Oikos

OIK-06141

Marx, J. M., Rall, B. C., Phillips, H. R. P. and Brose, U. 2019. Opening the black box of plant nutrient uptake under warming predicts global patterns in community biomass and biological carbon storage. – Oikos doi: 10.1111/oik.06141

Appendix 1

Additional figures of Original data and model simulations

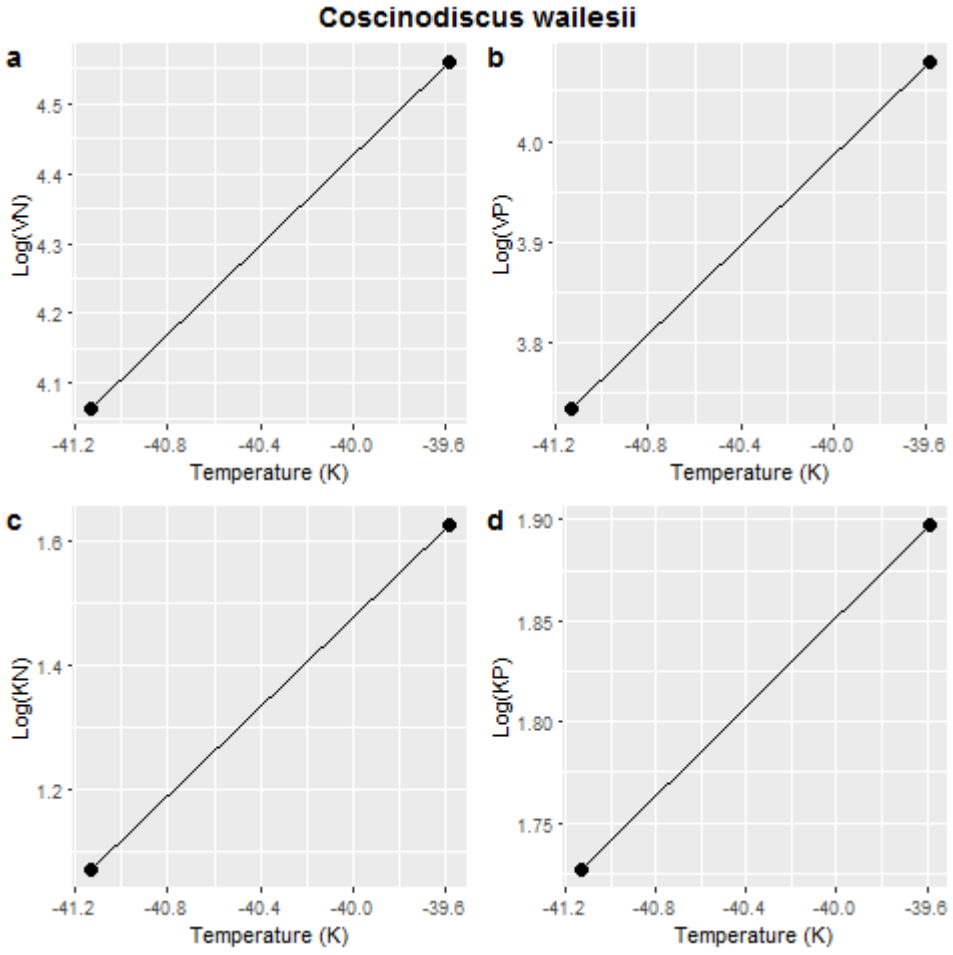

Figure A1. Original data and regression line of the log transformed maximum uptake rate (a, b) and half-saturation density (b, c) of nitrogen and phosphorus against temperature for phytoplankton species *Coscinodiscus wailesii.*

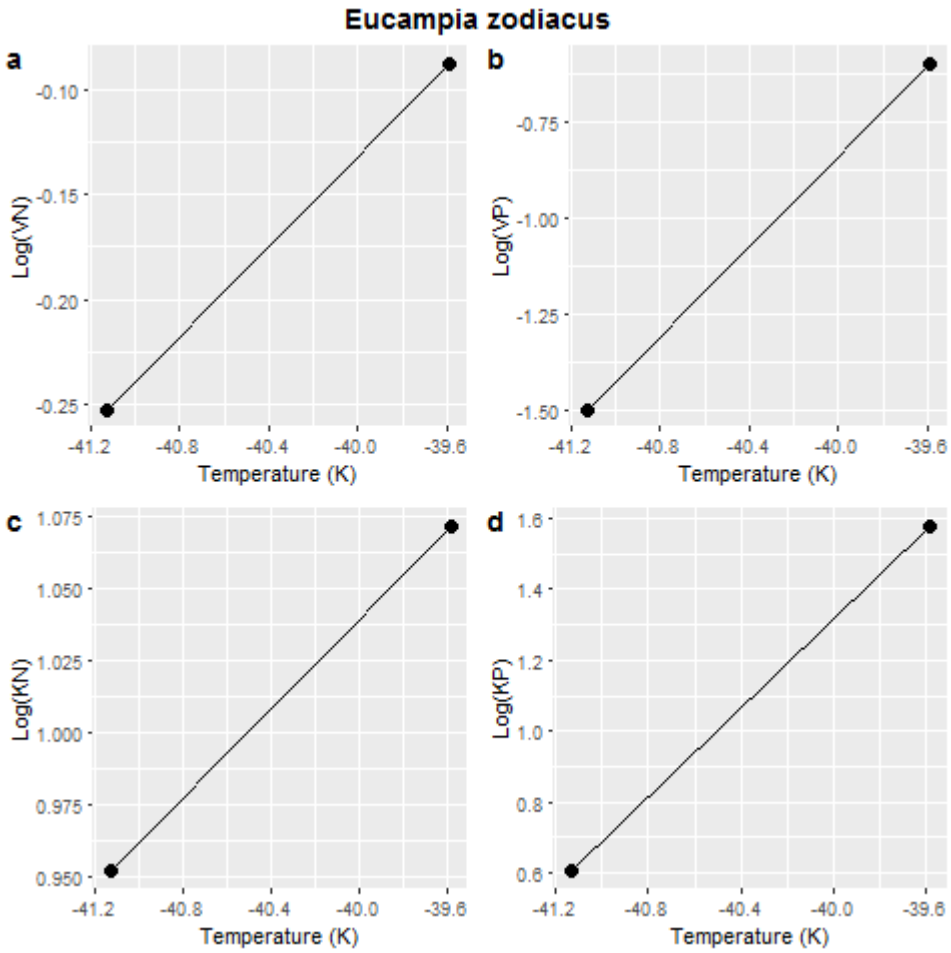

Figure A2. Original data and regression line of the log transformed maximum uptake rate (a, b) and half-saturation density (b, c) of nitrogen and phosphorus against temperature for phytoplankton species *Eucampia zodiacus*.

