

6.1.4. Honey (2)

Honey is the nectar of flowers obtained with the help of bees. It is a sweet liquid.

Synonyms

Madhu, madh, and mel.

Source

Honey is a viscid and sweet secretion stored in the honey comb by various species of bees, such as *Apis dorsata*, *Apis florea*, *Apis indica*, and *Apis mellifica*.

Family

Apidae

Occurrence and Distribution

Producers of honey include some regions of West Indies, California, Chile, Africa, Australia, New Zealand, and India.

Organoleptic Evaluation

- 1) **Colour:** Pale yellow to reddish brown viscid fluid.
- 2) **Odour:** Pleasant and characteristic.
- 3) **Taste:** Sweet and slightly acid.
- 4) **Appearance:** Translucent.

The surrounding flowers affect the taste and odour of honey, since the nectar has been collected from them. Prolonged storage of honey turns it opaque and granular as crystallisation of dextrose occurs. This honey is called as **granular honey**.

Chemical Constituents

The average honey composition is 14-24% of **moisture**, 23-36% of **dextrose**, 30-47% of **levulose** (fructose), 0.4-6% of **sucrose**, 0-7% of **dextrin** and **gums**, and 0.1-0.8% of **ash**. Little quantity of essential oil, vitamins, beeswax, pollen grains, formic acid, acetic acid,

succinic acid, maltose, dextrin, colouring pigments, and an admixture of enzymes (diastase, invertase, and inulase) are also found to be present. The quantity of sugar in honey is variable depending on the country, source of the nectar (fragment flowers in the region), and the enzymatic activity for conversion of nectar into honey.

Chemical Tests

The following tests establish the adulteration in honey:

- 1) **Fiehe's Test for Artificial Invert Sugar:** 10ml of honey is shaken for 5-10 minutes with 5ml petroleum or solvent ether. In china dish the ethereal layer formed at the top is separated out and evaporated. Then 1% solution of resorcinol is added to 1ml hydrochloric acid. A transient red colour appears in natural honey and the colour remains for a short duration in artificial honey.
- 2) **Reduction of Fehling's Solution:** A 2ml aqueous solution of honey is added with Fehling's solutions 1 and 2. Then the mixture obtained is heated on steam for 5-10 minutes. A brick red colour appears which confirms the presence of reducing sugars.
- 3) **Limit Tests:** The limit tests for chloride, sulphate, and ash (0.5%) are performed and compared with the Pharmacopoeial standards.

Therapeutic Efficacy

- 1) It acts as a mild laxative, bactericidal, sedative, and antiseptic.
- 2) It is employed in the therapy for cold, cough, fever, sore eye, throat and tongue, duodenal ulcers, liver disorders, constipation, diarrhoea, kidney and urinary disorders, pulmonary tuberculosis, marasmus, rickets, scurvy, and insomnia.
- 3) After surgery it is applied on open wounds to prevent infection and promote healing.
- 4) It aids in healing of carbuncles, chaps, scalds, whitlows, and skin inflammation.
- 5) It acts as vermicide.
- 6) It is used to treat aphthae and other infections of the oral mucous membrane.
- 7) It is helpful in the treatment of pre-operative cancer.
- 8) Arteriosclerosis in brain is treated by mixing honey with onion juice.
- 9) It is a constituent of medium used for preservation of cornea.

6.1.5. Arachis Oil

Arachis oil is a purified peanut oil used as a topical moisturiser for the skin. Arachis oil for parenteral dosage form should contain not more than 0.3% of water.

Synonyms

Groundnut oil and peanut oil.

Source

Arachis oil is a fixed oil expressed from the seed kernels of cultivated varieties of *Arachis hypogaea* Linn.

Family

Leguminosae

Occurrence and Distribution

Arachis plant is native to Brazil. The plant is also cultivated in Southern United States, China, Africa, and India.

Organoleptic Evaluation

- 1) **Colour:** Pale yellow coloured liquid

- 2) **Odour:** Faint and characteristic
- 3) **Taste:** Bland and nut-like
- 4) **Solubility:** Slightly soluble in alcohol; soluble in solvent ether, chloroform, and light petroleum.
- 5) **Extra Features:** A non-drying oil; when exposed to air, it thickens gradually and becomes rancid; it can be sterilised by dry heat process.

