

Apiculture

Ent-202





Apiculture

Define: Practice of keeping bees for honey production

- Types of Honey bees
 1. *Apis dorsata* (Apidae: Hymenoptera)
 2. *Apis florea* (Apidae: Hymenoptera)
 3. *Apis cerana* (Apidae: Hymenoptera)
 4. *Apis mellifera* (Apidae: Hymenoptera)



Apis dorsata

- Rock or wild bee, doomna makhi
- Live in colonies in single comb at rock bases or big trees
- Comb length 5 x 2 feet
- Comb – always in open place, never in darkness
- Very good yield – 80 lbs from single comb
- Ferocious – sting is painful
- At disturbance – follow victims for mile even in water
- Extraction of comb can be done by smoking or burning



Apis florea

- Little bees – choti makhi
- Comb in bushes, branches, or even in houses
- Known as stingless but it has sting
- Not economical – yield is only few lbs



Apis cerana

- Hill bees – domestic bees
- Live in hives in close covers, crevices of rocks, walls, and trees
- Build several comb side by side or parallel to each other
- Average yield 20 lbs
- Commonly found in Muree hills, hilly tract of Peshawar, Chitral and DI Khan



Apis mellifera

- European or Australian bee,
- Less prone to swarming
- Good yield – 10-30 lbs
- Preferred to live in concealed environment
- Easily domesticated



Apis dorsata

Apis mellifera

Apis cerana

5 mm



Biology

- Social insect
- Live in colonies
- Caste system
 - Queen
 - Drones
 - Worker



Queen

- 1 queen present in a colony
- Large abdomen – well developed sting (to kill other queen before emergence)
- Queen live 2-3 year
- Lay eggs 15000/day
- Fertilized eggs produce workers or queen
- Unfertilized egg produce drones
- Queen leave colony – mating, swarming – absconding
- Larva from which queen is to be reared is placed in a specialized cell and feed on Royal Jelly



Drones

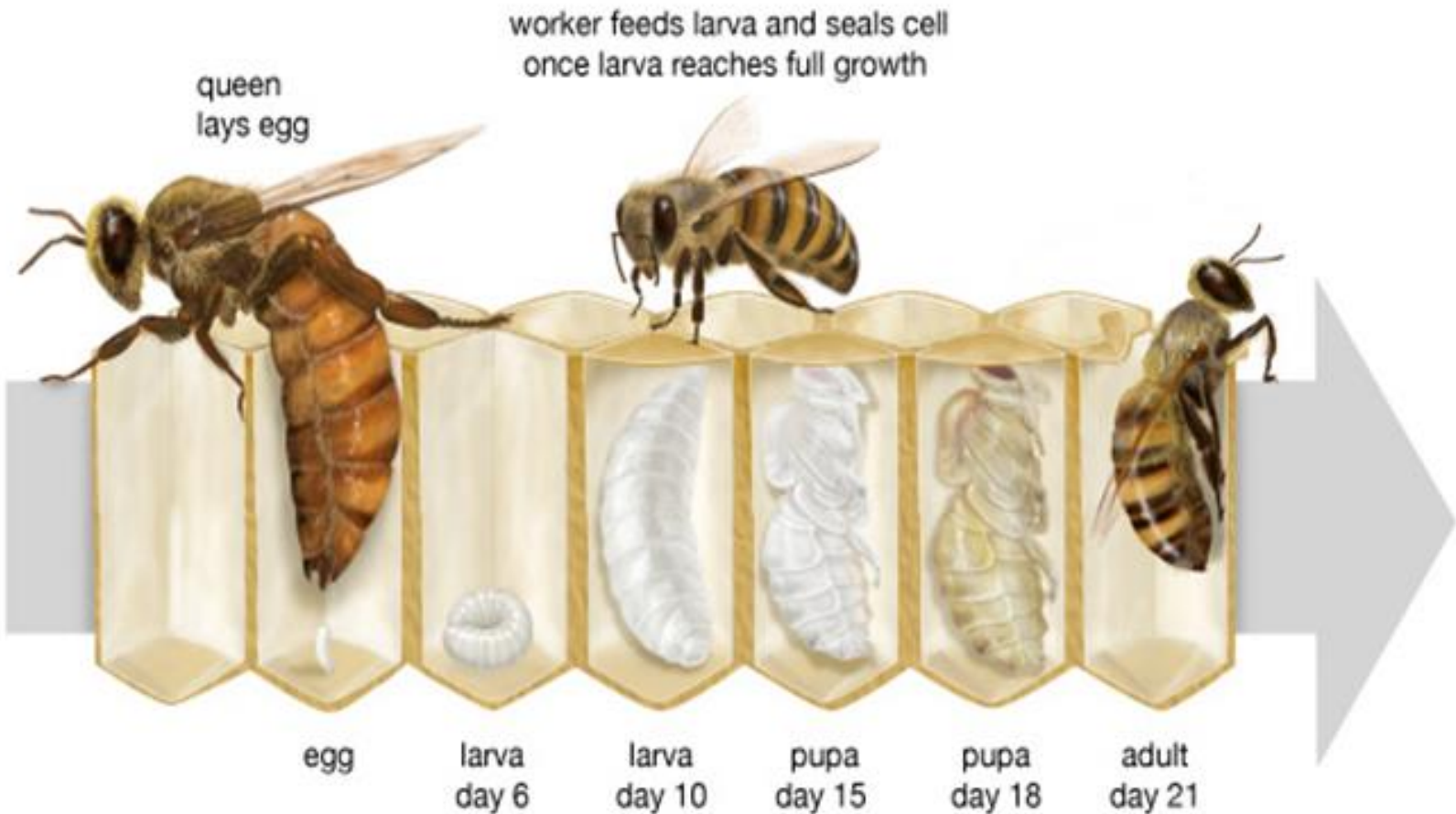
- Male
- No sting
- Fed by workers
- Function is to mate with queen
- Life is nearly 2 months