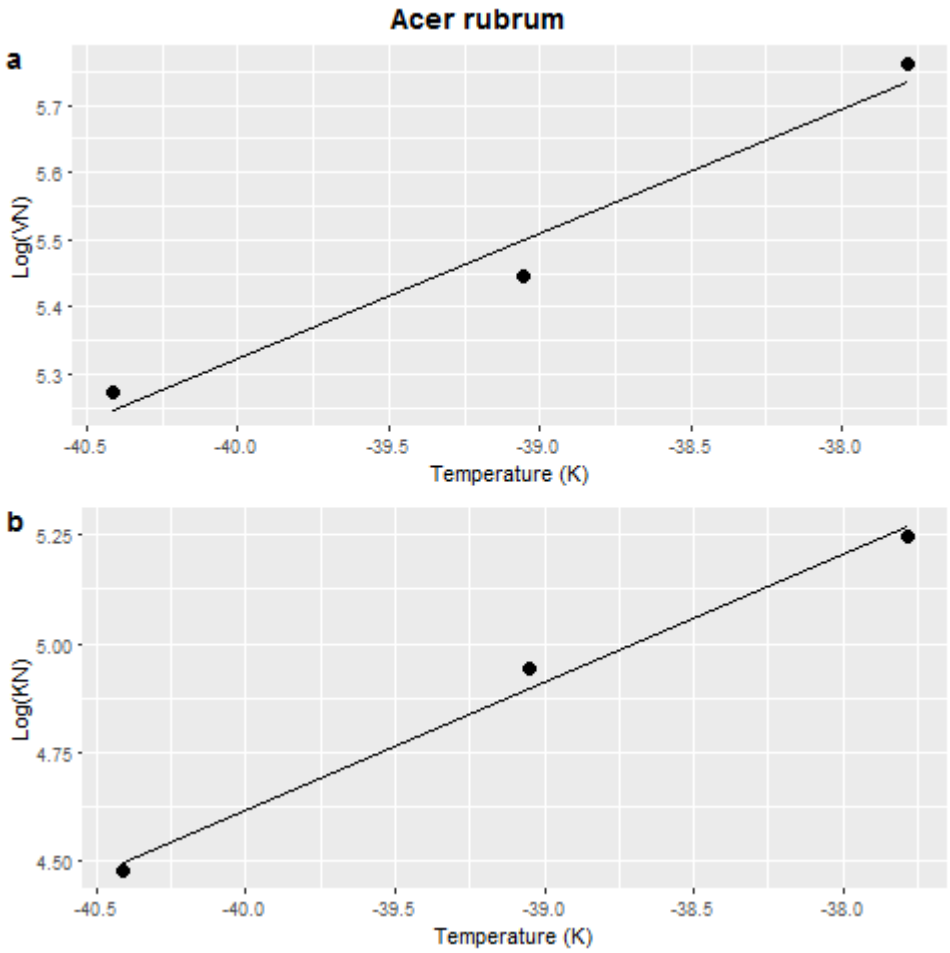

Figure A3. Original data and regression line of the log transformed maximum uptake rate (a, b) and half-saturation density (b, c) of nitrogen against temperature for tree species *Acer rubrum.*

