SUBJECT: ZOOLOGY
CLASS: S.Y.B.Sc.

COURSE TITLE: APPLIED ZOOLOGY-II

APICULTURE

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APICULTURE...
INTRODUCTION...

• Apiculture (Apis = honey bee + culture = to rear) is the most important branch of applied zoology and deals with rearing and management of honey bee to produce honey, bees wax, royal substance and also for pollination purpose to yield crop production.

• Definition, Rearing of honey bees on a commercial scale is called Apiculture.

• The bee keeping in United state, Canada, Australia, and New Zealand has achieved outstanding success. In India, people do not take much interest in bee keeping from commercial point of view but now-a-days in India bee keeping become popular and profitable.
Systematic position

- **Kingdom**: Animalia
- **Group**: Invertebrata
- **Phylum**: Arthropoda
- **Class**: Insecta
- **Subclass**: Pterygota
- **Division**: Endopterygota
- **Order**: Hymenoptera
- **Family**: Apidae
- **Genus**: Apis
- **Species**: dorsata, indica, florea, mellifera
Kinds of honey bees...

1. *Apis dorsata* (*Rock bee*)

2. *Apis indica* (*Eastern bee*)

3. *Apis millifera* (*Western bee*)

4. *Apis florea* (*Garden bee*)
Apis dorsata (Rock bee) HIVE
A. Florea HIVE
Apis mellifera (Western bee) HIVE
Life cycle....
Life cycle...

1 Nuptial flight / Marriage flight...

2 Egg...

3 Grub (larva)...

4 Pupa...

5 Adult...
Egg...

ARKive
grub(larva)...
Pupa...
Three-castes of honey bee... after pupation...

<table>
<thead>
<tr>
<th>Drone</th>
<th>Worker</th>
<th>Queen</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Eyes meet over head</td>
<td>1. Eyes far apart.</td>
<td>1. Eyes far apart.</td>
</tr>
<tr>
<td>2. Abdomen black, blunt, without sting</td>
<td>2. Triangular with sting.</td>
<td>2. Triangular with elongated.</td>
</tr>
<tr>
<td>3. It has life span 3 week.</td>
<td>3.6 week.</td>
<td>3. 2-3 years.</td>
</tr>
</tbody>
</table>
Caste system...
2) The Life Cycle of Honey Bees

<table>
<thead>
<tr>
<th>Developmental Stage</th>
<th>Duration of Stages</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Queen</td>
</tr>
<tr>
<td>Egg</td>
<td>3</td>
</tr>
<tr>
<td>Larval stage</td>
<td>$5 \frac{1}{2}$</td>
</tr>
<tr>
<td>Pupal stage</td>
<td>$7 \frac{1}{2}$</td>
</tr>
<tr>
<td>Total developmental time</td>
<td>16</td>
</tr>
</tbody>
</table>
Drone Bees

- **Males**
- **Larger eyes**
- **0 - 200 in the hive at any time**
- **Sole purpose is to mate with queen**
- **Die after mating**
Worker Bees

- Female (sterile)
- Perform all necessary tasks
- Different jobs depending on age
  - 2 days
  - 3-10 days
  - 15-20 days
  - 21-35 days
The Queen Bee

- Only fertile female
- Royal jelly
- Lays eggs
- Pheromones
- Nuptial Flight
**Bee Behaviour and Communication...**

- **Swarming...** the phenomenon of leaving off colony by the queen and other members is known as Swarming.

- **Supersedure...** when egg laying capacity of the old queen is lost or is suddenly dies a new young queen takes the old queen is called Supersedure.

- **Absconding...** Migration of the completed colony from one place to another place due to some unfavourable conditions of life.
Bee behaviour and communication...

Figure 1. Round dance

Figure 2. Waggle dance
Bee behaviour and communication...
Beekeeping equipments,
BEE BOX

Elements of a beehive
Unacapping knife.
Smoker...
Honey extractor...
Bee brush...
Honey bee products
Propolis (bee glue)...

Bee Propolis has a number of well-known therapeutic properties:

- potent antioxidant
- anti-microbial
- healing
- analgesic
- anesthetic
- anti-inflammatory.

Researchers from the University of Chicago Medical Center report that doses were given to mice with prostate tumors and tumor growth slowed by 50 percent!
Bee venom...
Royal jelly...
Bee pollination...
<table>
<thead>
<tr>
<th>Disease</th>
<th>Protozone</th>
<th>Infection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nosema disease</td>
<td>Nosema apis zander</td>
<td>Attacks lining of stomach &amp; intestine causing dysentery.</td>
</tr>
<tr>
<td>Amobic disease</td>
<td>Malpighamoeba mellificae</td>
<td>It also produce dysentery.</td>
</tr>
</tbody>
</table>
Bee enemies...

1. Wax moths.
2. Wax beetles
3. wasps..
4. ants.
5. Birds (bee eater)
I destroyed an entire beehive

So I could indulge myself in their honey
Any questions?