TRENDS IN VETERINARY PARASITOLOGY

A TWO-DAYS COURSE
DEPARTMENT OF VETERINARY PATHOLOGY, MICROBIOLOGY & PARASITOLOGY
FACULTY OF VETERINARY MEDICINE
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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*, *Physocyphalus sexalatus*
  - *Macracanthorhyncus hirudinacous*
    - Use coprophagous 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

<table>
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<tr>
<th>Locations</th>
<th>Nematode</th>
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<td>Hyostrongylus, Ascarops, Physocephalus</td>
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<td>S/intestines</td>
<td>Ascaris suum, Strongyloides, Trichostrongyulus, Globocephalus, Macracantherhynchus</td>
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<tr>
<td>L/intestines</td>
<td>Oesophagostomum, Trichuris</td>
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<td>Lungs</td>
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<td>Muscles</td>
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<td>Kidneys</td>
<td>Stephanurus</td>
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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:
  o 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 larviperous

**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

Morphology

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

Pathogenicity

• Skin lesions
• Anaemia
• Transmission of Swine pox, *Eperythrozoon 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
Haemoparasites

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* (monomorphc, stout, short flagellum)
- *T. brucei* (Chronic infections)

*Transmission:* *Glossina* spp

**Pathogenicity**

- Tissue damage in various organs
- Severe anaemia
- Immunosuppression
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. axeii* 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. axe* 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
• 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