Biology 771
The Evolutionary Ecology of Species’ Interactions
Fall Semester 2000
Dr. Karen Brown Sullivan, 515 Hubbard Hall

<table>
<thead>
<tr>
<th>RECIPROCAL EFFECTS OF SPECIES</th>
<th>CLASSIFICATION OF INTERACTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>A AND B</td>
<td></td>
</tr>
<tr>
<td>++</td>
<td>*Mutualism, *Mullerian Mimicry</td>
</tr>
<tr>
<td>- -</td>
<td>Competition</td>
</tr>
<tr>
<td>+ -</td>
<td>Predation, Parasitism, Batesian Mimicry</td>
</tr>
<tr>
<td>+ 0</td>
<td>*Commensalism</td>
</tr>
<tr>
<td>0 0</td>
<td>*Neutralism</td>
</tr>
<tr>
<td>- 0</td>
<td>Amensalism</td>
</tr>
</tbody>
</table>

*Types of Symbiosis

Lecture Topics

1. Competitive Interactions
   A. The Lotka-Volterra Competition Equations and Diffuse Competition
   B. Competitive Exclusion
   C. The Balance between Intraspecific and Interspecific Competition
   D. Evolutionary Consequences of Competition
   E. Laboratory Experiments in Competition
   F. Field Studies: Character Displacement, Ecological Release, Introduced Species

2. Predation and Parasitism
   A. The Lotka-Volterra Predator-Prey Equations and Oscillations
   B. The Functional and Numerical Response of Predators
   C. Prudent Predation and Optimal Yield
   D. Evolutionary Consequences of Predation: Prey Escape Tactics and Types of Mimicry
   E. Laboratory and Field Experiments in Predation
   F. Types of Parasitism: Ectoparasites, Endoparasites, Social parasites
   G. Coevolution among Herbivores and Plants (Herbivores as Predators?)

3. Mutualisms
   A. Endosymbiosis
   B. Plant-Pollinator Interactions and Conservation
   C. The Role of Floral Symmetry in Pollinator Coevolution
   D. Examples of Mutualisms among Diverse Groups of Organisms
   E. Other Types of Symbiotic Relationships

4. The Role of Indirect and Direct Interactions in Ecosystems
   A. Types of Indirect Interactions: Exploitative Competition, Apparent Competition, Food Chain
      Mutualism, Competitive Mutualism, and Facilitation
   B. Complex Interactions
   C. Species Interactions and Community Structure/Diversity

Course Requirements

Although there is not a required textbook for this course, there will be assigned readings from classic and current research papers. The course grade will be based on performance on four mid-term examinations (75%) and a written research paper (25%). Students enrolled for graduate credit will also be required to present a 25 minute seminar summarizing their research paper. Midterm examinations will be given on the following dates: September 15, October 13, November 8 and December 4.