YAKEEN NEET 2.0

2026

20.6.2025

STRUCTURAL ORGANISATION IN ANIMALS

ZOOLOGY | Lecture – 15

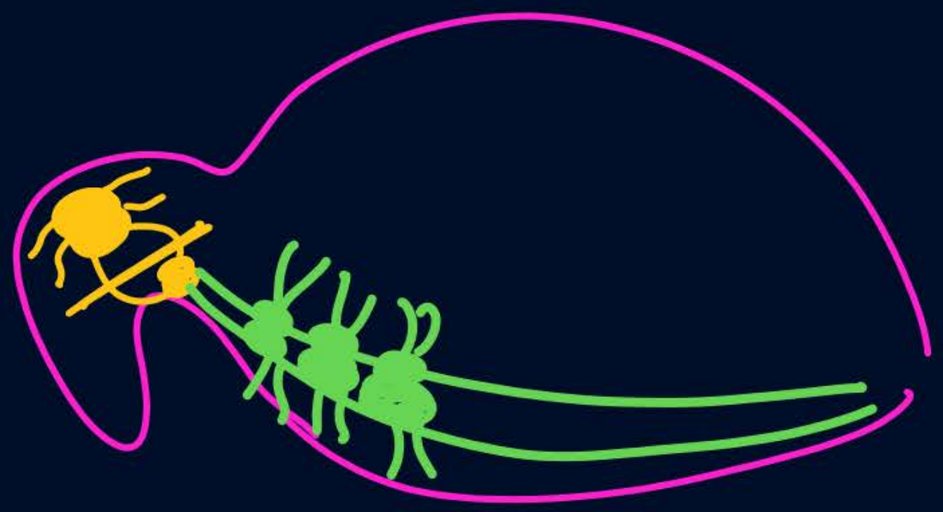
By- SAMAPTI MAM

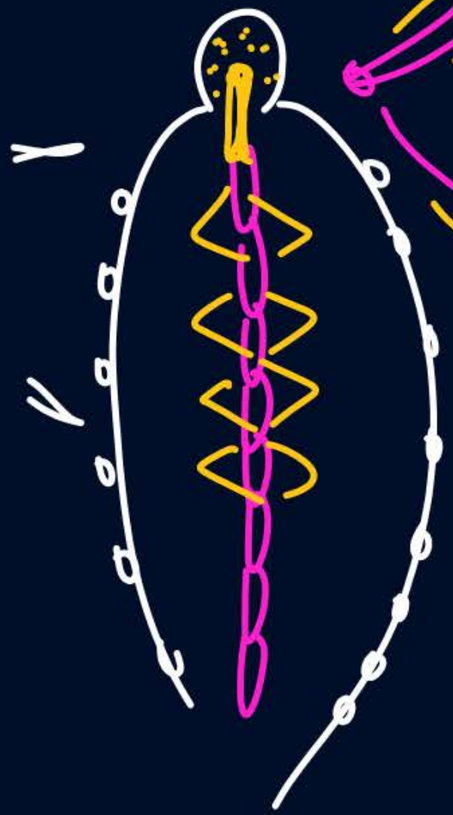
Topics to be covered

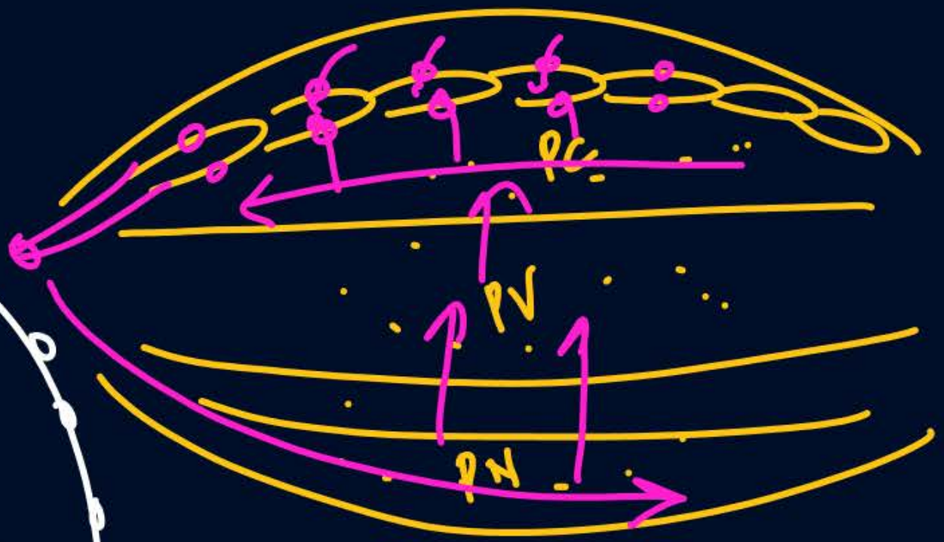
1. COCKROACH- ~~NERVOUS~~ Sensory structure, reproductive system
2.
3.
4.

MY TELEGRAM

#Leuciphiaxpress





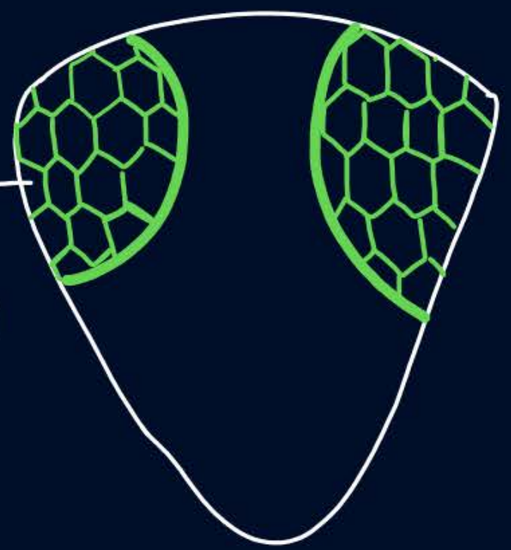


The nervous system of cockroach consists of a series of fused, segmentally arranged ganglia joined by paired longitudinal connectives on the ventral side. Three ganglia lie in the thorax, and six in the abdomen. The nervous system of cockroach is spread throughout the body. The head holds a bit of a nervous system while the rest is situated along the ventral (belly-side) part of its body. So, now you understand that if the head of a cockroach is cut off, it will still live for as long as one week. In the head region, the brain is represented by supra-oesophageal ganglion which supplies nerves to antennae and compound eyes. In cockroach, the sense organs are antennae, eyes, maxillary palps, labial palps, anal cerci, etc. The compound eyes are situated at the dorsal surface of the head. Each eye consists of about 2000 hexagonal ommatidia (sing.: *ommatidium*). With the help of several ommatidia, a cockroach can receive several images of an object. This kind of vision is known as mosaic vision with more sensitivity but less resolution, being common during night (hence called nocturnal vision).

Sensory structure: This includes:

1) Antennae: Touch, taste & olfactory (smell) receptor
2) Labial palps:
3) Maxillary palps:] Taste & olfactory receptor
4) Anal cerci: sound receptor
5) Compound eye: Vision.

- Each compound eye has: 2000 hexagonal structure c/a 'OMMATIDIA'
- With ommatidia, it receives several images of an object & this type of vision is k/a 'MOSAIC VISION'



↑ Sensitivity, Poor Resolution (Low Clarity); common in Nocturnal animals.

