

Lecture Outline

INSECT ECOLOGY

I. Trophic Relationships

- A. Phytophagous Insects - Herbivores
 - 1. monophagous, oligophagous, polyphagous
 - 2. detoxification enzymes
 - 3. feeding guilds
- B. Zoophagous Insects - Carnivores
 - 1. predation - entomophagy
 - 2. parasites / parasitoids
 - 3. hyperparasitism
 - 4. vertebrate parasites
- C. Decomposers - Saprophytes
 - 1. odor attractants
 - 2. dung beetles

II. Protective Strategies

- A. Survival
 - 1. diapause
 - 2. antifreeze
 - 3. migration
 - 4. polymorphism
- B. Defense
 - 1. chemical secretions
 - 2. aposematic coloration
 - 3. mimicry - Batesian and Mullerian
 - 4. cryptic coloration
 - 5. intimidation displays
 - 6. alarm reactions
- C. Coevolution
 - 1. insect/plant
 - 2. predator/prey

III. Population Dynamics

A. Demography

1. natality - fecundity and fertility
2. mortality
3. movement
 - a. immigration and emigration
 - b. aggregation and dispersal

B. Population Regulation

1. density independent factors
 - a. weather and microclimate
2. density dependent factors
 - a. exploitation
 - i. predators
 - ii. parasites
 - iii. pathogens
 - b. competition
 - i. intraspecific -scramble/contest
 - ii. interspecific - displacement
 - c. cooperation - symbiosis
 - i. mutualism
 - ii. commensalism

IV. Population Growth

A. Life Tables

1. intrinsic rate of increase
2. carrying capacity
3. extinction

B. Developmental Rates

1. growth curves
2. physiological time
3. developmental thresholds

Life Table for the European Corn Borer

<u>Age Interval</u>	<u>No. of Individ.</u>	<u>Mortality Factors</u>	<u>% Mortality</u>
egg	300	parasites & infertility	16.9
larvae	249.3	parasites & predators	66.1
pupae	84.5	parasites & predators	11.7
adults (pre-repro)	74.6	migration	93.7
reprod. adults	4.8	negligible	
