I. Definition
- Coevolution = evolution in two or more species in which the evolutionary changes of each species influence the evolution of the other species

- Can be mutualistic or antagonistic
- Another definition = evolution due to biotic interactions

II. Sequential Evolution
- Definition =
- By definition, this is
- E.g., Jermy suggests that
  - biochemical weaponry
  - Change in a food plant

III. Host-Parasite Coevolution
- Form of antagonistic coevolution or “arms race”
- Examine virulence and congruent phylogenies
- E.g., Myxoma virus and rabbits in Australia
  - In 1950, it was introduced to control pestiferous rabbits and was initially a deadly success (99%) 
  - Using lab experiments with

IV. Host-Parasite Coevolution
- Individual selection should favor viruses that reproduce the most
- However, kin selection
  - If the host is infected with only one parasite, then all of its offspring will be highly related
  - Prediction:

  - Vertical
  - vs. horizontal
  - Prediction:

V. Host-Parasite Coevolution
- The data support both predictions
- E.g., Herre (1993) examined nematode infection of fig wasps
VI. Predator-Prey Coevolution
   • Vermeij’s (1987) work on fossil
   • Over time, predators show
     • Over time, mollusks also show

VII. The Role of Competition
   • Recall that complexity is one trait
   • Competition is
     • Character displacement

VIII. The Red Queen Hypothesis
   • Van Valen coined the term after Lewis Carroll’s, *Alice Through the Looking Glass*. The Red Queen said:
     • The analogy for running is
     • Natural selection continually operates

IX. Products of Coevolutionary Arms Races
   • Camouflage in both predators and prey
   • Warning coloration
   • Mimicry
   • Aggression
   • Chemical warfare-sequestration of chemicals

X. Mutualistic Coevolution
   • Fossil record suggests coevolution between angiosperms and insects
   • Plants-N fixers
     • *Rhizobium* in legume nodules
   • Ant-aphid
   • Ant-plant
   • Pollinator-plant

XI. Pollinator-Plant Coevolution
   • Hummingbird beaks and insects proboscises
   • Fig and fig wasps; Yucca and yucca moths
     • Pellmyr’s work has shown
     • A female moth inserts