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VERSITA

Subulura (*Murisubulura*) *tanjinensis* sp. nov. (Nematoda, Subuluroidea) from *Eutamias sibiricus* (Laxmann) (Rodentia) in Tianjin, China

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Abstract

Subulura (*Murisubulura*) *tanjinensis* sp. nov. was collected from the Siberian chipmunks, *Eutamias sibiricus* (Laxmann) at Jixian County, Tianjin, China. The new species can be distinguished from all species of subgenus *Murisubulura* by the structures of labia lobes, by having a telamon and by the numbers of caudal papillae.

Keywords

Nematoda, *Subulura* (*Murisubulura*) *tanjinensis* sp. nov., Subuluridae, *Eutamias sibiricus*

Introduction

The species of the genus *Subulura* Molin, 1860 are parasites of birds and mammals. Inglis (1958, 1960) revised the classification of Subuluridae by comparing the head structures, and also described a new species, *Subulura ortleppi* Inglis, 1960. This species differs from the congeners by having six labial lobes at the oral opening. Quentin (1965) reported second species, *S. williaminglisi* Quentin, 1965, which is similar to *S. ortleppi* in the presence of labial lobes. Several years later, Quentin (1969) set up a new subgenus *Murisubulara* Quentin, 1969 based on the oral opening surrounded by six labial lobes, and assigned the two above species to this subgenus. Yagi and Kamiya (1981) added another species, *Subulura* (*Murisubulura*) *suzukii* Yagi et Kamiya, 1981. However, no species of subgenus *Murisubulura* has been reported from China. In the present paper, we describe a new species of *Subulura* (*Murisubulura*) collected from intestine of the Siberian chipmunks, *Eutamias sibiricus* (Laxmann) at Jixian County, Tianjin, China.

Materials and methods

Five Siberian chipmunks, *Eutamias sibiricus* (Laxmann) were captured and examined for parasites. Nematodes (23 males and 21 females) were collected from the intestine of the hosts. After washing in physiological saline, the specimens were fixed in hot 4% formalin, then stored in 70% ethanol until they were studied. For light microscopy examination, nematodes were cleared in lactophenol. Drawings were made with the aid of Nikon microscope drawing attachment. For scanning electron microscopy (SEM) studies, specimens were post-fixed in 1% OsO_4, dehydrated through an ethanol series and acetone, and then subjected to critical point drying. The specimens were coated with gold and examined with a Hitachi S-570 scanning electron microscope at an accelerating voltage of 15 kV. Measurements (minimum, maximum, followed by mean in parentheses) are given in micrometers, unless otherwise stated. Specimens have been deposited in the College of Life Sciences, Hebei Normal University (HBNU), Hebei Province, China.

Results

***Subulura* (*Murisubulura*) *tanjinensis* sp. nov.** (Figs 1 and 2)

General: Body long and slender. Anterior end of body bent dorsally. Cephalic plate with 4 ovoid double papillae, 2 prominent lateral amphids. Oral opening surrounded by six labial lobes, each of which consists of one inner pointed projection (Fig. 2B). Buccal capsule cylindrical with well cuticularized wall. Pharynx of 3 muscular portions each composed of 3 lobes twisted to make the pharynx have a helicoidal structure.

