BioOne COMPLETE

TWO NEW SPECIES OF THE GENUS XENYLLA TULLBERG, 1869 FROM CHINA (COLLEMBOLA: HYPOGASTRURIDAE)

Authors: Wu, Donghui, and Yin, Wenying

Source: Florida Entomologist, 90(2) : 378-383

Published By: Florida Entomological Society

URL: https://doi.org/10.1653/0015-4040(2007)90[378:TNSOTG]2.0.CO;2

BioOne Complete (complete.BioOne.org) is a full-text database of 200 subscribed and open-access titles in the biological, ecological, and environmental sciences published by nonprofit societies, associations, museums, institutions, and presses.

Your use of this PDF, the BioOne Complete website, and all posted and associated content indicates your acceptance of BioOne's Terms of Use, available at www.bioone.org/terms-of-use.

Usage of BioOne Complete content is strictly limited to personal, educational, and non - commercial use. Commercial inquiries or rights and permissions requests should be directed to the individual publisher as copyright holder.

BioOne sees sustainable scholarly publishing as an inherently collaborative enterprise connecting authors, nonprofit publishers, academic institutions, research libraries, and research funders in the common goal of maximizing access to critical research.

Downloaded From: https://complete.bioone.org/journals/Florida-Entomologist on 29 Mar 2024
Terms of Use: https://complete.bioone.org/terms-of-use

TWO NEW SPECIES OF THE GENUS *XENYLLA* TULLBERG, 1869 FROM CHINA (COLLEMBOLA: HYPOGASTRURIDAE)

DONGHUI WU[1,2] AND WENYING YIN[2]
[1]College of Earth Sciences, Jilin University, Changchun 130061, China
e-mail: wudhyang@yahoo.com.cn

[2]Institute of Plant Physiology & Ecology, Shanghai Institutes for Biological Sciences
Chinese Academy of Sciences, Shanghai 200032, China

ABSTRACT

Two new species of *Xenylla* from Jilin Province, Northeast China are described and illustrated. *Xenylla changlingensis*, **new species** clearly differs from the closely related species *X. piceeta* Stebaeva & Potapov, 1994 in the presence of dorsal *la*2 of thoracic segments II and III, the absence of ventral seta *p*2 on abdominal segment II, 1 median ventral seta above the retinaculum on abdominal segment III, and lack of teeth on the mucro. *Xenylla changchunensis*, **new species** is similar to the species *X. osetica* Stebaeva & Potapov, 1994. However, it is separable from the latter by the presence of a furca, a tenaculum, and the ventral chaetotaxy on abdominal segment III.

Key words: Collembola, Hypogastruridae, *Xenylla*, new species, China

RESUMEN

Se describe e ilustran dos especies del género *Xenylla* de la Provincia de Jilin, en el noreste de China. *Xenylla changlingensis* **nueva especie** claramente se distingue de su especie cercana *X. piceeta* Stebaeva & Potapov, 1994 por la presencia de *la*2 dorsal de los segmentos torácicos II y III, la ausencia de la seta ventral *p*2 en el segmento abdominal II, una seta mediana ventral arriba del retinaculum en el segmento abdominal III, y la falta de dientes sobre el mucro. *Xenylla changchunensis* **nueva especie** es parecida a *X. osetica* Stebaeva & Potapov, 1994. Sin embargo, se distingue de la especie posterior por la presencia de una furca, el tenaculum y la chaetotaxia ventral del segmento abdominal III.

The genus *Xenylla* was established by Tullberg for *X. maritima* Tullberg, 1869 as type species. It is one of the largest and most widespread genera in the family of Hypogastruridae. According to Thibaud et al. (2004), species in the genus *Xenylla* are mainly characterized by (1) 5+5, rarely 4+4 ommatidia, (2) postantennal organ absent, (3) mandible short with a well developed molar plate, maxillary head with normal lamellae, (4) furca rarely absent, showing a diverse morphology, if mucro separated from the dens, which normally bears 2 setae; mucro, however, fused with the dens or mucro absent, the dens has 1 or 2 setae, (5) empodium absent, and (6) abdominal segment V tergite with *p*3 as sensilla.

