The Biology and Control of *Giardia* spp and *Tritrichomonas foetus*

Patricia A. Payne, DVM, PhD*, Marjory Artzer, DVM

KEYWORDS

• *Giardia* • *Tritrichomonas foetus* • Dog • Cat • Diarrhea

This article may seem an odd combination of protozoal parasites to some readers; however, these two protozoal parasites are similar in their origins and both are causative agents of diarrhea in dogs and cats.[1,2] *Giardia* spp and *Tritrichomonas foetus* are both flagellated Protisits and because of their close association with host mucus membranes, they are considered to be muscoflagellates. Both live, feed, and disrupt the intestinal tract of dogs and cats. *Giardia* spp causes diarrhea in both dogs and cats and although *Tritrichomonas foetus* has rarely been found in the diarrheic feces of dogs, it is now considered to be the cause of an emerging infectious diarrheal disease of cats.[1] The in-depth 2007 review article in *Science* highlights several similarities of these two parasites at the molecular level, including metabolic and genetic traits, and suggests that they are of sister lineages.[4] These two protozoal parasites are different, yet interestingly similar in their biology and control (**Fig. 1**).

Diarrhea is a common clinical entity in small animal veterinary practice, and has many possible causes including stress, disturbances in water balance, nutritional and immune status, dietary indiscretion, neoplasia, inflammatory disease, and bacterial, parasitic, or viral pathogens or coinfections with any combination of these.[5,6] Any disruption of the normal intestinal flora and function can lead to an abnormal altered pH within the milieu, resulting in the overpopulation of opportunist pathogens. Stress has an effect on normal function and the immunologic integrity of the gut.[7] Giardiasis and intestinal tritrichomonasis are more common in animals housed in stressful situations, pet stores, puppy mills, shelters, and catteries.[8–10] The host-parasite relationships that cause diarrhea are complex and may be affected by many factors.[11,12]

Special concern for clients who are immunocompromised must be given in regard to proper diagnosis and sanitation measures when their pet has diarrhea.[13] Many

Department of Diagnostic Medicine and Pathobiology, College of Veterinary Medicine, Kansas State University, 333 Coles Hall, Manhattan, KS 66506-5600, USA
* Corresponding author.
E-mail address: payne@vet.k-state.edu (P.A. Payne).

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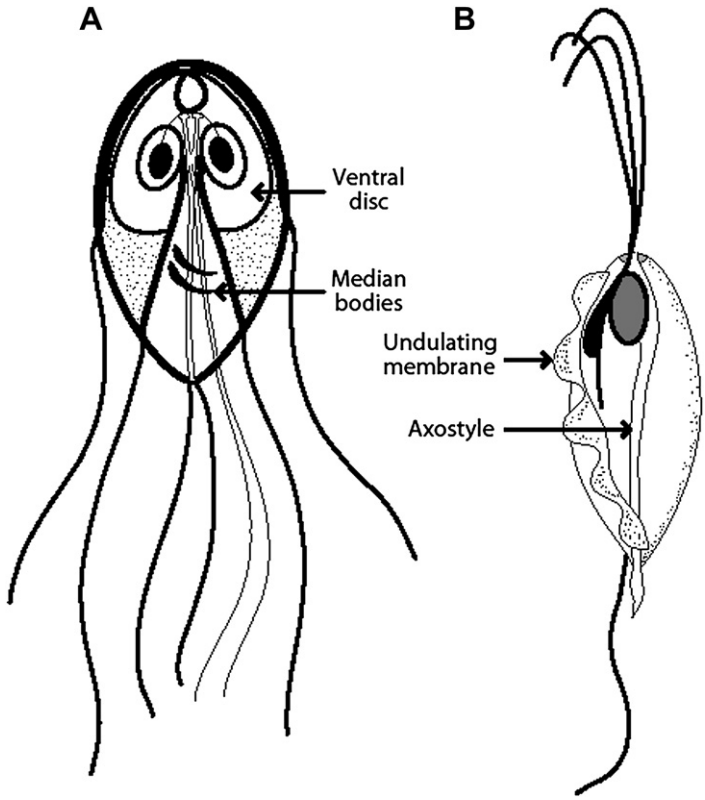

Fig. 1. Trophozoites of *Giardia* spp (*A*) and *Tritrichomonas foetus* (*B*).

species of *Giardia* occur worldwide in many hosts and some do have the potential to be zoonotic; *T foetus* occurs in cattle, pigs, dogs, and cats, and has not been considered to be zoonotic.[1] However, humans may be infected with the venereal trichomand species, *Trichomonas vaginalis*. Practical diagnoses of the underlying parasitologic cause of diarrheal infections in all animals are based on host, site specificity, direct observation, and molecular techniques. Efforts to determine a specific diagnosis are highly recommended. The zoonotic potential of diarrhea of dogs and cats, regardless of causative agent, is possible, and sanitation measures and treatment of all animals in the household when indicated cannot be overemphasized to clients.

GIARDIASIS

Giardiasis is caused by infections with *Giardia* spp parasites and occurs in many animal species including humans, cattle, sheep, goats, dogs, cat, rodents, birds, and amphibians. This cosmopolitan parasite causes a malabsorption syndrome in many of the humans and animals that it parasitizes.[14] The species of this genus is specific in some animals and intertwined in others. Many species and genotypes have been described, and it is recognized that some differ in host range but many are restricted to one host. The prevalence of each of the 7 genetic assemblies varies considerably from country to country.[15]