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P.G. Sem I, CC-1, Unit-1, subunit-4.2, Pg 1/1

Organs of Excretion: Kidney in Vertebrates

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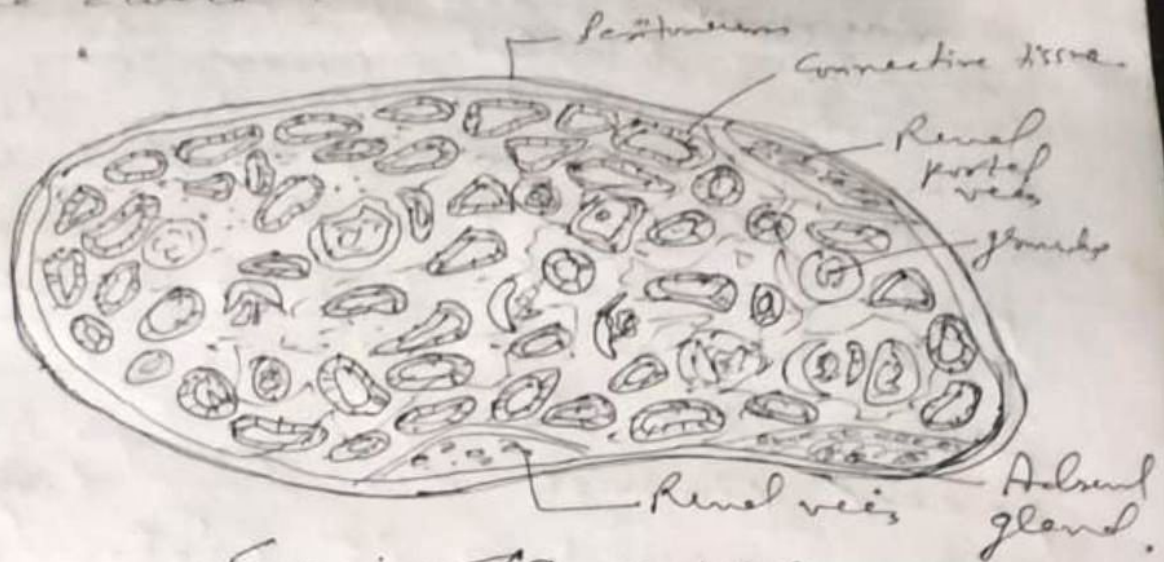
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Kidneys are the chief organs of excretion in almost all vertebrates, although their organisation varies from lower to higher vertebrates. Kidneys in fishes are mesonephric type, which discharge their wastes through cloaca. In these animals, testes in male and ovaries in female are closely associated with kidney and testes, therefore they form urinogenital systems. The nephrons are not well-developed. But, they become well-organised in Amphibians. In this group, kidneys are elongated, compact, flattened and dark red in colour. These are found in the lymph spaces above the coelom attached on either side of vertebral column. In larval stage, kidneys are pronephros, but in adult there are mesonephros. These are covered ventrally by peritoneum. In Amphibians, each kidney is composed of a no. of twisted renal

or uriniferous tubules held together by connective tissue and richly supplied with blood vessels and their capillaries. Each renal or uriniferous tubule starts as a thin double walled ciliated cup. The Bowman's Capsule, enclosing a bunch of blood capillaries, the glomerulus which receives blood from an afferent artery of the renal artery. Uriniferous tubules are the functional units of kidney. They are lined with a glandular coat placed with a renal vein. The tubule gets the blood supply from the capillaries of efferent artery and renal portal vein. The Bowman's capsule along with its glomerulus is called Malpighian body or corpuscle tubule. Each tubule opens into the collecting tubule which runs transversely across the kidney towards the dorsal surface. In turn of the transverse collecting tubules open into a longitudinal Bicadder's Canal, lying towards the inner margin of kidney and towards outer margin into the ureters. Ventral ciliated funnel-shaped nephrostomes. They carry wastes from coelom into renal vein in frog or in uriniferous tubule in tadpoles. From the outer smooth convex posterior side of each kidney arises a mesonephros or wolfian duct or ureter, which

passed backward to open into dorsal part of the cloaca.



Frog: To 8. of kidney

In Aves also, the main organ of nitrogenous waste excretion is kidneys.

They are two, dark brown, flattened, three lobed metanephros. Kidneys lying postero-dorsally in the body cavity and embedded in the hollow of the pelvic girdles. Their ventral surface is covered by peritoneum. They are provided with venous blood by the renal portal vein and arterial blood from the renal arteries. The renal arteries supplying the glomeruli, while the tubules are supplied both by efferent glomerular arterioles and branches of portal vein. A small, yellowish, elongated and streak-like adrenal body lies attached ventrally to the anterior lobe of each kidney. It is an adrenal endocrine gland also.

