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A new species and new record of the water mite genus *Lebertia* Neuman, 1880 (Acari: Hydrachnidia, Lebertiidae) from China

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ABSTRACT — A new species *Lebertia extendia* **n. sp.** is described and illustrated and *Lebertia* (*Pilolebertia*) *inaequalis* Koch, 1837 is reported for the first time from China. The new species can be distinguished from other species by the mediodistal seta inserted close to the ventrodistal seta and the extended posterior margin of Cx-IV and the larger number of swimming setae on II-leg-5. Furthermore, a key to the *Lebertia* species of China is provided.

KEYWORDS — water mites; new species; new record; systematics; running water; China

INTRODUCTION

The study of the genus *Lebertia* Neuman, 1880 in China started in 1994 when Jin reported two new species from the subgenus *Pilolebertia* (Jin 1994). To date, nine species of this genus have been reported from China: *Lebertia* (*Pilolebertia*) *porosa* Thor, 1900 (Thor 1900a; Guo and Jin 2002; Jin *et al*. 2010); *L.* (*P.*) *carmamaya* Cook, 1967 (Cook 1967; Guo and Jin 2002); *L.* (*P.*) *liangi* Jin, 1994; *L.* (*P.*) *ramiseta* Jin, 1994; *L.* (*P.*) *ciliata*, Jin, 1997 (Jin 1997a); *L.* (*P.*) *trifurcilla* Jin, 1997 (Jin 1997a); *L.* (*P.*) *pectinata* Guo *et* Jin, 2005; *L.* (*P.*) *pseudociliata* Guo and Jin, 2005; *Lebertia* (*Lebertia*) *abseta* Guo, Jin and Asadi, 2006 (Guo and Xu 2013). We add *L.* (*P.*) *inaequalis* Koch, 1837 as a new record to the Chinese fauna and also describe a new species *L.* (*P.*) *extendia* **n. sp.** for the world.

MATERIALS AND METHODS

All specimens were collected with a 200 μm mesh size hand net, preserved in Koenike's fluid, and mounted in glycerine jelly (Jin 1997b). The specimens were dissected under a Leica M125 stereoscope, described, and drawn under a Leica DM3000 microscope. The type material and non-type material is deposited in the Institute of Entomology, Guizhou University, Guizhou Province, P. R. China.

The abbreviations and terms used in text are as follows: Cx-I–IV: coxae I–IV. Ac-1: acetabula 1. I-L-1–6: first leg's segment 1–6. P-1–5: palp segment 1–5. ML: medial length. L: length. H: height. W: width. All measurements are given in μm.