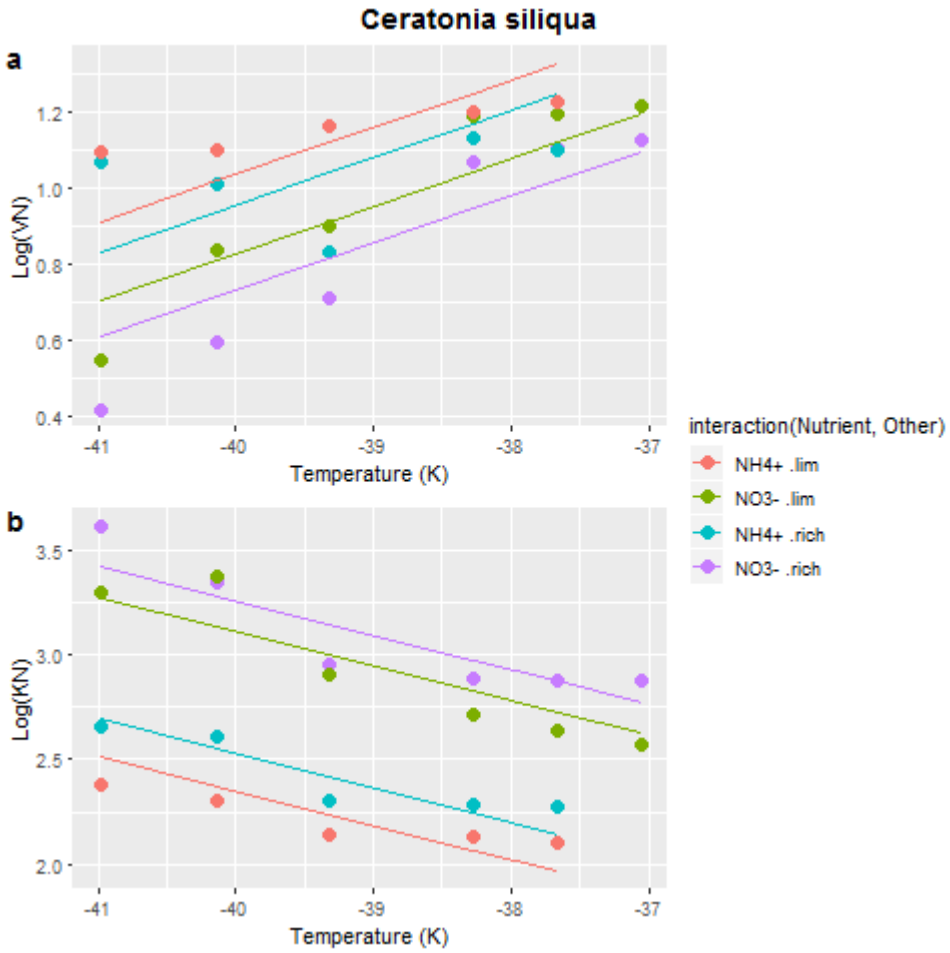

Figure A4. Original data and regression line of the log transformed maximum uptake rate (a, b) and half-saturation density (b, c) of nitrogen against temperature for tree species *Ceratonia siliqua.* The colours represent the additional variables (nutrient type and nutrient density) used in the original study.

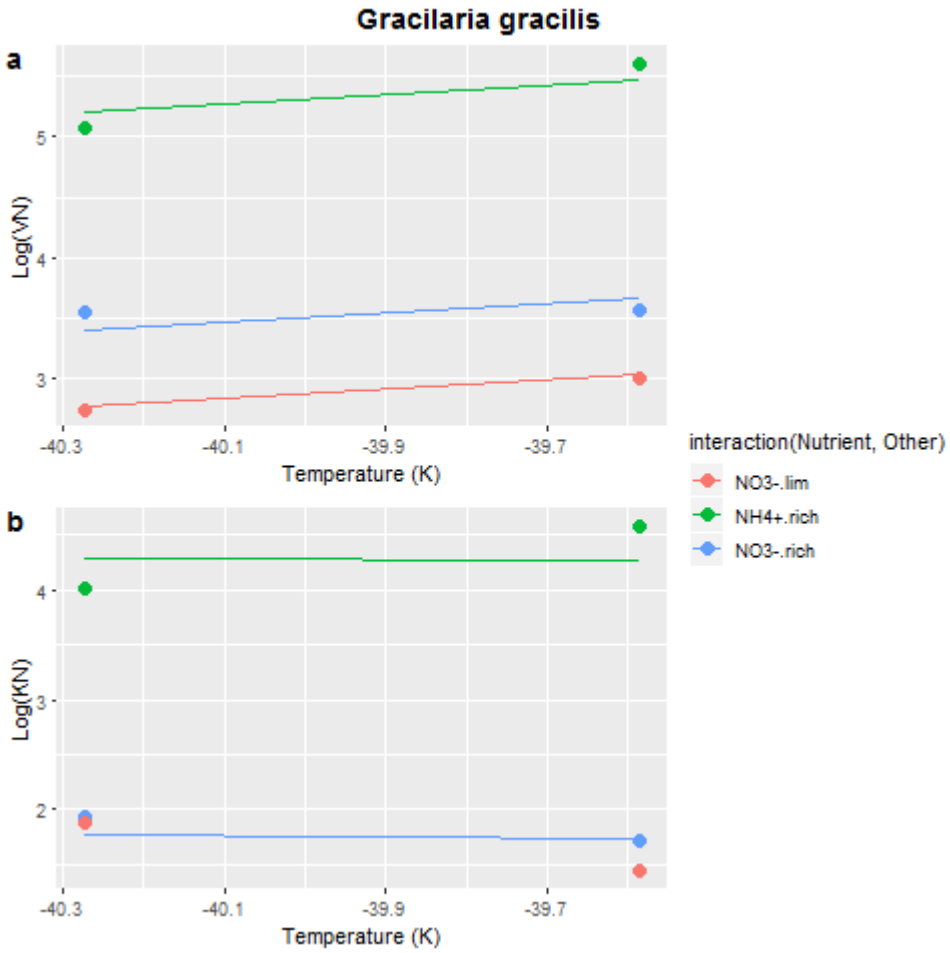

Figure A5. Original data and regression line of the log transformed maximum uptake rate (a, b) and half-saturation density (b, c) of nitrogen against temperature for algae species *Gracilaria gracilis.* The colours represent the additional variables (nutrient type and nutrient density) used in the original study.

