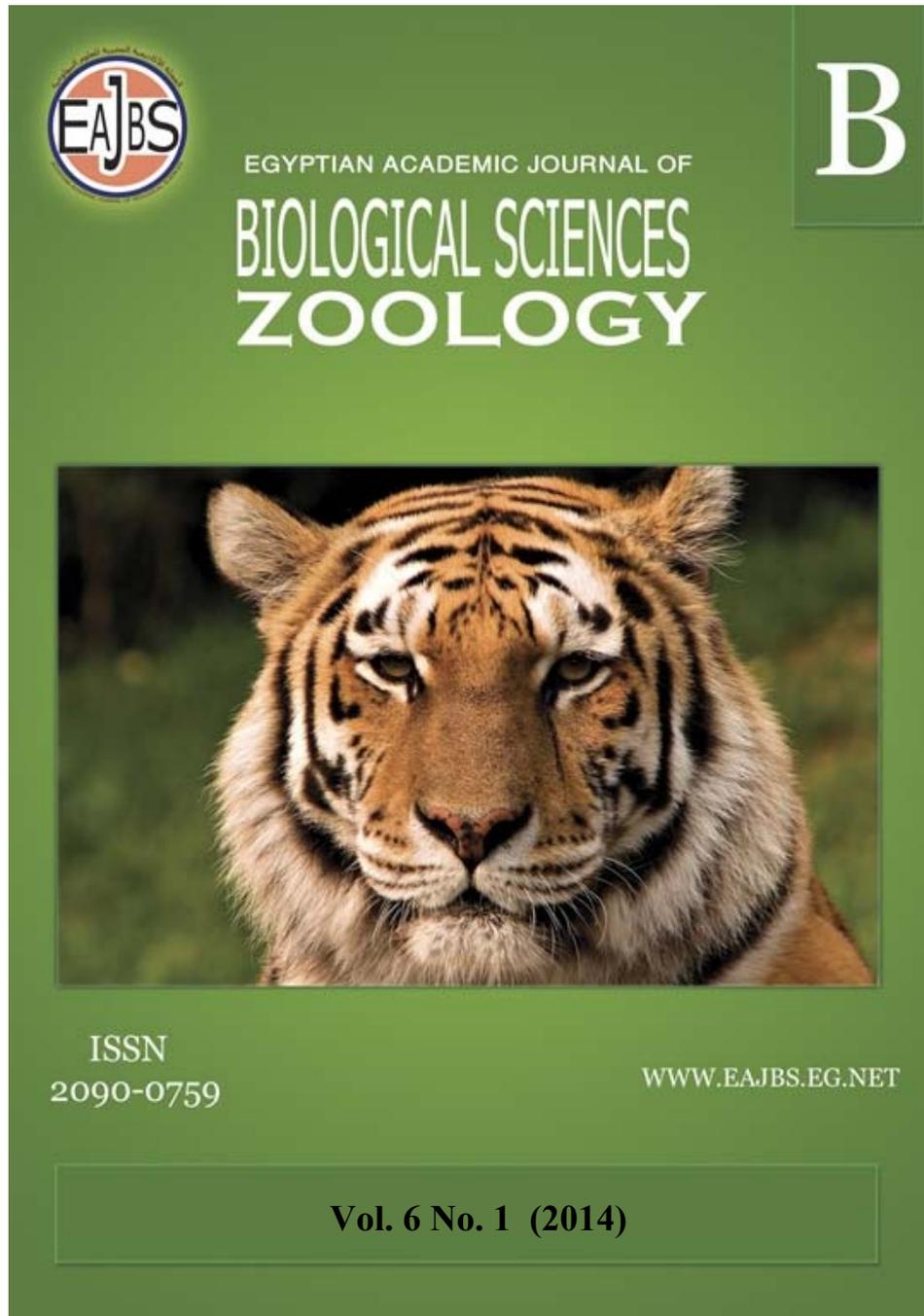


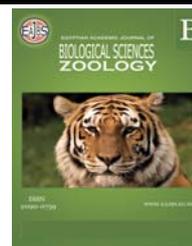
Provided for non-commercial research and education  
use.



Egyptian Academic Journal of Biological Sciences is the official English language journal of the Egyptian Society of Biological Sciences ,Department of Entomology ,Faculty of Sciences Ain Shams University .

The Journal publishes original research papers and reviews from any zoological discipline or from directly allied fields in ecology, behavioral biology, physiology, biochemistry, development, genetics, systematics, morphology, evolution , and general zoology.

[www.eajbs.eg.net](http://www.eajbs.eg.net)



## Redescription of two nematode parasites infecting Reptilia in Qena Governorate

Sohier A. Rabie, Mohey El-din Z. Abd El-Latif, Nadia I. Mohammed  
and Obaida F. Aboelhussien

Zoology department, Faculty of science, South Valley University, Egypt.

