

DESCRIPTION OF A NEW WATER MITE SPECIES OF THE GENUS *SIGTHORIA* KOENIKE (ACARI, HYDRACHNIDIA, ANISITSIELLIDAE) FROM VIETNAM

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ABSTRACT: Illustrated description of a new water mite species, *Sigthoria asiatica* (female, male, deutonymph) from standing waters of Vietnam is given.

KEY WORDS: Anisitsiellidae, *Sigthoria asiatica*, male, female, deutonymph, standing waters

INTRODUCTION

The genus *Sigthoria* Koenike, 1907 includes two species: *S. nilotica* (Nordenskiöld, 1905) and *S. minima* (Piersig, 1906) (K. Viets 1956; Cook 1974; K.O 1987). Lundblad (1969) considered *S. minima* as a junior synonym of *S. nilotica*: “Ich vermutte, dass *minima* keine von *nilotica* getrennte”. Only one species of water mite, *Nilotonia sketi* Pešić, 2013, belonging to the family Anisitsiellidae was known in the fauna of Vietnam (Pešić 2013). This paper describes the male, female and deutonymph of *Sigthoria asiatica* sp.n.

MATERIAL AND METHODS

Mites were collected by V. Gusakov in 2012 in standing waters of Vietnam. Sampling was made with a regular hand net with 70 µm mesh side. Specimens were fixed in 4% formalin.

Idiosomal setae and lyriform organs nomenclature is after Tuzovsky (1987): *Fch* — frontales chelicerae, *Fp* — frontales pedipalporum, *Vi* — verticales internae, *Ve* — verticales externae, *Oi* — occipitales internae, *Oe* — occipitales externae, *Hi* — humerales internae, *He* — humerales externae, *Hv* — humerales ventralia, *Sci* — scapulares internae, *Sce* — scapulares externae, *Li* — lumbales internae, *Le* — lumbales externae, *Si* — sacrales internae, *Se* — sacrales externae, *Ci* — caudales internae, *Pi* — praeanales internae, *Pe* — praeanales externae.

The following abbreviations are used: P-1–5, pedipalp segments (trochanter, femur, genu, tibia and tarsus); I–Leg-1–6, first leg, segments 1–6 (trochanter, basifemur, telofemur, genu, tibia and tarsus) i.e. III–Leg-4 = genu of third leg; L, length; W, width; D, diameter; n = number of specimens measured. All measurements are given in micrometers (µm); length of appendage segments is dorsal length. The type material is deposited in the

collection of the Institute for Biology of Inland Waters (Borok, Russia).

