

in the copulatory organ of

## VASCULAR OR FLUID TISSUE :-

These are motile connective tissue containing cells and matrix without fibres. Vascular tissues transport the materials from one place to the other. They include blood and lymph.

## BLOOD :-

Blood is a thick fluid composed of plasma and the cells (blood corpuscles). Blood is the basis of life. The pH of blood is 7.4 and sp. gr. is 1.06-1.09. The volume of blood in an adult person is about 5.5 litres.

(A) PLASMA :- It is slightly alkaline, non-living intercellular substance which constitute about 60% part of the blood. It is pale yellow but transparent and clear fluid.

Composition of plasma :- Plasma contain about 90-92% of water. Solid forms about 8% of plasma.

The mineral salts are chloride, bicarbonate, sulphate and phosphate of Sodium, Calcium, Potassium iron, magnesium

The nutrients includes, glucose, fatty acid phospholipids, cholesterol, fats, amino acids, vitamins etc

Plasma Proteins:- They constitute about 7 to 8% part of plasma. These mainly includes albumin, globulin, fibrinogen. Albumin and globulin help in water retention in plasma. Other proteins help in transport of thyroxine,  $Fe^{2+}$ , immunization by antibodies, neutralize the action of toxin and coagulation of blood at the site of injury.

Functions of Plasma:-

- i) Transportation of fat soluble vitamins and steroids.
- ii) Maintenance of normality of blood pH, salts Pressure
- iii) Retention of water from interstitial tissue fluid due to osmotic pressure
- iv) Coagulation and of blood at the site of injury, immunity.
- v) Thermoregulation and distribution of heat of body and skin.

B BLOOD CORPUSCLES (BLOOD CELLS):-

The blood cells that are found suspended in blood plasma are called as formed elements. Formed elements consist of three types of cells (i) Erythrocytes (RBC) (ii) Leucocytes (WBC) (iii) Platelets (mammal) or thrombocytes (Psg).

(i) Red Blood Corpuscles  
 Frog red blood corpuscles are nucleated, oval and biconvex.



Erythrocytes of Frog



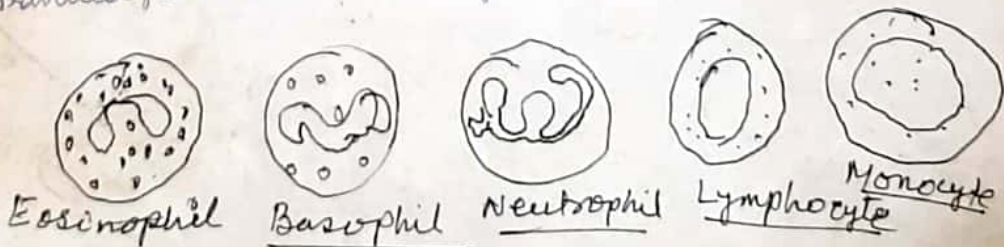
Erythrocytes of Rabbit

Mammals red blood corpuscles are non-nucleated, circular and biconcave except in camel and llama where they are nucleated. The cells are occupied by haemoglobin (Hb) a respiratory pigment which contain  $Fe^{2+}$  due to which it imparts red colour to RBC. Average life span of RBC is 120 days. Formation of RBC is called ~~erythro~~ erythropoiesis which takes place in haemopoietic tissues eg. liver, spleen etc. in foetus. But in adults the red bone marrows of long bones are haemopoietic.

Total number of RBCs is 5 million/cumm in male (man) and 4.5 million/cumm in female.

(ii) Leucocytes <sup>(WBC)</sup> They are nucleated, larger than RBC. They can change their shape like amoeba. The number is 6000-11000/cumm. Leucocytes are of two types

- (A) Granulocytes and (B) Agranulocytes.



B.Sc./G.A/200  
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1) Granulocytes :- These cells contain granules in their cytoplasm. Their nucleus is sub-divided. The granulocytes are produced by bone marrow. The granulocytes are of three types according to staining properties.

(a) Eosinophils :- They have two lobes nucleus and coarse granules. Their ~~st~~ granules take acidic stain and constitute 2-4% of total WBC. They contain histamine. These increase in number during allergic condition. Their main function is to bring about detoxification of toxin. These have life span of 14 hrs.


(b) Basophils :- These constitute about 0.5-2% of total WBC. The nucleus is 2-3 lobed. They take deep basic stain (blue). These are amoeboid and have a life span of 8-12 hrs.

(c) Neutrophils :- These constitute about 66% of total leucocytes. These contain multilobed (2-5 lobes) nucleus. They take neutral stain and appear purple. They are phagocytic (scavenger cells). Their life span is 10-12 hrs.

II. Agranulocyte :- The granules are not found in the cytoplasm of these cells. The agranulocytes are of two types.


(a) Lymphocytes :- They are small in size with scanty cytoplasm with large nucleus. They are produced by the lymph nodes, spleen, thymus, tonsil and Peyer's patches of intestine. They produce antibody. The life span is few days or even years. These are B- and T-lymphocytes.

(b) Monocytes :- They are large among all other leucocytes. The monocytes are produced by bone marrow. They are motile and phagocytic. The life span is 10-12 hrs in blood ~~years~~ in tissue.

  
Squamous epithelium

  
Cuboidal epithelium

Single cell

  
Brush border cell

cytoplasm. The <sup>hexamer</sup> produced by megakaryocyte with little  
The number varies from 0.15 - 0.45 million/cumm.  
They release thromboplastin which help in  
blood clotting.

LYMPH :- Lymph ~~Component~~ is like blood but has  
fewer blood protein, less Calcium and phosphorus  
and high glucose concentration. Erythrocytes  
and platelets are completely absent.

Lymph act as a 'middle man' which trans-  
port oxygen and food materials, hormones etc.  
Body cells are kept moist by lymph. It absorbs  
fatty acids, glycerol and fat soluble vitamin from  
intestine.

### III - MUSCULAR TISSUE:-

Muscular tissue develop from mesoderm.  
They bring about movement of body part and  
locomotion of the individual. They form bulk  
of body. They support the bone and other struc-  
ture. Muscle cells has contractility properties.

Muscular tissue is of 3 types

- ① Skeletal or Striped or Striated or voluntary muscle fibres.
- ② Smooth or Unstriped or involuntary muscle fibres.
- ③ Cardiac muscle fibres.

1) Skeletal muscle fibres :- These muscles are  
found in bundle and normally attached to muscles.  
It is also found in tongue, pharynx and beginning  
of oesophagus.

Each muscle fibre is an elongated cell  
surrounded by sarcolemma. Just beneath sar-  
colemma is found many nucleus (multinucleated)  
i.e. syncytial in nature. The cytoplasm (sarco-  
plasm) of each fibre has a large no. of myofibril  
which are tightly packed. Each myofibril shows  
dark and light bands of stripes alternate with  
each other.