

COMPARISON OF DIFFERENT COPROLOGICAL TECHNIQUES FOR DIAGNOSIS OF FASCIOLA INFECTION IN RUMINANTS*

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*Part of MVSc thesis submitted by the first author to Assam Agricultural University

ABSTRACT:

In the present study fecal samples collected from 50 animals slaughtered at local abattoirs located at Killing Village (Nineth mile) and Dwarandha, Khanapara, Assam were screened for the presence of *Fasciola* infection by five different faecal examination methods such as , standard sedimentation method, zinc sulfate centrifugal floatation, alkaline digestion method, formol-ether method and ethyl acetate sedimentation method . Among the methods of faecal examinations compared, alkaline digestion method could detect maximum number 17 (34 Percent) of samples as positive for Fasciolosis, followed by ethyl acetate sedimentation method 13 (26 Percent), formol-ether method Standard sedimentation method 10 (20 Percent) and Zinc sulfate centrifugal floatation method 3 (6 Percent).

INTRODUCTION

Fasciolosis, the liver fluke disease, is a disease of domesticated livestock caused by digenetic trematode *Fasciola hepatica*, Linnaeus, 1758 and *Fasciola gigantica*, Cobbold, 1855.

The liver fluke infection is found in dairy animals, wild ruminants, pig, horse, elephants and occasionally in human beings. The disease is

cosmopolitan in distribution with tropical region having *Fasciola gigantica*, while *Fasciola hepatica* is common in temperate zones though some part of the world may have both the parasites.

In India fasciolosis associated with tropical liver fluke *Fasciola gigantica* continues to be a major cause of morbidity and mortality in ruminants. There have been numerous reports on the incidence of this disease from different parts of the country varying from 30-80 percent (Borkakotty et al., 1984) with almost 70 percent cattle/buffalo carrying the infection in Kashmir.

Confirmatory diagnosis of the disease is done by routine faecal sample examination. But interpretation is generally variable depending upon host, age, defecation rhythm, egg laying rhythms, sampling techniques etc. In addition to sedimentation method a number of tests are routinely used for detection of helminth eggs and protozoan cysts in the faecal material of animals and stool sample of human beings. The field veterinarians mainly confine to sedimentation method for detection of liver fluke eggs in the dung sample of livestock, although it sometimes fail to deliver desired result. Hence it is envisaged to compare the different methods of coprological examination used for detection of other helminthic eggs or protozoan cysts with that of sedimentation method to find out the best.

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MATERIALS AND METHODS:

Faecal samples of 50 animals were collected. Each sample was examined by five different methods for the presence of Fasciola eggs viz.

1. Zinc sulfate centrifugal floatation method (Soulsby, 1982)
2. Ethyl acetate sedimentation method
3. Alkaline digestion method (Vohra and Agarwal, 2006).
4. Formol-ether method (Vohra and Agarwal, 2006).
5. Standard sedimentation method (Soulsby, 1982)

Each sample was examined 5 times before considering it as negative.

RESULTS :

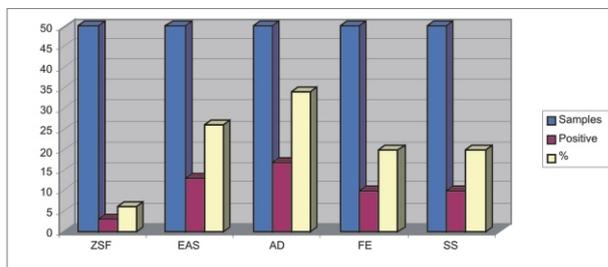
The results of the different methods of examinations are given in Table 1 and Figure1.

Table 1: Results of different coprological methods

Method of examination	No. of samples examined	No. of samples found positive	Percentage	Value of Chi-Square
Zinc sulfate floatation Method	50	3	6	*12.60
Etyhl acetate sedimentation Method	50	13	26	
Alkaline Digestion Method	50	17	34	
Formol Ether Method	50	10	20	
Standard Sedimentation Method	50	10	20	

*P<0.05.

Figure 1: Results of different coprological methods



*ZSF-Zinc Sulfate Centrifugal Floatation Method, *EAS-Ethyl Acetate Sedimentation Method, *AD-Alkaline Digestion Method, *FE-Formol-Ether Method, *SS-Standard sedimentation Method

DISCUSSION:

The diagnosis of Fasciola infection is mainly by detecting the eggs in faeces. The main disadvantage of this technique is that it cannot detect the infection in the prepatent period, during which the maximum damage to the liver occurs. Also eggs are released sporadically from the bile duct and consequent incorrect sampling can lead to false negative results.

Among the faecal examination methods, the most commonly used method in the diagnosis of fasciolosis is standard sedimentation method. Comparitively less works have been done for comparing different faecal examination techniques used in case of other flukes with standard sedimentation test to see whether they can be applied for diagnosis of fasciolosis. In the present study a total of 50 faecal samples were examined by five different faecal examination techniques and the results were compared to find out the most suitable test for diagnosis of fasciolosis. Out of 50 samples examined 10 (20 percent) samples were positive by standard sedimentation method, 3 (6 percent) samples

were positive by zinc sulfate floatation method, 13 (26 percent) samples were positive by ethyl acetate sedimentation method, 17 (34 percent) samples were positive by alkaline digestion method, and 10 (20 percent) samples were positive by formol ether method.

Thus the alkaline digestion method which is commonly used in diagnosis of schistosomiasis was found to be the best amongst the different coprological tests conducted in the present study as noted above, while the standard sedimentation and formol-ether method could detect the same number of animals positive for fasciolosis. The alkaline digestion method thus proved superior over other methods perhaps because it was able to disintegrate faecal material better (Vohra and Agarwal, 2006) and also more quantity of sample is processed by this method when compared to others.

Ethyl acetate sedimentation method could detect a slightly higher number of samples as positive for *Fasciola* infection, when compared to standard sedimentation method and formal ether method. Of all the five methods, zinc sulfate centrifugal floatation method, which is commonly used for diagnosis of protozoan infection could detect the lowest number of animals as positive for fasciolosis (Weller *et al.*).

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