PARASITIC HELMINTHES AMONG ANIMALS SLAUGHTERED AT DAKAHLIA PROVINCE ABATTOIRS

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ABSTRACT

This study was evoked to screen the helminth parasites among slaughtered animals in Dakahlia province through regular weekly visits to five cities abattoirs including Mansoura, Belquas, Dekernes, Senbellawine and Sherbeen . A total number of 2048 cattle, 648 buffaloes and 133 sheep were examined at slaughtering for detection of helminth parasites. Inspection of sheep GIT revealed Haemonchus spp. and Ostertagia spp. infections as abomasal worms and Moniezia spp. and Avitellina spp.as intestinal worms. Carcasses and liver inspection of slaughtered large animals revealed 2 genera of parasites (Setaria spp. in peritoneum and Fasciola spp. in liver). Inspection of GIT of large ruminants yielded 4 genera of helminthes including Paramphistomum spp., Carmyrius spp., Moniezia spp. and Toxocara vitulorum . Toxocara vitulorum was the gastrointestinal helminthes recovered from slaughtered buffalo calves less than 4 months of age. Paramphistomum, T. vitulorum and Haemonchus spp. infections were predominat during Autumn, while that of carmyrius and avitellina spp. was the highest during Winter. Moreover, Spring had the highest incidence of Fasciola, Ostertagia and Moniezia spp. of cattle, but that of sheep was increased during Summer. The prevalence and seasonal dynamics of the detected parasites were studied independently in each abattoir of the planned area.

Key words: *Helminth, ruminants. slaughter.*

الملخص العربى

الديـدان الموجـودة بالحيوانــات المذبوحــة بمحافظـة الدقهليـــة

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أجريت هذه الدراسة لفحص الطفيليات المنتشرة بين الحيوانات المذبوحة فى محافظة الدقهلية من خلال زيارات إسبوعية منتظمة إلى مجازر

خمس مدن وهى المنصورة وبلقاس ودكرنس والسنبلاوين وشربين، تم فحص عدد ٢٠٤٨ من الماشية، ٦٤٨ من الجاموس و١٣٣ من الأغنام أثناء الذبيح للكشف عن الديدان، وأثناء فحص المعى والأمعاء للأغنام وجد أربعة أنواع من الديدان وهى الهيمونكس والأوسترتاجيا بالمعدة بالإضافة إلى المونيزيا والافيتلينا بالأمعاء، وبفحص ذبائح وكبد المجترات الكبيرة من الأبقار والجاموس أسفرت عن تواجد ديدان الفاشيولا بالكبد وديدان السيتاريا بالتجويف البطنى. كما وجد أربعة أنواع من الديدان بالجهاز الهضمى وهى نوعين من ديدان الكرش وديدان المونيزيا بالأمعاء كما وجدت ديدن الاسكارس بأمعاء عجول الجاموس أقل من أربعة شهور من العمر، وبالنسبة للإصابة الموسمية، كان الخريف أكثر المواسم إصابة بديدان الاسكارس وديدان الكرش والهيمونكس أما الشتاء فكان أكثرها إصابة بالكارمريس والافيتيلينا، وبالنسبة للدودة الكبدية، الاوسترتاجيا والمونيزيا التى تصيب الأبقار فكانت أكثر إنتشاراً فى الربيع ولكن المونيزيا التى تصيب الأغنام فكانت أعلى إنتشاراً فى الصيف، وتمت دراسة معدل الانتشار وكذلك معدل الانتشار الموسمى لكل طفيل بصفة مستقلة بكل من المجازر محل الدراسة.

الكلمات الدالة : الديدان ، والحيوانات المجتره، الذبح.

INTRODUCTION

Nowadays, the rapid increase of human population in Egypt necessitates a proportional increase of feed substances. Animal meat is considered the main source of animal protein. Also, raising animals is an important mean to increase the national income allover the world. In Egypt, buffaloes, cattle, sheep and goats represent the majority of farm animals reared for meat and milk production. Such animals may suffer from parasitic agents that may affect their lives and or production either directly or indirectly.

Direct adverse effects of parasitic constrain may include deaths, especially in heavy infections or untreated animals. Besides, direct losses during meat inspection at slaughtering due to organ condemnation (as liver fibrosis in chronic fascioliasis). Also, parasitism may indirectly affect animal productivity and / or breeding in different ways as lowering fertility, decreased weight gain as well as decreased milk and /or meat production.

