# Description of a new water mite species of the genus *Stygothrombium* Viets, 1932 (Acariformes: Stygothrombioidea: Stygothrombiidae) from the Far East of Russia

# Описание нового вида водяного клеща рода *Stygothrombium* Viets, 1932 (Acariformes: Stygothrombioidea: Stygothrombiidae) из Дальнего Востока России

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A new water mite, *Stygothrombum orientalis*, based on male and deutonymph from running waters of the Far East is described with illustrations.

Иллюстрированное описание нового вида водяного клеща *Stygothrombum orientalis* **sp. nov.** (самец, дейтонимфа) из проточных водоемов Дальнего Востока.

**Key words**: water mites, Acariformes, Stygothrombiidae, *Stygothrombum orientalis,* new species, male, deutonymph, Far East of Russia

**Ключевые слова**: водяные клещи, Acariformes, Stygothrombiidae, *Stygothrombum orientalis,* новый вид, самец, дейтонимфа, Дальний Восток России

## INTRODUCTION

The aim of the present paper is to describe male and deutonymph of the new water mite species *Stygothrombum orientalis*. The materials were collected by T. Vshivkova (1983) in a mountain river of the Primory Territory of Russia.

## MATERIALS AND METHODS

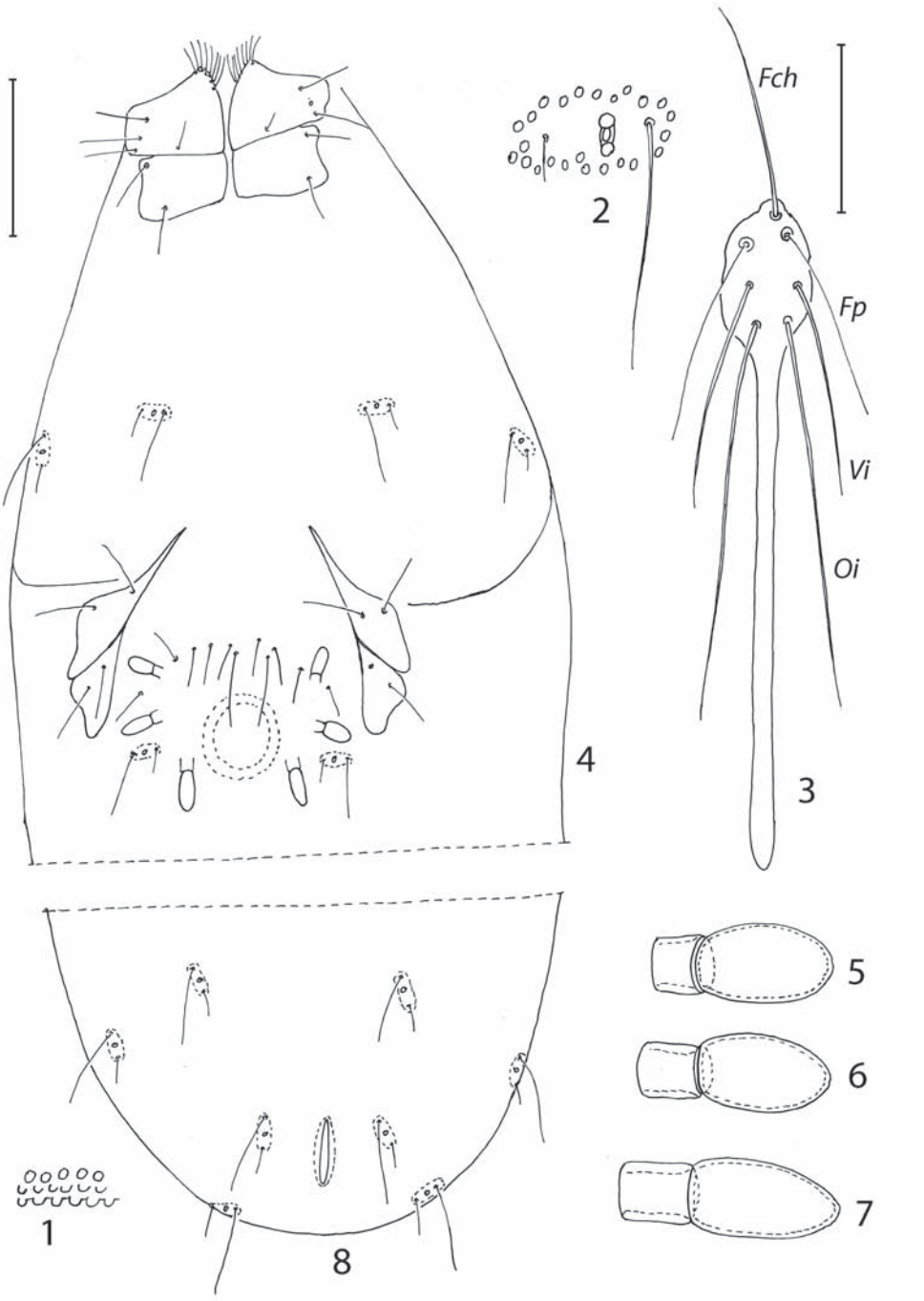
The material was collected by T.S. Vshivkova in streams of the Primorskiy Kray [Primorsky Territory] of Russia. The individuals were fixed in 3% solution of formalin, mite specimens were mounted in Hoeyr's medium. Terminology of idiosomal setae on the frontal plate follows Tuzovskij (1987): *Fch* – frontale chelicerarum, *Fp* – frontales pedipalporum, *Vi* – verticales internae, *Oi* – occipitales internae. Terminology of setae on segments of thee pedipalp follow Vercammen-Grandjean (1980): *a* – alantoid, *od* – odontus, *pod* – parodontus, *tct* – tectala. Besides, the following abbreviations are used: P-1 and P-2, pedipalp segments; P-1 – trochanter + femur + genu, P-2 – tibia + tarsus; I-Leg.1–6 , first leg, segments 1–6 (trochanter, basifemur, telofemur, genu, tibia and tarsus), i.e. II-Leg. 4 – genu of second leg; 1–3, ac. 1–3, genital acetabula (anterior, median, posterior); *s* – solenidion, L – length; n – number of specimens measured. Length of the appendage segments was measured along their dorsal side. All measurements are given in μm ($10^{-6}$).