RESULTS

Family Lebertiidae Thor, 1900b
Genus *Lebertia* Neuman, 1880

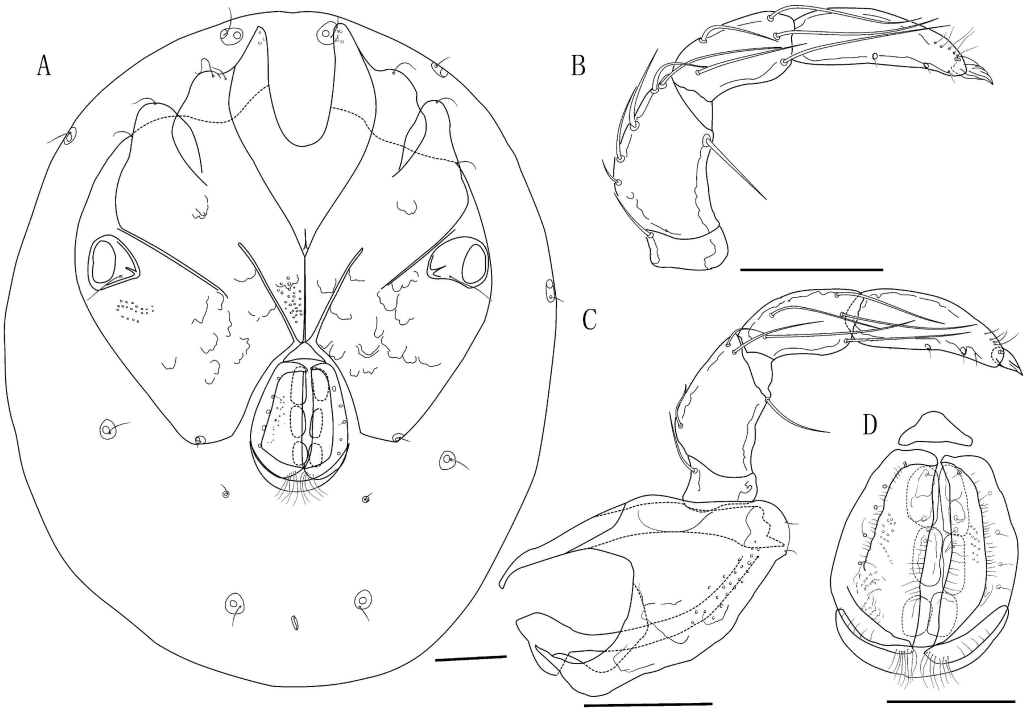


FIGURE 1: *Lebertia* (*Lebertia*) *inaequalis* (Male): A – Ventral view; B – Palp; C – Palp and gnathosoma; D – Genital field. Scale bars: A–D = 100 μm.

Lebertia* (*Pilolebertia*) *inaequalis (Koch 1837)
New record for China
(Figs. 1-2)

For synonyms see Gerecke (2009).

Material examined — Three males. Slide numbers BJ-IV-20020503, BJ-IV-20020504, and BJ-IV-20020507, from Beijing, P.R., China (40°07.76'N, 116°19.80'E), 43 m asl, collected in the Shahe River near Wenquan Park, Beijing, leg. Jianjun Guo, 15 May 2002. One female. Slide number BJ-IV-20020501. Same data as given for males. These samples are deposited in the Institute of Entomology, Guizhou University, Guizhou Province, P.R. China.

Remarks — *Lebertia inaequalis* was originally described from Germany by Koch in 1837. The main characteristics of the Chinese specimens match the description of Gerecke (2009), based on the smooth integument; short Cx-II (Cx-I/II ML ratio 1.32–1.44 in Chinese specimens, 1.1–1.7, generally > 1.3 in German specimens); slight but distinct indentation in gnathosoma; P-4 ventral margin divided by ventral seta insertions into 2: 1: 1; P-2 relatively long (28% total L of the palp in Chinese specimens, 25 – 28% in the German specimens); one minute peg-like seta on P-4 and the swimming numbers of legs. However, the Chinese specimens still have one slightly difference compared with the description from Germany in the size of some of the palp segments. The Chinese specimens measure P-4 113 – 138 μm long, while the type specimens from Germany are 133 – 180 μm long. Nevertheless, as most of the main characteristics and measurements of the Chinese specimens fit well in the description of Gerecke (2009), we conclude that the Chinese specimens are of the same species as those from Germany.

Habitat — Pools of higher order streams, macrophyte belts in standing waters, especially in the wave-zone (Lundblad 1968; Gerecke 2009), clean rivers.

