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تأثير بعض الكيماويات على الطور اليرقى والمعدى لديدان
التركوسترونجيليديا في الحيوانات المصيرية

أحمد عبدالجواد ، ملكة عاطف

أنه من أهم طرق مقاومة الإصابة بديدان التركوسترونجيليديا في الأغنام هو القضاء على أطوارها المعدية في الروث بالحظائر وأكوام السباح . ومن نتائج هذا البحث لوحظ أنه باستخدام المبيدات الحشرية مثل الازنتول ، المركوتوكس ، السيفين النيوجوفون والملايثون كانت النتائج ١٠٠٪ في القضاء على هذه الأطوار باستخدامها في التراكيز الآتية حسب ترتيبها المسبق لكل جرام من الروث ٦ ملجم ، ٥ ملجم ، ٥ ملجم ، ٤ ملجم ، ٤ ملجم .

وكان لتأثير طارد الديدان الثيابنزول تأثير فعال ١٠٠٪ عند تركيز ضعيف هو ٤ ملجم لكل جرام من الروث .

أما باقي الكيماويات فلم يكن لها تأثير قوى مثل مبيد الحشائش الجرامكسون وطارد الديدان الكيفين والقربان .



EFFECT OF SOME CHEMICALS ON FREE LIVING STAGES OF TRICHO STRONGYLIDAE
IN EGYPTIAN ANIMALS
(With 6 Tables)

By

A.F. ABDEL GAWAD and MALAKA ATIF MAHMOUD

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SUMMARY

One of the main methods for controlling the Trichostrongylidae infection in sheep is to reduce the number of their infective stages. It is clear that success was obtained by the application of insecticides, Asuntol, Bercotox, Seven, Neguvon and Malathion which gave 100% lethal effect to them at a concentration of, 0.6 mg/gm faeces, 5 mg/gm faeces, 5 mg/gm faeces, 4 mg/gm faeces and 4 mg/gm faeces respectively.

The anthelmintic Thiabendazole gave 100% efficiency at low concentration of 0.4 mg/gm faeces. Other chemicals proved to be less efficient.

INTRODUCTION

Several techniques have been applied for screening various chemical compounds in vitro for estimating their anthelmintic activity (LEVINE, 1953 and PARNELL, 1964). The effect of phenothiazine on soil inhabiting nematodes was also studied. (DESCHIEUS and LAMY 1945 a,b) stated that complete destruction of the adult stages of Rhabditis maerocera was attained after 24 hours by the use 1:500 suspension of phenothiazine in water. (PARNELL, 1940) reported that a concentration of 500 mg of phenothiazine/gm faeces is lethal to 90% of the nematodes in horse faeces. The helminths also used included adult liver flukes, tapeworm segments specially those of Monizia spp. and Iaenia of dogs, as well as adult female Ascarides and larvae of bursate nematodes.

Among the chemicals used were anthelmintics, which proved to have certain lethal effects against the larval stages of bursate nematodes. Therefore, the present investigation is to test the effect of some insecticides, herbicides and anthelmintics on the larval stages of bursate nematodes, Trichostrongylidae.

MATERIAL AND METHODS

Sheep faecal pellets were collected from the experimentally infected animals. They were broken up with low speed homogenizer to attain complete mixing of samples, three samples from each animal were submitted to faecal egg count (E.P.G) by the Wetzler Macmaster technique, (WETZEL, 1951), to ensure homogeneity. Each 20 gm. of faecal mixture were cultured after mixing with two table spoonful of sterilized fine saw dust for larval airing. Suitable amount of water was added to obtain a pasty mixture which was kept in an incubator at 26 - 27°C for 11 days. Daily aeration and moistening with few drops of water was essential. The larvae were gained by a modified Bearman's technique after (ROBERTS and O'SULLIVAN, 1950) and counted by a dilution method.