Family Anisitsiellidae Koenike, 1910

Genus *Sigthoria* Koenike, 1907

***Sigthoria asiatica* Tuzovskij, sp.n.**

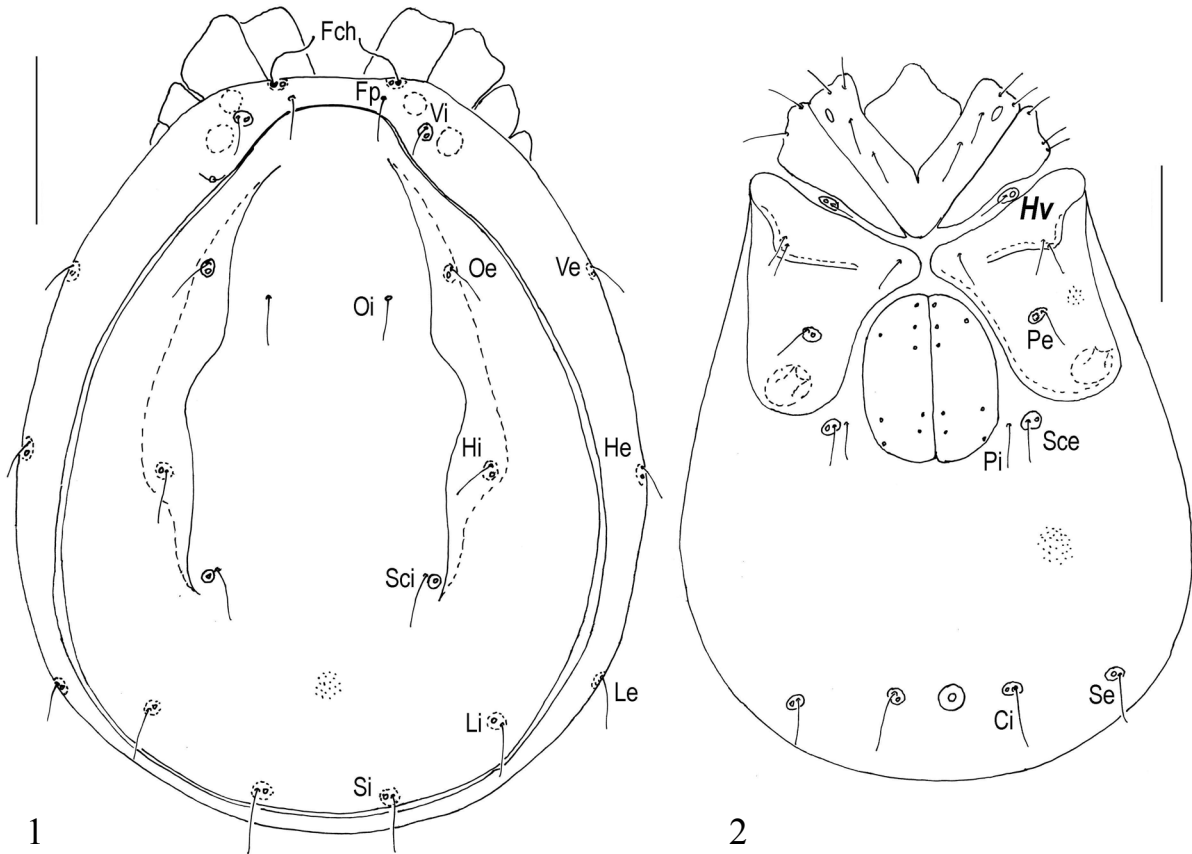
Figs 1–15

Material examined. Holotype: male, slide 9761, Vietnam, Dong Nai (Đồng Nai) Province, National park Cat Tien (Cát Tiên), Bau Chau Lake (Bàu Sầu) (N 11°27.668', E 107°20.376'), altitude 139 m, depth 1.2 m, water temperature 33.9 °C, pH 6.8, 11 May 2012 (leg. V.A. Gusakov). Paratypes: 2 males, 3 females, 3 deutonymphs, same data.

Diagnosis. Adults. Anterior portions of coxal plates I–III well extending to anterior margin of idiosoma, 12–14 pairs of small genital acetabula, fourth coxal plates elongate, triangular, P-3 with three dorsal setae and single ventral seta, IV–Leg-3–5 with relatively short, stout swimming setae. Genital flaps with five medial and three thin lateral setae each.

Both sexes. Idiosoma flattened dorsoventrally, dorsal and ventral shields present. Frontal margin straight (Fig. 1), anterior portions of coxal plates I–III well extending to anterior margin of idiosoma. Dorsal shield very large, covering nearly all dorsum, bearing six pairs of setae (Oi, Oe, Hi, Sci, Li, Si), narrowed anteriorly, expanded posteriorly, with a pair of undulating longitudinal ridges beginning at anterior end and ending near glandularia Sci, and with transverse depression between rows of setae Oi–Oi and Hi–Hi. Setae Fch, Fp, Ve, He and Sce inserted on dorsolateral extension of ventral shield flanking of dorsal shield. Eyes lenses well separated.

Ventral shield (Fig. 2) expanded posteriorly, coxal plates occupying approximately one half of area of ventral shield. Coxal plates I fused to each



Figs 1–2. *Sigthoria asiatica*, female: 1 — idiosoma dorsally, 2 — idiosoma ventrally. Scale bars: 1–2 = 100 μ m.

other medially. Suture line between coxal plates III–IV incomplete, disappearing medially, fourth coxal plates elongate, triangular, with a pair setae and glandularia (Pe) near middle. Genital field well projecting beyond posterior end of fourth coxal plates, with 12–14 genital acetabula on each side, genital flaps elongate (L/W ratio 2.1–2.4), with five medial and three lateral thin setae each (Fig. 6).

