Acarina 16 (1): 57–64

A NEW RECORD OF THE WATER MITE *HYDRYPHANTES TENUIPALPIS* THON (ACARIFORMES, HYDRYPHNATIDAE) FOR RUSSIA, WITH DESCRIPTION OF ITS DEVELOPMENTAL STAGES

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ABSTRACT: The first illustrated description of the larva, deutonymph and adults of the water mite *Hydryphantes tenuipalpis* from Yaroslavl' Province, Russia is given.

KEY WORDS: Hydryphantidae, *Hydryphantes tenuipalpis*, water mite, larva, deutonymph, female, male.

INTRODUCTION

The water mite *Hydryphantes tenuipalpis* is widely distributed in Europe and is only known from adults (Lundblad 1968; Gerecke 1996). I found this species for the first time in Russia (Yaroslavl' Province) and describe the larva, deutonymph adults.

MATERIAL AND METHODS

Six deutonymphs, 9 females, and 3 males were collected by the author from woodland temporary ponds near Borok, Nekouz Distr., Yaroslavl' Province, May–July 2000. Larvae (n=14) reared from three females in the laboratory conditions. The duration of the embryonic period at room temperature was 12–17 days.

The nomenclature of the idiosomal setae and lyriform organs follows Tuzovsky (1987). The following abbreviations are used: s — solenidion, s_1— solenidion on tarsus of legs I, s_2 — solenidion on tarsus of legs II; e — eupathidium, ac — acanthoid seta; P1–5, pedipalpal segments (trochanter, femur, genu, tibia and tarsus); I Leg.1–6, first leg, segment 1–6 (trochanter, basifemur, telofemur, genu, tibia and tarsus); tarsus of leg I: de_1— distance between the anterior end of the segment and eupathidium, ds_1 — distance between the anterior end of the segment and solenidion; tarsus of leg II: de_2 — distance between anterior end of the segment and eupathidium, ds_2 —distance between the anterior end of the segment and solenidion; n — the number of measured specimens. Measurements are given in micrometers.

Hydryphantes tenuipalpis Thon, 1899

Figs 1–7.

Larva. Color red. Body oval, dorsal shield is divided into 3 parts (Fig. 1, a). Proterosoma with 5 pairs of setae: Fch, Fp, Vi, Oi, Oe. Anterior pair of small platelets with setae Fch and Fp. Posterior plate narrows anteriorly and widens posteriorly; setae Vi and Oi situated on posterior portion of plate. Medial eye weakly developed, situated between setae Vi. Both pairs of trichobothria thin, Fp long, Oi short. Distance between bases of trichobothria Oi shorter than their length. Simple proterosomal setae (Fch, Vi and Oe) thick, but Fch slightly shorter than Vi and Oe. Hysterosomal dorsal setae Hi, He, Sci, Sce, Li, and Le subequal, their bases situated on very small rounded sclerites.

Coxae II triangular, coxae I and III trapezoid and broadly rounded medially (Fig. 1, b). Lateral setae on coxae I shorter than medial setae on coxae I and III. Urstigma rather large and situated on anterior edge of coxa II near its middle. Setae Si longer and thicker than other hysterosomal ventral setae. Setae Ci, Se, Pi and Pe subequal and slightly longer than anal setae (Ai, Ae).

Anal plate small, its shape variable (Fig. 2, a–d). Anal opening posterior to setae Ai in posterior portion of the plate. Setae Ai and Ae subequal.

Capitulum (Fig. 2, e) with wide base and comparatively narrow rostrum, ventral setae longer than dorsal ones. The mouth opening surrounded by numerous papillae. Basal part of capitulum with distinct, scale-like patterns. Basal segment of chelicera striate (Fig. 2, f). Cheliceral stylet heavy and without apical teeth (Fig. 2, g).

Palps moderately long (Fig. 2, h). Trochanter short without setae, femur with single dorsal seta. Genu with thick proximal seta and thin distal one. Tibia with three subequal, thin setae and large bifurcated dorsodistal claw. Tarsus with long solenidion, two short, thin proximal setae, and five thick, long setae.

