

Life Processes In Living Organism Part II.

(Along with this refers Classroom notes and diagram)

Reproduction:

It is a process in which new individual are formed like that of parents.

Sexual reproduction:

Reproduction which takes place by means of gametes is called as sexual reproduction.

Gametes:

Highly specialized haploid reproductive cell is called as gamete.

Male gamete : Sperm

Female gamete : Egg

Male Reproductive System

It consist of two types of organs

1.External genital organ: The reproductive organs which lie outside the body is called as external genital organ.

a)Scrotum or Scrotal sacs :

It is the pouch or bag like structure situated in between two legs below abdomen in hanging condition. It is made up of Dartos muscles. Internally it shows partition called as septum scrotii. Due to this partition two chambers are formed. In each chamber one testis is present .Testis are held in position by means of fibres called as gubernaculum. Scrotum acts as thermoregulators, it helps in maintaining temperature which is necessary for formation of sperm (34 C).

b)Penis :

It is male copulatory organ. It is an erectile organ. Its base is called root and its tip is slightly swollen and is called as glans penis. It is made up of muscles called corpora cavernosa and corpus spongiosum. At the tip of penis urethral orifice is present which helps to release urine and genital component (semen).

2. Internal genital organ: The reproductive organ which lies within the body is called as internal genital organ.

a)Testis :

There are two testis situated in scrotal sacs. They are oval , pink in shape and measures about 3 cm in length. It helps in formation of sperm and male sex hormone called as Testosterone.

b)Epididymis :

It is a tube measuring about 20 feet. It lies on one side of testis. It acts as temporary store house of sperm. It cares and also provide nourishment to sperm.

c)Vasa deferens:

It starts from epididymis and joins to ejaculatory duct. It carries sperm from epididymis to ejaculatory duct.

d) **Ejaculatory duct** : It is small duct of 2 cm . The two ejaculatory ducts joins to form urethra.

e) **Urethra** :

It is a tube of 16 to 18 cm .It lies within penis and open at its tip by an aperture called as urethral orifice.

f) **Reproductive glands** :

- **Cowper's gland** : These are pairs of small glands which secretes oily material over the penis and acts as lubricant.
- **Seminal vesicles** : It is also pair of gland. They produces seminal fluid. Seminal fluid contains glucose, fructose , fibrinogen and prostaglandin. This fluid provides nourishment to sperm
- **Prostate gland** : It produces prostatic secretion. It provides motility and increases viability of sperm.

Female reproductive system :

It also consist of

a) **External genital organ** :

In female the external genital organ is vulva.It shows two broad folds of skin called as labia majora and two thin inner folds called as labia minora. The cavity present between two labia minora is called as vestibule and shows clitoris, urethral orifice and vaginal orifice.

B) **Internal genital organ** :

1) **Ovaries** :

There are two ovaries situated in abdominal region one on either side of uterus.

It is almond shape, 2.5 cm in length and pink in colour. They are held in position by ligaments called as mesovarium. It helps in formation of egg and hormones called as estrogen and progesterone.

2) **Fallopian tube** :

It is atube of length 10 cm . it is divided into 3 parts i.e Isthmus (1cm), ampulla (7cm) and infundibulum (2cm). Over the infundibulum 10-12 finger like outgrowths are present called as fimbriae. Ampulla is the place of fertilization.

3) **Uterus** :

It is embryo sac . it is divided into three parts i.e fundus, body and cervix. Its volume is 8cm x 5 cm x 3 cm. It expands in size upto 10 times during pregnancy. It shows three layers i.e Perimetrium , myometrium and endometrium. Uterus provide nourishment to developing embryo.

4) **vagina** :

it is tubular passage of 10 -12 cm . It opens to outside by an aperture called as vaginal orifice. It helps in receiving penis , semen, release of child (parturition) and release of blood during menstrual cycle.

- **Menstrual Cycle :**

Cyclic flow of blood along with cellular debris , blood capillaries and dead egg by a non pregnant female through vagina is called as menstrual cycle.

