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Interactive comment on “Short-term temporal variations of heterotrophic bacterial” by G. Mével et al.

Anonymous Referee #1

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General comments

This work present a good set of information about particle-attached and free-living bacterial abundance (or biomass in this study) and productivity in NW Mediterranean Sea during summer-fall 2004 into the DYNAPROC-2 project and in connection with a previous study (DYFAMED site) in the near area. The study is based in one cruiser during 5 weeks in the area and intent to reveal the variation of heterotrophic bacterioplankton abundance and activity at different time scales (seasonal, weekly and hourly) and also in the vertical scale. Far as I know, there is not many datasets for microbial parameters in marine time-series studies, then this work provide a good material for future studies. Regarding the good dataset and the connection with other studies to respond more global question or patterns is needed to discuss and mention some aspect that can be

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improved.

Title can be improved; half of the article is referring about particle-attached bacteria and also about deep bacterial abundance and production profiles. Both parameters are not so common in the literature and can remark the importance of this work.

It was not that easy to find the information about P index in the webpage included in the article (<http://www.obs-vlfr.fr/proof/vt/op/ec/peche/pec.htm>). The authors must included a better way to find this information and should include a brief explanation of the data used to calculate this index.

Even when $0.8 \mu\text{m}$ (or $1.2 \mu\text{m}$ in GF/C filters) pore size is a nominal and operational limit, the authors must include how much is the under- or over-estimation of the particle-attached bacterial abundance and production. For bacterial abundance/biomass estimation authors can use epifluorescence microscopic counts of the four deep profiles (Materials and methods seccion). Under- or over-estimation of bacterial production by attached bacteria can be estimated reporting the differences (or not) between total bacterial production and free-living bacterial production using the filtration method. In addition, is not a clear difference between the terms total bacterial production (centrifugation method) and bacterial production by free-living bacteria (filtration method). Are these two methods reporting similar results?

What is the definition of euphotic layer in this work? Why the authors chose 0-150 m depth? Included any other parameter to define this layer (e.i. light profiles, turbidity, Secchi disc measurements or others)

Specific comments:

Page 1908, line 20. Correct the minimum value from Fig. 1 must be $< 5 \times 10^5$ cells ml^{-1} in surface (values at 263 Julian day)

Page 1914, lines 17-19. Clarifying the term 'nutrient releases by primary producers'. Bacteria can be C- or mineral nutrient-limited (N, P, Fe, etc) using C form phytoplankton

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activity or exportation, or competing with phytoplankton for mineral nutrients. Which of these processes you are referring?

Page 1914, lines 21-23. This study did not include any grazing experiment or predator abundance/activity to estimate the importance of the top-down control. There is previous information in the area about grazing rates over bacterioplankton?

Technical corrections

Page 1900, lines 6 and 11. Choose fall or autumn.

Page 1901, line 9. Say Ducklow, 1993; should say Ducklow et al., 1993

Page 1906, line 15. Say Fuduka, should say Fukuda

Page 1919, line 27. Missing reference: Billen et al., 1990

Page 1920, line 23. Say Fuduka, should say Fukuda

Page 1922, line 22. Included the complete reference with pages, must say Deep Sea Res. II, 49 especial issue, 1963-1964, 2002

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