Tropical Rainforest

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Climate

• 250 cm of rain a year
• Humidity of 77-88%
• Average temperature: 20-34 degrees Celsius
• Near equator
Abiotic factors

- “wet-deserts”: warm and rainy
- Water: necessary for all life in rainforest
- Sunlight: The ozone layer at the equator allows for maximum amount of sunlight; however, not a lot of sunlight hits the ground.
- Soil: Top layer provides nutrients

- Tropical rainforests supply about 20% of the world’s oxygen
Soil

• Rainforest soil is bad for agriculture
• Only the topsoil is rich with nutrients
• The nutrients get recycled faster than normal

Decomposers:
- leaf-cutter ants
- termites
- Bacteria
- fungi

http://indianapublicmedia.org/amomentofscience/rain-forest-soil-poor-trees-cut/
Food Web

Decomposers—earthworms, fungi, termites, and bacteria

A Food Chain in the Tropical Rain Forest Biome

Larger Predators
- Jaguar
- Snakes

Small Predators, Carnivores, Insectivores
- Reptiles
- Amphibians
- Bats
- Insects
- Birds

Primary Consumers
- Small Mammals
- Insects
- Parrots
- Monkeys
- Bats

Primary Producers
- Canopy level trees
- Understory trees
- Vines
- Epiphytes
- Many flowering plants

Emergent Layer
- Canopy
- Understory Layer
- Shrub Layer
- Ground Layer
  Bacteria, protozoans, fungi, detritivores rapidly digest all dead matter. Roots spread out just under the ground surface to capture nutrients.
Ecotone

- Definition: The transition area between two habitats
- Example: Transition point between Africa and savannah
Limiting Factors

- Sunlight
- Humans
- Weather
- Climate
- Soil

Adapted Plants

- **Kopak Tree**: Umbrella shaped and grows up to 150 feet
  - Adapted to sunlight by growing taller and wider
- **Strangler Fig**
  - Unable to grow tall on its own, uses other trees
- **Curare**
  - Has wide leaves for maximum absorption of light
  - Poisonous: prevents it from being eaten
Reasons for High Biodiversity

- Natural disturbances: tropical storms = damage = large gaps of destroyed plants = allows for new pioneer species = climax species
- Different layers = plants and animals w/ varied light and nutrient requirements to survive - emergent trees allows for vertical biodiversity
  - b/c of constant sunlight = enough to support plants in the lower strata
  - b/c no intense temperature changes = plants can devote all energy to growth and reproduction
- Stable climate = constant food supplies for organisms
- Age of forest = most time to become diverse

Fungi - Can't withstand pH lower than 3 or 4
- Dies when there isn't enough decaying matter
Ecosystem

- Generalist species:
  - **Fossa**: cat-like carnivorous animal. Diet = lemurs, rodents, insects, reptiles

- Specialist species: **Jambu Fruit dove**
  - Only eats Fruit

- Indicator species:
  - **tropical frogs** = consume large amounts of insects and are preyed.
  - small toads eat invertebrates and large frogs eat birds, fish, and small mammals
  - b/c frogs stabilizes an ecosystem = good indicator species = gauge population size

- Keystone Species:
  - **Jaguar**: predator that is able to control and stabilize ecosystem
Resource Partitioning

1. Lion-tailed Macaques
2. Bonnet Macaques
3. Hanuman Langurs

- Each eats different plant species
- Eat at different tree heights
- Resources are divided among each species to avoid competition

Symbiosis

- **Mutalistic** - Fungi provide nutrients for ants and in return the ant community keeps their larvae in the fungi which protects it and feeds it.

- **Commensalistic** - Bromeliad (plants on trees) provide shelter for frogs. Plants don’t receive any benefits in return.

- **Parasitic** - Strangler figs grow on their host tree and wraps itself around it, eventually strangling and taking the nutrients from it.
Environment problems and statistics on endangered species

- Deforestation
- Soil erosion (due to deforestation)
- Burning land for rice fields
Environmental Groups/Laws

- The Rainforest Foundation: against deforestation ruining homes of people and animals
- IBAMA, Brazil's Environmental Protection Agency: against human destruction of forest
- 1996 law in Southern America that prevents people from cutting more than 20% of the Tropical rainforest