Onset of menstrual cycle is called menarch (12 to 14 years) and complete stoppage is called menopause (47 to 50 years).

There are four phase of M.C i.e

1. Menstrual phase
2. Follicular phase
3. Ovulatory phase
4. Secretory phase

It is a cycle of 28 days. In first phase , which lasts for 5 days -bleeding occurs.

In second phase repairing of endometrium occurs. It continuous from 6th to 14th day. In third phase , at the end of 14th day ovulation occurs .If fertilisation takes place then secretion of progesterone continuous till 9 month. If fertilization does not takes place then after 28th day next menstrual cycle begins. Menstrual cycle gives new chance for female for being mother

- **Formation of Gametes**

Formation of gametes is called as Gametogenesis. Male produces sperm by testis and is called as spermatogenesis. Male starts its formation from puberty and it continued up to 55 to 60 years. Female is going to produce egg by ovary and process is called as oogenesis. It start production of egg fro puberty (12 to 14 year) and ends at 47 to 50 years (menopause).

- **Fertilisation :**

Fusion of male and female gamete is called as fertilization. During coitus sperm is released in vagina. From vagina it goes in uterus and then to fallopian tube. In ampulla fertilization occurs. The result of fertilization is zygote. The zygote develops into morula (16 cells) in ampulla and now morulla transfers into uterus where implantation takes place. Attachment of embryo to endometrium is called as implantation. After implantation placenta is formed which provides :

1. Nourishment to developing embryo
2. Oxygen to embryo
3. Hormones to embryo
4. waste to kidneys.

- **Sex determination in man**

In human sex is determined by chromosomes .There are two types of chromosomes in humans, i.e Autosomes(Somatic or body) and Allosomes(sex chromosomes). Autosomes are 44 where as Allosomes are 2. In male XY and in female XX. The individual which is heterogametic can determines the sex of individual. In human , male is heterogametic and hence male determines the sex.

Male
XY

Female
XX

XX Girl	XY Boy
XX Girl	XY Boy

- **Flower :**

Highly modified reproductive part of plant body is called as flower.

- Stalk of flower – Pedicel
- Condensed end of pedicel - Thalamus

Non-essential whorl : The parts of flower which don't have direct role in reproduction is called as non essential whorl. E.g. Calyx and Corolla

1. **Calyx :**

It is the first whorl of flower. It is composed of sepals. It is green in colour and protects the flower in bud condition.

2. **Corolla :**

It is second whorl of flower. It is made up of petals . Petals are brightly coloured and they attract the insects for pollination

Essential whorl : The parts of flower which has direct role in reproduction is called as essential whorl e.g Androecium and Gynoecium.

1. **Androecium :**

It is the third whorl of flower . It is male reproductive part. It is made up of stamens . Each stamens have three parts i.e Filament, connective and anther. Anther consist of two lobes in which four pollen chambers are present.Pollen grains are formed in pollen chambers.

2. **Gynoecium :**

It is fourth and last whorl of flower . it is female reproductive part. It is made up of carpel.Each carpel have three parts i.e stigma , style and ovary. Ovary contains rounded body in it called as ovules . Ovary in future gets converted to fruits and ovule gets converts to seeds.

Pollination :

Transfer of pollen grains from anther to stigma is called as pollination.

Self- Pollination :

Transfer of pollen grain from anther to stigma of same flower or different flower born on same plant is called as self pollination. It includes only one plant.

Cross pollination :

Transfer of pollen grain from anther to stigma of different flower born on different plant of same species or different species is called as cross pollination.

Pollinating agents :

The agents which helps in pollination is called as pollinating agents.

The living agents are called as Biotic agents and non living agents are called as abiotic agents.

Fertilisation :

On pollination, the pollen grains are deposited on stigma. On stigma the pollen grain gets germinated and forms pollen tube. The pollen tube contains two male gametes. The pollen tube moves towards ovule and enters ovule. On entering ovule , the pollen tube burst and liberates two male gametes. First male gamete fuses with egg and forms zygote whereas second male gamete fuses with polar nuclei and forms triploid endosperm. As fertilization occurs twice , it is also called as double fertilization.

