

## Two new water mite species of the genus *Limnesia* Thor from Ethiopia (Acariformes: Limnesiidae)

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*Limnesia ethiopiensis* sp. n. (female) and *L. luciferoides* sp. n. (female) from Tana Lake (Ethiopia) are described.

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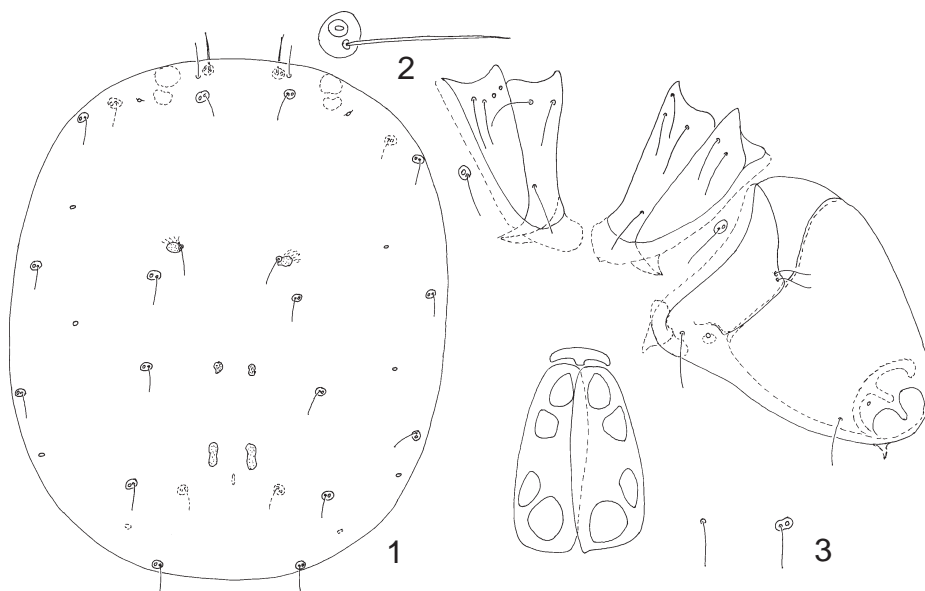
Both new species described in this paper were collected during the work of the junior author in the Russian-Ethiopian Biological Expedition.

### ***Limnesia* (Tetralimnesia) ethiopiensis** sp. n. (Figs 1-12)

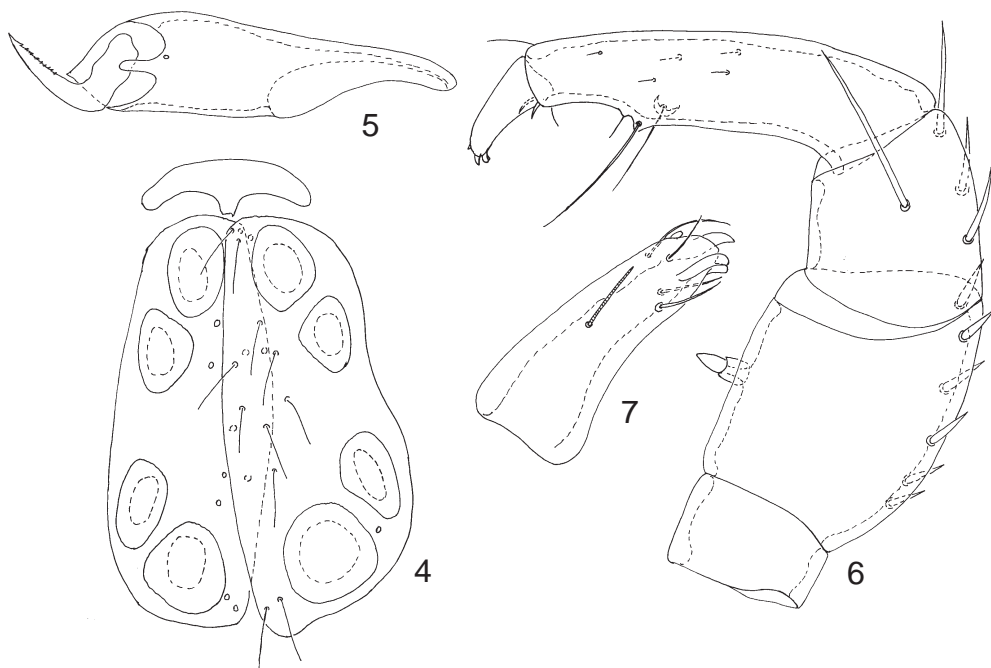
*Holotype*. ♀, **Ethiopia**, Tana Lake, 17.XI.2006, leg. A. Zhokhov; slide 9401 deposited in the collection of Institute for Biology of Inland Waters (Borok, Russia).

