Research Article

A New Species of the Genus *Dactylochelifer* Beier from Shanxi, China (Pseudoscorpiones: Cheliferidae)

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A new pseudoscorpion species, *Dactylochelifer luyaensis* sp. nov., belonging to the family Cheliferidae Risso, 1826, is described and illustrated in this paper. The specimens were collected from leaf litter in Shanxi province, China.

1. Introduction

Research on the systematics of Chinese pseudoscorpions is poor, and by now, only 73 species (subspecies) have been reported from China [1]. Considering the huge area of China and more than 3400 species known globally [2], obviously, further investigations of pseudoscorpion taxonomy from most areas of China are urgently needed [3].

The genus *Dactylochelifer* was erected by Beier in 1932 [4], and *Chelifer latreillii* Leach, 1817 was designated as the type species. This genus is widely distributed in Asia, Europe and North America. It is a large genus in the family Cheliferidae Risso, 1826, and at present includes 44 known species [2], among them only one species has been reported from China, *D. gansuensis* Redikorzev, 1934 [5].

Luyashan National Nature Reserve is located in the north of LvLiang Mountain Range, Xinzhou city, Shanxi Province. So far, no pseudoscorpions have reported there. Therefore, we went to Luya Mountain for collection in this Summer. While examining the pseudoscorpion specimens collected from leaf litter in Luya Mountain, we found a *Dactylochelifer* species to be new to science, and named it *Dactylochelifer luyaensis* sp. nov.

2. Material and Methods

The specimens referred to here are preserved in 75% alcohol and deposited in the Museum of Hebei University (MHB), Baoding city, China. Microscopical examination was carried

out with a Leica M165C stereomicroscope, which was also used for photo taking and the measurements. Drawings were made with the aid of a camera lucida mounted above the eyepiece of a compound microscope. The pattern of description and terminology follow Chamberlin [6] and Harvey [7]. The term “rallum” (for flagellum) is adopted following Judson [8]. Temporary slide mounts were made in glycerol. All measurements are given in mm.

The following abbreviations are used in the paper. Tactile setae: b: basal; sb: subbasal; st: subterminal; t: terminal; ib: interior basal; isb: interior subbasal; ist: interior sub-terminal; it: interior terminal; eb: exterior basal; esb: exterior sub-basal; est: exterior sub-terminal; et: exterior terminal. Cheliceral setae: gls: galeal seta; es: exterior seta; is: interior seta; sb: sub-basal seta; b: basal seta.

Dactylochelifer luyaensis sp. nov. Figures 1 and 2.

2.1. Type Material. Holotype male (Ps.-MHBUSX110706), Shanxi Province, Xinzhou City, Luya Mountain, China [38°43' N, 111°59' E], alt. 1710 m, July 6, 2011, leg. Zhi-zhong Gao. Paratypes: 1 male and 4 females, same data as for holotype.

2.1.1. Diagnosis. Small body size and tarsus I were modified; male genital lateral rods weakly fused anteriorly, and each one with an indistinct membranous ring-shaped tube; lateral apodeme well-developed; male galea terminal with 3

FIGURE 1: *Dactylochelifera luyaensis* sp. nov.; dorsal view of holotype.

(female 6) short branches; rallum of three blades, anterior two weakly denticulate distally; claws simple.

2.1.2. Etymology. The specific name refers to the type locality.

2.1.3. Description. Color: mostly reddish brown, carapace and pedipalps dark brown, remaining parts (legs, sternites and pleural membranes) light yellowish brown. Most setae denticulate.

Carapace. Surface: evenly and strongly granular. With a pair of well-developed eyes, slightly (1.04 times) longer than broad, both transverse furrows prominent, regularly granular. The median furrow is narrower and deeper than the subbasal one, with a narrow longitudinal shallow groove in metazone. With total of 40–45 setae, including 6 on anterior margin and 8 on posterior margin. All setae are short and denticuloclavate.

Abdomen. All tergites and sternites are divided. Lateral keels absent; weakly granular. Each half tergites with a dark spot close to middle line except tergites I, III, and XI. Tergal chaetotaxy (male): 9:10:11:14:18:19:16:16:16:14:12 (10 + 2 long tactile setae): 2 (simple setae). Pleural membrane with transverse groove. All of coxae are smooth; coxa IV is with *ca* 34 setae. Coxal sac taking up about 2/3 coxal length. Atrium is well seen, aperture of coxal sac towards vertical line on prolateral side of coxae IV. Sternal chaetotaxy (IV–XI): 10:13:14:13:12:12:10:10 (8 + 2 long tactile setae): 2 (simple and acuminate setae).