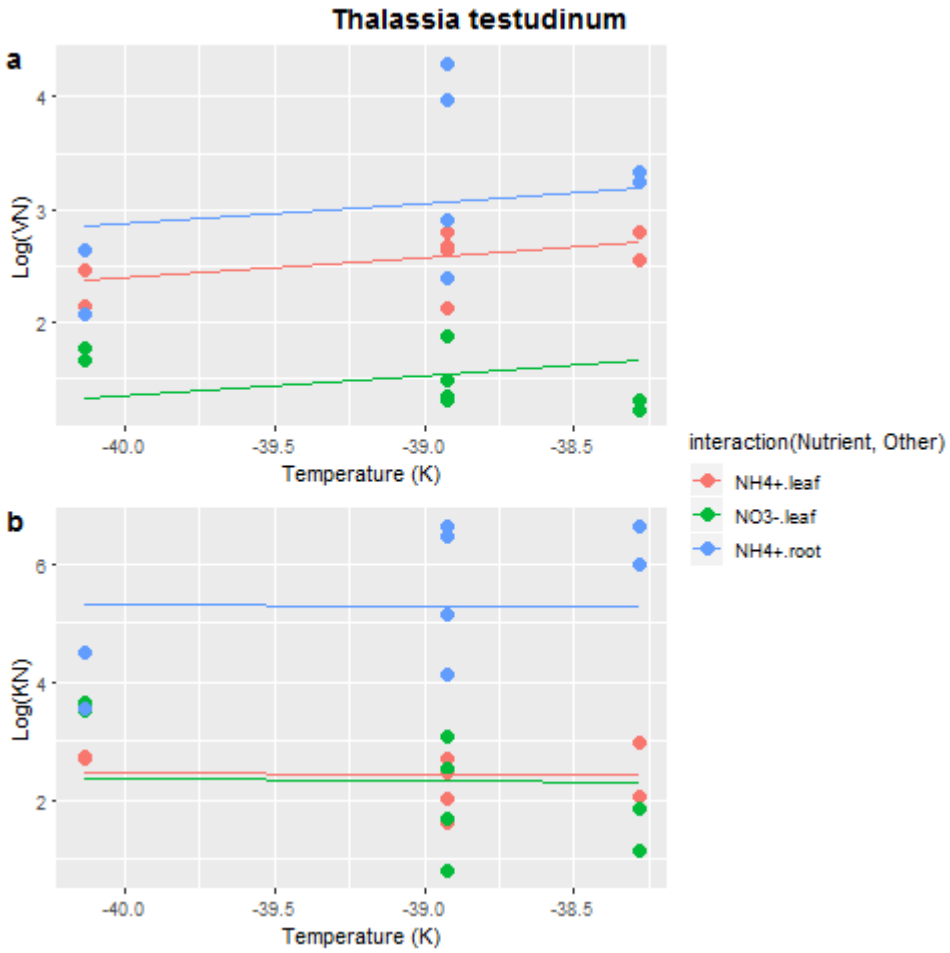

Figure A6. Original data and regression line of the log transformed maximum uptake rate (a, b) and half-saturation density (b, c) of nitrogen against temperature for algae species *Thalassia testudinum.* The colours represent the additional variables (nutrient type and plant part measured) used in the original study.

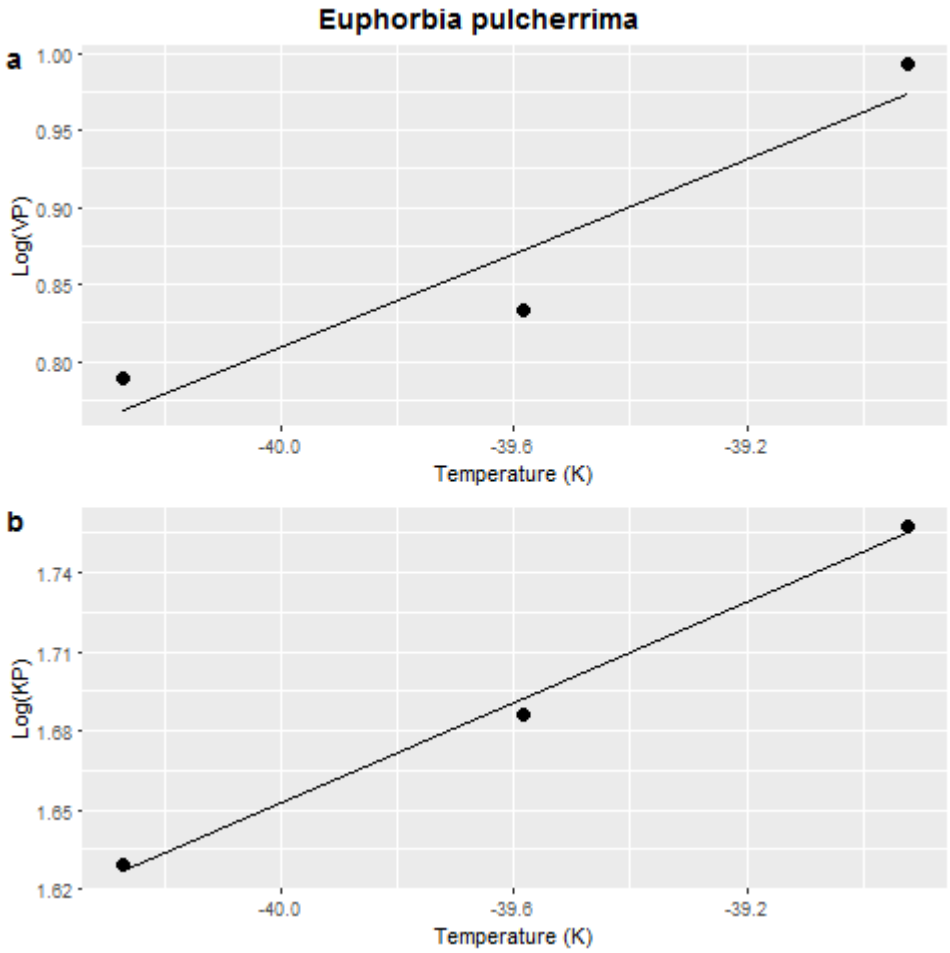

Figure A7. Original data and regression line of the log transformed maximum uptake rate (a, b) and half-saturation density (b, c) of phosphorus against temperature for shrub species *Euphorbia pulcherrima.*

