

***Thraustomermis chengduensis* n. gen., n. sp.**
(Nematoda : Mermithidae) parasitizing *Anopheles sinensis*
(Wiedemann) (Diptera : Culicidae) ⁽¹⁾

Jinzhang SONG * and Yufang PENG **

* Institute of Military Medical Sciences, Chengdu Military District, Chengdu, and

** Department of Parasitology, West China University of Medical Sciences, Chengdu, Sichuan, Peoples Republic of China.

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Summary – *Thraustomermis chengduensis* n. gen., n. sp. (Mermithidae) is described from adults of *Anopheles sinensis* in Chengdu, China. The diagnostic characters of the genus *Thraustomermis* are: medium-sized nematodes with six hypodermal cords, six cephalic papillae, no lip papillae, relatively small amphids, adult cuticle very thin lacking visible cross fibres, a barrel-shaped vagina which is straight and parallel to the transverse body axis, and postparasitic juveniles with a short tail appendage. The females reproduce parthenogenetically and require higher temperature (26-28 °C) for completion of development to the postparasitic stage in the host mosquito.

Résumé – *Thraustomermis chengduensis* n. gen., n. sp. (Nematoda, Mermithidae) parasite d'*Anopheles sinensis* (Wiedemann) (Diptera : Culicidae) – *Thraustomermis chengduensis*, n. gen., n. sp. (Mermithidae) est décrit à partir de spécimens provenant d'*Anopheles sinensis* récoltés dans la province de Chengdu, Chine Populaire. Les caractères diagnostiques du genre *Thraustomermis* n. gen. sont : taille moyenne, six cordes hypodermiques, six papilles céphaliques, pas de papilles labiales, amphides relativement petites, cuticule de l'adulte très mince et sans fibres transversales visibles, vagin en forme de tonneau parallèle à l'axe transverse du corps, queue des juvéniles postparasites pourvue d'un appendice court. Les femelles se reproduisent parthénogénétiquement et exigent une température élevée (26-28 °C) pour parvenir au stade postparasite dans leur hôte, le moustique.

Key-words : Mermithidae, *Thraustomermis chengduensis*, *Anopheles sinensis*, parthenogenesis, Nematoda.

In August, 1984, while collecting eggs of *Anopheles sinensis* recovered from Chengdu, four postparasitic juveniles of mermithid nematodes were found in an egg container. After transfer to sterile sand, the four postparasitic juveniles all developed to adult females after 11 days. These were preserved for morphological studies. In subsequent studies, postparasitic juveniles emerging from adult *A. sinensis* were put in sterile sand individually. All individually maintained postparasitic juveniles (n = 18) developed to adult females and oviposited. Preparasitic juveniles hatched from mature eggs. The morphology of the adults and the characteristic development indicated that this was a new genus and species of Mermithidae.

***Thraustomermis* n. gen.**

DIAGNOSIS

(Nematoda : Mermithidae). Adult female elongated, medium in size. Female tail without appendage, six hypodermal cords, six cephalic papillae, no lip papillae, amphids relatively small, adult cuticle very thin and easi-

ly ruptured, cuticle lacking visible cross fibres, vulva protruding obviously, vagina barrel-shaped and straight, the canal of the vagina parallel to the transverse body axis. The female reproduce parthenogenetically. Stylet present in preparasitic juveniles. Postparasitic juveniles with short tail appendage, parasitized in the body cavity of aquatic insects.

TYPE AND ONLY SPECIES

T. chengduensis n. sp.

***Thraustomermis chengduensis* n. sp.**
(Figs 1-3)

MEASUREMENTS

Females (type population, n = 13) : L = 19.6 mm ± 1.6 (11.5 – 30.0); a = 86.7 ± 5.2 (63.0 – 113.9); b = 11.1 ± 0.9 (8.0 – 15.4); V = ^{29.9}49.2^{33.9} ± 1.9 (42.8 – 56.2).

Postparasitic juveniles (n = 7) : L = 23.5 mm ± 1.8 (17.8 – 35.6); greatest diam = 230 ± 13.9 (186 – 282) µm; V = 50.3 (46.0 – 56.0); tail appendage = 47 ± 5.5 (28.8 – 65.0) µm.

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Preparasitic juveniles (n = 11) : L = 313 ± 20.5 (243 – 495); greatest diam = 15.0 ± 0.7 (11.6 – 19.6) μm ; stylet = 4.3 (3.7 – 5.2) μm .

Eggs (n = 14) : 66×57 (60.1 – 70.6 \times 52.3 – 63.3) μm .

Holotype (female) : L = 18.1 mm; a = 79.5; b = 10.8; V = $33.3 \ 55.4^{31.2}$.

