A very simple document on the Metabolic Theory of Ecology

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Abstract

This paper elaborates on the principles of chemistry, physics and biology drawn into a fundamental equation that links indididuals to higher orders of organization.

1 Introduction

Metabolism is the rate that organisms uptake and allocate resources for their growth, survival and reproduction [1].

2 Materials & Methods

Accounting for the effects of body size and temperature on individual metabolic rates, the formula can be provided as follows:

$$I = i_0 M^{\frac{3}{4}} e^{\frac{-E}{kT}} \tag{1}$$

where, i_0 is the normalization constant, M is the body size, E is the activation energy, k the Boltzmann's constant and T is the absolute temperature in K.

3 Results

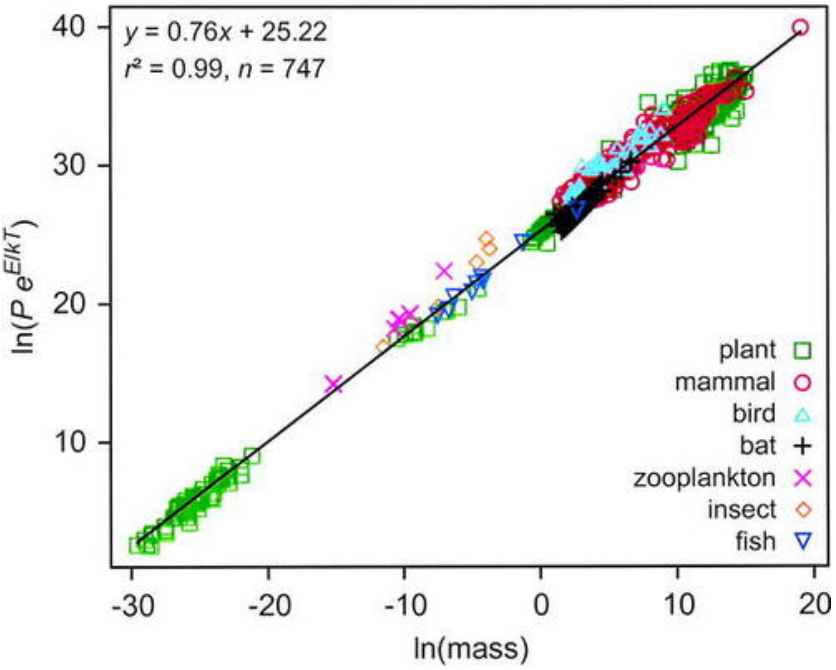

Figure 1: Mass dependence of temeprature-corrected maximal rates of whole-organism biomass production.

4 Discussion

The allometric scaling of this phenomenum applies across several orders of magnitude and levels of organization.

References

[1] James H Brown, James F Gillooly, Andrew P Allen, Van M Savage, and Geoffrey B West. Toward a metabolic theory of ecology. *Ecology*, 85(7):1771–1789, 2004.