

TRENDS IN VETERINARY PARASITOLOGY

A TWO-DAYS COURSE

**DEPARTMENT OF VETERINARY PATHOLOGY, MICROBIOLOGY &
PARASITOLOGY**

FACULTY OF VETERINARY MEDICINE

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PARASITIC DISEASES OF RABBITS

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PARASITIC DISEASES OF RABBITS

By Prof. P.K. Gathumbi - University of Nairobi, Faculty of Veterinary Medicine – Presented in a continuing education course on ‘Trends in Veterinary Parasitology at the Faculty of veterinary Medicine Kabete, August 10 -11, 2011

Arachnid Parasites of Rabbits

- Ear mite - *Psoroptes cuniculi*
- Common fur mite - *Cheyletiella parasitovorax* and *Leporacarus gibbus*
- Less common fur mites- *Trombicula autumnalis*, *Dermanyssus gallinae*
- Mange- Burrowing mites – *Sarcoptes scabiei* and *Notoedres cati*
- Ticks of rabbits: *Ixodes* sp., *Amblyomma* sp., *Boophilus* sp., *Rhipicephalus* sp., and *Haemophysalis* sp.

Psoroptes cuniculi – Ear mite

- Causes otitis externa in rabbits commonly referred to as ear canker .
- The condition is characterized by the presence of dry, brown crusty material on the inner surface of the ear. Advanced cases the crusts are readily apparent without the aid of an otoscope.
- treatment - generous application of mineral oil with or without miticide. clean the ear canal in severe cases prior to application of miticide . Repeat the treatment 3-4 times weekly

Female *Psoroptes cuniculi*



Psoroptes cuniculi



Psoroptes cuniculi



Psoroptes cuniculi Case No 163/2011



Fur mites

- Fur mites- *Cheyletiella parasitovorax* (potentially zoonotic) and *Leporacarus gibbus*
- Life cycle egg to adult – One host , Non burrowing associated with keratin of hair
- Causes alopecia and scaly/ seborrheic pruritic lesions and dandruff- from neck down the dorsum / back of the affected rabbit
- Diagnosis based on microscopy of skin scrapping for mites/ KOH digestion of hair for eggs

Alopecic lesions -Fur mite on lop rabbit



Cheyletiella parasitovorax



Photo courtesy TFH Publications

Cheyletiella parasitovorax



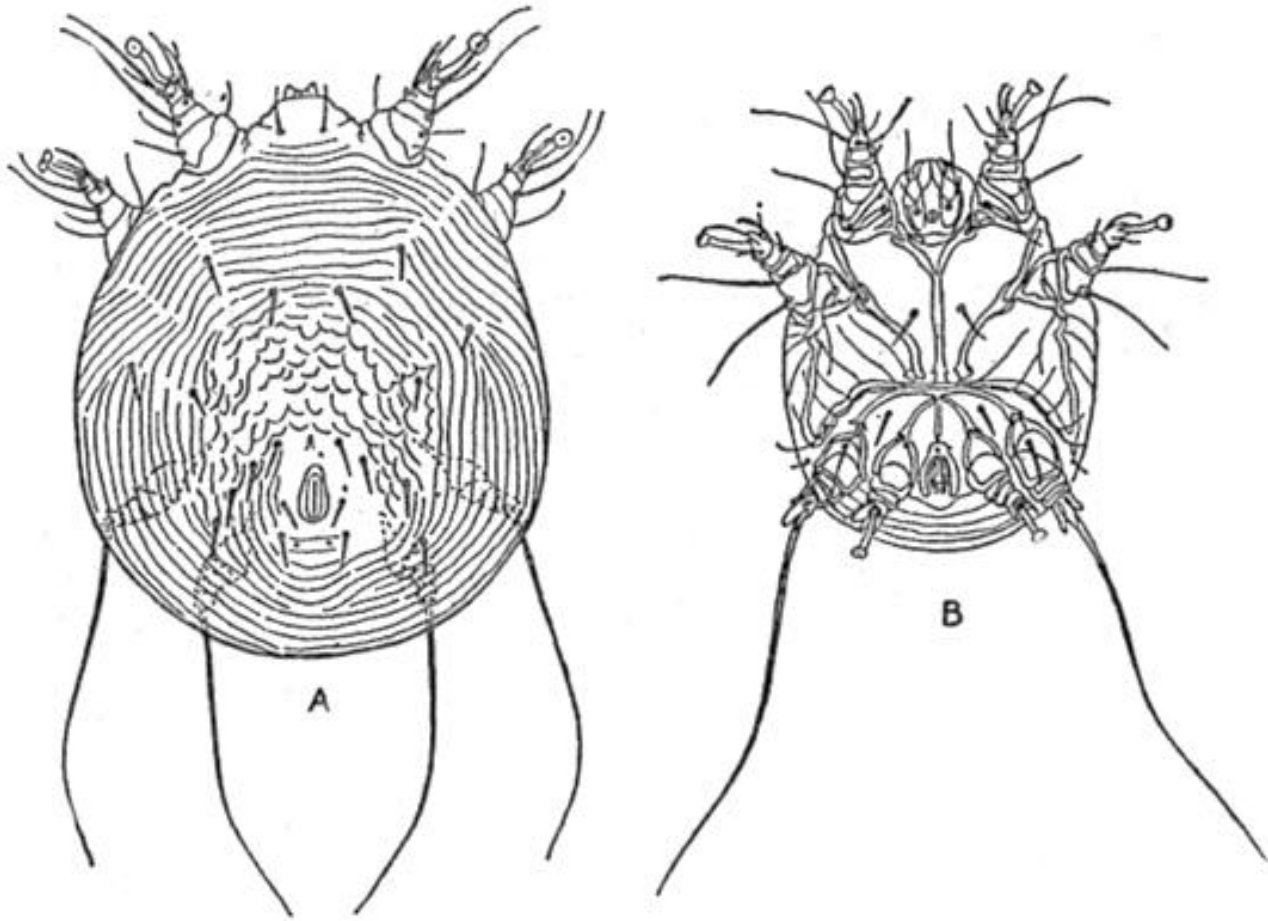
Mange mites.

