

## PARA3002 TUTORIAL

### BUG QUIZ

1

## PARA3002 TUTORIAL

1. Name 5 different modes of transmission for parasites.

- vector-borne
- faecal-oral
- predator-prey
- direct (venereal)
- transplacental
- transmammary

}

horizontal

}

vertical

2

## PARA3002 TUTORIAL

2. Name 6 different groups of vectors

- diptera
- fleas
- lice
- bugs
- ticks
- mites
- copepods
- snails

}

insects

}

arthropods

}

crustacea

}

gastropods

}

molluscs

3

## Vector-borne diseases

VECTORS	PATHOGENS
<ul style="list-style-type: none"> <li>• diptera</li> <li>• fleas</li> <li>• lice</li> <li>• bugs</li> <li>• ticks</li> <li>• mites</li> <li>• copepods</li> <li>• snails</li> </ul>	<ul style="list-style-type: none"> <li>• viruses</li> <li>• bacteria</li> <li>• protozoa</li> <li>• nematodes</li> <li>• cestodes</li> <li>• trematodes</li> <li>• fungi</li> </ul>

4

## Vector-borne diseases

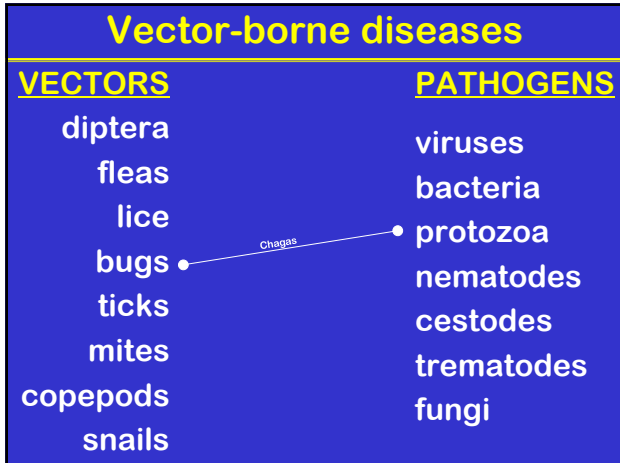
VECTORS	PATHOGENS
<ul style="list-style-type: none"> <li>• diptera</li> <li>• fleas</li> <li>• lice</li> <li>• bugs</li> <li>• ticks</li> <li>• mites</li> <li>• copepods</li> <li>• snails</li> </ul>	<ul style="list-style-type: none"> <li>• viruses</li> <li>• bacteria</li> <li>• protozoa</li> <li>• nematodes</li> <li>• cestodes</li> <li>• trematodes</li> <li>• fungi</li> </ul>

5

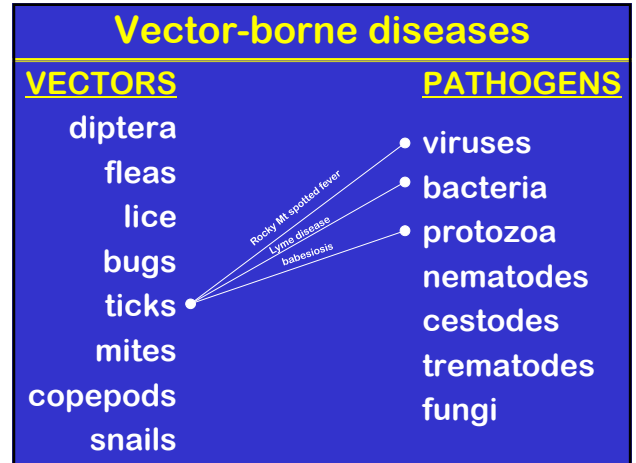
## Vector-borne diseases

VECTORS	PATHOGENS
<ul style="list-style-type: none"> <li>• diptera</li> <li>• fleas</li> <li>• lice</li> <li>• bugs</li> <li>• ticks</li> <li>• mites</li> <li>• copepods</li> <li>• snails</li> </ul>	<ul style="list-style-type: none"> <li>• viruses</li> <li>• bacteria</li> <li>• protozoa</li> <li>• nematodes</li> <li>• cestodes</li> <li>• trematodes</li> <li>• fungi</li> </ul>

