

Topic: Lipid

B.Sc. Botany Hons. III

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Dr. Sanjeev Kumar Vidyarthi
Department of Botany
Dr. L.K.V.D. College, Tajpur, Samastipur
L.N. Mithila University, Darbhanga

Classification of Lipid

Lipids can be classified according to their hydrolysis products and according to similarities in their molecular structures. Three major subclasses are recognized:

A. Simple lipids

- (i) **Fats and oils** which yield fatty acids and glycerol upon hydrolysis.
- (ii) **Waxes**, which yield fatty acids and long-chain alcohols upon hydrolysis.

(i) Fats and Oils

- Both types of compounds are called triacylglycerols because they are esters composed of three fatty acids joined to glycerol, trihydroxy alcohol.

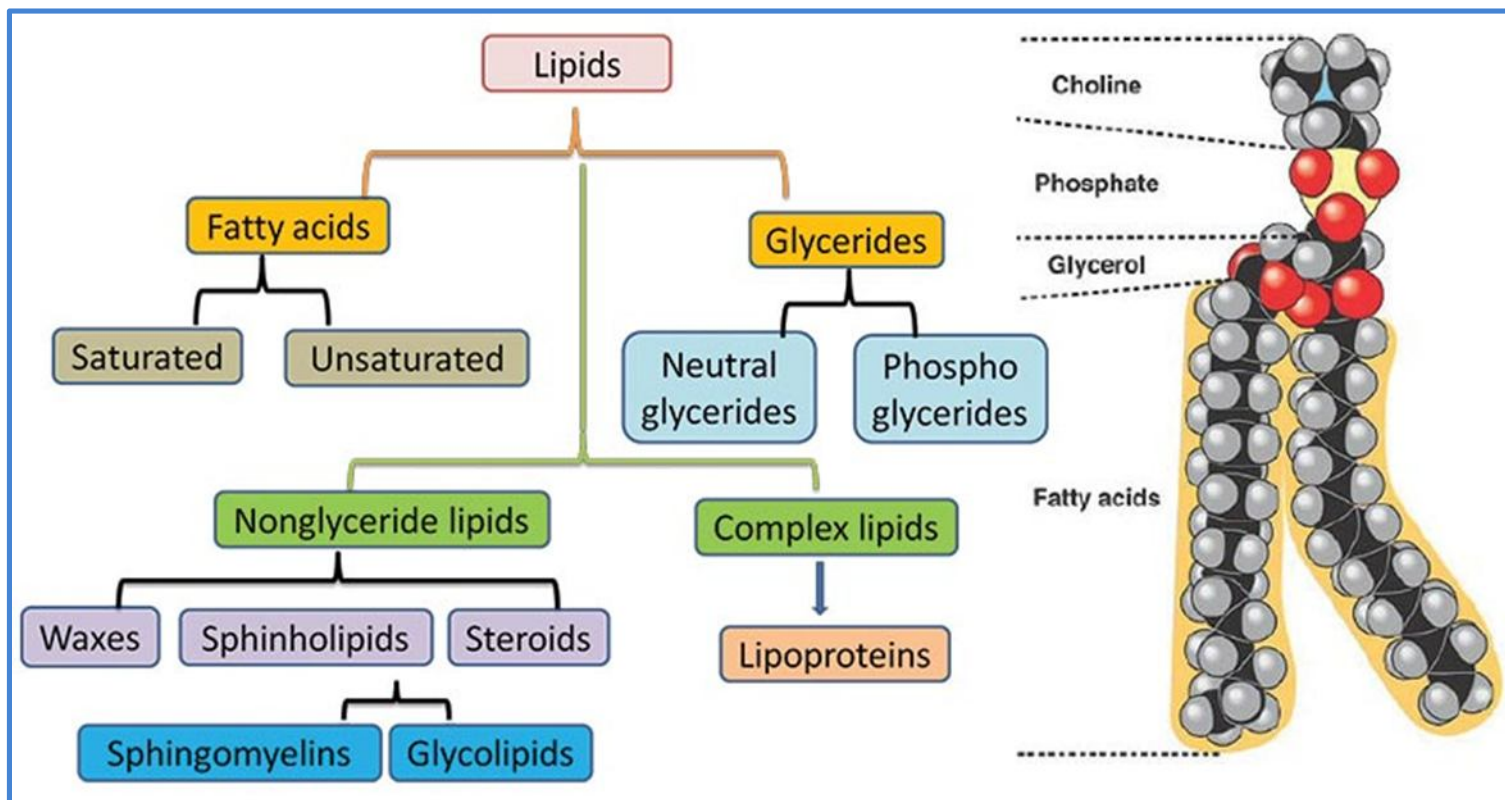


Fig 1. Classification of Lipid

- The difference is on the basis of their physical states at room temperature. It is customary to call a lipid a fat if it is solid at 25°C, and oil if it is a liquid at the same temperature.
- These differences in melting points reflect differences in the degree of unsaturation of the constituent fatty acids.

(ii) Waxes

- Wax is an ester of long-chain alcohol (usually mono-hydroxy) and a fatty acid.
- The acids and alcohols normally found in waxes have chains of the order of 12-34 carbon atoms in length.

B. Compound lipids

(i) **Phospholipids**, which yield fatty acids, glycerol, amino alcohol sphingosine, phosphoric acid and nitrogen-containing alcohol upon hydrolysis.

They may be **glycerophospholipids** or **sphingophospholipid** depending upon the alcohol group present (glycerol or sphingosine).

(ii) **Glycolipids**, which yield fatty acids, sphingosine or glycerol, and a carbohydrate upon hydrolysis.

They may also be **glyceroglycolipids** or **sphingoglycolipid** depending upon the alcohol group present (glycerol or sphingosine).

C. Derived lipids:

- Hydrolysis product of simple and compound lipids is called derived lipids.
- They include fatty acid, glycerol, sphingosine and steroid derivatives.
- Steroid derivatives are phenanthrene structures that are quite different from lipids made up of fatty acids.