### ABSTRACT

During a helminthological examination of *Tarentola annularis* (Geoffroy, 1828) and *Chalcides ocellatus* (Forsk., 1775), 12 out of 60 *Tarentola annularis* were found to harbour a large number of *Spauligodon aspiculus*, 30 out of 106 *Chalcides ocellatus* were found to harbour *Thelandros aegypti*.

**Key words:** *Tarentola annularis*, *Chalcides ocellatus*, *Spauligodon aspiculus* and *Thelandros aegypti*.

### INTRODUCTION

The genus *Spauligodon* was established when *Pharyngodoninae*, Travassos, 1919 was revised. Skrjabin *et al.*, (1960) retained *Pharyngodon* Diesing 1861, *Parathelandros* Baylis, 1930 and established *Spauligodon* Skrjabin, Schikhobalova and Lagodovskaja, 1960. They also placed the remaining genera in the Oxyuridae or Ozolaimidae. Chabud and Brygoo in 1962 suggested that the most important factor in speciation of reptilian oxyurids would be the geographical distribution.

Bursey and Goldberg (1995) stated that the species of *Spauligodon* can be separated on the basis of presence or absence of the spines on the tail of female and the shape of eggs.

While the genus *Thelandros* was established by Wedl (1861) for *T. alatus*, a nematode from the intestine of an Egyptian mastigure, *Uromastix aegyptia*, collected in Egypt. Chatterji (1933) described *parapharyngodon maplestoni* from the intestine of an oriental garden lizard, *Calotes versicolor*, collected in Burma. However, Baylis (1936), Karve (1938), Garcia-Calvente (1948) and Skryabin *et al.* (1951) considered this genus is a synonym of *Thelandros* Wedl, 1861. Freitas (1957), Sharpilo (1976), Adamson (1981), Baker (1987), Castaño-Fernandez *et al.* (1987), and Hering-Hagenbeck *et al.* (2002) considered *Parapharyngodon* different from *Thelandros* for the following reasons: Males of *Thelandros* have a genital cone, pendulant papillae outside the genital cone, lateral alae absent, and the tail is terminal and directed posteriorly; males of *Parapharyngodon* lack a genital cone, mammiliform papillae surrounds a more-or-less terminal anus, lateral alae are present, and the tail is subterminal and directed dorsally. Currently, 31 species are assigned to *Thelandros*, 13 from the Ethiopian realm, 11 from the Palaearctic realm, 3 from the Nearctic realm, 2 from the Oriental realm, 1 from the Neotropical realm, and 1 from the Australian realm (Bursey and Goldberg 2005).

## MATERIALS AND METHODS

60 specimens of *Tarentola annularis* and 106 specimens of *Chalcides ocellatus* were collected from Qena Governorate. The body cavity was opened and the gastrointestinal tract was removed by cutting across the oesophagus and rectum. The oesophagus, stomach, small intestine and large intestine of each host were examined separately for parasites. Nematodes were placed in glycerol, allowed to clear and examined under light microscope.

## RESULTS AND DISCUSSION

### *Spauligodon aspiculus* (Fig. 1 and 2)

**General:** Small nematodes; body tapering at both ends. The excretory pore is below the level of the oesophageal bulb. The oesophagus ends in valvulate, subspherical bulb which separated from oesophagus body by small constriction. The posterior part of tail is elongated, smooth and forms a thin needle-like projection.

**Male:** Small, white, fusiform nematodes; body tapering at both ends: length 1.51 mm (0.96-2.6 mm); width at level of excretory pore 0.16 mm (0.13-0.17 mm). Two lateral cuticular alae extend a long body, anteriorly initiating slightly in front of nerve ring level and posteriorly reaching to cloaca. The alae are well expanded near the posterior end of body. They measure about 0.02-0.29 mm in width and 0.09-0.11 mm in length. The oesophagus is cylindrical in shape and measures about 0.35 (0.32-0.39 mm) in length (including bulb), the distance of excretory pore from the anterior end is 0.65 (0.60-0.71 mm). The tail is provided with well developed membranous expansion called the caudal alae. The tail is filiform and extends beyond postcloacal papillae. It measures about 0.14 (0.11-0.2 mm) in length and the spicule is absent. There are three pairs of genital papillae, not all included in caudal alae. The first pair is preanal and formed from small sessile papillae. The second one is the first of the postanal pairs and situated near the posterior end of caudal alae. The second postanal pair is formed a large pedunculated papillae and situated immediately below forgoing pair.

**Female:** Small, white, fusiform nematodes; body tapering at both ends: length 3.36 (2.98-3.75 mm), width 0.22 (2.98-3.75 mm). The lateral cuticular alae are absent. The oesophagus is cylindrical in shape and measures about 0.46 (0.44-0.47 mm) in length. The excretory pore is slightly below the level of the oesophageal bulb and the distance from the anterior end is 0.57 (0.54-0.5 mm). The vulva is situated a short distance below the excretory pore and the distance from the anterior end is 0.61 (0.57-0.63 mm). The tail is conical, 0.4 (0.39-0.40 mm) in length and the filamentous part with no spines. The vagina is a well developed muscled tube. The ovaries are situated at the posterior half of the body. The egg is oval in shape, having a thin shell and measures 122-140  $\mu\text{m}$  in length and 54-62  $\mu\text{m}$  in width.