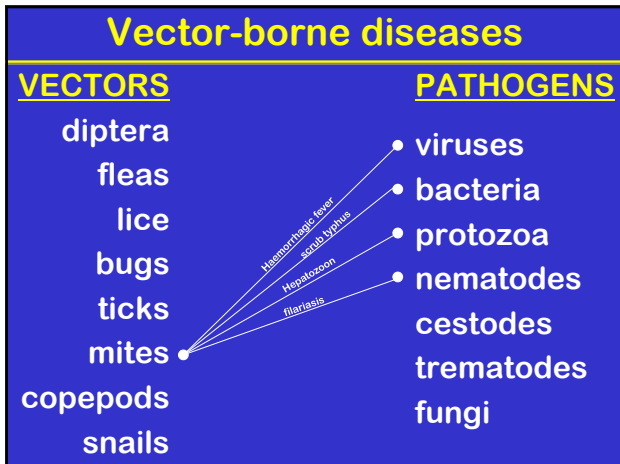
6



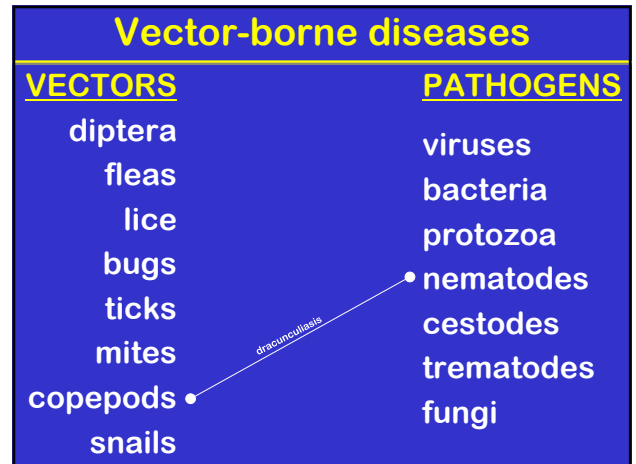
7



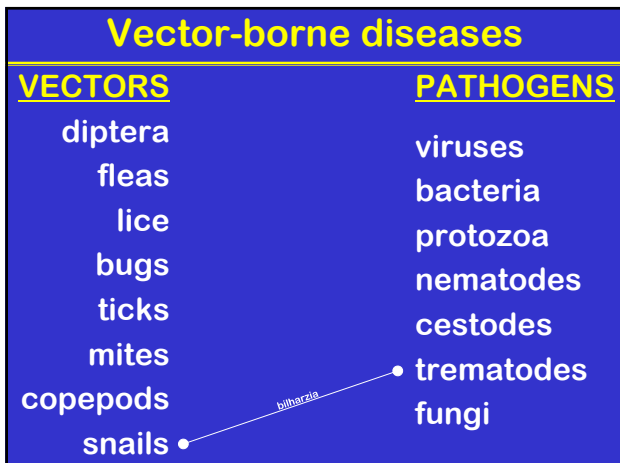
8



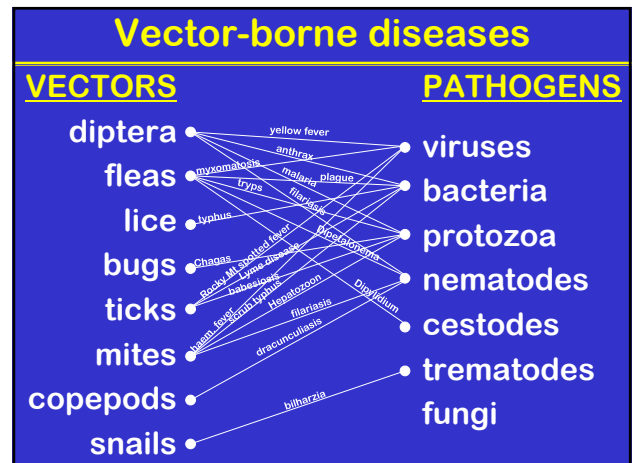
9



10



11



12

## PARA3002 TUTORIAL

### 3. What type of hosts are the vectors?

- **intermediate** host (asexual dev)  
e.g. snail supports asexual dev of *Schistosoma*
- **definitive** host (sexual dev)  
e.g. mosquito supports sexual dev of *Plasmodium*
- **paratenic** host (no dev, carrier)  
e.g. fish carry dev stages of *Clonorchis*

13

## PARA3002 TUTORIAL

### 4. Can vectors be parasites in their own right?

- **YES!**  
(they need to feed on host to vector disease)

Except for snails  
(no vampire snails known)

14

## PARA3002 TUTORIAL

### 5. What effects do they have on hosts?

- **pain** (annoyance, irritation, itching)
  - **trauma** (lesions, structural damage)
  - **dermatosis** (inflammation, ulceration)
  - **allergy** (hypersensitivity)
  - **anaemia** (blood loss)
  - **toxicosis** (poisoning, paralysis)
  - **transmit infections** (other pathogens)
- focal
- systemic

15

## PARA3002 TUTORIAL

### 6. How can we reduce vector contact?

#### Physical/mechanical separation

- **barriers** (screens, nets, clothing)
- **avoidance** (diurnal cycles, education)
- **quarantine** (diagnosis, isolation)
- **habitat alteration** (standing water, burning..)
- **repellants** (plants, chemicals)

16

## PARA3002 TUTORIAL

### 7. Can we make hosts more resistant to vectors?

Yes! **Selective breeding programs**

- **at least for animals**  
(e.g. tick resistant *Bos indicus* cattle)
- **determine heritability**  
(make sure resistance is positively correlated with good production parameters)

17

## PARA3002 TUTORIAL

### 8. Is vaccination an option?

**Qualified yes!**

? **Anti-toxin immuno-therapy**  
(e.g. anti-holocyclotoxin in dogs)

**Vaccination immuno-prophylaxis**  
(e.g. tick gut antigens)

18

## PARA3002 TUTORIAL

9. How can we reduce vector populations?

**Three basic strategies:**

**1. Kill them!**

- (chemical control) poisons
- (physical control) traps, removal..
- (bio-control) predators/parasitoids/pathogens

**2. Reduce habitat available**

- (drain swamps, clear land...)

**3. Reduce reproduction**

- (sterile male release)
- (*Wohlbachia* sterilization, feminization, killing)

19

## PARA3002 TUTORIAL

10. What are the targets of chemicals?

**insecticides/acaricides target:**

- neurotransmitters (Na channels, Cl channels, AchE)
- cuticle (growth regulators)
- ecdysis (juvenile hormones)

**molluscicides (snail baits):**

- metal salts
- metaldehydes
- AchE inhibitors

20

## PARA3002 TUTORIAL

In general, drugs target:

- DNA synthesis
- protein synthesis
- energy metabolism
- membrane function
- microtubule function
- neurotransmission

21

## PARA3002 TUTORIAL

DO  
NOT  
GET  
BITTEN!



22