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Veterinary Parasitology into the 21st Century



PROGRAMME AND ABSTRACTS

Development of a PCR-based assay for the identification of cyathostome species in horses.

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Cyathostomes are now recognised as the primary parasitic pathogen of the horse. Infection with these intestinal nematodes results in weight loss, colic and, in some cases, acute diarrhoea that can be fatal. Despite the widespread use of modern anthelmintics, disease due to cyathostomes is still common. There are several reasons for this: (i) cyathostomes can acquire resistance to benzimidazole drugs, (ii) when in arrested development in the intestinal mucosa, cyathostomes are highly refractory to most anthelmintic drugs and (iii) horses do not develop a strong acquired immunity to these parasites. Cyathostomes exist as a large subfamily consisting of over 40 different species which can only be identified by morphological examination of adult stages in the intestine. To enable diagnosis and identification of cyathostome species from egg and larval stages in faecal and pasture samples, a PCR-based assay of common species is being developed. Using DNA extracted from morphologically identified species, the ribosomal DNA (rDNA) intergenic spacer (IGS) region from cyathostomes has been amplified, using primers designed from published sequences of the adjacent 26S and 18S rDNA genes of other organisms. Amplified fragments (~1.4kb) have been cloned and sequenced in order to identify regions of inter-specific divergence that may be effective in species differentiation.

The helminth parasites of African wild carnivores and their importance

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Although African wild carnivores have their own characteristic helminth parasites, they also share some of the parasites of domestic animals and some have zoonotic importance. Some of the parasites are acquired from devouring prey animals where the infective larval stages occur. Care should, however, be taken when identifying parasites through finding eggs in faecal samples because some of these eggs may be those of species specific to prey animals, such as eggs of schistosomes or amphistomes. The helminthic fauna is dominated by nematodes and, to a lesser extent, by cestodes. Digeneans are few and rarely encountered. Species of *Toxocara*, *Toxascaris*, *Ancylostoma*, *Necator*, *Uncinaria* and others have direct life cycles. Species of *Physaloptera*, *Gnathostoma*, *Cyathospirura*, *Rictularia* and others use insects or other hosts as intermediate hosts. Species of *Trichinella*, *Trichuris*, *Capillaria* and others also occur. The cestode fauna is dominated by the family Taeniidae particularly species of *Taenia* and *Echinococcus*. Adult species of *Taenia* have a fairly high degree of host specificity but their larval infective stages exhibit loose host specificity.

Several species have veterinary and public health importance. Species of *Ancylostoma*, *Necator*, *Trichinella*, *Taenia*, *Echinococcus* and others infect man and other animals either as larval forms or adults, and have great economic importance.

The swine gastrointestinal antibody response to whipworm infection

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The swine whipworm, *Trichuris suis*, is a parasite present throughout the United States and is of growing concern to the swine industry worldwide because it is very pathogenic to growing pigs. The economic threat posed by *T. suis* and other intestinal parasite infections has created a strong interest in the development of parasite vaccines for the swine industry. Use of a vaccine either alone or with anthelmintics should reduce the economic losses. However, before effective parasite vaccines can be created, the dynamics of the swine gastrointestinal immune response to parasite antigens must be understood. In this study, an enzyme-linked immunospot (ELISPOT) assay was developed to measure total and antigen-specific (AS) IgG and IgA antibody secreting cells (ASC) from gut-associated lymphoid tissues (GALT) [mesenteric lymph node explants from jejunal region of small intestine (SI-MLN) and cecum in large intestine (C-MLN); colonic lymph nodes (Co-LN); and jejunal and ileocecal Peyer's patches (JJ-PP and IC-PP, respectively)] and lamina propria from the proximal colon removed from *T. suis* infected pigs. The local antibody responses were compared to peripheral antibody responses found in the spleen and submandibular lymph nodes. Serum IgG levels to *T. suis* were measured by ELISA. The total IgG and IgA ASC frequencies for the spleen and the SI-MLN were relatively constant, whereas, the frequencies for the lymphoid tissues closest to the site of the infection, C-MLN, Co-LN, and IC-PP, peaked dramatically during the course of the infection. AS-IgG and AS-IgA ASC frequencies were higher in tissues closest to parasite infection (C-MLN, Co-LN, IC-PP and proximal colonic lamina propria). There were no AS-ASC found in the submandibular lymph nodes. AS-IgG ASC predominated in C-MLN and Co-LN, whereas, AS-IgA ASC were higher in IC-PP and lamina propria. The kinetics of serum IgG levels were similar to antigen-specific ELISPOT results. The ELISPOT assay provided valuable information on the localization and compartmentalization of the swine gastrointestinal immune response to *T. suis* which resides in the cecum and proximal colon. In the future, this may be used in monitoring gastrointestinal immune parameters of pigs inoculated with a *T. suis* vaccine.

Polymorphism of buccal capsule of *Cylicostephanus calicatus* (Looss, 1900) Cram, 1924 (Nematoda, Strongylidae)

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During the study of Cyathostominae having got after dissection of horse in Thoms Institute of vaccine and serum (Siberia) two forms of *C. calicatus* were discovered. They were differed from after the buccal capsule sizes and marked as *forma minor* (width of buccal capsule 24-30 μ, length - 36-42 μ) and *forma major* (width of buccal capsule 30-35 μ, length - 43-51 μ). Measurements and statistic analysis of 40 males and 37 females of both forms were made. After other morphometrical characters those forms are the same. In *Cylicostephanus goldi* also the presence of two forms differs from the dimensions of buccal capsule were noted.

Till now intraspecific diversity of Cyathostominae of horses is studied not enough. Species *Cylicostomum barbatum* Smit and Notosoediro, 1923 and *Cylicostomum ornatum* Kotlan, 1919 were described earlier. These species differed from *C. calicatus* and *C. goldi* after the size of buccal capsule and were considered as synonyms later. We intended there were morphological forms of *C. calicatus* and *C. goldi* described above.