Leg 6-segmented. Leg II distinctly shorter than anterior and posterior ones. Number of leg

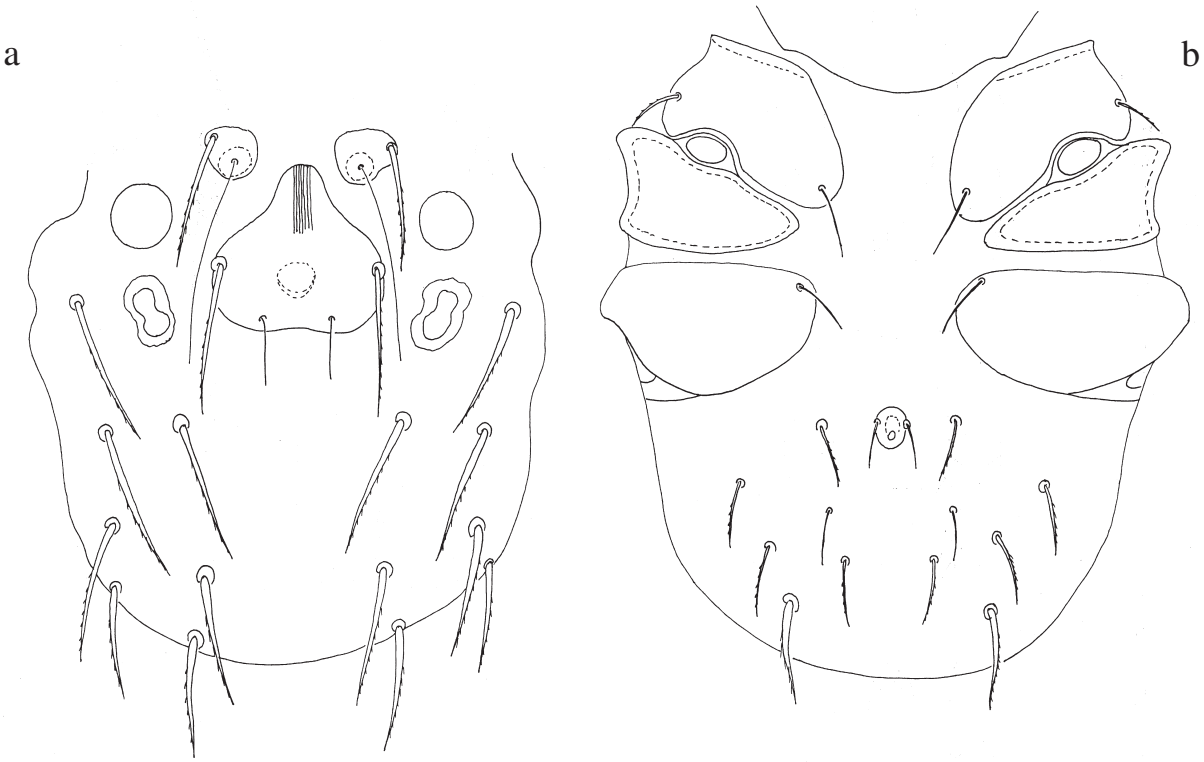

Fig. 1. *Hydryphantes tenuipalpis,* larva: a— dorsal view, b — ventral view.