Fruits and seeds :

Matured ovule is called seed .Embryo on development forms seed. Each seed shows two parts i.e embryonic axis and cotyledons. Embryonic axis shows radical , plumule , epicotyl and hypocotyl. Radical gives rise to root and plumule gives rise to shoot.

Ovary on maturation forms fruit. Each fruit consists of two parts i.e. Pericarp and seed. Pericarp shows three layers i.e epicarp, mesocarp and endocarp.

Asexual reproduction :

It does not involve gametes.

1) Binary fission :

The kind of reproduction in which one cell gives rise to two cell giving rise to two new individuals is called binary fission. It occurs in favourable condition. E.g Amoeba , Paramecium

2) Multiple fission –

The kind of reproduction in which one cell gives rise to many cell producing many new individual is called multiple fission. It occurs in unfavourable condition eg. Amoeba, plasmodium.

3) Fragmentation-

Due to accidental breakage the algal filament is broken down into small segment .such segments are called fragment .Each such fragment has the ability to develop into a new plant. The process of formation of new plant from fragments is called fragmentation.

4) **Regeneration** –

The process in which new organs or complete body is formed from remaining part of body is called as regeneration. E.g. when planaria larva is cut into small pieces then each piece has the tendency to develop into new organism.

5) **Spore formation** –

In fungus, Usually reproduction takes place by means of spores .in fungus the thread like structure are present called as mycellium or hyphae. On vertically upward direction reproductive body is called sporangium are born . These sporangium on maturity burst and liberates spores. When these spores falls on suitable substratum , they germinate and forms new fungus.

6) **Vegetative propogation** -

The reproduction which takes place by means of vegetative part of plant body is called as vegetative propogation . Roots, stem and leaves are vegetative part of plant body.

7) **Budding** –

It is seen in hydra ,yeast etc. In budding, small outgrowth develops which converts into buds. When bud detach ,it develops into new organism

In Vitro Fertilisation (IVF)

In this technique , fertilization is brought in test tube and the embryo formed is implanted in uterus of woman at appropriate time. IVF technique is used for having child in case of those childless couples who have problem like obstacle in oviduct, sperm count.

Surrogacy

There are some females who have problems related to implantation. For such females surrogacy is a better idea. In this technique egg from female is collected and is fertilized in test tube by the use of sperm of her husband. Now after fertilization , the embryo is transferred in another female Such a female whose uterus is used for development of embryo is called as surrogated mother and phenomenon is called as surrogacy.

Sperm Bank / Semen Bank

There are various problems related to sperm count and its formation in males .So as to have children in such couple sperm bank is a new concept. I

Here sperms are collected from sperm bank and is artificially inseminated in female at appropriate time and thus she gets pregnant .In sperm bank sperms are stored at -196°C and is called as cryopreservation.

Twins

If two individual borns at a time then it is referred as Twins. Twins are of two types i.e Fraternal twins(Non identical) and zygotic twin (Identical). In fraternal twins, mother produces two eggs, and both the eggs fertilizes to form two zygotes. Thus from two zygote (Di zygotic) two individuals are formed. Both are non identical.

Some time after formation of single zygote (Monozygotic) , the first cell division occurs and two cells are formed. But unfortunately both the cells gets separated and each cell develops into zygote and giving rise to two new individual. As both are formed from single zygote , it is called as identical twins.

Reproductive health

Occurance of menstrual cycle is related with reproductive health and overall health of women. Bleeding occurs in menstrual cycle. Due to this private parts need to maintained and clean time to time, otherwise problems related to reproductive health occurs. It is essential to clean genitals in both male and female.

- **STD :**

The diseases which are transferred from one person to other by direct sexual contact is called as sexually transmitted disease.

e.g : AIDS , Syphillis, Gonorrhoea, Genital Warts etc.