

Review of the Parasites of Large Animals

Introduction:

In labs 2 through 10 we presented you with the various parasites of veterinary importance in a taxonomic manner. However, as veterinarians, you will be dealing with the host as your patient and therefore only need to deal with the limited number of parasites that normally reside within or on that host. In this lab we will present you with the parasites you have previously learned, but grouped according to the large animal which they parasitize.

Objective:

To review the parasites of large animals in a host-oriented manner. The “checklist” parasites for this lab are the same ones that were in the labs in which you first learned them. For your convenience we have reprinted these parasites in the appendix to this lab.

At the Bench

1. The following Host-Parasites lists show the slides on the center bench and the slides in your Student Slide Box (SSB) which should be reviewed in this lab.

Note: These lists are not meant to be totally inclusive, for example *Cryptosporidium* and *Trichinella* can be found in all mammals, and mosquitos or other flies (SSB 73), some lice and ticks are not listed with any particular host. The following are some of the lice and ticks not listed elsewhere:

Parasite	SSB #
<i>Damalinia caprae</i>	80+81
<i>Linognathus</i> sp.	78
<i>Psoroptes</i> sp.	88
<i>Boophilus annulatus</i> larvae	93
<i>Dermacentor</i> sp.	96
<i>Rhipicephalus</i> sp.	95

Some slides on the center bench contain eggs that are very similar to the species cited (ex. *Strongyloides papillosus* #49, is almost identical to the eggs of *S. westeri* and *S. ransomi*).

2. Fecal Examinations:
 - a) Do a McMaster egg/gm count on the sheep feces found in tub #1.
 - b) Do a zinc sulfate centrifugation flotation on the pig feces in tub #3.

Demonstrations

Demos are arranged by host and predilection site. Even if a parasite can be found in more than one host, there will be only one demonstration. The following are lists of parasites covered in lab. These lists are not meant to be complete. Again, the CAL website is a good place to start your review.

CATTLE

Parasite	Location in Host	Diagnostic Stage**	Lab Specimen ⁺
* <i>Haemonchus</i>	abomasum	egg in feces	SSB 28
* <i>Ostertagia</i>	abomasum	egg in feces	
* <i>Trichostrongylus</i>	abomasum or sm. int.	egg in feces	
* <i>Paramphistomum</i>	rumen	eggs in feces	
* <i>Cryptosporidium</i>	sm. intestine	oocysts in feces	SSB 97
* <i>Giardia</i>	sm. intestine	cyst in feces	
* <i>Cooperia</i>	sm. intestine	egg in feces	
* <i>Nematodirus</i>	sm. intestine	egg in feces	
* <i>Bunostomum</i>	sm. intestine	egg in feces	
* <i>Strongyloides</i>	sm. intestine	larvated eggs in feces	B 49
* <i>Moniezia</i>	sm. intestine	eggs in feces	B 37, SSB 7
* <i>Trichuris</i>	lg. intestine	eggs in feces	
* <i>Eimeria</i>	cecum, lg. intestine	oocysts in feces	
* <i>Fasciola</i>	bile ducts	eggs in feces	B 11, SSB 12, 13
* <i>Dicrocoelium</i>	bile ducts	eggs in feces	SSB 16, 17
* <i>Dictyocaulus</i>	lungs	larvae in feces	
* <i>Hypoderma</i>	skin of back	larva in skin	
* <i>Psoroptes</i>	skin	adults on skin	SSB 88
* <i>Chorioptes</i>	skin	adults on skin	
* <i>Sarcoptes</i>	skin	adults in skin scrape	
* <i>Damalinia</i>	skin	adults on skin or hair	SSB 80, 81
* <i>Trypanosoma</i>	blood	trypanosome in blood smear	SSB 39
* <i>Taenia</i>	muscle	none	
* <i>Sarcocystis</i>	muscle	none	SSB 50
<i>Trichomonas</i>	reproductive organs	trophozoites on smear	SSB 42

* Also in other hosts.

