TRENDS IN VETERINARY PARASITOLOGY

A TWO-DAYS COURSE

DEPARTMENT OF VETERINARY PATHOLOGY, MICROBIOLOGY & PARASITOLOGY

FACULTY OF VETERINARY MEDICINE

UNIVERSITY OF NAIROBI

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PARASITES OF PIGS

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INTRODUCTION

- Pig production provides a good potential for high economic gain to the farmer
  - High feed conversion efficiency
  - High fecundity
  - Short generation interval

- Parasitism is one of the major limiting factors to profitable pig production
- Impact of parasitism is expected to be greater where the diet is insufficient

INTERNAL PARASITES

- Infectious diseases spread quickly and are easily recognised
- Loss of appetite, reduction in weight gain, poor feed utilization and potentiation of other pathogens are the common results
- Internal parasites fall into three categories; nematodes,cestodes and trematodes
- Parasites of Veterinary importance in the tropics and temperate countries include;

  Ascaris suum, Oesophagostomum spp, Trichuris suis,Hyostrongylus rubidus, Strongyloides ransomi,Metastrongylus spp ,*Stephanurus dentatus*

INTERNAL PARASITES……

- Helminths more common in the tropics but less common in temperate countries include;

  Ascarops strongylina,Physocephalus sexalatus

  Macracanththorhyncus hirudinacous

  -Use coprophagus beetles as intermediate hosts

  - Infections are common in outdoor reared pigs

- Helminths of zoonotic importance include;

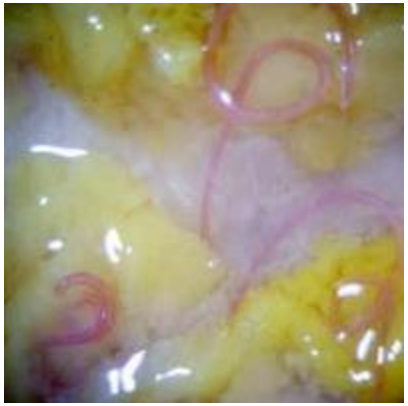
  Taenia solium (Cysticercosis), *Echinococcus granulosus*, *Schistosoma japonicum,Trichinella* spp

Nematodes of pigs

Locations	**Nematode**
Stomach	Hyostrongylus, Ascarops, Physocephalus
S/intestines	Ascaris suum, Strongyloides, Trichostrongylus, Globocephalus Macracanthorhynchus
L/intestines	Oesophagostomum, Trichuris
Lungs	Metastrongylus
Muscles	Trichinella
Kidneys	Stephanurus

