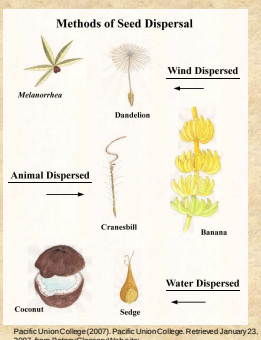
Mechanisms of Seed Dispersal:

Animals, Wind, Water, & Other



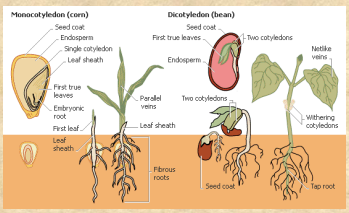
Pacific Union College (2007). Pacific Union College. Retrieved January 23, 2007, from BotanyGlossaryWeb site: http://www.puc.edu/Faculty/Gilbert_Muth/botglossw.htm

How do plants disperse their seeds?

- Animals
  - Carry seeds on fur or feathers
  - Eat edible fruits that contain seeds and pass through digestive system to be deposited later
  - Collect and bury seeds (ants and squirrels)
- Nature
  - wind…winged seeds, puff seeds, tumbleweeds
  - Water…float and travel to another location
  - Fire…some pine cones open only with heat

Mature Seed:

- ***Consists of an embryo that is frequently surrounded by a food reserve and a protective coating.***
- ***Is capable of germinating under the proper conditions and forming a mature plant.***



D. Seeds. Retrieved January 23, 2007, from Dierdra's Home Page Web site: http://students.umm.maine.edu/dierdre.fice/student3.html

Seed Dispersal:

- ***Adaptive mechanism of plants that ensures seeds will be:***
  - ***separated from the parent plants.***
  - ***distributed over as large an area as possible to ensure the germination and survival of some of the seeds to adult plants.***

http://www.visualsunlimited.com/images/watermarked/306/306990.jpg

Dispersal by Animals:

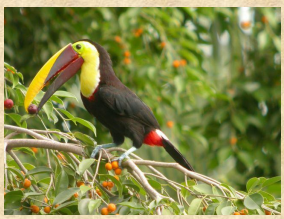
- Most flowering plants use animals to carry seeds.

Overview.net.Ltd (1995). Retrieved January 26, 2007, from Microscopy-UK Web site: http://www.microscopy-uk.org.uk/mag/imgoct00/pjpb3.jpg

Dispersal by Animals cont'd

- Some flowering plants produce edible fruits.
- These juicy, tasty, sweet, colorful fruits often have seeds that are animal dispersed.

Toucan eating fruit from a tree.



(Jan 26,2007). Retrieved January 26, 2007, from Oiseaux.net Web site: http://www.oiseaux.net/oiseaux/pictures/images/toucan.de.swainson.thbe.3q.jpg

Dispersal by Animals cont'd

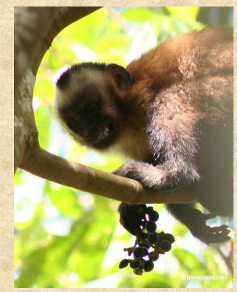
- **When the seeds of the plant become mature, the surrounding fruit becomes softer and its sugar content increases.**
- **Some fruits become fragrant and brightly colored to advertise their ripeness to animals.**

Ripened and unripened banana fruits on banana tree

M. (April 16, 2004). Our Florida Garden. Retrieved January 26, 2007, from Welcome to Mimi's HomePage Web site: http://www.mchristi.wso.net/new_garden.html

Dispersal by Animals cont'd

- Interactions with animals have helped flowering plants become the most successful plants on earth.



Brown capuchin monkey (Cebus apella) snarling while eating fruit.

Butler, R. (2007). World Travel Photos. Retrieved January 26, 2007, from Tropical Rainforest Conservation Web site: http://www.mongabay.com/images/peru/tambopata/Tambopata_1028_4366a.jpg

Dispersal by Animals cont'd
Animals eat fruits and defecate:

- When the animal ingests the fruit the animal digests the fleshy part.
  - The seed coat usually prevents the digestion of the seeds.
- Many such fruits contain laxatives to help the process along.
- The tough seeds usually pass unharmed through the digestive tract.

- The animal deposits the seeds, along with a fertilizer supply, miles from the parent plant where the fruit was eaten.


Seed dispersal by animal ingestion,
Blue Jay scat contains Rosa seeds and others

- *Note: One of the most common colors of fruits is red, a color insects cannot see very well; therefore, most of the fruit is saved for animals large enough to disperse the seeds.*


(May 17, 2002). Black Cherries. Retrieved January 26, 2007, from Seed Dispersal Web site: http://www.units.muohio.edu/dragonfly/itb/index.htmlx


Baskauf, S. (Jan. 22, 2007). Plant Features. Retrieved January 26, 2007, from Bioimages Web site: http://www.cas.vanderbilt.edu/bioimages/biohires/m/hmoru2-frcloseup11062.jpg

Seeds traveling on animals:

- *Some flowering plants have fruits modified as burrs that cling to animal fur or the clothes of humans.*


Cocklebur seeds on fur, seed dispersal

Cavagnaro, D. (2007). Cockleburr on Fur. Retrieved January 26, 2007, from Visuals Unlimited StockPhotography Web site: http://www.visualsunlimited.com/browse/vu300/vu300400.html

Animals bury seeds

- Small animals collect seeds and bury them as food stores for a later date when food is scarcer. Occasionally, these animals do not return to collect these seeds, and they leave them planted in the ground.