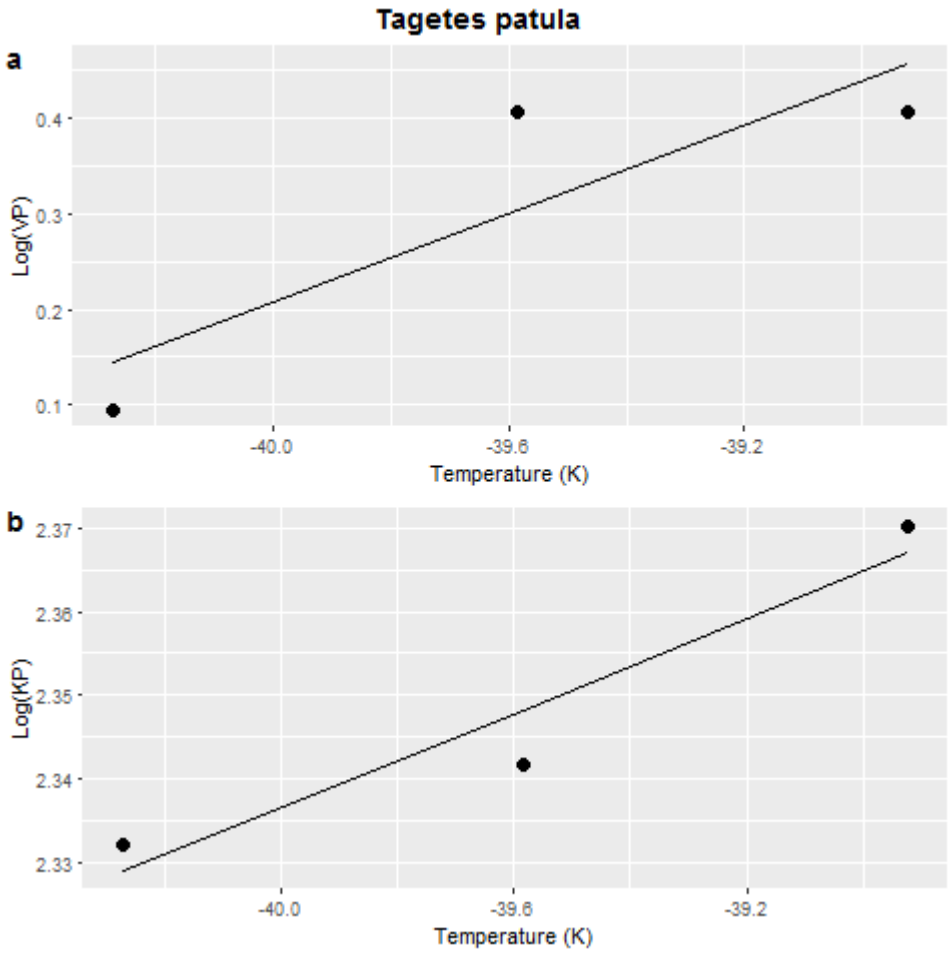

Figure A8. Original data and regression line of the log transformed maximum uptake rate (a, b) and half-saturation density (b, c) of phosphorus against temperature for herb species *Tagetes patula.*

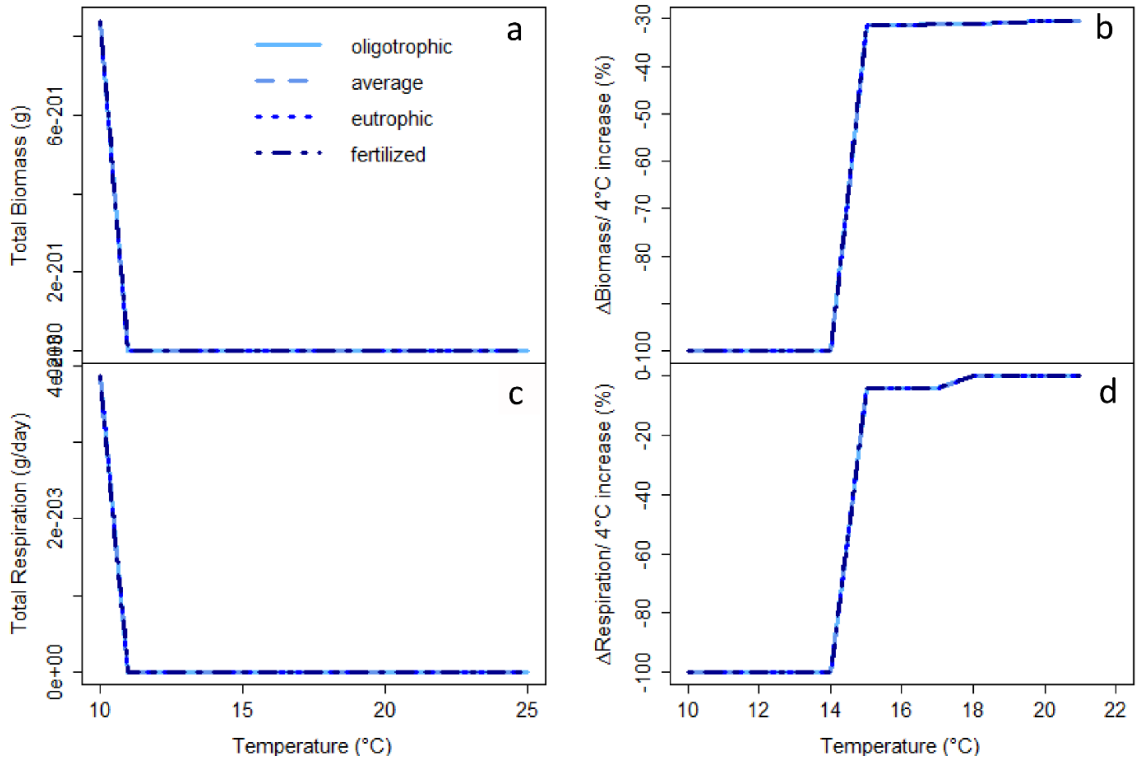

Figure A9. Results of simulations run with only nitrogen as nutrient. (a) total community biomass at different temperatures; (c) the corresponding total respiration. (b) and (d) show the %-change (Δ) in biomass and respiration, respectively, that would occur if the system would be warmed by 4°C, the x-axis here represents the baseline temperature.

