

Nematodes 2

BVM&S Parasitology
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Lecture topics

- The Ascarids
 - Migratory & non-migratory species
 - Hypobiosis
 - Paratenic hosts
- The Strongyles
 - Tissue feeders
 - Migratory & non-migratory species
- The Hookworms
 - Blood feeders
 - Skin penetration



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2

Main features of the Ascarids

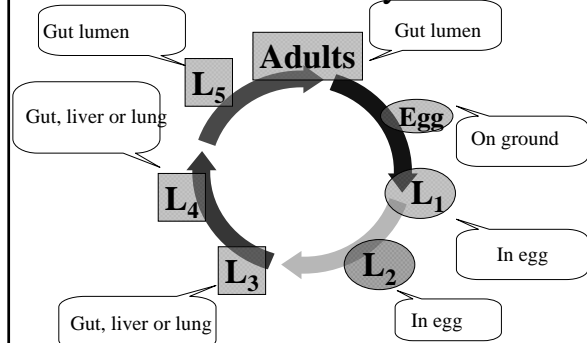
- Nematodes with a **simple mouth** enclosed by three lips.
- Males lack a bursa
- The infective stage is the **L₂ larva** enclosed in the **thick-shelled egg**.
- Often have **paratenic hosts**.
- Important parasites of Pigs, horses, poultry, cats, dogs and humans.



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3

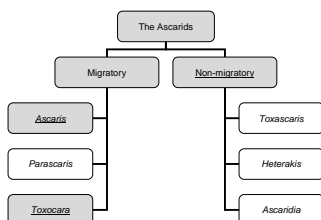
Ascarid life cycle



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4

Groups that you need to know about



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5

Important examples of non-migratory ascarids



Dogs & cats

- Toxascaris



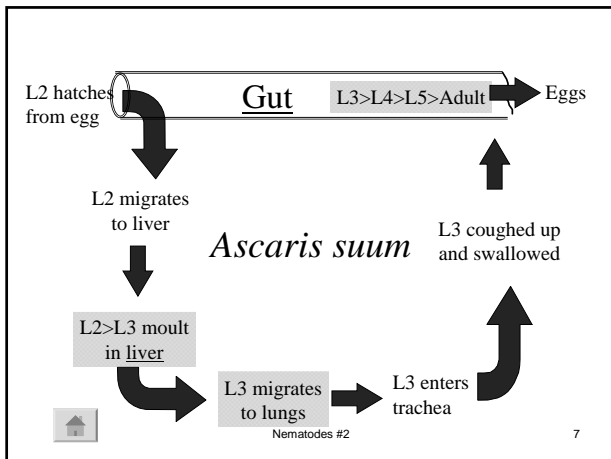
Poultry

- Ascaridia
- Heterakis



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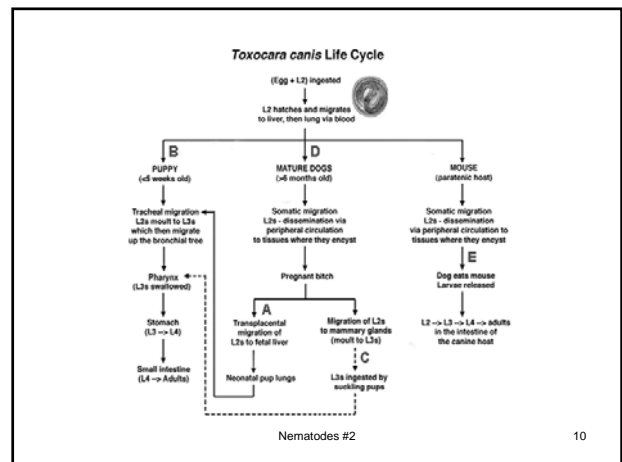
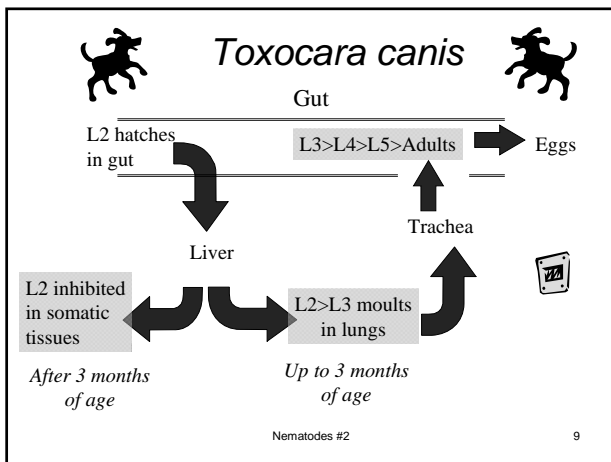
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Toxocara sp

