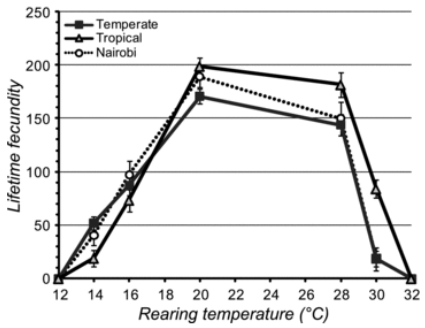
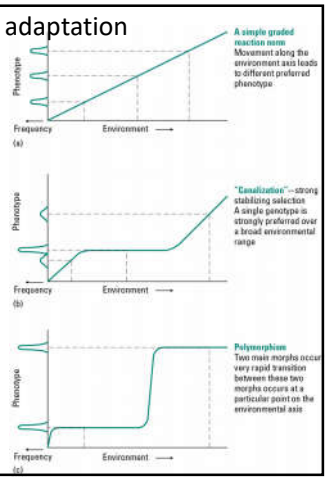
Reaction Norms

- Change in phenotype (or genotype) over a range of levels for one environmental variable (adaptagent).

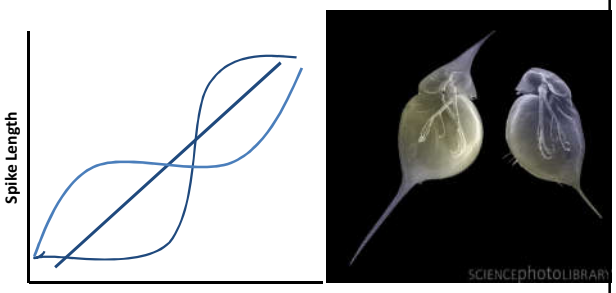


Plasticity, canalization and adaptation

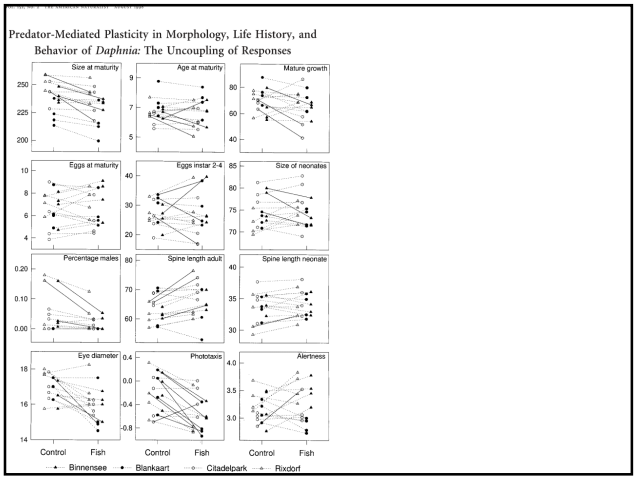
- Types of norms
  - **Graded**
  - **Canalized**
  - **Polymorphism**



Polymorphism example

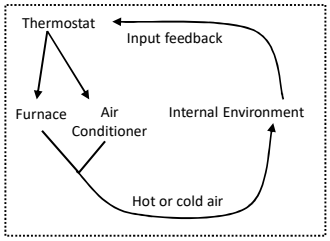


Remember – reaction norms can apply to morphology, behavior, physiological traits etc.



Homeostasis

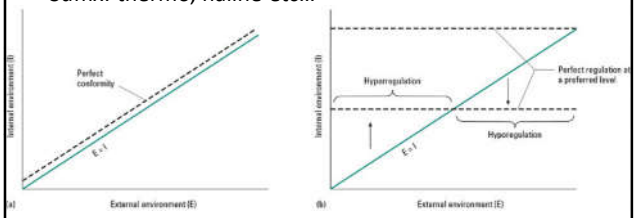
- Regulation of internal body conditions
- Often regulated via negative feedback system



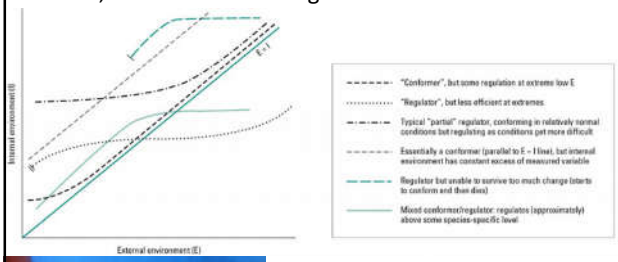
External Environment

External vs. Internal conditions

- Three general types of managing internal conditions
  - **Avoiders**
  - **Conformers**
  - **Regulators**
- Prefix: **Homeo** or **poikilo**
- Suffix: thermo, haline etc…

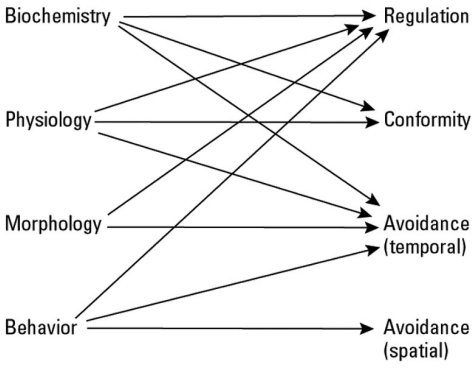


Avoiders, Conformers and Regulators



Icefish:
Stenothermal or eurythermal?
Oligothermal or polythermal?
Homeothermic or poikilothermic?
Ectothermic or endothermic?
Avoider, conformer or regulator?

Various methods for regulating, conforming or avoiding



Mechanisms of Adaptation

- **DNA** – genotype
- **Phenotype** – what selection acts on.
- Review basics of **protein synthesis.**
- Genes are expressed to produce proteins. Proteins perform most functions, make up what the phenotype is.