Structure of male genitalia of dactylocheliferine form, is as illustrated (Figure 2(13)). Lateral rod is weakly fused anteriorly, each lateral rods with a poorly visible membranous ring-shaped tube attached. Reversible sacs are large;

apodeme of eversible well developed with a bigger size as compared to that of other congeners; dorsal apodeme is large; lateral apodeme is very well developed.

Chelicera with poorly-visible scale-shaped sculpture. Five setae in basal part, all of them simple and pointed; with one lyrifissure on the ventral face of palm; both fingers are with a few different-sized teeth in the end. Movable finger with a seta in midway of terminal of finger; serrula exterior with 18 lamellae. Rallum with three blades, anterior two weakly denticulate distally (the first one blade with three spinules; the median one with only one spinule). Galea with three short terminal branches.

Pedipalp with trichobothriotaxy is as illustrated in (Figure 2(4)). Pedipalp slender, all segments with well-developed granulation, except for chelal fingers, which are scale-like sculpture; setae are short and prominently clavate; proportions: trochanter 1.41 times as long as broad; femur 3.89 times as long as broad; patella 2.76 times as long as broad; chela with pedicel 3.97 times as long as broad, chela without pedicel 3.72 times as long as broad, hand with pedicel 1.97 times, without pedicel 1.72 times, as long as broad. Movable finger 1.09 times as long as hand with pedicel and 1.24 times without pedicel.

Venom apparatus present in both chelal fingers, venom duct in both fingers slender, extend over trichobothrium *t* in movable fingers, venom duct short in fixed finger.

Leg I of typical facies, tibia and tarsus with numerous denticulate setae, tactile setae absent, well-visible scale-like sculpture, claws simple and asymmetric (Figure 2(6) and 2(12)); terminal tarsus inflated and modified; proportions: trochanter 1.00 times as long as deep; femur 1.57 times as long as deep; patella 2.23 times as long as deep; tibia 3.00 times as long as deep; tarsus 2.52 times as long as deep. Subterminal tarsal seta simple, arolium shorter than claws.

Leg IV. Surface: weakly and scale-like sculptured; tibia and tarsus with numerous denticulate setae, tactile setae are absent, trochanter 1.78 times as long as deep; femur + patella 3.12 times as long as deep; tibia 3.77 times as long as deep; tarsus 4.50 times as long as deep. Subterminal tarsal seta simple. Claws simple and asymmetric (Figure 2(5)).

Measurements (Length/Breadth, in mm). Carapace 0.70/0.67. Pedipalp: trochanter 0.31/0.22; femur 0.70/0.18; patella 0.58/0.21; chela with pedicel 1.15/0.29; length of chela without pedicel 1.08; length of hand with pedicel 0.57, without pedicel 0.50; length of movable finger 0.62. Leg I: trochanter 0.24/0.135; femur 0.19/0.13; patella 0.43/0.17; tibia 0.415/0.11; tarsus 0.36/0.08. Leg IV: trochanter 0.13/0.13; femur + patella 0.53/0.17; tibia 0.285/0.095; tarsus 0.29/0.115.

Brief Description of Female Paratype. Carapace slightly (1.03 times) longer than broad.

Chaetotaxy: anterior margin with six setae, posterior margin with six setae (total *ca* 45 setae). Tergal chaetotaxy: 12:17:18:19:22:22:21:22:21:18:15 (13 + 2 long

FIGURE 2: (2–14) *Dactylochelifer luyaensis* sp. nov., holotype (1, 3–6, 8–13) and female paratype (2, 7): (2) left pedipalp, dorsal view; (3) right pedipalp, dorsal view; (4) lateral view of right chelal fingers; showing chaetotaxy; (5) tarsal claws of leg IV, lateral view; (6) leg I, lateral view; (7) galeadorsal view; 8. galea; dorsal view; (9) rallum; (10) coxae IV, ventral view, showing coxal sac and atrium; (11) chelicera, dorsal view; (12) tarsal claws of leg I, lateral view; (13) genitalia, dorsal view; (14) leg IV, lateral view. Scale bars: 0.5 mm (2–4, 14); 0.2 mm (6, 10, 11, 13); 0.05 mm (5, 7–9, 12).

pseudotactile setae): 2 (short, but incrassate and denticulate terminally). Sternal chaetotaxy: (IV–XI): 11:14:14:13:16:16:15:10 (8 + 2 long tactile setae): 2 short and acuminate setae; one central cribriform plate and two lateral cribriform plate present. Galea with six short terminal branches (Figure 2(8)).

Proportions of pedipalp: trochanter 1.76 times as long as broad; femur 3.95 times as long as broad; patella 3.12 times as long as broad; chela with pedicel 3.88 times as long as broad, without pedicel 3.73 times as long as broad. Hand with pedicel 1.73 times, without pedicel 1.58 times, as long as broad. Movable finger 1.07 times as long as hand with pedicel, and 1.24 times without pedicel.