Burse and Goldberg (1995) stated that the species of *Spauligodon* can be separated on the basis of presence or absence of the spines on the tail of female and the shape of eggs.

The total absence of male spicule aligns the species under discussion with three other species of *Spauligodon* which are known to occur in reptiles. These species are *Spauligodon caymanensis* Bursey and Goldberg, 1995. *Spauligodon hemidactylus* Bursey and Goldberg, 1996 and *Spauligodon petersi* Bursey *et al.*, 1997. Nevertheless, there are a substantial differences between the present species and both of *S. caymanensis* and *S. hemidactylus*. These differences can be summarized as follows:

The present worm has 3 rounded lips but *S. caymanensis* and *S. hemidactylus* have 3 bilobed lips.

The present nematode has no spines on the tail of both males and females, but the tail of *S. caymanensis* and *S. hemidactylus* are provided with spines.

There are mensural variations between the present species and both of *S. caymanensis* and *S. hemidactylus*. The absence of cuticular spines on the tail of female is a characteristic feature binding the present species with *S. vojteki* Moravec *et al.*, 1987, *S. gehyrae* Bursey and Goldberg, 1996 and *S. petersi* Bursey *et al.*, 1997. *S. gehyrae* differs from the present species by the possession of male spicule, bilobed lips and the mensural variations. However *S. petersi* differs from the present species in the shape of lips and the mensural variation. By comparing the present species with *S. vojteki* Moravec *et al.*, 1987, it is clear that the present parasite is closed to *S. vojteki* in its measurements. Moravec *et al.*, (1987b) reported that *S. vojteki* is characterized by: three bilobed lips, the presence of male spicule and the egg width was 48-51  $\mu$  m.

However, the present species differs from *S. vojteki* by having 3 rounded lips and absence of male spicule. Moreover, the egg width of the present species is 54-62  $\mu$  m.

#### ***Thelandros aegypti* (Fig. 3, 4)**

**General:** Small nematodes; body tapering at both ends. The oesophagus is cylindrical and ending by a well developed bulb. The body is transversely striated and this striation of cuticle is extending from the cephalic collarete to the posterior end.

**Male:** Small, white; body tapering at both ends: length 3.2 (2.85-3.6 mm); width 0.28 (0.24-0.32 mm). The length of oesophagus (including bulb) is 0.56 (0.48-0.65 mm). The testes are situated at the midbody. The male tail is narrow and its length is 0.03-0.05 mm. Lateral alae is near the level of oesophageal isthmus. There are 3 pairs of anal papillae, the first and the second are pre and perianal. The last pair is situated at the mid point of dorsal projection. There is a single slender spicule, the distal end of this spicule is rounded and is 0.062-0.067 mm in length.

**Female:** The body length is 4.25 (3.65-4.85 mm); width 0.30 (0.25-0.36 mm). The length of oesophagus is 0.87 (0.76-0.98 mm). The vulva is post-equatorial and the distance of vulva from the anterior end is 2.4 (2.1-2.7 mm). The anterior ovary extends to the level of excretory pore and the posterior ovary extends posteriorly to the anal opening. The two uteri are opposed and the eggs are oval in shape. The egg is 78.69-84.27  $\mu$  m long and 51.34-68  $\mu$  m wide.

Walton (1941) reviewed the geographical and host distribution of genus *Thelandros*. He pointed out that the majority of the known species are from North Africa. However, a few species were reported from Asian, South American hosts and one from Australia. Walton (1941) described legless lizard and the female of *Thelandros sp.* from California. Read and Amrein in 1951 stated that the genus *Thelandros* consists of twenty three described species. Twenty-two of them have been described from reptiles and one from an amphibian Skrjabin *et al.*, (1960) reported that the presence or absence of lateral alae has a great importance to separate the genus, *Thelandros wedi*, 1861 and *Parapharyngodon Chatterji*, 1933. Several subsequent authors accepted their suggestion. Adamson (1981) redefined *Parapharyngodon* and *Thelandros* and distinguished them on the basis of male and female caudal morphology and egg structure. He also reported that *Parapharyngodon* spp. were found in insectivorous reptiles and amphibians, where *Thelandros spp.* are essentially parasites of herbivorous and omnivorous reptiles. Adamson and Nasher (1984b) described the pharyngodonid nematode, *Thelandros popovi* Markov and Bogdanov, 1963 from the posterior intestine of *Agama adramitana* in Saudi Arabia. Gupta and Duggal (1989) described *Thelandros baylist chatterji*, 1935 from the intestine of rock lizard, *Agama hemalayana* in Amerein, 1951. While *T. californiensis* male possesses 4 pairs of anal papillae, the present species and all closely related species have only 3 pairs of male anal papillae.