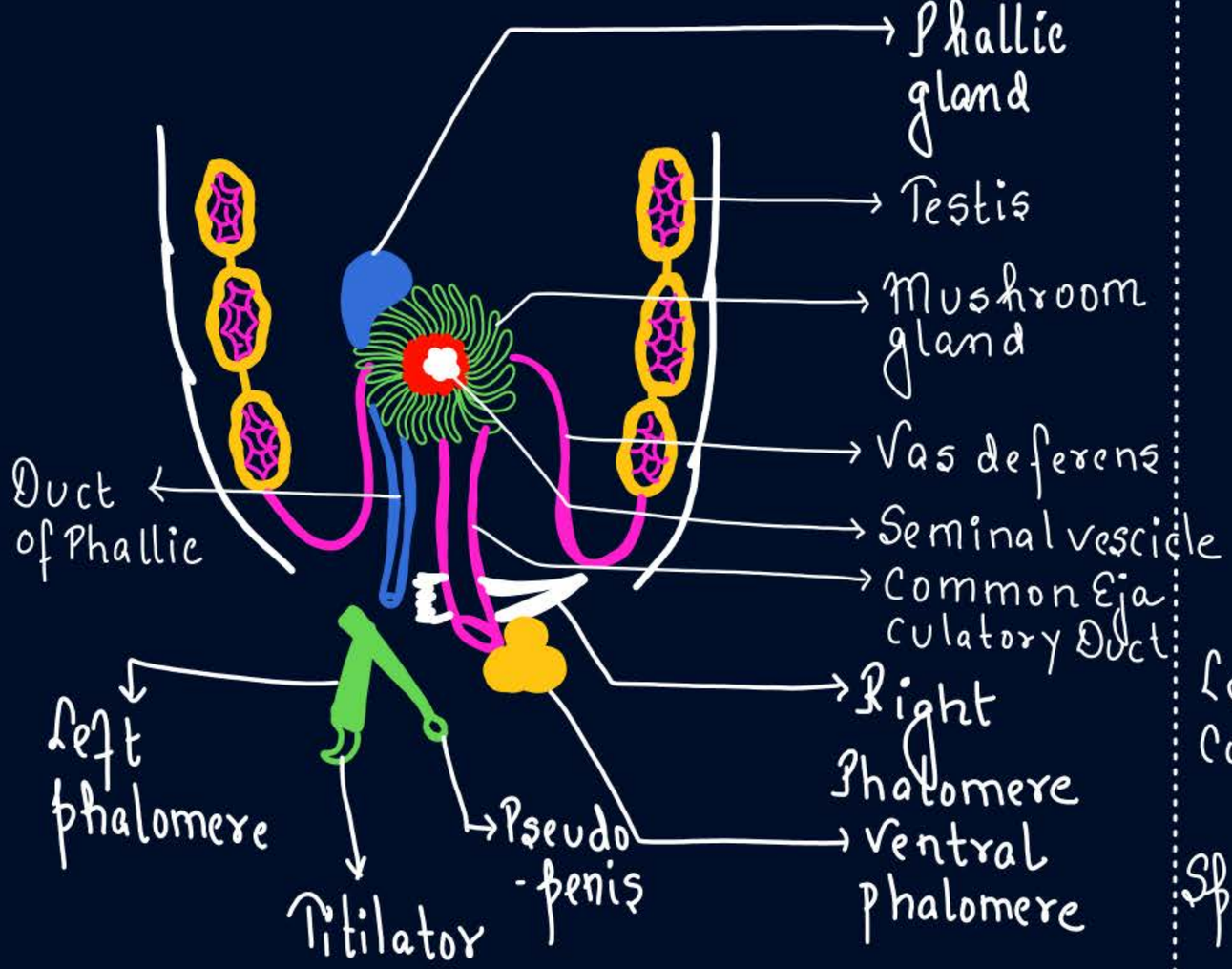
image formed in low light.

