Deptt of Zoology
Dr. Pritam Kumar
Shershah College, Sasaram.
V.K.S. University, Ara.

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B.Sc-Part-I (Zool). LIPIDS

Q] Describe the structure, function and classification of lipids ?

Ans:- Lipid is an important Complex organic Compound of living organism which is made by C.H. and O. it was first time reported by BLOOR. it is insoluble in water but soluble in ether, chloroform, benzene etc. it is a chief Compound of our food which provides energy to us hence it is also called energy yielding substance. 1 gm lipid provide 9.1 K.J energy hence it is also called richest source of energy. it Contains less oxygen then Carbohydrate. hence provides more energy then Carbohydrate. it also acts as reserve food material and accumulate under the skin.

STRUCTURE:- Lipids are the member of heterogenous group of chemicals i.e one molecules of lipid is made by 3 molecule of fatty acid and 1 molecule of glycerol.

Fatty acid is a type of organic acid in which one $-CH_3$ group, many $-CH_2$ groups and one $-COOH$ group are present. it's general formula is $CH_3-(CH_2)_n-COOH$ where $n \neq 0$. in different type food stuff different type of fatty acids are present which contain different number of CH_2. Some examples are as follows! ——

1. Butyric acid $[CH_3(CH_2)_2COOH]$ present in butter.
2. Palmitic acid $[CH_3(CH_2)_{14}COOH]$ present in Palm oil, animal fats and butter.
3. octanoic acid or caprylic acid $[CH_3(CH_2)_6COOH]$ Present in coconut oil.
4. Stearic acid $[CH_3(CH_2)_{16}COOH]$ present in animal fats.
5. Oleic acid $[CH_3-(CH_2)_7CH=CH-(CH_2)_7-COOH]$ present in olive oil.
6. Arachidic acid $[CH_3(CH_2)_{18}COOH]$ present in peanut oil.
7. Erucic acid present in mustard oil.

Classification! —— Lipids are classified into three groups! —— (1) Simple lipids (2) Compound lipids (3) Derived lipids.

(1) Simple lipids :— These lipids are found in the form of ester or fatty acid and alcohal (glycerol). when three molecules of fatty acid reacts with one molecule of glycerol then one molecule of triglyceride and three molecules of water are produced. For Example three molecules of butyric acid and one molecule of glycerol are combine to form one molecule of tributyrin with three molecules of water. All Simple lipids are edible but wax of beehive is not edible because it is made by 3 molecule of fatty acid and 1 molecule of alcohal with high molecular weight. Simple lipids are classified into two groups —— : (I) Fats (II) oils.

(I) Fats :— In these lipids saturated fatty acids are present hence these are found in solid form at room temperature. In Saturated fatty acid Single bond is present between Carbon atoms hence it is more stable and less reactive. eg :— Vanaspati, Butter, Ghee etc.

(II) oils :— In these lipids unsaturated fatty acids are present hence these are found in liquid stage at room temperature. In unsaturated fatty acid double bond are present between Carbon atoms hence

it is less stable and more reactive. eg:— mustard oil, olive oil, Sunflower oil etc. In some oils the unsaturated fatty acids are converted fatty acids by adding hydrogen molecules, this phenomenon is called hydrogenation.

(2) Compound lipids:— In these lipids some non fatty groups like phosphate, galactose, sulphur, protein etc are present with fatty acid. and glycerol. on the basis of presence of non-fatty groups Compound lipids are of following types:—

(A) phospholipids:— In these lipids phosp-hate is present. These are the important Compa[illegible] of plasma membrane. Some import-ant phospholipids are as follows:—

(i) Lecithin:— Lecithin is an important phospholipid of plant and animals which is made by fatty acid (palmitic acid, linoleinic acid), phosphoric acid, glycerol and choline.