



## The Birds and the Bees: Pollination & Dispersal

- I. **Pollination.** Pollen must travel to other flowers in order for successful cross-pollination to occur. How does pollen get around to different flowers? There are two main ways this occurs:
- a. *Wind pollination.* Some plants use wind to spread pollen around. Grasses, oaks, pines and other plants that live in open environments with lots of wind will often utilize this method. The disadvantage to this method is that it is inexact – the pollen could land anywhere the wind takes it, and very few grains will land on the stigma of other flowers (some may land in your nose and make you sneeze!). Wind-pollinated plants produce abundant pollen to increase their chances of success.
  - b. *Animal pollination.* Some flowers utilize a middleman (or middlewoman) to get their pollen around. Flowers do this by attracting small animals or insects to them with bright colorful flowers and scents that are attractive to certain species of insects or animals. When the animal visits the flower, it is rewarded with nectar, pollen or edible flower parts. In the process of feeding, the animal gets pollen on its body, legs, beak, head or nose, and when it visits another flower of the same species for another snack, the pollen gets delivered to that flower's stigma! The disadvantage to this method is that nectar and bright beautiful flowers can be expensive for the plant to produce (meaning it uses up a lot of the plants' nutrients), but the advantage is that it is more exact than wind pollination.



- II. ***Pollination syndromes.*** Often it is possible to guess what pollinates a plant just by looking at the shape, depth, color and scent of a flower. These characteristics that help us predict the pollinator are called *pollination syndromes*. The following is a list of pollinator types and their respective pollination syndromes.

<b>Pollinator</b>	<b>Flower depth / shape</b>	<b>Flower color</b>	<b>Flower scent</b>	<b>Time of floral opening</b>	<b>Reward</b>
Bird	Deep, wide tube	Bright red	None (birds can't smell)	Day and night	Nectar
Bee	No depth or very shallow	Yellow, blue or purple	Fresh, sweet	Day and night	Nectar and/or pollen
Butterfly	Deep, narrow tube	Red, yellow or blue	Fresh, sweet	Day and night	Nectar
Moth	Deep, narrow tube	White or pale green	Strong, sweet	Night	Nectar
Fly	No depth, flat	Purple or brown	Decaying flesh	Day and Night	Nothing (flies are duped)
Beetle	Flat to bowl shaped	Brown, purple or dull	Strong, fruity	Day and Night	Edible flower parts
Bat	Brush like or bowl shaped	Dull white or green	Strong fermented, musky	Night	Nectar
Wind	No depth or very little, small, often unimpressive	Pale green or pale yellow	No smell	Day and night	None

- The pollinators listed above are the most common groups of pollinators, however there are some flowers that are pollinated by other animals (though they are less common), for example some rodents, small reptiles and primates are known to pollinate some flowers.
- It is important to realize that often there are exceptions to these general syndromes. Some bird-pollinated flowers are not red, for instance. However, these general pollination syndromes hold true for a great number of flowers. Also, there are some flowers that scientists consider to be “generalists” meaning they attract many different pollinator types and are not clearly trying to attract just one type.

III. **Seed and Fruit Dispersal.** Once the flower is pollinated it will form seeds and fruit, however this is not the end of the story. Plants must also disperse their seeds. For plants to be successful, they must get their young out into the world and away from the parent plant. If a tree just drops all of its young to the soil right beneath it, the seedlings will not likely survive, because the parent is already using up most of the soil's nutrients. Plus it is important for plants to colonize other areas where they have a chance of getting pollinated by plants not related to them and avoid too much inbreeding. Thus, plants must disperse their seeds. Plants have several methods of doing this:

- a. *Wind dispersal* – some plants produce tiny seeds that can be blown around in the wind or they equip their seeds with a wind-friendly device, like a papery wing or bit of fluff, that helps them fly.
  - i. Example: think of the fluffy white dandelions people often like to blow into the wind. Each of those fluffy white things has a seed attached at the bottom.
- b. *Water dispersal* – aquatic plants and coastal plants can utilize water to disperse seeds. Water-dispersed fruits or seeds can usually float and will find their way to new ground through water currents.
  - i. Example: coconuts have water in them to make them buoyant. They can travel across oceans!
- c. *Mechanical dispersal* – some plants disperse their seeds by physically flinging them away! Plants that do this usually develop a fruit that explodes and can propel the seeds a short distance.
  - i. Example: the woody fruits of mahogany are equipped to do this.
- d. *Animal dispersal* – numerous plants utilize animals to get their seeds around. Some will do this by making little dry fruits that stick to an animals' fur. The burs you get on your clothes when walking in some areas are not there just to annoy you; they are hitching a ride on you!

Many plants that utilize animals as dispersers do so with yummy fruit that animals like to eat. You might think, 'but wait – if the animal eats the fruit, then they eat the seed too.' However, the seed is often not digested. Instead, the seed passes through the digestive system of the animal and comes out the other end intact and somewhere far away from the parent plant. As a bonus, the seed gets dropped off with some fertilizer as well! Some fruits have bigger seeds that animals do not ingest, but the animal will eat the fruit around the seed and leave the seed behind somewhere.

Some animals, like squirrels, have a habit of burying and storing nuts or other fruits. Inevitably, the squirrel will forget about many of their buried nuts and those forgotten can germinate.

