

## الديدان المعدية في الأغنام والماشية

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قام الباحثان بفحص الحيوانات المجتررة بمصر وخاصة الأبقار والأغنام لمعرفة مدى إصابتها بالديدان المعدية التى تسمى بالبارامفستوم .

ولقد تم تجميع عينات من هذه الديدان من عدد من عدد ٣٢٠ من الأبقار ، عدد ٩٨ من الأغنام من سلخانات القاهرة والإسكندرية . تم عمل وصف مقارن وتفصيلى من الناحية المورفولوجية والهستولوجية بين هذه الديدان وبين نوع معروف مورفولوجيا وهستولوجيا من نفس فصيلة الديدان التى تم تجميعها وهذا النوع تم الحصول عليه من جمهورية المجر .

وبمقارنة الصفات المورفولوجية والهستولوجية ثبت أن نوع الديدان المعدية من فصيلة «البارامفستوم» التى تصيب معدة الحيوانات المجتررة بمصر كان من نوع « البارامفستوم ميكثريم » على عكس ما كان معروف قديما والى الآن بأنها من نوع «البارامفستوم سيرفاى » . وعلى ذلك كل ما نشر من أبحاث مصرية على هذه الديدان من ناحية درجة وإصابة الحيوانات بها وكذلك وصفها المورفولوجى يجب اعتباره موجه الى نوع « الببارافستوم هيكرويثريم » وليس بالنوع الآخر . علاوة على ذلك قام الباحثان بإجراء تجارب بيولوجية على هذين النوعين ومحدد العامل الوسيط لكل منهما .

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## STUDIES ON *PARAMPHISTOMUM* SPECIES OF CATTLE AND SHEEP IN EGYPT

(with 2 tables and 12 Fig.)

By

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### SUMMARY

Egyptian ruminants have been investigated for *Paramphistomum* worms infestation. A detailed morphological and histological comparative study has been conducted demonstrating that the stomach fluke of cattle and sheep in Egypt were identical with *paramphistomum microbothrium* and the *Paramphistomum cervi* seemed to have no existence in Egypt. Therefore, literature in connection with *Paramphistomum cervi* in the Egyptian literature should be regarded as *Paramphistomum microbothrium*.

### INTRODUCTION

Approaching the literatures, there have been two species of paramphistomes frequently occurring in cattle and sheep in Egypt. LOOSS (1896) established the occurrence of *Amphistomum conicum* Rud., 1809 = *Paramphistomum cervi* Zeder, 1790 but later he concluded in 1912 that the species which had been believed to be *Amphistomum conicum* was identical with *Paramphistomum microbothrium*, FISCHOEDER, (1901). NASMARK (1937) recorded in his monograph, after examination of LOOSS'S original preparations and the material collected in Cairo during the Swedish-Sudan-Expedition, 1900-1901 that the whole material examined has proved to be *Paramphistomum microbothrium*. Recently DINNIK (1961) has also found this species in Phile Roux's collection originated from cattle and sheep slaughtered in Cairo.

In this connection, Egyptian authors, however, seemingly not consulted with the above literature and have been of the opinion that the common stomach fluke of cattle and sheep here is identical with *Paramphistomum cervi*. Indeed, the species investigated at the South borders El-Dirr in sheep by EZZAT (1949) and the by TADROS (1958) in cattle, sheep, buffalo and



Camel was referred as *Paramphistomum cervi*. The life cycle of this species has been then attempted by ABDEL-GHANI (1961). The cercariae of this worm were found by EL-GINDY (1963) in *Bulinus truncatus* and *Bulinus forskalii*.

The aim of this paper was to clarify the real specific status of the local common stomach fluke of cattle and sheep in Egypt on the basis of the presently collected materials differentiating between the two species of *Paramphistomum cervi* and *Paramphistomum microbothrium*.

### MATERIALS AND METHODS

The tested materials were mainly collected from Cairo and Alexandria slaughter houses within the period 1973-1974. Totally, 120 rumina of cattle and 98 of sheep have been examined. Upon quick autopsy, fresh stomach flukes were usually washed, fixed in FAA (Formalinacetic acidalcohol) and stored in 70 per cent alcohol with one per cent glycerine. Median sagittal sections from three selected specimens of each sample were prepared (8-10  $\mu$  thick) and were then dehydrated and stained according to NASMARK'S (1937) and DINNIK'S (1961) technique elucidating both the convolutions of the pars musculosa and the lobes of the testes. Determination of the species was based on NASMARK'S (1937) histological method, while the control worms of *Paramphistomum cervi* were derived from a Hungarian Collection.

