

KARACHI EDU COACHING CENTER • CLASS 9 BIOLOGY

Chapter 9: Transport

Comprehensive study of transport in plants (xylem, phloem, transpiration) and human cardiovascular & lymphatic systems.

Uptake of Water & Ions



Root Hair Absorption

Huge surface area absorbs water via osmosis and mineral ions via active transport from soil into root cortex.



Pathways to Xylem

Water moves through cortex via apoplast (cell walls) and symplast (cytoplasm) pathways into the vascular cylinder.

Transpiration Pull

Vapor Loss

Transpiration Process

Evaporation of water from leaf mesophyll cells through stomata creates a negative pressure gradient pulling water upward.

Cohesion-Tension

Ascent of Sap

Hydrogen bonding creates unbroken water columns in xylem vessels, allowing continuous upward transport against gravity.

Pressure–Flow Hypothesis



Source to Sink Dynamics

Sugars produced in leaves (sources) are actively loaded into phloem, driving water inflow and high hydrostatic pressure.



Unloading at Sinks

Sinks (roots, fruits, tubers) consume or store sugars, reducing pressure and forcing mass flow of sap through sieve tubes.

Blood Composition

Plasma (55%)

Watery fluid transporting ions, nutrients, hormones, and waste products.

RBCs (Erythrocytes)

Biconcave discs containing hemoglobin for efficient oxygen transport.

WBCs & Platelets

Leukocytes fight infections while platelets mediate blood clotting.

Heart Structure & Pumping

Four-Chambered Pump

Right atrium/ventricle handle deoxygenated blood; left atrium/ventricle handle oxygenated blood, separated by thick septa.

Cardiac Cycle

Coordinated sequence of atrial systole, ventricular systole, and cardiac diastole driving rhythmic heartbeat and pulse.

Vessels & Common Diseases

Arteries & Veins

Arteries carry blood away (thick walls); veins return blood with valves.

Atherosclerosis

Plaque buildup narrowing arteries, restricting blood flow and raising pressure.

Myocardial Infarction

Heart attack caused by total coronary artery blockage and tissue necrosis.

Questions & Discussion

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