Family **STYGOTHROMBIIDAE** Thor, 1935

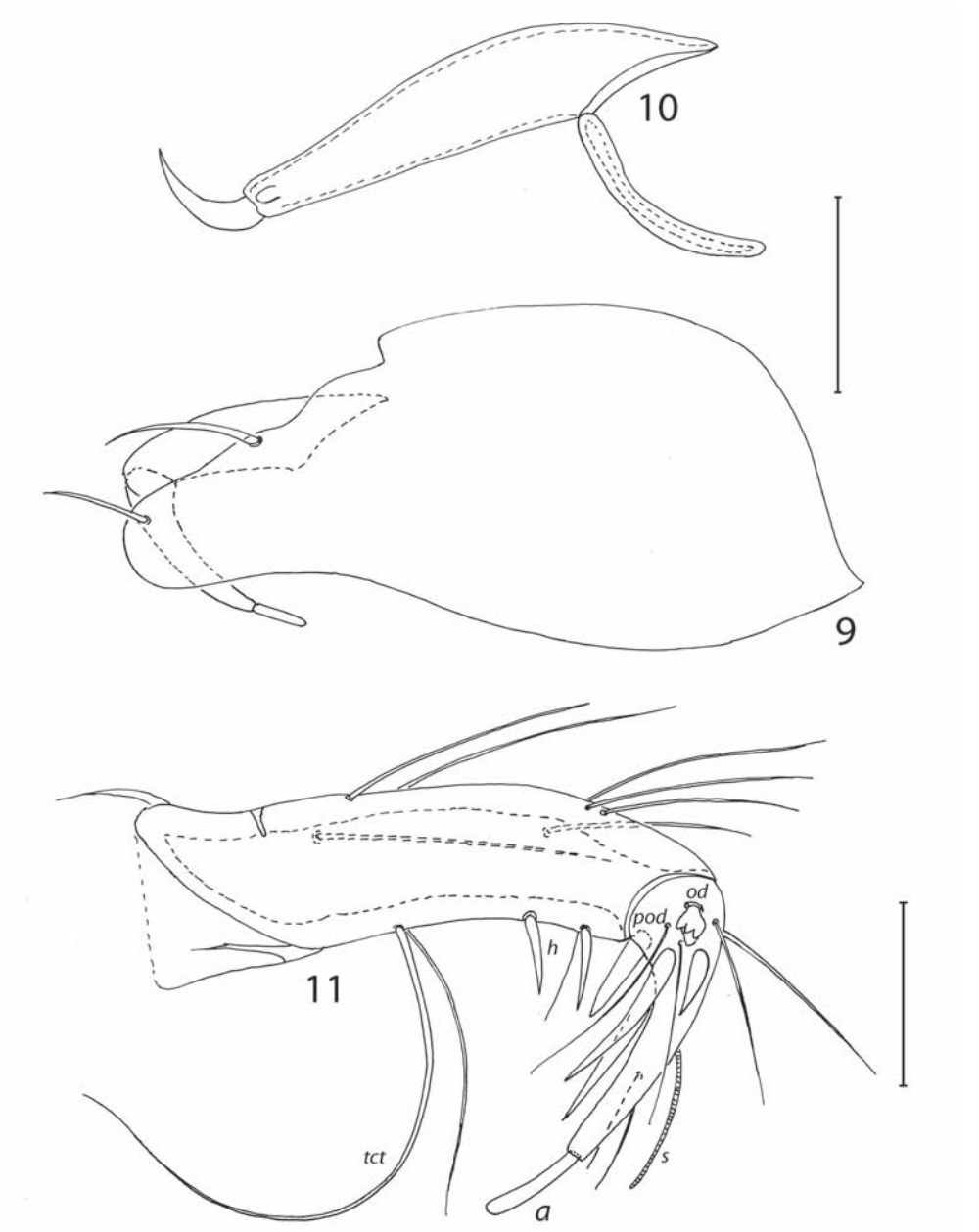
Genus ***Stygothrombum*** Viets, 1932

***Stygothrombum* (*Stygothrombum*) *orientalis*, sp. nov.**
(Figs 1–21)

*Holotype*. male, **Russia**, Primorsky Territory, Ussuri National Park, Komarovka River; depth about 0.4 m; substrates: stones, pebbles, sand, 28




**Figs 1–8.** *Stygothrombum orientalis* **sp. nov.**, male: **1** – fragment of integument, **2** – idiosomal glandularia with associated setae, **3** – frontal plate, **4** – anterior part of idiosoma, ventral