

كلية الطب .
قسم الطفيليات والميكروبيولوجيا .
رئيس القسم : أ . د . / عماد كامل نافع .

د راسة على مورفولوجية ديبثالونيميا فيثي ودورة حياتها
في القوارض في محافظة أسيوط - مصر

محفوظ فهمي ، محمد الصادق ، رفعت خليفة ، عبد الرحمن محمد ،
محمود الهادي منيب

وجد الباحثون اناث الديدان البالغة في نوعين من القوارض
بمحافظة أسيوط . واكتشف الباحثون لأول مرة مكان معيشة
الديدان في العائل النهائي (تحت الجلد) وقام الباحثون
بوصف الديدان وصفا كاملا وكذلك الميكروفلاريا التي توجد في
الدماء الطرفية للفئران المعدية ليلا ونهارا .

وقد حاول الباحثون اتمام دورة حياة هذا الطفيل في بعوض
الكيولكس والقراد اللين (ارجاس) وبق الفراش ، وقد
نجحت العدوى في القراد اللين ووصف الباحثون الأطوار
الموجودة في العائل الناقل ، غير ان محاولة عدوى فئران
معملية من هذه الحشرات لم تنجح .

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**STUDIES ON THE MORPHOLOGY AND LIFE CYCLE OF DIPTALONEMA
VITAE IN RODENTS OF ASSIUT PROVINCE EGYPT**
(With 3 Figures)

By
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SUMMARY

Adult females of Diptalონema vitae were found in subcutaneous tissue of one Rattus rattus frugivorus and Rattus norvegicus caught near Assiut city. Incidence of infection was low (0.45% and 1.6% respectively). Unsheathed microfilariae were described from peripheral blood of naturally infected rodents. Trial to explore the life cycle of the parasite yielded filariform larvae in soft ticks (Argas persicus persicus), 10-12 days after feeding on heavily infected rats. Trials to complete the life cycle in laboratory rats failed.

INTRODUCTION

ARAFA et al. (1974) recorded for the first time the presence of unsheathed microfilariae in the peripheral blood of some rats in Egypt. They were in doubt the exact taxonomic position of the microfilariae although they stated they were very similar to microfilariae of D. vitae. This work was done with a hope to find the adult worm of those microfilariae and to find the vector which transmits the parasite among rodents.

MATERIAL and METHODS

Among a big collection of rodents one white-bellied rate (Rattus rattus frugivorus) out of 232, and one Norway rat (Rattus norvegicus) out of 63, were found infected with microfilariae of O. vitae. Dissection of the two rats revealed the presence of adult female in the subcutaneous tissues. Microfilariae were examined and described from fresh specimens in wet preparations as well as thick drops stained with Giemsa stain. Adults were described and drawn by camera lucida. Laboratory bred Culex pipiens, Argas persicus persicus and cimex lectularis were allowed to feed on the laboratory infected rates. Periodical examination on the experimentally infected arthropods was done by squeezing, dissection and serial sectioning for determination of developmental stages. Also, trials were done to infect laboratory rats from experimentally infected mosquitoes, soft ticks and bed bugs.

RESULTS

Order Filariidae CLAUD, 1885. - Family Diptalonematidae WEHR, 1935.

Genus Diptalonema DIESING, 1861. - Diptalonema vitae Derpkagors KAYA, 1933.

Only female adult worms were encountered in the subcutaneous connective tissue of two rodents; one out of 232 (0.45%) Rattus rattus frugivorus and one out of 63 Rattus norvegicus (1.6%). Worm burden was only four worms in the former and six worms in the latter.

Adult female is filariform measuring 15-65 mm. in length and 0.46 - 0.49 mm. in maximum width. The cuticle is smooth and milky white in colour. Mouth opening is not surrounded by lips. Cephalic papillae are not conspicuous but there is a chitinous ring attached to the anterior extremity of the oesophagus which is cylindrical and without a clear line of demarcation between the anterior and posterior parts. It measures 2.2 - 2.6 mm. in length and 0.2 - 0.22 mm. in width. There are 2 cuticular shields which extend laterally on both sides of the anterior portion (Fig. 1a). The posterior extremity is long and tapering (Fig. 1b). The tail ends with two appendage-like processes (Fig. 1c). The vulva is present at a distance of 1.2 - 1.3 mm. from the anteriorend. The alimentary canal is not well demarcated in gravid females as the body cavity becomes mostly occupied by the uterus packed with larvae. The anus is subterminal, 0.6 - 0.68 mm. from the posterior end.

