

## THE WHO'S WHO OF INTESTINAL WORMS

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To most people, the word 'worms' conjures up mental pictures of wriggling earthworms of the type one digs up in the garden; the thought of these things inside your horse's intestine is revolting. Few people find out exactly what these organisms actually look like and the reality is much more varied and interesting. The purpose of this article is to demonstrate the appearance of the main types of intestinal worm and to discuss their life cycle. Worms are divided into family groups just like species of animal. There are three groups, or 'classes', of worm: nematodes, trematodes and cestodes.

### Nematodes

*Parascaris equorum* is the most like an earthworm of all the worms found in the horse. It is up to 40 cm long and lives in the small intestine and stomach (Fig 1). Both males and females of this class exist; the females produce eggs which are passed in the horse's droppings. These eggs are eaten from the field by the horse and return to the intestine where they hatch; larvae then penetrate the intestinal wall, migrate through the liver into the lungs and are coughed up and swallowed. They return to the small intestine where they mature and live. Migrating larvae can cause coughing; adults can reach such numbers that they actually block the intestine. Otherwise, clinical signs of ill-thrift and weight loss are the only signs. Unwary vets have been known to accidentally swallow adults when stomach-tubing infected horses (Fig 2).

Female *Strongyloides westeri* sometimes cause disease in foals. They are the only worm capable of free-living life cycles in the environment away from the horse. When the female larvae become infectious they penetrate the skin and migrate *via* the blood to the lungs, then to be coughed up and swallowed to become adult females within the intestine. They can also be picked up from the skin by the udder and be swallowed by the foal with the milk. Adult females are thin white worms approximately 1 cm long and are found within the small intestine, causing enteritis, diarrhoea and ill-thrift.

There are a large number of species of Strongyle, which live in the large intestine (Fig 3). There are three species of the large type: *S. vulgaris*, *S. edentatus* and *S. equinus*. The eggs are passed in the horse's droppings and hatch into larvae on the field. These migrate away from droppings to be eaten from surrounding

herbage. Inside, the larvae penetrate the intestinal wall, migrate around intestinal blood vessels causing variable damage and colic, before moving back into the large intestine as adults measuring 1 to 5 cm in length. The damage caused to intestinal blood vessels can be severe. Cyathostomes is the name given to the remaining 40 + species of 'small strongyle'. As with the large strongyles, eggs develop into larvae on the field. But unlike the large species, the larvae only penetrate as far as the wall of the intestine. When they return to the gut they attach by their head, causing erosion and irritation. Large infestations can therefore cause weight loss, colitis and diarrhoea, which can also be triggered by worming these horses.

*Oxyuris equi* live in the colon; males are small worms less than 1 cm long, whereas females are up to 10 cm long with a pointed tail (Fig 4). The females migrate to the anus and stick out their tails to lay eggs on the skin right by the anus. Eggs hatch within 5 days and migrate back inside. An infected horse will tend to rub its bottom and tail.

#### Cestodes

This group contains the tapeworm *Anoplocephala*, of which there are two types. Leaf-shaped adults live in the small intestine where they attach to the wall and absorb the food constantly washing over them (Fig 5). They release mature segments which disintegrate in the droppings to release eggs. Faecal egg counts are unreliable as the segments might not release eggs until after they have left the horse's body, blood tests are therefore necessary to accurately assess worm burdens. These eggs are eaten by forage mites on the pasture, which become infected. When horses eat the forage mites the development finishes and the horse becomes infected once again. Heavy infestation causes intestinal obstruction, scarring and inflammation around their attachment. Both these result in colic.

#### Trematodes

*Fasciola hepatica* is more commonly known as the liver fluke. Although infection of horses and donkeys occurs, it is much less common than in cows and sheep. Horses in particular seem more resistant to infection; they are more common in donkeys.

Flukes have an interesting life cycle. Leaf-shaped adults are found clustered in the bile duct, between the liver and small intestine. From here, eggs pass in the

droppings onto the land where they hatch into microscopic swimming creatures. These attach and penetrate to infect a species of water snail. Within the snail the creature multiplies and develops through more stages until it is released. Again, swimming creatures emerge which attach to blades of grass; these are eaten by the horse, cow or sheep. Once inside, the organism penetrates the intestinal wall, migrates through the liver and comes to rest once again in the bile duct. Disease is caused as they migrate across the liver damaging it and also by the obstruction and inflammation the adults cause within the bile duct. Infection can only occur where horses have access to pasture on which the water snail is found; this is mild, damp, slightly acid pasture such as is found in the west of the United Kingdom. It is a rare cause of disease in the UK and therefore is rarely tested for or treated in horses and donkeys, except in high risk regions.

This was not an exhaustive look at every species of worm in existence; only the principle species which live and cause disease within the horse's intestinal tract have been included. An article in the next edition of this magazine will focus on the other types of worms causing disease in horses.

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CAPTIONS FOR FIGURES:

Fig 1. Complete intestinal obstruction can follow heavy burdens of *Parascaris equorum*.



Fig 2. Beware unwary vets: *Parascaris equorum* found within a stomach tube withdrawn from an otherwise normal horse.

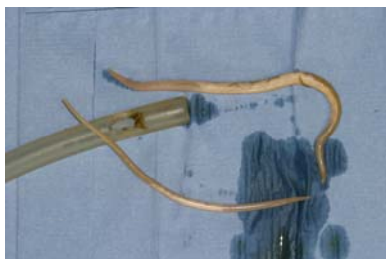


Fig 3. Cyathostomes found within the droppings of a heavily infested horse



Fig 4. Female *Oxyuris equi* found in the droppings of an infected horse.



Fig 5. Tapeworms, *Alopecophala* spp., clustered around the end of the small intestine in the caecum of a heavily infested horse.

