MIKA HARDISON-CARR

Beekeeping

Your First Year

Module 1

Table of Contents

Welcome

Welcome to Beekeeping! You are entering into a world that few know about but everyone depends on. Bees are literally the engine that makes our world go. One out of every three bites of food that are made possible by these little girls and guys. But what if there any bees? What would our world look like? Hmmmm.....
Lets see!

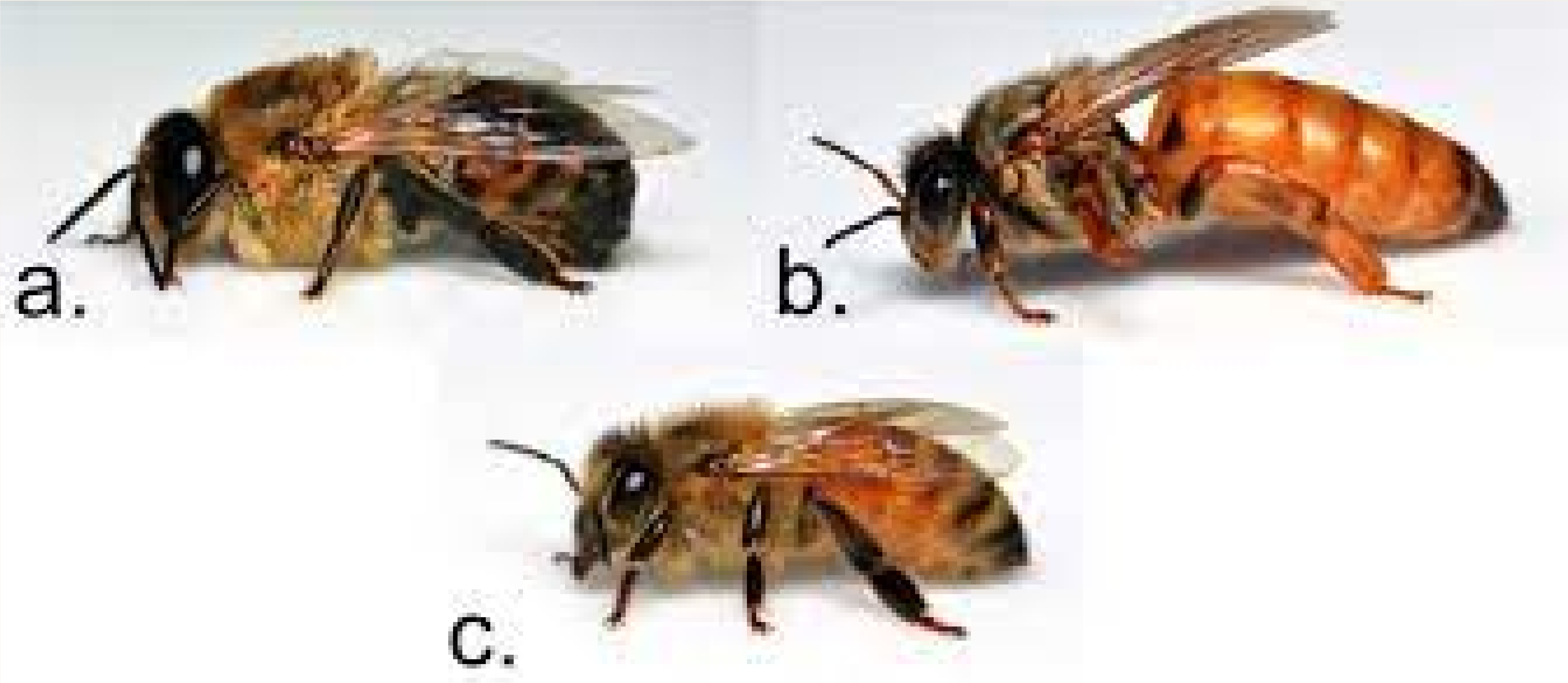
A World WIth No Bees

What if we woke up tomorrow and there were simply no bees? How would our world be different?

