

# Topic: Carbohydrates

**B.Sc. Botany Hons. III**

**Paper: VI Group: A**

Dr. Sanjeev Kumar Vidyarthi

Department of Botany

Dr. L.K.V.D. College, Tajpur, Samastipur


L.N. Mithila University, Darbhanga

## Carbohydrates

- Carbohydrates are a group of organic compounds consisting of C, H, O usually in the ratio of 1: 2: 1 and include such well known compounds as sugars, starch, cellulose etc.
- Previously, the carbohydrates were regarded as hydrates of carbon and corresponded to general formula  $(C.H_2O)_n$ .

But the group name 'carbohydrates' was sometimes found misleading because:

- Some organic compounds e.g., formaldehyde (HCHO), acetic acid ( $CH_3COOH$ ), lactic acid ( $C_3H_6O_3$ ) inositol ( $C_6H_{12}O_6$ ) etc. correspond to the general formula but are not carbohydrates.
- Some carbohydrates e.g., rhamnose ( $C_6H_{12}O_5$ ), rhamnohexose ( $C_7H_{14}O_6$ ), digitoxose ( $C_6H_{12}O_4$ ) do not correspond to the above general formula.

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- Besides containing C, H and O, some carbohydrates also contain nitrogen and sulphur.
  - Therefore, the carbohydrates are more appropriately referred to as polyhydroxyaldehydes or polyhydroxyketones and their derivatives or the substances which yield these on hydrolysis.
  - But, the group name 'carbohydrates' is still retained traditionally.
  - The metabolism of carbohydrates is importance to organisms.
  - Fundamentally, all organic foodstuffs are ultimately derived from the synthesis of carbohydrates through photosynthesis.
  - The catabolism of carbohydrates provides the major share of the energy requirement for maintenance of life and preformation of work.
  - Moreover carbohydrates act as energy reservoirs and serve architectural functions and are important constituents of nucleic acids.