Moreover, parasites many exaggerate other microbial diseases as bacterial pneumonia associated with lung worms infection, or carry other pathogens while wandering in tissues as Clostridium novyii, carried by migrating forms of Fasciola spp. to sheep liver, the primary cause of sudden death in sheep fascioliasis, due to the massive invasion of liver parenchyma with both organisms.

Therefore, this study was carried out to screen the parasitic helminthes among animals slaughtered at Dakahlia Province abattoirs, hopping to help the planning of suitable control strategies needed for eradication of the persistent parasites, to obtain the maximum benefits proposed from animal production.

MATERIAL AND METHODS

Regular weekly visits were submitted to main abattoirs of 5 cities including Mansoura, Belquas, Dekernes, Senbellawine and Sherbeen during the period extended from September 2005 to the end of August 2006. A total number of 2048 cattle, 648 buffaloes and 133 sheep were examined at slaughtering for

detection of parasitic helminthes. Examination of slaughtered animals had achieved in 2 ways:-

A. During meat inspection, the whole carcasses were systematically examined as follows:-

1. Lungs were examined by making incisions through lung tissue and large and small bronchi and bronchioles for detection of lung worms.

2. Livers were also examined by palpation and performing several incisions in liver parenchyma and bile ducts for detection of liver flukes.

3. Peritoneal cavities of slaughtered animals were also inspected for recovery of worms and / or cysts.

4. The obtained gastrointestinal tracts were examined for gastrointestinal helminthes;
   a) Rumen and reticulum were evacuated from ingesta and inspected for detection of rumen flukes.

   b) Abomasum was incised longitudinally, cleared from contents and careful examination was paid to the abomasal wall for detection of stomach worms. Also, wall scrapings were performed and collected in a small container for laboratory examination.
   c) Small and large intestines were separately opened and examined grossly for adult helminthes. Then, each part was opened and scrapings were transferred into a small container for laboratory examination.

   d) Material obtained from the above mentioned inspections were moved to Parasitology department, Faculty of Veterinary Medicine, Mansoura University for laboratory examination.

B. Laboratory examination and permanent preparation of the revealed parasites:

1. Scrapings taken from abomasum and intestines were left to sediment for 30 minutes, after which, the sediment was examined using binocular dissecting microscope and the detected parasites were picked up and put in a petridish containing tap water.

2. For washing and relaxation, the revealed worms were washed in tap water to remove any adhering debris or mucous, kept in a little amount of water in a refrigerator either for few hours or overnight to be died in a relaxed condition.

3. The revealed trematode flukes were compressed between two glass slides, fixed in 10% formaldehyde solution for at least 24 hours.
   - The compressed worms were then washed in water to get ride of formalin remnants and stained overnight in acetic acid alum carmine stain. Then, washed in tap water, to remove the excess of stain.
   - Differentiation, when needed, was carried out in acid - alcohol (70% ethyl alcohol + 4 % Hcl) until reaching the proper staining degree.
   - Then, the stained worms were dehy-

drated in ascending grades of ethanol, passed in xylene and finally mounted in Canada balsam.

4. Cestode helminthes were processed as trematode ones, but a special attention was given to scolices and mature and gravid segments.

5. The recovered nematode worms were picked up, cleared in lactophenol solution and mounted in polyvinyl alcohol. Also, fast green or light green stains were sometimes used for making coloured preparations by adding few crystals of the stain while clearing in lactophenol.

6. Photos were taken by digital camera (Fuji A340 finepix 4.0 million pixels) and computerized using ACDsee-version 6.0.

RESULTS & DISCUSSION

A total number of 2696 large ruminants and 133 small ruminants (sheep) were investigated in slaughtering houses of five centers belonging to Dakahlia province. Namely, Mansoura (2282 large ruminants and 133 small ruminants); Belquas (126 large ruminants); Senbellawine (106 large ruminants); Dekernes (114 large ruminants) and Sherbeen (68 large ruminants).

Regarding helminth parasites of sheep slaughtered at Mansoura abattoir, GIT inspection revealed Haemonchus spp. and Ostertagia spp. infections as abomasal worms and Moniezia spp. and Avitellina spp.as intestinal worms. Examination of abomasums revealed 35.71% Haemonchus infection either single or mixed with Ostertagia infection (11.22%). Examination of small intestine revealed 1.67% Moniezia infection and 6.67% infection with Avitellina; Table (1).

