

Faculty Science

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B Sc III -Paper I (Plant Resource Utilization, Palynology, Plant Pathology and Biostatistics)

Unit- II Topic- **General account on the oil yielding plants**

The fatty oils are also called fixed oils because, unlike the essential oils, they do not evaporate or become volatile, and they cannot be distilled without being decomposed. Chemically, they are triglycerides of complex organic fatty acids. The so-called oils are liquid at ordinary temperatures and usually contain oleic acid. The fats, on the other hand, are solid at ordinary temperatures and contain stearic or palmitic acid. The fatty oils are insoluble in water, but soluble in various organic solvents. They usually develop a rancid odor and taste. When a fat is boiled with an alkali, it decomposes and the fatty acid unites with the alkali to form soap.

Four classes of vegetable fatty oils are recognized-

(1) Drying oils- The drying oils are able to absorb oxygen and on exposure dry into thin elastic films. They are rich in unsaturated fatty acids, especially linoleic and linolenic acids. These oils are of great importance in the paint and varnish industries. e. g, linseed oil, safflower oil, soybean oil etc.

(2) Semidrying oils- The semidrying oils absorb oxygen slowly and only in limited amounts. They form a soft film only after long exposure. They are fairly rich in linoleic and saturated fatty acids but do not contain linolenic acid. Some of these oils are edible; others are used as illuminants or in making soap and candles. Some common are sesame oil, mustard oil and sunflower oil.

(3) Non-drying oils- The non-drying oils remain liquid at ordinary temperatures and do not form a film. They are fairly rich in oleic and saturated fatty acids. These oils are edible, and can be used for soap and lubricants. Some important are ground nut oil, castor oil, and olive oil.

(4) Fats- The fats are solid or semisolid at ordinary temperatures. They are fairly rich in saturated fatty acids They are edible and useful in the manufacture of soap and candles. e. g coconut oil and palm oil.

1.Linseed oil- *Linum usitatissimum*, Family Linaceae

It is an annual herb and native of coastal land of Mediterranean southwest Asia. In India, it is mainly grown in Madhya Pradesh, Uttar Pradesh, Maharashtra, Rajasthan Bihar, Karnataka and West Bengal. The oil is obtained from the

seeds. Seeds contain 33 to 43% which is extracted by both cold and hot expression. The oil contains linolenic acid, stearic, palmitic acid, oleic acid and linoleic acid.

Uses- It is used in the manufacture of paints, varnishes, soft soap and printer's ink. It is also used in lubricants, greases and polishes. Raw oil is used as an emollient, expectorant and diuretic. Oil cakes are used as a protein supplement for cattle and as a good manure.

2.Soyabean oil -*Glycine max*, Family Papilionaceae

It is a herb and native of South East Asia. In India it is cultivated mainly in Madhya Pradesh, Rajasthan, Chhattisgarh, Maharashtra etc. The oil is extracted from the seeds by expression or by treating ground seeds with some solvent. It contains mainly unsaturated fatty acids (linoleic, linolenic and oleic acids).

Uses- The oil is used in cooking. It is also used in the manufacture of candles, varnishes, grease, paints, insecticides and disinfectants. The oil cake has a good percentage of protein and is used as cattle feed

3.Sesame oil or til oil- *Sesamum indicum*, Family Pedaliaceae

It is an annual herb and native of Africa and India. It is the chief oil of India and has been cultivated from remote times. In India, it is cultivated mainly in Uttar Pradesh, Rajasthan, Madhya Pradesh, Orissa, Maharashtra, Tamil Nadu and Andhra Pradesh. The seeds contain about 50 % oil, which is easily extracted by cold pressure. The oil contains about 80% unsaturated fatty acids (oleic and linoleic acids),

Uses-The finer grades are tasteless and nearly colorless and are used as a substitute for olive oil in cooking and in medicine. It is a compulsory addition to margarine and other food products. The poorer grades are used for soap, perfumery, and rubber substitutes, and to some extent as lubricants. The oil is used for anointing the body, as fuel for lamps, and as food. The oil cake is a good cattle food.