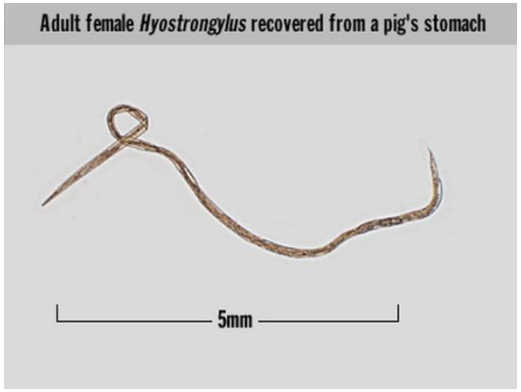
Hyostrongylus rubidus

Most important stomach worm of pigs



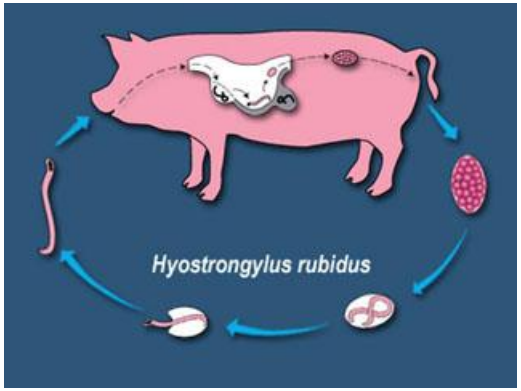
Morphology

- Reddish, slender worms
- Size range, 4 - 10 mm
- Males are bursate



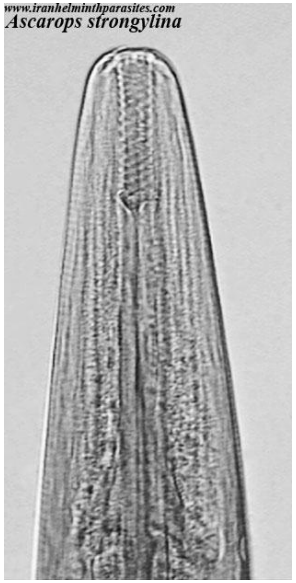
Pathogenicity

- Gastric ulcers
- Haemorrhagic gastritis
- Blood suckers, may cause anaemia



Ascarops strongylina

Predilection site: Stomach



Morphology

- Red in colour
- Size: 10 - 22 mm long
- Pharynx strengthened by double or triple spiral thickenings
- The thickenings continuous to the end

Pathogenicity

- Causes gastritis

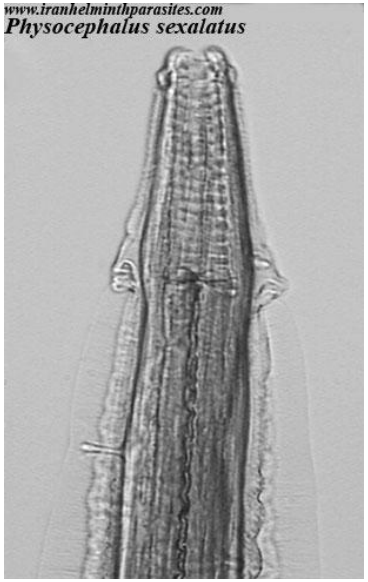
Physocephalus sexalatus

Intermediate hosts: Coprophagous beetle

Predilection site: Stomach

Morphology

- Size:6 - 22mm long
- Pharynx has single spiral thickenings
- The thickenings break into complete rings in middle portion



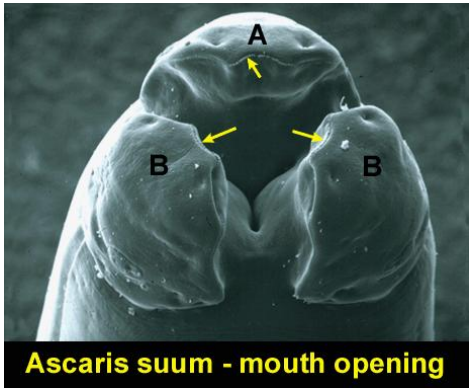
Pathogenicity

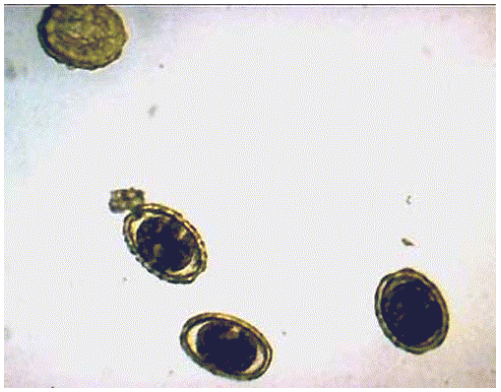
- Causes gastritis

Ascaris suum

Morphology

- Have three (3) well developed lips (1 dorsal, 2 sub-ventral
- Sizes: 15 - 41cm by 3 - 5mm thick
- Eggs:
  - Brown - yellow, oval in shape, thick shelled, thick albuminous layer with prominent projections

