



## Comparative efficacy of various anthelmintic drugs against *Fascioliasis* in cattle in Nangarhar, Afghanistan

Redwanullah Memlawal<sup>1</sup>, Ahmad Farid Rawan<sup>2\*</sup>, Mohammad Hamid Kadwal<sup>3</sup>

<sup>1,3</sup> Para-Clinic Department, Veterinary Science Faculty, Nangarhar University, Afghanistan

<sup>2</sup> Pre-Clinic Department, Veterinary Science Faculty, Nangarhar University, Afghanistan

### Abstract

The present study deals with the therapeutic trials against *Fascioliasis*. For this purpose a total of 80 cattle were used and were randomly divided into groups A1, A2, A3, B1, B2, B3, C and D. Efficacy of *Fumaria parviflora* aerial parts *Centrathereum anthelminticum* and *Triclabendazole* against *Fascioliasis* were measured. Efficacy was quantified by determined the difference of eggs per gram of faeces pre and post treatment. *Fumaria parviflora* at a single dose of 50, 60 and 70 mg/kg body weight reduced EPG by 46.34, 53.65 and 59.52 percent respectively. After the second dose the reduction in EPG was 82.92, 90.24 and 92.85 percent respectively, *Centrathereum anthelminticum* at a single dose of 50, 60 and 70 mg/kg body weight reduced EPG by 50.0, 53.48 and 56.09 percent respectively. After the second dose the respective reduction in EPG count was 71.42, 81.93 and 85.36 percent respectively, as *Triclabendazole* at recommended dose rate was 66.66 and 97.43 percent respectively effective at one and two dosage level. It was also noted that there was an increase in milk yield in all the treated groups. No side effects were reported in treated animals. The efficacy order of drugs was *Triclabendazole*, *Fumaria parviflora* and *Centrathereum anthelminticum*.

**Keywords:** *Fascioliasis*, *Fumaria parviflora*, *Centrathereum anthelminticum* and *Triclabendazole*

### 1. Introduction

*Fascioliasis* is a wide spread parasitic disease of ruminants and causes heavy economic losses. In Pakistan the incidence of both *Fasciola hepatica* and *Fasciola gigantica* have been reported (Kendall, 1956). These flukes wander in the liver parenchyma, cause haemorrhage and damage the tissue which leads to cirrhosis in chronic form (El-shazly *et al.* 2002). The principal pathogenic effects of *Fascioliasis* are anemia and hypo-albuminaemia and more than 0.5ml blood per fluke per day lost from liver (Jenning *et al.* 1956; Urquhart *et al.* 2001; Oyoduntan *et al.* 2008). In fluke affected areas the disease entity causes losses in terms of morbidity and high mortality (Phiri *et al.* 2005). *Fascioliasis* causes tremendous loss to human prosperity by parasitizing man and his livestock. Since fresh water snails are obligatory intermediate host for a large variety of trematodes, therefore they must be controlled (Walker *et al.* 2008). The incidence of *Fascioliasis* is increasing day by day in Nangarhar Province of Afghanistan as more areas are coming under water logging and salinity. In the absence of pasture dressing techniques the affected animals have to be treated with anthelmintics. Rational control of *Fascioliasis* involves the regular use of appropriate anthelmintic drugs however continuous use of drugs have led to the development of resistance. Moreover synthetic anthelmintics are well known to possess several adverse effects. Thus alternate therapeutic agents are needed to be constantly discovered. The present purpose study has been designed to record the prevalence of *Fascioliasis* in slaughter and clinically effected animals i.e. livestock forms, house hold and veterinary hospital.

### 2. Materials and Methods

The present study was conducted at Nangarhar Province,

from December, 2013 to February, 2014. Duration of study -3 months. *Therapeutic trials.* The following drugs were tried:

1. *Fumaria parviflora* (aerial parts)
2. *Centrathereum anthelminticum* (karigiri)
3. *Triclabendazole* (fasinex)

### Preparation of herbal drugs

The above mentioned herbal drugs was dried under shade and ground to powder form in an electric grinder then stored in airtight glass jar at 4c –Methanol extract was prepared and then administer to animals the dosage of herbal drugs was calculated on the basis of preliminary trials in other species and keeping in mind the drugs used in humans as an anthelmintic in traditional medicine whereas triclabendazole will be given at recommended dose rate. *Experimental animals.* A total of 80 animals of nearly same age and of either sex naturally infected with *Fascioliasis* were used for these trials. These animals were randomly divided into four main groups i.e. A, B, C, D. Animals in groups A and B was further sub divided into A1, A2, A3, B1, B2 and B3 having 10 animals in each sub group. Animals in group A1 A2 and A3 was treated with *Fumaria parviflora*, Animals in group B1, B2 and B3 was treated with *Centrathereum anthelminticum*. Animals (10) in group C will be treated with *Triclabendazole* while 10 animals in group D will not give any drug and served as control. Egg per gram of faeces and clinical performance was monitored. Faeces were examined on zero, 3<sup>rd</sup>, 7<sup>th</sup> and 18<sup>th</sup> day post treatment. Animals which remain positive on 18<sup>th</sup> day were given a second dose of the respective drugs. Faeces were examined on 21<sup>st</sup> and 28<sup>th</sup> day post treatment. Efficacy of the drugs was calculated as per formula described by Varady *et al.* (2004).

$$\text{Efficacy \%} = \frac{a - b}{a} \times 100$$

Where

a = Eggs per gram of faeces before treatment

b = Eggs per gram of faeces after treatment

**Statistical analysis**

Data thus obtained was subjected to statistical analysis by using Chi Square test and Independent sample Test through SPSS software version 17.0.