- *Burrowing mites:*
 - *Sarcoptes scabiei*
 - *Notoedres cati*

Life cycle

- Nymphs and larvae that live on the surface of the skin.
- Adult female burrow into the skin make tunnels and then lays eggs that hatch into larvae within the tunnels.
- Male adults and older larvae live on the surface of the skin.
- Life cycle from egg is 2 to 3 weeks.

Underside of *Notoedres cati* male A, Female B



Burrowing mites :*Sarcoptes scabiei*



Ticks in rabbits

- Ixotid (hard) ticks *Ixodes* sp., *Amblyomma* sp., *Boophilus* sp., *Rhipicephalus* sp., and *Haemophysalis* sp.
- Argasid (soft) ticks. *Otobius* sp., and *Ornithodoros* sp.
- Anaemia at heavy infestation

Rabbit ticks



Insects on rabbits

- Wild rabbits are mainly infested by rabbit flea *Spilopsyllus cuniculi*.
- Other species of fleas that can affect rabbits are *Pulex irritans*, *Cediopsylla simplex*, *Odontopsyllus multispinosus*, *Echinnophaga gallinacea*, or *Echidnophasis mymecobil*.
- *Ctenocephalides felis* or *Ctenocephalides canis* cat and dog flea- can also affect rabbits

Rabbit flea- Spilopsyllus cuniculi.



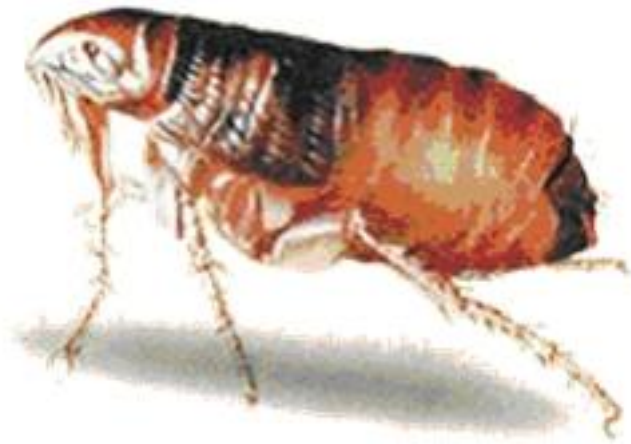
Chicken flea that can also infest rabbits- Echidnophaga gallinacea



Ctenocephalides canis



Ctenocephalides felis



(Rabbit bot fly)- *Cutebra* species

- *Cutebra* sp. flies can infest rabbits and other lagomorphs. They include *Cutebra buccata*, *C. cuniculi*, *C. lepivora*, *C. abdominalis*, *C. jelloni*, *C. ruficrus*, and *C. lepusculi*.
- Large, hairy flies
- Eggs laid in the environment hatch to larva and enters the body of its host through the skin
- *Cutebra* larvae cause lumps with perforated breathing holes in the subcutaneous tissue.

Botfly *Cutebra* sp. and maggot



Cutebra larva granuloma on rabbit



Rabbit bot



Myiasis (fly-strike) in Rabbits

- Myiasis, also called fly-strike
- Rabbits suffer in particular from the blowflies *Lucilia sericata*, *Calliphora* sp., the grey flesh fly *Wohlfahrtia* sp., the common screwworm fly *Callitroga* sp
- Poor hygiene, with rabbits kept on litter soiled with urine and excrements, untreated infected wound that attract flies.

Rabbit fly strike



Parasitic roundworms of the gastrointestinal tract of rabbits

Oxyuridae include:

- Passalurus ambiguus
- *Dermatoxyxs veligera*

Parasitic roundworms of the gastrointestinal tract of rabbits

Trichostrongylidae

- *Trichostrongylus calcatus*
- *Trichostrongylus sp.*
- *Obeliscoides cuniculi*
- *Nematodirus leporis*
- *Graphidium strigosum*
- *Strongyloides sp.*