Concerning the seasonal fluctuation of the revealed sheep helminthes, Haemonchus spp. showed its higher incidence during Autumn (46.4%) and Winter (38.1%) then, declined during Spring (25%) and Summer (29.7%). Ostertagia spp. reached its highest level in Spring and Autumn to be 16.7% and 14.3% respectively. The lowest incidence was recorded in Winter and Summer to be 9.5% and 8.1% respectively. On the other hand Moniezia infection was recorded only during Summer (5.6%), while completely disappeared during other seasons. Avitellina infection reached its maximum during Winter (12.5%) and Summer (11.1%), decreased in Autumn (3.9%), while disappeared in Spring season; Table (1).

Carcasses and liver inspection of slaughtered large animals revealed the infection with 2 genera of parasites (Setaria spp. in peritoneum and Fasciola spp. in liver). In this regard, Setaria spp. was only recovered from peritoneum of large animals slaughtered in Mansoura abattoir with a prevalence rate (0.08 %). Meanwhile, Fasciola spp. was detected in 1.03% of examined animals. Senbellaine had the highest prevalence (2.83 %) followed by Sherbeen (1.47 %), Mansoura (1 %) and Dekernes (0.88%) while animals slaughtered in Belquas abattoir were free from Fasciola infection; Table (2).

Paramphistomum spp., Carmyrius spp., Moniezia spp. and Toxocara vitulorum were

the gastrointestinal helminthes recovered from slaughtered large ruminants. Paramphistomum spp. infection recorded a total infection rate of 47.13%, where the highest incidence was in Dekernes (63.89%), followed by Senbellwaine (46.88%), Mansoura (46.44%), Sherbeen (43.75%) and finally Belquas (41.18%). Carmyrius infection was only recorded from animals slaughtered at Mansoura abattoir (1.43%); Table (2).

Moniezia spp. was detected in 7.36% of examined small intestine of slaughtered large ruminants in Dakahlia Province. The highest prevalence was recorded in Dekernes (10.53%) followed by Senbellwaine (9.09%) and Mansoura (7.99%), while, animals slaughtered at Sherbeen and Belquas were found free from Moniezia infection. Toxocara vitulorum was only recorded from buffalo calves (under 4 months of age) slaughtered at Mansoura abattoir (47.9%); Table (2).

Regarding the seasonal dynamics of the recorded parasites among the five centers in large ruminants, Fasciola spp. recorded its highest incidence during Spring (1.6%) followed by Winter (1.31%), Summer (1.18%) and finally Autumn (0.52%). The seasonal dynamics of the revealed parasites showed some differences among the investigated abattoirs, concerning Fasciola spp., the lowest prevalence in Mansoura was detected in Autumn and Summer to be (0.63%) and (0.87%) respectively, while higher prevalence was detected during Spring and Winter to be (1.6% and 1.45% respectively). In Senbellwaine center, Fasciola spp. was detected during summer and winter (6.25% and 2.44% respectively). In Dekernes and Sherbeen abattoirs, the same parasite was only detected in summer season (5.27% and 6.25% respectively), Table (3).

With special reference to the seasonal dynamics of rumen flukes of large ruminants, Paramphistomum spp. reached its peak in Autumn months (54.5%), followed by Summer and Winter (46.3% and 44.6%) while its minimal incidence was detected in Spring (38.5%). In Mansoura abattoir, it was found that Paramphistomum infection increased during Summer season (46.1%) toward its maximum incidence during Autumn (54.9%), while slightly decreased during Winter (43.8%) and Spring (34.2%). In Belquas Paramphistomum infection predominated during Spring and Summer (50% / each), while decreased in Autumn (41.7%) toward Winter (30%). In Senbellwaine, Paramphistomum revealed from rumen and reticulum during Autumn (60%), Summer (50%) and Winter (47.1%) but not in Spring season. In Dekernes abattoir, examination of gastrointestinal tract of large ruminants revealed Paramphistomum infection during Winter (71.4%), Spring (66.7%), Autumn (64.3%) and Summer (50%). Lastly, cattle slaughtered at Sherbeen abattoir showed infection rate of (42.9%) in Winter, reached its maximum in Spring (66.7%), while equal lowest incidences were recorded during Summer and Autumn seasons (33.3% / each), Table (4).