Measurements (Length/Breadth, in mm). Carapace: 0.72/0.70; Pedipalp: trochanter 0.37/0.21; femur 0.75/0.19; patella 1.06/0.34; chela with pedicel 1.28/0.33; length of chela without pedicel 1.23; length of hand with pedicel 0.57, without pedicel 0.52; length of movable finger 0.67.

2.1.4. Distribution. Only known from type locality presently.

3. Remarks

The genus of *Dactylochelifer* Beier, 1932, is a taxonomically confused genus [9]. This new species is very similar to

Dactylochelifer spasskyi Redikorzev, 1949 [10], but can be easily distinguished by smaller body size, by the ratios of carapace and trochanter of pedipalps; It is also different from other congeners by the shape of tarsus I (terminal of tarsus I modified and inflate); in addition, *D. luyaensis* sp. nov. with one central cribriform plate and two lateral cribriform plate. Differs from *D. minor* [10] and *D. monticola* [11, 12] by the ratios of carapace and each segment of pedipalps. Differs from *D. gobiensis* [10, 13] by structure of male genitalia (apodeme of eversible sac of more slender), the ratios of carapace and tibia of leg I.

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References

- [1] Y. W. Zhao, F. Zhang, Y. Jia, and M. S. Zhu, "A checklist of Pseudoscorpions from China (Arachnida: Pseudoscorpiones)," *Acta Arachnologica Sinica*, vol. 20, no. 1, pp. 30–41, 2011.
- [2] M. S. Harvey, "Pseudoscorpions of the world, version 2.0. western australian museum, Perth," <http://www.museum.wa.gov.au/catalogues/pseudoscorpions>.
- [3] Y. Jia, Y. W. Zhao, and M. S. Zhu, "A new species of the pseudoscorpion genus *Bisetocreagris* from China (Arachnida: Pseudoscorpiones: Neobisiidae)," *Zootaxa*, no. 2340, pp. 65–68, 2010.
- [4] M. Beier, "Pseudoscorpionidea II. Subord. C. Cheliferinea," *Tierreich*, vol. 58, no. 20, pp. 1–294, 1932.
- [5] V. Redikorzev, "Schwedisch-Chinesische wissenschaftliche Expedition nach den nord-westlichen Provinzen Chinas, unter Leitung von Dr. Sven Hedin und Prof. Sü Ping-Chang. Pseudoscorpiones," *Arkiv för Zoologi*, vol. 27, no. 20, pp. 1–4, 1934.
- [6] J. C. Chamberlin, *The Arachnid Order Chelonethida*, vol. 7, Biological Sciences, Stanford University, 1st edition, 1931.
- [7] M. S. Harvey, "The phylogeny and classification of the Pseudoscorpionida (Chelicerata: Arachnida)," *Invertebrate Taxonomy*, vol. 6, no. 6, pp. 1373–1435, 1992.
- [8] M. L. I. Judson, "A new and endangered species of the pseudoscorpion genus *Lagynochthonius* from a cave in Vietnam, with notes on chelal morphology and the composition of the Tyrannochthoniini (Arachnida, Chelonethi, Chthoniidae)," *Zootaxa*, no. 1627, pp. 53–68, 2007.
- [9] S. Dashdamirov, "A new species of the false-scorpion family Cheliferidae from Thailand, with remarks on *Ancistrochelifer* and *Metachelifer* (Arachnida: Pseudoscorpiones)," *Zootaxa*, no. 1325, pp. 347–362, 2006.
- [10] S. Dashdamirov and W. Schawaller, "Pseudoscorpions from Middle Asia, part 4 (Arachnida: Pseudoscorpiones)," *Stuttgarter Beiträge zur Naturkunde, A*, vol. 522, pp. 1–24, 1995.
- [11] M. Beier, "Pseudoscorpionidea. Contribution à l'étude de la faune d'Afghanistan. 27," *Förhandlingar vid Kungliga Fysiografiska Sällskapet i Lund*, vol. 30, pp. 41–45, 1960.
- [12] M. Beier, "Pseudoscorpionidea II. Contribution à l'étude de la faune d'Afghanistan. 56," *Förhandlingar vid Kungliga Fysiografiska Sällskapet i Lund*, vol. 31, pp. 1–4, 1961.
- [13] M. Beier, "Pseudoscorpionidea. Ergebnisse der zoologischen Forschungen von Dr. K. Kaszab in der Mongolei," *Reichenbachia*, vol. 11, pp. 283–286, 1969.