Excretory pore situated near posterior end of ventral shield between setae Ci. Setae Pi and Sce close to each other and inserted laterally to posterior portion of genital field.

Capitulum (Fig. 3) with short rostrum and two long, pointed posterior projections, both pairs of hypostomal setae approximately equal in length.

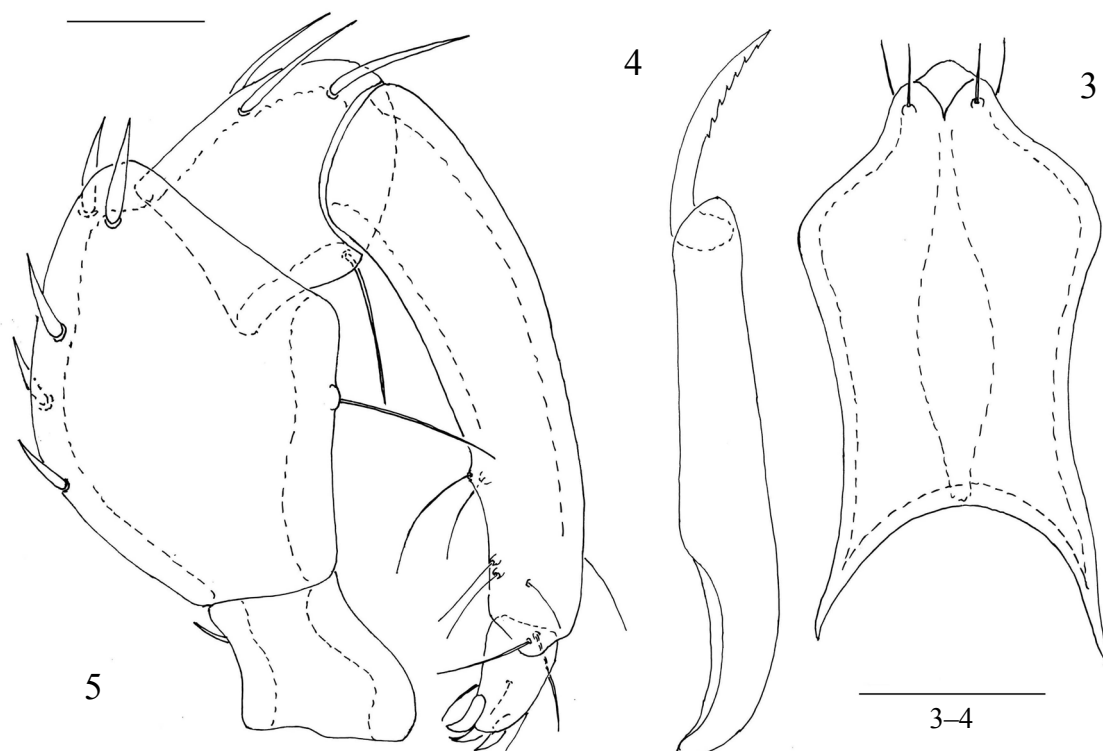
Chelicera slender (Fig. 4). Basal segment long, thin, approximately equal in thickness at whole length, proximal end bent ventrally; cheliceral stylet more or less sickle-shaped, with a few small teeth on concave side.

Pedipalp moderately long (Fig. 5): P-1 short, with single short dorsodistal seta; P-2 large with straight ventral margin, with single thin ventral seta distally middle of segment and five thick, short dorsal setae; P-3 with three dorsal setae (two proximal

