

Reproduction in Animals

Various life processes that you have studied earlier help organisms to survive. There is yet another important process that does not help an organism to survive but it is essential for the continuation of its own kind in nature. This process is known as reproduction. It is one of the most important characteristics of living organisms.

The process by which living organisms produce offsprings of their own kind is called **reproduction**.

This process helps all living organisms to increase in number by producing young ones of their own kind. It also helps in the continuity of life. It results in producing favourable variations in the organisms. In this chapter you will learn how reproduction takes place in animals.

TYPES OF REPRODUCTION

As in plants, there are two types of reproduction prevalent amongst animals. These are:

1. Asexual reproduction
2. Sexual reproduction

ASEXUAL REPRODUCTION IN ANIMALS

This occurs without involving sex organs. Asexual reproduction requires only one parent for multiplication and formation of new offsprings. It does not require both male and female parents. It is the simplest form of

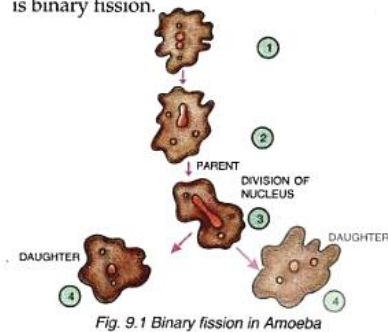
reproduction and is commonly found in unicellular organisms (hydra, *Amoeba*, *Paramecium*) and lower animals like starfish, sponges and worms.

The various methods of asexual reproduction commonly found in animals are as follows.

Binary Fission

When one mature unicellular organism like *Amoeba* splits into two daughter individuals, the process is called **binary fission**. This type of reproduction occurs when environmental conditions are most favourable.

In *Amoeba* the nucleus first divides into two nuclei (Fig 9.1). Then the cytoplasm divides into two parts, each containing a nucleus. A constriction develops in the body which gradually deepens to form two daughter amoebae. This type of reproduction is binary fission.



Budding

In this type of reproduction, as seen in hydra, a small outgrowth appears on the body of the organism. This outgrowth is called a **bud**. The nucleus of the parent body divides into two and one nucleus goes into the bud. The bud grows and finally gets detached from the parent body of hydra and begins to live as an independent individual (Fig. 9.2).

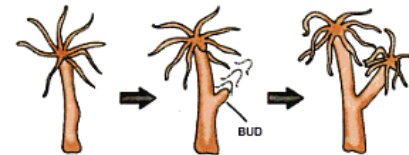


Fig. 9.2 Budding in hydra

Since new individuals develop from the bud in hydra, this type of reproduction is called **budding**.

Besides these two processes, there are other methods of asexual reproduction which you will study in your higher classes.

SEXUAL REPRODUCTION IN ANIMALS

This is one of the most common methods of reproduction, found in most animals including human beings. In sexual reproduction, two parents, one male and the other female, are required. Each parent produces reproductive cells called **gametes**. The male gamete is called a **sperm** and the female gamete is known as an **egg** or **ovum**.

Those organisms which produce only one type of gamete are called **unisexual**, e.g. dogs, cat, fish, man, birds, reptiles.

Those organisms which have both the male and female sex organs in their body are called **bisexual** or **hermaphrodite**, e.g. earthworm, leech, hydra.

Fertilisation

The process of fusion of the sperm with the ovum is called **fertilisation**. **Zygote** is formed after fertilisation. The zygote changes over a period of time to form a new individual.

Types of Fertilisation

Fertilisation is of two kinds.

1. External Fertilisation

In external fertilisation the fusion of male and female gametes takes place outside the body of the female. This is commonly seen in aquatic animals such as frogs and fish.

The female frog lays hundreds of eggs in the water where they are fertilised by the sperms released by the male frog.

2. Internal Fertilisation

In internal fertilisation the fusion of male gamete with the female gamete takes place

VIVIPAROUS AND OVIPAROUS ANIMALS

Animals which give birth to young ones are called **viviparous animals**.

Examples: dog, cow, cat, rat, human being.



Fig. 9.3 Some viviparous animals

Animals which lay eggs are called **oviparous animals**. The eggs are hatched by the mothers.

Examples: lizard, frog, fish, snake, crow, hen, butterfly.