### RESULTS AND DISCUSSION

The repeated examinations of individual Egyptian samples revealed that there were definite variations in the body dimensions of the mature worms from cattle and sheep (figs) 1-2), where the various worms from cattle appeared comparatively larger at every age than those of sheep and contained more ova (Table 1).

Characteristically, the pharynx was of calicophoron type (DINNIK, 1964) with a weakerly developed interior longitudinal muscle layer than it was indicated by NASMARK (1937), (Figs. 3-5). The gut caeca carried from five to six identical bands on either side of the body and the terminal parts of the caeca turn towards the dorsal surface. Although their blind ends touch each other but overlapping was fairly rare.



TABLE 1, Some measurements of *Paramphistomum microbothrium* from cattle and sheep

Hosts	Body in mm.	pharynx in mm.	Genital atrium in u			Diameter of the Acetabulum in mm.
			genital opening	Circular fold	genital chamber	
Cattle	6.0—11.0 ×	0.85—1.0 ×	400—700	160—350	150—190	1.6—2.0
	2.5—2.9	0.6—0.7				
Sheep	4.7—8.5 ×	0.65—1.0 ×	425—600	75—150	50—125	1.4—1.6
	2.0—3.0	0.45—0.6				

The genital atrium was of the Microbothrium type. Its structure was the same as has been described by NASMARK (1937). The sphincter papillae and the radial muscle layer of the genital atrium were fairly strongly developed (Figs 7-9). Measurements of the parts of the genital opening have been recorded in Table 1. The position of the genital opening might vary according to the circumstances of the fixation process, where in the most extreme cases it could be situated in front of the anterior tip of the pharynx (Fig. 8).

The number of the convolutions of the pars muscosa in specimens from cattle was 4-8, while from sheep they ranged from 7-10 bands. The testes which were approximately of the same size appeared deeply lobed, with 8-14 lobes in each.

The acetabulum was of the paramphistomum type (Figs 11-12 and Table 1). The corresponding muscular layers were well delimited as a dorsalis exterior 1 and 2 muscle series. (Table 2).



TABLE 2. The number of units in the circular muscle series of the acetabulum of *Paramphistomum microbothrium* from cattle and sheep and of *Paramphistomum cervi*

Hosts and Worms	d.e.1	d.e.2	d.i	v.e.	v.i.
Cattle					
<i>P. Microbothrium</i> . . . . .	13—20	16—37	38—42	16—19	44—56
Cattle					
<i>P. Cervi</i> . . . . .	10—17	15—30	29—44	12—15	46—50
Sheep					
<i>P. Microbothrium</i> . . . . .	13—28	21—32	20—47	15—22	43—62

d.e. = dorsalis exterior.

d.i. = dorsalis interior.

v.e. = ventralis exterior.

v.i. = ventralis interior.

The excretory pore was situated at a distance of 1.7-3.4 mm anterior to the posterior end of the body. The opening of the Laurer's canal was always behind the excretory pores and to the left side about 1.6-3.0 mm. from the posterior end. The excretory canal was 400-420 u in length. The eggs were approximately equal in size in specimens from cattle and sheep, being 149-160 u in length and 90-100 u width.

According to the previous findings, it was clear for the present writers to conclude that the materials under discussion belongs to *Paramphistomum microbothrium*. They differed from *Paramphistomum cervi*. Histologically, *Paramphistomum cervi* carried a pharynx of Liorchis type (Fig. 6) with a well developed interior longitudinal and middle circular muscle layers, while its genital atrium was of the Gracil type (Fig. 10) characterized by the slightly developed genital opening and the absence of circular and radial muscles. Its pars muscosa appeared poorly developed, exhibiting no convolutions and appeared as a straight tube measuring 0.70-0.75 mm. in length. The testes were slightly lobed with 3-5 lobes each. The acetabulum of *Paramphistomum microbothrium* and *Paramphistomum cervi* were of the same type, and the number of muscle units in the different muscle series did not demonstrate such a variance which we could emphasize it as a specific feature (Table 2).

In addition the present writers succeeded to infect *Bulinus truncatus* with miracidia of *Paramphistomum microbothrium*, while they failed to infect planorbid snails with these miracidia. On the other hand, the infection was succeeded in planorbids when the miracidia of *Paramphistomum cervi* were used.