Well for one your could forget about your morning cup of Joe...your occasional glass of wine, and much more...

Honeybees are the worlds leading pollinators. Responsible for $30 billion a year in crops. Pollinators help pollinate approximately 75 percent of the world's flowering plants, and 35 percent of the world's food crops. Of the 100 crop species that feed 90% of the world, 70 depend on pollination. They pollinate 70 of the around 100 crop species that feed 90% of the world. If we lose bees, we lose all of the plants they pollinate, all of the animals and birds that eat those plants and ultimately the people who depend on those food sources. Half the fruits and vegetables in the grocery stores disappear overnight. A food structure that supports 7 billion people now cant support them all.

The Caste System



Drones—Drones are male honey bees. The drone's head and thorax are larger than those of the females. Drones' large eyes touch on the top center of their head, which makes them appear more "fly-like." Their abdomens are thick and blunt at the end rather than pointy like the abdomens of the females. Drones are responsible for passing the colony's genes on to the next generation by mating with queens from other colonies.

Queens—Honey bee queens are the reproductive females of the species. The queen's head and thorax are similar in size to those of the worker. However, the queen has a longer and plumper abdomen than does the worker. Throughout most of the colony life cycle, the queen is the only reproductive female in the colony and is responsible for producing all of the offspring within the colony.

Workers—Worker honey bees usually are non-reproductive females. They are the smallest in physical size of the three castes, and their bodies are specialized for pollen and nectar collection. Workers perform all brood care, hive maintenance, and hive defense tasks in their colony. Rather than specializing in one job only, each worker progresses through colony tasks in predictable order based on age. This progression is called temporal (or age) polyethism.

