



***Leeonychiurus*, a new genus from East Asia (Collembola: Onychiuridae: Onychiurini)**

XIN SUN^{1,3} & JAVIER ARBEA²

¹Key laboratory of Wetland Ecology and Environment, Northeast Institute of Geography and Agroecology, Chinese Academy of Sciences, Changchun 130102, China

²C/ Ría de Solía 3, ch. 39, 39610 Astillero, Spain

³Corresponding author. E-mail: sunxin@neigae.ac.cn

Abstract

A new genus of Onychiurini including five species is described from East Asia. *Leeonychiurus* **gen. nov.** differs in its antennal III sensory organ with granulated sensory clubs and 11 chaetae in the distal whorl of tibiotarsi. The main diagnostic characters of the genera from the tribe Onychiurini and the five species from the new genus are summarized. A new species, *Leeonychiurus fusongensis* **sp. nov.**, is reported from northeast China and it can be easily distinguished from other species of the genus by the number of dorsal and ventral pseudocelli. The known Korean species *L. polychaetosus* is re-described by the examination of the type materials.

Key words: Taxonomy, *Leeonychiurus fusongensis* **sp. nov.**, China

Introduction

The subfamily Onychiurinae was erected by Börner in 1901 and included the Onychiuridae with furca absent or reduced to knobs and pigment absent or weakly developed. The subfamily was divided by Bagnall (1949), Pomorski (1996, 1998) and Weiner (1996) into six tribes: Onychiurini Börner, 1906, Oligaphorurini Bagnall, 1949, Protaphorurini Bagnall, 1949, Hymenaphorurini Pomorski, 1996, Cribrochiurini Weiner, 1996 and Thalassaphorurini Pomorski, 1998. So far, 212 known species in 14 genera are included in the tribe Onychiurini (Bellinger *et al.*, 1996–2014): *Onychiurus* Gervais, 1841, *Deuteraphorura* Absolon, 1901, *Absolonia* Börner, 1901, *Argonychiurus* Bagnall, 1949, *Onychiuroides* Bagnall, 1948, *Orthonychiurus* Stach, 1954, *Uralaphorura* Martynova, 1978, *Ongulonychiurus* Thibaud & Massoud, 1986, *Formosanochiurus* Weiner, 1986, *Bionychiurus* Pomorski, 1996, *Deharvengiurus* Weiner, 1996, *Vibronychiurus* Pomorski, 1998, *Pilonychiurus* Pomorski, 2007 and *Similonychiurus* Pomorski, 2007 (Table 1).

In this paper we erected a new genus of Onychiurini including five Asiatic species characterized by granulated sensory clubs on antennal III sensory organ and 11 chaetae on the distal whorl of tibiotarsus: *Onychiurus polychaetosus* Lee & Park, 1986, *Onychiurus saphianus* Nguyen, 2001, *Onychiurus antennalis* Sun & Zhang, 2012, *Onychiurus gulinensis* Sun & Zhang, 2012 and *Leeonychiurus fusongensis* **sp. nov.** (Table 2).

Material and methods

Specimens were mounted in Marc André II solution, after clearing in lactic acid, and were studied using a Nikon Eclipse 80i microscope. Material is deposited in the Key laboratory of Wetland Ecology and Environment, Northeast Institute of Geography and Agroecology, Chinese Academy of Sciences, Changchun (NEIGAE).

Labial types are named after Fjellberg (1999). Labium areas and chaetal nomenclature follow Massoud (1967) and D'Haese (2003). Chaetae on anal valves are named after Yoshii (1996). Furcal area is classified after Weiner

TABLE 2. Comparison of species in the genus *Leeonychiurus*.

Character	<i>fusongensis</i> sp. nov.	<i>gulinensis</i> *	<i>antennalis</i>	<i>polychaetosus</i>	<i>saphianus</i>
Dorsal pso formula	32/133/33343	32/122/33343	32/122/33343	22/233/33343	32/022/ 33353
Ventral pso formula	11/000/0112	11/000/0101	11/000/0101	01/000/0112	11/000/0112
Number of pso on subcoxae 1 of I–III legs	1/1/1	1/1/1	1/1/1	1/1/1	2/2/2
Number of psx on subcoxae 1 of I–III legs	1/1/1	1/1/1	absent	?	?
Ventral psx formula on Abd. I–VI	101002+1 ^m	101002+1 ^m	100000	?	?
Number of vesicles in PAO	13–16	20–21	52–60	30–36	16–18
Apical swelling on Ant IV	absent	absent	present	absent	absent
Number of dorsal chaetae on Th. I	8–10+8–10	7–8+7–8	7–8+7–8	13–16+13–16	8+8
Number of chaetae along axial line on Th II–III terga	4+4	3+3	3+3	5–6+5–6	4+4
Number of chaetae on Th. I–III sterna	0+0/1+1/1(2)+1	0+0/2+2/ 2+2(3)	0+0/1+1/1+1	0+0/1+1/ 1(4)+1	?
Unpaired chaetae on Abd. IV	p0	p0	absent	m0, p0	absent
Chaeta a1 on upper anal valve	absent	present	absent	present	absent
Ratio anal spine/claw	1	1	0,4	0,75	?
Empodial lamella	+	-	+	+	+

*In the original description of *O. gulinensis*, pso on Th. I tergum (1+1), psx on Abd. III (1+1) and Abd. VI (3) were overlooked.