Fig. 9.4 Some oviparous animals

inside the body of the female. Internal fertilisation is seen in cats, dogs, cows, goats, sheep, etc.

ACTIVITY 9.1

Visit a pond during rainy season. Look out for clusters of frog eggs floating in water. Observe these eggs carefully. Write a short report about the colour and size of the eggs.

SEXUAL REPRODUCTION IN HUMANS

In human beings the reproductive system in males and females are different with different organs performing different functions. In this section you will learn the reproductive parts and the process of reproduction in humans in detail.

The Male Reproductive System

The male reproductive system of humans consists of the following organs (Fig. 9.5).

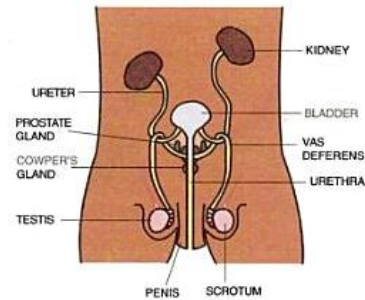


Fig. 9.5 Human male reproductive system

Testes

There is a pair of testes which lie outside the body within the scrotum. They produce millions of sperms.

Vas Deferens (sperm duct)

Vas deferens are two in numbers. This duct connects each testis to the urethra. It carries sperms to the urethra along with the secretion of reproductive glands. This mixture of sperms and secretions is called semen.

Urethra

The two vas deferens open into the urethra and pass through the penis.

Penis

Urethra leads to a muscular organ called penis. It is used to deliver semen into the vagina of the female during mating. It is used to pass urine as well.

Sperms

The sexual maturity in human males is attained around the age of 14 to 15 years. Sperms are produced in millions by the testes. They are very small in size. Each sperm consists of a head, a middle piece and a tail (Fig. 9.6). Sperms swim in semen with the help of a tail.



Fig. 9.6 Human sperm

The Female Reproductive System

The female reproductive system of humans consists of the following organs (Fig. 9.7).

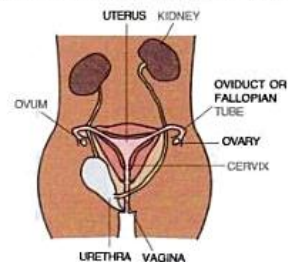


Fig. 9.7 Human female reproductive system

Ovaries

There are two ovaries which are situated in the abdominal cavity. Each ovary produces one mature ovum (egg) every month by a process called ovulation. Like sperm, an egg is also a single cell.



Fig. 9.8 Human ovum

Oviduct or Fallopian Tubes

It is a muscular tube which joins the uterus with the ovary. It carries the ovum into the uterus.

Uterus

It is a hollow, muscular, pear-shaped organ. The development of the baby takes place inside it. The lower narrow part of the uterus is called cervix.

Vagina

The uterus opens into a wide muscular tube called vagina. The vagina receives the penis during sexual intercourse. The sperms are discharged into the vagina.

Sexual maturity in human females is attained around the age of 11 to 12 years.

FERTILISATION IN HUMANS

The process of fusion of a sperm with an ovum is called fertilisation (Fig. 9.9). In

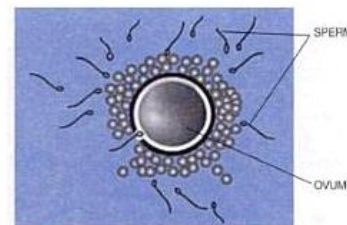


Fig. 9.9 Fertilisation of an ovum by the sperm

humans internal fertilisation occurs in the fallopian tubes. The ovum reaches the oviduct from the ovary. The sperms are released into the vagina by the penis during mating. These sperms then travel upward towards oviduct, where one sperm fuses with the ovum to form the zygote.

The fertilised egg or zygote continues its journey down the oviduct into the uterus. The zygote implants itself in the uterus wall and develops into a human embryo.

If the ovum is not fertilised by a sperm, it is expelled from the uterus along with the lining of uterus and blood through the vagina. This is known as menstruation.

Artificial Fertilisation: Test Tube Babies

Some women are unable to bear babies because their oviducts are blocked. This prevents the ovum from being fertilised as the sperms cannot reach the oviduct where the ovum is present. This problem can be overcome by fertilising an ovum with human sperms in the laboratory with a technology called **in vitro fertilisation (IVF)**.

