

Interactive comment on “Microbial community structure in the Western Tropical South Pacific” by Nicholas Bock et al.

Anonymous Referee #1

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General comments

This is an exhaustive and complete study in the West Tropical South Pacific Ocean, trying to elucidate which are the factors driving the microbial community structure in the photic layer (200 m). Authors did an amount of work measuring abundances of heterotrophic and phototrophic microorganisms, nutrients...etc, following a transect from mesotrophic to ultraoligotrophic area. Also, through established models they try to disentangle if microbes are top-down or bottom up controlled, and how is the role of limitation of nutrients and fixation of N₂. I am conscious that to explain all this without the reader losing attention it is not easy. But sometimes, due to small inconsistencies that I detail below, makes that the flow of the story to be lost.

Specific comments

C1

Abstract Page 1, line 23: What abundant are *Prochlorococcus*? Notice that *Synechococcus* are quantified.

Introduction and Material and Methods Page 2, line 22 the study was carried out from mesotrophy to ultraoligotrophy kinds of waters. In addition, in the introduction you are considering ultraoligotrophic areas and in the whole manuscript, you only refer to oligotrophic. Page 3, line 34, I would move the definition of stations to field sampling section. Then all stations after LDB are oligotrophic including LDA and thereafter ultraoligotrophic? Page 3, line 15, Vázquez-Dominguez is missing in the reference list Page 4, line 11, arrange sub-index for phosphate, nitrate, and nitrite

Results Page 4, line 37, Fig. 2 do not show temperature

Page 6, line 31, Why do you not show HNF and ciliate profiles?

Page 6, line 39, Gasol (1994) is missing in the reference list.

Page 6, Fig. 6. Very interesting the obtained results related with bottom-up and top-down issue. Although as the authors say there were no measures of grazing rates. Perhaps you might have a look on the paper of Lara et al. (2017) that for near stations to this study, during the MALASPINA cruise, they measured grazing and viral mortality rates (Lara, E., D. Vaqué, E.L. Sà, J.A. Boras, A. Gomes, ..., R. Massana, T.S. Catalá, G.M. Luna, S. Agustí, M. Estrada, J.M. Gasol & C.M. Duarte (2017) Unveiling the role and life strategies of viruses from the surface to the dark ocean *Sci. Adv.* 3: e1602565, doi: 10.1126/sciadv.1602565 3: 1-1).

Another paper from the same cruise that deals with this top-down, bottom-up issue from the point of view of bacteria could help you as is: Morán, X.A.G, J. M. Gasol, M. Pernice, J.-F. Mangot, R. Massana, E. Lara, D. Vaqué & C.M. Duarte (2017) Temperature regulation on marine heterotrophic prokaryotes increases latitudinally as a breach between bottom-up and top-down controls *Global Change Biol.* 23:3956–3964. doi: 10.1111/gcb.13730 23: 3956-3964.

C2

Page 7, line 5, About the interpretation of the large distance of d when using data from the ZI in the oligotrophic stations, since *Prochlorococcus* are pretty abundant, as well as *Synechococcus* and both could be a prey for HNF, I am wondering, which would be the result if you sum up all bacteria (heterotrophic and phototrophic) and apply the model again?. At the time that Gasol 1994, did the model it was very difficult to detect *Prochlorococcus* in the epifluorescence microscope, so, perhaps some of them were counted as heterotrophic bacteria after DAPI staining. Another way to corroborate this top-down bottom-up issue from the point of view of bacteria could be the application of Ducklow 1992 equation, relating bacterial biomass and bacterial production, but for that you will need bacterial production measurements. Did somebody measure it during this cruise? Ducklow H. 1992. Factors regulating Bottom-up control of bacterial biomass in open ocean plankton communities. Arch. Hydrobiol. Beih. Ergebn. Limnol. 37: 207-217

In summary, I consider this manuscript a relevant piece of work describing the microbial abundance and biomass through a gradient from meso to oligotrophic in a not explored tropical area of the Pacific Ocean, and I think that few changes will contribute to make it clearer.

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