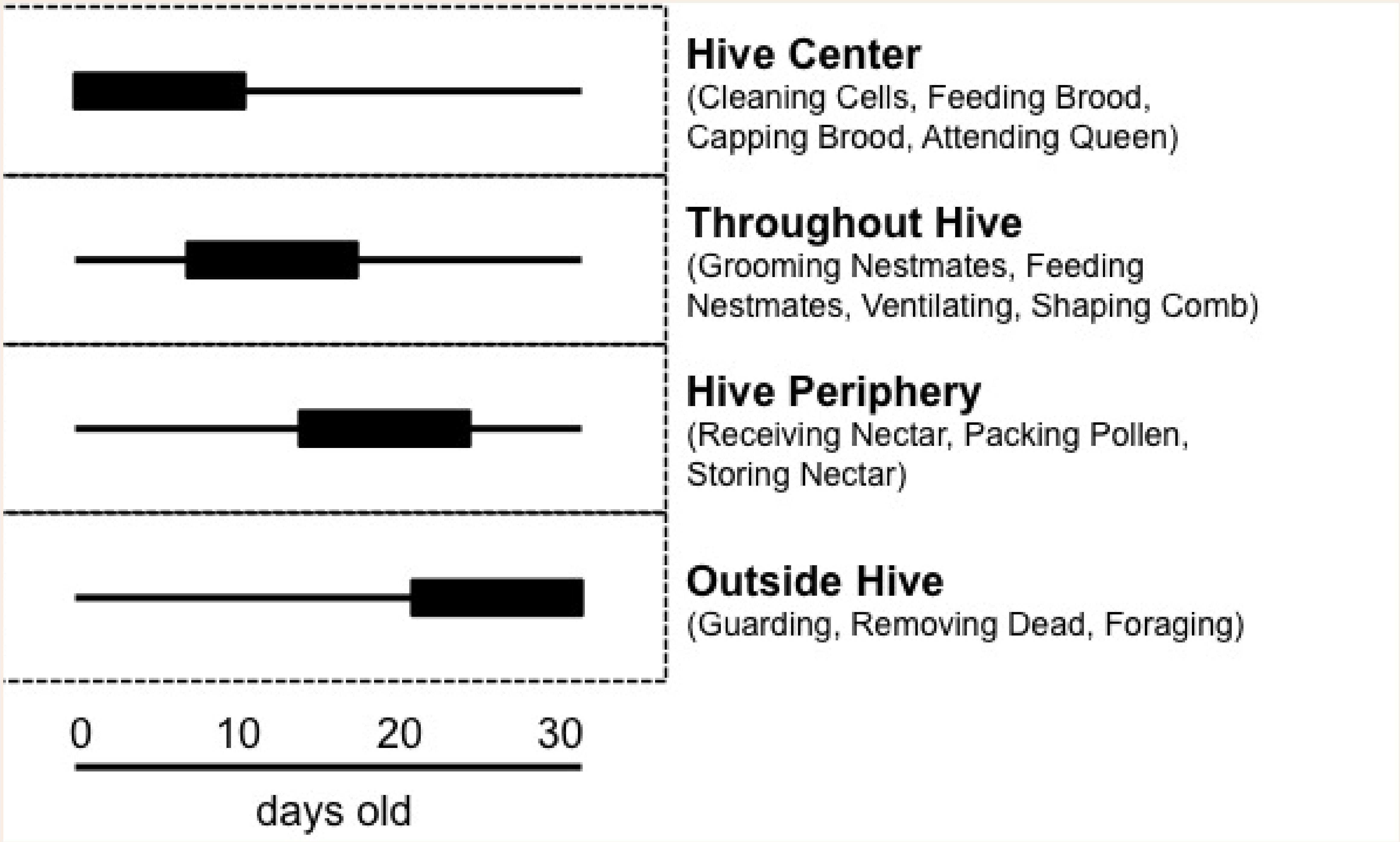
TEMPORAL POLYETHISM

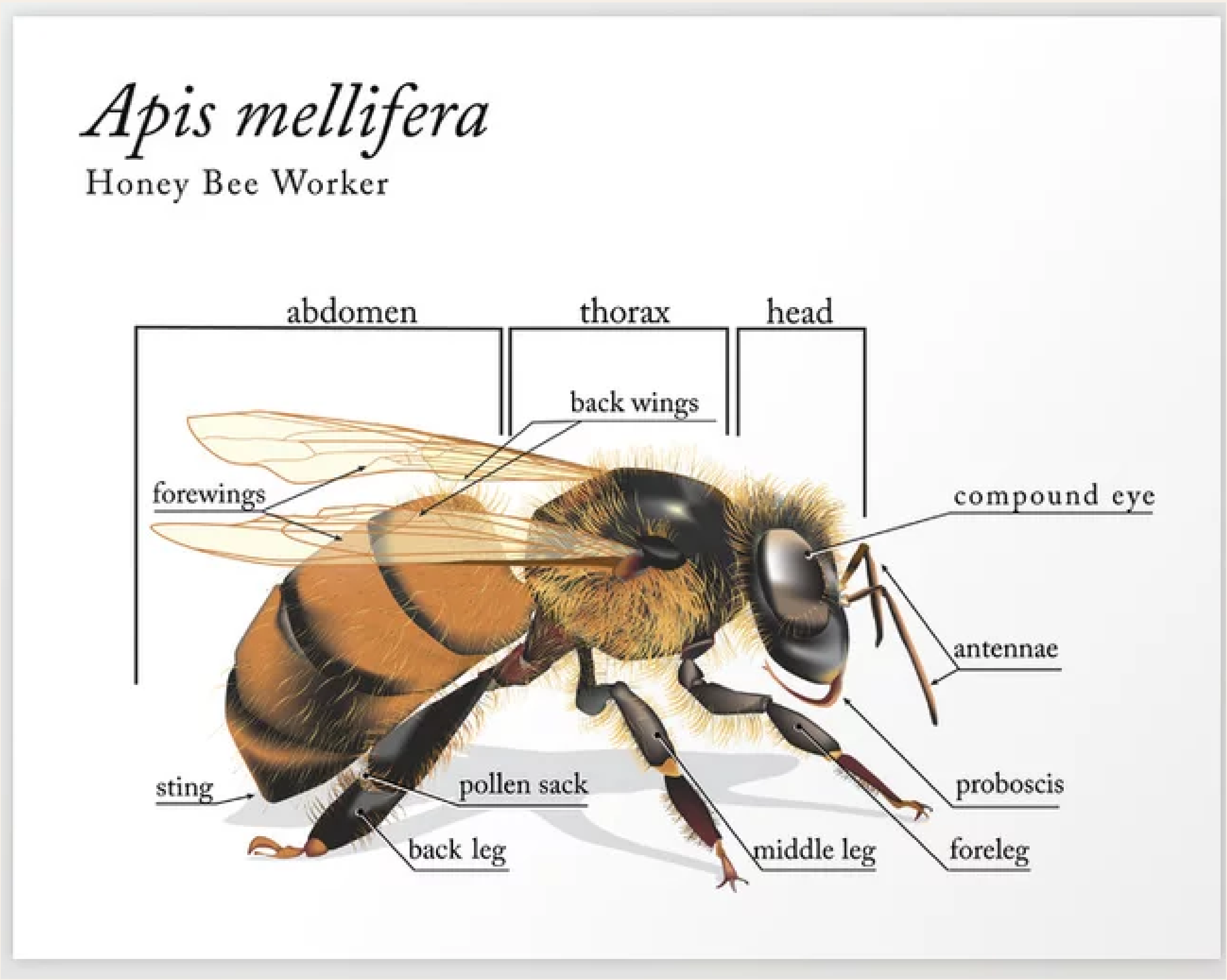
Temporal polyethism is the age-related division of labor that occurs within honey bee colonies. At different ages, worker bees are better suited to perform different tasks. Each worker performs colony tasks in a somewhat predictable progression throughout her lifetime rather than specializing in a single task.

In general, young workers perform jobs in the central area of the hive where the brood (immature honey bees) is. Young workers' jobs include cleaning brood cells, feeding and tending the brood, and tending to the queen. As they age, the workers take on duties in the outer regions of the hive. These jobs include building comb, receiving nectar and pollen, storing nectar and pollen, processing honey and ventilating the hive. The oldest bees perform tasks outside of the hive, such as guarding the hive, removing dead bees from the hive, and foraging.

This progression of jobs by age is believed to be regulated by juvenile hormone (JH). The levels of JH vary within a worker throughout her life. The changes in JH levels cause glands to activate/deactivate, which in turn changes workers' physiologies to fit their present jobs. For example, young bees tending brood have highly developed hypopharyngeal glands that enable them to produce the larval diet. On the other hand, older bees that are building comb have reduced hypopharyngeal glands, but highly developed wax glands for producing wax.

There is a fair amount of flexibility in the system, and not every bee will progress through the tasks in the most common order. For example, if many foragers are killed by pesticide exposure, younger bees will advance to foraging tasks more quickly than they would ordinarily in order to compensate for the loss. Conversely, if something like a brood disease dramatically reduces the number of young bees emerging, some older bees will revert to the "younger bee tasks" to ensure that all jobs are being completed


Hive Center
(Cleaning Cells, Feeding Brood,
Capping Brood, Attending Queen)
Throughout Hive
(Grooming Nestmates, Feeding
Nestmates, Ventilating, Shaping Comb)
Hive Periphery
(Receiving Nectar, Packing Pollen,
Storing Nectar)
Outside Hive
(Guarding, Removing Dead, Foraging)
0
10
20
30
days old


Apis mellifera
Honey Bee Worker
abdomen
thorax
head
back wings
forewings
compound eye
antennae
sting
pollen sack
proboscis
back leg
middle leg
foreleg

Antenna - are the main sensory organs, providing information on touch, smell, taste and hearing. There are 3000 odour recptors on each antenna of a worker bee, giving them an extremely well-developed sense of smell.

