

**COVENANT UNIVERSITY
NIGERIA**

*TUTORIAL KIT
OMEGA SEMESTER*

PROGRAMME: MICROBIOLOGY

COURSE: MCB 423

DISCLAIMER

The contents of this document are intended for practice and leaning purposes at the undergraduate level. The materials are from different sources including the internet and the contributors do not in any way claim authorship or ownership of them. The materials are also not to be used for any commercial purpose.

MCB 423

Contributors: Prof. Egwari, L.O., Dr Eni A.O., Dr Olasehinde G.I.

1. What is entomology
2. List the causative agents of filariasis in humans
3. Describe the role of *Toxoplasma gondii* as a cause of abortion in sheep
4. How does the knowledge of the life cycle of a nematode lead to effective control?
5. Explain what is meant by the term myiasis. List the types of Myiasis

Answer:

Myiasis is the infestation of live human and vertebrate animals with dipterous larvae, which at least for a period, feed on the host's dead or living tissue, liquid body substances, or ingested food. It is a relatively frequent occurrence in humans in rural, tropical and subtropical regions.

Types of Myiasis

Classifications of Myiasis

Superficial myiasis occurs when flies attracted to open or infected wounds or to odoriferous discharges from the eyes, ears, nose, mouth, or vagina, lay their eggs on these areas.

Dermal

sub-dermal

Nasal (nasopharyngeal) Myiasis - Obstruction of nasal passages and severe irritation. In some cases facial edema and fever can develop. Death is not uncommon.

Ocular/ Ophthalmomyiasis- Fairly common, this causes severe irritation, edema, and pain.

Cutaneous Myiasis - Painful, slow-developing ulcers or furuncle- (boil-) like sores that can last for a prolonged period.

6. Differentiate between facultative myiasis and obligate myiasis.
7. Briefly describe the life cycle and clinical consequences of one example of each of these two types of myiasis to illustrate your answer.
8. Describe the important pathological features of nematode migration within the final host. Use named examples to illustrate your answers.
9. Compare and contrast the routes and mechanisms by which pathogens are transmitted by ticks, and pathogens transmitted by insects, get from one mammal host to another. In your answer use one named example of a pathogen transmitted by a tick, and one transmitted by an insect.
10. Describe briefly the life-cycle of the sheep tick *Ixodes ricinus* and explain how the life-cycle and feeding behavior results in transmission of a tick-borne pathogen of your choice
11. List the parasites transmitted by mosquitoes

Answer:

Plasmodium Species

Filarial worms

12. Describe the life cycle of a named insect vector

Define the following

13. Parasite

14. Host

15. Vector

16. Zoonotic disease

17. Arthropods
18. Describe the laboratory diagnosis of two named filarial worms
19. List three viruses that are transmitted by arthropods
20. Discuss the prevention and control of arthropod-borne diseases
21. What are Arboviruses?

Arthropod-borne viruses (arboviruses) is a non-taxonomic designation for viruses that can replicate in both vertebrate hosts and arthropod vectors. These viruses can be transmitted to man by arthropod vectors by means of infected blood

22. State two virus families where arboviruses belong and give one examples of each

- **Togaviruses (Alphavirus) e.g. EEE, WEE, and VEE**
- **Bunyaviruses e.g. La Cross Encephalitis**
- **Flaviviruses e.g. Yellow Fever, dengue, Japanese Encephalitis**

23. State two arthropod vectors that transmit arboviruses

Several arthropod vectors are involved in Arbovirus transmission notably;

- **Mosquitoes: Arboviruses transmitted by mosquitoes include Japanese encephalitis, dengue, yellow fever, St. Louis encephalitis, EEE, WEE, VEE etc.**
- **Ticks: *Ixodespersulcatus* and *Ixodesricinus* transmit the two most commonly known tick-borne encephalitides, Russian spring-summer encephalitis (RSSE) and Central European encephalitis (CEE) respectively.**
- **Sandflies e. g. Sicilian sandfly fever, Rift valley fever**

24. Highlight factors that may enhance transmission of the viral infection by the arthropod (5 marks: 1 mark for any five points)

- **Vector abundance**
- **Host abundance**
- **Vector-host encounter rate**
- **Host immunity (high susceptibility)**
- **Antibody dependant enhancement (a phenomenon whereby antibodies raised in response to a particular pathogen interact with antigenically similar pathogens and facilitate infection)**
- **Density of infected host**
- **Vector reproductive cycle**
- **Availability of supplement host**
- **Host behavior**
- **Co-infection with other infectious agents such as microfilaria, which may induce lesions in the midgut epithelial barrier and thereby facilitate viral dissemination to the hemocoel**

25. Outline effective preventive and control measures needed to curtail the spread of an arboviral encephalitis outbreak (**5 marks: ½ mark for any 10 point**)

The first concerns would be to ascertain the aetiology of the reported arboviral encephalitis and the arthropod vector(s) involved in the transmission. Since there are several different types of arboviral encephalitis and several groups of arthropod vectors implicated in the transmission of arboviral encephalitis, general preventive and control measures aimed at curtailing the spread of the virus will include;

- **Rapid effort to identify the specific virus involved**
- **Quarantine infected persons**
- **Public education to create awareness of the disease**
- **Mass immunization of uninfected individuals where vaccine is available**
- **Identification of the arthropod vectors involved**
- **Cleaning out of stagnant waters, bushes etc with a view to eliminating vector breeding areas**
- **Wearing of protective clothing such as long trousers and long sleeved shirts to prevent vector bite**
- **Adjusting outdoor activities to avoid being outdoor at vector peak activity periods e.g. early mornings, late evenings and nights for mosquitoes**
- **Use of insect repellent**
- **Use of door, window and bed nets**
- **Use of insecticide**