

Dept. of Parasitology,  
Fac. of Medicine, Assiut University,  
Head of Dept. Prof. Dr. R.M.A. Khalefa

## SOME ANOMALIES OF HYMENOLEPIS DIMINUTA (RUDOLPHI, 1819)

(With 7 Fig.)

By

FATMA, G. SAYED and A.A. HASSAN

(Received at 16/6/1994)

### بعض التشوهات الخلقية في ديدان الهمينوليبس ديمينوتا

فاطمه سيد ، محمد الله حسن

تم فحص ديدان الهمينوليبس ديمينيوتا المأخوذة من الأمعاء الدقيقة للفئران في مدينة  
أسيوط ووجد بها بعض التشوهات الخلقية . وتركزت هذه التشوهات في القطع الناصجة لهذه  
الديدان . وكانت النسبة المئوية للديدان المشوهة للعادية ٦٥ % .

وشملت الآتى :

- ١ - الاختلاف في عدد وترتيب وشكل وحجم الخصيات
- ٢ - الاختلاف في شكل وحجم المبيض
- ٣ - الانقسام الجزئي لبعض القطع الناصجة .
- ٤ - ظهور بعض القطع عقيمه .

## SUMMARY

Examination of *Hymenolepis diminuta* worms collected from the small intestines of naturally infected rats (*Rattus rattus*) in Assiut City revealed different anomalies. All these anomalies were observed in mature segments of the worms and include the following: 1-The number, the arrangement, shape and size of the testes. 2- Shape and size of the ovary. 3- Incompletely segmented mature segments. 4- Sterile segments.

Keywords: Anomalies *Hymenolepis diminuta*.

## INTRODUCTION

Congenital anomalies among cestodes were studied by many authors (COATS, 1891, MERDIVENCI, 1964, and HAMDY, 1971). Abnormalities among *Hymenolepis* species were recorded by BACIGALUPO (1952), HEYNEMAN (1961), HAMDY *et al.* (1979) and SIDKY (1981). In the present study some observations on the anomalies of *Hymenolepis diminuta* worms were recorded.

## MATERIAL AND METHODS

*Hymenolepis diminuta* worms were collected from 50 naturally infected rats (*Rattus rattus*). After sacrifice, the rats were dissected, their small intestines were removed, opened and examined under a dissecting microscope. Adult worms were removed from the intestines and washed in saline several times, flattened and then were fixed in 70% alcohol. Staining of the worms was done using acetic acid-alum carmine. The worms were then dehydrated in ascending grades of alcohol and then cleared in clove oil for few minutes and mounted in Canada balsam for microscopic examination. The abnormalities of the worms were photomicrographed.

## RESULTS

The incidence of *H. diminuta* infection among the collected rats (*Rattus rattus*) was 40%. Microscopic examination of *H. diminuta* worms revealed 65% of the worms showing abnormalities in mature segments in the forms of:

1. Absence of poral testis (Fig. 1, a).
2. Two sporal testes one overlapping the other (Fig. 1, b).
3. Two aporal testes fused together (Fig. 2, a).

## ANOMALLES OF HYMENOLEPIS DIMINUTA

4. Two aporal testes occur in a tandem position (Fig. 2,b)
5. Lack of one (the medial) aporal testis (Fig. 2,c)
6. Presence of three aporal testes (one of them smaller than the others), (Fig. 2,d)
7. Lack of one (the lateral) aporal testis (Fig. 3,a)
8. Presence of smaller ovary (Fig. 3,b)
9. Lack of ovary and presence of three poral testes two of them small and one bigger.  
- the three previously mentioned anomalies occur in three successive segments, (Fig. 3,c)
10. Incomplete separation of two segments showing four aporal testes, partially fused two ovaries, (Fig. 4,a). This segment showing tandem two aporal testes, (Fig. 4,b)
11. Presence of three aporal testes with lack of the poral one (Fig. 5,a)
12. Presence of three aporal testes with the poral one in its place (Fig. 5,b)
13. Reciprocal position of testes; one aporal and two poral (Fig. 6,a,b)
14. Appearance of sterile segments Fig. (7)
15. Size and location of aporal and/or poral tests were noticed to be different in serial segments.

### DISCUSSION

*Hymenolepis diminuta* Rudolphi, 1819, the common rat tape worm is of wide world distribution. In this paper investigations on some congenital anomalies in *Hymenolepis diminuta* worms from rats (*Rattus rattus*) revealed that: Most abnormalities are found in the arrangements and numbers of the testes in mature segments. Other anomalies such as incompletely separated mature segments, the appearance of sterile segments and difference in shape or size of the ovary are uncommon. According to the available literature the anomalies in the arrangements of the testes were recorded for the first time in the present work.