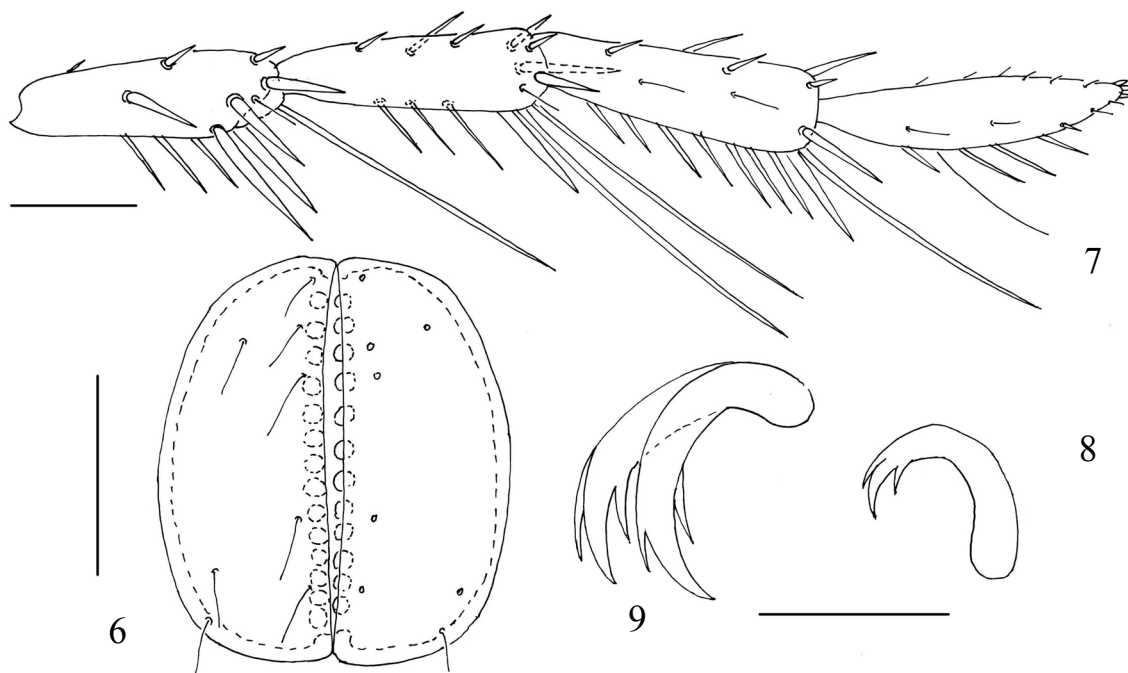
near middle of segment and one dorsodistal seta) and single ventrodistal seta; P-4 long, slightly curved dorsoventrally, with four thin ventral setae located on small tubercles in distal half, two distal (internal and external) setae and one dorsodistal seta; P-5 short, with three short curved distal spines.

Legs IV with moderately long, stout “swimming” distal setae (Fig. 7); IV–Leg-3 with one, IV–Leg-4 with two, IV–Leg-5 with one such setae, but there are no true swimming setae. IV–Leg-6 without claws, usually with three (rarely two or four) relatively short, thick setae, one long, thin seta proximally to middle of segment and few short, thin filiform setae and spines. Claws of I–Leg-6 hook-like (Fig. 8), claws of II+III–Leg-6 sickle-shaped (Fig. 9). All claws with thin, short dorsal and ventral spurs.

Male. Measurements (n=3). Idiosoma L 420–445, W 345–360; dorsal shield L 400–420, W 300–305; coxal plates III+IV L 160–170, W 120–125; genital flap L 90–102, W 39–42; genital acetabulum D 4–6; basal segment of chelicera L 145–150, cheliceral stylet L 50–55; pedipalpal segments (P-1–5) L: 20–24, 69–72, 41–43, 84–90, 17–19; leg segments L: I–Leg-1–6: 33–35, 42–48, 45–48,



Figs 3-5. *Sigthoria asiatica*, female: 3 — capitulum, 4 — chelicera, 5 — pedipalp. Scale bars: 3-4 = 50 μm, 5 = 20 μm.

