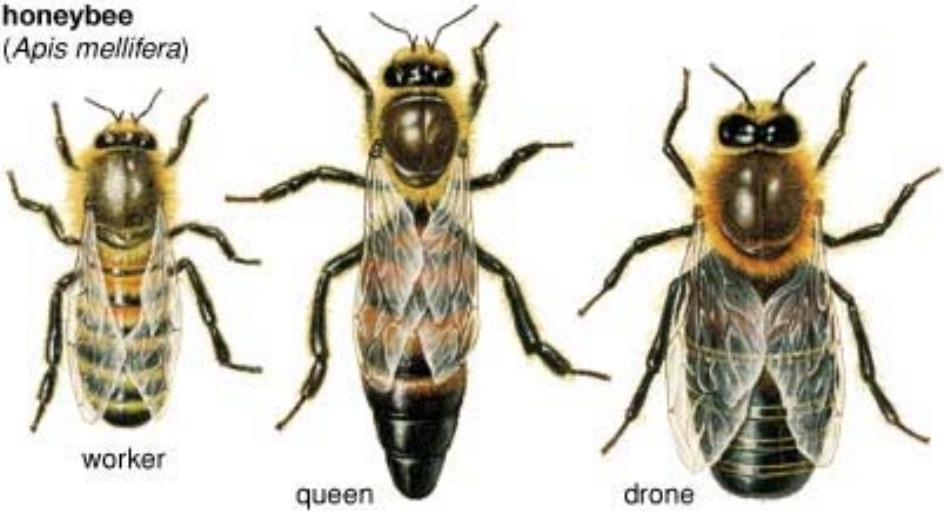


Honey Bee Lifecycle



Bauer, USDA

honeybee
(*Apis mellifera*)



worker

queen

drone

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Honey Bee Lifecycle

- ❑ Laid singly in individual cells
- ❑ Hatch after 3 days into larvae
- ❑ C-shaped, grub-like
- ❑ Fed by workers
- ❑ Feeds for few days
- ❑ Enters prepupa phase



Honey Bee Lifecycle

- PrePupa
 - ▣ Larvae elongates
 - ▣ Workers cap up the cell with beeswax
 - ▣ Turns in to pupae within hours
- Pupa
 - ▣ Does not feed
 - ▣ Little to no movement
 - ▣ Capped inside cell
 - ▣ Darkens and develops wings as ages
 - ▣ Chews through cap to emerge as adult
 - ▣ Egg to Adult –
 - 16-21 days





Honey Bee Adult

- Drone (only males) – form from unfertilized eggs
- Worker (sterile females), majority of colony
- Queen (reproductive) – fed royal jelly



Queen

- All eggs have the potential to become queens
 - Royal jelly – hours after hatching and through larvae
 - Food delayed, sub-optimal queen
 - Laid in special cells – peanut shaped
 - Egg to adult – 16 days
 - Largest in colony
 - Lives 3-4+ years
- First two weeks – mating flights
 - Holds sperm in spermatheca
 - Muscular control
 - Fertilized = females / Unfertilized = males
 - Deteriorates over time – drone > workers
- Lays up to 1500 eggs per day



Queen

- Queen is in control of the colony
 - ▣ Pheromones
- Suppresses ovaries of workers
- Stimulates foraging
- Prolongs workers' lives
- Coordinates swarms



- Constantly groomed, pheromones spread by workers
- Calming effect

Honey Bee Workers

- Variety of jobs, determined by age
 - ▣ Regulate hive temperature
 - ▣ Build, clean, maintain and defend hive
 - ▣ Forage gather for food
 - ▣ Determine what resources needed
 - ▣ Care for queen and brood

- 28 days from egg to adult



Honey Bee Workers

- Day 1-2 – Cell Cleaning (Housekeepers)
 - ▣ Clean brood cells before next use
- Day 3-11 – Nurse Bees
 - ▣ Feed worker larvae
- Day 6-11 – Advanced Nurse Bees
 - ▣ Feed royal jelly to queen larvae
- Day 12-17 – Wax Production (Builders)
 - ▣ Build & repair cells
 - ▣ Store nectar and pollen
 - ▣ Wax glands



Honey Bee Workers

- Day 22-42 –
Foragers
 - ▣ Travel up to 1.5 miles for food
 - ▣ Collect water and solid food
 - ▣ Communicate with other foragers for food/water source recruitment



Honey Bee Worker

- Has functional ovaries
 - ▣ Cannot mate
 - ▣ Half chromosomes – all males
- Pheromones from queen and brood, suppress ovary activation



Honey Bee Drones

- Develops from unfertilized egg
- Cannot sting
- Larger eyes – 2x
- Larger than worker, smaller than queen
- Gather, mate, hive construction, nursing
- 30 days from egg to adult



Lifecycle of a Honey Bee Colony

- Major goal – survive through the winter

- During winter
 - Colony clusters together for heat
 - First half – no brood produced
 - Drones killed off
 - Coldest temperatures (after winter solstice)
 - Begin reproductive phase



Lifecycle of a Honey Bee Colony

- Mid – Late Winter (coldest time)

- Eggs laid

- Food consumption increases

- Starvation and freezing a norm

- 70's New York – 25% colonies last past their first 12 months

- Early Spring – when nectar sources available

- Growth increases

- More workers emerging, more egg laid

- Food to supplement stored food



Lifecycle of a Honey Bee Colony

- Mid – Spring
 - ▣ Queen cells built, eggs laid, royal jelly fed
 - ▣ Several queen cells in various stages of development
 - Workers get queen excited
 - Parent queen and half workers take flight – swarm
 - Scouts find home within hours



Lifecycle of a Honey Bee Colony



- Remaining Spring/Summer
 - Hive continued to be built
 - Population built up to prepare for winter
 - Population ranges 10K-60K per year
 - 10 pounds biomass
 - Need 100 pounds to get through winter
 - Nectar seasons is extremely brief
 - Especially Texas (droughts and heat)
 - Must be efficient foragers