

FIRST RECORD OF LARVA IN THE MITE GENUS *THINOSEIUS* (ACARI: MESOSTIGMATA: EVIPHIDIDAE)

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ABSTRACT: The larva and protonymph of *Thinoseius spinosus* (Willmann, 1939) (Acari: Mesostigmata: Eviphididae) are described. The larva of mites of the genus *Thinoseius* Halbert, 1920 is recorded for the first time.

KEY WORDS: Parasitiformes, *Thinoseius spinosus*, larva, protonymph, systematics, Crimea

INTRODUCTION

The genus *Thinoseius* Halbert, 1920 includes about 20 described species inhabiting algal debris on seashores of North America, Europe, Japan, Far East of Russia, Greenland, High Arctic, Australia, and a few islands in Southern Hemisphere (Bregetova 1977; Evans 1954; Gwiazdowicz and Coulson 2010; Halliday 2010; Makarova and Böher 2009; Masan and Halliday 2010; Takaku 2000). *Thinoseius spinosus* (Willmann, 1939) is currently known from many localities in Northern Hemisphere: Iceland, Scandinavia, British Isles, Germany, Ukraine, Bulgaria, Latvia, Russia, North America, Greenland (Masan and Halliday 2010; Makarova and Böher 2009). Despite numerous records and wide geographical distribution of this species, only its deutonymph and adults are currently described (Evans 1954; Hirschmann 1966; Karg 1993). The drawing of the opisthonotal shield of the protonymph was given by Karg (1973), but description of other morphological characters never been provided. The larva of the genus *Thinoseius* remained unknown.

During the study of mites inhabiting algal debris on seashores of Black and Azov seas in Nature Reserves of Crimea, I collected all developmental stages of *Thinoseius spinosus*. The purpose of this paper is to describe larvae and protonymphs of this species.

MATERIALS AND METHODS

Mites were collected from algal debris using Berlese funnels and mounted on slides in Hoyer's medium. The mites were examined under a light microscope with phase contrast. Drawings were made with a camera lucida. The nomenclature follows Evans and Till (1979). All measurements are given in micrometers (μm). The examined material is deposited at the collection of the Nikita Botanical Gardens — National Scientific Center, Yalta, Ukraine.

SYSTEMATICS

Family Eviphididae Berlese, 1913

Genus *Thinoseius* Halbert, 1920

Thinoseius spinosus (Willmann, 1939)

Figs 1–20

Description. Larva (Figs 1–9). Body poorly sclerotized. Idiosoma 264–300 long, maximum width 204–240.

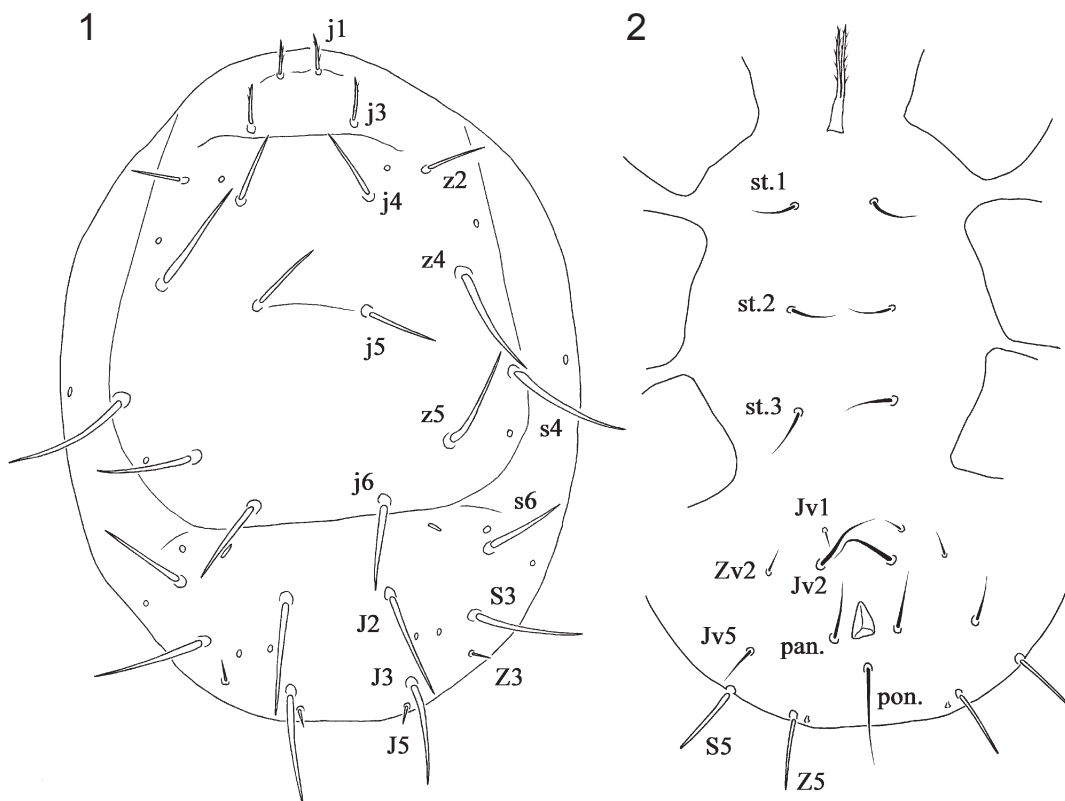
Idiosomal dorsum (Fig. 1) with poorly sclerotized podonotal shield, bearing 9 setae. Setae j1 and j3 barbed, other idiosomal setae smooth. Most of dorsal setae relatively long, blunt-ended, except for short and pointed J5 and Z3.