Cockroaches are dioecious and both sexes have well developed reproductive organs (Figure 7.18). Male reproductive system consists of a pair of testes one lying on each lateral side in the 4^{th} -6^{th} abdominal segments. From each testis arises a thin vas deferens, which opens into ejaculatory duct through seminal vesicle. The ejaculatory duct opens into male gonopore situated ventral to anus. A characteristic mushroom-shaped gland is present in the 6^{th}-7^{th} abdominal segments which functions as an accessory reproductive gland. The external genitalia are represented by male gonapophysis or phallomere (chitinous asymmetrical structures, surrounding the male gonopore). The sperms are stored in the seminal vesicles and are glued together in the form of bundles called spermatophores which are discharged during copulation. The female reproductive sysytem consists of two large ovaries, lying laterally in the 2^{nd} – 6^{th} abdominal segments. Each ovary is formed of a group of eight ovarian tubules or ovarioles, containing a chain of developing ova. Oviducts of each ovary unite into a single median oviduct (also called vagina) which opens into the genital chamber. A pair of spermatheca is present in the 6^{th} segment which opens into the genital chamber.

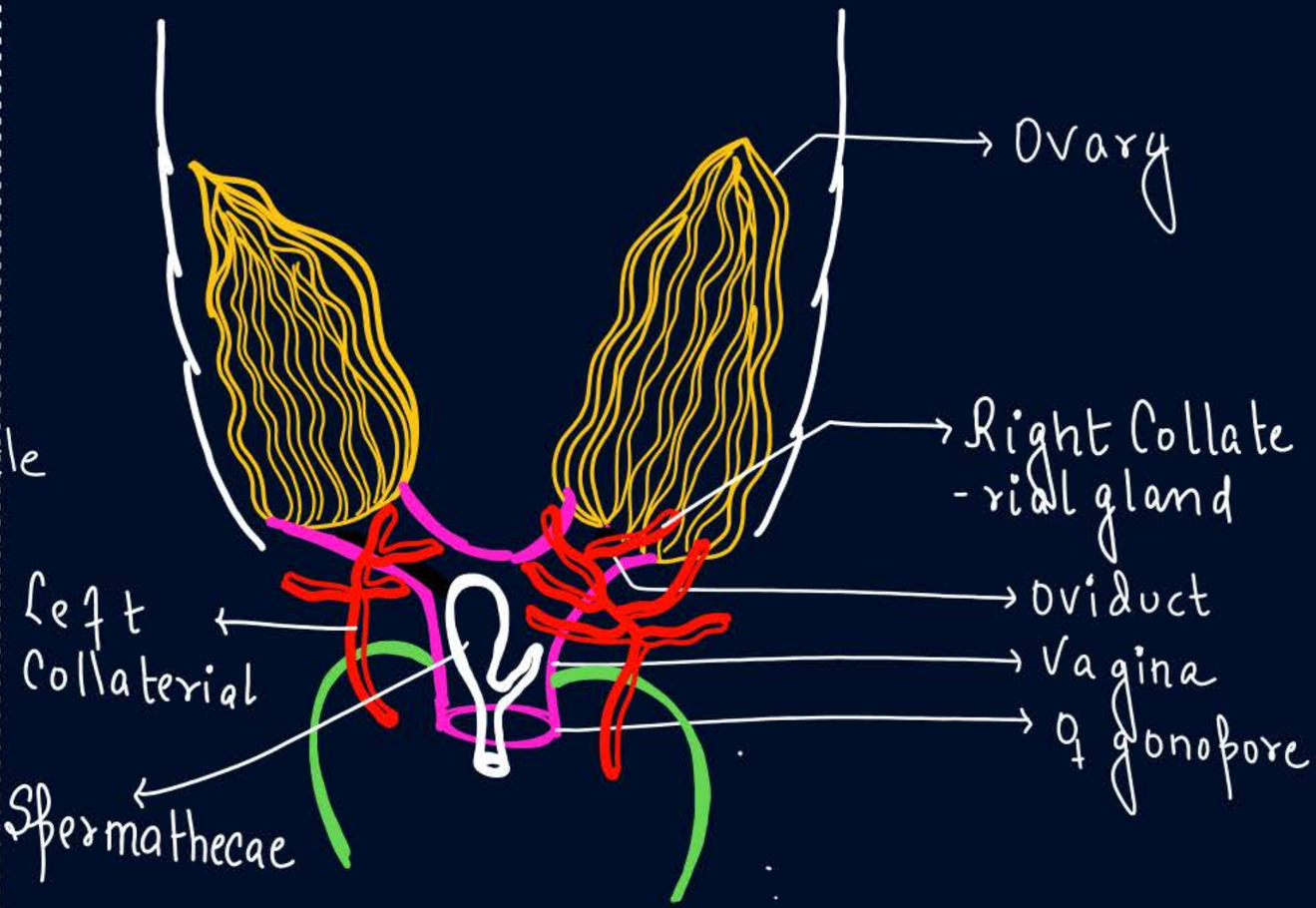
Sperms are transferred through spermatophores. Their fertilised eggs are encased in capsules called oothecae. Ootheca is a dark reddish to blackish brown capsule, about 3/8" (8 mm) long. They are dropped or