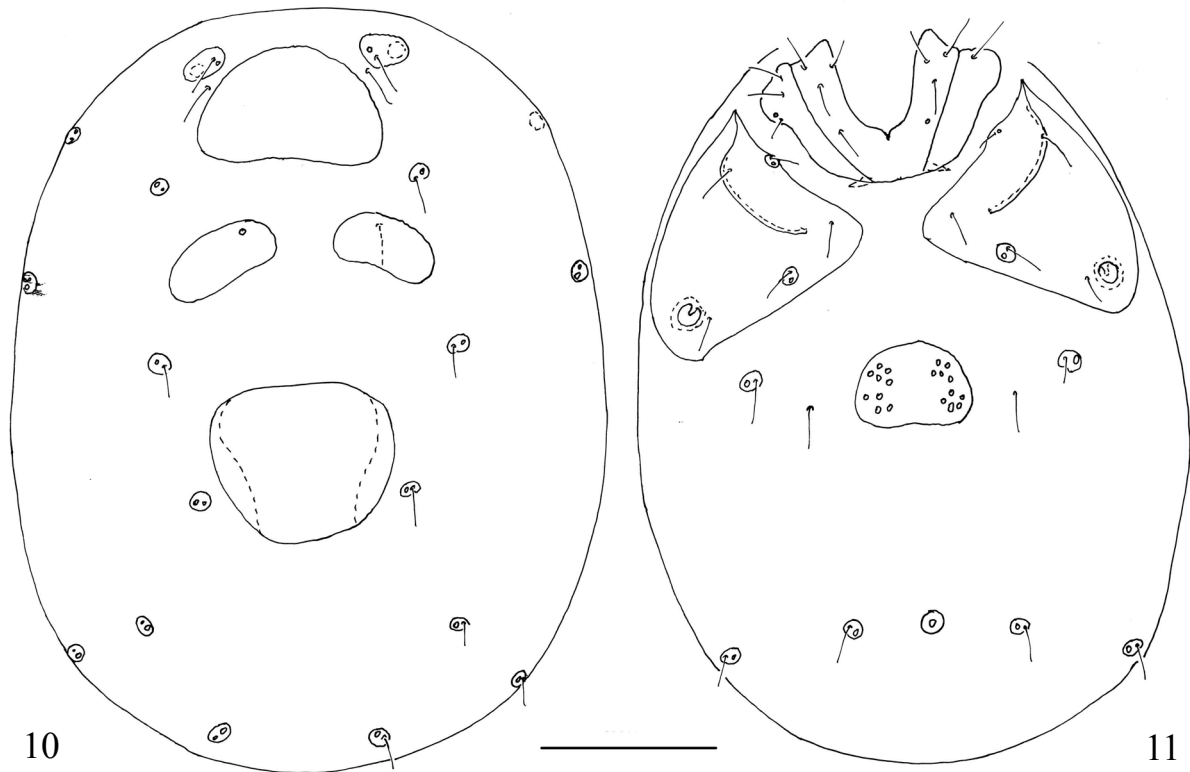


Figs 6-9. *Sigthoria asiatica*, adults: 6 — genital field, 7 — IV-Leg-3-6, 8 — claws of leg I, 9 — claws of leg III; 6 — female, 7-9 — male. Scale bars: 6-7 = 50 μm, 8-9 = 20 μm.

63-66, 78-80, 85-90; II-Leg-1-6: 33-35, 52-55, 52-55, 75-80, 100-105, 110-115; III-Leg-1-6: 40-45, 50-53, 48-51, 75-80, 93-96, 80-85; IV-Leg-1-6: 60-72, 54-65, 62-70, 85-90, 100-110, 110-120.

Female. Similar to male, but genital field larger than in male.

Measurements (n=3). Idiosoma L 415-465, W 350-380; dorsal shield L 400-420, W 300-320; coxal plates III+IV L 160-180, W 95-120; genital flap L 110-115, W 48-54; genital acetabulum D 5-6; basal segment of chelicera L 120-150, cheliceral stylet L 48-50; pedipalpal segments (P-1-5) L: 23-25, 75-78, 40-43, 90-96, 18-20; leg



Figs 10–11. *Sighthoria asiatica*, deutonymph: 10 — idiosoma dorsally, 11 — idiosoma ventrally. Scale bar = 100 μ m.

segments L: I–Leg-1–6: 35–42, 42–48, 47–49, 55–65, 72–75, 78–85; II–Leg-1–6: 35–42, 51–57, 48–55, 70–80, 95–100, 85–108; III–Leg-1–6: 40–48, 50–55, 52–57, 75–80, 90–92, 78–85; IV–Leg-1–6: 65–70, 60–65, 69–72, 93–96, 95–108, 110–115.

Deutonymph. Dorsum with four plates (Fig. 10). Anterior plate large, wider than long, with almost straight posterior margin and convex anterior one. Posterior plate large with straight anterior margin, as long as wide or slightly wider than long. Two small transverse plates situated between anterior and posterior plates and bearing seta Oi each.