Trichuridae

- *Trichuris leporis*

Parasitic roundworms of the gastrointestinal tract of rabbits

Filarioididae

- *Dirofilaria scapiceps*
- *Dirofilaria uniformis*
- *Brugia lepori*

Parasitic roundworms of the gastrointestinal tract of rabbits

Ascaroidea

- *Bayliascaris procyonis*
- *Bayliascaris columnaris*
- *Toxocara canis*

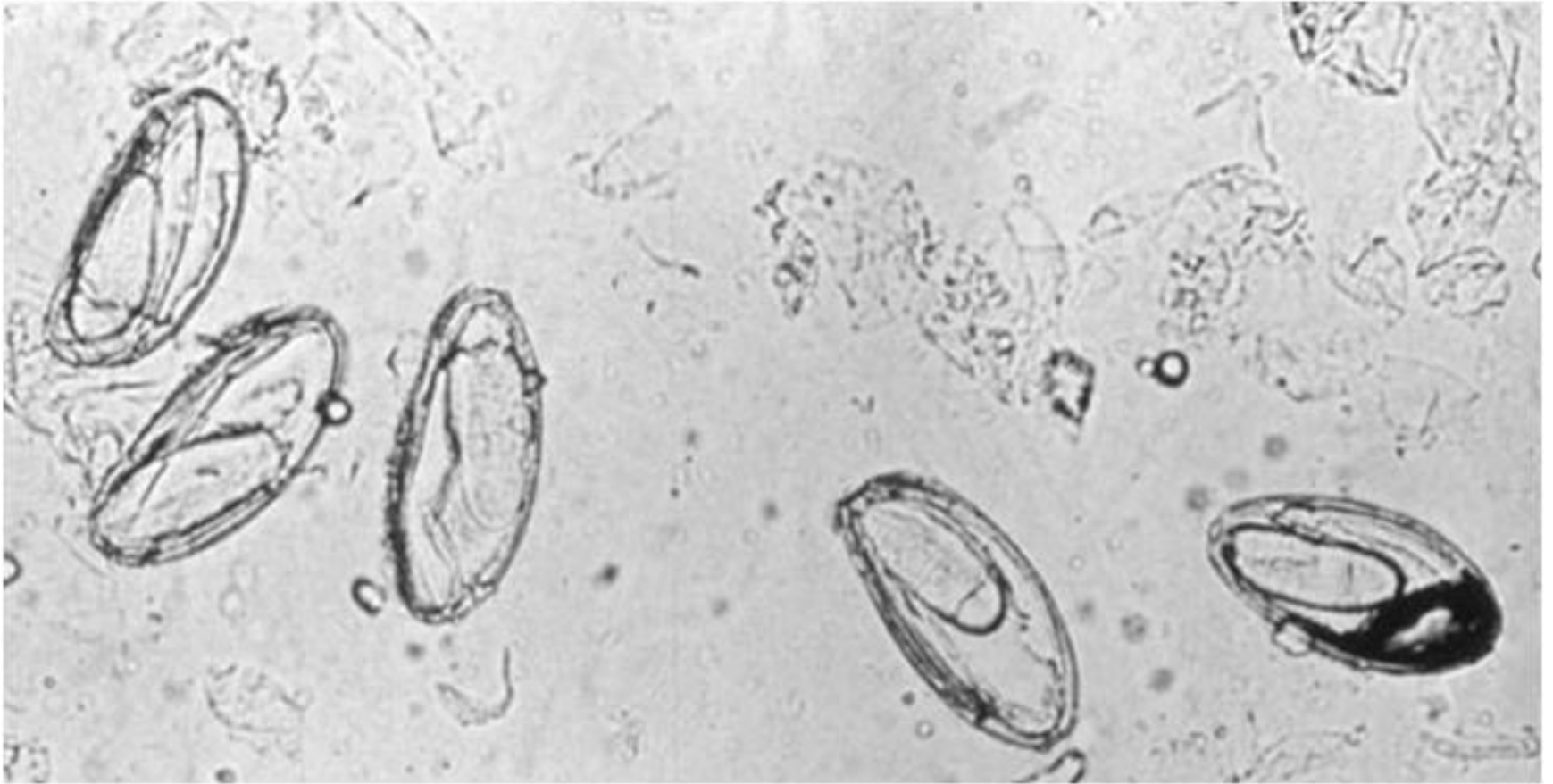
Metastrongyloidea

- *Protostrongylus boughtoni*

Rabbit pinworm



Eggs of *Passalurus ambiguus* (Rabbit pinworm)



Passalurus ambiguus (Rabbit pinworm)

- Direct life cycle: the eggs to larvae to adult worm (white hair-like worm) that develop in the mucosa of the small intestine and the caecum
- Mucus threads in faeces is an indicator of intestinal worm infestation in rabbits (DD-mucoid enteritis).

Mucus threads in rabbit faeces : indicate GIT worm infestation

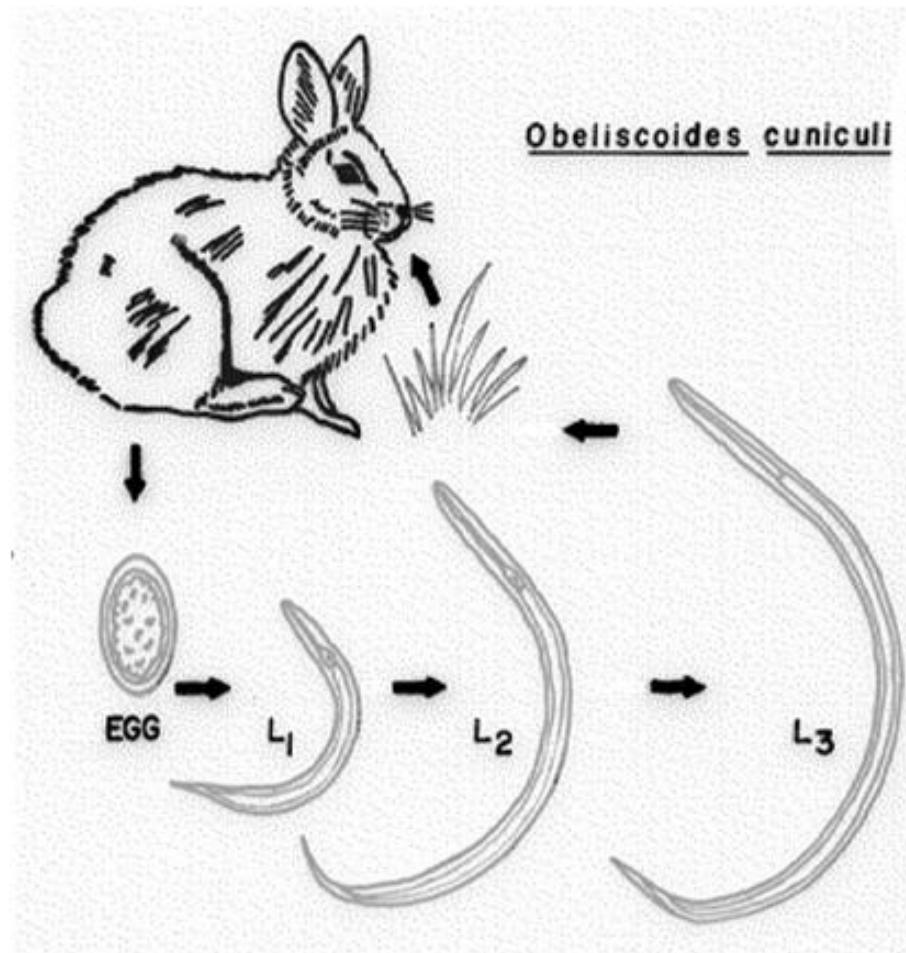


Obeliscoides species

rabbit stomach worm.

- *Obeliscoides cuniculi multistriatus* infecting hares (*Lepus americanus*)
- *Obeliscoides cuniculi cuniculi* infecting mainly the Cottontail rabbits (*Sylvilagus floridanus*).