Workers

- Main strength of colony
- 5000 or more in a colony – depending on species and colony strength
- Imperfectly developed females and don't lay eggs
- First 3 weeks: work indoor – hive cleaning, wax making, caring of young ones
- Afterward: outdoor work – collecting nectar, pollen, and water, defense
- Life of worker is 6 weeks
- In winter they may live up to 6 months
- Bees can produce 1 lb wax by consuming 8-12 lbs honey
- To avoid this honey consumption, we supply artificial comb formation in frames

Life cycle

Life cycle of honeybees



Life cycle

- Remain active throughout year
- **Winter:** bees don't work – sit together – eat honey to create heat
- **Spring:** queen start egg laying – brood rearing begins
- **March-mid April:** Colony become strong
- Nest crowded – **swarming**





Seasonal management

Spring management

- Spring is an important period for honey bees – increase population
- Open colony on a sunny day and study:
 - Condition of queen
 - Quantity of brood
 - Amount of honey
 - Clean the hive
 - Give more comb space if required

Swarming

- Division of colony – natural phenomena
- Take place during spring season
- Reasons of swarming are as follows:
 - Overcrowding
 - Lack of ventilation
 - Lack of space for storing honey
 - Lack of field work from workers



Control of swarming

- Replace crowding
- Clip wings of old queen
- Provide abundant comb space and ventilation
- Search and destroy queen cell regularly
- Place wire entrance guard – queen not able to go out



How to increase the number of colonies

- Swarming period is the best

DIVIDE A COLONY INTO 2 COLONIES

- Place a new hive at side of old hive
- Take 2 frames from honey with brood together with old queen on it – shift into new box
- Place the new hive 50 yards away
- Examine the old hive after 10-14 days to see the new queen

MAKE ONE COLONY FROM 3-4 COLONIES

- Place a new hive with comb foundation at side of old hive
- Place one brood frame and one frame with honey and some bees from 3-4 old colonies
- Place the new hive 50 yards away
- Examine new colony after 10-14 days, destroy all queen cell except one