So far, about 126 species of the genus *Xenylla* have been described worldwide (Christiansen 2006). However, only one, *X. boerneri* Axelson, 1905, has been reported from East China (Zhao et al. 1997). The taxonomy of the fauna of many Chinese habitats is poorly known, especially those of soil. In the present paper, two new species of the genus *Xenylla* that were found from Northeast China are described.

Abbreviations

*a*1, 2, … — setae 1, 2, … of the anterior row, counted from the "middle line", *m*1, 2, … — setae 1, 2, … of the middle row, counted from the "middle line", *p*1, 2, … — setae 1, 2, … of the posterior row, counted from the "middle line", *c*1, 2, … — cervical setae 1, 2, … of area occipitalis, counted from the "middle line", L*a*1, 2, …— setae 1, 2, … of the lateral anterior row in thoracic segments, L1, 2, …— lateral setae 1, 2, …. in head (Yosii 1960; Gama 1988).

Xenylla changlingensis, **new species**

(Figs. 1-10)

Type Materials

Holotype: Female, from the grassland of *Leymus chinensis*, 44°35'N, 123°30'E, 141 m altitude, Changling county, Jilin Province, Northeast China, 6-5-2005, collected by Dr. Donghui Wu. Paratypes: Two females, 3 males, same data as holotype. Holotype and paratypes deposited in Shanghai Institute of Plant Physiology & Ecology.

Description

Body length up to 0.95 mm. Body color in alcohol dark blue-violet. With 5+5 ommatidia in head (Fig. 1). Antennal segment I with 7 setae, antennal segment II with 12 setae. Sensory organ of antennal segment III consists of 2 microsensilla which are embedded in a tegumentary fold and

Downloaded From: https://complete.bioone.org/journals/Florida-Entomologist on 29 Mar 2024
Terms of Use: https://complete.bioone.org/terms-of-use