Distribution — Extended parts of the Palaearc-

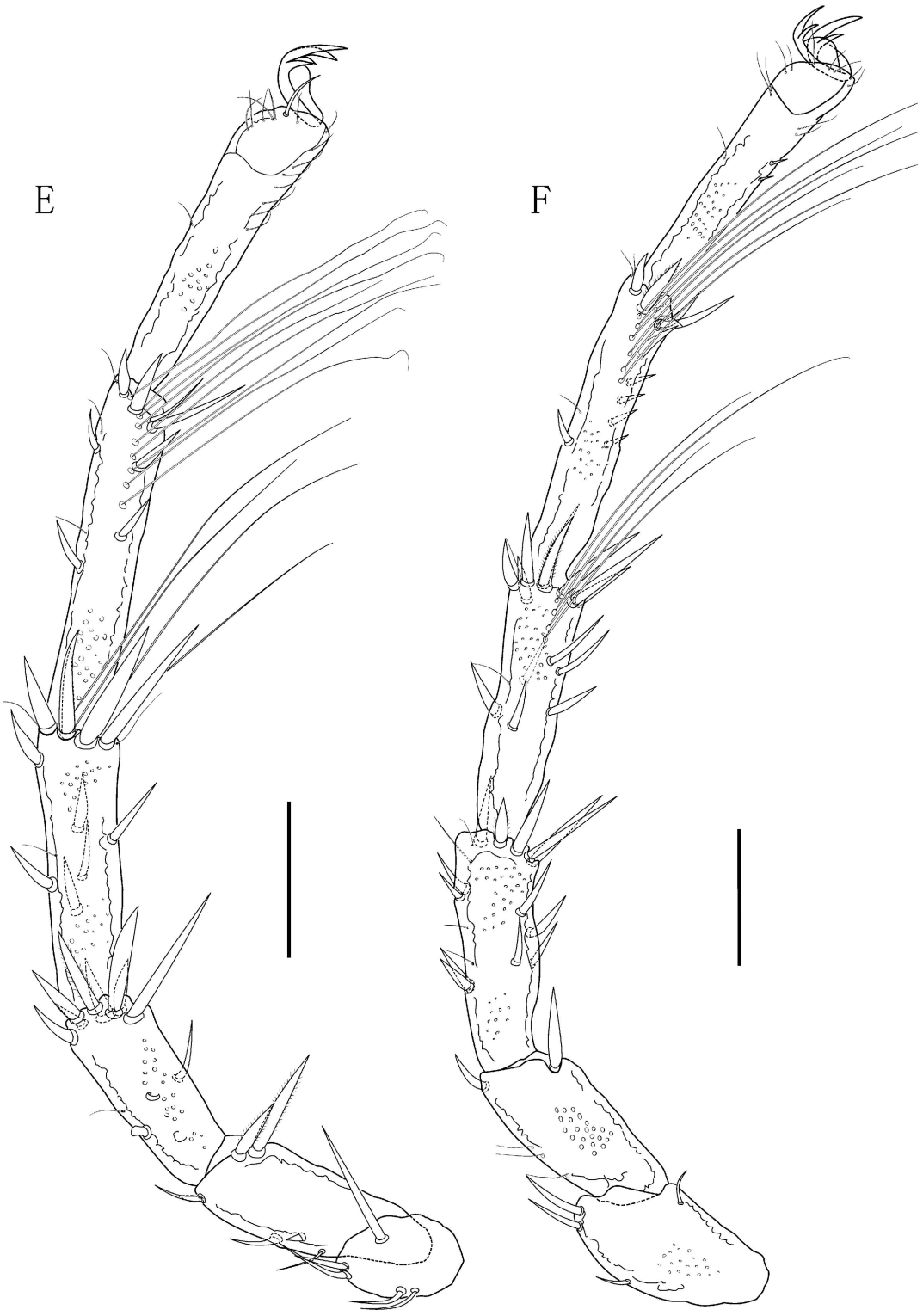


FIGURE 2: *Lebertia* (*Lebertia*) *inaequalis* (Male): E – III-L-1-6; F – IV-L-1-6. Scale bars: E–F = 100μm.

