

FIRST REPORT OF THE FAMILY LECHYTIIDAE
(ARACHNIDA: PSEUDOSCORPIONES) FROM CHINA,
WITH THE DESCRIPTION OF A NEW SPECIES

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The family Lechytiidae is here reported from China for the first time. A new species of the genus *Lechytia* from Yunnan Province is described and illustrated under the name *Lechytia yulongensis* sp. n.

Key words: pseudoscorpion, taxonomy, *Lechytia*.

INTRODUCTION

The Lechytiidae Chamberlin, 1929, is a small family of Pseudoscorpiones, presently including 24 species in a single genus (HARVEY 2013). Lechytiids show extensive distribution ranges, particularly in tropical and sub-tropical areas. However, they are quite small, easily overlooked and seldom collected, with the result that the distribution of *Lechytia* is very poorly known. The sole genus *Lechytia* was established by BALZAN (1892) in the subfamily Chthoniinae. Later *Lechytia* was placed in the tribe Lechytiini (BEIER 1932, CHAMBERLIN 1929, HOFF 1956, MUCHMORE 1975) or the subfamily Lechytiinae (MORIKAWA 1960, MURTHY & ANANTHAKRISHNAN 1977) of the family Chthoniidae. HARVEY (1992) elevated the tribe Lechytiini to family status as Lechytiidae.

While examining pseudoscorpion specimens collected from Jade Dragon Snow Mountains, Yunnan Province of China, we found three lechytiid specimens with four trichobothria on the dorsum of the chelal hand, *ib* and *isb* forming a transverse pair basally and *eb* and *esb* forming a longitudinal pair centrally; cheliceral rallum a linear row of eight blades, all straight except the second one from subdistal end which is strongly recumbent; the apical seta of palpal coxa acuminate; no coxal spines; no intercoxal tubercle; the spinneret present in males as a distinct, rounded elevation; and the genital area with the anterior setae bordering the genital opening acuminate, but the posterior ones bifurcate at tips. We here describe this new species under the name *Lechytia yulongensis* sp. nov., which is the first member of the genus *Lechytia* and the family Lechytiidae known from China.

MATERIAL AND METHODS

The terminology used in this paper follows CHAMBERLIN (1931), HARVEY (1992) and JUDSON (2007). All specimens are preserved in 75% alcohol. They were examined and illustrated using a Leica 205A stereomicroscope with a drawing tube, which was also used for the measurements. Detailed examination was carried out with an Olympus BX53 general optical microscope. Temporary slide mounts were made in glycerol. All measurements are given in mm. The type specimens are deposited in the Museum of Hebei University (MHBHU), Baoding City, China.

The following abbreviations are used in the text for the trichobothria: *b* = basal; *sb* = sub-basal; *st* = sub-terminal; *t* = terminal; *ib* = interior basal; *isb* = interior sub-basal; *ist* = interior sub-terminal; *it* = interior terminal; *eb* = exterior basal; *esb* = exterior sub-basal; *est* = exterior sub-terminal; *et* = exterior terminal; *dx* = duplex trichobothria. Carapacal chaetotaxy is expressed in the form 6–2 (18), where 18 refers to the total number of setae, 6 the number on the anterior margin and 2 the number on the posterior margin.

TAXONOMY

***Lechytia yulongensis* sp. n.**

(Figs 1–4)

Type material. Holotype male (Ps.-MHBHU-YN12080301): China, Yunnan Province, Yulong County, Jade Dragon Snow Mountains, Maoniuping (27°08'N, 100°13'E), alt. 3254 m, 3 August 2012, Aki Nakamura leg. Paratypes: two males (Ps.-MHBHU-YN12080302-03), same data as for holotype.

Etymology. The specific name refers to the type locality.