view, **5** – anterior acetabula, **6** – median acetabula, **7** – posterior acetabula, **8** – caudal part of idiosoma, ventral view. Scale bars: 50 μm (1–3, 5–7), 200 μm (4, 8).




**Figs 9–11.** *Stygothrombum orientalis* **sp. nov.**, male: **9** – capitulum, lateral view, **10** – chelicera, lateral view, **11** – pedipalp. Scale bars: 100 μm (9–10), 50 μm (11).

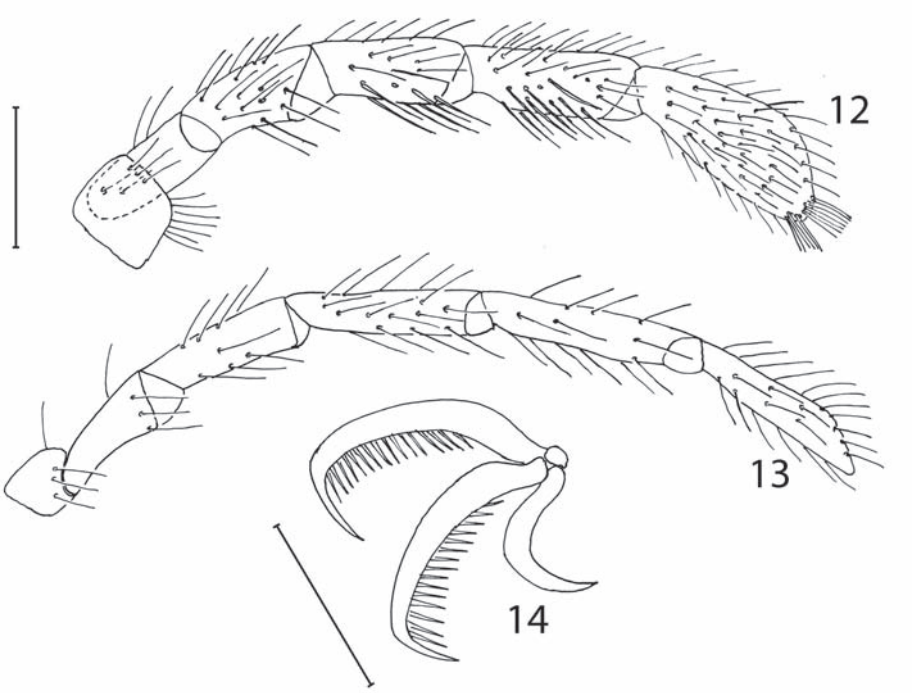
Oct.1983, leg. T.S. Vshivkova, slide 9587, deposited in the collection of Institute for Biology of Inland Water (Borok, Russia).