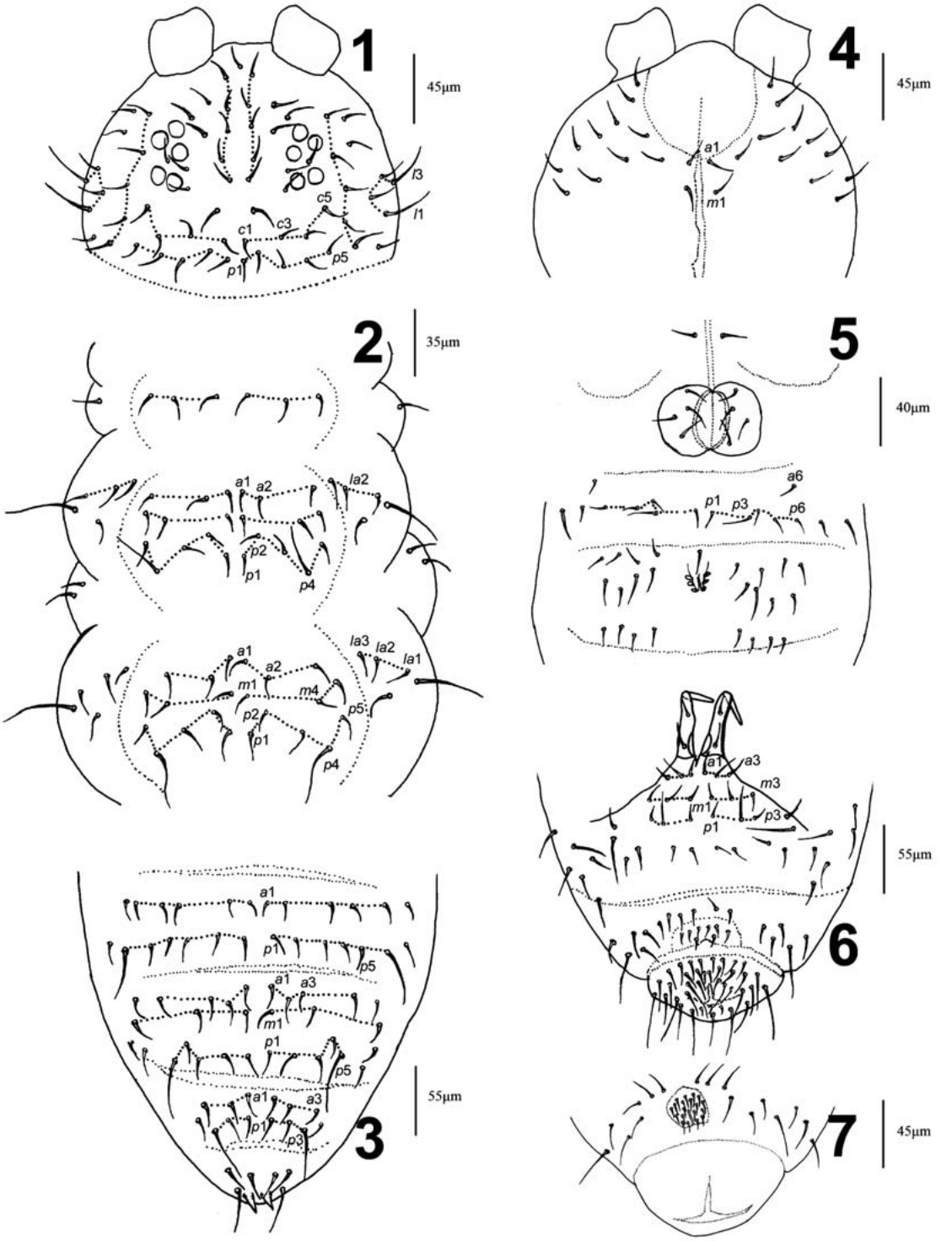


Fig. 1-7. *Xenylla changlingensis*, **new species**. 1. Dorsal chaetotaxy of the head. 2. Dorsal chaetotaxy of Th. I - III. 3. Dorsal chaetotaxy of Abd. III - VI. 4. Ventral chaetotaxy of the head. 5. Ventral chaetotaxy of Th. III, Abd. II and III, ventral tube, and retinaculum. 6. Ventral chaetotaxy of Abd. IV and V female genital plate, and anal plate. 7. Male genital plate.

Downloaded From: https://complete.bioone.org/journals/Florida-Entomologist on 29 Mar 2024
Terms of Use: https://complete.bioone.org/terms-of-use

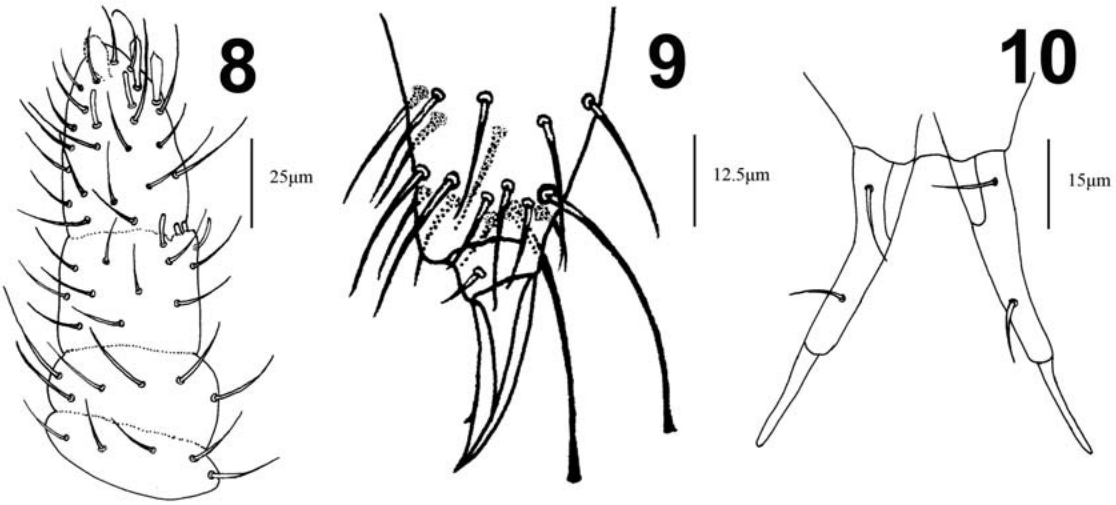


Fig. 8-10. *Xenylla changlingensis*, **new species**. 8. Antenna, dorsal view. 9. Tibiotarsi III with claw. 10. Furca, posterior view.