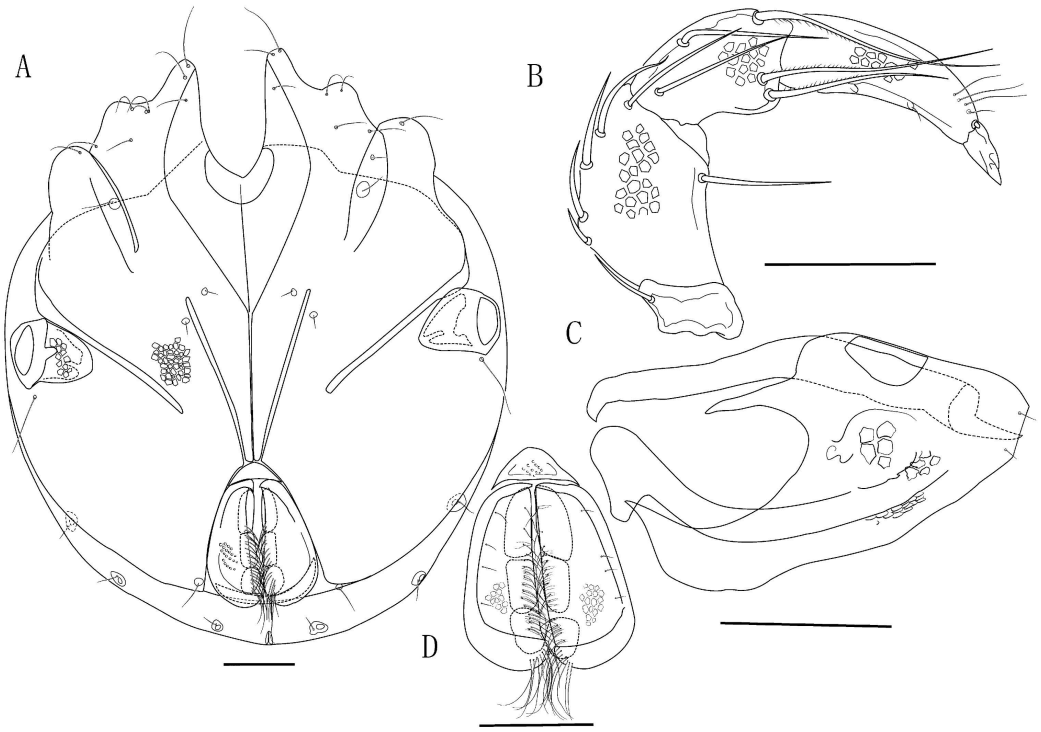


FIGURE 3: *Lebertia* (*Pilolebertia*) *extendia* (Male): A – Ventral view; B – Palp; C – Gnathosoma; D – Genital field. Scale bars: A–D = 100 μm.

tic (Lundblad 1956; Lundblad 1968; Valdecasas and Camacho 1986; Gerecke 2009; Di Sabatino *et al*. 2010).

Lebertia (*Pilolebertia*) *extendia* n. sp. (Fig. 3-4)

Type series — Holotype: Male. Slide number GZ-IV-19981002, from Maolan National Nature Reserve, Libo County, Guizhou Province, P.R. China (25°82.23'N, 107°37.21'E), 800 m asl, collected in Maohe river near a village, leg. Jianjun Guo, 02 October, 1998. Paratype: 1 Male. Slide number GZ-IV19971004, same data as holotype, leg. Daochao Jin, 04 October, 1997. Both holotype and paratype are deposited in the Institute of Entomology, Guizhou University, Guizhou Province, P.R. China

Diagnosis — P-3 distal setae pectinated, mediodistal seta inserted close to the ventrodistal seta. The ventral seta insertions divide the ventral margin of P-4 into 1: 1: 1 (Fig. 3B). Medial suture Cx-I/II almost equal in length (Fig. 3A). Coxal field extended and the posterior margin of Cx-IV almost reaching to the posterior end of the genital field.

Description — Male (n = 2). Colour yellowish-brown. Idiosoma almost round in outline, 713 (700) in L and 653 (610) in W. Integument smooth on the dorsal surface, palps, legs, and coxal field with reticulated frame work (mesh size 8 – 13). Coxal field extending and almost embracing the posterior margin of the genital field; Coxal field 755 (760) in L, 660 (650) in W; Cx-I/II ML 194 (205) / 205 (188), ratio 0.95 (1.09); Cx-II narrow, posterior margin approximately 19 (25) in W, posteromedial margin of Cx-IV forming a right angle. Genital field with three pairs of acetabula, the first two pairs rectangular, and the third pair almost round in outline (Fig. 3A). Length of acetabula: Ac-1, 60 (53); Ac-2, 50 (51); Ac-3, 37 (38); genital flap 179 (165) in L; genital field 155 (140) in W. Excretory pore smooth. Capitulum ventral L 190 (198), chelicera L 255 (275) (Fig. 3C).