The microfilariae are found in peripheral blood without obvious periodicity. They are unsheathed with a broad cephalic end (Fig. 2). They measure 0.22 - 0.23 mm. in length & 0.009 - 0.010 in width.

By squeezing or dissecting of Culex pipiens, Argas persicus persicus and Cimex lectularis previously fed on heavily infected rat, a filariform transparent larva was recovered from a soft tick 10 - 12 days after an infective blood meal. The larvae which measure 230 - 240 U was characterised by having a well developed cylindrical oesophagus extending beyond the middle of the body (Fig. 3). It measured 130 - 134 U in length and 9 - 10 U in width. Cuticle is aspinous. There are four pairs of papillae, three of which are distributed on the 2 lateral margins of the anterior part of the oesophagus. The other pair is situated at the anterior portion of the body (Fig. 3). A small spine protrudes from the anterior extremity.

Serial sections of some soft ticks which have been submitted to infection with the rodent microfilarial failed to reveal the larvae. Also trials to continue the life cycle in albino rats & wild rodents through culicine mosquitoes, soft ticks & bed bugs failed.

DISCUSSION

There are about forty species of the genus Diptaltonema (CHABAUD and CHAQUET, 1933). SAHACHER (1973) stated that among 85 genera and species of filarial worms, only Brugia phagani was reported to occur in Muridae. However, WORM et al. (1961) reported natural infection of D. vitae in the Libyan jird. BARN (1967) also reported that filarial worm D. vitae has been found in rodents as definitive hosts and were transmitted by soft and hard ticks. AFAFA et al. (1974) were the first to report natural infection of rats in Egypt with unsheathed microfilariae identical with D. vitae. The present work, however includes the first description of the adult worm in Egypt. The description agrees with the morphological features of the genus as described by YAMAGUTI (1961).

BURN (1967) suggested that soft & hard ticks are the vectors necessary for transmission of D. vitae. This was provisionally proved during the present work. However, further work is still required to reveal the whole life cycle of this worm.

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EXPLANATION OF FIGURES

- Fig. (1): Female adult worm of D. vitae.
A- Anterior end
B- Posterior end
C- Spine-like oppendages at the posterior extremity.
- Fig. (2): Microfilariae of D. vitae in peripheral blood.
- Fig. (3): Developmental stage of D. vitae:
A- Larva in soft tick (Argas persicus)
B- Anterior part of the larva showing pupilay pattern.