*Description* (nomenclature of body setae and lyriform organs according to Tuzovskij, 1987). *Female*. Body oval. Integument soft and smooth. Eyes with black pigment; anterior eyes larger than

posterior (Fig. 1). Dorsum with three pairs of small muscle attachment plates. Anterior and median pairs of plates smaller than posterior ones. Anterior plates transverse and fused with bases of setae Oi. Median plates more or less rounded, located between setae Sci. Posterior plates elongate, located in front of setae Li. Setae Fch (Fig. 2) thick; other idiosomal setae thin. Trichobothria Fp and Oi without glandularia; other dorsal setae with accompanying glandularia. Anterior pair of lyriform organs ( $i_1$ ) situated slightly behind posterior eyes;  $i_2$ - $i_4$  located along lateral margins of body. Medial borders of first coxae small, rounded, separated medially; apodemes



**Figs 1-3.** *Limnesia ethiopiensis* sp. n., female: **1**, idiosoma, dorsal view; **2**, seta Fch; **3**, coxae of legs and genital plates, ventral view.



**Figs 4-7.** *Limnesia ethiopiensis* sp. n., female: 4, genital flap; 5, chelicera; 6, pedipalp; 7, pedipalpal tarsus.

weakly developed (Fig. 3). Coxae III+IV triangular. Suture line between coxae III+IV in their median portion not developed. Setae Pe and associated glandularia well separated; base of seta Pe located on anteromedial margin of coxae III; glandularia Pe open near posteromedial margin of these coxae. Anal opening situated slightly in front of setae Ci. Setae Pi without glandularia. Fifth pair of lyriform organs ( $i_5$ ) in posterior portion of ventral side.

External genital organ with four pairs of acetabulae. Genital flaps elongate (ratio length/width = 2.4), with 11-12 thin setae located mainly along their medial parts (Fig. 4). First pair of genital acetabulae larger than second and third pairs, but smaller than fourth pair. First and second pairs of acetabulae noticeably separated from third and fourth pairs. Pregenital sclerite well developed.