For testing the effect of chemical compounds, an estimated amounts of it were thoroughly mixed with the faecal cultures before incubation. For each compound, 2 to 5 tests were carried out at each time. Meanwhile 2 to 5 control cultures free from any chemical compounds were used in each trail.

The chemicals used were:

1. Malathion: 0,0,-dimethyl dithiophosphate of diethyl mescaptosuccinate. (Cyanamid)
2. Neguvon: 0,0-dimethyl-2,2,2,-trichloro-1-hydroxyethyl phosphate. (Bayer)
3. Asuntol: 50% wettable powder (coumaphos). 0,0-diethyl 0-(3-chloro-4-methyl-7-coumarinyl)-phosphorothioat. (Bayer)
4. Percotox: (2:3-p-dioxane 5-bis-(0,0,-diethyl dithiophosphate). (Cooper)
5. Seven: 1-naphthyl-N-methyl carbamate. (Union Carbide)
6. Gramoxon: dimethyl B pyridium dimethyl sulphate. (ICI)
7. Loxon 2: 0,0, di-(2-chlorethyl)0-(3 chloro-4-methylcoumarin-7-yl) phosphate. (Cooper)
8. Coopafine: 90% micronized phenothiazine (Dibenzothiazine, thiodiphenylamine) (Cooper)
9. Verban: 25% piparazine base as piparazine dihydrochloride. (Cyanamid)
10. Thiabendazole: (Thiabendazole). (2-(4-thiazolyl)-benzimidazole). (Merek Sharp & Dome)

RESULTS

Tables 1 and 2 show the effect of the insecticides Malathion, Neguvon, Percotox, Seven and Asuntol. Table 3 show the effect of herbicide Gramoxon. While tables 4 and 5 show the effect of anthelmintics Loxon 2, Coopafine, Verban, and Thiabendazole. All results are summarised in table 6.

From these results, it is clear that the insecticides were more efficient than the other compounds. As well as the anthelmintic Thiabendazole in low concentrations.

TABLE (1)

Mean % number of living Trichostrongylidae larvae hatched after sheep faecal culture mixed with chemicals per gram faeces in different concentrations

Chemicals	Control		1 mg/gm		2 mg/gm		3 mg/gm		4 mg/gm		5 mg/gm	
	Larvae No	%	Larvae No	%	Larvae No	%	Larvae No	%	Larvae No	%	Larvae No	%
Malathion	17882	100	6180	34.6	1610	9.0	266	1.5	0	0	-	-
Neguvon	92090	100	30548	33.2	11139	12.1	891	1.0	0	0	-	-
Bercotox	104590	100	25663	24.5	14316	13.7	3984	3.8	146	0.14	0	0
Seven	266850	100	9673	3.6	3366	1.3	2192	0.8	1624	0.6	0	0

TABLE (2)

Mean % number of living Trichostrongylidae larvae hatched after sheep faecal culture mixed with chemical per gram faeces in different concentrations

Chemical	Control		0.2 mg/gm		0.3 mg/gm		0.4 mg/gm		0.5 mg/gm		0.6 mg/gm	
	Larvae No	%	Larvae No	%	Larvae No	%	Larvae No	%	Larvae No	%	Larvae No	%
Asuntol	56768	100	209	0.4	101	0.2	49	0.1	17	0.03	0	0

TABLE (3)

Mean % number of living Trichostrongylidae larvae hatched after sheep faecal culture mixed with chemical per gram faeces in different concentrations

Chemical	Control		1 mg/gm		2 mg/gm		3 mg/gm		4 mg/gm		5 mg/gm		6 mg/gm	
	Larvae No	%	Larvae No	%	Larvae No	%	Larvae No	%	Larvae No	%	Larvae No	%	Larvae No	%
Gramoxon	41339	100	42781	10.3	20925	50.6	4041	9.8	2583	6.2	198	0.5	238	0.6

TABLE (4)