*Paratypes*. One male and one deutonymph, same locality and date as holotype.

*Description*. Male. Idiosoma flat vermiform, ratio length/width 2.1–2.6. Integument colourless soft and papillate (Fig.1). Idiosomal glandularia openings not on distinct sclerite platelets, but surrounded

by unpapillate integument; each glandularia associated with long seta and short one (Fig. 2). Dorsum with frontal plate (crista metopica, Fig. 3) bearing in its anterior portion one unpaired anterior seta (*Fch*), one pair of trichobothria (*Fp*) and two pairs simple setae (*Vi, Oi*); setae *Fch, Fp* and *Vi* approximately equal in length and considerable shorter than *Oi*; trichobothria *Fp* thin hair–like, other simple setae relatively thick. Anterior portion of frontal plate short and wide, its posterior portion long and narrow. Posterior portion of frontal plate approximately four times as long as anterior part. Frontal eye and lateral eyes completely absent. Coxal plates in four groups, anterior and posterior groups widely separated (Fig. 4). Anterior coxal groups placed closely together, but not fused to each other. Coxal plates I trapezoidal, their anterior margin concave, posterior margin straight; medial margin convex and considerably longer than lateral margin. Coxal plate I with 8–11 short anteromedial setae, three rather long lateral setae and single short seta near middle of posterior margin. Coxal plate II trapezoidal, its medial margin slightly shorter than lateral margin, with two lateral setae. Posterior coxal groups elongate and widely separated, coxal plate III with long pointed process and two thin setae; coxal plate IV nearly triangular, with two setae. Genital field without sclerites, genital opening anteriorly flanked by row of fine setae (10 to 12), among which two medial setae considerably longer than others; with three pairs of stalked, cupuliform acetabula in perigenital area. Anterior acetabulum (Fig. 5) and median acetabulum (Fig. 6) approximately subequal, posterior acetabulum (Fig. 7) slightly larger than anterior and median ones. Excretory pore as longish slit, placed near posterior end of ventral surface (Fig. 8).

Gnathosoma relatively small, located at end of protrusible membranous tube, with




**Figs 12–14.** *Stygothrombum orientalis* **sp. nov.**, male: **12** – leg I, **13** – leg IV, **14** – claws. Scale bars: 100 μm (12–13), 50 μm (14).