Diagnosis. This new species is characterized by the following combination of characters: carapace with two indistinct eye spots, the anterior margin finely denticulate; marginal teeth of chelal fingers well developed and distinctly retrorse; male with well-developed spinneret on movable finger of chelicera; both apical setae of palpal coxa simple at tip (*hoffi* species-group); eleventh sternite apparently reduced; chela 3.55–3.59 times longer than broad; palpal femur 4.00 times longer than broad; movable finger 1.36–1.37 times longer than hand; trichobothria *b* and *sb* only about one areolar diameter apart.

Description. Male – Chelicera, carapace, legs and abdomen yellowish-brown; palp light brown (Fig. 1).

Carapace (Figs. 2a, 4b): subquadrate, somewhat longer than broad, constricted anteriorly; surface with fine, anastomosing, transverse striations; no epistome present, but anterior margin slightly convex and with 10–11 distinct denticles; posterior part with squamous sculpturing; with two indistinct eye spots, each almost one ocular diameter from anterior margin; carapacal chaetotaxy: 6–2, (18), the pre-ocular seta shorter than others in anterior row.

Coxal area (Figs 3a, 4f): coxa I with a low, triangular apical projection; two long setae at tip of manducatory process, setae P 2+3, I 7, II 5, III 6, IV 7, all setae acuminate, including apical setae of palpal coxa; no coxal spines; no intercoxal tubercle.

Chelicera (Figs 2b, 4c): about 0.60–0.70 as long as carapace; palm with 5 setae, of which a short one located laterally; galeal seta located at middle of movable finger; fixed finger with one large tooth, and three roughened ridges proximally; movable finger with an acute apical tooth and 3 pointed, conspicuous middle teeth; movable finger with a distinct spinneret hump. Rallum consisting of 8 blades, the subdistal blade strongly recumbent, others straight (Fig. 3d).

Palp (Figs 2c–2f, 3b, 4a): chela robust; trochanter 1.60–1.80, femur 4.00, patella 1.77–1.83 and chela 3.55–3.59 times longer than broad; chelal hand 1.56–1.59 times longer than broad; movable chelal finger 1.36–1.37 times longer than hand; chelal finger curved in dorsal view. Fixed finger with 41–43 pointed, retrorse teeth, movable finger with 35 retrorse teeth, depressed basally; fixed finger with a small accessory tooth on inner side about at level of second marginal tooth. Trichobothria: *ib*, *isb*, *eb* and *esb* on dorsum of hand, *ib* and *isb* situated basally, *eb* and *esb* situated medially; fixed finger with four (*et*, *it*, *est* and *ist*), plus two special sensory hairs (*dx*) present, located near the tip of fixed finger; movable finger with four (*t*, *b*, *sb*, *st*), *b* situated slightly closer to *sb* than to *t*; *b* and *sb* only about one areolar diameter apart; sensilla absent.

Abdomen (Figs 3c, 4g) ovate, tergites and sternites undivided, eleventh sternite greatly reduced, only a narrow, thin membrane existing between tenth sternite and ventral anal plate. Tergal chaetotaxy: 4–5: 4–5: 6: 6: 6: 6: 6: 6: 4: T2T: 0; sternal chaetotaxy: 8–9: (3)29–33(3): (3)8(3): 12: 10: 10: 10: 8: 2TT2: –: 2; lateralmost ones on anterior tergites and smaller than those medially, and lateral two on each tergite set close together; anterior genital operculum with 8–9 setae, genital opening slit-like in basal half, each side with 10–12 marginal setae, anterior setae bordering genital opening acuminate, posterior ones bifurcate.



Fig. 1. *Lechytiya yulongensis* sp. n., holotype, male: habitus, dorsal view.