Bacigalupo and Bacigalupo (1952) noticed abnormal eggs of *Hymenolepis diminuta*. Sidky (1981) recorded different abnormalities of mature and gravid segments of *Hymenolepis diminuta* from *Rattus rattus* such as sterile mature and gravid segments, fused mature segments and intercalary mature segments.

On the other hand, HAMDY et al. (1979) studied some anomalies of *Hymenolepis nana* and observed alternating common genital pore for two successive segments and intercalary proglottids. These anomalies were not recorded in the present

study. Heyneman (1961) suggested that these anomalies appear to be an interference with the normal pattern of differentiation and growth. He stated that this phenomenon represents a mutation activated by a specific host strain or an extraordinary specific direct host influence on an otherwise normal parasite. Sidky (1981) mentioned that the anomalies may be of interest as regards factors affecting the growth of the worms. The present authors noticed that most of the anomalies occur in successive segments or segments separated from each other by very few normal segments. Also it was noticed that these anomalies were oftenly encountered in *Hymenolepis* worms obtained from *Rattus rattus* (Sidky, 1981 and Present study) which might denote that this rodent is unsuitable host for *H. diminuta*.

Other explanation for the congenital anomalies might be due genal mutation. This phenomenon is, therefore, in need of further investigations to find out the factors affecting abnormal cleavage and formation of *H. diminuta* worms; particularly after the recent progress in molecular biology.

#### REFERENCES

- Bacigalupo, J. and Bacigalupo, A.D. (1952): Oeufs anormaux d'*Hymenolepis diminuta* Coptes Rendus des Seances de La Socit, 146/ p.589.
- Coats, J. (1891): A case of prismatic variety of *Taenia saginata*. Glasgow Med. J., 35., (2) p.103.
- Hamdy, E.I. (1971): A note on an anomalous *T. saginata*. J. Egypt. Soc. Parasit., 1: 151-154.
- Hamdy, E.I. Nasr, N.T. and Amin, F.A. (1979): Some anomalies of *H. nana*. Ibid., 9 (2): 443-447.
- Heyneman D. (1961): A natural population of anomalous branched *H. nana* in a colony of DBA/1 mice. Nature, 191: 292.
- Merdivenci, A. (1964): An abnormal *T. saginata* with double genital pores. J. Parasitol. 50 (2).
- Sidky, H.A. (1981): Some abnormalities of *Hymenolepis diminuta* (Rudolphi 1819). J. Egypt. Soc. Parasit. 11 (1): 83-86.

#### Description of Figures Plate (I)

- Fig. (1) a : Absence of poral testis.  
b: Two testes one overlapping the other.
- Fig. (2) a: Two aporal testes fused together.  
b: Two aporal testes occur in tandem position.  
b: Lack of one (medial) aporal testis.  
d: Presence of three aporal testes.

*ANOMALLES OF HYMENOLEPIS DIMINUTA*

- Fig. (3) a: Lack of one (Lateral) aporal testis.  
b: presence of smaller ovary.  
c: Lack of ovary and presence of three poral testes.  
Fig. (4) a: Incomplete separation of two segments showing 4 aporal testes, partially fused two ovaries.  
b: Tandem two aporal tests.

Plate (II)

- Fig. (5) a: Presence of three aporal testes with lack of the poral one.  
b: Presence of three aporal testes with the poral one in its place.  
Fig. (6) avb: Reciprocal position of testes, one aporal and two poral.  
Fig. (7) sterile segments.

Fig. (1)

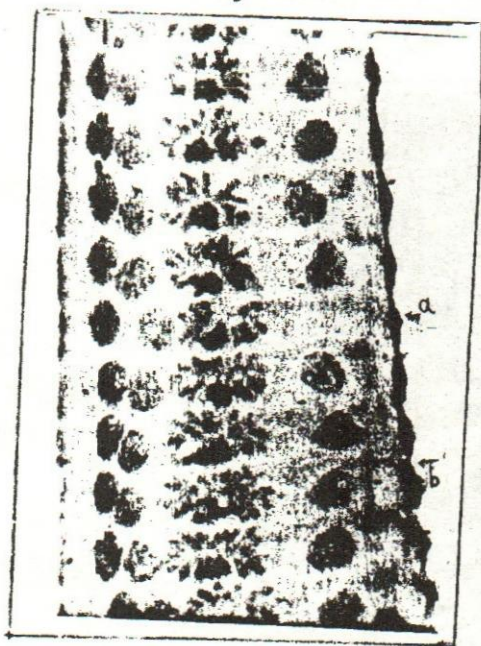


Fig. (2)