On the other hand, Carmyrius infection reached its maximum in Winter season (5%) and sharply decreased in Spring (1.3%) and Summer (1. 4%) to be completely disappeared in Autumn season. Toxocara vitulorum (in buffalo calves below 4 months of age) reached

its peak during Autumn (60.3%), while it was moderate in Winter (47.7%) and summer (46.4%) while Spring had the lowest prevalence (23.1%), Table (5).

With regard to intestinal parasites of the same animals, Summer season had the highest prevalence of Moniezia spp. (10.2%), followed by Spring (7.6%), Winter (5.6%) and Autumn (5.3%). In Mansoura abattoir, Moniezia infection was the highest during Summer (9.8%) and Winter (8.5%), followed by Spring (7.2%) and Autumn (6.3%). In Senbellwaine and Dekernes abattoirs, Moniezia infection was only detected during summer season (16.7 % and 33.3 % respectively). Table (6).

In the current study, 2 genera of abomasal nematodes were recorded in sheep; Haemonchus spp. and Ostertagia spp. Hemonchus spp. showed higher incidence (35.1%) than Ostertagia spp. (11.22%). The obtained results was coincided with **El- Azazy, 1990 in Sharkia** and **El-Azazy, 1995** in Saudi Arabia but disagreed with Cabaret, 1984 in Morocco. Moreover, 2 genera of intestinal helminthes were recorded; Moniezia spp. and Avitellina spp. the obtained results were on contrary with **Aydenzoz** and **Yldz, 2003** in Turkey who recorded a higher incidence of Moniezia spp. (3.98%) and a lower one for Avitellina spp. (0.86%). These differences may be due to different ecological or managemental factors.

Dealing with the seasonal dynamics of the revealed sheep parasites; Haemonchus spp. and Ostertagia spp. showed nearly similar fluctuations (increased in Autumn and decreased in Summer). The achieved results were in agreement with **Cabaret, 1984** in Morocco , but disagreed with **Reid** and **Armour, 1975** who found that the incidence was decreased in Autumn and early Winter. Moniezia spp. in the current study was revealed only during Summer. This result was disagreed with **Belem et al; 2001** who mentioned that the incidence was increased during the rainy seasons.

In the present study, the incidence of Fasciola spp in slaughtered large ruminants was considerably low (1.03%). The achieved results were agreed with Baldock and Arthur, 1985 in Austrlaia (1.1%) but much lower than that obtained by **El-Shazley et al; 2002** in Dakahlia (12.31%), and **Pfukenyi** and **Mukaratirwa, 2004** in Ethiopia (37.1%). The lower incidence of fascioliasis nowadays may be attributed to the application of covered drainage system for irrigation of agricultural lands which declines the intensity of snail intermediate host spread, and the repeated use of fasciolicide drugs. On the other hand Setaria spp. was revealed only from 0.08% of slaughtered large ruminants, this very low incidence was nearly similar to that recorded by **Rehbein et al; 1996** in Germany (0.00 %).

Concerning the incidence of ruminal flukes, the obtained results of Paramphistomum spp. were near that obtained by **Lee and Lee 1971** (68.4%). Also, these results were in agreement with the range obtained by **Mage et al; 2002** in France (44.7%) and **Rangel-Ruiz et al., 2003** (3.33 - 96.67% with average 39.1%).

The recorded prevalence of Moniezia spp in investigated abattoirs were around the results concluded by Lee and **Lee, 1971M** (8%), while

it was much higher than that detected by Regassa et al; 2006 (0.4%) and **Aydenzoz and Yldz, 2003 in Turkey** (0.22% for M. benedeni and 0.11% for M. expansa), Toxocara vitulorum was recovered from 47.93% of examined buffalo calves which was very higher than that recorded by **Akyol, 1993** in Turkey (5.1%) and **Regassa et al.; 2006** in Ethiopia (2.8%) in cattle calves. This marked difference may be attributed to species susceptibility.