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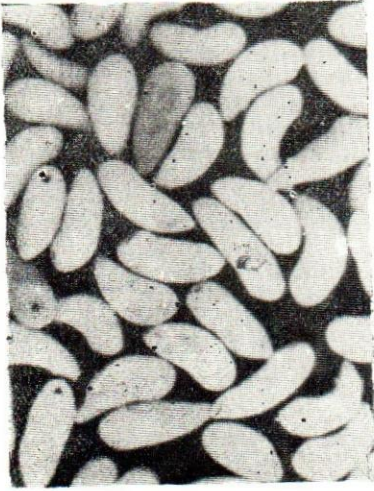


Fig. 1

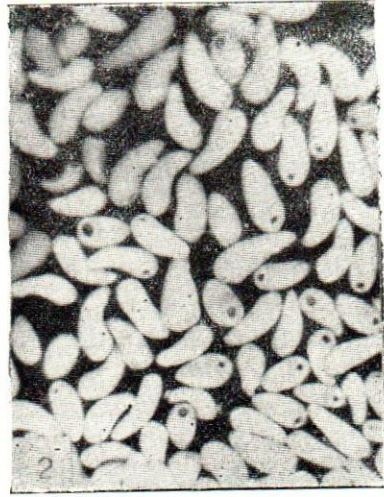


Fig. 2

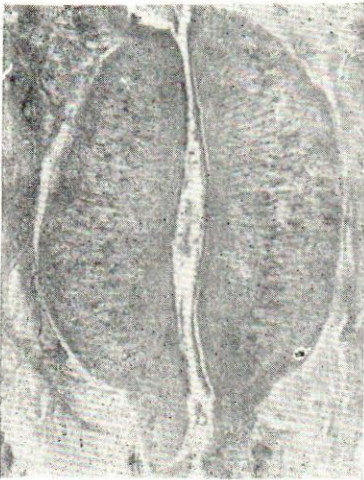


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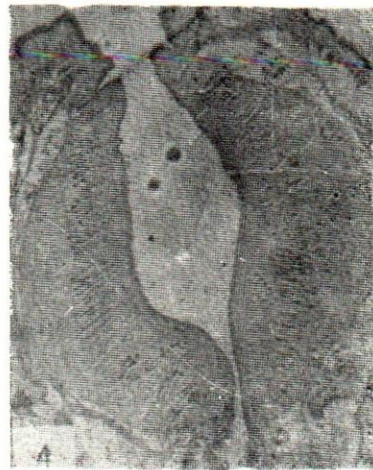


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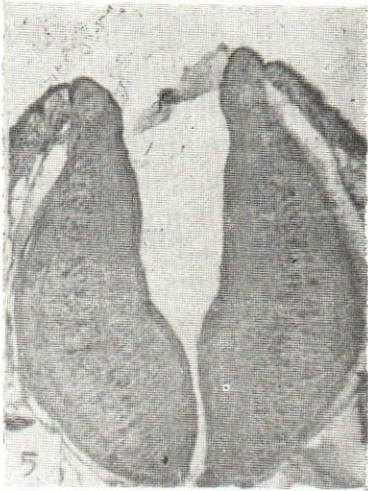


Fig. 5

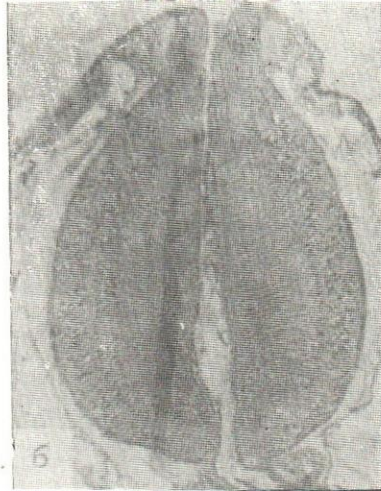


Fig. 6



Fig. 7



Fig. 8





Fig. 9

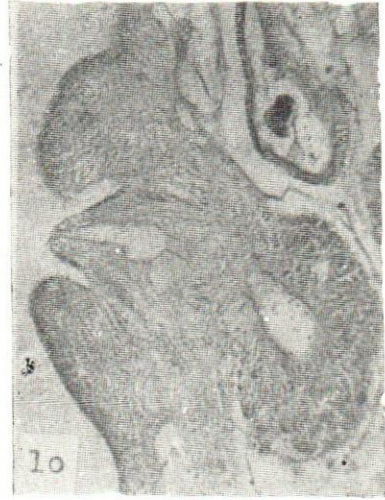


Fig. 10



Fig. 11



Fig. 12

Figs. 1-12. — Microphotos of *P. microbothrium* and *P. cervi*, 1-2 = fixed specimens *P. microbothrium* from cattle/ Fig. 1/ and sheep Fig. 2/, photos were made with the same magnification; 3-5 = median sagittal sections of the pharynx of *P. microbothrium*; 6 = median sagittal section of the pharynx of *P. cervi*; 7-9 = median sagittal sections of the genital atrium of *P. microbothrium*; 10 = median sagittal section of the genital atrium of *P. cervi*; 11-12 = median sagittal sections of the acetabulum of *P. microbothrium*, dorsal / Fig. 11 / and ventral. / Fig 12 / halves.