Essay about DEB theory

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Due to deb theory i had the chance to discover a practical application of mathematics to biology, for me it was a great opportunity to enlarge my knowledge, this theory is a valuable input to understand the order and function of different individuals from the prokaryote to eukaryote.

The theory presents simple mechanistic rules that describe the uptake and use of energy and the consequences for physiological organization through-out an organism's life cycle, including the relationships of energetics with aging. Stage transitions cannot be linked to age.

Metabolism is organized in the same way within all animals. Everybody has at least one structure and one reserve.

Volumetric length is assumed as the cubic root of volume.

Extreme supply or demand systems don't exist; all species represent a mixture of these extremes.

DEB models describe the rates at which an organism assimilates energy and elemental matter from food and uses them for maintenance, growth, development, and reproduction.

These physiological rates depend on the state of the organism, and his environment. Changes in physiological rates and fluxes of elemental matter impact population and ecosystem dynamics.

Energy is supplied by the intake of food; this food is assimilated and goes to a reserve pool. Reproduction controls survival across generations in many species. The amount of assimilated food is proportional to V2/3. The reserve pool is not mended to be a storage place.

One fraction called kappa (κ) goes to the volume as maintenance and growth. Again, κ is proportional to the volume. The other fraction, 1-κ, goes to maturity and reproduction (after completion of maturity).

The amount of energy invested continuously into gametes production is accumulated in a buffer and then it is converted into eggs.

Reproduction does not compete with growth, which is in agreement with the fact that many organisms do not stop growing after reproduction has started.