Reproductive System

♂ REPRODUCTIVE SYSTEM



♀ REPRODUCTIVE SYSTEM



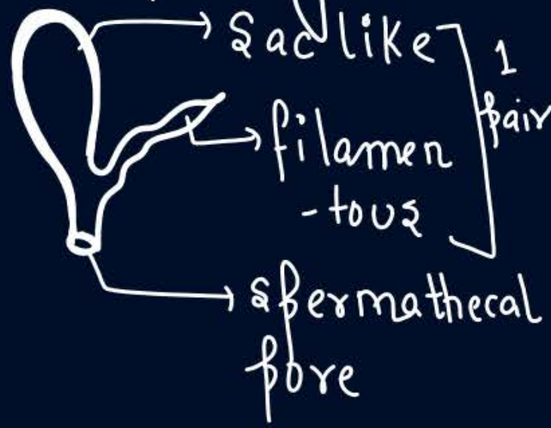
♂ REPRODUCTIVE SYSTEM

1) **Testis**: 1 pair, Each testis: TRILOBULAR
   - 4th – 6th abdominal segment
   - helps in Sperm formation
2) **Vas deferens**:
   - 1 pair
   - Carry Sperm
3) **Common Ejaculatory Duct**: Both vas deferens fuses to form Common Ejaculatory duct whose opening is: ♂ GONOPORE.
4) **Seminal vesicle**: White, shiny structures that helps in storage of Sperms & gluing of Sperm to form SPERMATOPHORE

♀ REPRODUCTIVE SYSTEM

1) **Ovary**: 1 pair, each ovary has 8 ovariole
   - 2 - 6th abdominal segment
   - formation ova

2) **Oviduct**:
   - 1 pair
   - Carry ova
3) **Common oviduct / VAGINA**: Both oviduct fuse to form common oviduct whose opening is k/a ♀ GONOPORE.
4) **Spermathecae**: paired
   - Stores the sperm received during Copulation.



♂

5) **Phalic gland / Conglobate gland**: Its secretions forms protective covering around spermatophore.

6) **Mushroom / Utricular gland**:

→ Located: 6-7th Abdominal Segment

→ ♂ → Accessory gland whose secretion helps in nourishment of developing sperm.

7) ♂ → **Genital pouch**: (H.W)

8) **Phalomere / Ext. genitalia / Gonapophyses**: Chitinous, assymetrical structure around ♂ gonopore, help during Copulation.