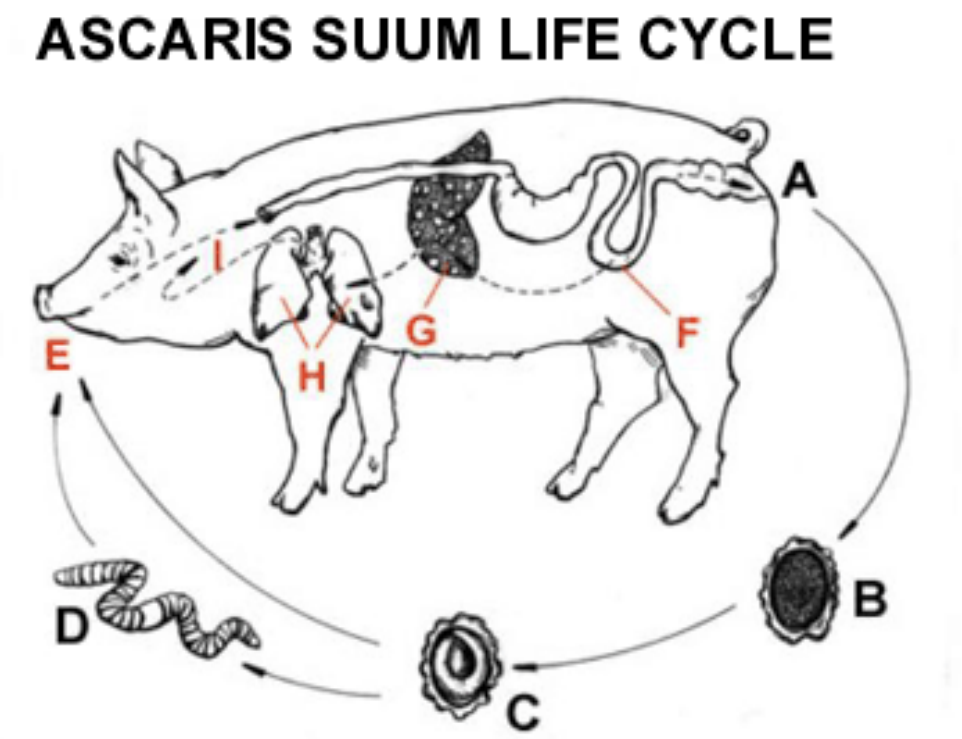




Genus: *Ascaris cont...*

Transmission

- Ingestion of eggs with L_2



Genus: Ascaris cont..

Pathogenicity & clinical signs

- Malnutrition
- Migrating larvae cause tissue damage, hemorrhage, verminous pneumonia
- Large numbers of adults become twisted into bundles & obstruct intestinal lumen or cause intestinal rupture
- May wonder into stomach, cause irritation & vomiting
- May enter bile or pancreatic ducts where they cause obstruction
- Cause diarrhoea, abdominal distensions & pains

Clinical & Post-mortem A. suum

Trichuris suis

Predilection sites: Caecum & colon

Morphology

- Size: 5 – 7 cm
- Thin hair like anterior part
- Thick posterior part
- Posterior end curved in males
- Eggs: Typical trichurid
- Barrel shaped, bipolar plugs

Pathogenicity

- Blood suckers
- Burrow anterior end into mucosa
- Irritate mucosa

Oesophagostomum dentatum

Morphology

- Size: 6 - 24 mm
- Males are bursate
- Have cylindrical buccal capsule
- Have leaf-crown
- Have cephalic vesicle, ventral cervical groove
- May have cephalic papillae

Pathogenicity

Larvae normally arrested in gut wall to form nodules

Adults irritate mucosa

- Diarrhoea
- Unthriftiness

Metastrongylus

Species: *Metastrongylus apri, M.salmi, M. pudendotectus*

Predilection sites: Bronchi & bronchioles

Morphology

- Whitish
- Size: 9 – 58mm
- Bursate

Pathogenicity

- Chronic bronchitis & emphysema
- Coughs, nasal disharges, dyspnoea
- Deaths

Trichinella spiralis (garbage worm)

- Small worms(2-4mm)
- Posterior part only slightly thicker than the anterior
- Neither spicule nor sheath
- Females are larviparous

Hosts: Man, pigs, rats and other mammals

Geographical distribution: World wide

Predilection sites: Small intestines, muscle (larvae)

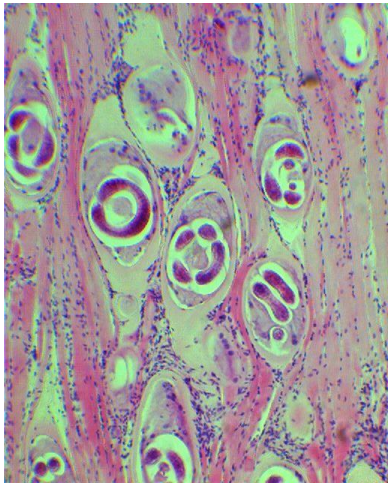
Trichinella spiralis cont..

