and discussed. A table with corresponding assignments would facilitate the interpretation of the fig. 11

Answer: The authors agree that the former title might imply an in depth characterization of the two different lines. Therefore, we will change the title (*Reconstructing fine scale skeletal structures and growth mode in the coral Porites lutea (Cnidaria, Scleractinia): a laser confocal Raman microscopy study*) as also suggested by referee #1 J-P Cuif. In the revised version we follow the suggestions of referee #1 J-P Cuif, who suggest limiting this first paper on the method and the structural information gained. Therefore, the main focus of the revised version is the structural information of coral skeletons in relation to three-dimensional growth patterns. The chemical characterizations will be provided as preliminary results in the revised version that demonstrate the potential of Raman analyses. A detailed assignment of organic compounds and an in depth discussion will be provided in a second paper.

Some minor points of the referee #2:

C4441

1. Page 8279, line 28: Why authors decided to use polarizer at 0 and analyzer at 90 degrees?

2. Page 8282, line 1: The SEM maps in this study show different concentration of Mg throughout analyzed samples. Considering the broadening and shift of v1 CO₃ band induced by Mg²⁺ when incorporated into calcitic minerals (Bischoff et al. 1985), it could be that different concentration of Mg in the aragonite crystals lead to differences in the relative peak intensity of the v1 carbonate band used for orientation measurements. Can authors comment on this?

3. Page 8306, Figure 11. Caption Change: Analysator = Analyzer

Answer: 1. We used this kind of setting as so we derived the best result and resemblance with crystal orientation.

2. This is an interesting point that deserves consideration. However, we focused in the present work on the spatial rather than on the spectral resolution of the Raman maps and did not study relative peak shifts or broadening as shown in Bischoff et al. 1985. Moreover, it is still debated if Mg is hosted predominately in the organic or mineral phase (Finch and Allison, 2008), which will be relevant for the fact whether a change in peak position will occur.

3. will be changed in the revised version.

Finch, A.A., Allison, N.: Mg structural state in coral aragonite and implications for the paleoenvironmental proxy. *Geophys. Res. Lett.*, 35, L08704, 1-5, 2008.

Interactive comment on Biogeosciences Discuss., 9, 8273, 2012.