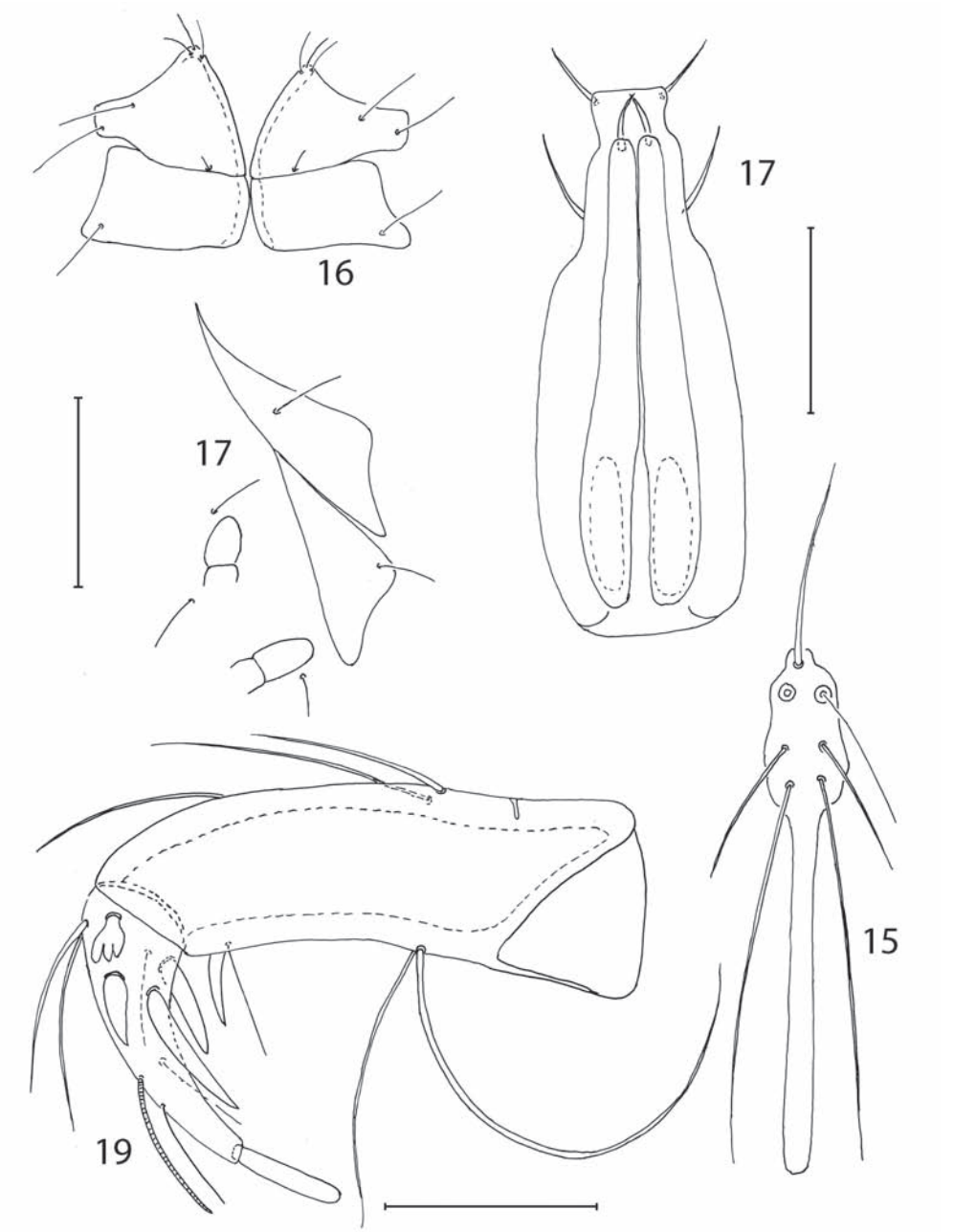
orifice directed dorsally and flanked by two pairs of unequal setae on well-developed rostrum (Fig. 9). Capitular base relatively large with convex ventral margin and approximately three times as long as rostrum, anterior hypostomal setae shorter than posterior ones. Chelicerae not fused to each other. Basal segments of chelicera (Fig. 10) long, tapering distally with straight ventral margin and convex dorsal margin; cheliceral stylet very short, crescent. Sigmoid pieces (air sacs) well developed, long and curved. Pedipalp (Fig. 11) possessing two unequal segments: first segment includes trochanter + femur + genu (P-1-3) (trochanter fused to femur + genu but dorsal groove present); three unequal dorsoproximal setae, four approximately subequal dorsodistal ones, two long unequal ventroproximal ones, two relatively short stout ventrodistal harpago setae and single thin ventrodistal seta. Odontus seta with three short thick denticles, tectala seta twice as long as ventroproximal one. Second segment (tibia + tarsus, P-4-5) curved, tapering distally with short dorsal odontus seta and lanceolate one, rather long ventroproximal parodontus, two long sword setae, single dorsal solenidion, five thin unequal setae and rather large terminal alantoid seta with rounded tip.

First pair of legs thicker than other pairs of legs. Leg I (Fig. 12) with large numbers of rather uniform fine setae, but on genu and tibia ventrolateral setae longer and thicker than dorsal ones; tarsus I with two bundles of fine ventrodistal setae. Legs II–IV slender with relatively few fine setae (Fig. 13). Tarsi of all legs with three appendages: paired ambulacra and unpaired empodium (Fig. 14). Ambulacra rather large and ventrally pectinate, empodium considerably smaller than ambulacra and not pectinate.