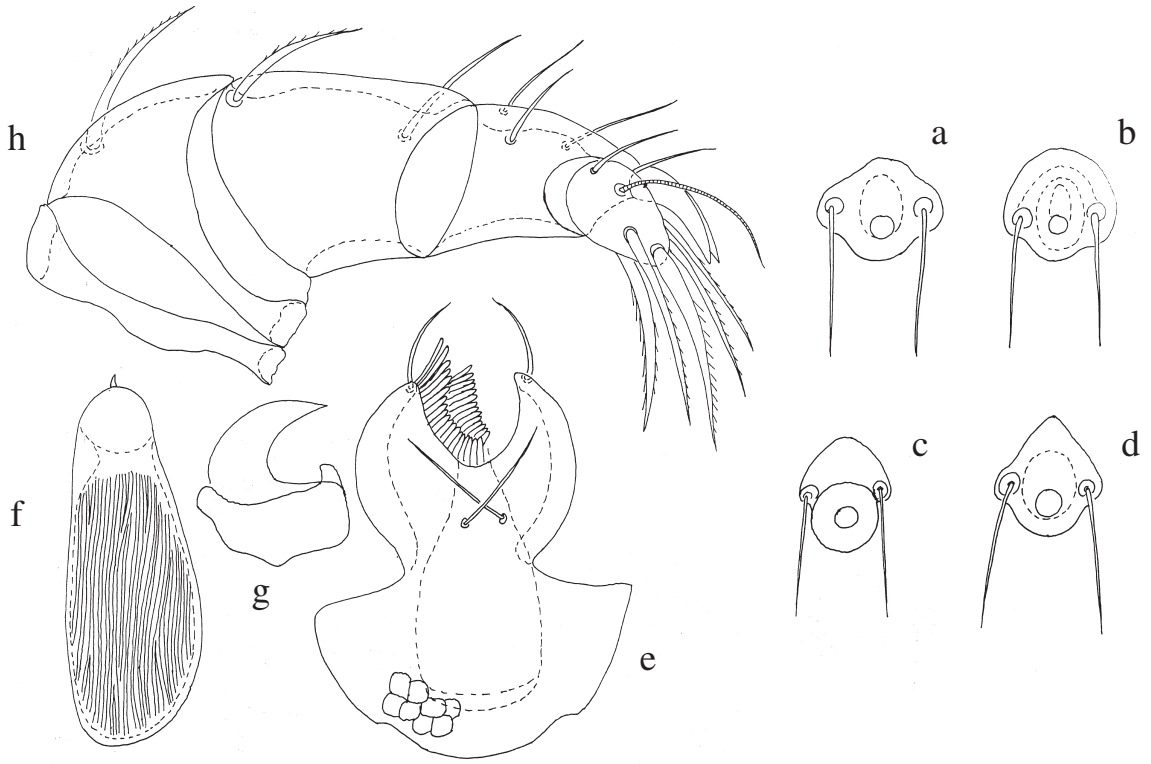

Fig. 2. *Hydryphantes tenuipalpis,* larva: a–d — anal plate, e — capitulum, ventral view; f — chelicera, dorsal view; g — cheliceral stylet, lateral view; h — pedipalp, lateral view.

setae (specialized setae indicated in parentheses): I Leg. 1–6 — 1, 2, 5, 6 (s, e), 13 (2s, e), 23 (s, e, ac); II Leg. 1–6 — 1, 2, 5, 6 (s, e), 12 (2s), 22 (s, e, ac); III Leg. 1–6 — 1, 1, 5, 5 (s), 11 (s), 20. All simple setae heavy and usually with long serrations. Eupathidia situated in distal parts of genu I and tibia I (Fig. 3, a), and occupy proximal position of tarsus I, close to solenidion basis. Solenidion and eupathid-

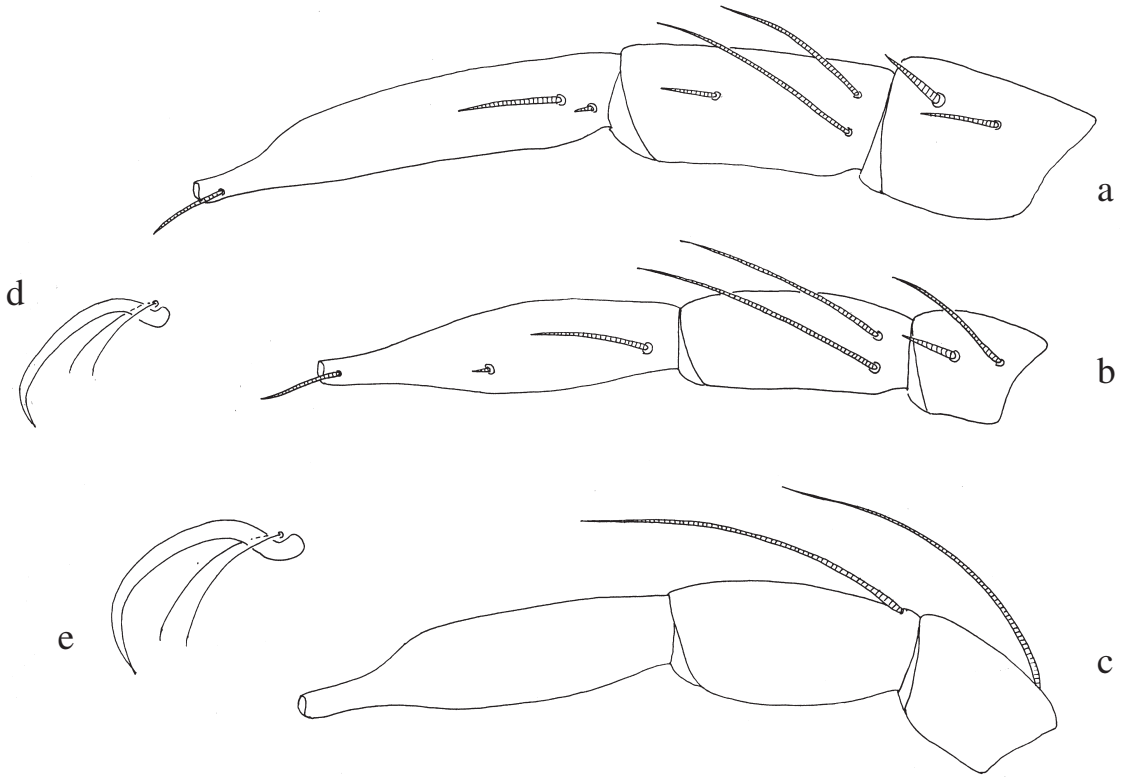

Fig. 3. *Hydryphantes tenuipalpis,* larva: a — genu, tibia and tarsus of leg I, b — genu, tibia and tarsus of leg II, c — genu, tibia and tarsus of leg III, d — claws of leg I, e — claws of leg III. Simple setae on genu, tibia and tarsus I–IV are not shown.

ium on genu I subequal. Solenidion 2.5–3.0 times longer than eupathidium on genu II (Fig. 3, b). Tibia I and II with unequal proximal solenidia. Genua I–III with proximal solenidia (Fig. 3, a–c). Solenidia on genu and tibia III subequal. On tarsus II, solenidion is proximal and eupathidium is submedial. Tarsi I and II with rather long distal acanthoid setae.

