

ABSTRACT. A study was conducted to determine the efficacy of three flotation media, namely sodium nitrate (Fecasol), zinc sulfate (Ovum Flotation Dry) and zinc sulfate (Fecasol Z) to detect intestinal helminth and protozoan infections in dogs. Parasites detected in the feces of a series of 40 random access dogs from the Alachua County Animal Shelter included Ancylostoma spp., Toxocara canis, Trichuris vulpis, Capillaria aerophila, Dipylidium caninum, Isospora canis, Giardia canis, Sarcocystis sp. and Demodex canis. No statistical differences were noted among the prevalences of any of these parasites due to the flotation media used. Traditionally zinc sulfate has been used for the detection of Giardia cysts, but sodium nitrate was just as effective in diagnosing this parasite and the cytoplasm of the cysts did not collapse to one side of the cyst in this medium as it did in zinc sulfate. This enables the diagnostician to see the normal components in the Giardia cyst, as nuclei and fibrillar structures are lost when the cytoplasm collapses as in zinc sulfate.

Comparison of Efficacy of Three Flotation Media

submitted by:

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MATERIALS AND METHODS

Fecal samples were collected from kennels holding recently captured and untreated dogs from the Alachua County Animal Shelter in Gainesville, FL. There were no criteria for selection of feces other than it was present and fresh. Collections were made from April to July 1995. All fecal samples were kept refrigerated until examined and they were examined within 5 days of collection. Once in the laboratory, three 1 gram aliquots from each sample were weighed into individual sample cups identified with the numbers of the dog run.

Each cup was designated A, B or C. These were randomly assigned to be floated in either the sodium nitrate or one of the two zinc sulfate solutions. All samples were set up on a staggered basis so that they were all floated for 10 minutes. The same person read all of the slides which were only designated with the dog ID number and the letter, allowing them to be done in a blinded manner. The 22 mm

coverslip was scanned back and forth until all of it was viewed. It was scanned under 100x total viewing magnification and higher magnification was used to confirm small parasites as Giardia cysts and sporocysts of Sarcocystis. The same person set up all of the slides to keep treatment as uniform as possible. No effort was made to quantify the egg or cyst numbers. If the animal was positive, it would have been treated with the appropriate antiparasitic agent regardless of the number of eggs or cysts seen. The person doing the reading of slides was a highly experienced medical technologist who has been reading fecal examinations of dogs in the Veterinary Medicine Teaching Hospital for 5 years and had worked in human diagnostic laboratories prior to that. Once all three samples from each dog were completed, they are recorded in a data book. At the end of each series, individual aliquots were identified as to flotation medium by the person setting up the samples from the log kept of this information.

Upon completion of the fecal samples from 40 dogs, prevalences were determined (number of dogs infected with each parasite divided by the number of dogs examined and multiplied by 100). the prevalences as detected by the three media were analyzed by the Fisher's exact test with the alpha level set at 0.05.

RESULTS

The prevalence of the parasites as detected by the three flotation media are presented in Table 1. Five species of helminth were diagnosed along with three species of protozoan and one species of arthropod parasite. *Ancylostoma* spp. were present in 85% of the dogs, and *Toxocara canis* and *Trichuris vulpis* were both in 30%. The tapeworm, *Dipylidium caninum*, was seen in the feces of only one of 40 dogs as was *Capillaria aerophila*, a nematode lungworm. The most common protozoan parasite was *Isospora canis* found in eight dogs whereas *Giardia canis* was found in only three dogs and *Carcocystis* sp. was present in a single dog. A mite, *Demodex* sp., was detected for the prevalence of any species across flotation medium.

While no flotation medium out performed any other in parasite detection, the cysts of *Giardia* underwent a collapse of their cytoplasm to one side making it impossible to see the nuclei or fibrillar structures present. In sodium nitrate, these cysts usually retained their normal structure making visualization of the internal structures possible.

DISCUSSION

An interesting point is that a major survey of canine helminths in the Southeastern United States determined by fecal examination by Ciba Animal Health indicated the prevalence of *Ancylostoma* was about 37%, *Toxocara* was 18% and *Trichuris* was 20%. Furthermore, they found 52% of the dogs they examined had a least 1 of these parasites. In our study, 39 of 40 (98%) of the dogs had at least one species of

parasite. Their study included dogs from 131 animal shelters across the USA. It is possible that the more northern states in southeastern region may have diluted their findings because our data from a sample from similar dogs indicate that these parasites are much more common that their summary indicates.

Few studies have been published on the comparison of fecal flotation media and individual preferences or biases from distributors determine what flotation media are used. The present study indicates that both sodium nitrate and zinc sulfate do equally well in diagnosis of parasites by fecal flotation. References have suggested using zinc sulfate for detection of *Giardia* cysts. Our study indicates a single medium can be used to detect infections of this flagellate as well as other protozoans and helminths that might be present. Having a medium that is processed with quality controls built in and is ready to use when purchased has merit over those that will be mixed for use in the practice. As mentioned in the results, the cysts of *Giardia* are more recognizable unless one is conditioned to seeing the altered appearance from using zinc sulfate. It also needs to be noted that the cysts of *Giardia* can be detected when viewing under the 10x objective. To be efficient in finding the cysts, the light must be cut back to give good contrast and the viewer needs to focus immediately under the coverslip, or these cysts will be missed.

Table 1. Prevalence of parasites as detected by Fecasol, Fecasol Z and Ovum Float from dogs examined in Gainesville, Florida.

Parasite Species	Fecasol		Fecasol Z		Ovum Float	
	No.	Inf. (%) *	No.	Inf. (%)	No.	Inf. (%)
<i>Ancylostoma</i> spp.	34	(85%)	34	(85%)	33	(82%)
<i>Toxocara canis</i>	11	(28%)	12	(30%)	10	(25%)
<i>Trichuris vulpis</i>	12	(30%)	12	(20%)	7	(18%)
<i>Capillaria aerophila</i>	1	(2%)	1	(2%)	0	
<i>Dipylidium caninum</i>	0		0		1	(2%)
<i>Giardia canis</i>	3	(8%)	2	(5%)	2	(5%)
<i>Isospora canis</i>	7	(18%)	6	(15%)	8	(20%)
<i>Sarcocystis</i> sp.	1	(2%)	1	(2%)	1	(2%)
<i>Demodex</i> sp.	0		0		1	(2%)

* No. Inf. = Number of dogs infected; % = Percentage of dogs infected