Chemical Constituents

Arachis oil contains glycerides of fatty acids, such as **oleic, linoleic, stearic,** and **arachidic acids**. It may also consist of lignoceric and palmitic acids.

Oleic acid [$-\text{CH}_3(\text{CH}_2)_7\text{CH}=\text{CH}(\text{CH}_2)_7\text{COOH}$]

Palmitic acid [$-\text{CH}_3(\text{CH}_2)_{14}\text{COOH}$]

Arachidic acid [$-\text{CH}_3(\text{CH}_2)_{18}\text{COOH}$]

Linoleic acid [$-\text{CH}_3(\text{CH}_2)_4\text{CH}=\text{CHCH}_2\text{CH}=\text{CH}(\text{CH}_2)_7\text{COOH}$]

Raw oil may contain **aflatoxin** (a carcinogenic substance produced by fungal growth) and colouring substances. The colour, odour, impurities, and even aflatoxin can be removed from arachis oil by refining. Arachis oil also contains 31% of polyunsaturated fatty acid.

Chemical Test

Under UV radiation, arachis oil shows blue fluorescence.

Therapeutic Efficacy

- 1) It is used as a solvent for intramuscular injections.
- 2) Due to its resemblance with olive oil, it is used for preparing liniments, plasters, and soap.
- 3) Since it is non-drying oil, it is used as a lubricant.
- 4) It produces a firm and excellent white soap.
- 5) It is also used in the form of an enema to treat faecal infections.
- 6) It lubricates and softens the faeces and promotes bowel movement.

6.1.6. Starch

Starch is a white, colourless, solid carbohydrate ($\text{C}_6\text{H}_{10}\text{O}_5$) which occurs in the form of minute granules in seeds, tubers, and other plant parts. They are an important constituent of rice, corn, wheat, beans, potatoes, and many other vegetables.

Synonym

Amylum.

Source

Starch is a polysaccharide granule obtained from the grains of maize (*Zea mays* Linn.), rice (*Oryza sativa* Linn.), wheat (*Triticum aestivum* Linn.), or potato tubers (*Solanum tuberosum* Linn.) (figure 6.1).

Family

Maize, rice, and wheat belong to **Gramineae** family and potato belongs to family **Solanaceae**.

Occurrence and Distribution

Starch is commercially produced in tropical and sub-tropical countries. In India the main source of starch is maize which is produced 1, 60,000 tonnes per year.

Organoleptic Evaluation

- 1) **Colour:** Rice and starch grains are white; wheat is cream coloured; potato is slightly yellowish.
- 2) **Odour:** Odourless.
- 3) **Taste:** Bland and mucilaginous.
- 4) **Shape:** Occurs as fine powder or irregular, angular masses readily reducible to powder.
- 5) **Size:** Vary depending upon the type.