DESCRIPTION

Female : In fixed specimen, adult female is open C-shaped, narrowed at the anterior end, bluntly rounded posteriorly, has six hypodermal cords and six cephalic papillae. Body diameter at the level of cephalic papillae is 51 μm , at the nerve ring is 98 μm , at the vulva is 220 μm , at the end of trophosome is 121 μm . Yielding ratios of 0.51, 1.0, 2.23, 1.24 when compared to the width at the nerve ring. The mouth is terminal. Amphids located behind the lateral papillae, length amphidial pouch 11.2×3.5 (9.2 – 12.3 \times 2.9 – 3.9) μm . Distance from nerve ring to the head is 189 (149 – 222) μm . The trophosome packed with storage material, beginning at 394 (264 – 489) μm from the head and ends from 170 (110 – 437) μm the tail tip. The vulva protrudes

obviously and the vagina is barrel-shaped. The canal of the vagina is straight and parallel to the transverse body axis, not lying at any angle to the body axis. Cuticle is very thin. Cuticle thickness at the anterior end is 1.2 μm , at the nerve ring is 1.3 μm , at the vulva is 1.4 μm , and at the posterior end is 1.6 μm .

Postparasitic juveniles : Slightly larger than the adults, with a short tail appendage, genital primordium located in the middle of the body.

Preparasite juveniles : Slender and active worm, possess a well developed stylet.

Egg : Oval or spherical in shape. Egg shell thin and transparent, single cell when oviposited.

TYPE MATERIAL

Holotype : Female deposited in Institute of Military Medical Sciences, Chengdu Military District, P.R. China.

Paratypes : Four females were deposited at West China University of Medical Sciences, Chengdu, Sichuan-610044, P.R. China.

TYPE HOST AND LOCALITY

Adult *Anopheles sinensis* collected from Chengdu, Sichuan, P.R. China.

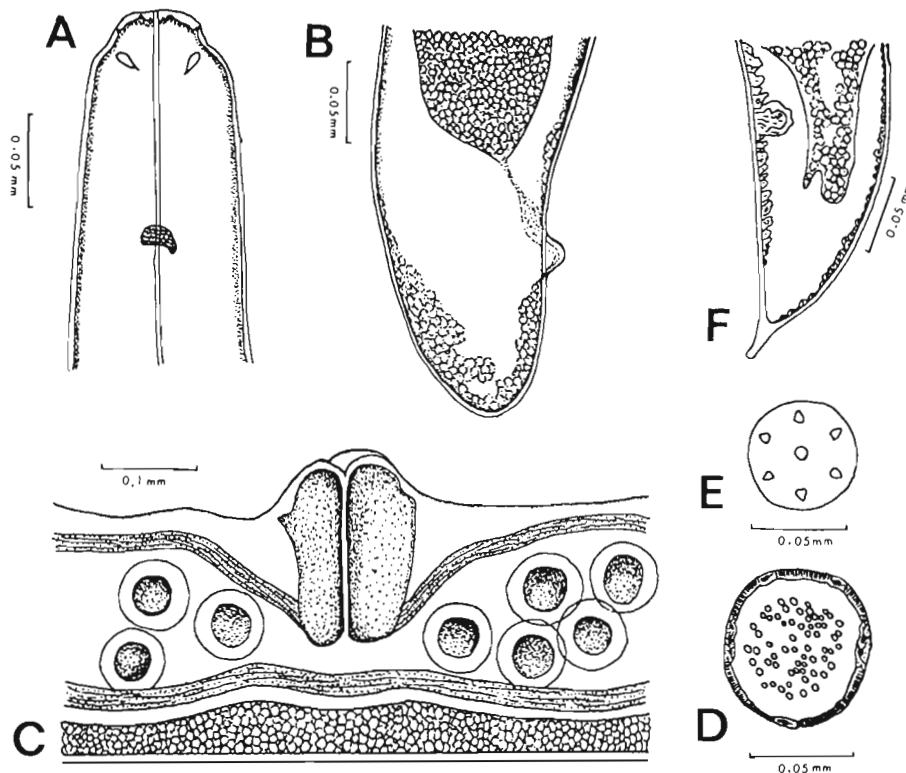


Fig. 1. *Thraustomerms chengduensis* n. gen., n. sp. A : Adult female head, ventral view; B : Adult female tail, lateral view; C : Lateral view of the vaginal region of the adult female; D : Cross-section of adult showing six hypodermal cords; E : Face view of the adult showing six cephalic papillae; F : Lateral view of the postparasite tail.