flanked by 2 longer guard sensillum. Antennae IV with a simple apical bulb and 4 weakly thickened sensillum, of which 3 are dorso-external and 1 dorso-internal, and 2 inernal sensillum, which are thinner and shorter than the others (Fig. 8). External maxillary lobe with 2 sublobal hairs.

Tibiotarsi each with 2 capitate, dorsal tenent hairs, which are longer than the inner edge of the claws. Claws with a small, distal internal tooth, 2/3 as long as tibiotarsal hairs (Fig. 9). Mucro well separated from the dens with 2 posterior setae, 1/2 as long as the dens but dens and mucro particularly slender, width of dens at distal seta about an eighth its length, mucro straight and without teeth (Fig. 10). Ventral tube with 4+4 setae. Retinaculum with 3+3 teeth (Fig. 5). Female genital (Fig. 6) and male genital plate (Fig. 7) normal. Anal spines small, on weakly developed papillae separated at the base, 1/4 as long as claws (Fig. 3).

Chaetotaxy, consisting of short setae and longer and fine sensorial setae. Dorsally head without seta *c*2 (*a2 a*/*c* to Babenko), cephalic setae *l*1 and *l*3 subequal (Fig. 1), thoracic segments II-III with central setae in 3 rows, on thoracic segments II-III *p*2 displaced apically relative to *p*1, and on thoracic segment III *a*2 displaced distally compared with *a*1 (Fig. 2), on abdominal segments I-III *p*5 present, abdominal segments IV with *a*3. Abd. V with *a*2 (Fig.3). Ventrally head without seta *p*1 (Fig. 4), thoracic segments II and III with a pair of medial setae, abdominal segments II without *p*2 and *a*5, abdominal segments III with 1 median seta above the retinaculum (Fig. 5).

Comment

The new species is distinguished from all the known species of the genus *Xenylla* by the absence of mucronal teeth, dorsal side of head without *c*2 seta, seta *p*2 on tergite of thoracic segments II-III set in front of *p*1 seta, head without ventral seta *p*1, thoracic segments II and III with a pair of ventral medial setae, abdominal segment II without ventral setae *p*2 and *a*5, abdominal segment III with 1 median ventral seta above the retinaculum, abdominal segment IV with ventral seta *m*1, unguis with 1 internal tooth.

Etymology

This species is named after the type locality.

Taxonomic Remarks

This species keys out to *X. piceeta* Stebaeva & Potapov, 1994 (Babenko et al. 1994), from Far East, southern maritime province, Russia, which was collected in litter of a fir forest (Babenko et al. 1994), but the new species clearly differs from *X. piceeta* by the presence of dorsal *la*2 of thoracic segments II and III, which is stable on the tergites, and the absence of ventral seta *p*2 on abdominal segment II. On abdominal segment III, *X. changlingensis* has only 1 median ventral seta above the retinaculum, while *X. piceeta* has a pair of medial setae. In addition, the mucro of *X. changlingensis* is straight and thin, but lacking teeth.

Xenylla changchunensis, **new species**
(Figs. 11-19)

Type Materials

Holotype: Female, from the deciduous-coniferous mixed forest of Jingyuetan Park, 43°45'N, 125°27'E, 242 m altitude, Changchun city, Jilin

Downloaded From: https://complete.bioone.org/journals/Florida-Entomologist on 29 Mar 2024
Terms of Use: https://complete.bioone.org/terms-of-use