By comparing the present material with *T. bicaudantus*, *T. minutus*, *T. baylisi* and *T. popovi*, it is clear that the present species has some similarity to both *T. popovi* and *T. baylisi*

due to the presence of caudal alae in all. However, the present nematode differs from *T. popovi* in the following:

- The oral opening of the present worm is surrounded by 3 lips but *T. popovi* has no lips.
- The clear mensural variations between them.
- The host and locality.

## REFERENCES

- Adamson, M. L. (1981): *Parapharyngodon osteopili* n. sp. (Pharyngodonidae: Oxyuroidea) and a revision of *Parapharyngodon* and *Thelandros*. Systematic Parasitology, 3: 105-117.
- Adamson, M. L. and Nasher, A. K. (1984a): Pharyngodonidae (Oxyuroidea: Nematoda) of *Agama yemenensis* in Saudi Arabia: hypothesis on the origin of pharyngodonids of herbivorous reptiles. Syst. Parasitol., 6 (4): 299-318.
- Adamson, M. L. and Nasher, A. K. (1984b): Pharyngodonidae (Oxyuroidea: Nematoda) of *Agama yemenensis* in Saudi Arabia with notes on *Parapharyngodon*. Can. J. Zool., 62 (12): 2600-2609.
- Baker, M. R. (1987): Synopsis of the Nematoda parasitic in amphibians and reptiles. Memorial University of Newfoundland Occasional Papers in Biology, 11: 1-325.
- Baylis, H. A. (1936): Nematoda. I. Ascaridoidea and Strongyloidea. The Fauna of British India. Taylor and Francis, London, UK, 408 pp.
- Burse, C. R. and Goldberg, S. R. (1995): *Spauligodon caymanensis* sp. n. (Nematoda: Pharyngodon) from *Anolis conspersus* (Sauria: Polychridae) from Grand Cayman Island. British West Indies. J. Helminthol. Soc. Wash., 62 (2): 183- 187.
- Burse, C. R. and Goldberg, S. R. (1996b): *Spauligodon gehyrae* n. sp. (Nematoda: Pharyngodonidae) from *Gehyra oceanica* (Sauria: Gekkonidae) from Guam, Mariana Islands, Micronesia. J. Parasitol., 82 (6): 962-964.
- Burse, C. R. and Goldberg, S. R. (1996c): *Spauligodon hemidactylus* n. sp. (Nematoda: Pharyngodonidae) from *Hemidactylus frenatus* (Reptilia: Gekkonidae) from Oceania. J. Parasitol., 82 (2): 299-301.
- Burse, C. R. and Goldberg, S. R. (2005): Two new species of Pharyngodonidae (Nematoda: Oxyuroidea) and other nematodes in *Agama caudospina* (Squamata; Agamidae) from Kenya, Africa. Journal of Parasitology, 91: 591–599.
- Burse, C. R.; McAllister, C. T. and Freed, P. S. (1997a): *Spauligodon petersi* sp. n. and *Spauligodon smithi* sp. n. from lizards of cape province, South Africa. J. Helminthol. Soc. Wash., 64 (2): 234-239.
- Castaño-Fernandez, C.; Zapatero-Ramos, L. M.; Solera-Puertas, M. A. and Gonzalez-Santiago, P. M. (1987): Descripción de *Parapharyngodon lilfordi* n. sp. (Oxyuroidea, Pharyngodonidae) en *Podarcis lilfordi* (Reptilia, Lacertidae) de las Islas Baleares. Revista Ibérica de Parasitología, 47: 275-281.
- Chatterji, R. C. (1933): On a new nematode, *Parapharyngodon maplestoni* gen. nov., sp. nov., from a Burmese lizards. Annals of Tropical Medicine and Parasitology, 27: 131–134.
- Freitas, J. F. T. (1957): Sobre os gênero *Thelandros* Wedl, 1962 e *Parapharyngodon* Chatterji, 1933, com descrição de *Parapharyngodon alvarengai* sp. n. (Nematoda, Oxyuroidea). Memórias do Instituto Oswaldo Cruz, 55: 21-45.
- García-Calvente, I. (1948): Revisión del género *Pharyngodon* y descripción de nuevas especies. Revista Ibérica de Parasitología, 8: 367-410.