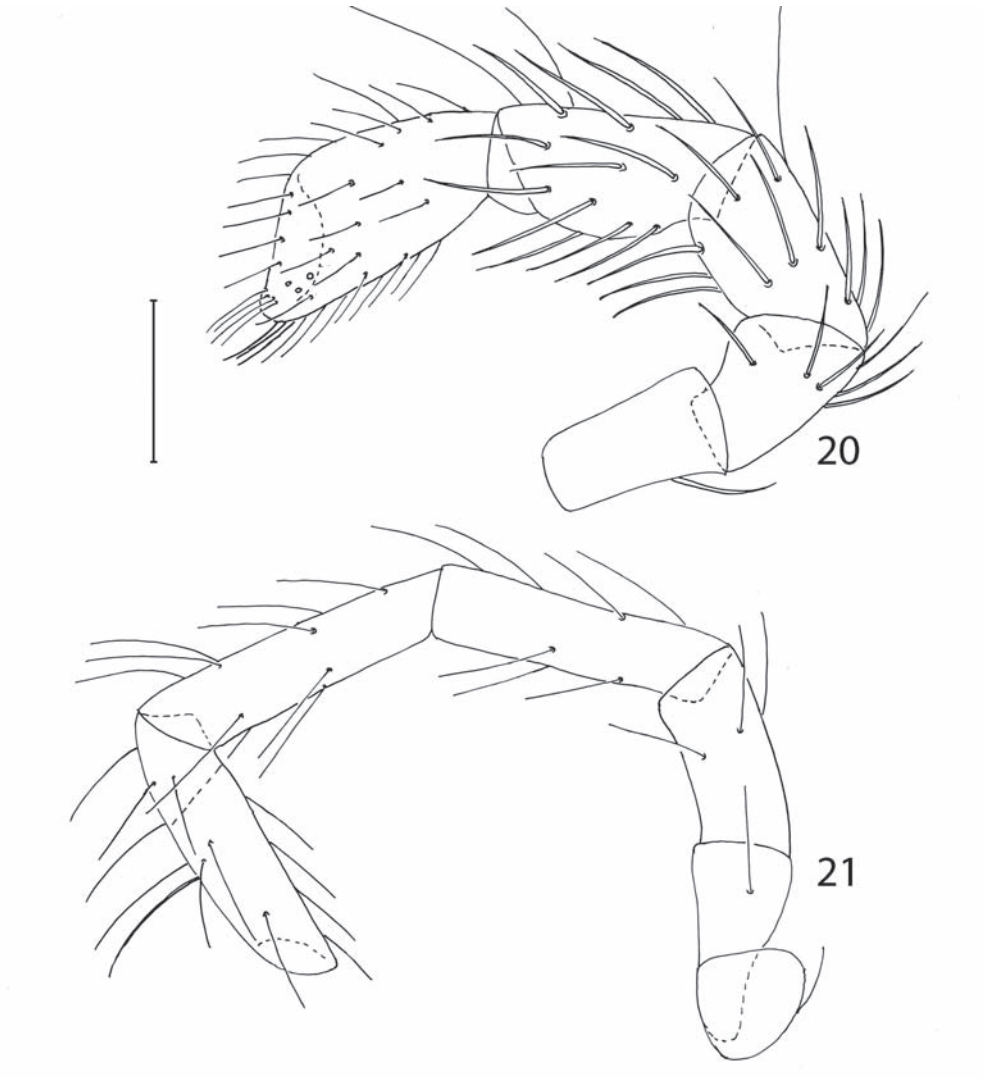
Measurements (n=2). Length of body 1340–1750, width 670–690; length of dorsal plate 170–190, width its anterior portion 40–46, width its posterior portion 12–15; length of capitulum 335–342, length of rostrum 84–90, length of basal segment of chelicera 220–230, length of cheliceral stylet 48–55; length of coxal plates I+II 145–155, length of coxal plates III+IV 240–250; length/diameter of genital acetabula (ac. 1–3): 33–36/24–25, 30–33/ 22–24, 40–43/24–25; length of pedipalpal segments (P-1-3, P-4-5): 120–135, 72–85; length of leg segments: I-Leg. 1–6: 60–65,110–115, 100–110, 105–110, 105–125, 120–130, 125–150; II-Leg. 1–6: 42–48, 70–85, 70–80, 85–95, 105–115, 95–120; III-Leg. 1–6: 40–45, 75–95, 85–115, 100–135, 120–150, 120–140; IV-Leg. 1–6: 45–60, 95–100, 105–115, 130–150, 140–170, 130–150.

