Prof ANIL KUMAR zoology

B.Sc HONS Part-III Paper-V

Topic:- Write short Notes on:

a. Types of enzyme

b. Harmones of Pancreas

c. Testes.

Prof ANIL KUMAR
Associate Professor zoology R.R.S college MOKAMA P.P.U

Ans. (a) Types of Enzyme–The systematic study of enzyme was initiated in 1837 when Berzilius recognised the catalytic nature of biological reactions. Six main divisions each with 4-13 subclasses are utilized in the calssification of enzymes, one the basis that the reaction catalysed by an enzyme is the specific property that distinguishes one enzyme from another.

(i) Oxidoreductases–Enzyme catalyzing oxidoreductions between a pair of substrates *A* and *B*. Formerly known as dehydrogenases or oxidases.

(ii) Transferases–Enzymes catalyzing a transfer of a group × between a pair of substrates *A* and *B*

$$A_x + B \rightarrow B_x + A.$$

e.g.—Trans aminases, kinases and transacetylases

(iii) Hydrdases–Enzymes catalyzing the hydrolysis of ester, peptide, glycosyl, acid anhydride, C–C and other bonds eq. lipase.

(iv) Lyases–Enzymes that catalyze removal of groups from substrates by mechanisms other than hydrolysis e.g.– a decarboxylase would be included in this group.

(v) Isomerases–Enzymes catalyzing inter conversion or optical, geometric or positional isomers, eg.–D-3 phosphoglyceraldehyde.

(vi) Ligase–Enzymes catalyzing the linking together of two molecules coupled to the breaking of a pyrophosphate bond in ATP or a similar compound. e.g.–DNA ligase, + – RNA synthetase.

(b) Harmones of pancreas–Pancreas is a flattened, pinkish gland with secretes the digestive pancreatic juice as well as, two main protein harmones, insuline and glucagon. About 98%-99% part of the gland is exocrine and formed of pancreatic acini-Remaining 2% part of the pancreas in endocrine in nature which is called islets of longelan's.

Insulin–It is secreted by the betacells of Isletis of congerhans and named insulin by schaefer. It is most important regulator of carbohydrate metabolism in the body. Its principles role is to enormously increase the permeability of cell membrane for glucose, amino acids and potassium, magnesium and phosphate ions from blood into the cells. It enhances proper utilization of glucose and other metabolities in all body cells, exception—RBCs and cells of the brain : Insulin ensures the normal basal metasolic rate and normal biosynthesis of RNA, DNA and proteins. It also ensures maintenance of proper food reserve of body in between the meals by stimulating glycogenesis in muscles and liver cells, and lipogenesis in adiopose tissues. Evidently Insulin act as an anabolic growth factor. Oversecretion of Insulin may be a genetic defect.

Glucagon–This is secreted by the alpha cells of inlets of longer hans. It was discovered by *kimball* and *Murlin*. It is also a large polypeptide. Its elevate glucose level in blood when glucose is deficient.

Modern physiologists have postulated that D and F cells of Pancreas secrete *somatostain* (ss) and pancreatic polypeptide (pp) respectively. *Somato statin* slow down and regulate absorption of digested nutrients into the blood form the gut and to retard the secretion of insulin, glucagon and P.P. conversely, the P P is assigned a function of restricting secretion of ss from D cells. It also promotes hepatic lipogenesis, demotes lipolysis in adipose tissues and retards secretion of both insuline and glucogon.

(c) Testes–Gonads (Testes and ovary) in vertebrates are differentiated out of indifferent or sipotential mesodermal genital ridges. Primordial germ cells migrate into these ridges and trigger the proligeration of the genital rudiment into a peripheral cortex and an inner medulla. During sex differentiation the germ cells migrate into the medulla and develop into testes but the cortex regresses.

The testes in fish is composed of weird shapes of seminiferous tubules in which sperms are produced. The mature lobules (seminifersus tubule) become flush with one another and open into the vas deferens. Testis in fishes is mostly lobular type but in some fishes it is acinar. spermatophores are produced in acinar testes. *Leydig* cells and sertoli cells are found in a fish testes leydig cell secrete androgen (testosterone)

The Testes of reptiles undergoes cyclical changes. Avian testes also exhibits cydic variation in activity and matures usually once a year.

The activity of the mammalian testes is cyclic in some wild animals specially living in temperate and could regions. In most other mammals testicular cycle is continuous and extends up to quite an advanced age.

The structural unit of testes is convoluted tubules called seminiferous tubules each testies of man contains about 800 highly cosled tubules. Each seminiferous tubule consists of connective tissue fibres and epithelical cells. These cells are of two types. Most of them are cuboidal in structure and form primerdial germ cells while some of them are elongated, have broad bas and narrow apical ends. The latter are called sertoli cless. Cells patches of round cells lying in between the seminiferous tubules are called leydig cells these three types of cells perform three distinct type of functions.

Primerdial germ cells gives rise to sperm by the process of spernatogenesis.

Sertoli cells are believed to regulate the differentiation of spermatozoa and to nourish them. leydig's cells work as endocrine part of the testis. These secretes hormones collectively called Androgens. These indude huge amount of testoster one and less amount of estrogen.