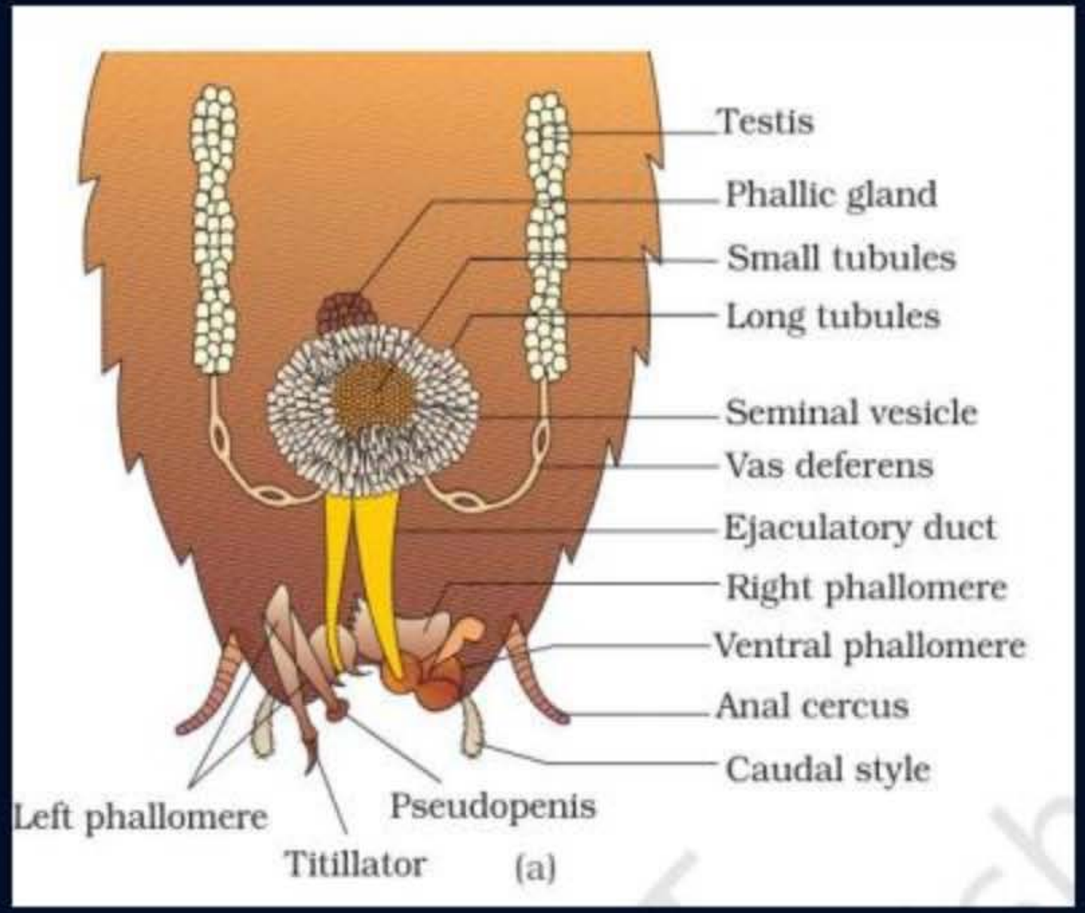
♀

5) **Collaterial gland**: 1 pair
- Secretion form egg case k/a '**OOTHECAE**' (dark reddish to Blackish Brownish) around fertilised eggs.

6) ♀ **genital pouch**: (H.W)

