

Interactive comment on “Diversity of cultured photosynthetic flagellates in the North East Pacific and Arctic Oceans in summer” by S. Balzano et al.

Anonymous Referee #3

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Referee comments # 3 to the manuscript "Diversity of cultured photosynthetic flagellates in the North East Pacific and Arctic Oceans in summer" by S. Balzano et al.

General comments

The manuscript is generally well written, clear and easy to read. The work comprises a large amount of work and is solid. The aim of the work is well described by the title. In order to better understand the diversity, distribution, and ecological role of marine protists there is a need for more strains in culture to be able to characterize them morphologically and genetically, and to be able to link a genotype to a morphotype. Increasingly the microbial diversity is described by molecular methods, but we lack taxonomic reference for the majority of the diversity found. This manuscript contributes with this needed baseline by bringing a considerable number of new strains into culture

C2729

and characterize them genetically in the rDNA region and by light microscopy. One strain was also examined by electron microscopy (EM). However, further examinations in the electron microscopy of several of the strains would be desired in order to identify them to species and describe them in more detail, especially of possibly new taxa. This may however be out of the scope for this manuscript. One of the main strengths of the manuscript is the method and effort to isolate all mono-algal strains, and these strains will hopefully be described morphologically in more detail by EM in following manuscripts.

Specific and technical comments

Abstract:

l.5: change phytoplankton enrichment to algal medium enrichment

l.10. Heterokontophyta. Change to Ochrophyta, which is synonymous, but preferred by Algaebase (www.algaebase.org).

Material and methods:

p. 6223, l. 25. Change "hand pipetting" to "single cell capillary or pipette (as appropriate) isolation" if this was the method used

p. 6224, l. 10. If "Hand isolation" is the same as hand pipetting, use the same term and give if possible a reference to this method.

6225, l. 28. Give the names at the same taxonomic level, e.g. at the division level.

Results:

p. 6228: Undescribed Mamiellaceae: It would indeed be interesting with examinations by transmission electron microscopy (TEM) of these strains to clarify their identity. Whole mounts are probably enough to show both the flagellar hairs and the scale morphology.

C2730

p. 6232: Prymnesiophyceae: Again I would encourage using TEM (whole mounts) to clarify the identity of the Haptolina strains.

p. 6235: I suggest to add Chrysophyceae before Dinobryon and Dictyochophyce before Pedinellales to have an equal taxonomic level for all taxa within Ochrophyta.

p. 6236: Again I would encourage using TEM (whole mounts) or SEM to clarify the identity of the Pedinellales strains.

p. 6237: Further identification and description of the unidentified pelagophytes (SEM and thin sectioning/TEM) is encouraged in a following manuscript. It could be mentioned what is needed in order to identify these species further.

Tables: Use the latest taxonomy and confer with Algaebase.

Figures:

Fig. 2. The pictures are beautiful, but it would be easier to find out which species are shown if they are numbered a, b, c, etc.

Fig. 3. The font should be larger to be able to read this figure.

Fig. 6. *Ceratium* spp. were used as out group, but is an ingroup of dinoflagellates. Argue why this is possible (or use another out group). Make sure that the names follow the latest taxonomy (confer with Algaebase). Use italic for all species names.

Supplementary material:

Table 1. The text from "Culture were enriched by either.... is unclear and needs to be rewritten.

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