Empodium large and crescent on all tarsi. Ambulacra short and thin on tarsi I and II (Fig. 3, d), they are slightly shorter than on tarsi III (Fig. 3, e).

Measurements (n=5). Length of the dorsal plate 37–44, width 45–50; length of urstigma 11–13, height 6–8; diameter of anterior lateral eyes 15–17; length of anal plate 10–13, width 10–14; length of setae Fch 28–30; length of setae Fp 65–72; length of setae Vi 36–47; length of setae Oi 14–25; distance between bases of setae Vi 41–44; distance between bases of setae Oi 15–25; length of capitulum 100–112, width 90–100; length of rostrum 55–60; length of basal segment of chelicera 85–92, width 35–38; width of strips on basal segment of chelicera 0.5–1.0, distance between strips on basal segment of chelicera 0.3–0.8; length of cheliceral stylet 22–25; length of the palpal segments (P 1–5): 6–8, 31–38, 31–35, 18–20, 11–14; length of legs segments: I Leg. 1–6 — 26–34, 20–24, 18–22, 31–38, 38–42, 75–82; II Leg. 1–6 — 25–28, 20–25, 13–15, 21–27, 33–40, 57–67; III Leg. 1–6 — 27–30, 20–22, 15–18, 23–28, 40–44, 61–72; ds_1 11–13, de_1 6–8, ds_2 6–9, de_2 32–34.

Deutonymph. Color red. Body oval and somewhat flattened dorsoventrally. Dorsal plate relatively small, distinctly narrows laterally, anterior margin convex, posterior margin straight or slightly concave (Fig. 4, a). Posterolateral projections of dorsal plate short, their length equal to 1/5 length of basal portion of plate. Proterosoma with six pairs of setae (Fch, Fp, Vi, Ve, Oi, Oe). Dorsal plate has two pair of trichobothria (Fp, Oi) and medial eye, situated posterior bases of Fp. Base of trichobothria Oi anterior to posterior margin of plate. Setae Fch longer and thicker than other idiosomal setae. Trichobothria Fp and Oi without glandularia, other dorsal setae with accompanying glandularia. Lateral eyes in capsules. First pair of lyriform organs (i_1) slightly posterior to eye capsules; i_2–i_4 similarly situated, anterior to humeral, scapular, and lumbar rows of setae.

Leg coxae (Fig. 4, b) in engorged/fully developed specimens occupy approximately one-half length of body. All coxae with long, thin setae. Medial edge of coxae III well developed, two times shorter than lateral one. Coxae IV triangular, their medial edges weakly developed. Lateral edge of coxae IV longer than lateral edge of coxae III. Anal