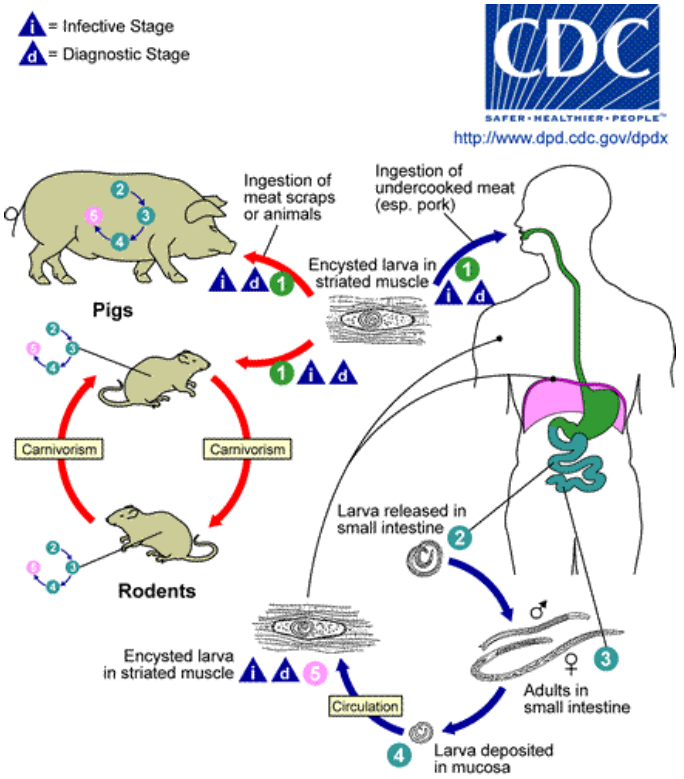
Morphology

- Slender worms
- Posterior part slightly thicker than the anterior
- Size: 1.4 –4 mm

Transmission

- Carnivorism





Trichinella spiralis cont..

Pathogenicity

- Zoonotic
- Muscle pain

Control

- Proper cooking of meat
- Freezing
- Cook / boil pig feed
- Proper housing of pigs

TRANSMISSION RATE

- Management practices determine transmission rate and the risk of economic losses
- Differences exist between indoor and outdoor production system mainly on the type of feed and use of anthelmintics
- High prevalence rate reported in outdoor production system due to poor housing and hygiene
- Infection levels in different age groups are strongly influenced by the immunogenicity of individual helminth spp

External parasites

-Importance varies due to differences in climate and production systems

Haematopinus suis

<u>Morphology</u>

- Size: 5-6mm long
- Long narrow head
- Large claws on each of the six legs

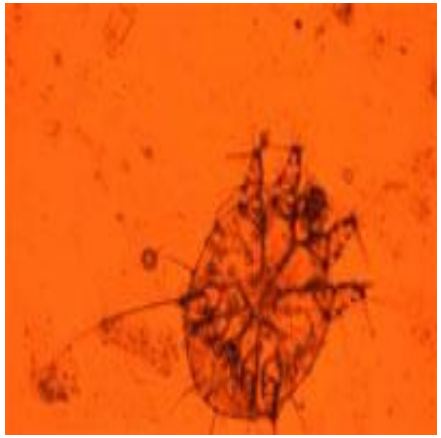
<u>Pathogenicity</u>

- Skin lesions
- Anaemia
- Transmission of Swine pox, *Eperythrzoon suis*

External parasites cont……

Sarcoptes scabiei var. suis

Location: Skin(head,ears,shoulders,neck,legs and tail)



Morphology

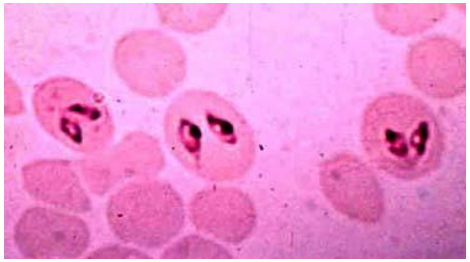
- Tiny mites
- Size:0.3-0.5 mm long
- Round body
- 8 stumpy legs
- unjointed pedicels