**3. Results**

Efficacy of drugs was calculated on the basis of reduction in egg counts after treatment. The mean percentage in the number of fluke eggs for each treatment group was compared with the corresponding control group (Table 1).

**Efficacy of *Fumaria parviflora* aerial parts**

Efficacy of *Fumaria parviflora* at a dose dose of 50mg/kg body weight was 46.34% and 82.92% at one dose level and two dose levels, respectively. Higher dose of 60 mg/kg and 70 mg/kg were 53.65% and 59.72% efficacy at one dose level, and 90.24% and 92.85% effective at two dose levels. Respectively (Table 1). EPG count increased in untreated control group.

**Table 1**

Drug used	Dose level mg/kg	Efficacy (%) on different days	
		18 <sup>th</sup> day	28 <sup>th</sup> day
<i>Fumaria parviflora</i>	50	46.34	82.92
	60	53.65	90.24
	70	59.52	92.85
<i>Centratherrum anthelminticum</i>	50	50.00	71.42
	60	53.48	81.93
	70	56.09	85.36
<i>Triclabendazole</i>	10	66.66	97.43

**Efficacy of *Centratherrum anthelminticum* karigiri**

Table 1 show that *Centratherrum anthelminticum* at 50 mg/kg dose caused a 50% and 71.60% decrease in EPG counts on day 18 and day 28, respectively. At dose rate of 60 and 70 mg/kg the figure was 53.48% and 56.09% effective, respectively, at one dose level, whereas at two dose levels the drug was 81.93% and 85.36% effective.

*Efficacy of Triclabendazole.* EPG count showed an incriasing trend in control group. A single 10mg/kg oral dose of Triclabendazole caused a significant reduction in EPG count from 3<sup>rd</sup> day post treatment onward (P<0.05). The efficacy of single dose was 66.66% in 18<sup>th</sup> day post treatment. After the administration of the second dose on 18<sup>th</sup> day, EPF count was significant decreased as compared to control. The efficacy was 97.43% on 28<sup>th</sup> day post treatment. (Table 1).

**4. Discussion**

For the effective chemotherapy and strategic chemoprophylaxis of *Fascioliasis*, a safe drug is required with high activity against all stages of *Fasciola*. Modern drugs are efficacious (effective) but most of them possess adverse effects Levine (1982) [6]. Hence the development of newer, safe, curative and economical drug has remained an active area of research. The anti-parasitic activity of

indigenous drugs including *Fumaria parviflora* aerial parts (Shahterah) and *Centratherrum anthelminticum* in different doses levels were evaluated their efficacies were compared with each other and with control and with modern drug i.e. *Triclabendazole* (Fasinex).

*Fumaria parviflora* at 50, 60, and 70 mg/kg body weight was 82.92, 90.24 and 92.85 percent effective respectively on 28<sup>th</sup> day. Among these levels i.e. 50, 60, 70 mg/kg body weight no significant difference was noted with each other. At dose level of 70mg/kg body weight it was 59.52% effective, which gave nearly same efficacy as that of treated control. I.e. *Triclabendazole*. Highly significant difference was noted with control (Positive). Nearly similar results were recorded by Akhtar and Javed (1985, 1991) [1] Akhtar and Farha (1986), Maqbool *et al.*(2004) [7], reported that this drug contains 40% alkaloid which might be its active ingredient. It was also conducted that *Fumaria parviflora* at dose rate of 50mg/kg body weight gave similar results as that of 60 and 70 mg/kg body weight. In treated cattle showed milk production was influenced by the drug.

It was observed that there was an increase of 23.54% in milk yield after the second treatment of this drug. No side effects of treatment were seen on pregnant animals. Maqbool *et al.* (2004) [7] also reported similar results. *Centratherrum anthelminticum* at 50, 60 and 70 mg/kg body weight was percent 71.42, 81.93 and 85.36 effective against *Fascioliasis* respectively on post treatment day 28<sup>th</sup>. It was concluded that *Centratherrum anthelminticum* at dosage rate of 50 mg/kg body weight was equally effective as compared to other levels. These findings are in agreement with Maqbool *et al.* (2004) [7] the milk yield definitely affected by various dosage levels of this drug. An increase of 28.93% was observed in animals after the second treatment. No ill effects on pregnant animals and on milk yield was found. Similar observations were recorded by Maqbool *et al.* (2004) [7].