- Large white worm (~10cm) found in the small intestine of **dogs and cats**.
 - *T.canis* - dogs.
 - *T.cati* (*T.mystax*) - cats.
- Hepato-tracheal **and** somatic migration
- Hypobiotic larvae
- Endogenous transplacental infection

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T.canis – an important zoonosis

- Causes **visceral larva migrans**.
- Effects usually limited to the liver but can affect other organs such as the eye.
- Infection by **ingestion of infective eggs** from dog faeces leading to larval migration.
- **Children at particular risk** from close contact with dogs or areas that are contaminated with dog faeces.

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Toxocara cati (*mystax*)

- Life cycle similar *T.canis*
- Transmission
 - principally **transmammary**
 - Ingestion of a paratenic host containing L₂
- **Prenatal** infection does not take place - compare with *T.canis*

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The Strongyles

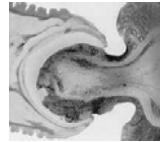
- Tissue feeders with large buccal capsule
- Bursate
- Infective form = ensheathed L₃ on pasture
- Migratory and non-migratory species
- Important parasites of
 - Ruminants
 - Equines

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13

Adaptations for tissue feeding

- Large buccal capsule
 - Cutting plates
 - "Teeth"
- Sometimes called "plug-feeders"



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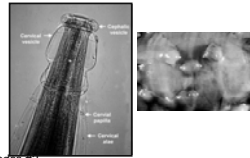
14

Important examples of strongyles of ruminants

Chabertia -
Intestinal worm of
sheep & cattle



Oesophagostomum -
Intestinal worm of
sheep & goats



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15

Strongyles of equines

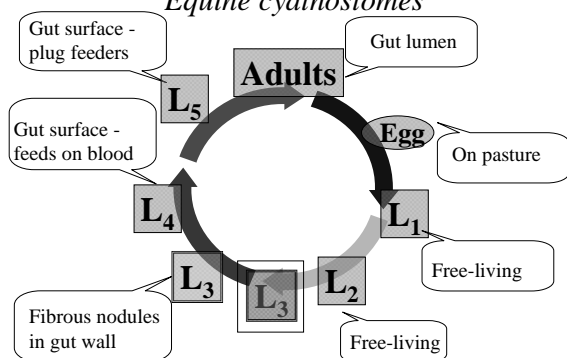


	<i>Small strongyles aka cyathostomes</i>	<i>Large strongyles</i>
Adults	Large intestine	Large intestine
Infective form	Ensheathed L ₃	Ensheathed L ₃
Larval behaviour	Develop in nodules in the intestinal wall	Somatic migration
Number of species	15	3 - <i>Strongylus</i>

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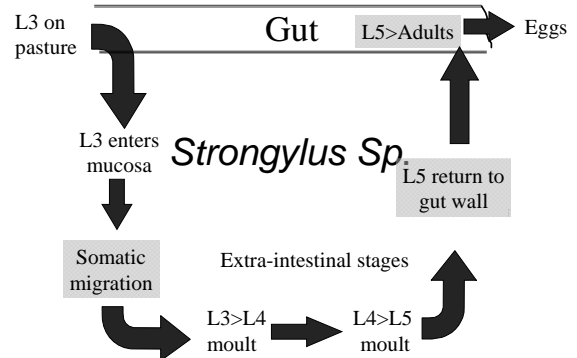
16