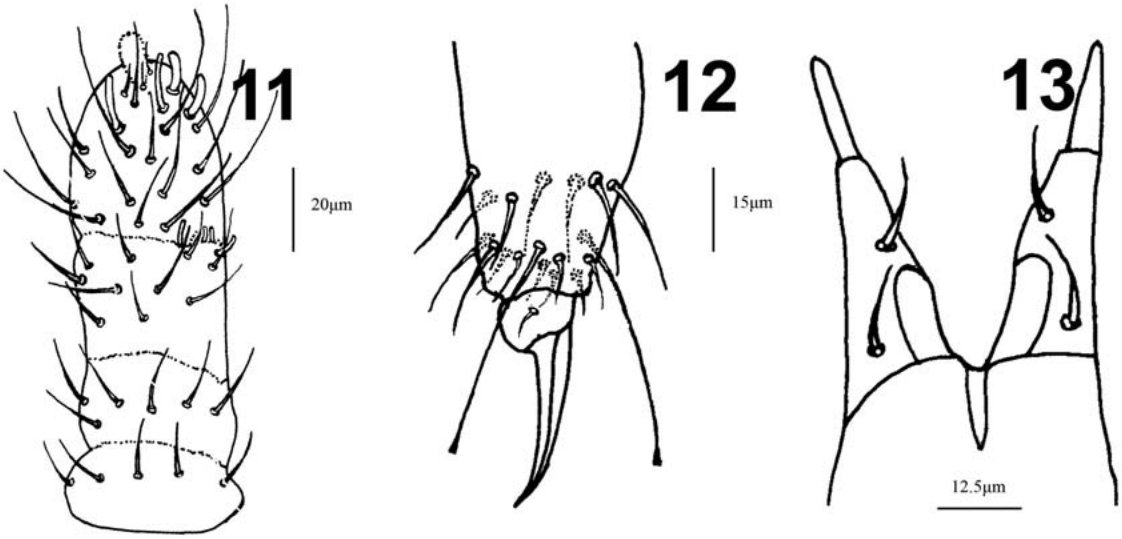


Fig. 11-13. *Xenylla changchunensis*, **new species**. 11. Antenna, dorsal view. 12. Tibiotarsi III with claw. 13. Furca, posterior view.

Province, Northeast China, 3-9-2003, collected by Dr. Donghui Wu. Paratypes: Two females, same data as holotype. Holotype and paratypes deposited in Shanghai Institute of Plant Physiology & Ecology.

Description

Body length up to 0.81 mm. Body color in alcohol red-brown. Antennal segment I with 7 setae, antennal segment II with 12 setae. Sensory organ of antennal segment III consists of 2 microsensilla, embedded in a tegumentary fold and flanked by 2 longer guard sensillum. Antennae IV with a simple apical bulb and 4 weakly thickened sensillum, of which 3 dorso-external and 1 dorsointernal, and 2 internal sensillum, thinner and longer than the others (Fig. 11). External maxillary lobe with 3 sublobal hairs.

Tibiotarsi each with 2 capitate, dorsal tenent hairs, longer than the inner edge of the claws. Claws toothless, 11/15 as long as tibiotarsal hairs (Fig. 12). Dens with 2 posterior setae. Mucro well separated from the dens, straight and fine without teeth, dens broad, at level of distal setae length of dens about 3 times breadth**,** ratio mucro: dens = 1/2 (Fig. 13). There are 4+4 setae on ventral tube. Retinaculum with 3+3 teeth (Fig. 18). Female genital plate (Fig. 19). Anal spines short, inserted on poorly developed papillae, 1/4 as long as claws (Fig. 16).

Chaetotaxy, consisting of short setae and longer and fine sensorial setae. Dorsally head without seta $c1$ with both $p1$ and $p2$, $l1$ longer than $l3$ (Fig. 14), thoracic segments II-III with medial setae in 3 rows, seta $p2$ on tergite of thoracic segments II-III set in front of $p1$, on thoracic segments III $a2$ displaced distally relative to $a1$ (Fig. 15), on abdominal segments I-III, $p5$ present, abdominal segments IV without $a3$, abdominal segments V without $a2$ (Fig. 16). Ventrally head with seta $p1$ (Fig. 17), thoracic segments II and III with a pair of medial setae, abdominal segment II without $p2$ and $a5$, abdominal segment III with 1 median seta above the retinaculum (Fig. 18), abdominal segment IV without $m1$ (Fig. 19).