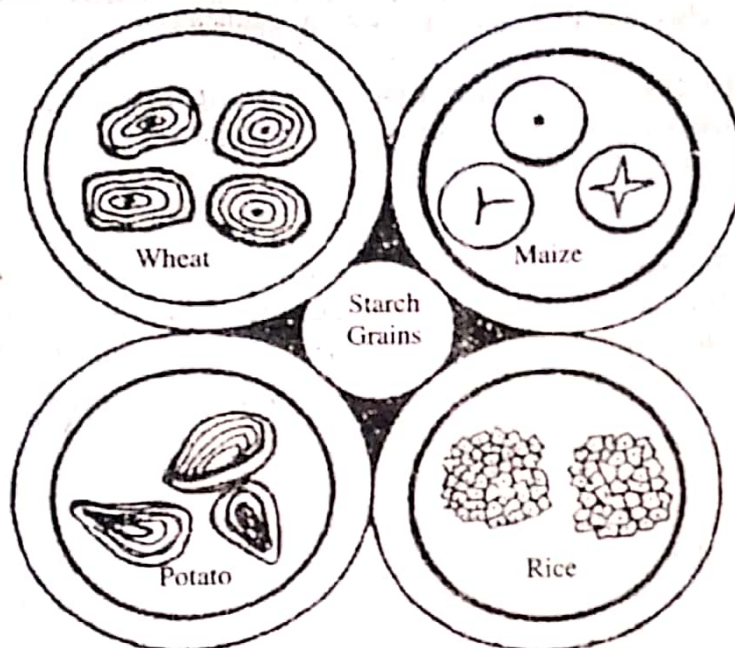
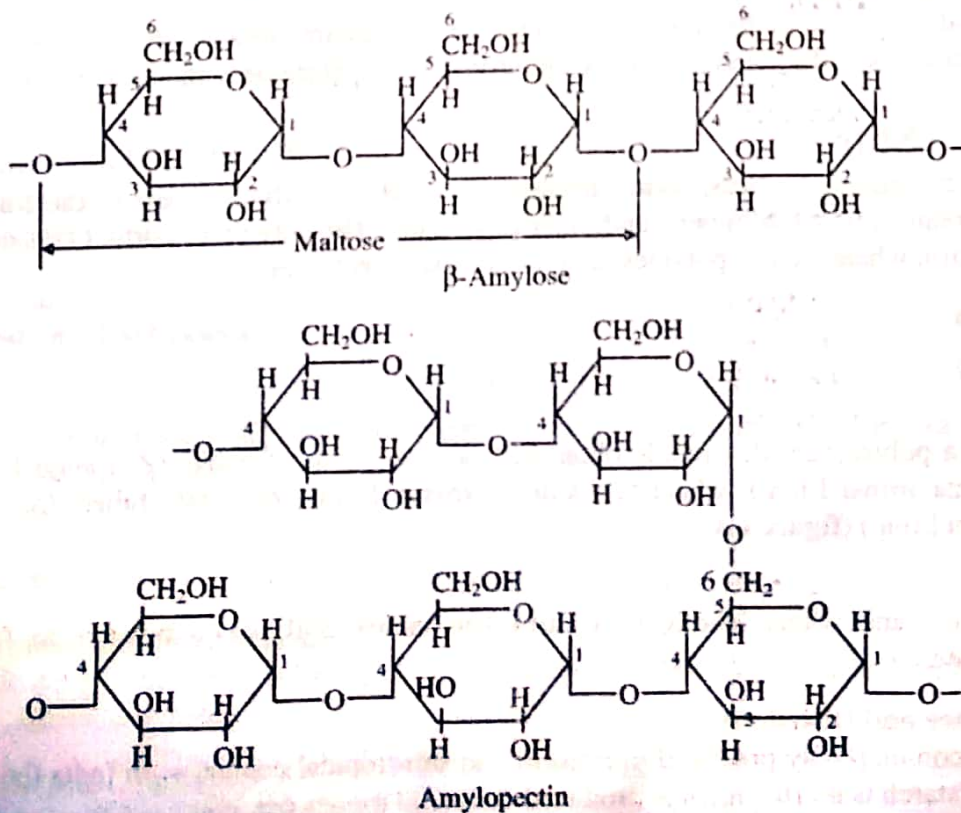


Figure 6.1: Commercial Starches



Chemical Constituents

Amylose (β -amylose) and **amylopectin** (α -amylose) are the two different polysaccharides present in starch in 1:2 ratio. The former is water-soluble, while the latter is water-insoluble, but swells in water and is responsible for the gelling property of starch. With iodine, amylose produces blue colour, while amylopectin produces bluish black colour.

Chemical Tests

- 1) It responds positively to Fehling's solution test.
- 2) It gives the Molisch's test for carbohydrates.
- 3) On boiling 1gm of starch with 15ml water and subsequent cooling, a translucent viscous jelly is produced.
- 4) On adding iodine to the jelly obtained from the above test, its colour changes to deep blue which disappears on warming and turns red on cooling.

Therapeutic Efficacy

- 1) It is used as an absorbent and demulcent.
- 2) Its protective and absorbent property makes it a suitable ingredient in dusting powder.
- 3) It is used as a disintegrator and binder in tablets and pills.
- 4) It is also used as a diluent (or filler) and lubricant in capsules and tablets.
- 5) It is used as a diagnostic aid for proper identification of crude drugs.
- 6) It is used as an indicator in iodimetric analysis.
- 7) It is used as an antidote in iodine poisoning.
- 8) Glycerine of starch is used as an emollient and a base for suppositories.
- 9) It is used as the starting material for producing liquid glucose, glucose syrup, dextrose and dextrin on a large scale.
- 10) It is applied topically in itching. 