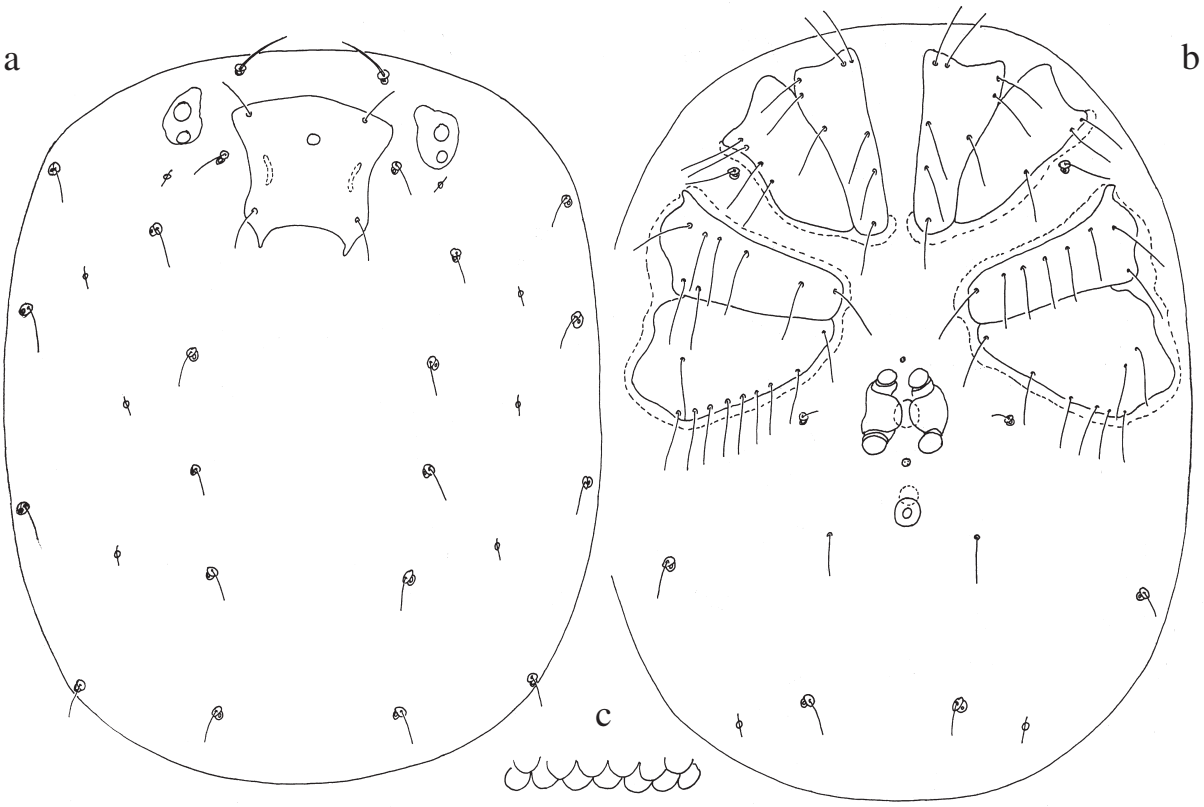

Fig. 4. *Hydryphantes tenuipalpis,* deutonymph: a — dorsal view, b — ventral view, c — fragment of integument.

opening surrounded by sclerotized ring. Setae Pi without glandularia; other ventral idiosomal seta (Ci, Se, Pe, Hv) with accompanying glandularia. Fifth pair of lyriform organs (i_5) lateral and slightly posterior to setae Ci. Integument with numerous rounded papillae (Fig. 4, c).

External genital organ with two pair of acetabula, genital sclerite rather large, pre- and postgenital sclerites small. Anterior and posterior genital acetabula (Fig. 5, a–b) almost equal in size and shape. Genital flaps wide, with 5–7 thin setae, situated along their medial margins.

Capitulum (Fig. 5, c) with short rostrum, length equals to 1/9–1/10 length of capitulum. Ventral edge of capitular base convex. Mouth disc rather large, with numerous short papillae, dorsal and ventral pairs of setae subequal.

Basal segment of chelicera with dorsal hump (Fig. 5, d). Cheliceral stylet long, length exceeds half of length of basal segment. Cheliceral stylet with by numerous denticles, situated along its lateral edge.

Trochanter of pedipalps (Fig. 5, e) rather large, with single dorsodistal seta. Femur with 9–11 setae, dorsal edge of segment convex, 2.5–3.0 times longer than ventral one. Genu with three, sometimes two, setae. Pedipalpal tibia tapering distally, with 2 lateral (internal and external) setae, one thin dorsal seta, and short thick spine. All setae of tibia distal. Pedipalpal tarsus (Fig. 5, f) with short proximal solenidion and 8 simple (thin and thick) setae situated mainly in distal portion of segment.

Swimming setae present on following segments of legs (Leg Telofemur Genu Tibia): II — 0 , 0–2, 8–12; III — 2–3, 4–7, 7–10; IV — 2–3, 9–11, 8–13.

Claws simple, without additional denticles, but with dorsal plate.

Measurements (n=6). Length of body 935–1190, width 875–1100; length of dorsal plate 210–350, width 210–350, length of posterior projections of dorsal plate 37–62; length of genital flaps 75–88, width 62–75; diameter of genital acetabula (ac.1–2) 30–38, 37–45; length of eye capsules 87–113, width 55–88; length of capitulum 225–375; length of rostrum 30–50; length of chelicera 275–440; length of chelicera stylet 112–175; length of pedipalpal segments (P1–5) — 62–75, 70–113, 50–75, 100–163, 15–25; length of leg segments: I Leg. 1–6 — 75–90, 75–115, 75–125, 110–190, 150–215, 160–225; II Leg. 1–6 — 75–90, 75–115, 100–150, 150–240, 185–290, 225–3000; III Leg. 1–6 — 75–100, 85–125, 110–150, 175–265, 210–365, 235–

