Ana Espitia
VIST 305
2/12/15
Due: 2/17/15

Research the bee's natural habitat, dietary needs, and predators

Research the reasons why the bee is included on the Endangered Species List

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Bee's natural habitat, dietary needs, and predators;

Pollinators like bees have always been taking for granted but until recently we finally realize that preserving bees and other pollinators is essential for our economies that deeply depend on them. (reword)

- Bee's natural habitat:
  - It is believed that the original habitats are tropical climates and heavily forested areas.
  - They are known to thrive in natural or domestic environments. But prefer to live in gardens, woodlands, orchards, meadows, and other flower heavy areas.
  - Believed they originated in African and spread from there.
  - The reason why honey bees build nests inside tree cavities or under edges of objects is to hide themselves from predators and any other type of threat.
  - It is said that regardless of honey bees living in tropical or temperate climates, they maintain their hives with a constant temperature of 90 to 95 degrees F.
- Dietary needs:
  - The honey bee is a herbivorous animal and therefore lives purely on the nutrients from plants.
  - Honey bees require:
    - Nutrients must be present in the right ratio for honey bees to survive and thrive.
      - carbohydrates (sugars in nectar or honey)
        - nectar is the bees' energy source and extremely important for;
          - growth
          - breeding
          - flying
          - keeping warm
        - Sugar;
          - most effective for stimulating bees into breeding, foraging for pollen, and metabolizing stored honey and protein.
          - It helps for when out of season honey flow, to prepare bees for pollination, start bees breeding earlier in the Spring and to prepare hives for queen breeding.
          - stored honey is a good energy source but bees are reluctant to use it unless is extremely needed.
          - Feeding only on sugar is not a balanced diet
      - Protein (amino acids/pollen)
        - Pollen:
          - main source of protein and is required for muscle growth in brood and young adult bees.
          - Bees need pollen with at least 20% protein
          - Pollen is obtained from flowers or from pollen stored in the combs
        - It is regarded as very good for hive build-up
        - They consume body-protein to create jelly to feed their brood
        - Protein and amino-acids:
          - protein is not just protein. It is made up of separate parts called amino-acids

        - Amino-acids are individual kinds of materials
        - most amino-acids can be reconstituted from other amino-acids
        - but the ones that can't be reconstituted from other amino-acids are called essential amino-acids
        - all amino-acids are needed in specific quantities in order to obtain best results.
    - Bee body-protein:
        - Bees store protein in their body, and use it to make wings, muscles, and other body organs.
        - The higher protein level in their body the better for they are stronger and live longer.
        - They can have very high levels of body-protein levels of over 60% crude protein
        - When they have low body-protein of less than 30% they have a shorter life span, suffer from diseases, and produce very poor honey.
    - Protein and Stress:
        - According to the bee's level of stress they are under their required protein levels change rate.
- lipids (fatty acids, sterols)
    - A sterol, 24-methylene cholesterol, is common in pollen and is the major sterol source for honey bees.
    - Sterol is the precursor for important hormones such as molting hormone, which regulates growth because it is required at the time of each molt.
    - The total lipid concentration within a pollen supplement is recommended to be 5%–8%.
- vitamins
    - Nurse bees are thought to need the following vitamin B complex for brood rearing: thiamine, riboflavin, nicotinamide, pyridoxine, pantothenic acid, folic acid, and biotin. Ascorbic acid (vitamin C) also seems essential for brood rearing.
    - vitamin needs of a honey bee colony are satisfied if pollen stores are abundant in the hive or fresh pollen is being brought into the colony.
- minerals (salts)
    - High amounts of potassium, phosphate, and magnesium are required
    - Excessive levels of sodium, sodium chloride, and calcium have been shown to be toxic to honey bees
    - all the required minerals can be obtained from pollen, although nectar also contains minerals.
    - Dark honey contains higher levels of minerals
    - The optimal ash concentration for maximum brood rearing seems to be at 0.5%–1%. Pollen with more than 2% ash inhibits brood production.
- water (vital nutritional requirement)
    - bees forage for water for two reasons:
        - use it to dilute honey so that honey can be added to brood food
        - use water to cause evaporative cooling by fanning over a thin layer of water when the ambient temperature is over 35° C.
        - During winter time, bees have enough water from condensation over the inner cover, so the issue is usually too much water, which can drip on the cluster and kill bees if there is not adequate ventilation.