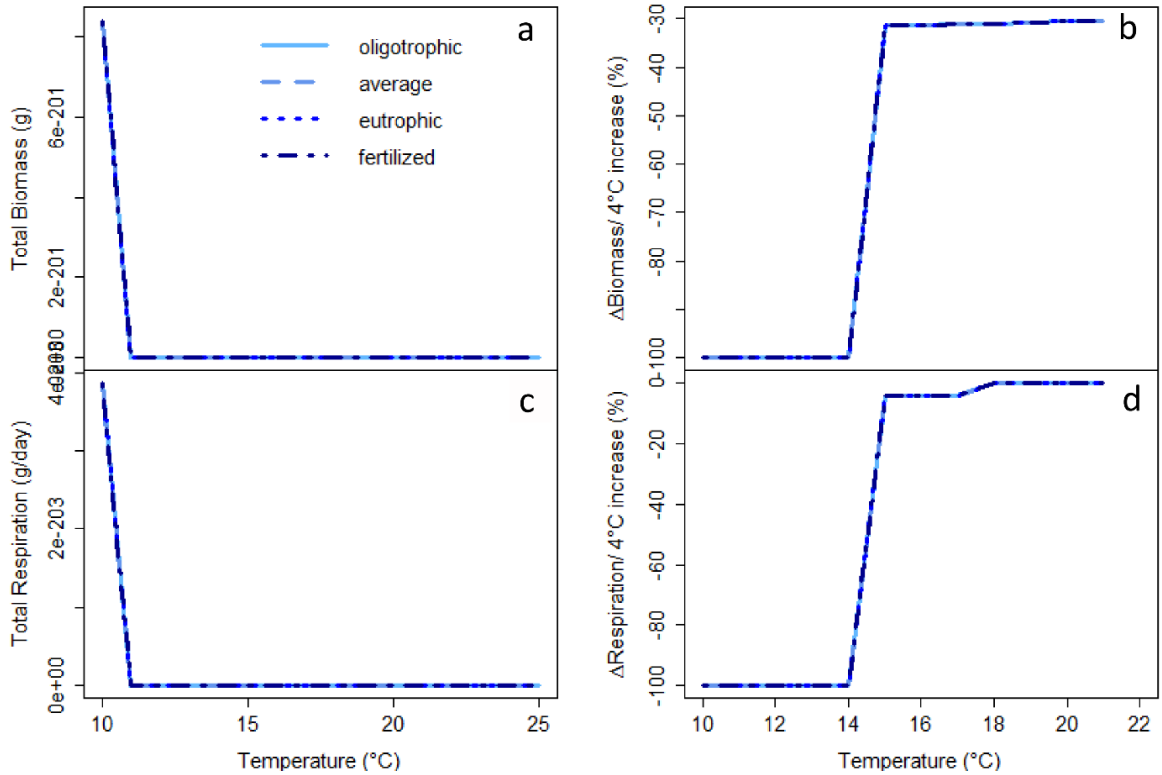

Figure A10. Results of simulations run with only phosphorus as nutrient. (a) total community biomass at different temperatures; (c) the corresponding total respiration. (b) and (d) show the %-change (Δ) in biomass and respiration, respectively, that would occur if the system would be warmed by 4°C, the x-axis here represents the baseline temperature.