** The stage used to diagnose the infection in a living animal, if **none**, biopsy or serology may be used.

+ B= Slide on center bench, SSB=Student Slide Box slide #

SHEEP AND GOATS

Parasite	Location in Host	Diagnostic Stage	Lab Specimen
* <i>Paramphistomum</i>	rumen	eggs in feces	
* <i>Haemonchus</i>	abomasum	egg in feces	SSB 28
* <i>Ostertagia /Teladorsagia</i>	abomasum	egg in feces	
* <i>Trichostrongylus</i>	abomasum or sm. int.	egg in feces	
* <i>Cooperia</i>	sm. intestine	egg in feces	
* <i>Nematodirus</i>	sm. intestine	egg in feces	
* <i>Bunostomum</i>	sm. intestine	egg in feces	
* <i>Cryptosporidium</i>	sm. intestine	oocysts in feces	SSB 97
* <i>Giardia</i>	sm. intestine	cyst in feces	
* <i>Strongyloides</i>	sm. intestine	larvated eggs in feces	B 49
* <i>Moniezia</i>	sm. intestine	eggs in feces	B 37, SSB 7
* <i>Eimeria</i>	lg. intestine	oocysts in feces	
* <i>Trichuris</i>	lg. intestine	eggs in feces	
* <i>Dictyocaulus</i>	lungs	larvae in feces	
<i>Muellerius</i>	lungs	larvae in feces	SSB 31
* <i>Echinococcus</i>	liver and others	none	
* <i>Dicrocoelium</i>	bile ducts	eggs in feces	SSB 16, 17
* <i>Fasciola</i>	bile ducts	eggs in feces	B 11, SSB 12, 13
<i>Oestrus</i>	nasal cavities	none	
<i>Melophagus</i>	skin	adult on skin	SSB 68
* <i>Hypoderma</i>	dermis of back	larva in skin	
* <i>Psoroptes</i>	skin	adults on skin	SSB 88
* <i>Chorioptes</i>	skin	adults on skin	
* <i>Damalinea</i>	skin	adults on skin or hair	SSB 80, 81
* <i>Sarcoptes</i>	skin	adults in skin scrape	
* <i>Trypanosoma</i>	blood	trypanosome in blood smear	SSB 39
* <i>Taenia</i>	muscle	none	
* <i>Sarcocystis</i>	muscle	none	SSB 50

* Also in other hosts.

SWINE

Parasite _____	Location in Host	Diagnostic Stage	Lab Specimen
<i>Hylostrongylus</i>	stomach	eggs in feces	
* <i>Giardia</i>	sm. intestine	cysts in feces	
<i>Cystoisospora</i>	sm. intestine	oocysts in feces	
* <i>Cryptosporidium</i>	sm. intestine	cysts in feces	SSB 97
* <i>Eimeria</i>	intestine	oocysts in feces	
* <i>Strongyloides</i>	sm. intestine	eggs in feces	B 49
<i>Ascaris</i>	sm. intestine	eggs in feces	B 59, SSB 23
<i>Macracanthorhynchus</i>	sm. intestine	eggs in feces	
* <i>Trichinella</i>	sm. intestine + muscle	none	SSB 38
<i>Oesophagostomum</i>	lg. intestine	eggs in feces	SSB 27
* <i>Trichuris</i>	lg. intestine	eggs in feces	
<i>Balantidium</i>	lg. intestine	cysts in feces	SSB 55, 56
* <i>Fasciola</i>	bile ducts	eggs in feces	B 11, SSB 12, 13
<i>Stephanurus</i>	kidney	eggs in urine	
<i>Metastrongylus</i>	lungs	larvated eggs in feces	
* <i>Haematopinus</i>	skin	adults on skin	SSB 83
* <i>Sarcoptes</i>	skin	adults in skin scrape	SSB 88

* Also in other hosts.