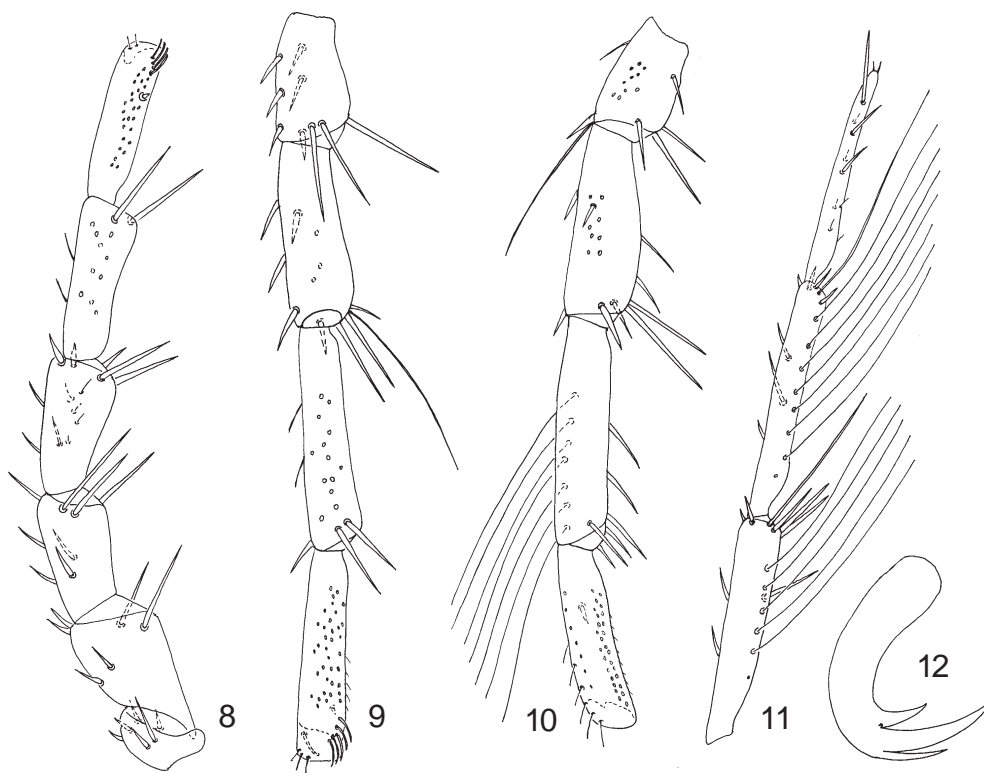
Chelicera with large basal segment and small stylet (Fig. 5). Cheliceral stylet with numerous very small teeth. Trochanter of pedipalp (Fig. 6) short, without setae. Femur with six short dorsal setae; ventral side with moderately developed cylindrical tubercle bearing spine-like seta. Genu with three dorsal unequal setae and long lateral one, base of last seta situated in distal portion of segment. Tibia with two well developed ventral tubercles, each of them bearing rather long unequal seta, and very small tubercle with short seta.

Pedipalpal tarsus (Fig. 7) with one solenidion, four thin setae, one small dorsodistal and three thick distal setae, and spines.

Legs I without swimming setae; basifemur, telofemur, genu and tibia slightly enlarged distally (Fig. 8). Legs II-IV (Figs 9-11) with swimming setae, their number as follows: 1 on genu II and telofemur III, 6-7 on tibia III and genu IV, 8-9 on tibia IV. Tarsus of leg IV with three thick setae, terminal thick seta 0.3 times as long as this segment. Ambulacra of legs I-III with large median and short dorsal and ventral teeth (Fig. 12).

Measurements,  $\mu\text{m}$ . Length: body 875 (width 750); between anterior end of first coxae and posterior end of fourth coxae 412; coxae III+IV 140 (width 110); setae Fch 57-60 (width 3); genital flaps 170 (width 70), width of pregenital sclerite 77, genital acetabulae (ac1-ac4): 35 (width 25), 30 (width 24), 35 (width 22), 35-40 (width 35-40); basal segment of chelicera 290, cheliceral stylet 85, segments of pedipalps 35, 120, 80, 168, 42; height of tubercle on femur of pedipalp 11, spine-like ventral seta on pedipalpal femur 11 (width 5); segments of legs: I – 60, 85, 90, 95, 105, 110; II – 55, 90, 95, 125, 155, 145; III – 78, 72, 85, 125, 155, 125; IV – 120, 95, 130, 175, 185, 175.

**Comparison.** *Limnesia ethiopiensis* sp. n. is similar to *L. maglioi* Cook, 1966, from which



**Figs. 8-12.** *Limnesia ethiopiensis* sp. n., female: **8**, leg I; **9**, telofemur, genu, tibia and tarsus of leg II; **10**, telofemur, genu, tibia and tarsus of leg III; **11**, genu, tibia and tarsus of leg IV; **12**, claw of leg III.

