SUBJECT: BIOLOGY

CLASS: SS 3

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TRANSPORT IN ANIMALS

The main materials that are transported in animals are:

1) digested food e.g. glucose, amino acids etc.

2) water (3) Oxygen (4) excretory products such as Carbon dioxide, Urea and water.

5) hormones

In most animals, blood is the main medium of transport.

BLOOD.

It consists of a watery fluid, called PLASMA. In which are suspended in large numbers of cells of several kinds.

Plasma: The liquid part of the blood. Made up mainly of water. Many substances are dissolved in it, they include soluble proteins (e.g. albumin, fibrinogen), antibodies hormones, enzymes, gases, digested food e.g. glucose, amino acids etc. waste materials (e.g. Urea) mineral salts especially sodium chloride and sodium hydrogencarbonate.

Blood serum: Is blood plasma from which the fibrinogen has been removed.

Blood Cells. There are three types:

1) Erythrocytes or red blood cells.

2) Leucocytes or white blood cells; and

3) Platelets

Red blood cells or erythrocytes

Each red blood cell is circular, concave on both sides and flat. A mature cell does not have a nucleus. The inside of the cell is filled with the oxygen- carrying pigment called haemoglobin.

Haemoglobin combines with oxygen in conditions of high oxygen concentration, forming a weak compound called Oxyhaemoglobin.

The red cells are made in the red bone-marrow of the short bones such as the sterium (breast –bone), ribs and vertebrae.

Red blood cells have a short life of about 3 months; after which they breakdown and disintegrate in the liver spleen.

Haemoglobin contains an element, Iron. The haemoglobin is broken down to bilirubin and ferritin. The liver stores the iron in ferritin, which is used to produce more new red blood cells, and gets rid of the bilirubin via the bile.

Function of red blood cells.

1) They transport oxygen from the lungs to the body cells.

White blood cells or leucocytes.

They are bigger than the red blood cells and have nuclei. (they are nucleated) They are fewer in number and have short life span of few days. White blood cells are made in the bone-marrow, the lymph nodes and the spleen.

There are two main groups of white blood cells.

a) Phagocytes or granulocytes (they have lobed nuclei)

b) lymphocytes or agranulocytes (they have bean shaped nuclei)

The phagocytes can ingest and destroy bacteria and dead cells by engulfing them.
The lymphocytes produce antibodies which can destroy invading micro-organisms. There are lymphocytes which produce anti-toxins to neutralize the effects of toxins in the body.

Platelets

These are tiny round or irregular cells, very much smaller than red or white blood cells. They are cells without nuclei. (non-nucleated).

They are formed in large bone marrow cells. (I.e. budded off from special, very large cells in the red bone marrow.

Functions

- **They aid clotting of blood.**
- **They transport digested food/hormones.**

FUNCTIONS OF BLOOD

1) Transport of oxygen from the lungs to the tissues.

2) Transport of Carbon dioxide from the tissues to the lungs.

3) Transport of excretory materials from the tissues to the kidneys.

4) Transport of digested food from the ileum to the tissues.

5) Distribution of hormones (hormones are carried from the glands to the target organs).

6) Distribution of heat (temperature control)

7) Formation of clot

8) Prevention of infection (Action of white blood cells).