Regarding the seasonal fluctuation of the revealed helminth parasites infecting slaughtered large ruminanats, Fasciola spp incidence in this investigation was the highest in Spring and Winter, while the lowest was in Summer and Autumn. The achieved results were coincided with **Khallaayoune** and **El-Hari, 1991, Pfukenyi** and **Mukaratirwa, 2004** who stated that the incidence was in wet seasons more than the dry seasons. Also, **Phiri et al; 2005** recorded higher incidence of fascioliasis in May and June (Spring).

On the contrary of Fasciola spp, Paramphistomum spp. infection in slaughtered large ruminants showed a higher prevalence in Summer and Autumn, and a lower one in Spring and Winter. These results were consistent with that described by **Rangel-Ruiz et al; 2003** in Mexico. Moreover, Moniezia spp, incidence was increased in Summer and Spring and a moderate incidence was observed in both Autumn and Winter. These results were disagreed with **Belem et al; 2001**, who stated that Moniezia spp. infection was the highest in rainy seasons. This difference may be attributed to the incidence of parasitic existence in the large numbers of animals examined during Summer than other seasons.

Generally, there were some variations in the prevalence and seasonal dynamics among the investigated abattoirs even they have nearly the same microclimate. These differences may be attributed to managemental factors (food type and repeated drug usage in treatment and prophylaxis of parasites) as well as vicinity of pastured animals to branches of river and water channels.

Table (1): Prevalence and seasonal incidence of helminth parasites revealed from sheep in Mansoura abattoir

Season	Intestines					Stomach worms				
	NO. Ex.	*Moneizia spp.*		*Avitellina spp.*		No. Ex.	*Haemanchus spp.*		*Ostertagia spp.*	
		+ve	%	+ve	%		+ve	%	+ve	%
Autumn	26	--	0.00	1	3.9	28	13	46.4	4	14.3
Winter	8	--	0.00	1	12.5	21	8	38.1	2	9.5
Spring	8	--	0.00	--	0.00	12	3	25.0	2	16.7
Summer	18	1	5.6	2	11.1	37	11	29.7	3	8.1
Total	60	1	1.67	4	6.67	98	35	35.71	11	11.22

Table(2): prevalence of helminth parasites in large ruminants in Dakahlia province.

District	Rumen& reticulum					Intestine						liver			peritoneum		
	No. Ex.	*Paramphistomum spp.*		*Carmyerius spp.*		*Moniezia spp.*			*Toxocara vitulorum* *			*Fasciola spp.*			*Setaria spp.*		
		+ve	%	+ve	%	No. Ex.	+ve	%	No Ex.	+ve	%	No. Ex.	+ve	%	No. Ex.	+ve	%
Mansoura	491	228	46.44	7	1.43	288	23	7.99	217	104	47.9	2282	23	1	2282	2	0.08
Belquas	34	14	41.18	--	0.00	25	--	0.00	--	--	--	126	--	0.00	126	--	0.00
Senbellawine	32	15	46.88	--	0.00	22	2	9.09	--	--	--	106	3	2.83	106	--	0.00
Dekernes	36	23	63.89	--	0.00	19	2	10.53	--	--	--	114	1	0.88	114	--	0.00
Sherbeen	16	7	43.75	--	0.00	13	--	0.00	--	--	--	68	1	1.47	68	--	0.00
Total	609	287	47.13	7	1.15	367	27	7.36	217	104	47.9	2696	28	1.03	2696	2	0.07

Toxocara vitulorum revealed from buffalo calves below 4 months of age.
Setaria species revealed from abdominal cavity of cattle

Table (3): Seasonal dynamics of *Fasciola spp.* in Dakahlia province.

Season / Abattoir	Autumn	Winter	Spring	Summer
Mansoura	0.63	1.45	1.6	0.87
Belquas	0.00	0.00	0.00	0.00
Senbellawine	0.00	2.44	0.00	6.25
Dekernes	0.00	0.00	0.00	5.27
Sherbeen	0.00	0.00	0.00	6.25
Total	**0.52**	**1.31**	**1.6**	**1.18**

Table (4): Seasonal dynamics of *Paramphistomum spp.* in Dakahlia province.