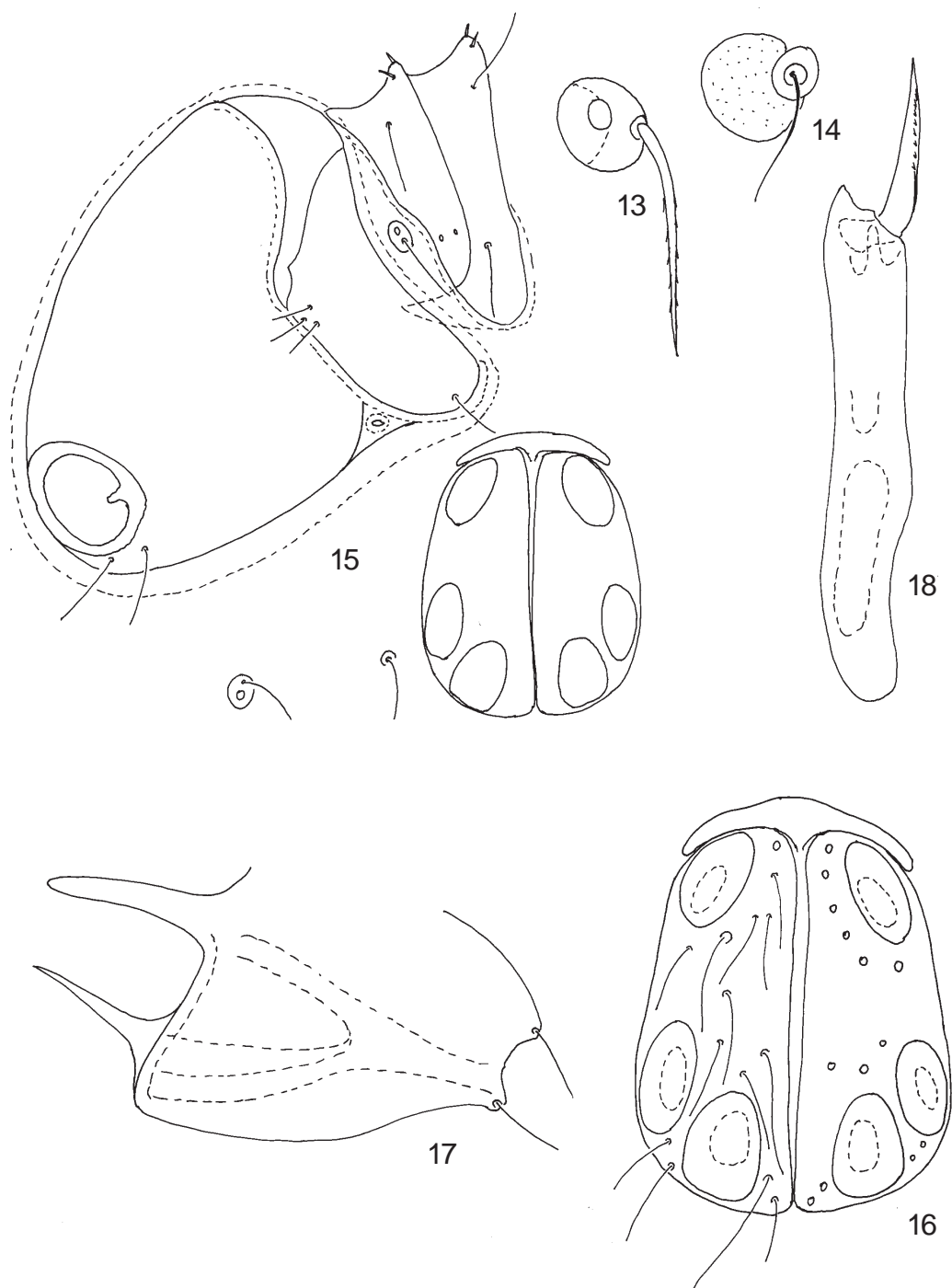
especially clearly differs in the structure of the external genital organ, position of glandularia Pe and number of swimming setae on posterior pairs of legs. In the female of *L. maglioi*, first three pairs of genital acetabulae (ac1-ac3) equal in sizes; glandularia Pe located approximately on half way between anterior margin of coxae III and suture line between coxae III+IV; third and fourth legs with several swimming setae (Cook, 1966). In the female of *L. ethiopiensis*, first pair of genital acetabulae (ac1) larger than second pair (ac2) and third pair (ac3), glandularia Pe located near suture line between coxae III+IV, third and fourth pairs of legs with numerous swimming setae.