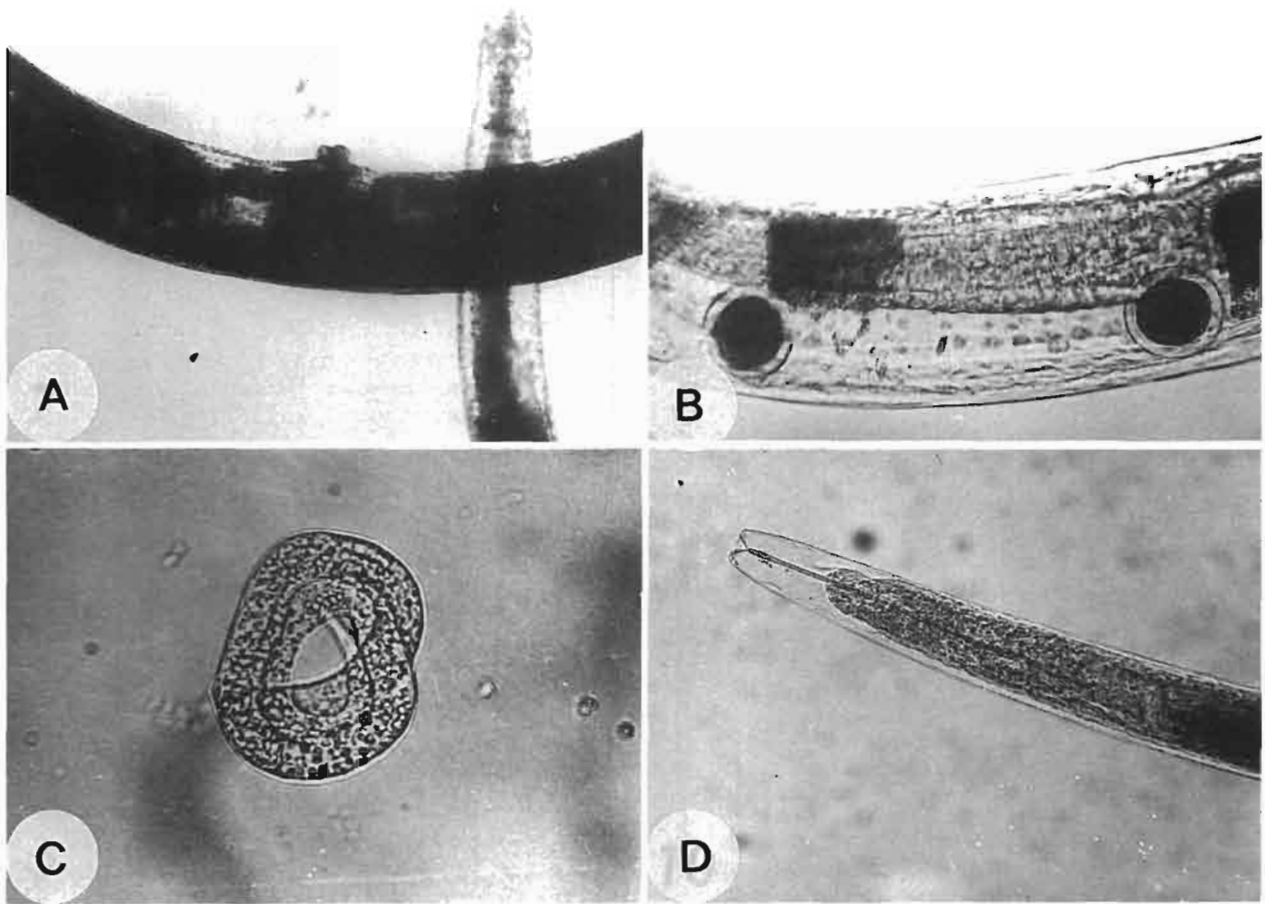


Fig. 2. *Thraustomeris chengduensis* n. gen., n. sp. A : Lateral view of vaginal and anterior part of an adult female; B : Lateral view of mature female with eggs in the uterus; C : Mature egg with preparasitic juvenile; D : Head of a postparasitic juvenile.

DIAGNOSIS

Females reproduced parthenogenetically, no males were recovered. Females narrowed at the anterior end, bluntly rounded posteriorly with well-defined female reproductive system. Amphids are small. Cuticle is very thin. Vagina is barrel-shaped. The canal of the vagina is straight and parallel to the transverse body axis, not lying at any angle to the body axis.

BIOLOGY

During three years (1984 to 1986) of collecting adult *A. sinensis* in breeding places in Chengdu we found parasitized adult *A. sinensis* in late July to the beginning of October. Air temperature reached 26-28 °C during this observational period.

The authors observed all (n = 18) individually cultured single adult female ovipositing eggs and that these eggs continued development to preparasitic juveniles. Mature female with well defined female reproductive system, male reproductive organs and sperm not ob-

served in adult female or young female. This constitutes definitive evidence for parthenogenesis.

