Polysaccharides.

When more than 10 monosacch-arides unites to form Polysa-ccharide. They donot have sweet taste. They are amorphous Subs-tances insoluble in water. They have high molecular weight. They form Colloidal Solution when treated with water They have not exhibits any properties of aldehyde or ketone groups.

Polysaccharides are of two types homopolysaccharide and heteropolysaccharides.

Homopolysaccharides:-

Homosaccharides are formed of only one type of monosaccha-rides eg. Starch, glycogen, Cellulose etc.

Starch:

It yields glucose only on hy-drolysis, so it is called glucan. It is reserved food materials in plant and found in tapioca, cereals, legumes, potatoes etc.

It is made up glucose mol-ecules. Glucose molecules may be arranged in branched and unbranched chains.

The glucose units are linked by α-1,4 linkage in unbranched chain where as unbranched

are formed by α-1,6 glycosidic bond.

Starch is made up of two structurally different homo-polysaccharides units. They are amylose and amylopectin. There are 20% amylose and 80% amylo-pectin.

1. Amylose:

It is homopolysaccharides with a molecular weight range from 10,000 to 50,000. It has α-1,4 glyco-sidic linkage.

Amylose chain is formed of a helix; each turn has 6 glucose units.

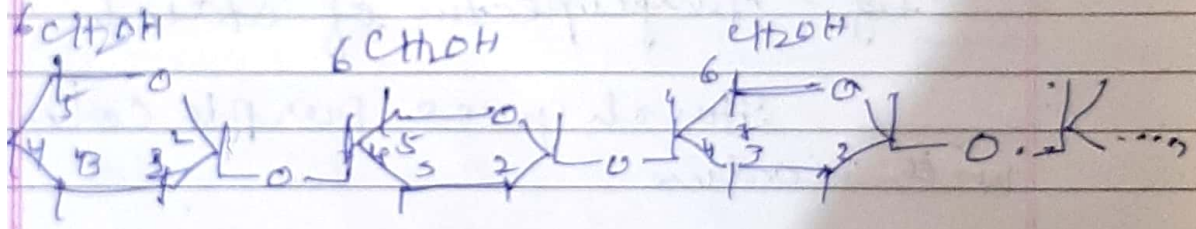

Fig- Amylose of Starch

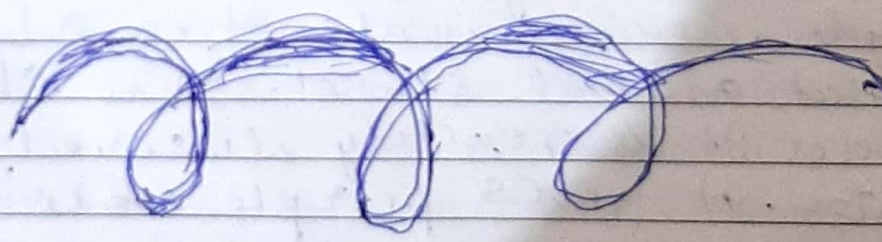

Fig- Helix of amylose.

ii) Amylopectin:

It is branched chain polysaccharide in starch. It gives isomaltose during incomplete hydrolysis. It has α-1,4 glycoside linkage and α-1,6 glycoside linkage

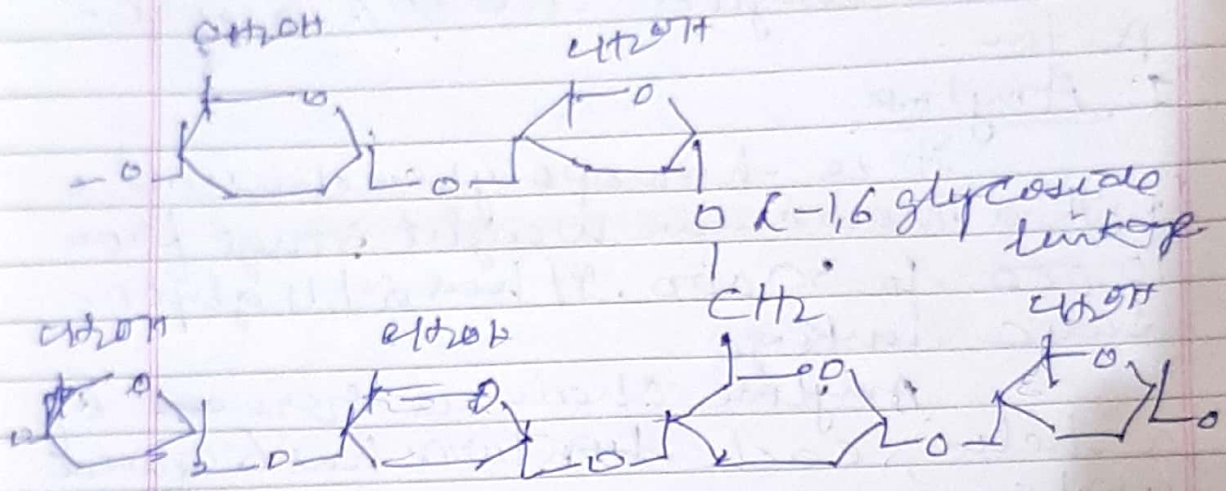

Fig - Amylopectin of starch.

Starch gives purple colour with iodine.

2. Glycogen:

It is major reserve carbohydrate in animals. It is also called animal starch. It is white powder. It is readily dissolved in water. It gives purple colour with iodine.