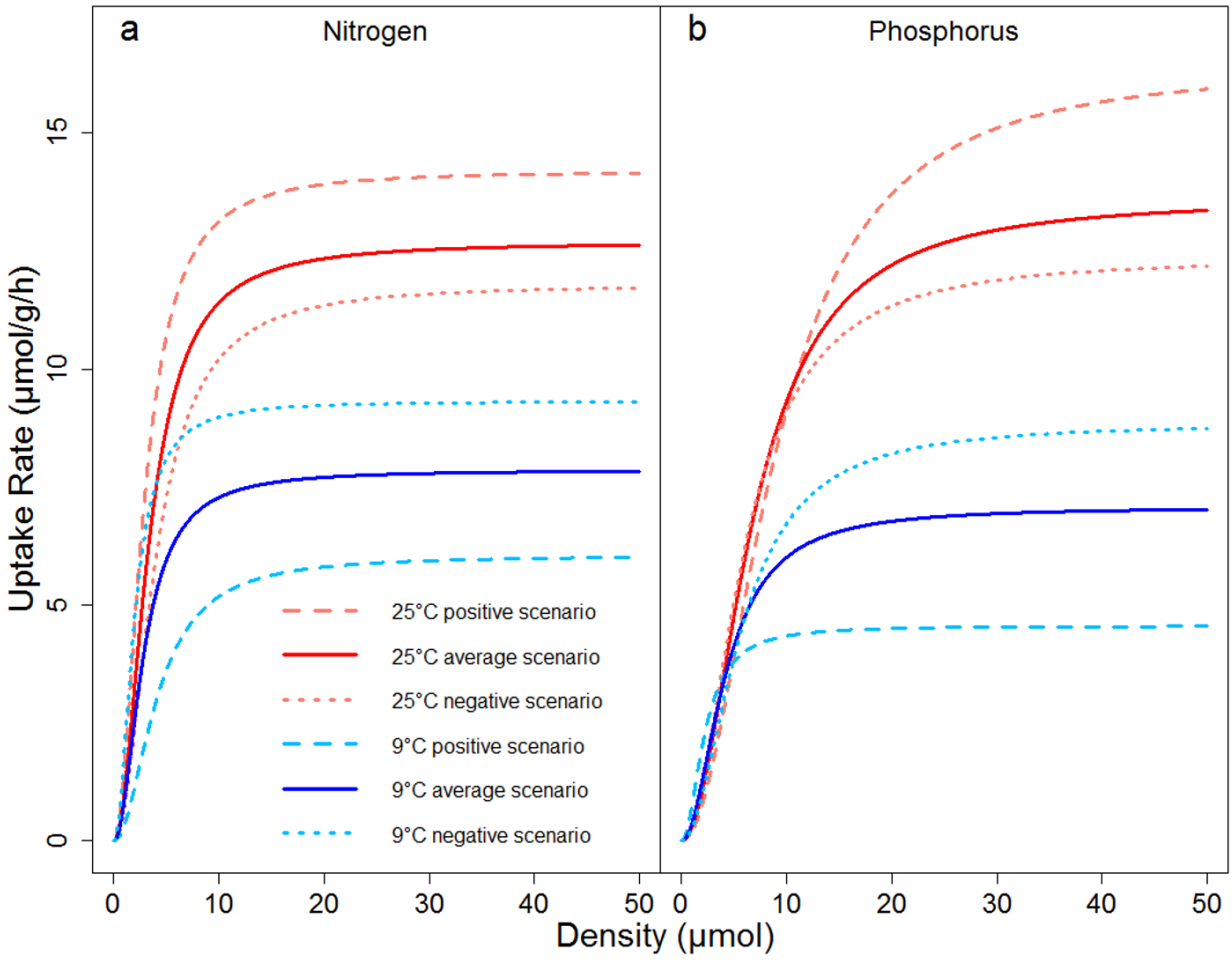

Figure A11. Sensitivity plot showing plant nutrient uptake curves at 9 and 25°C using the most positive, average and most negative scenario for plant nutrient uptake based on the activation energies of half-saturation density and maximum uptake rate. This figure shows plant nutrient uptake at 9°C in blue and 25°C in red. The solid lines represents the average activation energy as used in the model. The dashed lines shows plant nutrient uptake being most positively affected by temperature using the maximum activation energy for maximum uptake rate and the minimum activation energy for half-saturation density. The dotted lines show the most negative scenario for plant nutrient uptake using the minimum activation energy for maximum uptake rate and the maximum activation energy for half-saturation density.

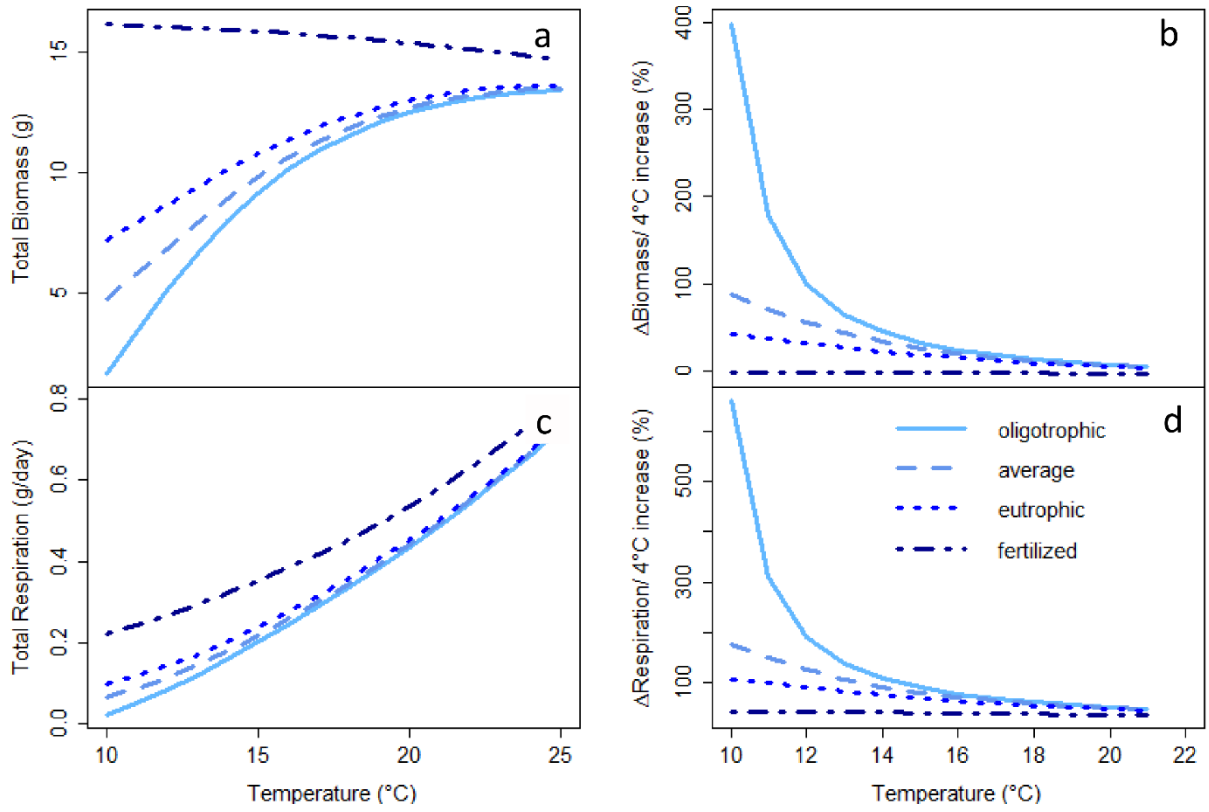

Figure A12. Results of simulations run under the most positive scenario using the maximum activation energy for maximum uptake rate and the minimum activation energy for half-saturation density. (a) total community biomass at different temperatures; (c) the corresponding total respiration. (b) and (d) show the %-change (Δ) in biomass and respiration, respectively, that would occur if the system would be warmed by 4°C, the x-axis here represents the baseline temperature.