7) **Phallomere / External genitalia / Gonapophyses**

Hard Chitinous structure, help during Copulation



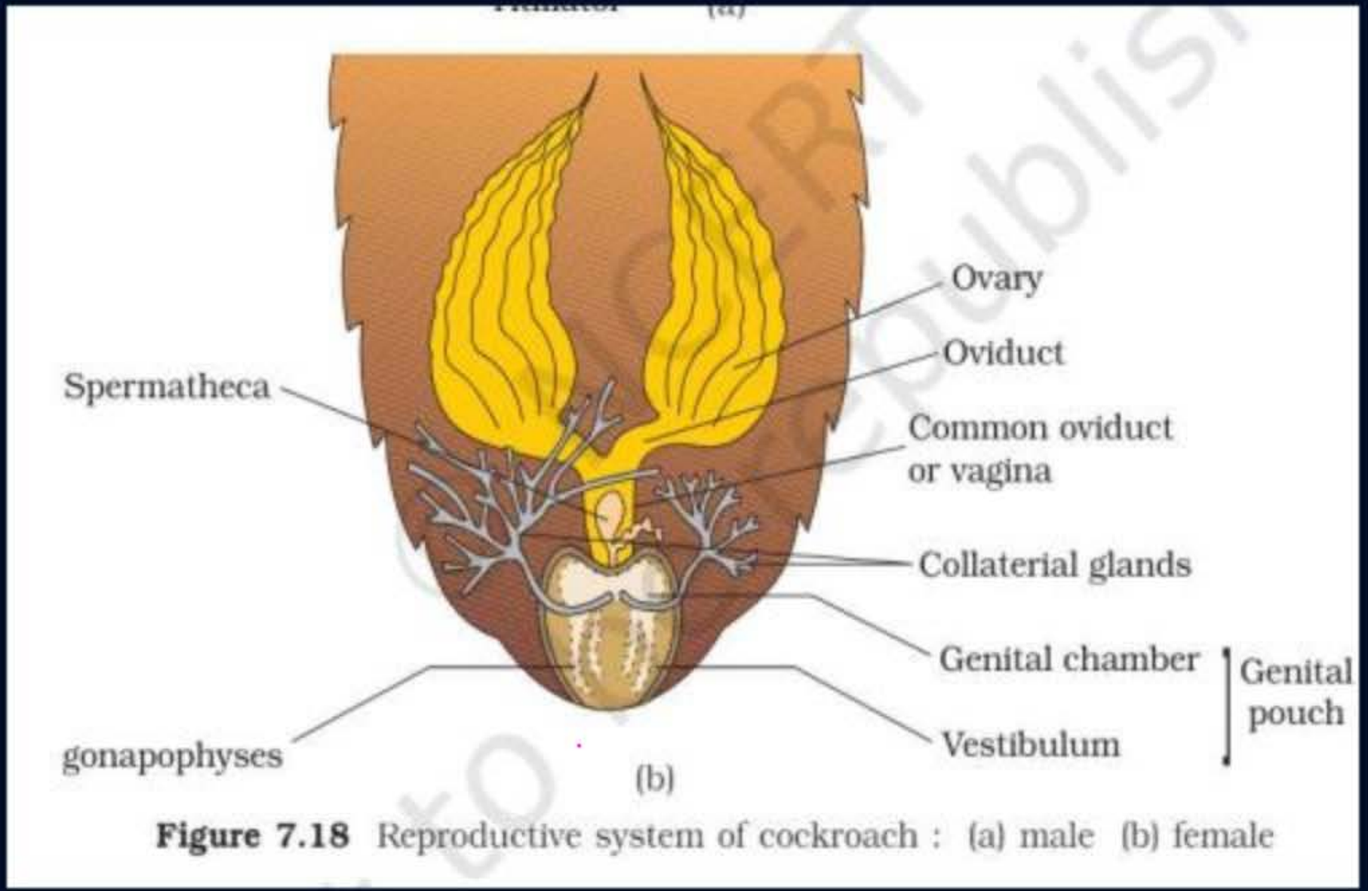


Figure 7.18 Reproductive system of cockroach : (a) male (b) female

glued to a suitable surface, usually in a crack or crevice of high relative humidity near a food source. On an average, females produce 9-10 oothecae, each containing 14-16 eggs. The development of *P. americana* is paurometabolous, meaning there is development through nymphal stage. The nymphs look very much like adults. The nymph grows by moulting about 13 times to reach the adult form. The next to last nymphal stage has wing pads but only adult cockroaches have wings.

Many species of cockroaches are wild and are of no economic importance. A few species thrive in and around human habitat. They are pests because they destroy food and contaminate it with their smelly excreta. They can transmit a variety of bacterial diseases by contaminating food material.

Ncert catalyst

Q-1. READ THE FOLLOWING STATEMENT AND CHOOSE THE CORRECT ANSWER

STATEMENT 1- Gizzard has an outer layer of thick circular muscles and thick inner cuticle forming six highly chitinous plate called teeth.

STATEMENT 2- The midgut is broader than hindgut and hindgut is differentiated into ileum, colon and rectum.