It is a branched polymer of glucose with α-1,4 linkage and α-1,6 types of linkage.

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at unbranched and branched respectively.

The external branches of glycogen molecules contain 6 to 7 glucose units. The internal branches contain only 3 glucose units.

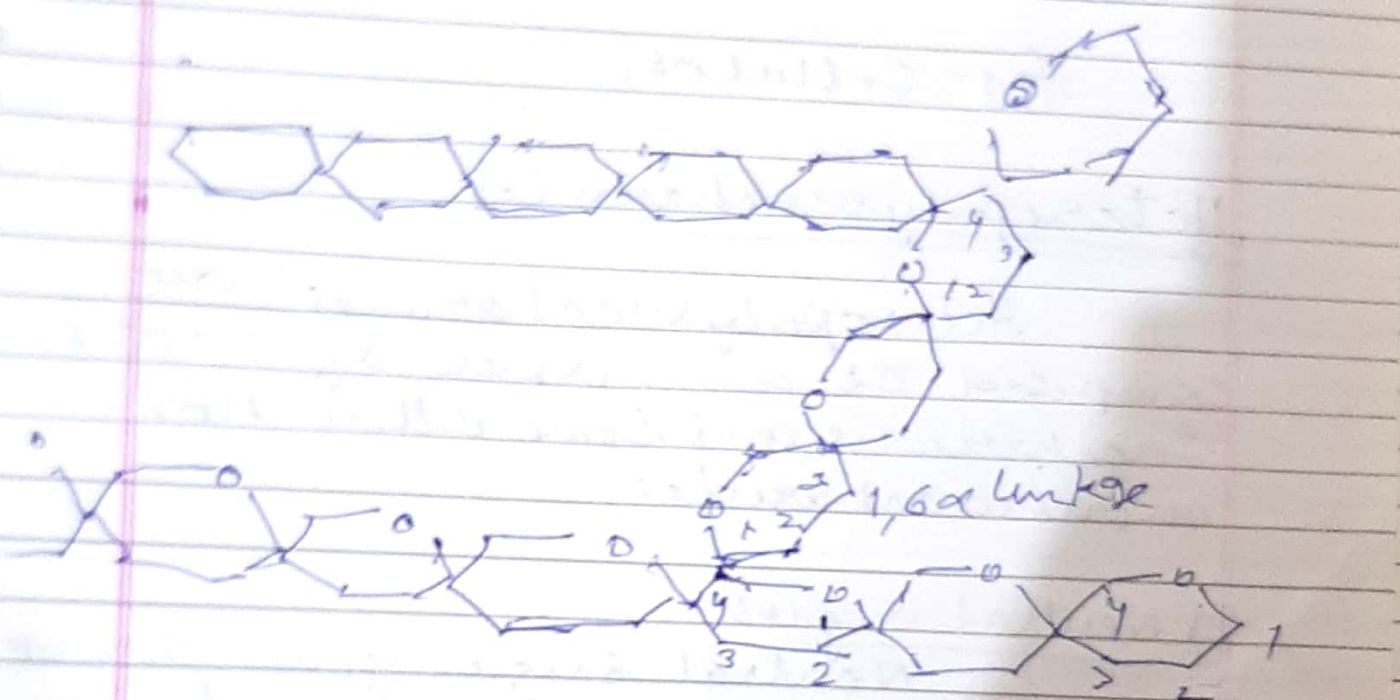

Fig- Structure of glycogen

iii) Cellulose:

It is the main constituents of cell walls of plants. It also occurs lignin and cotton. It molecular weight ranges between 2,00,000 to 20,00,000. It may contain 1200 to 12500 glucose units per molecule. Cellulose is not digested by man. Ruminant and some wood eating insects digest cellulose.

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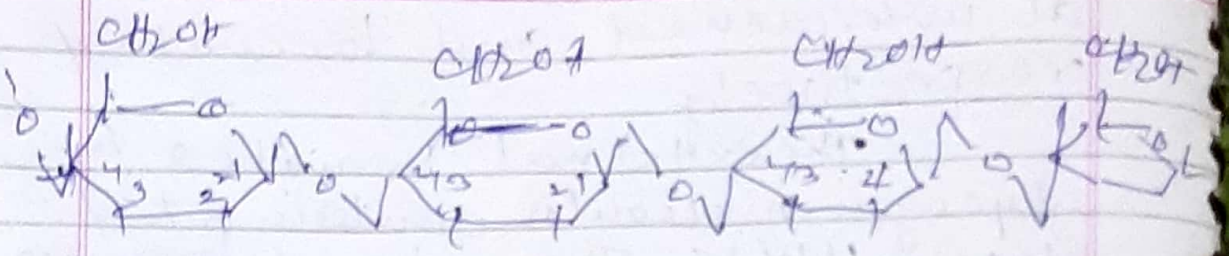

β D glucose β -1,4 linkge.

Fig - Cellulose.

Heteropolysaccharides:

Heteropolysaccharides are composed of a mixture of monosaccharides and some other non-monosaccharides.

1) Neutral Sugars:

Neutral sugar gives more than one type of sugar units on hydrolysis and some times non-sugar components also. Ex. hemicellulose, mucilage and pectic substances.

2) Mucopolysaccharides

Mucopolysaccharides are composed of a mixtures of sugar as well as derivatives of sugar such as amino sugar, uronic acid, N-acetylamine etc eg. Hyaluronic acid, Chondroitin, Chondroitin Sulphate, heparin, Agar-agar etc.

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