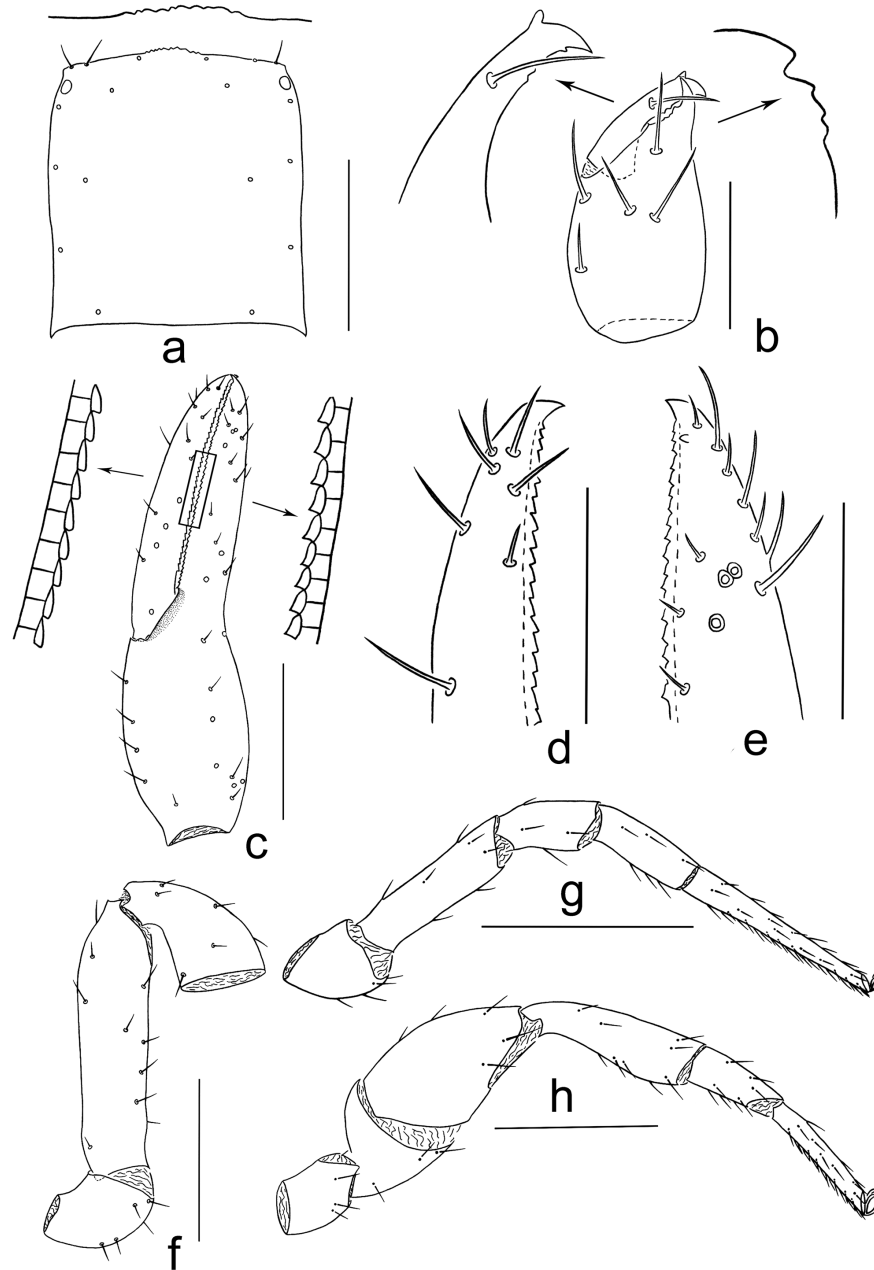


Fig. 2. *Lechyttia yulongensis* sp. n., holotype, male: a = carapace, dorsal view, b = left chelicera, dorsal view, c = left chela, lateral view, d = tip of movable finger, dorsal view, e = tip of fixed finger, dorsal view, f = left palp (minus chela), dorsal view, g = left leg I, lateral view, h = left leg IV, lateral view. Scale bars: 100 μm (d, e), 150 μm (b), 250 μm (a, c, f–h).

Legs I (Figs 2g, 4d) and IV (Figs 2h, 4e); robust, surfaces nearly smooth; leg I femur 3.17–3.50 times longer than deep, leg IV femur+patella 2.31–2.33 times longer than deep. Tarsi with two elongate openings along dorsal surface each with crenulate margins.