*Triclabendazole* (Fasinex) was given to cattle at recommended dose rate i.e. 10mg/kg body weight on 18<sup>th</sup> day, second dose was given and caused 97.43% reduction in EPG count. Similar results were also noted by various workers in various parts of the world. Martin *et al* (2009) [8]. He used different anthelmintics against *fascioliasis* and found that animals treated with two doses of triclabendazole recoverd completely. Moll *et al.* (2000) [9] used triclabendazole against bovine helminthes and found that single dose of triclabendazole was effective against all bovine helminthes. Results of present research were also similar to the findings of Richard *et al.* (1990) [12] he used triclabendazole against *Fasciola hepatica* in Cattle flock and concluded that triclabendazole was highly effective drug against *Fasciola hepatica* at single dose. A significant increase (35.47%) in milk yield was noted. No bad effect of this drug was observed.

**5. Conclusion**

*Fumaria parviflora* at a single dose of 50, 60 and 70 mg/kg body weight reduced EPG by 46.34, 53.65 and 59.52 percent respectively. After the second dose the respective reduction in EPG was 82.92, 90.24 and 92.85 percent respectively. *Centratherrum anthelminticum* at a single dose of 50, 60 and 70 mg/kg body weight reduced EPG by 50.0, 53.48 and 56.09 percent respectively. After the second dose the respective reduction in EPG count was 71.42, 81.93 and 85.36 percent respectively and *Triclabendazole* at

recommended dose rate was 66.66 and 97.43 percent respectively effective at one and two dosage level.

## 6. Acknowledgment

We heartily appreciate the cooperation of UVAS Lahore Parasitology Laboratory, especially from Habib-ul-Nabi for analyzing the experiments.

## 7. References

1. Akhtar Ms, I Javed. Comparative efficacy of *Fumaria parviflora* and morantel tartrate against mixed gastrointestinal nematode infection in sheep. Pak. J. Pharmacol. 1985; (2):31-35.
2. Akhtar Ms, N Farah. Phytochemical screening of *Morus alba* (stem bark) *Nigella sativa* (seeds) and *Fumaria parviflora* (aerial parts). J. Pharm. Univ. Karachi. 1988; (5):9-14.
3. El Shazly AM, Wafa SA, Havidg FM, Soliman M, Riffat MM, Morsy TA. *Fascioliasis* among live and slaughtered animals in nine centers of Dakahlia Governorate. J Egypt Soc Parasitol. 2002; (31):47-57.
4. Jennings FW, Muligan W, Urquhart GH. Veterinary Parasitology, Exp Parasitol. 1996; (2):103-104.
5. Kendall SB. Relationship between the species of *Fasciola* and their molluscan hosts. Advances in Parasitol. 1956; (8):59-95.
6. Levine ND. Nematode parasite of domestic animals and man. *Burgers Munaepolisi*. 1982; (4):254.
7. Maqbool A, Hayat CS, Tanveer A. Comparative efficacy of various indigenous and allopathic drugs against *Fascioliasis* in buffaloes. Vet. Arhiv. 2004; 74 (2):107-114.
8. Martin P, Chambers M, Hennessy D. Efficacy against *Fasciola hepatica* and the pharmacokinetics of triclabendazole administered by oral and topical routes. Aust Vet J. 2009; 87(5):200-203.
9. Moll L, Gaasenbeek CP, Vellema P, Borgsteede FH. Resistance of *Fasciola hepatica* against triclabendazole in cattle and sheep in the Netherlands. Vet Parasitol. 2002; 91(1-2):153-158.
10. Oyeduntan A, Adedokun, Adekunle B, Ayinmode, Benjamin O, Fagbemi. Seasonal prevalence of *Fasciola gigantica* infection among sexes in Nigerian cattle. Vet Res Medwell. 2008; (2):12-14.
11. Phiri AM, Phiri IK, Sikasunge CS, Monrad S. Prevalence of *Fascioliasis* in Zambian cattle observed at selected abattoirs with emphasis on age, sex and origin, J Vet Med Series. 2005; (13):414-416.
12. Richards RJ, Bowen FL, Essenwein F, Steiger RF, Buscher G. The efficacy of triclabendazole and other anthelmintics against *Fasciola hepatica* in controlled studies in cattle. Veterinary Record. 1990; (126):213-216.
13. Urquhart GM, Armour J, Dunvan JI, Dunn AM, Jennings FW. Veterinary Parasitology. ELBS, Longman U.K. 2001; (9):109
14. Varady M, Konigova A, Corba J. A field study to evaluate the efficacy of fenbendazole on 9 stud farms. Vet Med Czech. 2004; (49):42-46.
15. Walker SM, Makundi AE, Namuba FV, Kassuku AA, Keyyu J, Holy EM, *et al.* The distribution of *Fasciola hepatica* and *Fasciola gigantica* with southern Tanzania constraints associated with intermediate host. Parasitol. 2008; (135):495-503.