HORSE

Parasite_	Location in Host	Diagnostic Stage	Lab Specimen
<i>Gasterophilus</i>	stomach	none	SSB 70, 71
* <i>Giardia</i>	sm. intestine	cysts in feces	
* <i>Cryptosporidium</i>	sm. intestine	cysts in feces	SSB 97
<i>Trichostrongylus</i>	sm. intestine	eggs in feces	
<i>Parascaris</i>	sm. intestine	eggs in feces	B 19
<i>Strongyloides</i>	sm. intestine	eggs in feces	B 49
<i>Anoplocephala</i>	sm.+lg. intestine	eggs in feces	
* <i>Eimeria</i>	intestine	oocyst in feces	
<i>Oxyuris</i>	lg. intestine	eggs on perianal skin	B 13
<i>Strongylus</i>	lg. intestine	eggs in feces	SSB 30
<i>Trichonema</i>	lg. intestine	eggs in feces	SSB 26
<i>Setaria</i>	peritoneal cavity	microfilaria in blood	
* <i>Dictyocaulus</i>	lungs	larva in feces	
<i>Psoroptes</i>	skin	adults on skin	SSB 87
* <i>Chorioptes</i>	skin	adults on skin	
* <i>Sarcoptes</i>	skin	adults in skin-scrape	SSB 88
<i>Dermacentor</i>	skin	adults on skin	
* <i>Damalinia</i>	skin	adults on skin or hair	
* <i>Haemopinus</i>	skin	adults on skin or hair	
<i>Trichodectes</i>	skin	adults on skin or hair	
* <i>Onchocerca</i>	lg. ligaments	microfilaria in skin	
<i>Babesia</i>	blood	trophozoite in RBCs	
* <i>Trypanosome</i>	blood	trypanosomes in blood	SSB 39

* Also in other hosts.

Appendix Lab 12 Checklist material covered in this review.

Learn to identify:

- Giardia cysts
- Eimeria* oocysts
- Tritrichomonas* trophozoites
- Babesia* spp. in a blood smear
- Giardia* trophozoites
- Cryptosporidium* oocysts (acid fast stained)

Be able to do the following techniques:

- McMaster egg count to determine the EPG.
- Fecal Egg Count Reduction Test

Be able to identify the following:

- A typical “strongyle-type” egg
- Nematodirus* spp. egg
- Haemonchus* Adult (Largest abomasal nematode)
- Ostertagia* Adult (abomasal nematode - middle in size)
- Trichostrongylus* Adult (Smallest abomasal nematode)
- Strongylus vulgaris* Adult
- Large Strongyle Adult (generic, from horse)
- Small Strongyle Adult (generic, from horse)
- Recognize the typical lungworm L1 (“kinked” tail) and be able to identify to species (by host).
- Recognize *Dictyocaulus* spp. L1 from cattle (larva with straight tail in fresh feces).
- Recognize the eggs of *Strongyloides* spp.

Be able to identify the following:

- The eggs of the following Ascarids: *Ascaris suum*, *Parascaris equorum*
- Adult ascarids to species.
- The eggs of the following Trichocephalids: *Trichuris* spp. & *Capillaria* spp.
- The eggs and adult female of the horse pinworm: *Oxyuris equi*.
- Be able to identify the L1 of *Trichinella spiralis* in a “squash-prep” of muscle.

Be able to identify the following trematode eggs:

- any trematode egg (A brown egg with an operculum is considered a trematode egg or a trematode-like egg.)
- Fasciola hepatica* (the operculum, the size and the host should be sufficient to identify this egg).
- Dicrocoelium dendriticum* (the operculum, the size and the host should be sufficient to identify this egg).

Be able to identify the adults of the following:

- Fasciola hepatica* (by size, shape and location within the host).
- Dicrocoelium dendriticum* (by size, shape and location within the host).
- Fascioloides magna* (by size, shape and location within the host).
- Paramphistomum* spp. - (by size, shape and location within the host).
- an acanthocephalan (a predilection site in the small intestine, and the presence of a anterior proboscis covered with spines coupled with the lack of suckers on the anterior end is enough to identify an adult acanthocephalan.)

Be able to identify the eggs of:

- Anoplocephalids - *Anoplocephala* spp. and *Moniezia* spp. (Triangular or square eggs)

Be able to identify the adult of:

- Anoplocephala perfoliata* (by the size, shape and predilection site)

Be able to recognize a representative mite from each of the following 5 families:

- Dermanyssidae
- Psoroptidae
- Demodicidae
- Chyletidae
- Sarcoptidae

Be able to:

- Use the pictorial key to identify an unknown tick specimen to the genus level.
- Recognize *Rhipicephalus*, *Ixodes*, *Dermacentor*, *Amblyomma* ticks without using a key.

Be able to recognize:

- the suborders of flies by antennal type (Nematocera, Brachycera, Cyclorrhapha)
- Melophagus ovinus*
- Adult flies of the family Tabanidae
- Chewing lice and the two subgroups: Amblycera and Ischnocera
- Sucking lice

Using a pictorial key be able to:

- prepare posterior spiracles of muscoid fly larvae and make a genus diagnosis
- identify flea adults to species