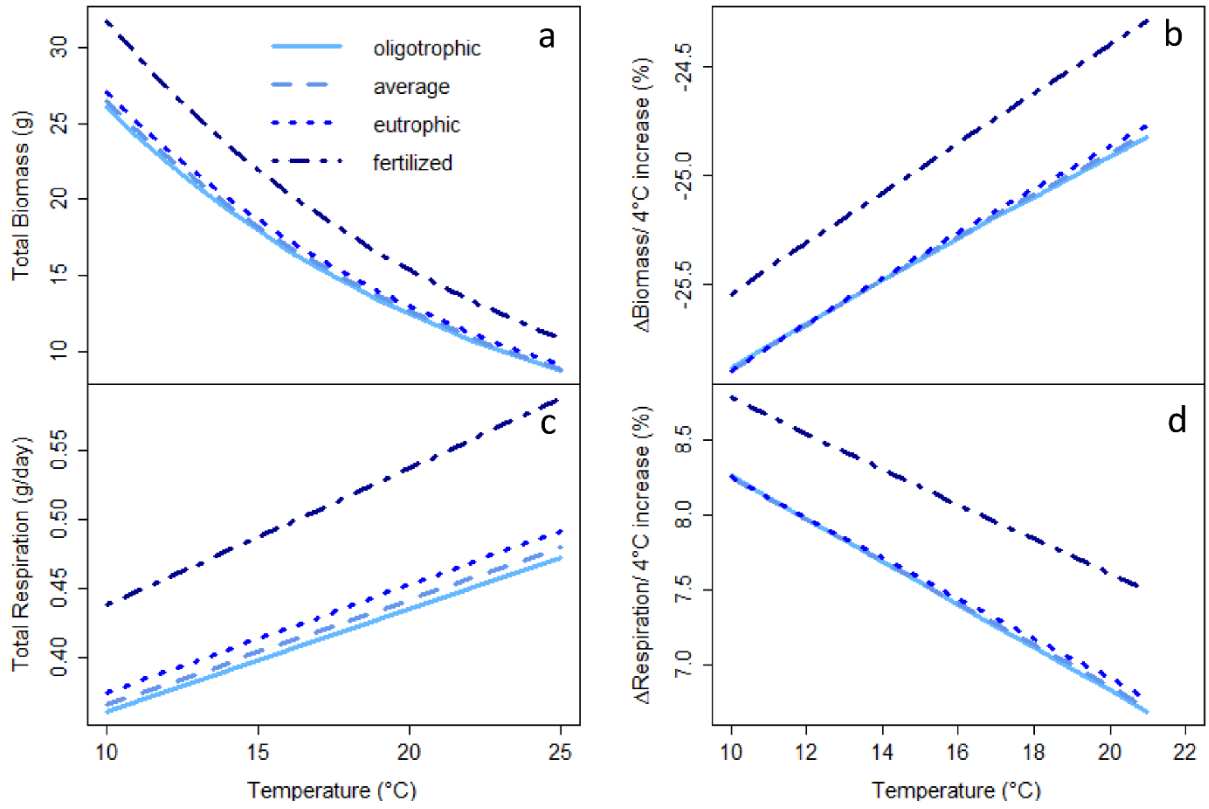

Figure A13. Results of simulations run under the most negative scenario using the minimum activation energy for maximum uptake rate and the maximum activation energy for half-saturation density. (a) total community biomass at different temperatures; (c) the corresponding total respiration. (b) and (d) show the %-change (Δ) in biomass and respiration, respectively, that would occur if the system would be warmed by 4°C, the x-axis here represents the baseline temperature.

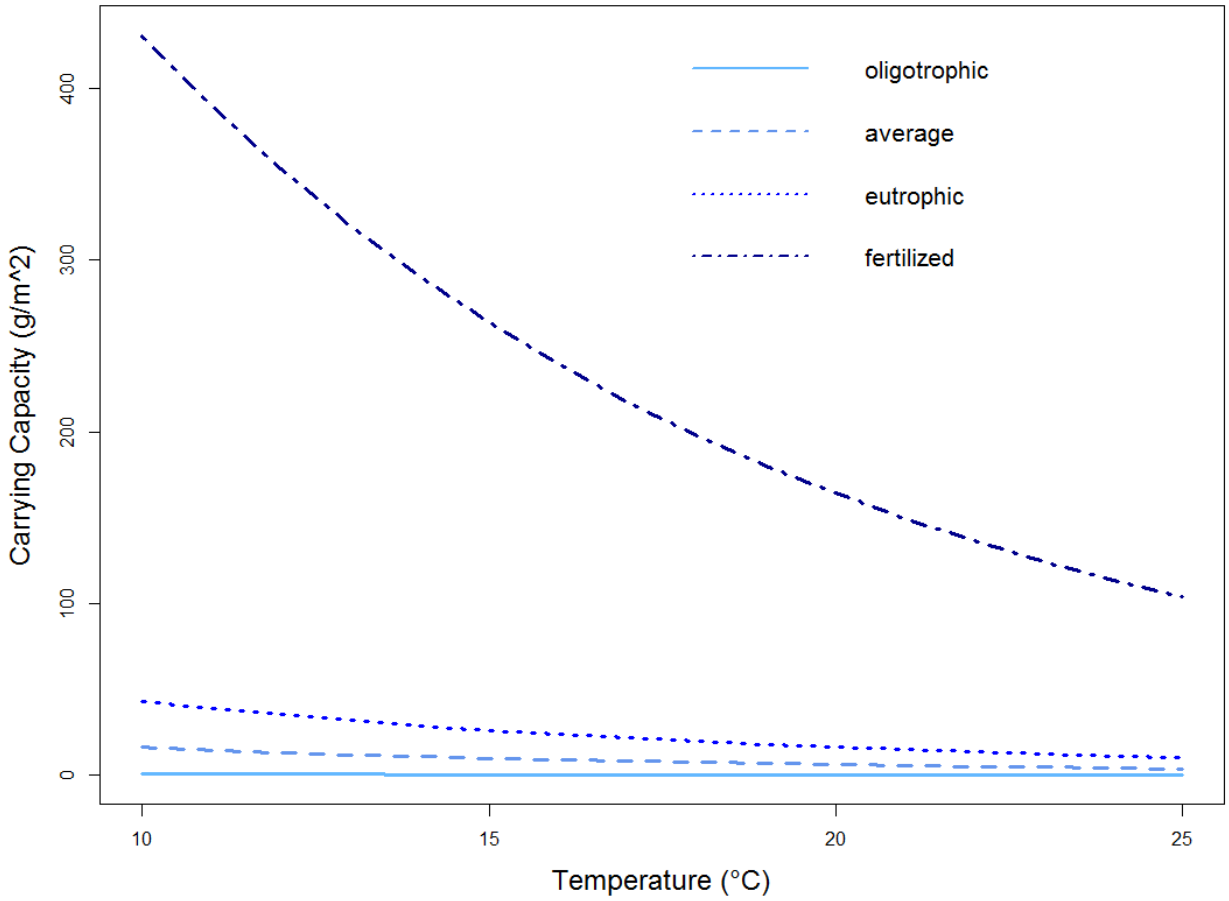

Figure A14. Carrying capacity against temperature. The four lines represent different nutrient density scenarios.