

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

Composition of fully ripened honey	Per cent (Approx.)
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 B₁ (Thiamine), B₂ (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