Measurements (length/breadth or depth, in mm, ratios in parentheses). Male (holotype and paratypes). Body length 1.38–1.44. Carapace 0.37–0.40×0.35–0.37 (1.06–1.08). Chelicera 0.24–0.26×0.13 (1.85–2.00), movable finger length 0.12–0.13. Palpal trochanter 0.16–0.18×0.10 (1.60–1.80), femur 0.40×0.10 (4.00), patella 0.22–0.23×0.12–0.13 (1.77–1.83), chela 0.61–0.64×0.17–0.18 (3.55–3.59), hand 0.27–0.28×0.17–0.18 (1.56–1.59), movable finger length 0.37–0.38 (1.36–1.37×hand). Leg I trochanter 0.10–0.11×0.08 (1.25–1.38), femur 0.19–0.21×0.06 (3.17–3.50), patella 0.11×0.05–0.06 (1.83–2.20), tibia 0.12–0.14×0.04–0.05 (2.40–2.80), tarsus 0.24×0.03 (8.00); leg IV trochanter 0.15×0.09 (1.67), femur+patella 0.35–0.37×0.15–0.16 (2.31–2.33), tibia 0.25–0.27×0.07 (3.57–3.86), metatarsus 0.13–0.14×0.05–0.06 (2.33–2.60), telotarsus 0.19–0.21×0.03 (6.33–7.00).

Distribution. China (Yunnan Province).

Remarks. Because of few collections, *Lechytia* species have rarely been studied in recent years and little is known about the relationships between them. However, two distinct species-groups can be recognized in this genus (MUCHMORE 1975, 2000, JUDSON 1992), the *L. arborea* species-group and the *L.*

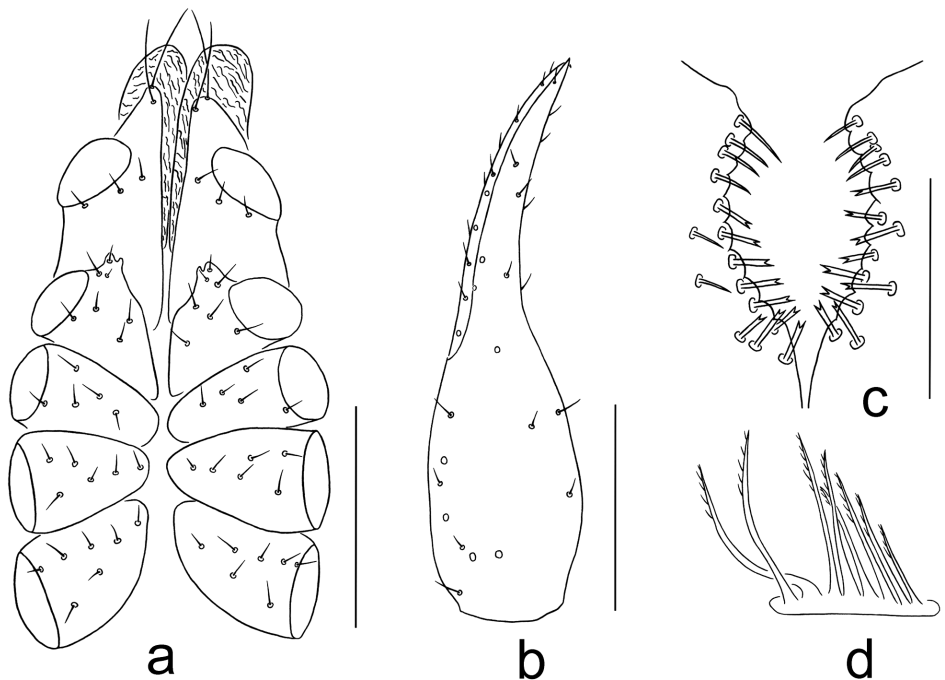


Fig. 3. *Lechytia yulongensis* sp. n., holotype, male: a = coxal region, ventral view, b = left chela, dorsal view, c = male genital opening, d = rallum. Scale bars: 30 μ m (d), 50 μ m (c), 250 μ m (a, b).

