Ecology, Spring 2004

Text reading assignments and study questions

Chapter 4 Temperature Relations

pp. 85-88 (stop at "Aquatic Temperatures")
pp. 89-91 (stop at "Temperature and Bacterial Activity")
pp. 92-93 (stop at "Temperature Regulation by Plants")
p. 96 (stop at "Grasshoppers…")
pp. 97-99 (start at "Temperature Regulation by Endothermic Animals"; stop at "Aquatic Birds and Mammals")
pp. 105-106
p. 107

- Be able to use the following terms: macroclimate, microclimate, acclimation, ectotherm, endotherm, evaporative cooling, metabolic heat.
- Explain how plants can create microclimates. Use an example.
- Draw a graph predicting temperature optima of enzymes from: a starfish from the Alaskan coast and a starfish from the coast of Panama.
- Use the concept of acclimation to explain why Olympic athletes often train at high latitudes where oxygen concentration is low.
- Explain how the following organisms regulate temperature: alpine lizards, humans.
- Be able to answer review questions 1 - 6, 9 on p. 108.

Chapter 5 Water Relations

pp. 111-112 (stop at "Water Content of Air")
pp. 113-114 (start at "Water Movement in Aquatic Environments"; stop at "Water Movement Between Soil and Plants")
pp. 120-122 (start at "Water Conservation by Plants and Animals"; stop at "Dissimilar Organisms…")
pp. 127-129 (start at "Case Histories"; stop at "Applications and Tools")

- Be able to use the following terms: isosmotic, hypoosmotic, hyperosmotic.
- Design the ideal leaf for a desert plant (not a cactus). Contrast this leaf with a typical leaf from plant suited for a humid environment.
- Lizards' scales provide some protection from drying, but salamanders' moist skins do not. Predict differences in thermoregulation by lizards and salamanders.
- Be able to answer review questions 1, 7 - 9 on p. 134.

Chapter 6 Energy and Nutrient Relations

pp. 137-138 (stop at "Measuring PAR")
pp. 138-144 (stop at "Carnivores")
p. 157 (start at "Summary Concepts")

- Be able to use the following terms: autotroph, heterotroph, herbivore, detritivore, carnivore
- Why is photosynthesis referred to as "carbon fixation"?
- Explain how C_4 and CAM photosynthesis help plants cope with life in a dry environment.
- Be able to answer review questions 2 - 4 on p. 158.

Chapter 8 Population Genetics and Natural Selection

pp. 189-191 (stop at "Variation in Plant Populations")
pp. 195-196 (start at "Phenotypic and Genetic…"; stop at "Variation in Animal Populations")
pp. 198-202 (start at "Case Histories"; stop at "Genetic Variation in Island Populations")
pp. 204-207 (start at "Case Histories"; stop at "Applications and Tools")
pp. 211-212 (start at "Summary Concepts")

- Explain the evidence of Clausen, Keck, and Heisey that alpine *P. glandulosa* are adapted to their habitat.
- Draw two graphs predicting the results of a common garden experiment: 1) if populations are not adapted to their habitats, and 2) if populations are adapted to their habitats.
- Why is it helpful to know when a population will not undergo genetic change (i.e., will not evolve)?
- A rare allele occurs at a frequency of 0.004 in a population; the alternative allele has a frequency of 0.996. Use the Hardy-Weinberg equations to calculate the frequency of each genotype (homozygous rare, heterozygous, homozygous common).
- Be able to answer review questions 4 - 9.