Co-evolution of plants and their pollinators

A. Co-evolution

B. Plant reproductive biology

C. The problem of pollen transfer
   1. Attractants and rewards

D. Pollen vectors and syndromes
   1. Biotic vectors: bees, moths, butterflies, birds, bats, others
   2. Abiotic vectors: wind and water
   3. Pollination by deceit
   4. Reward thieves
What would your grade be if grades were assigned today?

Calculation of percentage of points earned so far:

Total points out of 300 =
Quiz1 + Quiz2 + Quiz3 + Quiz4 + Exam1(3.03) + Exam2(3.03)

Points earned/300 = Percent

**Approximate Grades:**

78% - 100%  A
65% - 77%    B
47% - 64%    C
less than 47% D
Attractants
- color
- scent
- shape

Rewards
- nectar
- pollen
- shelter
- chemicals
- heat
Pollination by bees
Nectar guides direct pollinators to rewards in the flower.

In wild geranium, the nectar guides are only visible under ultra-violet light.

UV light                  Natural light
Some flowers provide a landing pad for pollinators
A honeybee with full pollen baskets
Pollination by moths
Pollination by butterflies
Hummingbird pollination
A sunbird pollinating a bird-of-paradise flower
Bat pollination
Pollination by marsupials and spiders: it’s rare but it happens!
The generalist pollination syndrome has something for everyone
Wind pollination
Wind borne pollen has been found at 19000 ft altitude and as much as 3000 miles from the nearest possible source.
Hydrochory - pollination by water in Vallisneria
A carrion mimic that is pollinated by carrion flies
Hugo de Vries with a stinking corpse lily
A flower that mimics the gills of a fungus
A flower with fake pollen
Deceit pollination in bucket orchids
Pseudocopulatory orchids

These are flowers

This is not!
A nectar robber taking a reward without pollinating