In this technique the doctor collects freshly released egg and sperms and keeps them together for a few hours for **in vitro fertilisation**. Here the fertilisation occurs outside the body of the female. In case fertilisation occurs, the zygote is allowed to develop for about a week. The zygote is then placed into the uterus of the mother. The embryo gets implanted and develops into a baby in about nine months. Babies born through this technique are called **test tube babies**.

This technique is quite useful when natural fertilisation fails. This technique was first successfully introduced in humans in 1978.

Development of Embryo

Once the zygote reaches the uterus, it implants itself there. The zygote then starts dividing repeatedly to give rise to a ball of cells. The developing baby is called the **embryo** during the first eight weeks after fertilisation. The embryo attaches itself to the uterus wall with the help of **placenta**. The embryo continues to develop in the uterus. It gradually develops body parts such as hands, legs, eyes, ears, etc. From eight weeks till birth, the baby is called **foetus**. During this period of pregnancy, the baby takes in nourishment from the mother through the placenta and the **umbilical cord** (Fig. 9.10).



Fig. 9.10 Foetus in the uterus

The uterus increases in size as the foetus grows. The uterus is filled with a fluid called **amniotic fluid** that protects the foetus from jerks and change in temperature.

Gestation and Child Birth

The period between fertilisation and the birth of the baby is called **gestation**. The expectant mother is called **pregnant**. In humans it lasts for about 40 weeks or around nine months.

After nine months of pregnancy, the baby is delivered. Natural child birth or labour can

last for several hours and is very painful for the mother. Sometimes due to some complications, doctors remove the child from the womb surgically. This is known as **caesarian operation**.

Babies delivered before completing gestation period are termed as **premature babies** and need special care.

METAMORPHOSIS IN FROGS AND SILKWORM

Newborn mammals and newly hatched birds have similar shape and structure as their parents. In some animals, the young ones may look very different from the adults. You have studied in class VII the life cycle of a silkworm in which it passes through different stages of growth. These stages are:

eggs → larvae or → pupa → adult
caterpillar

The pupa of a silkworm looks very different from the adult moth.

A frog is another such example in which a tadpole looks so different from the adult. Let us study the life cycle of a frog (Fig. 9.11). A frog lays eggs in large numbers. The process of laying eggs in large numbers is called **spawning**. The baby that hatches out of the frog's egg is called **tadpole**. The tadpole undergoes several changes before it becomes an adult frog. In the same way, a caterpillar that hatches out of the cocoons of a silkworm becomes an adult moth.

egg → tadpole → adult

This process of change by which a larva is transformed into an adult is called **metamorphosis**. Thus a tadpole and caterpillar undergo metamorphosis to become an adult frog and an adult silkworm moth, respectively.

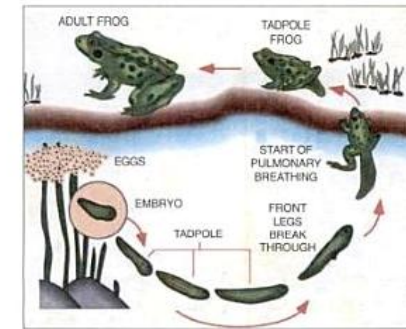


Fig. 9.11 The life cycle of a frog

EVALUATION

OBJECTIVE EVALUATION

A. Write True (T) or False (F) against the following statements in the given brackets.

1. Internal fertilisation takes place outside the female's body. ()
2. Birds and snakes are oviparous animals. ()
3. A tadpole is the young one of a frog. ()
4. Animals like amoeba multiply by budding. ()
5. The fusion of male and female sex cells is called fertilisation. ()
6. Monthly bleeding in women is called menstruation. ()

B. Fill in the blanks.

1. Testes produce
2. The cells involved in sexual reproduction are called
3. joins the uterus and the ovary.
4. In animals like fish and frog fertilisation takes place.
5. The human zygote gets implanted in the
6. IVF stands for

C. Match the items in Column A with the items in Column B.

- | Column A | Column B |
|-------------------------|---------------|
| 1. Sexual reproduction | (a) Earthworm |
| 2. Asexual reproduction | (b) Ovum |
| 3. Testes | (c) Penis |
| 4. Ovary | (d) Sperm |
| 5. Hermaphrodite | (e) Hydra |
| | (f) Man |