

Diseases of Honey Bees And Their Control

Bee Diseases

- Honey bees are attacked by a **large number of diseases** which are caused by different organisms including **virus, bacteria, protozoan** and **mites** both ectoparasitic and endoparasitic.
- The **extent of damage varies** from death of some brood or adults to complete loss of colonies.
- The disease **spreads from one colony to other** through different **manipulations** done in the apiary as well as through **robber bees, swarms** and **drifting bees**.
- Brief account of symptoms and control measures are given below which can also help in differentiating one disease from the other.

Bee Diseases

Brood diseases:

1. American Foul Brood
2. European Foul Brood
3. Sac Brood/Thai sac brood

Adult diseases:

1. Nosema disease
2. Acarine disease

1. American Foul Brood

- **Causative Organism:** *Paenibacillus larvae* (bacteria)
- **Time of death:** Late larval or early pupal stage
- **Cappings:** Sunken and punctured
- **Color of dead brood:** Off white to light cream to brown; coffee brown to dark brown or almost black
- **Position of dead brood:** Lying flat on cell base
- **Consistency of dead brood:** Sticky to ropy
- **Odour of dead brood:** Glue pot, putrid faint
- **Type of brood affected:** Worker, rarely drone or queen
- **Control:** Terramycin @ 0.250-0.400 g in 5L sugar syrup feeding

2. European Foul Brood

- **Causative Organism:** *Melissococcus pluton* (bacteria)
- **Time of death:** Coiled larvae in unsealed cell (usually young unsealed larvae sometime older sealed larvae)
- **Cappings:** Dead brood in uncapped stage
- **Color of dead brood:** Yellowish white to grey or dark brown, dark brown or almost black as compared to glittering white in case of normal brood
- **Position of dead brood:** Coiled, twisted or collapsed
- **Consistency of dead brood:** Soft and gummy ; rarely sticky or ropy, granular
- **Odour of dead brood:** Slightly sour to penetratingly sour, Putrid fish
- **Type of brood affected:** Worker, drone and queen
- **Control:** Feed Terramycin @ 0.2g in 500ml conc. Sugar syrup

3. Sac Brood/Thai sac brood

- **Causative Organism:** Virus (sac brood in *A. mellifera* and Thai sac brood in *A. cerana*)
- **Time of death:** Late larval stage; (usually older sealed larvae sometimes young unsealed larvae)
- **Cappings:** Capping removed or punctured often with two holes.
- **Color of dead brood:** Straw colored, starts darkening from head
- **Position of dead brood:** Extended with head curled upright in cells
- **Consistency of dead brood:** Sac like with watery content
- **Odour of dead brood:** None to slightly sour; faint sour
- **Type of brood affected:** Workers only
- **Control:** No effective cure

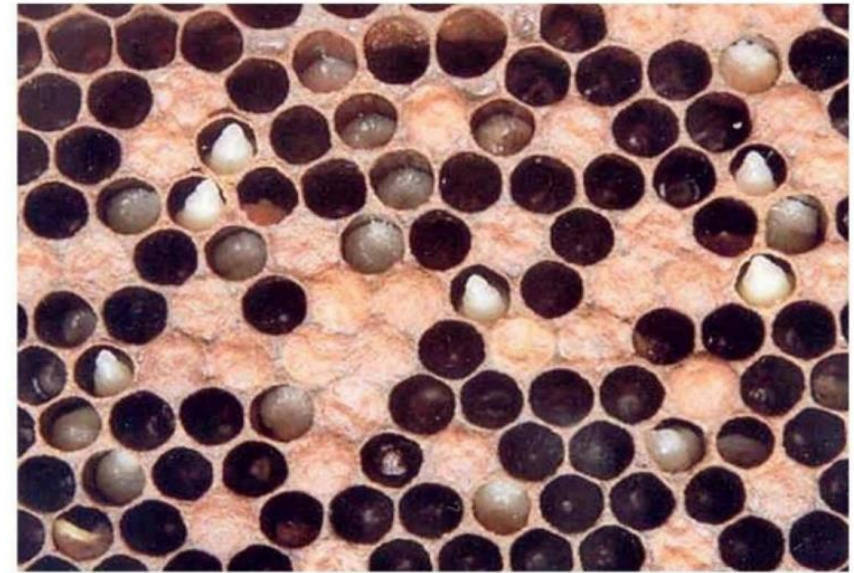
| | American Foul Brood | European Foul Brood | Sac Brood/Thai sac brood |
|---------------------------|-------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------|
| Causative Organism | <i>Paenibacillus larvae</i> (bacteria) | <i>Melissococcus pluton</i> (bacteria) | Virus (sac brood in <i>A. mellifera</i> and Thai sac brood in <i>A. cerana</i>) |
| Time of death | Late larval or early pupal stage | Coiled larvae in unsealed cell (usually young unsealed larvae sometime older sealed larvae) | Late larval stage; (usually older sealed larvae sometimes young unsealed larvae) |
| Cappings | Sunken and punctured | Dead brood in uncapped stage | Capping removed or punctured often with two holes. |
| Colour of dead brood | Off white to light cream to brown; coffee brown to dark brown or almost black | Yellowish white to grey or dark brown, dark brown or almost black (Fig. 17.2) as compared to glittering white in case of normal brood (Fig. 17.1) | Straw coloured, starts darkening from head |
| Position of dead brood | Lying flat on cell base | Coiled, twisted or collapsed | Extended with head curled upright in cells (Fig. 17.3) |
| Consistency of dead brood | Sticky to ropy | Soft and gummy ; rarely sticky or ropy, granular | Sac like with watery content |
| Odour of dead brood | Glue pot, putrid faint | Slightly sour to penetratingly sour, Putrid fish | None to slightly sour; faint sour |
| Type of brood affected | Worker, rarely drone or queen | Worker, drone and queen | Worker only |
| Control | Terramycin @ 0.250 – 0.400g in 5lt sugar syrup feeding | Feed Terramycin @ 0.2g in 500ml conc. Sugar syrup | No effective cure |



Healthy worker brood of *A. mellifera*



European foul brood disease in *A. mellifera*



Sac brood disease in *A. mellifera*

1. Nosema disease

- **Causative organism:** *Nosema apis* (protozoan)
- **Symptoms:** Infected bees collect in front of hive, sluggish, crawlers on leaf blades, distended abdomen, dysentric
- **Control:** Feed fumigillin 200 mg in sugar syrup to each colony or 0.5-3.0 mg in 100ml sugar syrup.
or
Two feedings at weekly interval of Dependel-M @0.5g/litre/colony

2. Acarine disease

- **Causative organism:** *Acarapis woodi* (Endoparasitic mite)
- **Symptoms:** Bees gather in front of hive as crawler bees and unable to fly; disjointed wings having typical 'k' wing condition
- **Control:** Fumigate using folbex strips at weekly intervals or with formic acid (85%) @ 10ml/colony and replenish the quantity after every 24 h for 21 days



Symptoms of nosema disease in *A. cerana*