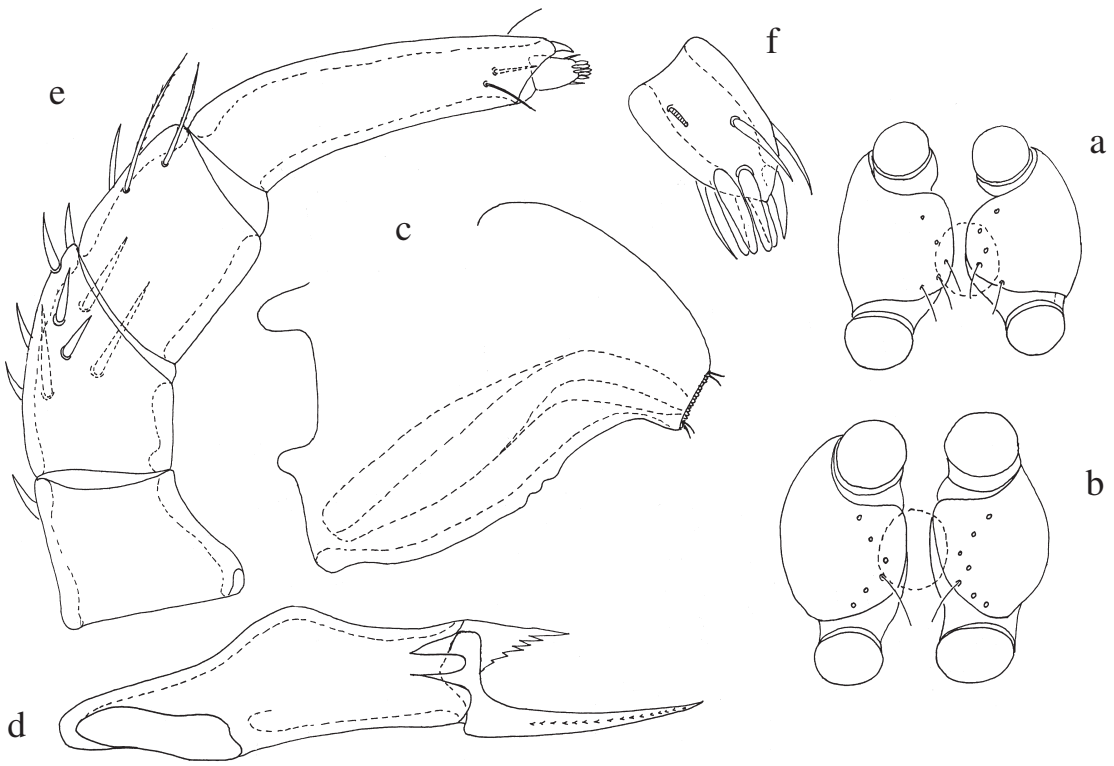

Fig. 5. *Hydryphantes tenuipalpis,* deutonymph: a–b — external genital organ, ventral view; c — capitulum, lateral view; d — chelicera, lateral view; e — pedipalp, lateral view; f — pedipalpal tarsus.

325; IV Leg. 1–6 — 100–185, 100–175, 125–225, 210–350, 235–340, 225–325.

Adults. Males and females similar to deutonymph, but differ in structure of external genital organs, large sizes, by more numerous setae on all segments of pedipalps and legs, and by number of glandularia. Males and females do not exhibit external sexual dimorphism, but mature females larger than males.

Dorsal plate with convex anterior margin (Fig. 6, a) or its anterolateral margin forming blunt edge (Fig. 6, b–c). Posterior margin of dorsal plate straight or concave. All coxae of legs with numerous and rather long setae (Fig. 6, d). External genital organ with two flaps and three pairs of acetabula (Fig. 6, e). Posterior acetabula larger than anterior ones, middle acetabula small and situated in posterior portion of genital organ. Genital flaps wide, with 16–22 medial setae at both sexes. Setae Pi with accompanying glandularia

Capitulum (Fig. 7, a) with rather long rostrum, length equal to 1/3–1/5 of length of capitulum. Basal segment of chelicera (Fig. 7, b) with dorsal hump, cheliceral stylet long.

Pedipalpal trochanter (Fig. 7, c) with 3–5 dorsal setae, femur with 15–20, genu with 5–13 setae. Tibia slender, usually with two dorsal submedial setae, three thin distal setae, and short thick dorsodistal spine. Pedipalpal tarsus (Fig. 7, d) with short solenidion, 4 thin and 5 thick simple setae.

Legs with following number of swimming setae (Leg Telofemur Genu Tibia): II — 0, 3–8, 12–20; III — 2–4, 15–19, 18–30; IV — 1–5, 17–27, 14–25.

Measurements, female (n=9). Length of body 1875–2500, width 1750–1940; length of dorsal plate 535–615, width 535–625, length of posterior projections of dorsal plate 75–90; length of eye capsules 175–190, width 120–130; length of genital flaps 275–325, width 125–150; diameter of genital acetabula (ac.1–3) 50–62, 35–40, 75–90; length of capitulum 385–440, length of rostrum 90–125, diameter/height of mouth disk 87–125; length of chelicera 680–715, length of basal segment of chelicera 500–590, length of cheliceral stylet 260–290; length of pedipalpal segments (P1–5) — 110–125, 160–175, 125–140, 275–300, 30–40; length of leg segments: I Leg. 1–6 — 135–165, 185–225, 225–250, 280–365, 375–415, 375–400; II Leg. 1–6 — 135–150, 185–200, 260–315, 450–490, 535–575, 510–540; III Leg. 1–6 — 150–165, 185–200, 285–315, 485–515, 535–600, 510–550; IV Leg. 1–6 —275–300, 225–325, 410–475, 650–690, 600–650, 510–565.

