

## Lecture 5 BEE PRODUCTS - THEIR PROPERTIES AND USES

1. Honey
2. Bees Wax
3. Royal Jelly
4. Bee Venom
5. Propolis
6. Pollen

### 1. Honey

- A sweet, viscous fluid - Produced by honey bees
- Collected as nectar from nectaries at base of flower
- Also collected from extra floral nectaries (nectar secreted by parts other than flowers)
- Collected also from fruit juice, cane juice

### Collection and ripening of honey

- Bee draws nectar by its tongue (proboscis)
- Regurgitated by field bees
- Collected by hive bees - Deposited in cells in comb
- Nectar contains 20-40% sucrose
- Invertase converts sucrose into dextrose (glucose) and levulose (fructose)
- Invertase is present in nectar itself and in saliva of honey
- Ripening of honey is by action of enzyme and by evaporation of water by fanning of wings

| <b>Composition of fully ripened honey</b>        | <b>Per cent (Approx.)</b> |
|--|---------------------------|
| Lrvulose   | 41.0                      |
| Dextrose   | 35.0                      |
| Sucrose  | 1.9                       |
| Dextrins   | 1.5                       |
| Minerals   | 2.0                       |
| Water  | 17.0                      |
| Undetermined (Enzymes, Vitamins, Pigments, etc.) | 1.6                       |

### Pigments

Carotene, Chlorophyll, Xanthophyll

**Minerals include**

Potassium, Calcium, Phosphorus, Sodium, Magnesium, Manganese, Copper, Sulphur, Silica, Iron.

**Vitamins**

Vit B<sub>1</sub> (Thiamine), B<sub>2</sub> (Riboflavin), Nicotinic acid, Vit.K, Folic acid, Ascorbic acid, Pantothenic acid.

**Physical properties of honey**

1. Honey is hygroscopic. If exposed to air it absorbs moisture
2. Honey is a viscous fluid. Heating of honey reduces viscosity
3. Specific gravity of pure honey is 1.35 - 1.44 gms/cc
4. Refractive index of honey - Helps to find moisture content measured using refractometer

**Purity test for honey**

1. Measure specific gravity of honey using hydrometer
2. If the specific gravity is between 1.25-1.44 it is pure honey

**Aroma and flavour of honey**

1. Acquired from the nectar of the flower
2. Lost if heated or exposed to air for long time

**Colour of honey**

1. Depends on the nectar of flower (plant species)
2. Darker honey has stronger flavour
3. Lighter honey has more pleasant smell

**Fermentation of honey**

- Honey containing high moisture can ferment
- Sugar tolerant yeast present in honey cause fermentation
- Fermentation more at 11-21°C
- Fermentation leads to formation of alcohol and carbon dioxide
- Alcohol later converted into acetic acid
- Fermented honey sour in taste due to acidity
- Heating honey to 64°C for 30 min destroys yeast and prevents fermentation

**Crystallization or granulation of honey**

- This is a natural property of honey (particularly at low temperature)
- Dextrose present in honey granulate and settle down
- Levulose and water remain top - More prone to fermentation
- High ratio of Levulose/Dextrose (L/D) - Less granulation
- High ratio of Dextrose/Water (D/W) - More granulation