- Gupta, N. K. and Duggal, C. L. (1989): On two oxyurid nematodes from rock lizard in Himachal Pradesh. Res. Bull. Pan. Univ. Sci., 40 (1-2): 85-87.
- Hering-Hagenbeck, S. F. B. N.; Petter, A. J. and Boomker, J. (2002): Redescription of some *Spauligodon* spp., and *Parapharyngodon* spp., and of *Skrjabinodon mabyae* (Sandground, 1936) Inglis, 1968 (Pharyngodonidae: Oxyuroidea) from insectivorous South African lizards. *Onderstepoort Journal of Veterinary Research*, 69: 7-29.
- Karve, J. N. (1938): Some nematode parasites of lizards. Pages 251-258 in Livro jubilar do professor Lauro Travassos, editado para comemorar o 25 aniversario de suas actividades scientificas (1913-1938). Typographia do Instituto Oswaldo Cruz, Rio de Janeiro, Brasil.
- Moravic, F.; Barus, V. and Rysavy, B. (1987b): Some parasitic nematodes, excluding Heterakidae and Pharyngodonidae, from reptiles in Egypt. *Fol. Parasitol.*, 34: 269-286.
- Sharpilo, C. P. (1976): Parasitic worms of the reptilian fauna of the USSR: Systematics, chorology, biology. Naukova Dumka, Moscow, 287 pp. (In Russian).
- Skryabin, K. I.; Shikhobalova, N. P. and Mozgovoy A. A. (1951): Key to Parasitic Nematodes. Vol. 2. Oxyurata and Ascaridata. Izdatel'stvo Akademii Nauk S.S.S.R., Moscow (English translation by Amerind Publishing Co. Pvt. Ltd., New Delhi, India, 1982, 703 pp.).
- Skrjabin, K. I.; Shikhobalova, N. P. and Lagodovskaya, E. A. (1960): Oxyurata of animal and man. part I. *Osnovynematologii* 8. Publ. House Acad. Sci. U.S.S.R., Moscow.
- Walton, A. C. (1941): Distribution of the genus *Thelandros* (Nematoda: Oxyurida). *Proc. Helminthol. Soc. Wash.*, 8: 15-18.
- Wedl, K. (1861): Zur Helminthenfauna Ägyptens. *Akademie der Wissenschaften. Mathematisch-Naturwissenschaftliche*, 44: 463-482.