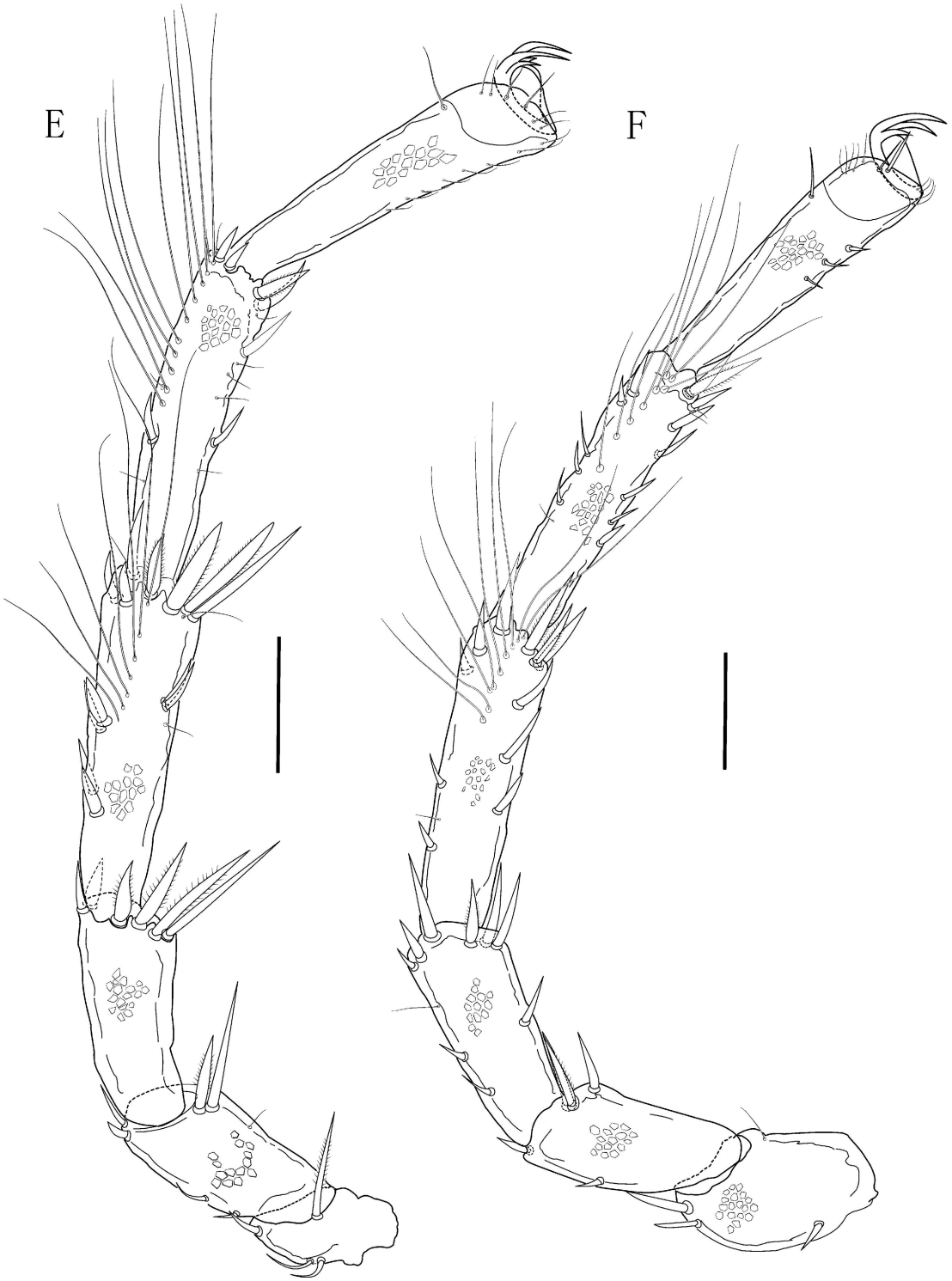


FIGURE 4: *Lebertia* (*Pilolebertia*) *extendia* (Male): E – III-L-1 – 6; F – IV-L-1 – 6. Scale bars: E–F = 100 μm.