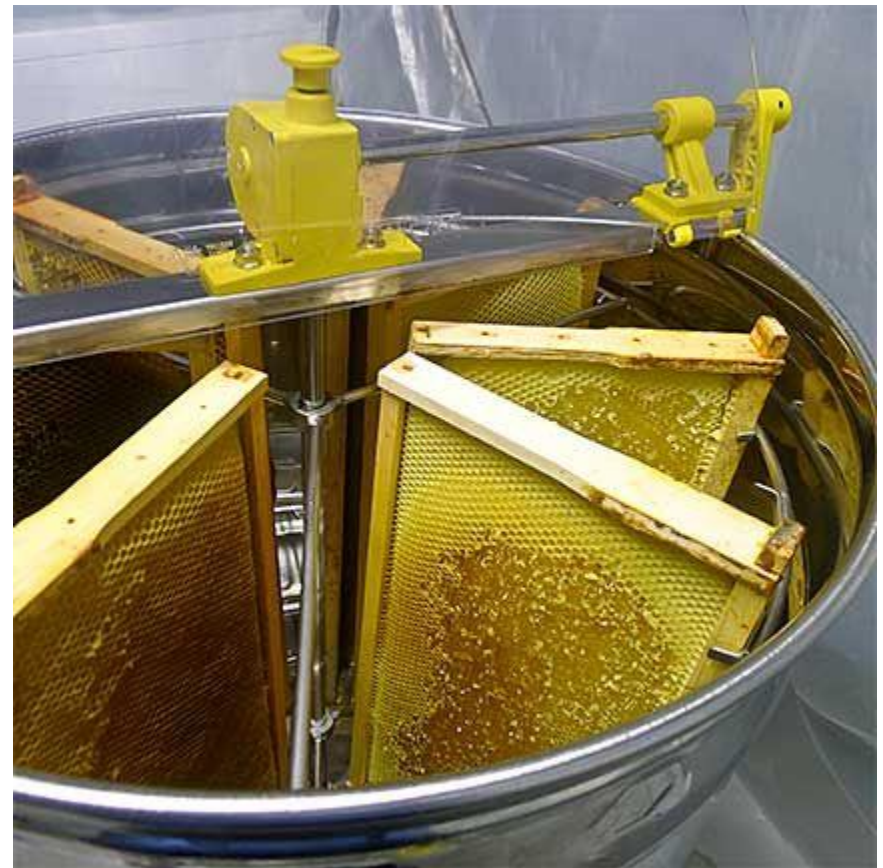
Honey flow

- It is the period when honey bees gather and store surplus honey in the hive after attaining peak population in the colony
- Honey flow period is April-May in different localities of Pakistan
- Make an ample space for honey store
- Honey extraction – leave some honey in each hive for bees to pass summer



Honey extraction

- When honey flow stopped – if $\frac{1}{2}$ to $\frac{3}{4}$ cells are capped – start extraction
- Take out frames
- Remove the bees
- Put frames in extractor and revolve



Summer management

- In this period bees abscond and colonies become weak due to:
 - Adverse climate
 - Attack of wax moth
 - Lack of food source
- Control absconding by:
 - Better ventilation
 - Food provisioning
 - Watching bee enemies

Winter management

- Colonies should be protected:
- Keep colonies strong with plenty of honey and good queen
- Unite weak colonies with strong colonies

Feeding of honey bees

- During scarcity period bees have to be fed
- Honey or sugar syrup
- Mix 2 parts of sugar and 1 part of water otherwise 50:50
- Put solution in dishes with few straws floating on surface to avoid drowning of honey bees



Bee enemies

- **Wax moth:** feed on comb wax – bee leave the hive
- **Hornets:** destroys bee at hive entrance and in the field – search their nest and fumigate to kill them
- **Black ants:** take honey, pollen and nectar and fight with bees – bees may abscond
- **Varroa mites:** parasites of bees – make them weak



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Thank You