Life cycle of *Obeliscoides cuniculi*



Clinical signs of *Obeliscoides cuniculi*

- Usually asymptomatic in rabbits.
- At necropsy, adults worms adhere closely to the stomach mucosa
- Stomach mucosa is thick and granular - due to the parasite granulomas and glandular hyperplasia.

Graphidium strigosum

- Host: wild rabbit (*Oryctolagus cuniculus*), and in palaeartic Leporidae, such as the hare (*Lepus europaeus*, *L. capensis*).
- Not much is known about the biology and the life cycle of this parasite.
- Direct life cycle (Egg-L1-L2-L3), adult occur in the stomach of wild rabbits and hares

Graphidium strigosum- egg



Nematodirus leporis

- *N. leporis*; a thin-necked intestinal worm ; in wild rabbits and hares.
- Direct life cycle; Thick-layered eggs ; much larger (250*100 μ m) than those from other Trichostrongylidae; eggs often dividing at shedding .
- L1-L2-L3 in the environment . L₃ larva ingested by the host; exsheath and penetrate mucosa of the small intestine, and molt into the L₄ and immature adults.

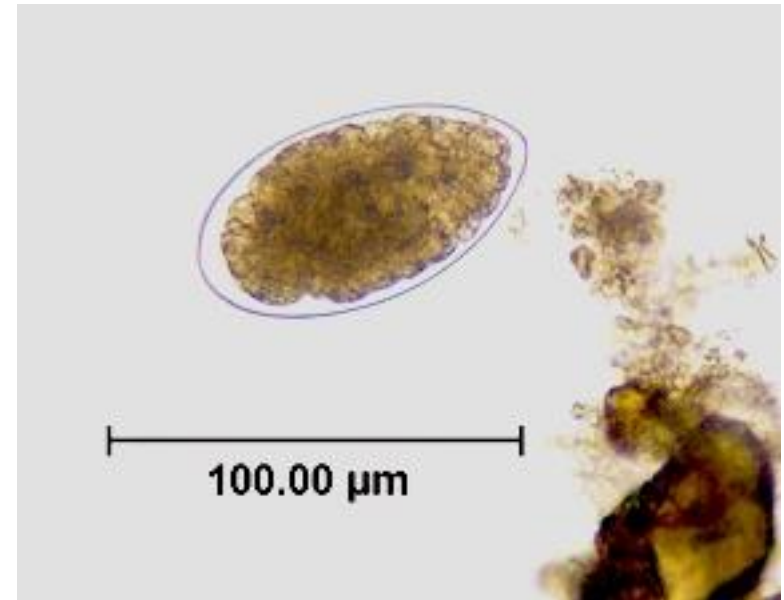
Nematodirus leporis - egg



Trichostrongylus calcaratus

- *Trichostrongylus* parasitic worms are commonly observed to infest wild rabbits and cottontails,
- *Trichostrongylus calcaratus*; small intestine and the colon of the rabbit.
- Direct life cycle pass in the feces Eggs to L1, L2, L₃, L₄ and L₅ develop into mature forms in the digestive tract of the host
- Other trychostrongylus spp that have been seen in rabbits: *Trichostrongylus affinis* , *Trichostrongylus retortaeformis* , *Trichostrongylus ransomi* , *Trichostrongylus colubriformis* (*T. instabilis*)

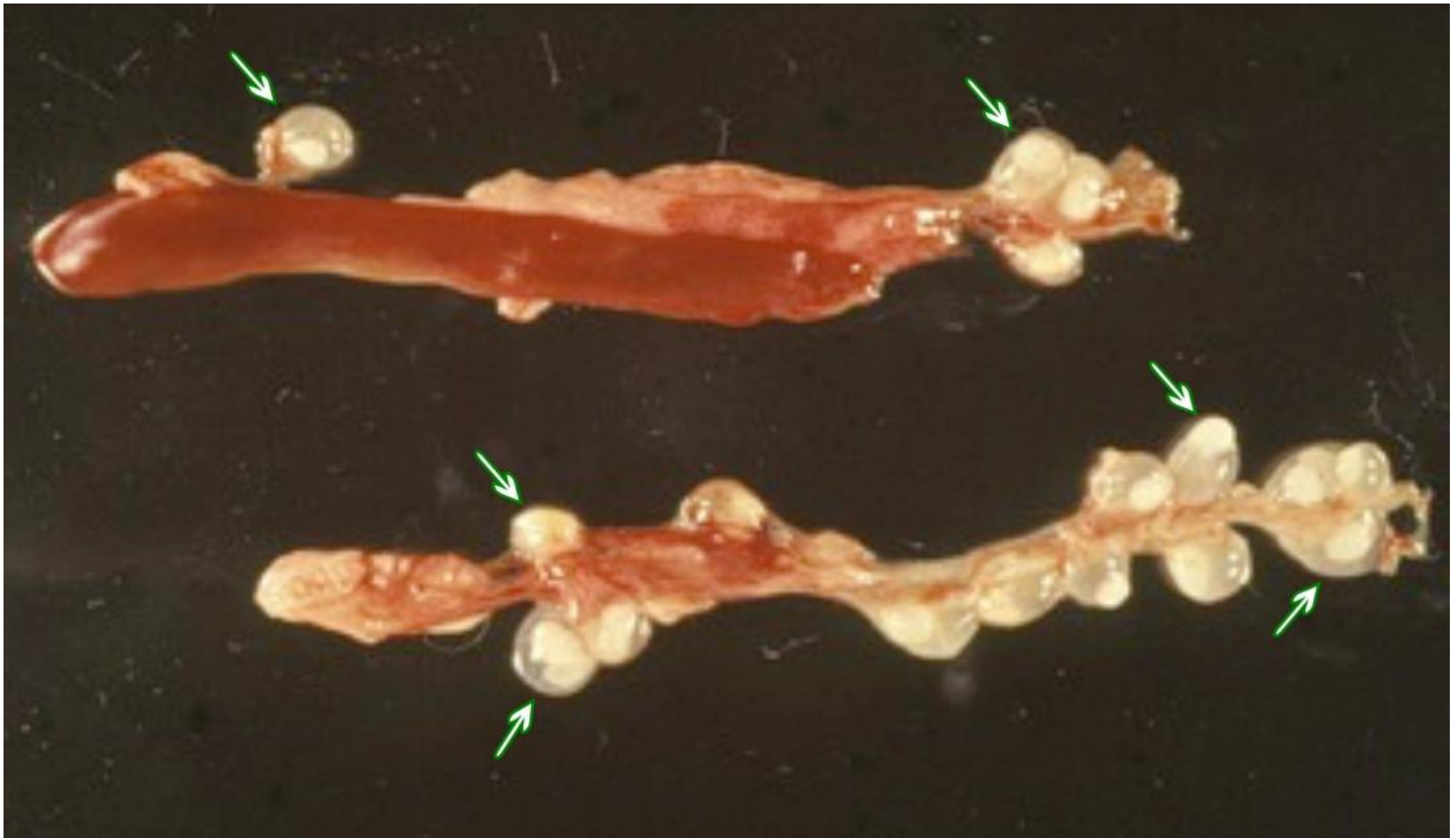
Trichostrongylus sp. female worm and egg