***Limnesia (Limnesia) luciferoides* sp. n.**  
(Figs 13-22)

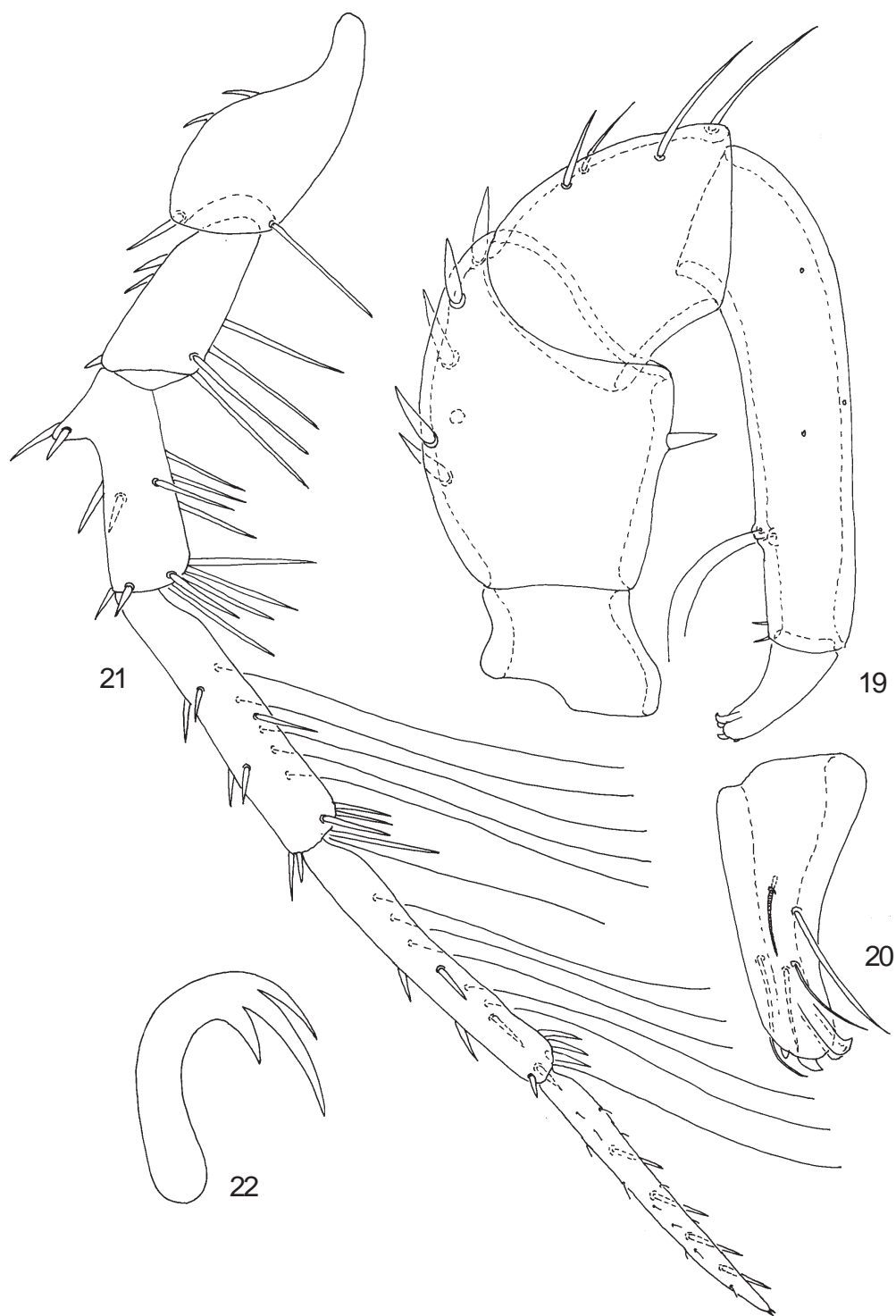
*Holotype.* ♀, **Ethiopia**, Tana Lake, in stomach of catfish *Clarias gariepinus* (Burchell, 1822), 17.XI.2006, leg. A. Zhokhov; slide 9401 deposited in the collection of Institute for Biology of Inland Waters (Borok, Russia).