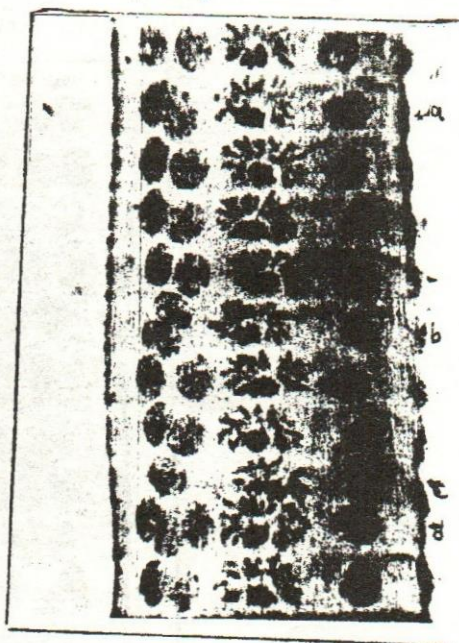


Fig.(3)

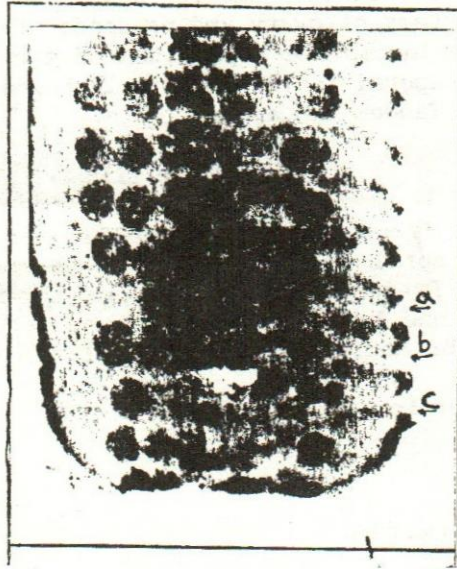


Fig. (4)

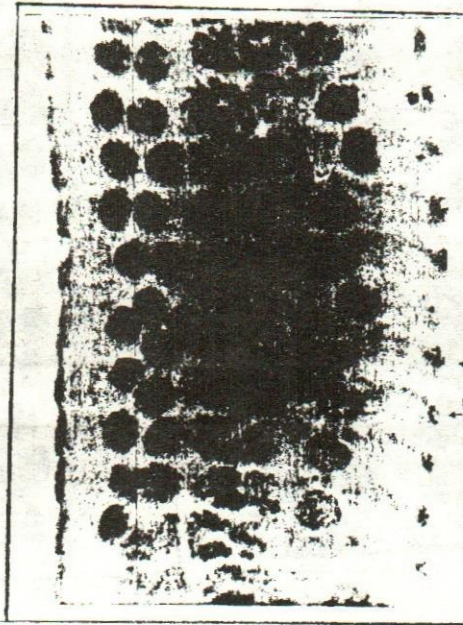


Fig. (5)

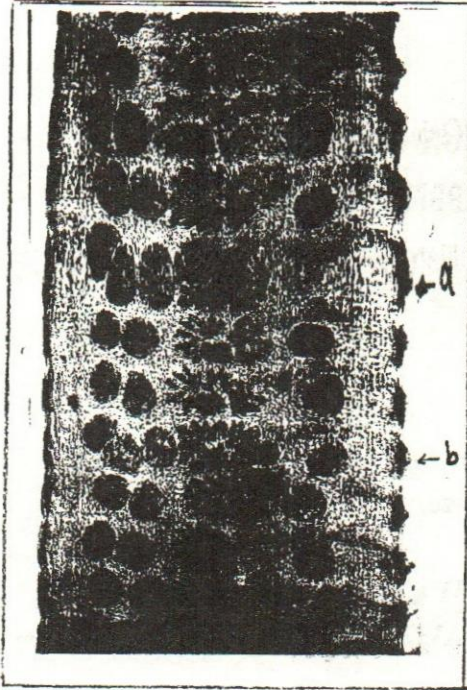


Fig. (6)

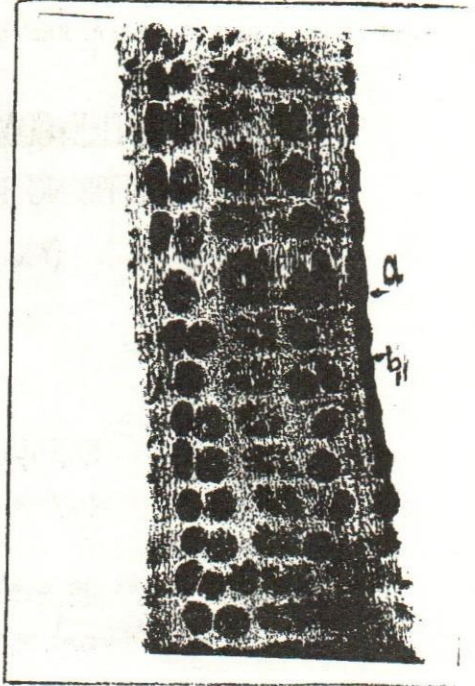


Fig (7)