4. Sunflower oil- *Helianthus annuus*, Family Compositae or Asteraceae

It is an important oil seed crop of India. Sunflower seeds contain 42 to 50% oil. In India it is cultivated mainly in Karnataka Maharashtra Tamil Nadu and Andhra Pradesh. The oil contains mainly unsaturated fatty acids (oleic and linoleic acids).

Uses- Sunflower oil is a very good cooking medium. Sunflower oil contains protein and vitamin A. It is easily digested. It is also used in making paints and soap.

5. Sarson oil- *Brassica campestris*, Family Cruciferae or Brassicaceae

It is an herb and is grown as an oil seed crop mainly in Uttar Pradesh, Punjab, Bihar and Assam. The oil content is 32 to 40%. Erucic acid is the characteristic fatty acid of mustard oil. The oil is extracted by expression or solvent.

Uses- The oil is used for cooking and burning. It is also used in ayurvedic medicines as liniment or for massage in paralytic diseases and in gum diseases. It is used in tanning process. The oil cake is used as cattle feed and as a fertilizer.

6. Groundnut oil-*Arachis hypogaea*, Family Papilionaceae

Groundnut, a native to Brazil, is an important source of oil. It is a low growing herb of tropical and sub-tropical regions. The crop is largely grown in Andhra Pradesh, Gujarat, Tamil Nadu, Karnataka, Uttar Pradesh, Madhya Pradesh, Punjab and Rajasthan. The oil is expressed from seeds both by hydraulic presses and expellers. Oil content of seeds varies from 40 to 50%. It is also rich in phosphorus and vitamins. Oil contains mainly oleic acid.

Uses- It is predominantly used for culinary purposes. It is used for the manufacture of vegetable ghee by hydrogenation. The oil is used as a laxative and emollient. It is also used in soap making, in leather dressings, furniture creams and in making shaving creams, cold creams, candles etc. The oil cakes are used as feed for animals and as a manure

7. Castor oil- *Ricinus communis*, Family Euphorbiaceae

Castor is a native to Eastern Africa and India. It is a large Shrub. It is cultivated cheaply in Andhra Pradesh, Maharashtra and Orissa. Castor oil is obtained from the seed. The seed contain 35 to 55% of the oil. Ricinoleic acid (91 to 95%) is the main fatty acid present in oil.

Uses- Castor oil is used as a purgative. It is excellent lubricant especially for airplane engines. It is also used for transparent soap, textile soap, typewriter ink, perfumes, varnishes and paints. It is water resistant and so that it is used for coating fabrics for protective covering for airplanes, insulation food containers, guns etc. It is also used for preserving leather. The oil cake is used as a fertilizer.

8. Olive oil- *Olea europaea*, family Oleaceae

The tree is native of Mediterranean region. It is grown in Northern India. The oil is squeezed from the pulp either by hand or mechanical. The finest grades are obtained by the hand method. The oil contains mainly unsaturated fatty acids such as oleic acid and linoleic acid.

Uses- It is used chiefly as salad or cooking oil. It is also used in medicine and cosmetics. The inferior grade oil is used for soap making and as lubricants. The oil cake is used as cattle feed.

9. Coconut oil -*Crocus nucifera*, Family Palmae or Arecaceae

It is a tall palm cultivated cheaply in Kerala, Tamil Nadu and Karnataka. The oil is obtained from dry meat of coconut. The oil is colourless and remains solid at temperature below 24⁰ C. Chiefly saturated fatty acids present in coconut oil are lauric, myristic and palmitic acids.

Uses- Refined coconut oil is edible and is extensively used for food products. Unrefined coconut oil is commonly used for cooking in Kerala. The oil is used for making confectionery and candy bars. Coconut oil has long been used for the best soaps, cosmetics, shaving creams, shampoos and other preparations. It is only used in Marine soap. The oil cake is used as fodder and as manure.

Reference-

Albert F. Hill (1998) "Hill's Economic Botany". Mc Graw Hill Education India Pvt Ltd.

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