*Description. Female.* Body oval. Integument soft and smooth. Eyes with black pigment; anterior eyes larger than posterior. Setae Fch (Fig. 13) thick; other idiosomal setae and lyriform or-

gans arranged as in *L. ethiopiensis*. Dorsum without median and posterior muscle attachment plates. Bases of setae Oi fused with very small sclerites (Fig. 14). Medial borders of first coxae broad; first coxae lying very closely together medially, but not fused; apodemes moderately developed (Fig. 15). Median margin of third coxae rounded; coxae IV triangular; suture line between coxae III+IV distinct. Setae Pe and associated glandularia separated; glandularia Pe lying in a triangular area formed by a bifurcation of apodeme between third and fourth coxae; associated seta far removed from glandularia Pe, lying near medial tip of third coxae. Setae Pi without associated glandularia. External genital organ (Fig. 16) with three pairs of acetabula, located between posterior coxal groups. Genital flaps elongate (ratio length/width 2.6), with 15-16 thin setae. First pair of genital acetabula slightly longer than second and third pairs, but last pair wider than anterior two pairs. First pair of acetabula noticeably separated from second and third pairs; second pair lying lateral to third pair. Pregenital sclerite well developed. Capitulum (Fig. 17) with convex ventral margin; dorsodistal projections



**Figs 13-18.** *Limnesia luciferoides* sp. n., female: **13**, setae Fch; **14**, seta Oi; **15**, fragment of ventral surface; **16**, genital flaps; **17**, capitulum, lateral view; **18**, chelicera, lateral view.



**Figs 19-22.** *Limnesia luciferoides* sp. n., female: **19**, pedipalp, lateral view; **20**, pedipalpal tarsus; **21**, leg IV; **22**, claw.

longer than ventrodiscal ones; mouth opening with two pairs of approximately subequal setae. Chelicera (Fig. 18) with slender basal segment and rather long stylet. Cheliceral stylet with rather numerous, very small teeth.

Trochanter of pedipalp (Fig. 19) short, without setae. Femur with five or six short dorsal setae; ventral margin straight, without tubercle; spine-like seta pointed, located in ventrodiscal portion of this segment. Genu with two short proximal and two long distal dorsal setae. Tibia with two small tubercles bearing two rather long unequal setae. Pedipalpal tarsus (Fig. 20) with one solenidion, four thin unequal setae, very small dorsodistal and three rather large distal spines. Telofemur of leg IV (Fig. 21) with proximal dorsal conic tubercle bearing two short, thick setae. Legs I without swimming setae; legs II-IV with swimming setae, their number as follows: 1 on telofemur II and telofemur III, 4 on genu III, 8 on tibia III, 6 on genu IV, 6-7 on tibia IV. Tarsus of leg IV with four subequal thick setae. Ambulacrae of legs I-III with large median and short dorsal and ventral teeth (Fig. 22).

Measurements,  $\mu\text{m}$ . Length: body 685; between anterior end of first coxae and posterior end of fourth coxae 462; coxae III+IV 350; setae Fch 60 (width 3); genital flaps 180 (width 70), genital acetabula (ac1-ac3): 54 (width 26), 48

(width 24), 48 (width 36); chelicera 354, cheliceral stylet 108; segments of pedipalps 35, 115, 90, 153, 42; spine-like ventral seta on pedipalpal femur 15 (width 5-6); segments of legs: I – 60, 90, 90, 115, 115, 125; II – 65, 90, 100, 145, 160, 160; III – 90, 78, 90, 145, 170, 150; IV – 168, 115, 150, 190, 215, 210.

*Comparison.* Female of *Limnesia luciferoides* sp. n. is similar to female of *L. lucifera* Koenike, 1898, from which especially clearly differs in the structure of leg IV and size of chelicera. Telofemur IV of female of *L. luciferoides* is with proximal dorsal tubercle, genu IV and tibia IV with 6-7 swimming setae, length of chelicera 354  $\mu\text{m}$ ; in contrast, in female of *L. lucifera* telofemur IV is without proximal dorsal tubercle, genu IV and tibia IV with 10-11 swimming setae, length of chelicera 456  $\mu\text{m}$  (Lundblad, 1942).

## References

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