

Phenotypic Plasticity and Energy Budget: Density Effects on Life History Traits

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Poster ID

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Context

Individuals life history depends on both:

- the amount of **energy available** in the environment;
- how each **individual uses** it.

Within the same population, different organisms may have different energy allocation strategies.

This ability to adapt and respond to the environment plays an important role in enhancing population stability.

However, the extent to which resource availability could affect individual pace of life, especially current changing ecosystems, still requires additional research.

This work aimed to investigate how **individual pace of life**, expressed as:

- metabolic rate,
- growth rate,
- maturity rate,

and the overall population-level energy budget, are influenced by changes in **individuals resource availability**.

Materials and Methods

Cohorts with different population densities of the species model *Gammarus insensibilis* were maintained for 45 days with conditioned *Phragmites australis*.

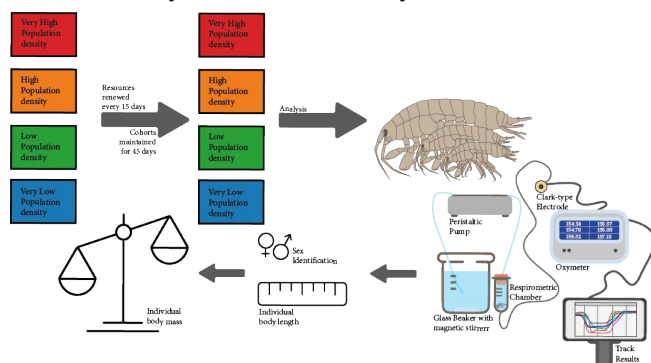
Every 15 days:

- resources were renewed,
- the overall health condition of the cohorts was checked.

Individual traits such as:

- metabolism,
- body mass,
- body length,
- sex

were individually measured after 45 days.



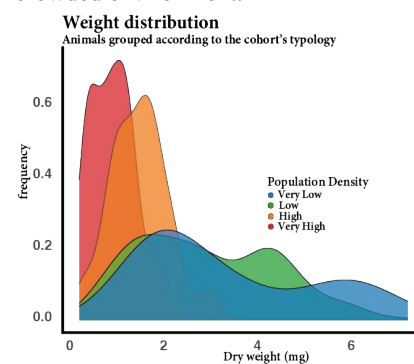
Conclusions

This study highlights how **population density**, by altering individual's resource availability, **alters** the rates in aquatic macroinvertebrates influencing their **pace of life**.

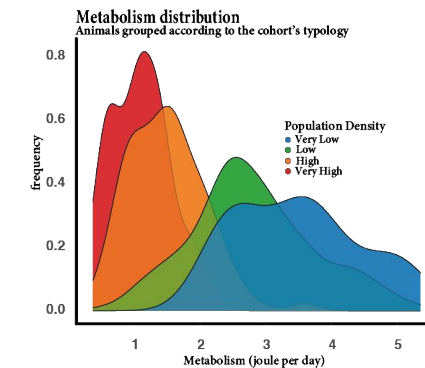
These findings highlighted how environmental factors and individuals traits are tightly connected.

Results

Individuals reared in conditions with a lower population density grew faster with respect to the individuals reared in a more crowded environment.



Individual's energetic requirement negatively scales with population density.



In overall, **independently from the body mass**, a lower population density was related to animals with larger dimensions and higher energetic requirements

