Energy Investment in Growth Rate and Reproduction

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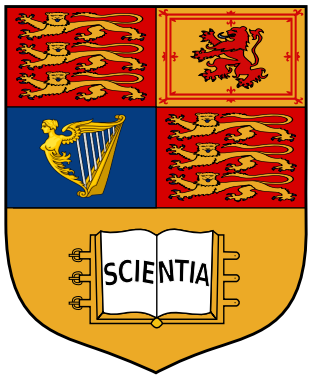

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Formatted in the journal style of Functional Ecology

Submitted for the MSc in Computational Methods in Ecology and Evolution

Abstract

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I would like to thank my supervisor..... thanks to luke who gave a great base to start from on the project

Code and Data Availability

code and data is available at: `https://github.com/Don-Burns/Masters_Project`

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1 Introduction

Growth is in essence a balancing act between how much energy an organism can acquire and the amount of energy required for maintenance, that is movement, digestion et cetera.

Key to the above models is that many physical rates scale with mass to some power, known as power laws. That is some rate Y can be expressed for any mass by $Y = Y_0 m^{\beta}$.

In classic OGMs this is most notable in determining how much energy an organism acquires at a given mass where gain = constant $\times$ mass$^{0.75}$. This scaling is based on the work of [WBE97] [AGB05]

1.1 section layout (old)

What is an OGM and ontogenic growth?

An ontogenetic model or OGM is a model which describes the development of an organism. Within a metabolic framework this describes how an organism's assess to and and alocation of energy changes throughout its lifetime.

explain west's model

explain terms

why is 'a' resting metabolic rate?

explain charnov's contribution

- graph with generic example of the plot for illustration purposes

explain what I am adding to 'cm' and why –¿ maybe leave for the methods?

talk about barneche 2018

raises question of scaling elsewhere

talk about samraats work and how I plan to use it

the goal of my paper

2 Methods

2.1 Gain

2.2 Loss

2.2.1 Maintenance Cost

2.2.2 Reproductive Cost

2.3 Reproductive Output

2.4 notes

c bounded between 0 and 1 since it is basically GSI

3 Results

4 Discussion

5 Conclusion

References

[AGB05] A. P. Allen, J. F. Gillooly, and J. H. Brown. "Linking the global carbon cycle to individual metabolism". In: *Functional Ecology* 19.2 (2005), pp. 202–213. ISSN: 02698463. DOI: 10.1111/j.1365-2435.2005.00952.x.

[WBE97] Geoffrey B. West, James H. Brown, and Brian J. Enquist. "A general model for the origin of allometric scaling laws in biology". In: *Science* 276.5309 (1997), pp. 122–126. ISSN: 00368075. DOI: 10.1126/science.276.5309.122.