Animals bury seeds cont'd

- Squirrels bury oak acorns and sometimes forget where they buried them, thus planting a tree far away from the parent plant.

natzoo.si.edu/Animals/.../UrbanNatureWatch/Watches

Animals bury seeds cont'd

- Blue Jays also bury acorns. They usually remember where they bury them, but at times they bury more than they need. This leaves some acorns in the ground, which may eventually sprout.

Wind Dispersal

- Small, hard, dry fruits are often dispersed by wind. Some plants have seeds within fruits acting as kites or propellers that aid in wind dispersal.

Seed dispersal from the Common Milkweed (Asclepias syriaca), North America.

Leroy Simon / Visuals Unlimited

Wind Dispersal cont'd:

- Most of these plants produce a large number of seeds, but most of the seeds will not produce mature plants.
- Their large number and ability to disperse to new habitats ensure that at least some will grow and eventually produce seeds themselves.

Overproduction

www.painetworks.com/pagesrf/ii/ii0822.html

Wind Dispersal cont'd:

- Some plants have seeds within fruits acting as kites or propellers that aid in wind dispersal.

Maple winged fruits

*www.oplin.lib.oh.us/tree/.../**maple**_hedge.html*

Wind Dispersal cont'd

- The entire tumbleweed plant dries up and is blown across fields and roads, dispersing seeds as it tumbles.

http://waynesword.palomar.edu/images/tweed3b.jpg

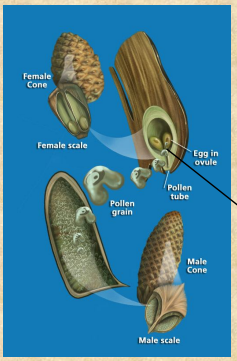
- Pine cones use wind to disperse their seeds:
  - After one to three years of maturing, the pine cone opens up and the winged seeds travel on the wind.

http://www.bio.brandeis.edu/fieldbio/pkenlan/HTML/Pinaceae/pinus_rigida.html

- Where natural fires are common, many seeds require intense heat to break dormancy.
- Seedlings are therefore most abundant after fire has cleared away competing vegetation.

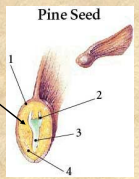
Ex: Pitch pine cone: during a fire the pitch pine cones will open in extreme heat.

http://www.campton.sau48.k12.nh.us/neflora/images/neflora/3-29_Pitch_Pine_Cone_small.JPG



http://www.karencarr.com/Images/Gallery/2004_gallery_gymnosperm_meiosis.jpg

- The process of seed production for pine trees to seeds.



Water Dispersal

- Some small, hard, dry fruits are also dispersed by water. These plants have seeds that float and travel on the water until washed up on shore.
- Fruits such as the large seeded pod of the 'Black bean' *Castano-spermum australe* (below) float well in water.

Water dispersal of seeds in the rainforest

http://rainforest-australia.com/Fruits_and_Seed_Dispersal.htm

Water Dispersal cont'd

- Some plants produce a moderate number of very large seeds with a high amount of nutrients, which ensures the survival of most of the offspring.

Coconut Palm

http://www.ericandleandra.com/photos/cancun/images/1_coconut_tree.jpg

Water Dispersal cont'd

http://waynesword.palomar.edu/plfec398.htm#crab

- Box fruits, ***Barringtonia asiatica***, are widespread drift fruits in the tropical Pacific, remaining buoyant for more than two years. They are common in the turquoise-blue waters of French Polynesia.

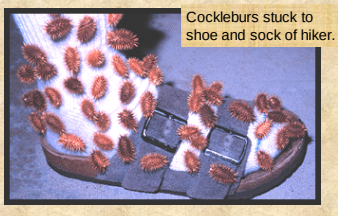
Popping Seeds

- Some seeds have evolved a popping mechanism for short distance dispersal.
  - As the seed matures, the pod or husk dries out and may start to shrink around the seeds.
  - After it shrinks so far, it may "pop" and scatter the seeds around.

Touch-me-nots are aptly named. The seed capsules develop from mid summer through fall. If touched, picked or otherwise disturbed, they rupture like a broken spring; projecting their seeds several feet.

http://www.isledegrande.com/giimages9/touchmenotseedpod.jpg

The End



Cockleburs stuck to shoe and sock of hiker.

http://waynesword.palomar.edu/images/cockle6b.gif