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- Predators:
    - Birds
    - Rodents
    - Reptiles
    - Insects
    - Apocephalus borealis larvae

Reasons why the bee is included on the Endangered Species List;

- falling victims to a combination of insecticides and parasites
- impaired protein production changes in agricultural practice
- unpredictable weather
- CCD; Colony collapse disorder
- TRSV; Tobacco ringspot virus affects the bees negatively
- habitat destruction
- pesticide use (e.g..Imidaclorid)
- poor nutrition
- viruses
- parasite varroa mite
- and stress are often mentioned as the likely causes
- inadequate food supply
- It is not 100% sure why they are disa

How they affect us the people and environment:

- Without bees to pollinate many of our favorite fruits and vegetables, the United States could lose $15 billion worth of crops -- not to mention what it would do to your diet.(reword)
- Apples, cucumbers, broccoli, onions, pumpkins, carrots, avocados, almonds … and it goes on
- Beekeepers first sounded the alarm about disappearing bees in 2006. Seemingly healthy bees were simply abandoning their hives en masse, never to return. Researchers call the mass disappearance Colony Collapse Disorder, and they estimate that **nearly one-third of all honey bee colonies in the country have vanished**.(reword)
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Random fun facts:

- Pine tree pollen is only 5% to 7% protein, so is a poor food source for bees
- Average life span: 6 weeks

Resources:

http://www.orkin.com/stinging-pests/bees/habitat-of-a-honey-bee/
http://en.wikipedia.org/wiki/Honey_bee
http://www.beeccdcap.uga.edu/documents/caparticle10.html
http://www.honeybee.com.au/Library/pollen/nutrition.html
http://www.endangeredspeciesinternational.org/insects6.html
http://www.nrdc.org/wildlife/animals/bees.asp

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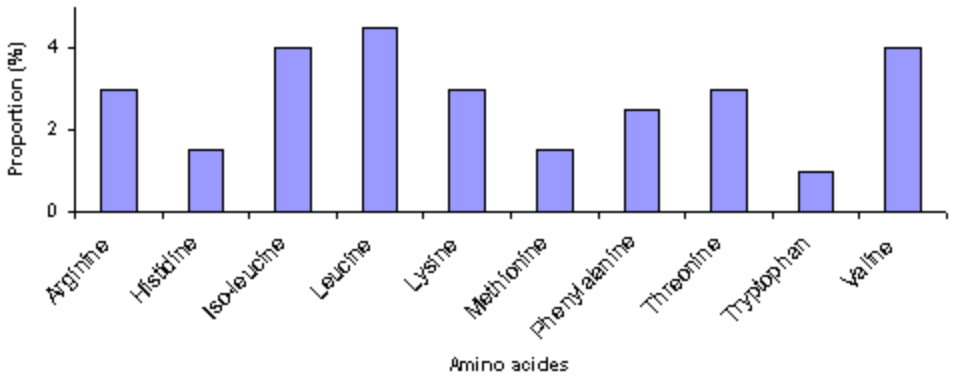
http://a-z-animals.com/animals/honey-bee/
https://www.whitehouse.gov/the-press-office/2014/06/20/fact-sheet-economic-challenge-posed-declining-pollinator-populations

Images/graphs:



Proportion (%) of the 10 essential amino acids needed by honey bees (deGroot, 1953).

Table 1: Essential amino-acids for honey bees

Amino-acid	Minimum required % of amino-acid in protein digested
Threonine	3.0
Valine	4.0
Methionine	1.5
Leucine	4.5
Iso-leucine	4.0
Phenylalanine	2.5
Lysine	3.0
Histidine	1.5
Arginine	3.0

Tryptophan	1.0

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List of what bees pollinate:

Fruits and Nuts

- Almonds
- Apples
- Apricots
- Avocadoes
- Blueberries
- Boysenberries
- Cherries
- Citrus
- Cranberries
- Grapes
- Kiwifruit
- Loganberries
- Macadamia nuts
- Nectarines
- Olives
- Peaches
- Pears
- Plums/Prunes
- Raspberries
- Strawberries

Vegetables

- Asparagus
- Broccoli
- Carrots
- Cauliflower
- Celery
- Cucumbers
- Cantaloupe
- Honeydew
- Onions
- Pumpkins
- Squash
- Watermelons

Field Crops

- Alfalfa Hay
- Alfalfa Seed
- Cotton Lint
- Cotton Seed
- Legume Seed
- Peanuts
- Rapeseed
- Soybeans
- Sugar Beets
- Sunflowers