III. Community Ecology

A. Community Definition

B. Community properties
   1. Species number
   2. Relative abundance
   3. Species diversity
   3. Relationships among species

C. Effects of species interactions on species diversity
   1. Paine’s intertidal experiment

D. Effects of patchiness and disturbance on species diversity
   1. The intermediate disturbance hypothesis
Community Ecology
Species number varies

Alpine tundra

tropical forest

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Fig. 53.21 Species Diversity

Simpson’s D = 4

Simpson’s D = 1.53
Fig. 53.22 A common pattern of species relative abundance

A histogram showing the distribution of species abundance. The x-axis represents the number of individuals represented in a sample, and the y-axis represents the number of species. The graph illustrates a species abundance distribution where a few species are common and many are rare.
Fig. 53.11 A food web
Rocky intertidal community
Simplified food web of a rocky intertidal community

- Pisaster (sea star)
  - Chitons 2 sp
  - Limpets 2 sp
  - Thais (snail)
  - Bivalves (Mussels)
  - Acorn Barnacles 3 sp
  - Goosenecked Barnacles 1 sp
Disturbance
Fig. 53.19 Succession on glacial moraines
<table>
<thead>
<tr>
<th>Years after Deglaciation</th>
<th>Dominant Plant</th>
<th>Other Common Species</th>
</tr>
</thead>
<tbody>
<tr>
<td>0–30</td>
<td>Dryas</td>
<td>Fireweed, willows, mosses, cottonwoods</td>
</tr>
<tr>
<td>30–80</td>
<td>Alder</td>
<td>Willows</td>
</tr>
<tr>
<td>80–200</td>
<td>Sitka spruce</td>
<td>Alder, willows</td>
</tr>
<tr>
<td>200–300</td>
<td>Sitka spruce,</td>
<td>Mountain hemlock</td>
</tr>
<tr>
<td></td>
<td>western hemlock</td>
<td></td>
</tr>
<tr>
<td>&gt; 300</td>
<td>Sphagnum moss</td>
<td>Bog plants</td>
</tr>
<tr>
<td></td>
<td>(in flat areas)</td>
<td></td>
</tr>
</tbody>
</table>