A STUDY ON THE *IN VITRO* SURVIVAL OF *A. galli* IN TWO DIFFERENT ANTHELMINTICS.

9

Shanti Rajora* Seema Jain S. S. Lal*****

Abstract

The primary aim of the present invitro study was to provide artificial conditions. The anthelmintics used for the present study were ivermectin and morantel. The parasites **A. galli** *were collected from the small intestine of fowl slaughtered freshly in local abbatoir. It was observed that there was a decrease in survival of worm after exposure with anthelmintics. The worm* **A. galli** *survived for maximum period of 16 and 18 hours in lock-lewis solutions containing ivermectin and morantel respectively whereas their maximum survival in lock-lewis solution was 32 hours. The cent- percent survival was found up to 20 hours but it was reduced after exposure with antiparasitic drugs. The present study could be used to understand the effect of various drugs on the above parasites and other intestinal parasites in vivo.*

Key words: *invitro, A. galli, ivermectin and morantel.*

Introduction:

Especially the numerous species of nematodes, are of considerable medical and economic importance because they threaten the health and life of humans and animals .Therefore various anthelmintic drugs have been developed in order to control the disease caused by helminths to minimize the adverse effect of worm burden. India is the native place of the wild jungle fowl. *A galli* one of the most common parasite of chickens, causes heavy economic losses in them by reducing their growth rate and meat production. The disease caused by *A. galli is* "ASCARIDIASIS" affecting the general health of the birds. These infected chickens reveal retarded growth and poor utilization of feed even if balanced diet is given (Chubba and wakelliell, 1963). Besides all these, presence of nematodes also cause malnutrition in hosts, which is one of the major causes of decreased return of products derived from animals. (Jel life, 1953; WHO,

*&**Department of Zoology, R. G. P. G. College, Meerut-250003, India.

* **Department of Zoology, C.C.S. University, Meerut-250003, India.

1967; Tripathy *et al.*, 1971; Gupta *et al.*, 1977; Nasheim and Forsum, 1980 and Stephenson *et al.* 1980). Since it is known that the efficacy of antiparasitic drugs may decrease with approximately 10 years of use depending on different factors (e.g. development of resistance; Prichard 1994; Sangster *et al.*1985), it is necessary to determine the activity of these drugs from time to time Although a good deal of information is now available about anthelmintics and their mode of action but the parasites are still flourishing. There is a great need, therefore, to search new drugs. The designing, formulation and marketing of new anthelmintics require studies regarding various aspects of the action of the anthelmintic not only on the parasite but also on the host. The *in vitro* cultivation of nematode parasite is an important tool which might ultimately be used in the study of many aspects of nematode biology, and the elucidation of some of the complex factors which are involved in the host-parasite relationship(Paul and jones1956).

Materials and Methods:

The parasites used in the study were collected from different parts of the intestine of fowl. The parasite *A. galli* were recovered from the small intestine of fowl slaughtered freshly in local abbatoir. The intestine was cut open longitudinally with blunt end of the scissors to recover the parasites. After removing from the intestine, the parasi were washed with tap water and th with distilled water thoroughly. To stu the effect of morantel and ivermect three groups of parasites A, B, and were made. For control, in group A, t parasites *of A. galli* mixed distributi were kept in a petridish containing loc lewis solution. In group B, ten parasit of *A. galli* of mixed distribution we kept in a petridish containing lock-lew solution with morantel in 50 µg / m concentration. In group C, ten parasit of *A. galli* of mixed distribution we kept in petridish containing lock-lew solution with ivermectin in 50 µg / m concentration

All the petridishes were kept 37°C for incubation and observatio were taken after every four hours.

Results And Discussion:

1. Survival Of The Male An Female (*A. galli*) In Lock-Lew Solution (Control) .Table 1:

Both male and female worm survived for a maximum period of 3 hours. The percentage of survival wa 100 percent up to 20 hours. Th percentage of survival was 100, 50, 2 and zero in male and 100, 50, 20 an 100, 50, 10 and zero in female after 2(24, 28 and 32 hours respectively.

Table No1:

2. *In Vitro* Effect Of Anthelminti Ivermectin On The Survival Of *A*

***galli* (50 µg/ml concentration): Table1.**

This concentration of ivermectin showed 100 percent survival up to 4 hours. All worms were paralyzed within 16 hours of exposure with this drug. The mortality percentage was 10, 20, 50, 100 in male and 10, 20, 50, 100, in female after 4, 8, 12 and 16 hours respectively.