Cestodes Rabbit as intermediate host

- *Taenia pisiformis* – *definitive host* :carnivores like dogs-
- The development of the parasite occurs in two stages:
- An intermediate stage in abdominal cavity or liver in form of bladder worms also known as *Cysticercus pisiformis*. Aberrant cysts may form in the lungs or brain
- Rabbit infected after ingestion of the eggs contaminated with infested dog faeces

Cysticercus pisiformis in the abdominal cavity of a rabbit



Cestodes continued

- ***Multiceps serialis***
- Synonym- *Taenia serialis*.
- Adult form in dogs and cats. Its incidence in house rabbits is rare.
- Intermediate one in hares or wild rabbits,
- In rabbits, cysts of *Multiceps serialis* in the subcutaneous tissues and muscle mass.
- Potentially zoonotic

Life cycle of tapeworms



Cyst of *Taenia multiceps*



Cyst of *Taenia multiceps* exposed to show numerous white heads of immature tapeworms.

Cestodes of rabbits – rabbits as definitive host

- Mature tapeworm occurs in the rabbit intestines
- Commonly infest wild or domestic rabbits and wild lagomorph species like the American cottontail rabbit or hares, They include:
- *Monoecocestus americanus* - the porcupine tapeworm;
- *Ctenotaenia ctenoides*;
- *Cittotaenia variabilis*- the rabbit tapeworm;
- *Mosgovoyia pectinata americana* or *M. perplexa*;

Cestodes of rabbits – rabbits as definitive host contd'

- Rare in pet rabbits, and essentially caused by *Cittotaenia variabilis*.
- The life cycle of these worms is not well understood
- Proposed that Arthropods like oribatid mites (mites living in the soil) transmit the rabbit tapeworm *Cittotaenia variabilis*.
- The rabbit ingest the mites; the larval form will develop in the abdomen and the liver.
- Adult stages are found in the intestine-1 cm wide, and can reach as long as 20 cm.
- *Cittotaenia variabilis* is characterized by a scolex (head) with 4 suckers that will attach to the intestinal wall.

Rabbit tapeworm



Figure 4. A portion of a rabbit tapeworm, Cittotaenia. These parasites are confined to the rabbit's intestines and go unnoticed by hunters unless the intestines are punctured. Harmless to humans. (Photo by Nancy Lamb.)