Comment

The new species is distinguished from other species of *Xenylla* by possessing a mucro without teeth, dorsal side of head with $c1$ ($p1\ a/c$ Babenko et al. 1994) seta absent, seta $p2$ on tergite of thoracic segments II-III set in front of $p1$ seta, thoracic segments II and III with a pair of ventral medial setae, abdominal segment II without ventral setae $p2$ and $a5$, abdominal segment III with 1 median ventral seta above the retinaculum, abdominal segment IV without ventral seta $m1$, unguis lacking teeth.

Etymology

Named *changchunensis* alluding to Changchun, the city where the species was found.

Taxonomic Remarks

The new species resembles *X. osetica* Stebaeva & Potapov, 1994 in general shape, antenna, tibiotarsi, and claws, especially in dorsal chaetotaxy,

Downloaded From: https://complete.bioone.org/journals/Florida-Entomologist on 29 Mar 2024
Terms of Use: https://complete.bioone.org/terms-of-use

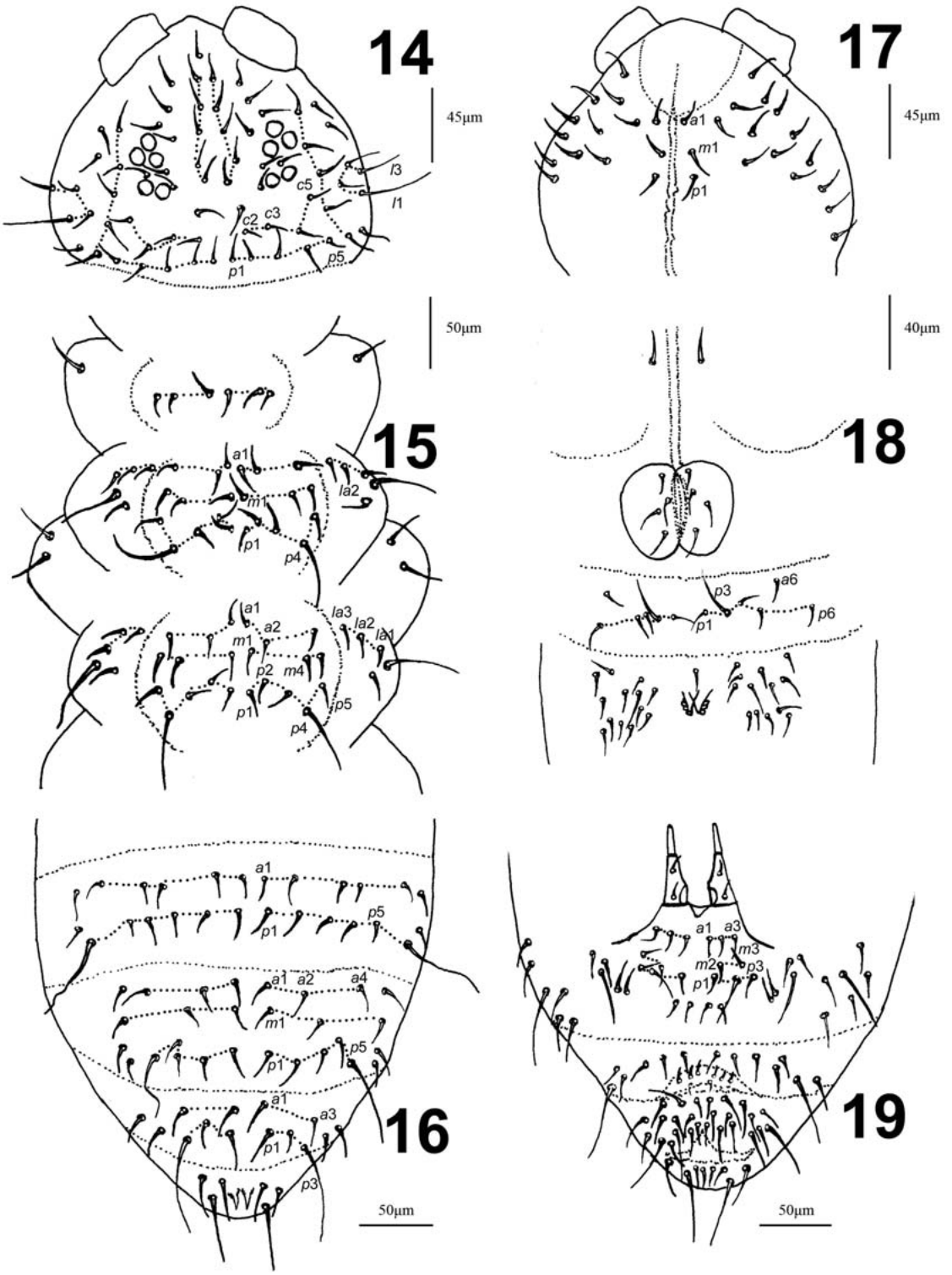


Fig. 14-19. *Xenylla changchunensis*, **new species**. 14. Dorsal chaetotaxy of the head. 15. Dorsal chaetotaxy of Th. I-III. 16. Dorsal chaetotaxy of Abd. III-VI. 17. Ventral chaetotaxy of the head. 18. Ventral chaetotaxy of Th. III, Abd. II and III, ventral tube, and retinaculum. 19. Ventral chaetotaxy of Abd. IV and V, female genital plate, and anal plate.

Downloaded From: https://complete.bioone.org/journals/Florida-Entomologist on 29 Mar 2024
Terms of Use: https://complete.bioone.org/terms-of-use

but distinctly differs from *X. osetica* in the following characters: (1) furca and tenaculum present, and (2) ventral chaetotaxy on abdominal segment III.

KEY TO SPECIES OF THE CHINESE *XENYLLA* TULLBERG, 1869

1. Furca without mucro, retinaculum with 2+2 teeth . . . . . *X. boerneri* Axelson, 1905