1. Statement I is correct but Statement II is incorrect.
2. Statement I is incorrect but Statement II is correct.
3. Both Statement I and Statement II are correct.
4. Both Statement I and Statement II are incorrect.

In the heart of the cockroach, if the "ostia" were permanently sealed, the most immediate and significant consequence for the circulatory flow would be:

(A) Haemolymph would be able to be pumped anteriorly by the heart normally.

(B) The heart would cease to be an elongated muscular tube.

(C) Haemolymph from the haemocoel/sinuses would be prevented from entering the heart chambers.

(D) The fan-shaped Alary muscles would lose their function.

QUESTION

Given below are two statements.

Statement I: Gizzard helps in grinding the food particles.

Statement II: Gizzard has an inner layer of thick circular muscles and thin outer cuticle forming six highly chitinous plates called teeth.

In the light of the above statements, choose the most appropriate answer from the options given below.

1. Statement I is correct but Statement II is incorrect.
2. Statement I is incorrect but Statement II is correct.
3. Both Statement I and Statement II are correct.
4. Both Statement I and Statement II are incorrect.

QUESTION

Assertion(A): In cockroach exchange of gases occurs at tracheoles by diffusion.
Reason(R): In the respiratory system of cockroach, trachea which opens through 12 pairs of small holes called spiracles present on the lateral side of the body.

1. Both Assertion (A) and Reason (R) are true, and Reason (R) is a correct explanation of Assertion (A).
2. Both Assertion (A) and Reason (R) are true, but Reason (R) is not a correct explanation of Assertion (A).
3. Assertion (A) is true, and Reason (R) is false.
4. Assertion (A) is false, and Reason (R) is true.

Which of the following is characteristic feature of cockroach regarding sexual dimorphism? (2023 NEET)

1. Presence of sclerites
2. Presence of anal cerci
3. Dark brown body colour and anal cerci
4. Presence of anal styles

Q-5
4

QUESTION

Cockroaches are;

1. nocturnal and herbivores.
2. diurnal and carnivores.
3. nocturnal and omnivores.
4. diurnal and herbivores.

Q-6

(3)

QUESTION

In female cockroaches, the 7th sternum is P---------shaped and together with the 8th and 9th sterna forms a , Q ----------.
Identify P and Q so as to complete the given statement.

1. P – round, Q – brood pouch
2. P – boat, Q– genital pouch
3. P – boat, Q – ootheca
4. P – oval, Q – genital pouch

Q-7
(2)

QUESTION

Which of the following characteristics is incorrect with respect to cockroach?

1. 6-8 pair of gastric caeca is present at the junction of foregut and midgut.
2. Hypopharynx lies within the cavity enclosed by the mouth parts.
3. 10th abdominal segment in both sexes, bears a pair of anal cerci.
4. In each segment, exoskeleton has hardened plates called sclerites.

Q-6
1

Homework

- REVISE CLAASNOTES / ZOOLOGY MED EASY

MODULE HW
Rest all questions of cockroach from all exercises

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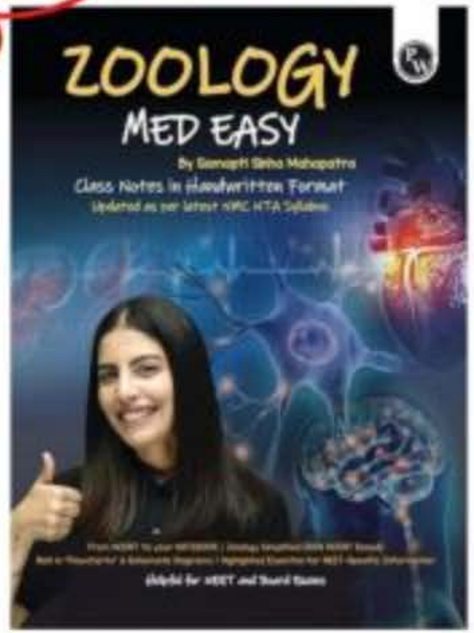

THANK YOU