Numbers of swimming setae: II-L-5, 6 (8); III-L-4, 6 (7); III-L-5, 7 (10); IV-L-4, 9 (7); IV-L-5, 10 (8). IV-L-1 with one dorsal and two dorsodistal setae. Ventral setae on L-III-IV (Figs. 4E, 4F): III-L-1, 1 (1); III-L-2, 1 (2); III-L-3, 1 (1); III-L-4, 3 (3); III-L-5, 6 (7) (two strong and peg-like, others hair-like); III-L-6, 7 (8) (hair-like); IV-L-1, 1 (1); IV-L-2, 1 (1); IV-L-3, 1 (1); IV-L-4, 3 (3); IV-L-5, 6 (6); IV-L-6, 3 (3). P-2 with five setae, the ventral seta as long as or even slightly longer than the ventral length of P-2; P-3 distal setae pectinated, dorsal setae separated from each other, the mediodistal seta inserted close to the ventrodistal seta (distance approximately 9 – 11); P-4 distally narrowed with four fine dorsal setae and one minute peg-like seta (3 – 4 in length), the ventral seta insertions divided the ventral margin into 1: 1: 1 (Fig. 3B). P-2/P-4 0.95 (0.89) in L and total length of palp 410 (470). L/H of the palp: P-1, 31 (38)/53 (54), ratio 0.58 (0.70); P-2, 119 (133)/75 (88), ratio 1.59 (1.51); P-3, 100 (115)/63 (64), ratio 1.59 (1.80); P-4, 125 (150)/43 (48), ratio 2.90 (3.13); P-5, 38 (40)/16 (18), ratio 2.38 (2.22). L/H of legs: I-L-1, 75 (88)/50 (70), ratio 1.5 (1.26); I-L-2, 105 (145)/68 (73), ratio 1.54 (1.99); I-L-3, 118 (125)/60 (68), ratio 1.97 (1.84); I-L-4, 175 (175)/58 (60), ratio 3.02 (2.92); I-L-5, 163 (183)/45 (48), ratio 3.62 (3.81); I-L-6, 150 (160)/38 (38), ratio 3.95 (4.21); II-L-1, 63 (80)/63 (75), ratio 1.00 (1.07); II-L-2, 108 (113)/75 (80), ratio 1.44 (1.41); II-L-3, 108 (138)/65 (75), ratio 1.66 (1.84); II-L-4, 188 (208)/58 (70), ratio 3.14 (2.97); II-L-5, 218 (230)/45 (55), ratio 4.84 (4.18); II-L-6, 188 (213)/45 (50), ratio 4.18 (4.26); III-L-1, 86 (80)/65 (78), ratio 1.32 (1.03); III-L-2, 147 (140)/78 (80), ratio 1.88 (1.75); III-L-3, 159 (175)/72 (73), ratio 2.21 (2.40); III-L-4, 252 (245)/70 (68), ratio 3.60 (3.60); III-L-5, 263 (288)/53 (58), ratio 4.96 (4.97); III-L-6, 247 (238)/61 (55), ratio 4.05 (4.33); IV-L-1, 174 (185)/101 (98), ratio 1.72 (1.89); IV-L-2, 166 (148)/86 (85), ratio 1.93 (1.74); IV-L-3, 197 (205)/85 (78), ratio 2.32 (2.63); IV-L-4, 278 (275)/76 (70), ratio 3.66 (3.93); IV-L-5, 274 (300)/63 (63), ratio 4.35 (4.76); IV-L-6, 246 (265)/66 (65), ratio 3.73 (4.08).

Etymology — "Extend" means "enlarge", the new species is named after the enlarged posterior margin of Cx-IV.

Remarks — The new species can be distinguished from other species by the mediodistal seta inserted close to the ventrodistal seta and the extended posterior margin of Cx-IV.