Equine cyathostomes



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17



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18

Strongylus sp - migratory patterns

Species	Location of first moult	Location of second moult
<i>Strongylus vulgaris</i>	Submucosa	Cranial mesenteric artery
<i>Strongylus edentatus</i>	Liver	Flanks & hepatic ligaments
<i>Strongylus equinus</i>	Gut musculature	Gut parenchyma

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19

Controlling equine strongyles

- Anthelmintics
 - Timing
 - Active ingredient
 - Adults
 - Larvae – especially migratory species
 - Rotate active ingredients to combat drug resistance
- Pasture management
 - Removal of faeces
 - Harrowing of paddocks
 - Rotational grazing
 - Pasture “resting” for 6 months
 - Alternative species grazing e.g. sheep



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20

Main features of the the hookworms

- Parasites of the intestine of most higher mammals other than horses.
- Prominent dorsal bending of the head - “hook”.
- Buccal capsule armed with broad cutting plates or teeth.
- Blood feeders.
- The L₃ enters either orally or in some cases percutaneously.

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21

Important examples of hookworms in UK

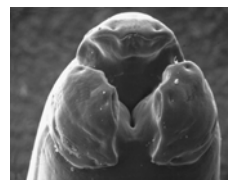


- *Bunostomum* - found in the small intestine of ruminants.
- *Uncinaria* “northern” hookworm of dog, cat & fox.
- *Ancylostoma* – “tropical” canine hookworm – coming soon to a practice near you?

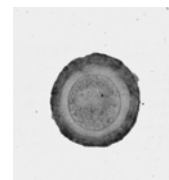
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22

Ascarids



Mouth surrounded by three lips



Thick walled egg



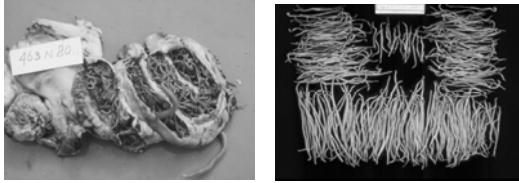
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23

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24

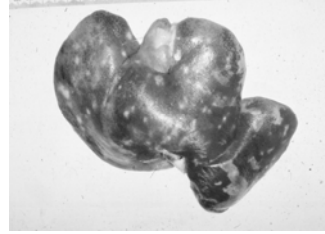
Ascaris infection from pig



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25

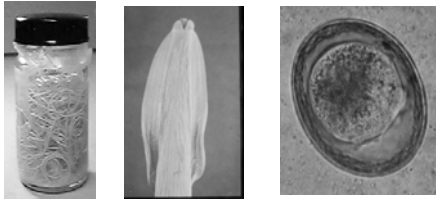
White spot liver



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26

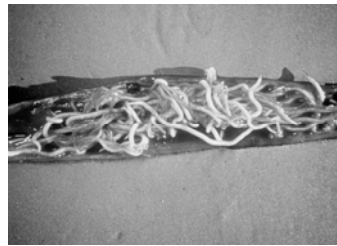
Toxascaris



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27

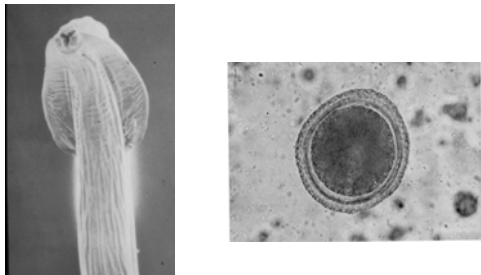
Ascaridia



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28

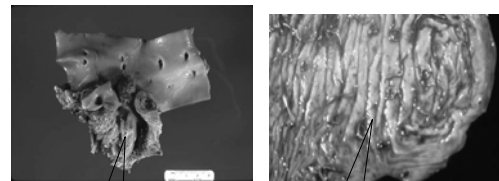
Toxocara



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29

Strongylus



Damage to arterial wall by *S. vulgaris* larvae

Damage to intestinal wall by *S. equinus* larvae



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30