Brain - bees have excellent learning abilities. Their brains processes information used in navigation and communication as well as memory.

Compound eye - A compound eye is made up of many eye units. Each unit takes in a separate image and transfers the information to the brain where it is pieced together into a single image.

Glossa - is a long cylindrical "tongue" which can be extended and dipped into nectar.

Heart - unlike mammals, honey bees and insects have an open circulatory system, meaning their blood is not contained within tubes like veins or arteries. The blood is free-flowing throughout the body cavity and is pumped via the heart.

Honey stomach - A storage sac used to carry nectar back to the hive. It is an extension of the oesophagus with a valve at its end known as the proventriculus which prevents nectar from entering the ventriculus, or stomach, (unless needed).

Hypopharyngeal gland - used in the production of brood food which, together with the Mandibular glands, produce royal jelly for feeding queen bee larvae.

Mandibles - are mouthparts used to manipulate solid substances and for fighting (defence).

Ocelli - are the simple eyes as opposed to compound eyes. Bees have 2 large compound eyes and 3 ocelli. Compound eyes have poor image resolution, but possess a very large view angle and the ability to detect fast movement. Ocelli provide information for the bee on light intensity; bees can see ultra-violet light.

Spiracle - the breathing system in bees is a series of hollow tubes connected to air sacs in the body. The openings of these hollow tubes are called spiracles.

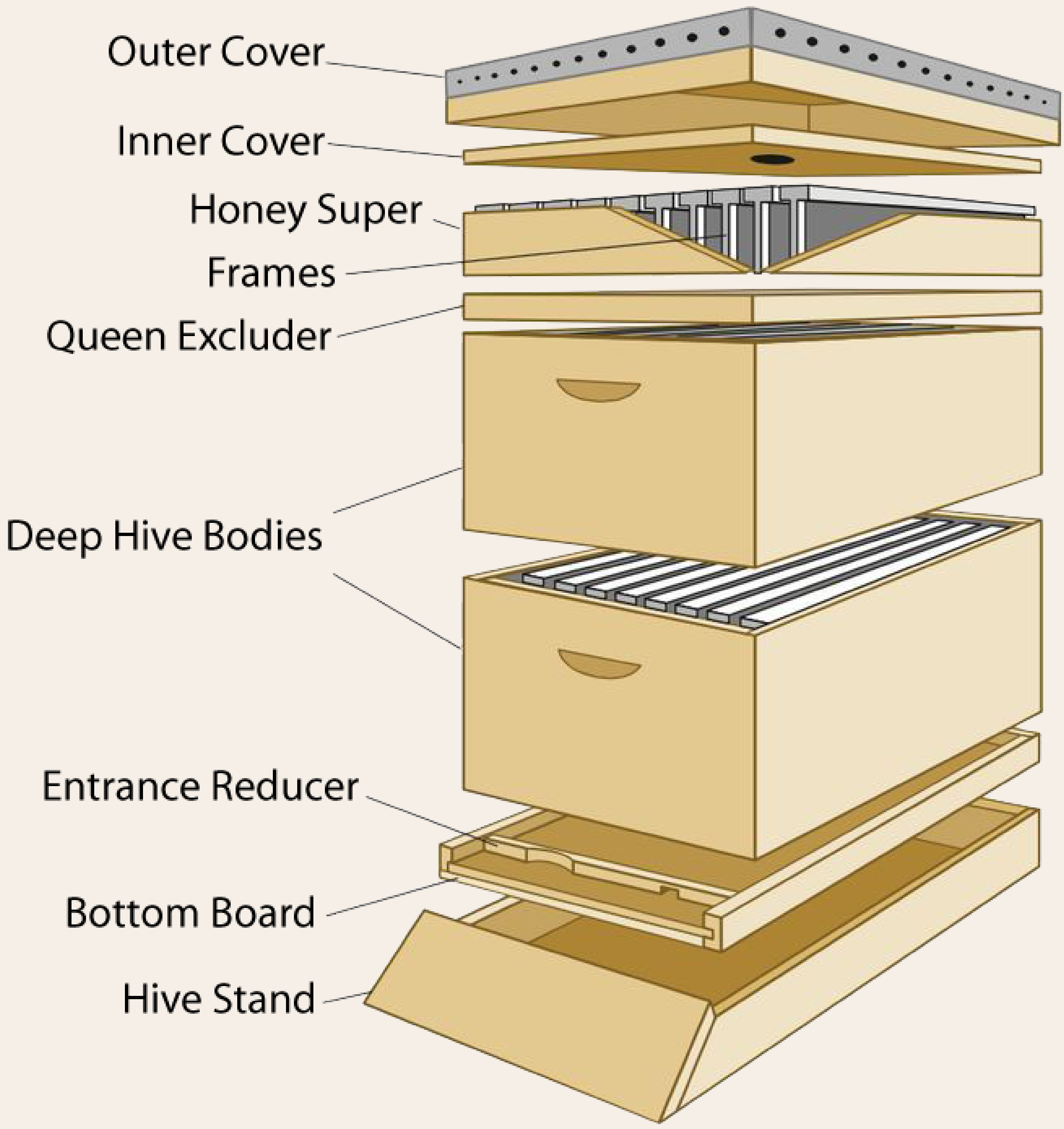
Sting - punctures the skin and pumps venom into the wound. In worker bees the sting has a barbed end. Once pushed into the skin of a mammal the sting cannot be withdrawn and the sting is ripped out of the bee. The venom sac will remain with the sting. Queen bees have a longer sting with smaller barbs. Drones (males) do not have a sting; the sting is an adaption of the female's ovipositor.