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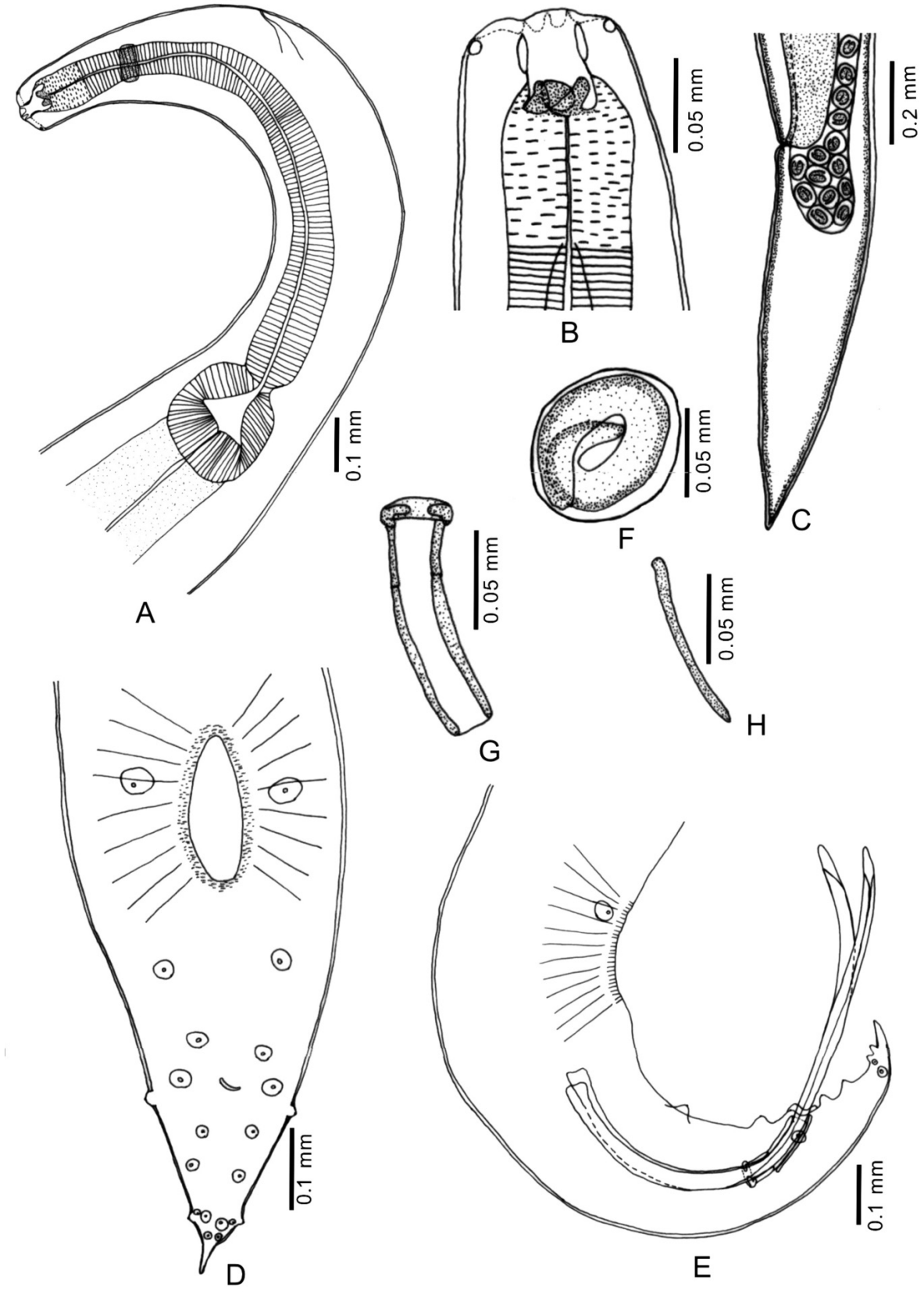

Fig. 1. *Subulura* (*Murisubulura*) *tanjinensis* sp. nov.: **A.** Anterior end of male, lateral view. **B.** Cephalic extremity, lateral view. **C.** Posterior end of female, lateral view. **D.** Posterior end of male, ventral view. **E.** Posterior end of male, lateral view. **F.** Egg. **G.** Gubernaculum, ventral view. **H.** Telamon, lateral view