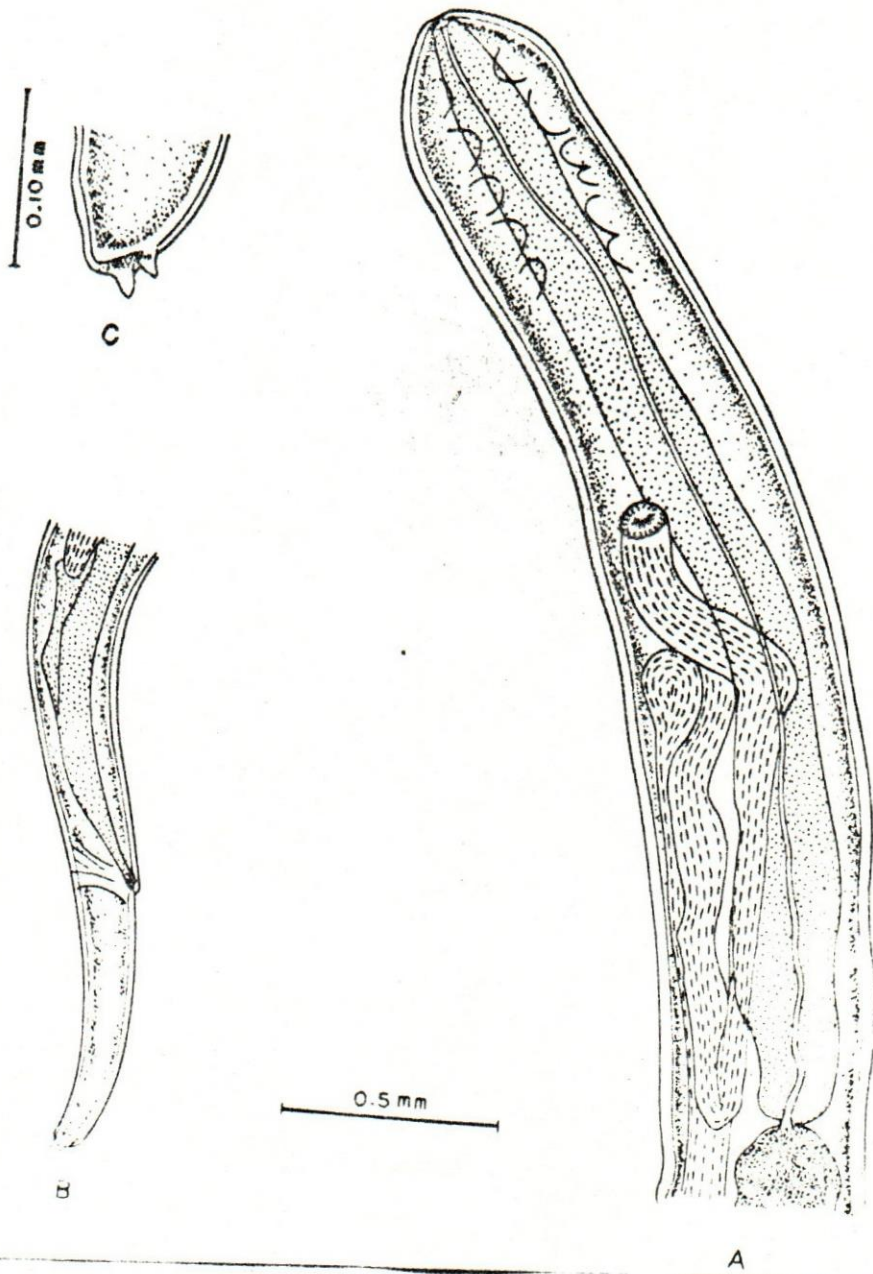


Fig. : (1)

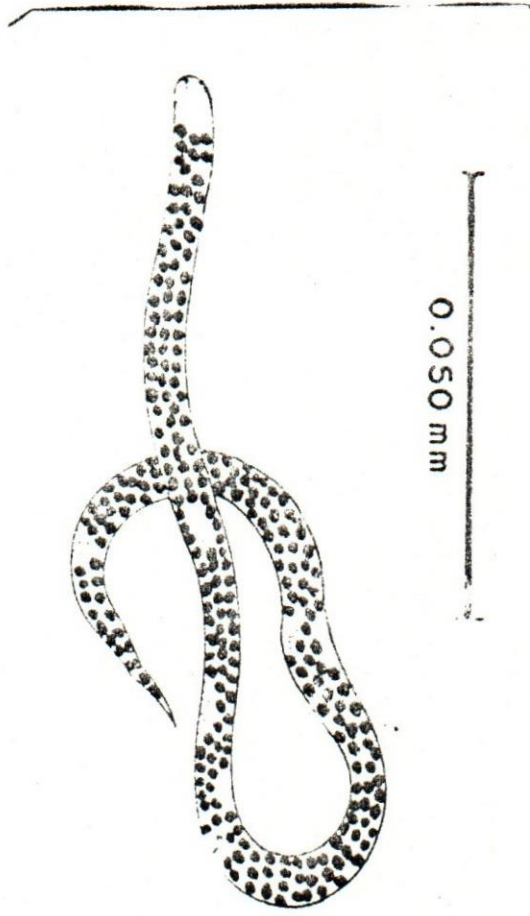
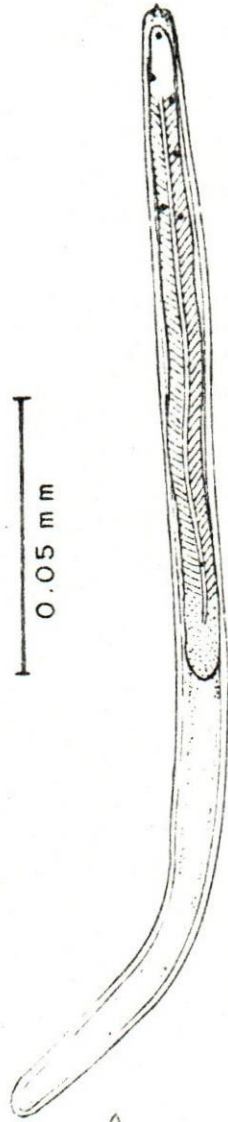
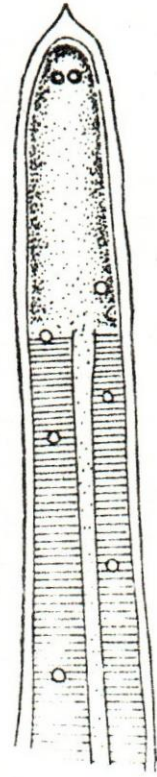


Fig. : (2)



A

Fig. : (3)



B