Stomach - unlike the honey stomach, the regular stomach (Ventriculus) is used to digest food for the bee. The processed food passes through the intestines and then out.

Venom sac - holds venom. The sac contracts repeatedly to pump venom through the sting.

Wing muscles - bees beat their wings 230 times a second! Each wing consists of a fore and rear wing and is powered by two pairs of large indirect muscles. The two pairs of wings are coupled together by a row of hooks (hamuli) on each hind wing that grip in a groove that exists on the rear edge of the fore wing.The driving force results from a propeller-like twist given to each wing during the upstroke and the down-stroke. Seven more pairs of small muscles can make slight variations in the actual angles of the wings to cause the bee to hover, moves forward or turn. When bees need to lift heavy cargo (nectar and pollen), they don’t flap their wings faster – they stretch out their wing stroke.

Let's Beekeep!



Hive Cover - telescoping cover ''telescopes" over the sides of the top super to protect the hive. Galvanized covering.

Inner Cover - Creates a dead air space - for insulation from heat and cold.

Shallow Supers - For "'surplus" honey storage. Honey can typically be harvested from these supers.

Queen Excluder - Keeps the queen bee in the brood chambers as she is too large to pass through the excluder.

Deep Hive Bodies - "brood chambers" are the bee's living quarters. Queen lays eggs in these chambers and brood is raised. Honey is stored for the bees' food.

Bottom Board - Forms the floor of the hive. Shown with entrance reducer.

Hive Stand- Supports the hive off the ground to keep hive bottom dry and insulate hive.

Tools of the trade

Beekeeping Management Calendar for North Florida
Month Management Recommendations

January

1) Feed colonies if light. (Colonies can starve!)
2) Nosema can be a significant colony problem this time of year. Making sure colonies are well fed will reduce Nosema
spore counts (one million spores per bee is considered a high spore count).
3) Repair/paint old equipment.