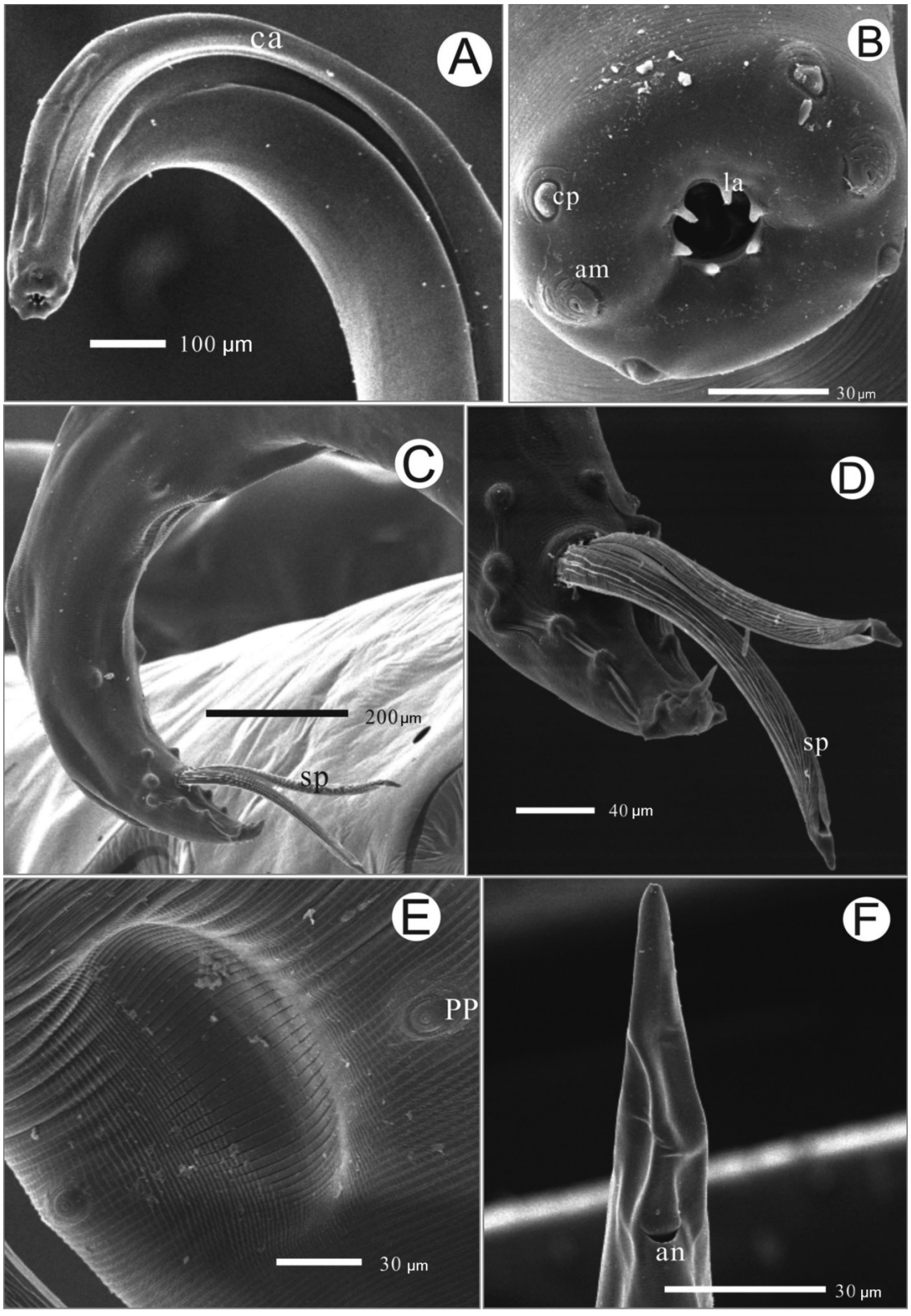

Fig. 2. SEM of *Subulura* (*Murisubulura*) *tanjinensis* sp.nov.: **A.** Anterior end of male, lateral view. **B.** Cephalic extremity, en face view. **C.** Posterior end of male, lateral view. **D.** Male tail, ventral view, showing the spicules and caudal papillae. **E.** Preanal sucker, ventral view. **F.** Posterior end of female, ventral view. **Abbreviations**: am – amphid; an – anus; ca – cervical alae; cp – cephalic papillae; la – labial lobe; pp – preanal papillae; sp – spicule

Cervical alae present, originating behind the cephalic plate and extending to the posterior part of oesophagus (Fig. 2A).

Male: Body 11.14–14.98 (13.76) mm long, maximum width 380–510 (470); 80–100 (96) wide at the head region. Buccal capsule 20–30 (26) long. Oesophagus including bulb 1.08–1.32 (1.218) mm long and 100–140 (121) wide. Oesophageal bulb 180–220 (205) long and 150–230 (194) wide. Nerve ring 250–300 (274) and excretory pore 450–500 (487) from anterior end, respectively. Cervical alae 760–920 (850) long. Precloacal sucker without cuticular ring, 690–910 from posterior end. Tail with pointed tip, 200–260 (220) long. Caudal alae absent. Eleven pairs of caudal papillae with 3 pairs of preanal, 2 pairs of adanal, and 6 pairs of postanal. Spicules equal, 850–1020 long. Alae present at almost whole length of spicules except terminal tip, two alae of each spicule folded ventrally and joined together at ventral side, but remaining triangular-shaped notch near the distal end of spicule (Fig. 2F). Gubernaculum shovel-shaped, 103–123 long. Telamon claviform, 78–103 long.