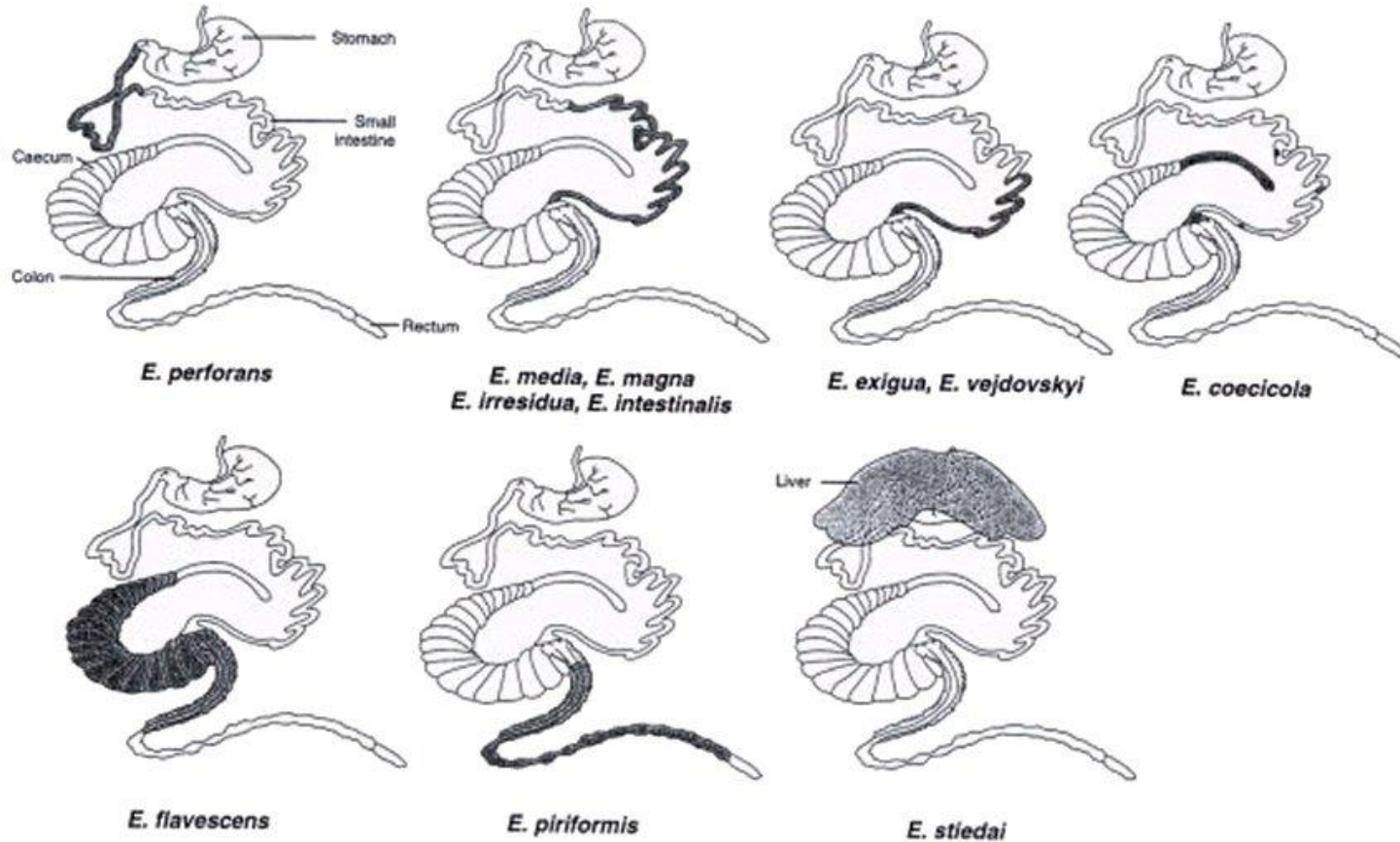
Intestinal coccidiosis

- The intestinal form- youngsters from the age of 6 weeks to 5 months
- Caused by different *Eimeria* species - *E. magna*, *E. peforans*, *E. media*, and *E. irresidua*. the intestinal type is by far the most common
- Diarrhea (gray to yellow porridge free-flowing content in the small intestines) or semisoft faeces , weight loss and presence of mucus in faeces

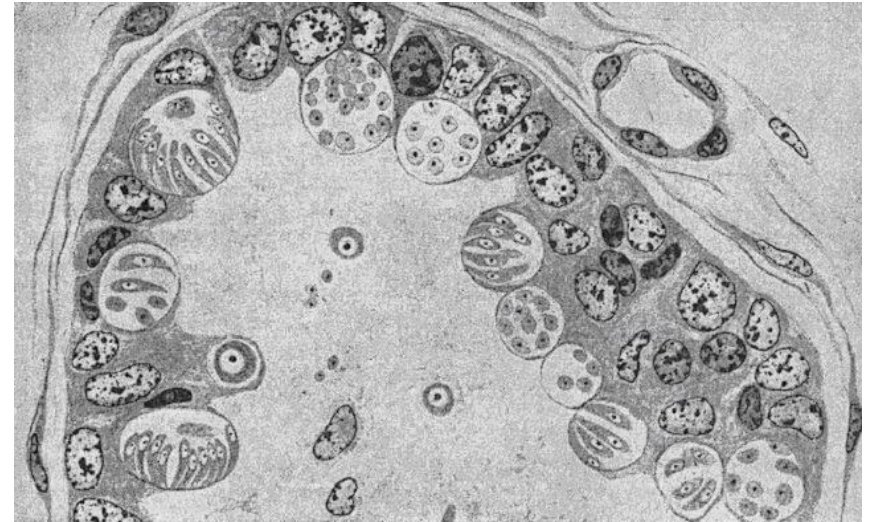
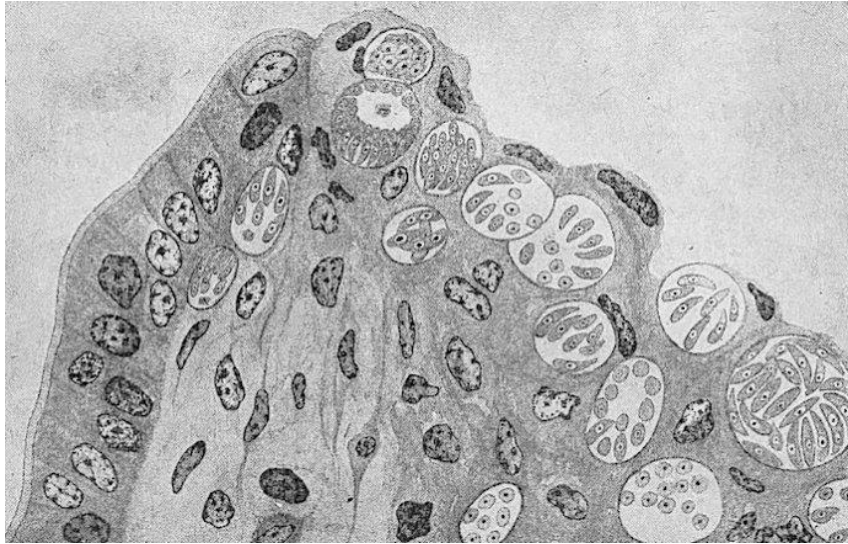
Coccidiosis

- Spores enter enterocytes – several asexual divisions (schizogony); "Merozoites" released and infest other enterocytes; final stages of schizogony form gametes that initiate sexual reproduction resulting in Oocytes - shed in the feces.
- The asexual and sexual stages differ often in their location, organ and tissue specificities.