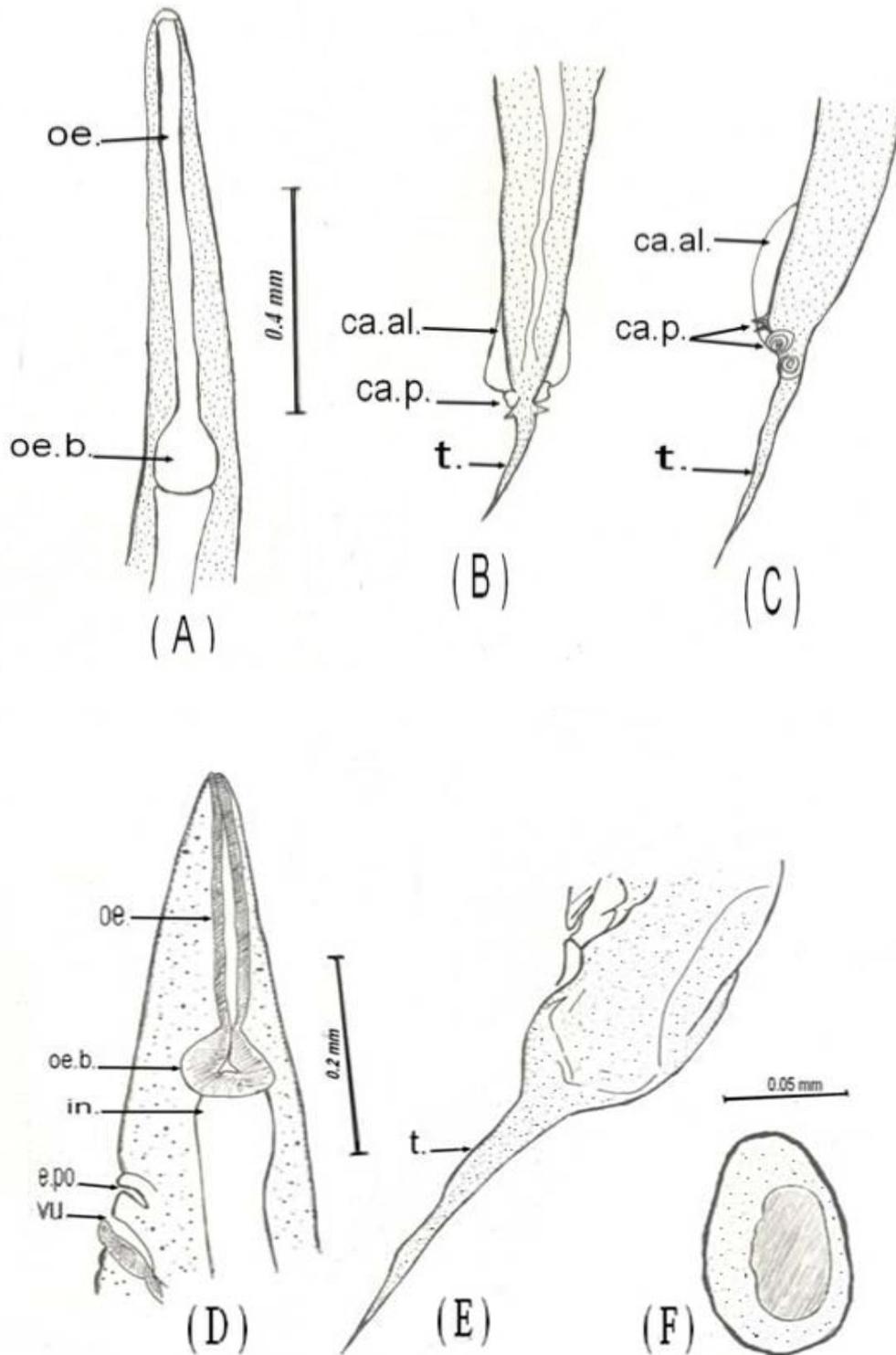


Fig. 1: *Spauligodon aspiculus*: (A) male, anterior end; (B) male, posterior end (ventral view); (C) posterior end of male (lateral view); (D) female, anterior end; (E) female, posterior end; (F) egg. (oe. = oesophagus, oe.b. = oesophageal bulb, in. = intestine, e.po. = excretory pore, vu. = vulva and t. = tail).

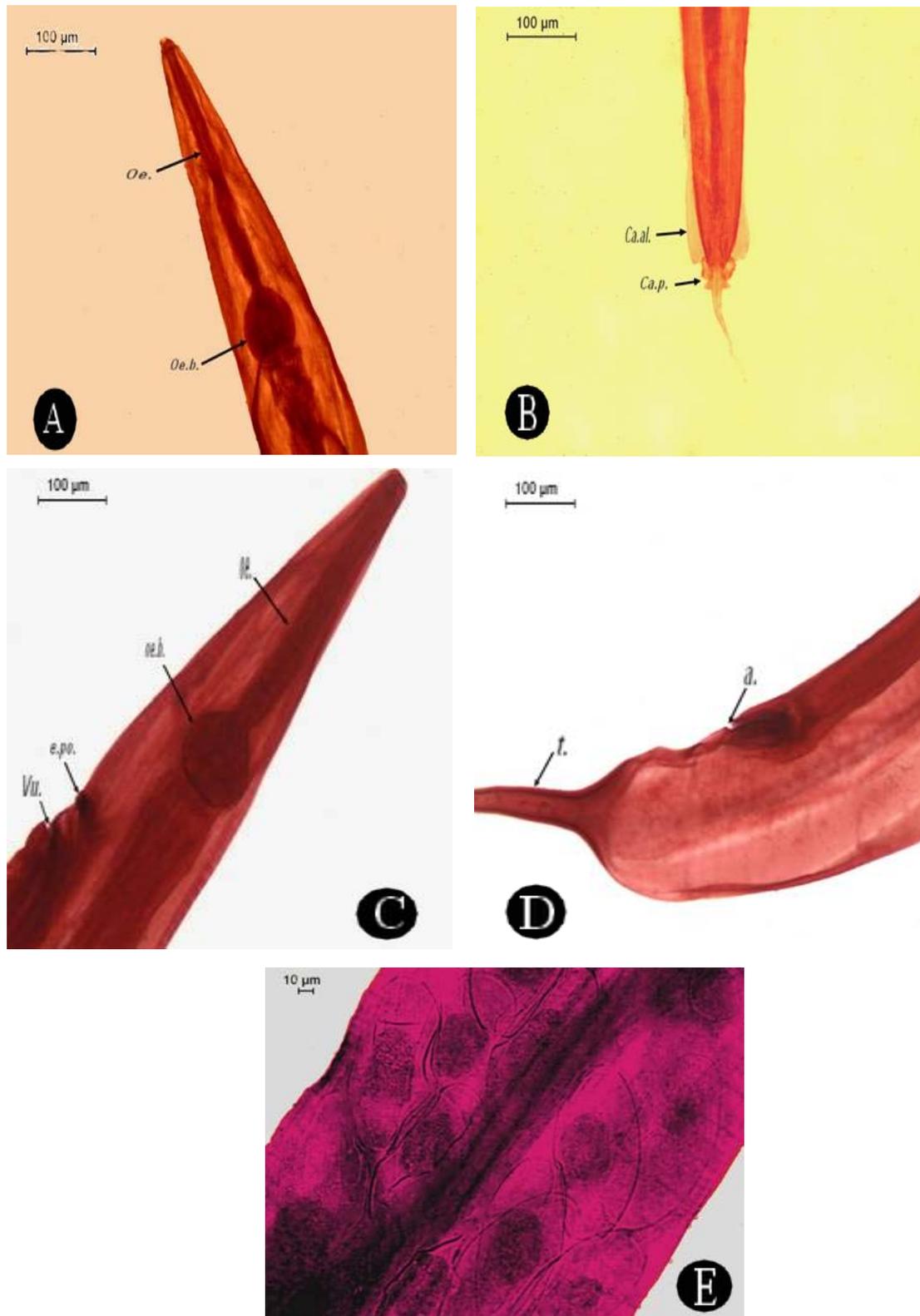


Fig. 2: *Spauligodon aspliculus*: (A) Anterior end of male, (B) posterior end of male, (C) Anterior end of female, (D) posterior end of female, (E) Egg.

