

## **Part I. Interspecific Competition**

### **I. Introduction to species interactions**

- A. Mutualism**
- B. Commensalism**
- C. Amensalism**
- D. Predation**
- E. Parasitism**
- F. Types of Interspecific Competition**
  - 1) Exploitative Competition**
  - 2) Interference Competition**

### **II. Classic Competition Theory**

- A. Lotka-Volterra Model**
  - 1) Assumptions**
  - 2) Mathematical Interpretations**
  - 3) Competitive Outcomes**
- B. Competitive Exclusion**
  - 1) Competitive Exclusion Principle**
  - 2) Diffuse Competition**

### **III. Resource Partitioning and Utilization**

- A. Resource Partitioning: Theoretical Considerations**
- B. Differential Resource Utilization**

### **IV. The Niche**

- A. Fundamental Niche versus Realized Niche**
- B. Niche Overlap**
- C. Niche Responses**

## **Part II. Concepts of Predation**

### **I. Introduction to Predation**

- A. Types of Predation (Biophagy)**
  - 1) Parasitoidism**
  - 2) Cannibalism**
  - 3) Herbivory**

### **II. Models of Predation**

- A. Lotka-Volterra Model**
  - 1) Assumptions of the Model
  - 2) Graphical Analysis
    - a. Predator-Prey Isoclines
    - b. Stable Oscillation
- B. Nicholson-Bailey Model**
- C. Rosenzweig-MacArthur**
- D. Ratio-Dependent Predation**

### **III. Predator Response**

- A. Functional Response**
  - 1) Type I Response
  - 2) Type II Response
    - a. Handling Time
    - b. Holling's Disk Equation
  - 3) Type III Response
    - a. Prey Threshold of Security
    - b. Switching
    - c. Search Image
- B. Numerical Responses**

### **IV. Foraging Theory**

- A. Optimal Diet**
- B. Foraging Efficiency**
- C. Risk-Sensitive Foraging**