Pathogenicity

- Chronic allergic dermatitis

Haemoparastes

Babesia spp



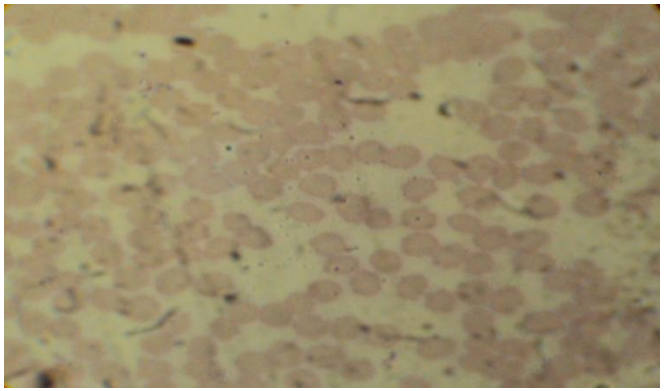
- *B.trautmani* (Long and narrow) *B.perroncitoi(*Small rounded form)
- Occurs in pairs,oval,amoeboid and ring forms in RBCs
- Transmission: *Rhipicephalus* spp *Boophilus spp and Dermacentor spp*

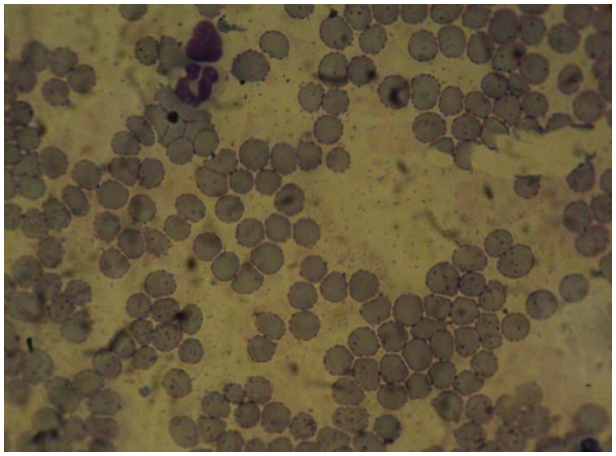
Pathogenicity

- Haemolytic anaemia
- Abortion in pregnant animals

Eperythrozoon spp

- *E. suis* and *E. parvum*
- Occurs on the surface of erythrocytes
- Transmission: parenteral routes,*H.suis*



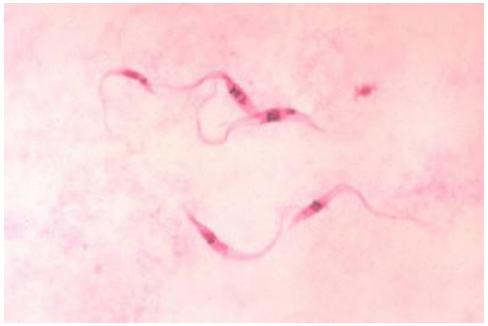


Pathogenicity

- *E.suis* causes haemolytic anaemia
- Significant with other concomitant infections

Trypanosomes

- *T. congolense simiae* (polymorphic)
  *T. suis (*monomorphic,stout ,short flagellum)
  T. brucei (Chronic infections)
- Transmission: *Glossina* spp