February

1) Queen issues are especially problematic this time of year. Remedy failing queens as necessary.
2) Feed colonies if light. (Colonies can starve!) Also supply pollen supplements if necessary.

March

1) Nosema can be a significant colony problem this time of year. Making sure colonies are well fed will reduce Nosema
spore counts (one million spores per bee is considered a high spore count).
2) Colonies can be treated with Terramycin (oxytetracycline) or Tylan (tylsoin) for American foulbrood (AFB) prevention or
Lincomix (lincomycin) or Terramycin (oxytetracycline) for European foulbrood (EFB). These products require a prescription
or a veterinary feed directive from a veterinarian.
3) Colony populations begin to grow. Add supers and/or control swarming as necessary.
4) Make nucs/splits.

April

1) Queen issues are especially problematic this time of year. Remedy failing queens as necessary.
2) Continue to control swarming.
3) Make nucs/splits as new queens and packages become available.
4) Add supers; the primary nectar flow begins this month.

May

1) Queen issues are especially problematic this time of year. Remedy failing queens as necessary.
2) Continue to control swarming.
3) Super as necessary.

June

1) Varroa populations begin to grow, so monitor your colonies. Consider treating when Varroa levels reach 3% (3 mites per 100 bees as determined by an alcohol wash or a sugar shake). Treatment options include: Apiguard, Apistan, Apivar, Hopguard, and Mite Away (always follow label instructions).
2) Remove and process honey; main flow slows.

July

1) Monitor for Varroa. Consider treating when Varroa levels reach 3% (3 mites per 100 bees as determined by an alcohol wash or a sugar shake). Treatment options include: Apiguard, Apistan, Apivar, Hopguard, and Mite Away (always follow label instructions).
2) Remove and process honey; main flow stops.

August

1) Feed colonies if light. (Colonies can starve!)
2) Monitor for Varroa. Consider treating when Varroa levels reach 3% (3 mites per 100 bees as determined by an alcohol wash or a sugar shake). Treatment options include: Apiguard, Apistan, Apivar, Hopguard, and Mite Away (always follow label instructions).
3) Colonies can be treated with Terramycin (oxytetracycline) or Tylan (tylsoin) for American foulbrood (AFB) prevention or Lincomix (lincomycin) or Terramycin (oxytetracycline) for European foulbrood (EFB). These products require a prescription or a veterinary feed directive from a veterinarian.
4) Monitor and control for small hive beetles. Control options include GardStar and in-hive beetle traps (Hood trap, West beetle trap, Beetle Blaster, etc.).
5) It's hot! Ensure adequate colony ventilation.

September

1) Feed colonies if light. (Colonies can starve!)
2) Monitor for Varroa. Consider treating when Varroa levels reach 3% (3 mites per 100 bees as determined by an alcohol wash or a sugar shake). Treatment options include: Apiguard, Apistan, Apivar, Hopguard, and Mite Away (always follow label instructions).
3) Nosema can be a significant colony problem this time of year. Making sure colonies are well fed will reduce Nosema spore counts (one million spores per bee is considered a high spore count).

October – December

1) Feed colonies if light. (Colonies can starve!)

2) Monitor for Varroa. Consider treating when Varroa levels reach 3% (3 mites per 100 bees as determined by an alcohol wash or a sugar shake). Treatment options include: Apiguard, Apistan, Apivar, Hopguard, and Mite Away (always follow label instructions).

3) You can treat colonies for Nosema disease this time of year. Making sure colonies are well fed will reduce Nosema spore counts (one million spores per bee is considered a high spore count). Some beekeepers also treat colonies with fumagilin with varied effectiveness (always follow label instructions). Recheck spore counts in colonies 2–3 weeks after treatment.

4) Monitor and control for small hive beetles. Control options include GardStar and in-hive beetle traps (Hood trap, West beetle trap, Beetle Blaster, etc.). Always follow pesticide label instructions.