Mean % number of living Trichostrongylidae larvae hatched after sheep faecal culture mixed with chemicals per gram faeces in different concentrations

Chemicals	Control		10 mg/gm		20 mg/gm		30 mg/gm		40 mg/gm	
	Larvae No	%	Larvae No	%	Larvae No	%	Larvae No	%	Larvae No	%
Loxon 2	4900	100	186	3.8	0	0	0	0	184	3.8
Coopafine	6103	100	1874	30.7	4594	75.3	4138	67.8	742	12.2
Verban	8444	100	6909	81.8	1283	15.2	1878	22.2	2856	33.8

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TABLE (5)

Mean % number of living Trichostrongylidae larvae hatched after sheep faecal culture mixed with chemical per gram faeces in different concentrations

Chemical	Control		0.1 mg/gm		0.3 mg/gm		0.4 mg/gm		0.5 mg/gm	
	Larvae No	%	Larvae No	%	Larvae No	%	Larvae No	%	Larvae No	%
Thiabendazole	199322	100	1228	0.62	190	0.095	0.5	0.0002	0	0

TABLE (6)

Chemical efficiency

Chemicals	Concentration /gm faeces	Over 96% larval reduction	Concentration /gm faeces	100% larval reduction
Asuntol	0.5 mg	99.97	0.6 mg	100
Bercotox	4 "	99.89	5 "	100
Gramoxon	6 "	99.5	-	-
Seven	4 "	99.4	5 "	100
Neguvon	3 "	99	4 "	100
Malathion	3 "	98.5	4 "	100
Thiabendazole	0.3 "	99.9	0.4 "	100

DISCUSSION

The control of gastrointestinal nematodes depends mostly on the treatment of animals with available anthelmintics. The intention to find other methods for controlling the infective stages is needed to be applied in the field. Therefore screening tests of various chemicals in the laboratories found necessary to notice their effect on the infective larval stages of Trichostrongylidae. (THERNE, 1951) has measured the penetration power of the various fumigants through soil by plotting the number of dead and surviving free living nematodes found at various distances from the point of fumigant application.

The preinfective larval stages of gastrointestinal nematodes of sheep develop to the infective larval stages outside the body of the host. These larvae feed on bacteria in their surroundings (MCGY, 1929) until they develop to the infective larval stages. They are affected with the surrounding temperature, moisture, size of the faecal pellets and other various factors in their biotop.

Since long time ago, various chemicals have been tried to kill eggs or preinfective larvae, (LAPAGE, 1956). He also added that few chemical substances would kill them quickly under laboratory conditions and no substances was known to kill them on the pasture in reasonable time.

LEVINE (1953) tried 14 compounds and concluded that addition of 0.1% Auromycin, 0.1% Hexachlorocyclopentadiene and 0.053% of n-hexyl isocetylamine to horse faeces prevent the development of Strongylides larve.

OLTEANU (1961) succeeded in reducing the number of nematodes larvae on testing various substances under laboratory conditions and concluded that Lougols solution, Iodine vapour, 5% Carbolic acid, 20% Dithiazine, 10% Formalin and 0.2% Nacl were also effective.

PUCHEUE (1962) found that the use of 300 KG Calcium cyanamide per Hektar at pH of 5.6 to 7.0 reduced the number of hatching Trichostrongylidae eggs to 98.5%, while 150 KG Calcium cyanamide per Hektar destructed one third of eggs. (GEVREY and EUZELY, 1965) found that 500 KG per Haktar are suggested for complete destruction of these parasites.

In the present study as in table (6), used chemicals proved to be efficient in reducing the number of larvae to 99.97% while in higher concentrations of insecticides were 100% lethal. Hence the spray of the faecal matter with suitable concentration would be used as a mean for controlling Trichostrongylides to minimum and could be applied.

It is recommended by the authors that the success of the above results depends mainly on using low concentration of chemicals and proper mixing with faecal matter which are less to produce any toxic effect to the animals.

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