Female: Body 21.30–26.55 (22.55) mm long, maximum width 510–690 (620); 110–130 (116) wide at the head region. Buccal capsule 20–30 (29) long. Oesophagus including bulb 1.33–1.62 (1.488) mm long and 120–200 (141) wide. Oesophageal bulb 220–270 (240) long and 190–300 (224) wide. Nerve ring 270–350 (314) and excretory pore 480–650 (538) from anterior end respectively. Cervical alae 850–1200 (918) long. Vulva near the middle of body, 8.40–10.24 (9.48) mm from anterior end. Tail conical, 800–920 long. Eggs ovoid and embryonated, 62–85 (74) long and 49–64 (57) wide.

Type host: *Eutamias sibiricus* (Laxmann) (Rodentia, Sciuridae).

Site of infection: Intestine.

Type locality: Jixian County, Tianjin, China (117°40′E, 40°05′N).

Prevalence and intensity: 3 infected/5 examined, 8–22 (14.7) specimens.

Type specimens: Holotype male (HBNU-0903), allotype female (HBNU-0904), paratypes: 9 males (HBNU-0905), 9 females (HBNU-0906).

Etymology: The species name refers to its geographic location (Tianjin).

Discussion

The new species has six labial lobes at the oral opening, interlabia absent, therefore, it belongs to subgenus *Murisubulura*. Up to now, three valid species of the subgenus have been reported including *S.* (*M.*) *ortleppi* Inglis, 1960 from *Rhabdomys pumilio* and *Rattus* (*Praomys*) *namaquensis* in Union of South Africa, *S.* (*M.*) *williaminglisi* Quentin, 1965 from *Hybomys univittaus*, *Crycetomys gambianus* and *Thamnomys rutilans* in the Central Africa Republic, and *S.* (*M.*) *suzukii* Yagi et Kamiya, 1981 from *Apodemus speciosus* in Japan. *S.* (*M.*) *tanjinensis* sp. nov. differs from the three above species by the labial lobe consisting of inner projection instead of inner and outer projections, by having telamon vs. telamon absent, and by having 11 pairs instead of 10 pairs of caudal papillae. In addition, the new species is different from *S.* (*M.*) *ortleppi* in the absence of caudal alae (caudal alae present in the latter), and in the length of spicules (0.85–1.02 mm vs. 1.10–1.40 mm). *S.* (*M.*) *tanjinensis* sp. nov. can be distinguished from *S.* (*M.*) *williaminglisi* in having cervical alae vs. cervical alae absent, and in the spicule length (0.85–1.02 mm vs. 1.45–1.50 mm). The new species differs from *S.* (*M.*) *suzukii* in the shape and length of gubernaculum (shovel-shaped, 0.103–0.123 mm long in the former vs. tongue-like, 0.132–0.180 mm long in the latter), and in the length of female tail (0.80–0.92 mm vs. 0.964–1.840 mm).

Mészáros (1975) described a new genus and species, *Kaszabospirura steinmanni* Mészáros, 1975, based on two female specimens collected from *Allactaga sibirica* in Mongolia. Chabaud (1978) considered *Kaszabospirura* Mészáros, 1975 not to be a spirurid nematode, he synonymized this genus with *Murisubulura*. Because of lacking detailed cephalic structure and male information, this species needs to be redescribed. We consider *K. steinmanni* as a *species inquirenda*.

Recently, Ubelaker *et al*. (2007) described a new species, *Subulura novomexicanus* Ubelaker, Easter-Taylor, Marshall et Duszynski, 2007 from *Spermophilus spilosoma* in New Mexico, USA and considered a member of *Murisubulura*. However, in the description of this species, mouth surrounded by 6 labial lobes, separated by 6 interlabia, is characteristic of the subgenus *Tepuinema* Díaz-Ungía, 1964 (see Chabaud 1978). Therefore, *S. novomexicanus* should be assigned to *Tepuinema*.

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