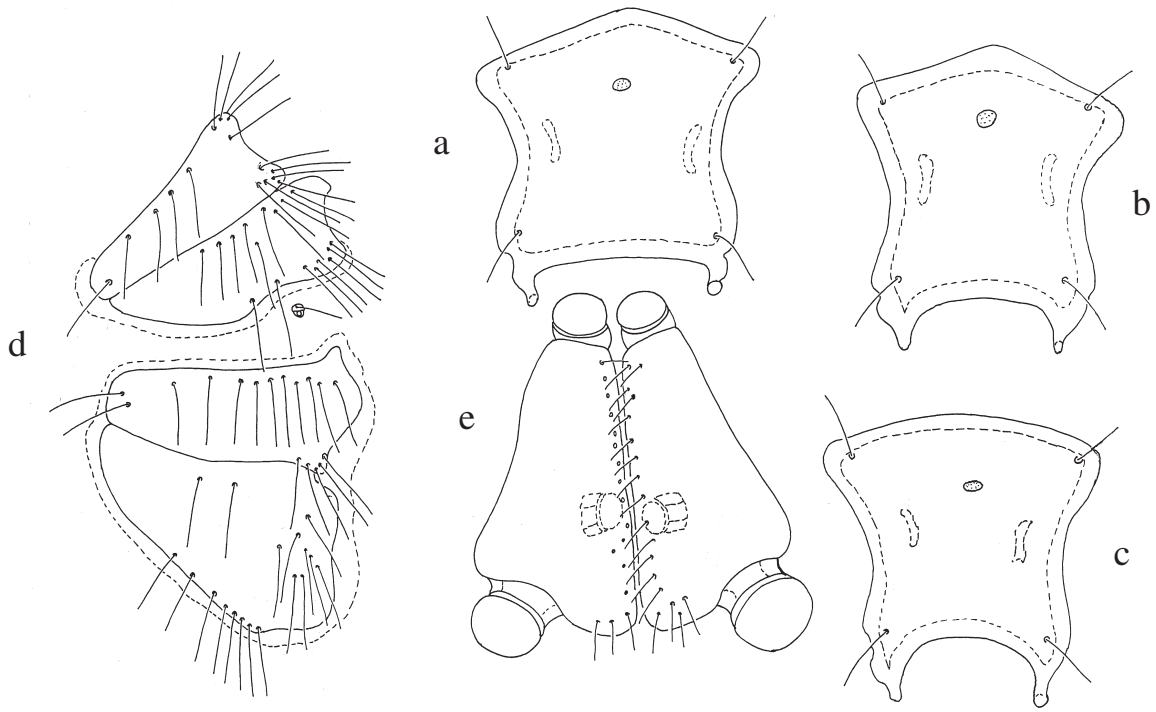

Fig. 6. *Hydryphantes tenuipalpis,* female: a–c — dorsal plate, d — coxae I–IV, e —external genital organ.

Male (n=3). Length of body 1310–2000, width 1060–1625; length of dorsal plate 335–565, width 335–525, length of posterior projections of dorsal plate 75–100; length of eye capsules 100–175, width 85–125; length of genital flaps 210–300, width 85–140; diameter of genital acetabula (ac.1–3) 35–50, 20–25, 50–75; length of capitulum 280–350, length of rostrum 60–100, diameter/height of mouth disk 62–88; length of chelicera 465–600, length of basal segment of chelicera 375–465, length of cheliceral stylet 185–215; length of pedipalpal segments (P1–5) — 75–100, 100–150, 75–125, 185–250, 20–30; length of leg segments: I Leg. 1–6 — 65–140, 110–165, 135–215, 210–300, 235–340, 275–375; II Leg. 1–6 — 85–125, 125–175, 175–250, 285–440, 350–500, 350–475; III Leg. 1–6 — 85–150, 125–190, 175–275, 300–465, 350–525, 360–500; IV Leg. 1–6 — 200–275, 175–275, 275–375, 400–575, 410–600, 375–500.

DIFFERENTIAL DIAGNOSIS

Hydryphantes tenuipalpis is closely related to *H. ruber* (De Geer, 1778). *H. tenuipalpis* was originally described as a form or subspecies of *H. ruber* (Thon, 1899) and was cited as subspecies in many papers (Viets 1919, 1928, 1936, 1956; Laska 1962; Szalay 1964) or, subsequently, as species (Lundblad 1962, 1968; Biesiadka 1972; Ozkan 1982; K.O. Viets 1978, 1987; Gerecke 1996).