Acknowledgements

The present study was supported by the National Natural Sciences Foundation of China (NO. 31301862, 31311130106, 31370532) and the Fund for Excellent Young Scholars of Northeast Institute of Geography and Agroecology, Chinese Academy of Sciences (DLSYQ13003). We are also indebted to D.H. Wu (NEIGAE, China) for the collection of the specimens and to K.W. Park (Jeonbug Nat'l. Univ., Korea) for the loan of the types of *L. polychaetosus*. Thanks also to Frans Janssens (University of Antwerp, Belgium) and Wanda M. Weiner (Polish Academy of Sciences, Poland) for their comments on the generic classification of Onychiurinae.

References

- Absolon, K. (1901) Weitere Nachricht über europäische Höhlencollemellen und über die Gattung *Aphorura* A.D. MacG. *Zoologischer Anzeiger*, 24, 385–389.
- Bagnall, R.S. (1948) Contribution toward a knowledge of the Onychiuridae (Collembola–Onychiuroidea). I–IV. *Annals and Magazine of Natural History*, 11, 631–642.
<http://dx.doi.org/10.1080/00222934708654672>
- Bagnall, R.S. (1949) Contribution toward a knowledge of the Onychiuridae (Collembola–Onychiuroidea). V–X. *Annals and Magazine of Natural History*, 12, 498–511.
<http://dx.doi.org/10.1080/00222934908654001>
- Bellinger, P.F., Christiansen, K.A. & Janssens, F. (1996–2014) Checklist of the Collembola of the World. Available from: <http://www.collembola.org> (accessed 18 February 2014)
- Börner, C. (1901) Über einige theilweise neue Collemellen aus den Höhlen der Gegend von Letmathe in Westfalen. *Zoologische Anzeiger*, 24, 333–345.
- Börner, C. (1906) Das System der Collemellen nebst Beschreibung neuer Collemellen des Hamburger Naturhistorischen Museums. *Mitteilungen aus den Naturhistorischen Museum in Hamburg*, 23, 147–188.
- Börner, C. (1913) Die Familien der Collemellen. *Zoologischer Anzeiger*, 41, 315–322.
- D'Haese, C.A. (2003) Homology and morphology in Poduromorpha (Hexapoda, Collembola). *European Journal of Entomology*, 101, 385–407.

<http://dx.doi.org/10.14411/eje.2003.060>

- Fjellberg, A. (1999) The labial palp in Collembola. *Zoologischer Anzeiger*, 237, 309–330.
- Gervais, P. (1841) Designation of type and description of genus *Onychiurus*. *Echo Monde Savant*, 8, 372.
- Lee, B.H. & Park, K.H. (1986) Three New Species of Onychiuridae (Collembola) from a Korean Cave. *The Korean Journal of Systematic Zoology*, 2 (1), 11–20.
- Martynova, E.F. (1978). *Uralaphorura*, a new name for *Uralia* Martynova, 1976 (Collembola: Onychiuridae). *Entomologische Berichten*, 38, 63.
- Massoud, Z. (1967) Monographie des Neanuridae, Collemboles Poduromorphes à pièces buccales modifiées. In: Delamare Deboutteville, C. & Rapoport, E.H. (Eds.), *Biologie de l'Amérique Australe. III*. CNRS, Paris, pp. 7–399.
- Nguyen, T.T. (2001) Some new species of Collembola from Vietnam. *National Centre for Natural Science and Technology of Vietnam, Journal of Biology*, 23 (3), 1–12.
- Pomorski, R.J. (1996) The first instar larvae of Onychiurinae – a systematic study (Collembola: Onychiuridae). *Genus*, 7 (1), 1–102.
- Pomorski, R.J. (1998) Onychiurinae of Poland (Collembola: Onychiuridae). *Genus, International Journal of Invertebrate Taxonomy*, Supplement, 1–201.
- Pomorski, R.J. (2007) Three new genera of Onychiuridae (Collembola). *Zootaxa*, 1461, 49–58.
- Stach, J. (1954) The Apterygotan fauna of Poland in relation to the world-fauna of this group of insects. Family: Onychiuridae. *Acta Monographica Musei Historiae Naturalis, Polska Akademia Umiejetnosci*, 1–219.
- Sun, X., Deharveng, L. & Wu, D.H. (2013) Broadening the definition of the genus *Thalassaphorura* Bagnall, 1949 (Collembola, Onychiuridae) with a new aberrant species from China. *ZooKeys*, 364, 1–9.
<http://dx.doi.org/10.3897/zookeys.364.6332>
- Sun, X. & Zhang, F. (2012) Two new species of *Onychiurus* (Collembola: Onychiuridae) from Eastern China. *Journal of Natural History*, 46 (31–32), 1895–1904.
<http://dx.doi.org/10.1080/00222933.2012.707236>
- Thibaud, J.M. & Massoud, Z. (1986) Un nouveau genre d'Insectes Collemboles Onychiuridae cavernicoles des Picos de Europa (Espagne). *Bulletin du Museum National d'Histoire Naturelle*, Paris, 4^e Série, 8 (Section A, 2), 327–331.
- Weiner, W.M. (1986) Onychiurinae Bagn. of North Korea: *Formosanochiurus* g. n. Problems concerning the status of the genus *Onychiurus* Gerv. In: Dallai, R. (Ed.), *2nd International Seminar on Apterygota*. Siena, Italy, pp. 93–97.
- Weiner, W.M. (1996) Generic revision of Onychiurinae (Collembola: Onychiuridae) with a cladistic analysis. *Annals of the Entomological Society of France (N. S.)*, 32, 163–200.
- Yoshii, R. (1996) Identity of some Japanese Collembola IV. “*Deuteraphorura*” Group of *Onychiurus*. *Annals of the speleological research institute of Japan (Iwaizumi)*, 14, 1–15.