

Interactive comment on “Physico-chemical and biological factors influencing dinoflagellate cyst production in the Cariaco Basin” by Manuel Bringué et al.

Anonymous Referee #3

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The manuscript by Bringué and colleagues focuses on a short (2.5 years) time series of dinoflagellate cysts in the Cariaco Basin, a site well known for its remarkable sedimentary climatic record, and the home of the late CARIACO time-series program. The objectives of the work were to document the seasonal changes in dinoflagellate cyst production in the basin, to relate this production to climatic changes (e.g. upwelling, stratification, etc), and to investigate the relationships between dinoflagellates and other major planktonic groups that could impact cyst production/competition for resources. The authors state that the importance of this work is that it provides new insights into the ecology of cyst-producing dinoflagellates, and will allow for more detailed interpretations of fossil assemblages extracted from sedimentary records in the

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basin and elsewhere.

The manuscript is interesting and in general well written; it does have however some things that need to be addressed. Details are provided below.

Pg. 2

Line 7: Replace “southern Caribbean upwelling system” for Southeastern Caribbean Sea, so it’s not as redundant

Line 9: Please add Rueda-Roa, 2012 as citation for the secondary upwelling. Pg. 3

Line 3-5: Please pick the most relevant citations; there are too many.

Line 8: Please add ‘subsequently’ between ‘has’ and ‘been’ (e.g. ...basin has subsequently been...) Pg 4

Citing figure 1 with location/map would have been helpful also in line 1 of pg 4, when reference is made to the CARIACO site.

Line 15-19: this has been stated in the introduction; I suggest removing/reducing the sentence in the introduction and leaving the longer description in the env. Setting section. Line 25: The CARIACO site is mentioned anew; I would suggest being more concise – the authors can choose whether to provide location in the setting section (top of pg. 4) or in the methods, but fragmented as it is now it’s repetitive.

Pg. 8

Line 3-19: This does not seem to belong in the statistical analysis section; it should be moved to the beginning of the methods, to the 3.1 Sample collection and analyses part.

Results, section 4.1: Was there a reason why the authors decided to define their own upwelling/non-upwelling seasons, instead of following already defined ‘seasons’ from previously published literature? (e.g. Astor et al., 2013; Lorenzoni et al., 2011; Taylor

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et al., 2012)? They mention their definition is consistent with others, then why not go with those?

Line 31: Please be quantitative; what does “higher temperatures in shallow waters” refer to? What is higher? What is shallow?

Pg 10

Line 19: Is there an ‘of’ missing between the words ‘contribution Echinidinium’? Line 28: ‘pulses’ should be singular (pulse)

Pg. 12

Line 9-8: is repetitive, as has already been stated in the introduction

Line 23-27: Revise sentence and perhaps break it up; as it is, it’s a bit confusing. Line 28: There is a ‘are’ missing at the end of the line, after ‘sites’

Line 27-31: revise sentence; it’s not clearly written and can be worded better Pg. 13

Line 14-15: Statistical significance is provided for correlations between fluxes and cyst, and the text suggests that the relationships are significant, though the provided suggests otherwise ($p = 0.000$). Generally, the p is set at 5% or 1%. The authors are advised to check their statistics and their interpretations.

The discussion in general presents many results which may be more appropriate to move to the ‘results’ section. For example, Pg. 16 has abundant results and references to figures which may be better moved to results, and the discussion section may then focus better on the actual discussion of results.

Pg. 17

Please revise correlation coefficients and p values – as they are it’s impossible to tell whether they are significant or not.

The reference to the ENSO impact in the Strait of Georgia is out of context – the

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geographic location is farther north and not even in the same ocean. It is suggested that it be removed as it adds nothing to the discussion.

Pg 19

Line 1: The authors conclude that “On interannual time scales, dinoflagellate cyst production seems to be influenced by the strong 1997/98 El Niño event, with a one year lag”, though from their data and discussion it was apparent that they were not able to draw this conclusion?

It is also unclear how the “work expands our knowledge of cyst-producing dinoflagellate ecology, helping the interpretation of fossil assemblages from the basin’s sedimentary record and worldwide.” It would have been a benefit if the authors had included in the discussion a paragraph where they tied it all together and specifically explained how this work would help the interpretation of fossil assemblages from the basin’s sedimentary record. The authors stress the importance of the work in the introduction, but then limit themselves at characterizing the cysts and seasonality and don’t put the results in the context of why this is important.

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