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Interactive comment on "Cushion bog plant community responses to passive warming in southern Patagonia" *by* Verónica Pancotto et al.

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Comment on the under-review manuscript "Cushion bog plant community responses to passive warming in Southern Patagonia" by: Erika Hodgson*, Naomi Gunasekara*, Jonathan Garrido-Mirapeix Munn*, Ryan Newman*, Kai Westwell*, Georgios Kazanidis** *Undergraduate student in the course "Critical Thinking in Ecological and Environmental Sciences" at the University of Edinburgh **Tutor in in the course "Critical Thinking in Ecological and Environmental Sciences" at the University of Edinburgh

Dear authors, as part of the undergraduate course "Critical Thinking in Ecological and Environmental Sciences" at the University of Edinburgh we have read carefully the mentioned above manuscript and we would like to express here our thoughts. We

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have found this piece of work is, in overall, a timely and interesting manuscript and we hope that our thoughts will help the authors to improve the status of their under-review paper.

Abstract We feel that that the abstract is well written with a use of clear language. We think, however, that the authors should highlight/elaborate further on some of their interesting findings. E.g., we think that they should have highlighted that while some aspects of the plant's biology were affected by the rising temperatures (e.g., biometric features, photosynthesis, respiration) others (e.g., pigments) were not; suggestions explaining this "divergence" would be welcome. Also, we feel that the authors should have clarified which IPCC climate scenarios they have incorporated in their work.

Introduction The introduction has a good structure in overall. We think, however, that the authors could have addressed the particular research gap more thoroughly. For example, the authors should have explained why they have chosen to work with the species Astelia pumila e.g., is this a cosmopolitan species, does it have a key role in ecosystem structure and functioning? Clarification on these aspects could increase the overall impact of the manuscript and its findings and make it more accessible. We feel also that the "Introduction" would have benefited if the authors had made some null hypothesis about the impacts of the changing abiotic parameters on the species biology. We feel that the lasts parts of the Introduction should mention to the readers which are the main aims and objectives of the work and how the findings will fit into the larger picture. Currently the last parts of the Introduction (e.g., lines 41-45) should be removed to the "Materials and Methods" section of the paper. Materials and Methods Lines 89-90: Please mention the measurements units used for measuring the size of the plant's leaves. Line 96: Can you please explain how the number "86" has been reached/calculated? The current number of replicates (n=3) for the semicircular plastic walls is acceptable; however higher numbers could provide higher statistical robustness. We acknowledge that logistical constraints may have prevented the use of these plastic walls. There was also no mention of the number of individual organisms present

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per plot. Line 113: The sampling dates were mentioned, but it was not said how many replicate measurements were taken for the the CO2 flux measurements on the treatment and control plots during this time. We do acknowledge that this information was in appendix A1.

Results Lines 185-210 (“Treatments effects on temperature”). We think that these lines would fit better in the “Materials and Methods” section. Lines 215-218 suggest that the growing season ranges from September to April. Please clearly define the range of the growing season in the “Materials and Methods” section. Figure 3, panel d (September 2017). Based on the p-values that are provided the differences are not statistically significant ($p>0.05$). The authors state in the caption that “. . .this difference is less significant ($p < 0.1$)” which sounds a bit odd. Table 1. Please mention in the caption of the Table the measurement units for the growth rate. Figure 4. Some of the information provided in the caption is rather redundant (e.g. We divided the area estimates into two groups referring to midsummer and late summer (see supplementary Table S2) and compared the respective treatment and control means using a Mann-Whitney U-test). We feel that this level of details is not necessary in here and would be adequate if it is only shown in the “Materials and Methods”, section.

Discussion We feel that it is not the best way to start a Discussion by highlighting technical aspects; instead the authors could have given a succinct overview of the major/most interesting findings based on which they will build their Discussion.

Studying the impacts of rising temperature on plant biology is a key feature; however, it is common knowledge that it is not the parameters that exerts stress on organisms; based on that it would be welcome if authors mention that a multiple-stressor experiment would have provided a better insight about the effects of climate change. Also, elaboration (even a succinct one) on the findings of other relevant studies about the impacts of multiple stressors on plant performance and implications about ecosystem structure and functioning (e.g., elemental cycling) would be great.

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Conclusions The last part of the conclusions should have highlighted how the key findings of the present work fit into the bigger picture e.g. in the functioning and resilience of ecosystems where these plants are abundant. It may be beneficial to conclude by highlighting why your findings are relevant and potentially suggest management strategies to reduce the impact on Astelia pumila. It would be welcome also the authors to highlight some research gaps that would simulate future research works.

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