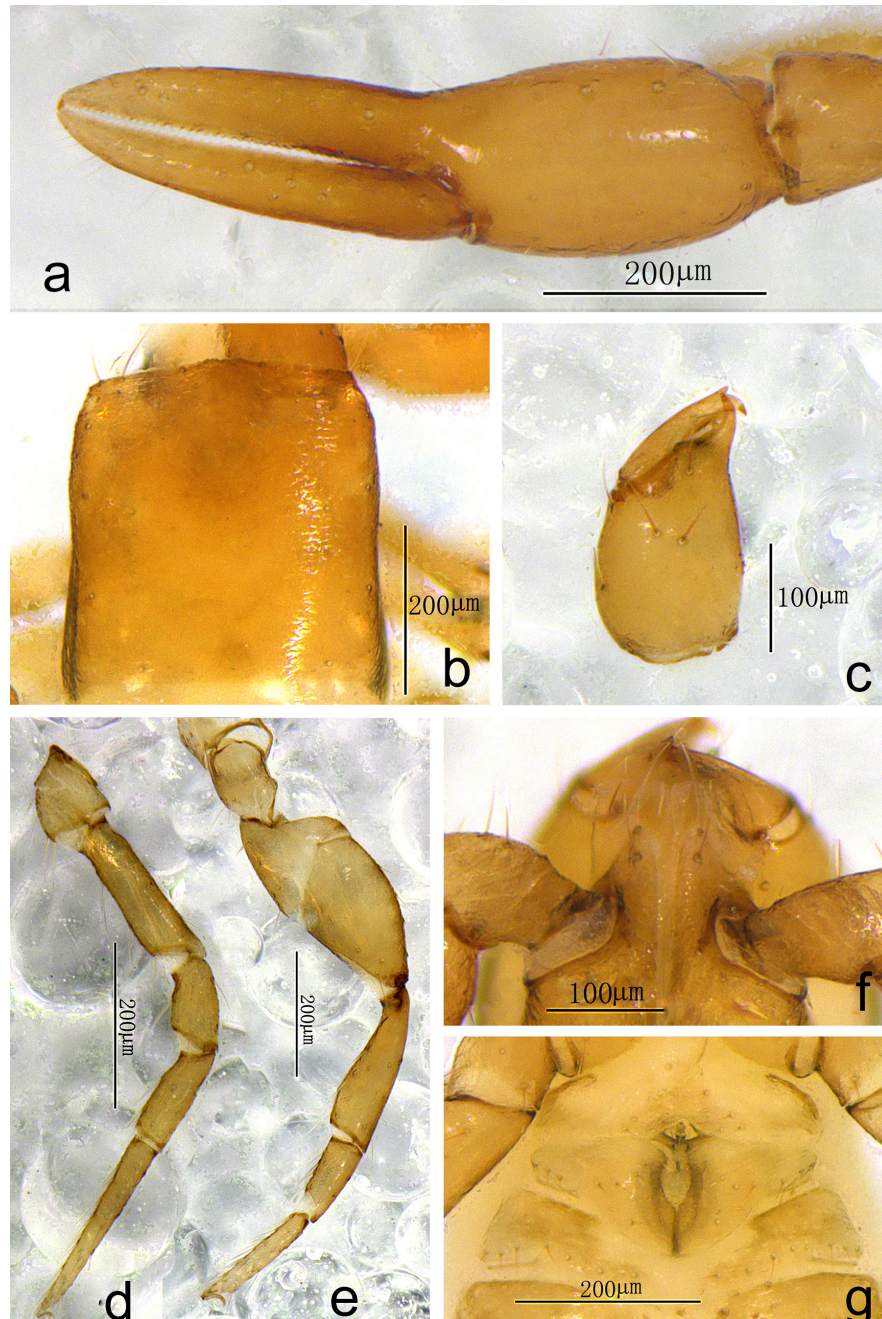


Fig. 4. *Lechytiya yulongensis* sp. n., holotype, male: a = left chela, lateral view, b = carapace, dorsal view, c = left chelicera, dorsal view, d = left leg I, lateral view, e = left leg IV, lateral view, f = apex of the palpal coxae, g = genital area of male.

