***Note***

**Evaluating temperature-dependence of growth allometry**

Max Lindmarka,1, Jan Ohlbergerb, Anna Gårdmarkc

a Swedish University of Agricultural Sciences, Department of Aquatic Resources, Institute of Coastal Research, Skolgatan 6, Öregrund 742 42, Sweden

b School of Aquatic and Fishery Sciences (SAFS), University of Washington, Box 355020, Seattle, WA 98195-5020, USA

c Swedish University of Agricultural Sciences, Department of Aquatic Resources, Skolgatan 6, SE-742 42 Öregrund, Sweden

1 Author to whom correspondence should be addressed. Current address:

Max Lindmark, Swedish University of Agricultural Sciences, Department of Aquatic Resources, Institute of Marine Research, Turistgatan 5, 453 30 Lysekil , Sweden, Tel.: +46(0)104784137, email: max.lindmark@slu.se

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Abstract

Introduction

Introduction

Materials and Methods

*Allometric growth model*

The allometric growth can be rewritten as:

Find derivative with respect to *T*. Apply product rule:

Factor out :

Go back to normal form:

cannot be 0, so parenthesis needs to be. If is a constant, the expression for the maximum does not have in it. If declines with temp, optimum is lower for larger masses. (Show this in a figure, two allometric growth curves, with or without temperature effect on )

In this study, we utilize a newly collated dataset on the intraspecific scaling of body growth in relation to temperature. Given that we use strictly below-optimum data, we do not find an overall clear interaction. However, including data near or beyond will lead to an interaction (maybe show this also? Fit the same model to all data?), likely a negative one since large fish have a lower optimum growth temperature (Lindmark et al. 2021).

*Data*

We use data from a recently published meta-analysis.

*Statistical Analysis*

Brms models

Results

Results

|  |  |  |
| --- | --- | --- |
|  | **log y** | |
| *Predictors* | *Estimates* | *CI (95%)* |
| Intercept | 12.27 | 3.35 – 21.19 |
| log mass intra | -0.10 | -0.32 – 0.11 |
| temp arr intra | 0.01 | -0.23 – 0.25 |
| log mass | -0.26 | -0.44 – -0.08 |
| temp arr | -0.27 | -0.50 – -0.05 |
| log\_mass\_intra:temp\_arr\_intra | 0.04 | -0.03 – 0.12 |
| N species\_ab | 13 | |
| Observations | 222 | |
| Marginal R2 / Conditional R2 | 0.623 / 0.777 | |

Chart

Description automatically generated

Chart, funnel chart

Description automatically generated

Discussion

Discussion

Code and Data Availability

All data and R code (lists of studies in literature search, data preparation, analyses and figures) can be downloaded from a GitHub repository (<https://github.com/maxlindmark/warm_life_history> ) and will be archived on Zenodo upon publication.

References

Lindmark, M., J. Ohlberger, and A. Gårdmark. 2021. Optimum growth temperature declines with body size within fish species. bioRxiv 2021.01.21.427580.

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Author Contributions

Author Contributions

Supporting Information

Chart

Description automatically generated with medium confidence

Chart, histogram

Description automatically generated