3. *In Vitro* Effect Of Anthelmintic Morantel On The Survival Of *A. galli* (50 µg/ml concentration): Table1.

(50 µg/ml con.).The cent-percent survival was observed only up to 8 hours in male and female both. All worms were paralyzed after 20 hours of exposure with morantel. Mortality percentage was 10, 50 and 100 in male and 20, 40, 100 in female after 12, 16, 20 hours of exposure respectively.

Several physiological solutions are reported in which nematodes can survive for long periods, even outside the host. Fleig medium was reported best medium for support of immature and mature *S. cervi* (Gupta *et al.*, 1982). Lock-Lewis solution was reported most suited physiological solution for survival of *Procamallanus* and *Protospirura* (Lal & Mittal 1978). Largest survival of *A. galli* was observed in 0.8-0 9 percent sodium chloride (Nacl) solution (Narain, 1973). In the present study, maximum survival of *A. galli* in the Lock-lewis was observed in 32 hours.

Intestinal nematodes are subjected to appreciable osmotic variations in the medium (Prosser, 1961), and appeared to be capable of adjustment to varying osmolarity. Survival studies also help to see the *in vitro* effect of anthelmintics. Investigations were carried out to observe the effect of anthelmintics (Ivermectin and Morantel) *in vitro* survival of *A. galli* at 50 µg/ml concentrations. It was observed that there was a decrease in survival of worm after exposure with anthelmintics. The worm *A. galli* survived for maximum period of 16 and 18 hours in lock-lewis solutions containing ivermectin and morantel respectively whereas their maximum survival in lock-lewis solution was 32 hours. The cent- percent survival was found up to 20 hours but it was reduced after exposure with antiparasitic drugs.

The results of the experiment in the present *invitro* study (survival test, drug uptake time dependence, dose dependence and comparison with other drugs) has increased our knowledge and will make it easier to propose the optimum application of ivermectin and morantel.

References

1. Chubb 51 And Wakelin (1963). *Proc Nutr. Soc.* **22**:20-25.

2. **Prosser, C.L. (1961)**The comparative animal physiology. (W.B. Saunders, London).

3. Narain, B. (1973). Survival of *A. galli* in sodium chloride solution at different temperature. *Ind. J. Exp. Biol. (II).* **6**: 590-591.

4. Gupta, B.C., Parshad, V.R. And Guaraya, S.S. (1982). Effect of CO_2, Temperature, PH and number of worms on the *invitro* survival, histology and histochemistry of *P. cervi* .*Vet. Parasitol.* **11**: 193 - 202

5. Lal, S.S. And Mittal, R.P. (1978). *In vitro* survival of some fish and rat nematodes in different physiological saline. *Bioresearch.* **2 (1 & 2)**: 77-81.

6. Nasheim, M.C. And Forsum , E.(1980). The influence of *A. suum* on protein utilization of malnourished pigs. Federation Proceedings. **39**:888.

7. Tripathy, K., Gonzalez, F. Loteru, H. And Blanoso.(1971). Effects of Ascaris infection in human nutrition. Am. J. of Trop. Me Hygiene. **20**: 212-218.

8. Sheriff, James C. (2005). Effe iverm ectin on feeding by *Haemon contortus in vivo. Vet. parasitol.* **128-(** 341-346.

9. Stephenson, L.S. Crompton, D. T.W.J., Nosheim, M.C. And Jansen, A (1980 b), Relationship between As infection in Kenya. J.Trop. Paediatric **(6)** *: 246-263.*

10. Prosser, C.L. (1961) The compar animal physiology. (W.B. Saun London).

11. Sangster, N. C, Prchard R. K. And L E.(1985) Tubulin and benzimida resistance on *Trichostrong colubriformis. J Parasitol* **71**:645-651

12. Prichard, R.K. (1988). Anthelminti control .*Vet. Parasitol.* **27**:97-109.

Table No1: Percentage of mortality of male and female: *A. galli* in control and Lock - Lewis solution containing anthelmintic (Ivermectin and morantel).

Time in Hours	Lock-Lewis Solution		Lock-Lewis Solution with ivermectin		Lock- Lewis Solution with Morantel	
	Male	Female	Male	Female	Male	Female
0	0	0	0	0	0	0
4	0	0	10	10	0	0
8	0	0	20	20	0	0
12	0	0	50	50	10	20
16	0	0	100	100	50	40
18	0	0			100	100
24	20	10				
28	50	80				
32	100	100				