Coxal plates arranged in three groups (Fig. 11). Anterior coxal groups fused to each other medially. Coxal plates III+IV triangular, sclerites bearing setae and glandularia Hv fused to anterior margin of coxal plates; setae and glandularia Pe situated near medial margin of coxal plates IV. Excretory pore lying near posterior end of ventrum between setae Ci. Setae Pi and Sce close to each other and located in interspace between genital field and posterior coxal plates on each side. Excretory pore surrounded by sclerotized ring.

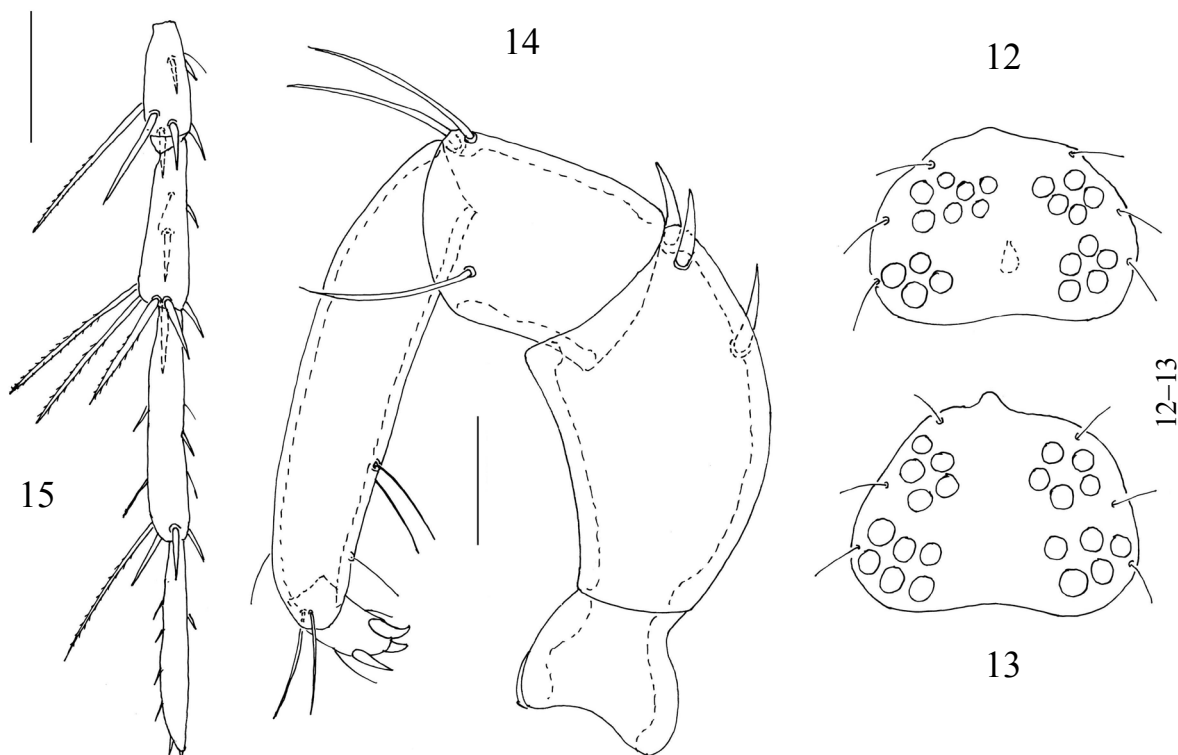
Genital plate (Figs 12–13) wider than long, with 9–11 small acetabula and three thin setae on each side.

Pedipalp moderately in length (Fig. 14): P-1 short, without seta; P-2 large, with concave ventral margin and three thick subequal dorsal setae; P-3 with two dorsodistal setae and single ventrodistal seta distally middle of segment; P-4 long, with three thin ventral setae in distal half, two distal (internal and external) setae and one dorsodistal seta; P-5 short, with three short curved distal spines.

Shape and arrangement of setae on IV–Leg-3–6 as shown in Fig. 15. Swimming setae on IV–Leg-3–5 (1–2–1, respectively) short and stout.