The adults of *H. tenuipalpis* differ from *H. ruber* by the rather long rostrum, the large mouth disk and the slender pedipalpal tibia (Lundblad 1962). These species especially differ in the structure of the chelicera: ratio length of basal segment of the chelicera/length of the cheliceral stylet in *H. ruber* is 1.8–2.1, whereas in *H. tenuipalpis* this ratio is 1.5 (Gerecke 1996). In the Yaroslavl' specimens this ratio is 1.7–2.1 in the female, and 2.0–2.7 in the male (in the male, the length of the basal segment of the chelicera was measured in dorsodistal projection).

The length of trichobothria Oi in the larva of *H. ruber* is larger than the distance between the bases of these setae (Prasad and Cook 1972; Wainstein 1980), the solenidion on genu I is twice as long as the eupathidium. In contrast, in the of larva *H. tenuipalpis*, the length of trichobothria Oi is shorter than distance between the bases of these setae, and the solenidion and eupathidium on genu I are subequal.

Infraspecific variation. The female of *H. tenuipalpis* from Sweden (Lundblad 1962) differs in sizes of the mouth organ from the Yaroslavl' specimens (character states of the female of *H. tenuipalpis* from Yaroslavl Province are in parenthesis): the length of the capitulum 500 (385–438), diameter/height of the mouth disk 69 (87–125), the length of the pedipalpal tibia 325 (275–300), the length of the basal segment of the chelicera 552 (500–590), the length of the cheliceral stylet 314 (260–288).

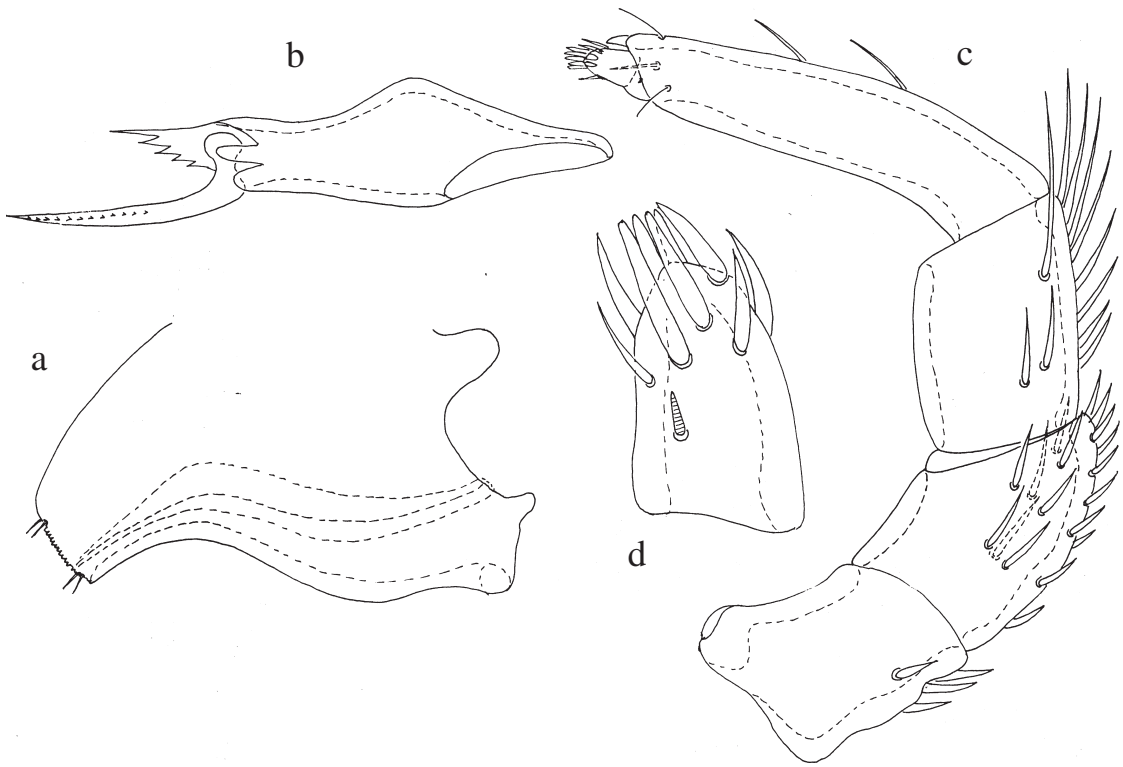

Fig. 7. *Hydryphantes tenuipalpis,* female: a — capitulum, lateral view; b — chelicera, lateral view; c — pedipalp, lateral view; d — pedipalpal tarsus.

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