Earthworm.. Cockroach.. Frogs...

Structural Organisation in Animals.. PART-2

Earthworm :→

Common Indian Earthworms are pheretima and Lumbricus.

* Morphology →
- Colour: Glistening reddish brown (due to presence of porphyrin).
- 1st segment: Peristomium (buccal segment) which contains the mouth
- Clitellum: (Circular bands of glandular tissue): 14-16 segments.
- Body is divisible into 3 prominent regions — 1) preclitter 2) Clitellar. 3) post Clitellar regions.

* Digestive System →
- Digestive system includes buccal cavity (1-3 segments), Oesophagus (5-7 segments), gizard (8-9 segments), Stomach (9-14 segments).
- Intestine (starts from 15th segment onwards and continues till the last segment) and anus (last segment).

* Blood Vascular System →
- Blood Glands → present on 4th, 5th and 6th segment, produces blood corpuscle and haemoglobin.

* Excretory System →
- Both ammotelic and ureotelic.
- Nephridia: Excretory organ, also perform osmoregulation.

* Nervous System →
- Anterior part has tactile, chemo, photo and buccal receptors

* Reproductive System →
- Hermaphrodite but protandrous.
- Male Reproductive System: 2 pairs of testes (10th and 11th segment), testes sacs, 2 pairs of seminal vesicles, vasa differentia (upto 18th segment), a pair of prostate glands (17-20 segments) and accessory glands (in 17th and 19th segment) Prostate and vasa deferentia opens to exterior by pair of male genital pores.
- Female Reproductive System: pair of Ovaries (at the inter-segmental septum of the 12th and 13th segments), 2 short Oviducts that open outside by female genital pore.

Cockroach :→

- periplatena Americana is largest species of Cockroach.

* Morphology →
- Body covered by hard chitinous exoskeleton (brown in colour), exoskeleton has hardened plates called sclerites (formed by cuticle).
- Arthrodial membrane (thin and flexible articular membrane) joined sclerites to allow movement of body and appendages.
- Body segmented into 3 regions — Head, Thorax and abdomen.
- Males bear thread-like anal styles (absent in females).

* Digestive System:→
- 3 region of alimentary canal — foregut, midgut and hindgut.
- Malpighian tubules: Excretory organ, 100-150 yellow coloured thin filamentous tubules present at junction of midgut and hindgut that removes excretory product from haemolymph.
- Hindgut: Ileum, Colon, rectum (with 6 rectal glands) and anus.

* Circulatory System:→
- Open type vascular system with vessels opening into haemocoel.
- Haemolymph is composed of colourless plasma and haemocytes.

* Respiratory System:→
- Tracheal tubes carry oxygen from air to all parts, subdivided into tracheoles (where exchange of gases takes place through diffusion).

* Nervous System:→
- Consist of central, peripheral and sympathetic system.
- Dorsally located eyes consists of 2000 hexagonal ommatidia to make up mosaic vision of cockroach.
- Other sense Organ: Antennae, maxillary palps, labeal palps, anal cerci etc..

* Excretory System→
- Uricotelic and comprises of Malpighian tubules (lined by glandular and ciliated cells), fat body, nephrocytes and uricose glands.

* Reproductive System:→
- Male: A pair of testis in 4th-6th abdominal segments, vas deferens that opens from testes to ejaculatory duct through seminal vesicles.
External genitalia: Male gonapophyses (phallomeres).
- Female: Ovaries in 2nd-6th abdominal segments, formed of group of ovarian tubules (ovarioles) that contain a chain of developing ova.
- Fertilization and Development: Female produce 9-10 oothecae, each with 14-16 eggs. Paurometabolous development, i.e. through nymphal stage.

Frogs...

most common species of frog in India is Rana tagrina.

*Morphology:-
- Body is divisible into head and trunk, streamlined. A neck and tail are absent.
- Sexual dimorphism: male produces sound vocal sacs during breeding season.
- Male frogs can be distinguished by presence of sound producing vocal sacs and also a copulatory pad on the first digit of the forelimbs which is absent in female frogs.

* Digestive System→
- Digestive glands include liver, pancreas, gastric and intestinal glands.

* Circulatory System→
- Well developed closed type.
- Includes heart, blood vessels, arterial system, venous system, blood and

lymphatic system.

- 3 chambered heart (2 atria and 1 Ventricle)
- Atria are separated by inter-auricular ~~sy~~ septum.
- Special venous connection b/w liver and intestine and kidney and lower parts of the body.

* Respiratory System →

- 3 modes : Cutaneous, buccopharyngeal, and pulmonary.

* Nervous System →

- Highly developed and comprises of CNS, PNS and ANS.

* Urinogenital System : →
  ↳ excretory and reproductive system.

- Excretory System : Kidneys (made up of large number of nephrons), through which ureter in female, and urinogenital duct in male arises.
- Males have Bidder's canal
- Females have 2 ovaries.
- Fertilization is external, and takes place in water.
  Tadpole larval stage, undergoes metamorphosis to form the adult.

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