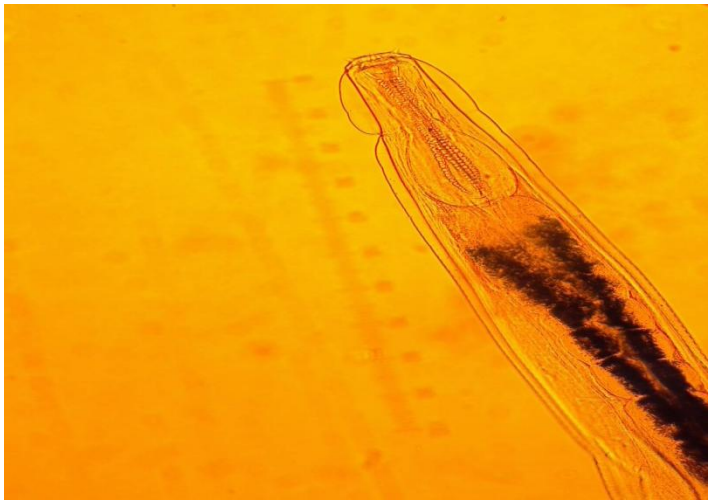
<u>Pathogenicity</u>

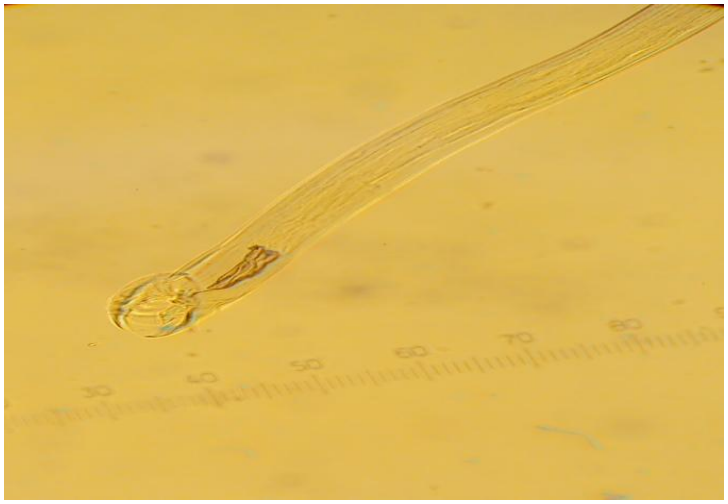
- Tissue damage in various organs
- Severe anaemia
- immunosupression

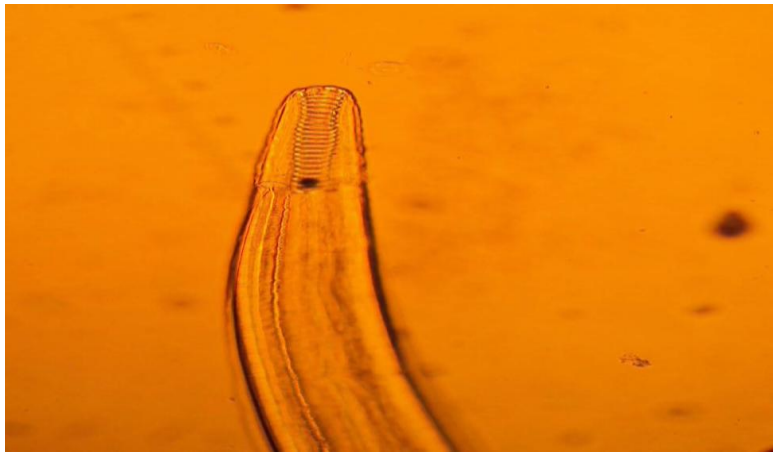
Recent survey- Homabay District

- Pigs were examined by faecal and post-mortem methods
- Overall prevalence was high may be due to outdoor production system(housing and hygiene)
- Parasite spp were *Oesophagostomum* spp, *Strongyloides* spp,*Trichuris* spp, *Ascaris* spp, *Metastrongylus* spp, *H. rubidus*, *T. axei* and *P.sexalatus*
- Faecal examination indicated high prevalence of *Oesophagostomum* spp.*T.suis*, *S. ransomi*, *H. rubidus* and *Ascaris* spp had a lower prevalence
- P.M examination indicated a high prevalence of *Oesophagostomum* spp, *H.rubidus*,*P.sexalatus* and *Metastrongylus* spp

Worms recovered at P.M







Survey cont…..

- *T. suis*, *T. axei* and *A. suum* had a low prevalence
- P.M examination reveals the spp and is more accurate.
- Overall high prevalence could be due to outdoor production system: pigs were rarely dewormed and were not supplemented with commercial feeds
- Adults recorded highest mean epg while piglets recorded the lowest mean epg may be due to continuous exposure of adult pigs to infective stages
- Infection levels varied from division to division probably a reflection of influence of climate on survival of infective stages

Survey conti…….

- Most of the animals had low to moderate egg counts and low worm burdens(Sub-clinical infections)
- Subclinical infections are important economically
  - -retarded growth
  - -reduced productivity of animals
  - - Susceptibility to other infections
- Helmithosis is a prominent problem for pig farmers and many farmers are living with it; it is not a major issue to farmers
- Need to undertake educational efforts if pig farmers are to realise production and economic benefits associated with the control of helminths