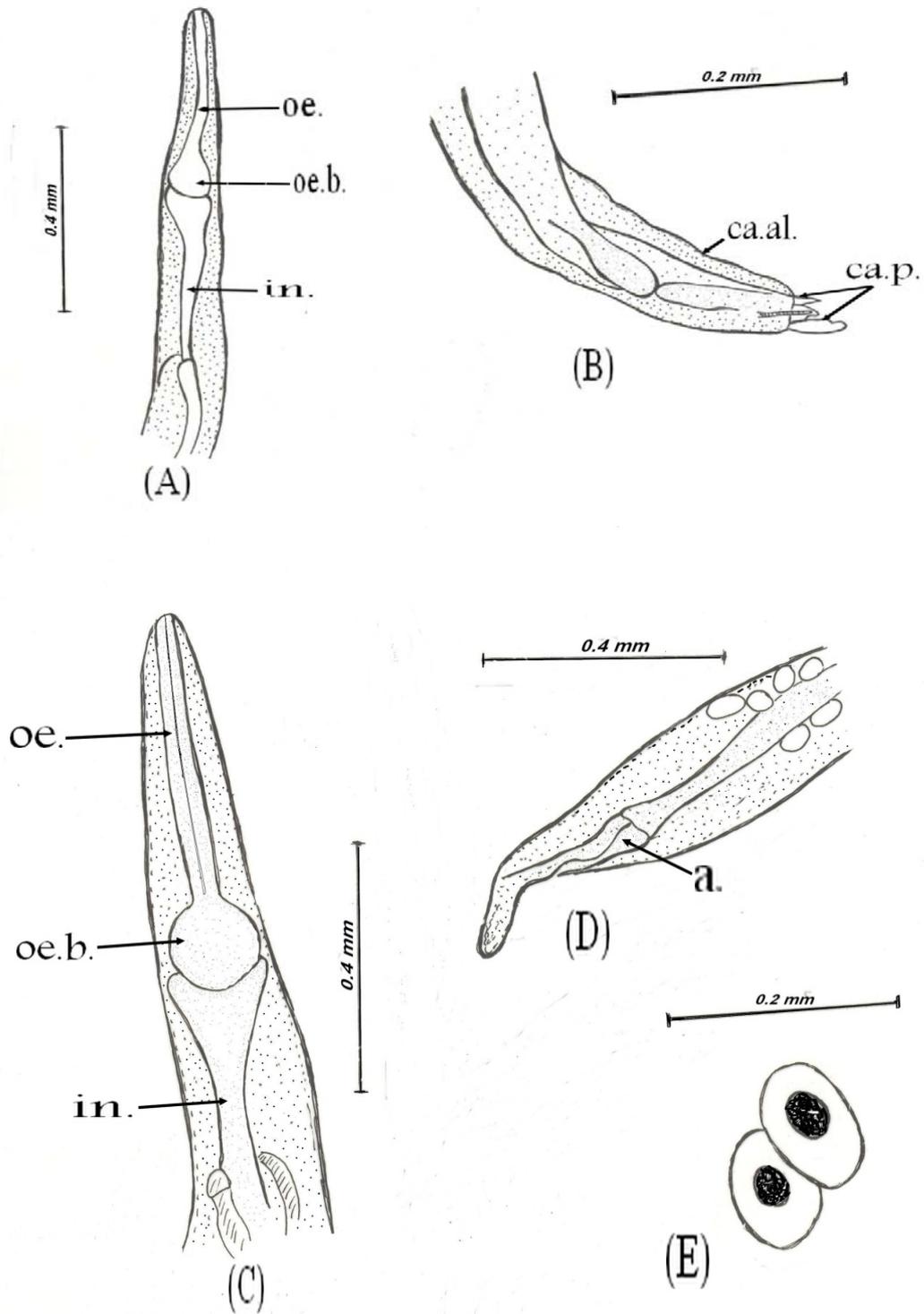


Fig. 3. *Thelandros aegypti*. (A) male, anterior end; (B) male, posterior end; (C) female, anterior end; (D) female, posterior end; (E) egg. (oe. = oesophagus, oe.b. = oesophageal bulb, in. = intestine, a. = anus, ca.al. = caudal alae and ca.p. = caudal papillae).

