

The Organism in Its Environment (1)

I. The Meaning of Adaptation

A. Components of Natural Selection

II. Tolerance

A. Liebig's Law of the Minimum

B. Law of Limiting Factors

C. Shelford's Law of Tolerance

III. Constraints and Trade-Offs

IV. Autotrophs and Heterotrophs

A. Autotrophs – Primary Producers

B. Heterotrophs

1) Secondary Producers

2) Consumers

3) Decomposers

Plant Adaptations (1): Photosynthesis and the Light Environment

I. Photosynthesis

A. Light and Dark Reactions

1) Dark Reactions

a. Rubisco

b. Calvin-Benson Cycle = C₃ cycle (handout)

B. Uptake of Carbon Dioxide

C. Transpiration

D. Dark Respiration

E. Alternate Photosynthetic Pathways: C₄ and CAM Plants

II. Light

A. Response of Net Photosynthesis to Variation in PAR

1) Light Responses Curve

2) Light Compensation Point

3) Light Saturation Point

4) Photoinhibition

B. Plant Response to Reduced PAR

C. Plant Adaptation to Variation in the PAR Environment

1) Shade Intolerant versus Shade Tolerant Plants

D. Response to Ultraviolet Radiation

1) Ozone Depletion

III. Periodicity and Plant Processes

A. Critical Daylength

1) Day-Neutral Plants versus Short-Day Plants versus Long-Day Plants