

Interactive comment on “Temperature dependence of Arctic zooplankton metabolism and excretion stoichiometry” by M. Alcaraz et al.

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Most of the general comments of referee # 3 affect the manuscript structure, or mention the necessity of more precision regarding methods, notation, etc., that do not affect the essence of the paper. Therefore, their fulfilment seems quite easy. The specific comments (mainly the need for grammar improvements, already kindly facilitated by the referee) and questions about precise aspects will be also commented below.

General comments:

- 1) Suggested new short title: “Effects of temperature on the metabolic stoichiometry of Arctic zooplankton”.
- 2) Although in our opinion the units in which the metabolic rates are expressed are
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clear enough in the “Methods” section, we have no problems to insist in their nature as C-specific metabolic rates in the “Introduction”. Similarly, we will explain the meaning of RQ (i.e., the molar ratio of CO₂ produced to O₂ consumed, the factor used to transform C-specific oxygen consumption rates into C-specific carbon respiratory losses), and also use the acronyms suggested by referee # 3. The null hypothesis (i.e., that temperature had a similar accelerating effect on respiration and ammonia and phosphate excretion rates) will be clearly stated.

3) The requirements about re-organisation of the paper (i.e., to avoid any reference to methods in other sections and the necessary links with the studies in which primary production data were obtained) can be easily fulfilled.

4) We will improve the descriptions regarding the handling of the experimental organisms, their size-selection etc., as well as the community composition both of zooplankton and their potential prey, and the possible changes in the incubated community by the inclusion of carnivores in “Results”. Similarly, the limitation of the experimental setup, the limitations of any extrapolation of the results obtained, and the apparently high Q₁₀ values will be discussed.

Specific comments:

- 1) P. 7444. Line 10: OK, we will substitute “less” by “least”. Line 12: OK, we will change. Line 14: OK, we will change. Line 15: we will change by “shifts in the size, community structure and chemical composition of primary producers”.
- 2) P. 7446. Line 20: “filtered” is a typing mistake, we will delete. Line 22: The units of respiration and ammonia and phosphate excretion will be given.
- 3) P. 7447. Line 2: The acronym RQ will be explained (see above). Line 6: “into” will be replaced by “in”. Line 7: “closed by” will be replaced by “enclosed by” Line 24: We agree, in the equation there is a mistake, a minus sign is required before the exponent. Line 28: OK, we will specify that eV are the units for activation energy.

- 4) P. 7448. Lines 16-18: We meant that the lack of relation between average individual mass in the experiments and temperature allow to exclude any bias in the results obtained as resulting from the control exerted by individual mass in specific metabolic rates. We will re-write. Line 22: We will make the change suggested, and relocate the methods into the corresponding "Methods" section.
- 5) P. 7449: Line 8: the null hypothesis will be stated (see above, General Comments point 2). Line 13: OK, we will refer to Table 3. Line 14: OK, typing mistake, instead of "Table IV" it should be "Table 4". We can't identify the methods mentioned in line 14 by referee # 3, that ought to be relocated.
- 6) P. 7450. Line 11: "an" will be replaced by "a". The "rising trait" here was meant, in an unimodal response to temperature, the increasing part until the temperature optimum, before the decrease at further temperature rises. Lines 10 and 18: We will move "here" as required. Line 25+: In the the differences in the Q10 values obtained for respiration and ammonia and phosphate excretion, that meant different relative responses to a given temperature rise, are mentioned. At the same time the fact that the obtained Q10 are from 2 to 3 times higher than previous Q10 values is discussed.
- 7) P. 7453. Line 13: OK, "Antractic" will be corrected.
- 8) Table 1 Legend: The space before "respiration" will be inserted.
- 9) Table 4: Ok, the way to calculate the N and P requirements by phytoplankton, etc., will be included in "Methods". "at" will be replaced by "in".
- 10) Fig. 2, Y-axis: OK, we will replace *, the units will be better explained, and acronyms changed as suggested above (General Comments, 2).
- 11) Fig. 3: Substitution of "Arrhenius plots" by "Plots of the Arrhenius equations", as suggested above. Substitution of "ordinates" and abscissae" by "abscissa" and "ordinate"?
- 12) Fig. 4: Acronyms and terminology will be improved as suggested above (General
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Comments 2).

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