*Deutonymph*. Idiosoma similar to that in male, but smaller. Idiosoma flat vermiform, ratio length/width 2.2. Frontal plate with relatively short and wide posterior portion (Fig. 15). Anterior portion of frontal plate twice wider posterior one. Seta *Fch* slightly longer than trichobothria *Fp* and setae *Vi*; setae *Oi* very long. Posterior portion of frontal plate approximately 2 times as long as anterior portion. Coxal plates I (Fig. 16) trapezoidal, their anterior margin slightly concave, posterior margin more or less straight; medial margin convex and considerably longer than lateral one. Coxal plate I with three anteromedial short setae, two rather long lateral ones and single short seta near middle of posterior margin. Coxal plate II trapezoidal its medial margin slightly shorter than lateral one, with single lateral seta. Posterior coxal groups elongate and separated by a wide interspace, coxal plate III with rather long pointed processes and one thin seta (Fig. 17). Coxal plate IV triangular with one anterolateral seta. Genital field with two pairs of stalked, cupuliform acetabula in perigenital area and three pairs of fine subequal setae. Second acetabulum slightly longer than anterior one. Excretory pore as longish slit, placed near posterior end of ventral surface.

Capitulum (Fig. 18) relatively small and pyryform, placed at end of protrusible membranous tube, with orifice directed dorsally and flanked by two pairs of unequal setae on well-developed rostrum. Capitular base approximately 2.5 times as long as rostrum,




**Figs 15–19.** *Stygothrombum orientalis* **sp. nov.**, deutonymph: **15** – frontal plate, **16** – coxal plates I+II, **17** – coxal plates III+IV, left side, **18** – capitulum and chelicerae, dorsal view, **19** – pedipalp. Scale bars: 50 μm (15, 18), 100 μm (16–17), 25 μm (19).




**Figs 20–21.** *Stygothrombum orientalis* **sp. nov.**, deutonymph: **20** – leg I, **21** – leg IV. Scale bar: 50 μm.

posterior hypostomal setae longer than anterior ones. Basal segments of chelicera very long, tapering distally with straight ventral margin and convex dorsal margin; chelicer al stylet very short, crescent. Pedipalp trochanter fused to femur + genu but dorsal groove present (Fig. 19). First segment large, with three unequal dorsal setae, two long unequal ventroproximal ones, one relatively short ventrodistal harpago seta and single thin ventrodistal one. Second segment curved, tapering distally with short odontus seta and lanceolate one, rather long parodontus, long sword seta, single dorsal solenidion, five thin unequal setae and terminal alantoide with rounded tip.

First pair of legs thicker than other pairs of legs. Tarsus of leg I with large numbers of rather uniform fine setae, but with rather long and thick setae on basifemur, genu and tibia (Fig. 20). Legs II–IV slender with few fine setae (Fig. 21).

Measurements (n = 1). Length of body 1040, width 465; length of dorsal plate 102,

width its anterior portion 24, width its posterior portion 12; length of capitulum 205, length of basal segment of chelicera 168, length of cheliceral stylet 18; length of coxal plates I+II 145–155, length of coxal plates III+IV 240–250; length/diameter of genital acetabula (ac. 1–2): 30/15, 36/15; length of pedipalpal segments (P-1-3, P-4-5): 78, 45; length of leg segments: I-Leg. 1–6: 35, 65, 60, 72, 85, 93; II-Leg. 1–6: 35, 57, 42, 63, 65, 90; III-Leg. 1–6: 35, 48, 55, 72, 85, 95; IV-Leg. 1–6: 36, 60, 72, 102, 115, 102.

*Comparison*. The new species is similar to *S. japonicum* Imamura, 1956, which is described based on the deutonymph, from which it is easily distinguishable by the structure of the pedipalps, shape of the posterior coxal plate, size of the frontal plate and the genital acetabula. The deutonymph of *S. japonicum* is characterised by the following features. The frontal plate is long, 177 mμ; the first pedipalpal segment is shorter than P-2, their length is, respectively, 63 and 72 mμ; P-1 with two large ventrodistal harpago setae, P-2 with one heavy modified seta, the genital acetabula is very shortly, the anteromedial corner of the coxal plate III is short and rounded. In contrast, in the deutonymph of *S. primoryensis* **sp. nov.** the frontal plate is relatively short, 102 mμ; the first pedipalpal segment longer than P-2, respectively 78 and 45 mμ; P-1 possess one small ventrodistal harpago seta, P–2 with four heavy modified setae, the genital acetabula is long, the anteromedial corner of the coxal plate III is long and pointed.

*Etymology*. The species epithet *primoryensis* is derived from the name of the province where it was collected (Primorskiy Kray, or Primorskiy Territory, or Primorye).

*Habitat*. Running waters.

*Distribution*. Asia: Russia, Far East, Primorsky Kray.

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