Measurements (n=3). Idiosoma L 285–415; anterior dorsal plate L 65–72, W 90–110; middle dorsal plates L 30–35, W 48–64; posterior dorsal plate L 90–115, W 78–125; coxal plates III+IV L 108–140, W 95–105; genital plate L 50–65, W 70–85; genital acetabulum D 8–12; basal segment of chelicera L 102–105, cheliceral stylet L 42–45; pedipalpal segments (P-1–5) L: 15–18, 60–63, 35–39, 72–78, 15–18; leg segments L: I–Leg-1–6: 23–25, 35–37, 35–37, 45–48, 54–60, 55–63; II–Leg-1–6: 27–30, 42–45, 40–45, 55–60, 75–78, 80–90; III–Leg-1–6: 29–32, 39–42, 40–45, 55–60, 75–78, 80–90; IV–Leg-1–6: 45–41, 42–48, 45–48, 70–78, 85–95, 100–115.

Differential diagnosis. The new species is similar to *Sighthoria nilotica* (Nordenskiöld, 1905). Adults of *S. asiatica* sp. n. differ from *S. nilotica*



Figs 12–15. *Sigthoria asiatica*, deutonymph: 12–13 — genital plate, 14 — pedipalp, 15 — IV-Leg-3–6. Scale bars: 12–13 = 50 µm, 14 = 20 µm, 15 = 100 µm.

by the following characters (character states of *S. nilotica* follow Viets 1935, 1956, Lundblad 1951, 1969; Cook 1966, 1974; Panesar 2004 and are indicated in parenthesis): adults — the fourth coxal plates elongate, triangular, Fig. 2 (rectangular, nearly square); the basal segment of the chelicera equal in thickness at its whole length, Fig. 5 (thickened distally); P-3 with three dorsal setae, Fig. 6 (with two dorsal setae); IV-Leg-3–5 with relatively short, stout swimming setae, Fig. 7 (with very long, thin setae).

Etymology. The species is named after the continent where it was collected (Asia).

Habitat. Standing waters.

Distribution. Vietnam: Dong Nai Province.

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REFERENCES

- Cook, D.R. 1966. The water mites of Liberia. *Memoirs of the American Entomological Institute*, 6: 1–418.
- Cook, D.R. 1974. Water mite genera and subgenera. *Memoirs of the American Entomological Institute*, 21: 1–860.
- Lundblad, O. 1951. Vorläufige Beschreibung einiger ostafrikanischer Hydracarinae. *Entomologisk Tidsskrift*, 72: 157–161.
- Lundblad, O. 1969. Indische Wassermilben, hauptsächlich von Hinterindien. *Arkiv för Zoologi*, 22 (10): 280–443.
- Panesar, A.R. 2004. Evolution in water mites (Hydrachnellae, Acari). A revision of the Anisitsiellidae Koenike, 1910. *Zoologisches Forschungsinstitut und Museum Alexandr Koenig*, Bonn, 52: 1–144.
- Pešić, V. 2013. A remarkable new *Nilotonia* species (Acari, Hydrachnidia, Anisitsiellidae) from percolating water of a cave in Cat Ba island in Halong Bay, Vietnam. *Zootaxa*, 3710 (4): 372–380.
- Tuzovsky, P.V. 1987. *Morfologiya i postembrional'noye razvitiye vodyanykh kleshchey* [Morphology and Postembryonic Development in Water Mites]. Moscow, Nauka, 1–172 pp. [In Russian]
- Viets, K. 1935. Die Wassermilben von Sumatra, Java and Bali nach der Ergebnissen der Deutschen Limnologischen Sunda-Expedition. *Archiv für Hydrobiologie*, Supplement, 13 (5): 484–594.
- Viets, K. 1956. *Die Milben des Süßwassers und des Meeres. Hydrachnellae et Halacaridae (Acari)*. Zweiter und dritter Teil: Katalog und Nomenklator. Jena, G. Fischer, 1–870.
- Viets, K.O. 1987. Die Milben des Süßwassers (Hydrachnellae und Halacaridae [part.], Acari. 2. Katalog. *Sonderbände des Naturwissenschaftlichen Vereins in Hamburg*, 8: 1–1012.