hoffi species-group. The *L. arborea* species-group has the following characters: (1) apical setae of palpal coxa bifurcate; (2) eleventh tergite with chaetotaxy 1T2T1; (3) spinneret of male absent or indistinct; (4) most teeth of chelal reduced. The *L. hoffi* species-group is diagnosed by having: (1) apical setae of palpal coxa simple, acuminate; (2) eleventh tergite with chaetotaxy T2T; (3) male with spinneret nearly as well developed as in female; (4) chelal teeth well developed, mostly cuspated. Based on these criteria, *L. yulongensis* sp. n. can easily be assigned to the *L. hoffi* species-group.

Five *Lechytia* species had previously been recorded from Asia: *L. madrasica* Sivaraman, 1980, *L. indica* Murthy & Ananthakrishnan, 1977 from India, *L. sakagamii* Morikawa, 1952 from Japan, *L. himalayana* Beier, 1974 from Nepal and *L. asiatica* Redikorzev, 1938 from Vietnam. The new species differs from *L. madrasica* and *L. indica* by the presence of eyespots on carapace, which are lacking in *L. madrasica* and *L. indica*. It can be separated from *L. sakagamii* by the male movable finger with a distinct spinneret hump (absent in male of *L. sakagamii*) and by trichobothria *b* and *sb* only about one areolar diameter apart (*b* and *sb* close together, only about half an areolar diameter apart in *L. sakagamii*). *L. himalayana* is distinguished from the new species by the ratio of movable finger longer than hand ($1.20\times$ vs $1.36\text{--}1.37\times$), and by possessing a much longer carapace (1.25 times as long as broad, compared with 1.06–1.08 times in *L. yulongensis* sp. n.). *L. asiatica* differs from the new species by its smaller size (palpal femur 0.3 mm vs 0.40 mm, chela 0.20 mm vs 0.27–0.28 mm), and its relatively shorter movable chelal finger ($1.10\times$ vs $1.36\text{--}1.37\times$ hand).

The new species resembles *L. hoffi* Muchmore, 1975 from America, both in having a spinneret hump in the male and the chelal teeth well-developed, but *L. hoffi* differs from *L. yulongensis* sp. n. in having two corneate eyes (reduced to eye spots in *L. yulongensis* sp. n.) and chelal ($3.55\text{--}3.59$ vs $3.90\text{--}4.10$) times longer than hand; furthermore, the form of teeth on the movable chelal finger is different (with 35 retrorse teeth, depressed basally), as opposed to 8–12 small, triangular teeth at distal end, followed by 19–24 long, low teeth, nearly all with cusps in *L. hoffi*). The new species also resembles *L. kuscheli* Beier, 1957 from Chile in having the apical seta of the palpal coxa simple, but it differs from the latter in having a much more robust chela ($3.55\text{--}3.59$ times longer than broad, as opposed to 4.8 times in *L. kuscheli*).

Considering biogeographical distribution, both *L. yulongensis* sp. n. and *L. hoffi* could be collected nearby the Tropic of Cancer, and occurred at relatively high elevations. As *L. hoffi* has been recorded from a wide area in the western United States, we presume *L. yulongensis* sp. n. maybe have a widespread distribution in China (or Asia).

Members of family Lechytidae are distributed worldwide with eleven species recorded from South and North America, six species from Africa, one

species from Turkey, one species from Australia, and five species from Asia and the Pacific region (HARVEY 2013). *L. yulongensis* sp. n. is the first member of the family Lechytidae to be discovered in China; two male specimens were collected from conifer forests using the bark spraying method, and one male specimen was collected from conifer forests using Berlese extraction. Therefore we presume *L. yulongensis* sp. n. maybe a corticolous species, or it lives in the soil, or in both conditions.

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