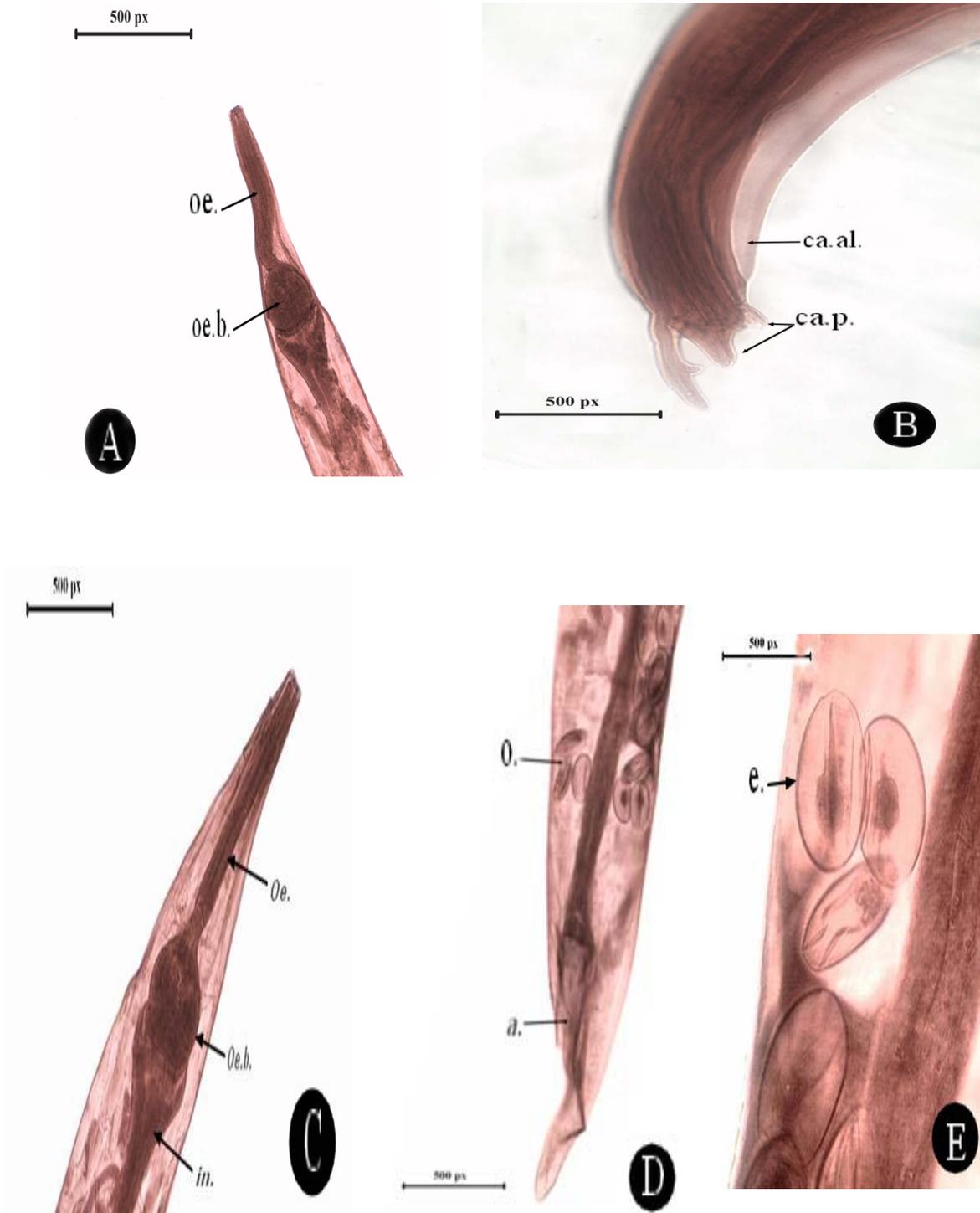


Fig. 4: *Thelandros aegypti*: (A) male, anterior end; (B) male, posterior end; (C) female, anterior end ; (D) female, posterior end; (E) egg. (oe. = oesophagus, oe.b. = oesophageal bulb, in. = intestine, a. = anus, ca.al. = caudal alae, ca.p. = caudal papillae and o. = ova).

## ARABIC SUMMARY

## إعادة وصف نوعين من النيماتودا التي تصيب الزواحف في محافظة قنا

سهير احمد حمدى ربيع- محى الدين زين العابدين عبد اللطيف- نادية ابراهيم محمد – عبيده فوزى أبوالحسين.

قسم علم الحيوان- كلية العلوم بقنا – جامعة جنوب الوادى.

تم فحص 60 عينه من البرص الأسود *Tarentola annularis* وجدت 12 عينه منها مصابة بأعداد كبيرة من

الديدان الأسطوانية *Spauligodon aspiculus* ( بنسبة 20 %) ، كما تم فحص 106 عينه من الدفان الكبير

*Chalcides ocellatus* وجدت 30 عينه منها مصابة بالديدان الأسطوانية *Thelandros aegypti* ( بنسبة 28,3%).

و قد تم دراسه هذه الديدان وإعادة وصفها باستخدام الميكروسكوب الضوئى .