Lebertia (*Pilolebertia*) *insignis* Neuman, 1880 is similar to the new species in the position of the mediodistal seta on P-3 and the distributions of ventral setae on P-4. Nevertheless, there are still many differences: 1) medial suture Cx-I is slightly longer than Cx-II in *L. insignis* (1.2 – 1.3 in *L. insignis*), but in the new species medial sutures Cx-I/II are almost equal in length (ML 0.95); 2) P-2 of the new species is slightly longer than that of *L. insignis* (P-2/P-4 L 0.78 – 0.80 in *L. insignis*, but 0.95 in the new species); 3) the Cx-IV posterior margin is truncated in *L. insignis*, but in the new species the coxal field extends with the posterior margin of Cx-IV almost reaching to the posterior end of the genital field; 4) II-L-5 with 2 swimming setae in *L. insignis*, while the new species has 6 – 10 swimming setae on II-L-5. (Gerecke 2009; Bursali *et al*. 2011).

Female unkown.

Habitat — Maohe river near Banzhai village.

Distribution — China, known only from the type locality.

Key to Chinese species of *Lebertia*

1. Numerous swimming setae on II-III-IV-L, II-L with at least two swimming setae on leg 2
— Swimming setae reduced in number, II-L-5 with at most one hair-like swimming seta on the segment *L.* (*L.*) *abseta* Guo, Jin & Asadi, 2006

2. P-3 mediodistal seta very close to the ventrodistal seta, coxal field extended, occupying approximately 6/7 of the dorsal surface, the posterior margin of Cx-IV almost reaching the end of the genital flap. . . . . *L.* (*P.*) *extendia* **n. sp.**
— P-3 mediodistal seta more centrally or approaching dorsodistal seta, coxal field not extended and the posterior margin of Cx-IV not reaching to the end of the genital flap 3

3. Ventral setae insertions dividing the ventral margin into three sectors equal in length 4

— Ventral setae insertions dividing the ventral margin into one longer sector and two shorter distal sectors 5

4. P-3 with five long setae pectinated, peg-like seta of P-4 relatively minute (L<5). . . . . *L.* (*P.*) *pectinata* Guo & Jin, 2005
— P-3 with five long setae smooth, peg-like seta of P-4 relatively large (L>5) . . . *L.* (*P.*) *porosa* Thor, 1900

5. Medial suture Cx-II long (Cx-I/II ML ratio 0.8 – 1.2) 6
— Medial suture Cx-II short (Cx-I/II ML ratio 1.4 – 2.0) 7

6. P-3 ventrodistal seta pectinated, El with seta-like cuticle extensions 8
— P-3 ventrodistal seta smooth, El without seta-like cuticle extension 9

7. A1, E1 smooth, ventral setae of P-4 inserted close to each other . . . . . *L.* (*P.*) *inaequalis* Koch, 1837
— A1 setae serrated, El with seta-like cuticle extensions sharing a base, ventral setae of P-4 inserted away from each other 10

8. E1 with three seta-like cuticle extensions, ventral margin of P-4 divided by ventral setae into 2: 2: 1, 9 – 13 swimming setae on II-III-IV-L-5 . . . . . *L.* (*P.*) *ciliate* Jin, 1997
— E1 with two seta-like cuticle extensions, ventral margin of P-4 divided by ventral setae into 4: 3: 1, 4 – 7 swimming setae on II-III-IV-L-5 . . . . . *L.* (*P.*) *pseudociliata* Guo & Jin, 2005

9. Male genital field with high numbers of medial setae (about 20-35) in posterior part . . . . . *L.* (*P.*) *carmamaya* Cook, 1967
— Male genital field with fewer medial setae (about 6) in posterior part. . . . . *L.* (*P.*) *liangi* Jin, 1994

10. E1 with three seta-like cuticle extensions, ventral seta of P-2 inserted slightly away from the distal margin of the segment . . . . *L.* (*P.*) *trifurcilla* Jin, 1997
— E1 with one seta-like cuticle extension, ventral seta of P-2 inserted at the distal of the segment . . . . . *L.* (*P.*) *ramiseta* Jin, 1994

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