Season / Abattoir	Autumn	Winter	Spring	Summer
Mansoura	54.9	43.8	34.2	46.1
Belquas	41.7	30	50	50
Senbellawine	60	47.1	0.00	50
Dekernes	64.3	71.4	66.7	50
Sherbeen	33.3	42.9	66.7	33.3
Total	**54.5**	**44.6**	**38.5**	**46.3**

Table (5): Seasonal dynamics of *Carmyrius spp.* and *ToxocaraVitulorum* in large ruminants in Mansoura abattoir

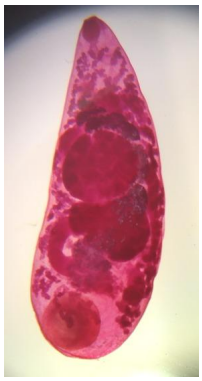
Season	Autumn	Winter	Spring	Summer	Total
Carmyrius gregarius	0.00	5	1.3	1.4	1.43
Toxocara vitulorum	**60.3**	**47.7**	**23.1**	**46.4**	**47.93**

Table (6): Seasonal dynamics of *Moniezia spp.* in Dakahlia province.

Season / Abattoir	Autumn	Winter	Spring	Summer
Mansoura	6.3	8.5	7.2	9.8
Belquas	0.00	0.00	0.00	0.00
Senbellawine	0.00	0.00	0.00	16.7
Dekernes	0.00	0.00	20	33.3
Sherbeen	0.00	0.00	0.00	0.00
Total	**5.3**	**5.6**	**7.6**	**10.2**

Parasitic helminthes revealed from slaughtered animals

Rumen flukes in rumen

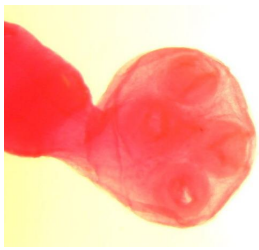


Paramphistomum species, adult

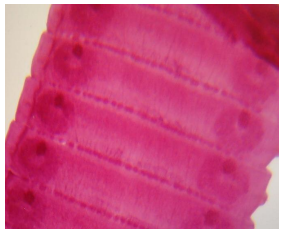
Carmyrius gregarius, adult

Fasciola gigantica, adult

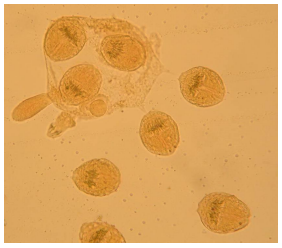
Moniezia expansa, adult



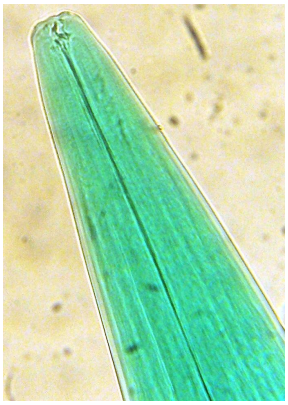
Moniezia expansa, scolex



Moniezia expansa, M.S

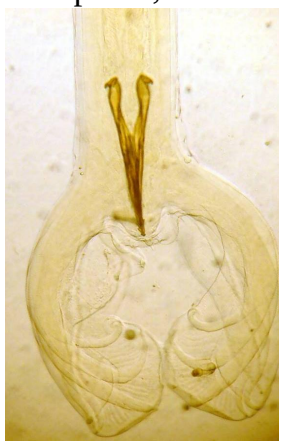


Hydatid, scolices and broad capsule

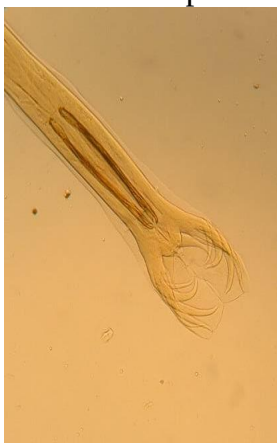


Haemonchus spp, anterior end

Haemonchus spp. ♀ vulval flap

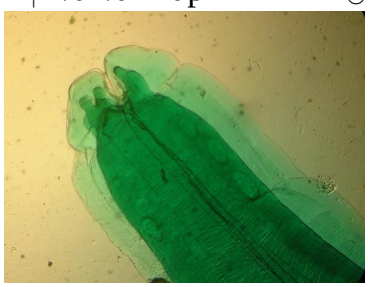


Haemonchus spp. ♂ bursa



Ostertagia spp. ♂ bursa

Toxocara vitulorum, adult worms



Toxocara vitulorum anterior end

Setaria spp., adult, anterior end.

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