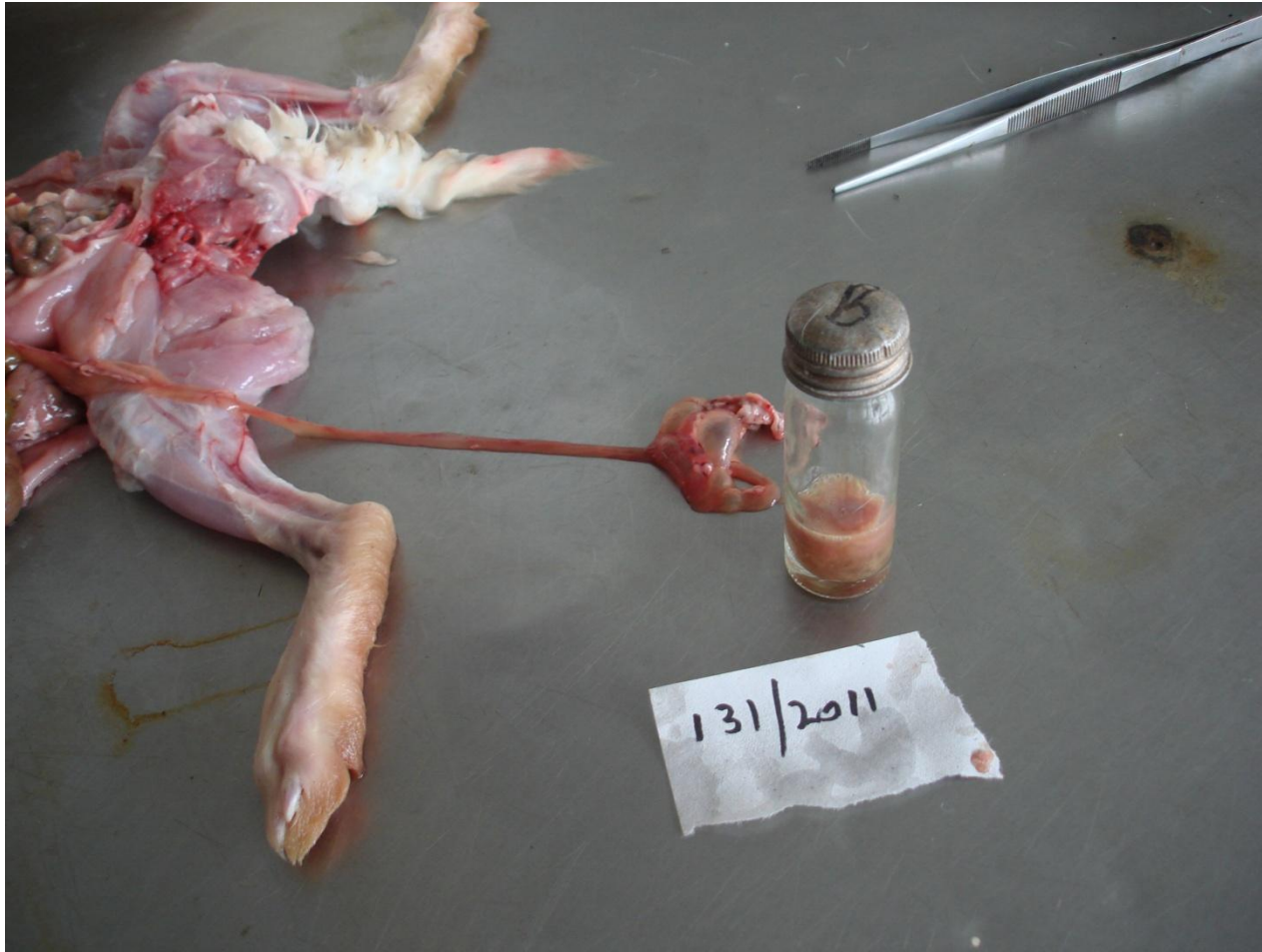
Tissue specificity of intestinal *Eimeria* species



Eimeria parasites in the enterocytes (Left) and liver (right)



Intestinal coccidiosis rabbit



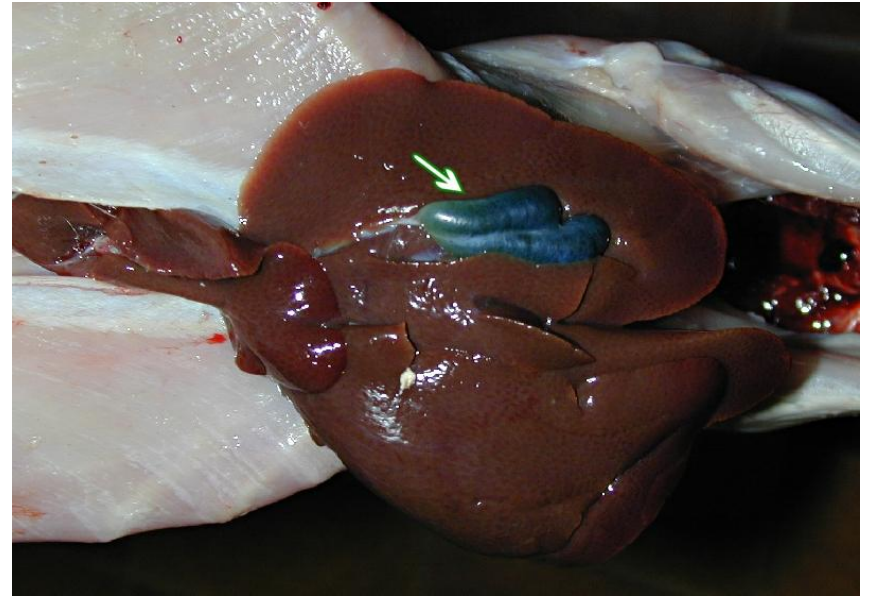
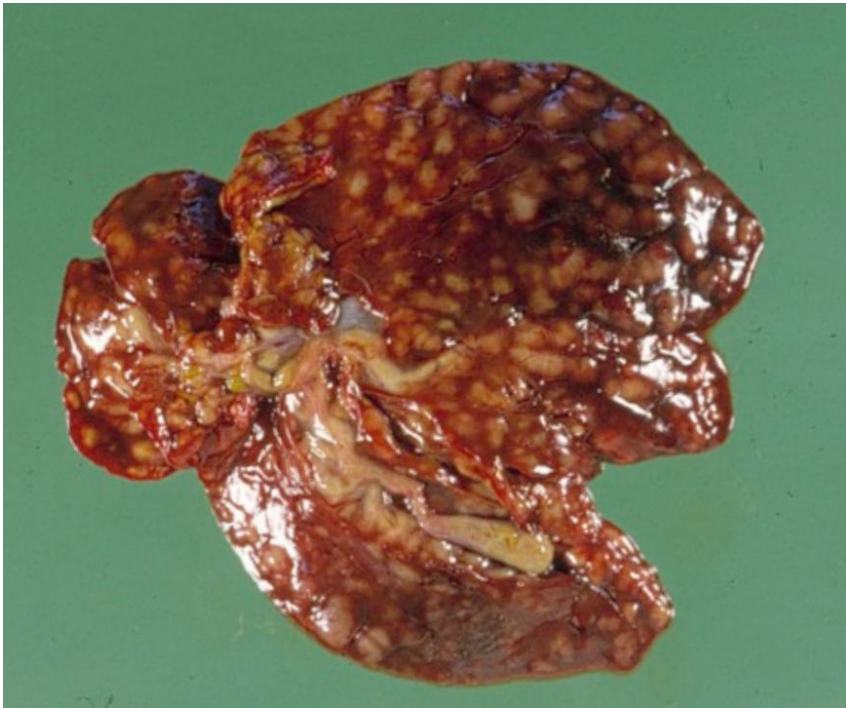
Intestinal coccidiosis in rabbits