Remarks

Some characters of the new genus are allied to *Filipjevimeris* Polezhentsev & Artyukhovsky, *Strelkovimeris* Rubtsov, *Kurshymeris* Zahidov & Poinar, *Diximeris* Nickle and *Tunicameris* Schuurmans-Stekhoven & Mawson. The female in some species of *Filipjevimeris* is parthenogenetic (Poinar & Welch, 1968), the adult cuticle lacks cross-fibres, and there are six hypodermal cords (Polezhentsev & Artyukhovsky, 1958; Poinar, 1977, 1979). However, in *Filipjevimeris* the vagina is S-shaped and the genus is parasitic in terrestrial insects (Ipatyeva, 1963; Poinar, 1979). These latter characters are in contradiction to *Thraustomeris* n. gen. where the vagina is straight, barrel-shaped; moreover, the new genus is parasitic in aquatic insects. These characters distinguish *Thraustomeris* n. gen. from *Filipjevimeris*. In *Strelkovimeris* amphids are medium in size, vagina S-shaped, parasitizing in aquatic insects (Poinar, 1979).

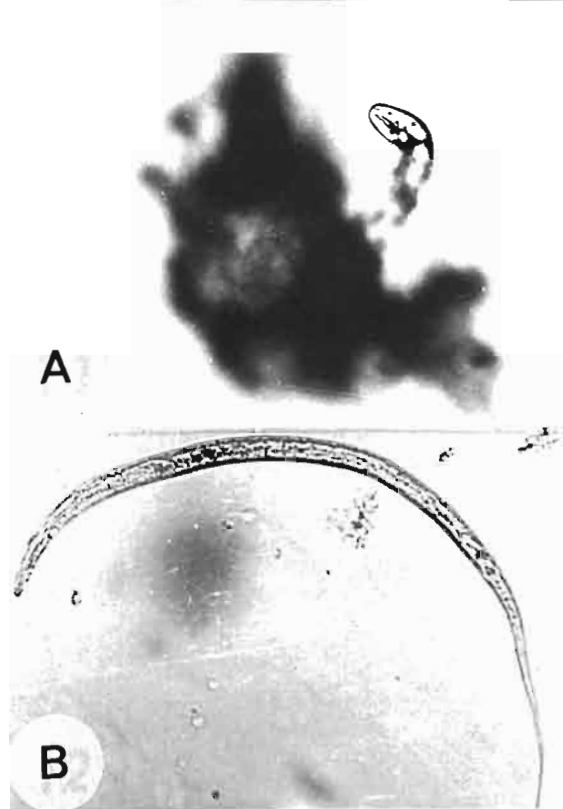


Fig. 3. *Thraustomermis chengduensis* n. gen., n. sp. A : Preparasitic juvenile emerging from an egg; B : Preparasitic juvenile.

But the barrel-shaped vagina and the female *Thraustomermis* n. gen. reproducing parthenogenetically can distinguish it from *Strelkovimermis*. In *Tunicamermis* no adult males are found, the vagina is straight, barrel-shaped, but cross-fibres are present in the cuticle (Schuurmans-Stekhoven & Mawson, 1955; Poinar, 1979). Thus, *Thraustomermis* which does not have cross-fibres in the cuticle can be distinguished from *Tunicamermis*.

Welch (1962), Poinar (1979), and Nickle (1972) defined the genus *Mesomermis* and its synonym *Neomesomermis* as : six hypodermal cords, six cephalic papillae, aquatic host, large amphids, two spicules, barrel-shaped vagina and blunt tail in both adult sexes. Besides these characters, the type species, *Mesomermis flumenalis* has a vagina lying at some angle to the body axis (Welch, 1962, Ebsary & Bennett, 1974). Many well – described species of this genus, such as *M. paradisi* from black – flies (Poinar & Hess, 1979), *M. japonicus* (Poinar & Saito, 1979), *M. camdenensis* (Molloy, 1979) and *M. guatemalae* (Poinar & Takaoka, 1981) all possess this character. Some morphological characters of the new genus are similar to those of *Mesomermis* von Daday. Both generally possess six hypodermal cords, six cephalic papillae, and a barrel-shaped vagina. But in *Thraustomermis* n. gen., the adult cuticle is very thin (less than

2 μ m), amphids are relatively small, the vulva projects obviously, the canal of the vagina is straight and parallel to the transverse body axis. These characters separate the new genus from *Mesomermis*. The female *Thraustomermis* n. gen. reproduces parthenogenetically which is quite different from the amphimictic reproduction found in *Mesomermis*.

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