—Mucro separated from dens that has 2 setae, retinaculum with 3+3 teeth 2

2. Dorsal side of head without c2 seta, abdominal segment IV with ventral seta *m*1, unguis with 1 internal tooth . . . . . *X. Changlingensis* sp. nov
Dorsal side of head with *c*1 seta absent, abdominal segment IV without ventral seta *m*1, unguis lacking teeth . . . . . *X. Changchunensis* sp. nov

ACKNOWLEDGMENTS

Thanks to Mr. Rongdong Xie, Mr. Yiming Yang, Dr. Yunxia Luan, Dr. Yun Bu, and Dr. Yan Gao for help in our taxonomic work. Thanks also to two anonymous reviewers for excellent suggestions. This study is supported by the National Natural Sciences Foundation of China (No. 40601047, 30370169), and China Postdoctoral Science Foundation (20060390643).

REFERENCES CITED

BABENKO, A. B., N. M. CHERNOVA, M. B. POTAPOV, AND S. K. STEBAEVA. 1994. Family Hypogastruridae, pp. 259-305, 329 *In* N. M. Chernova [ed.], Collembola of Russia and Adjacent Countries.

CHRISTIANSEN, K. A. 2006. Http://www.collembola.org.

GAMA, M. M. DA. 1988. Filogenia des espécies de *Xenylla* à escala mundial (Insecta, Collembola). Evolución boilógia 2: 139-147.

THIBAUD, J. M., H. J. SCHULZ, AND M. M. G. ASSALINO. 2004. Hypogastruridae, *In* W. Dunger [ed.], Synopses on Palaearctic Collembola 4: 7-10, 217-250.

YOSII, R. 1960. Studies on the Collembolan genus *Hypogastrura*. The American Midland Naturalist 64: 257-281.

ZHAO, L., A. H. TAMUR, AND X. KE. 1997. Tentative Checklist of Collembolan Species from China (Insect). Publications of the Itako Hydrobiological Station 9: 15-40.

Downloaded From: https://complete.bioone.org/journals/Florida-Entomologist on 29 Mar 2024
Terms of Use: https://complete.bioone.org/terms-of-use