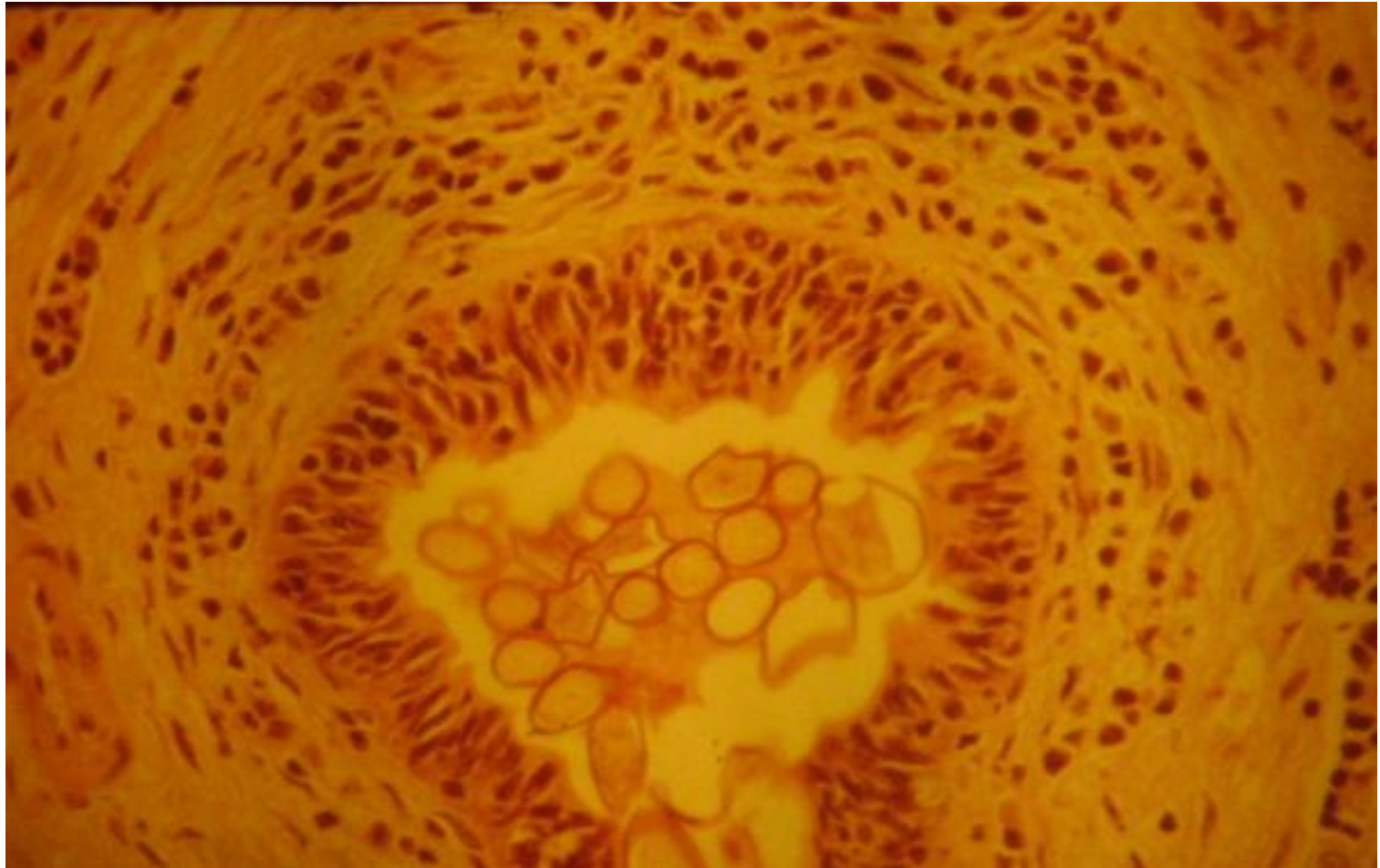
Hepatic coccidiosis

- Hepatic coccidiosis
- The liver form of coccidiosis affects rabbits of all ages. *Eimeria stiedae*
- This form of coccidiosis runs either as a chronic course
- At necropsy, liver, gall bladder and bile duct are distended and enlarged. White nodules cover the surface of the liver. The protozoa can be found in the liver and biliary ducts. An impression smear of the liver reveals the presence of coccidia.

Hepatic coccidiosis (Left) normal liver (right)



Hepatic coccidiosis



Encephalitozoon cuniculi

- Life cycle of *E. cuniculi* not well understood; Many healthy rabbits are subclinical carriers
- Mode of transmission unclear; appears to be vertical: Mother to litter, rather than horizontal: via infected droppings and urine.
- Target the nervous system , Liver, kidney
- Diagnosis of Encephalitozoonosis -
Histopathology of target organs - Mononuclear meningoencephalitis, nephritis / hepatitis

End

- Thank you