Idiosomal venter (Fig. 2) without shields, with pointed ventral setae.

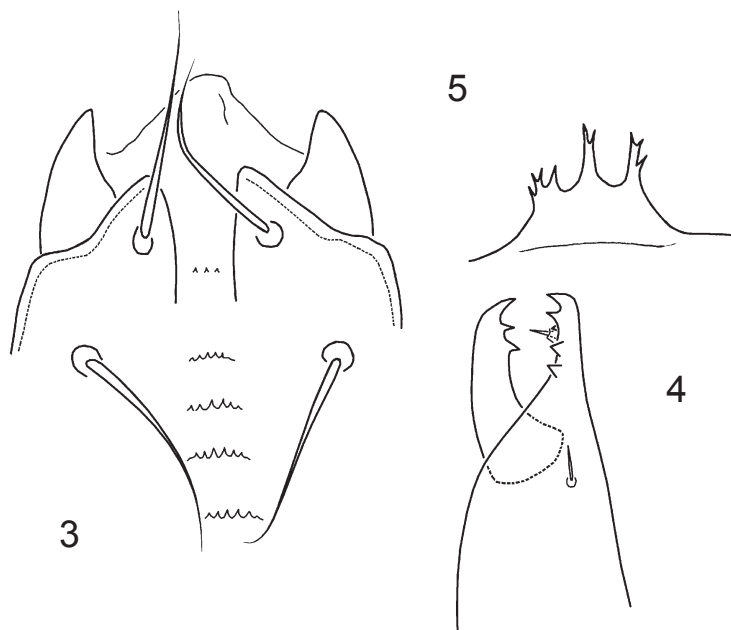
Length of idiosomal setae: j1 20–21, j3 20–23, j4 33–34, j5 33–34, j6 44–45, z2 22–25, z4 52–56, z5 45–48, s4 67–68, s6 36–44, J2 55–56, J3 51–56, J5 7–8, Z3 10–11, Z5 31–33, S3 57–59, S5 31–33, st.1 20–25, st.2 18–24, st.3 19–24, Jv1 12–16, Jv2 39–40, Jv5 22–23, Zv2 13–14, pan. 28–29, pon. 51–53.

Gnathosoma (Figs 3–6). Tectum as in Fig. 3. Chelicerae (Fig. 4) with 2 large teeth on movable chela, fixed chela with 4 teeth and pilus dentilus. Cheliceral setae present. Subcapitulum with 2 pairs of setae. Deutosternum with 5 transverse rows of denticles (Fig. 5). Corniculi relatively short and wide. Palp apotele 2-tined (Fig. 6). Chaetotaxy of palps (from trochanter to tarsus): 0–4–5–12–10. Palpfemur with 1 filiform and 3 blunt-ended, dorsal median setae with 1–2 barbs; palpgenu with 4 filiform and 1 spine-like setae; palptibia with 2 solenidia and 10 filiform setae, palptarsus with 8 solenidia and 2 filiform setae. Length of palps 108–130.

Legs (Figs 7–9). All legs with 2 claws and well developed pulvilli. Length of legs: I — 324–354, II — 226–274, III — 242–264. Leg I (Fig. 7):



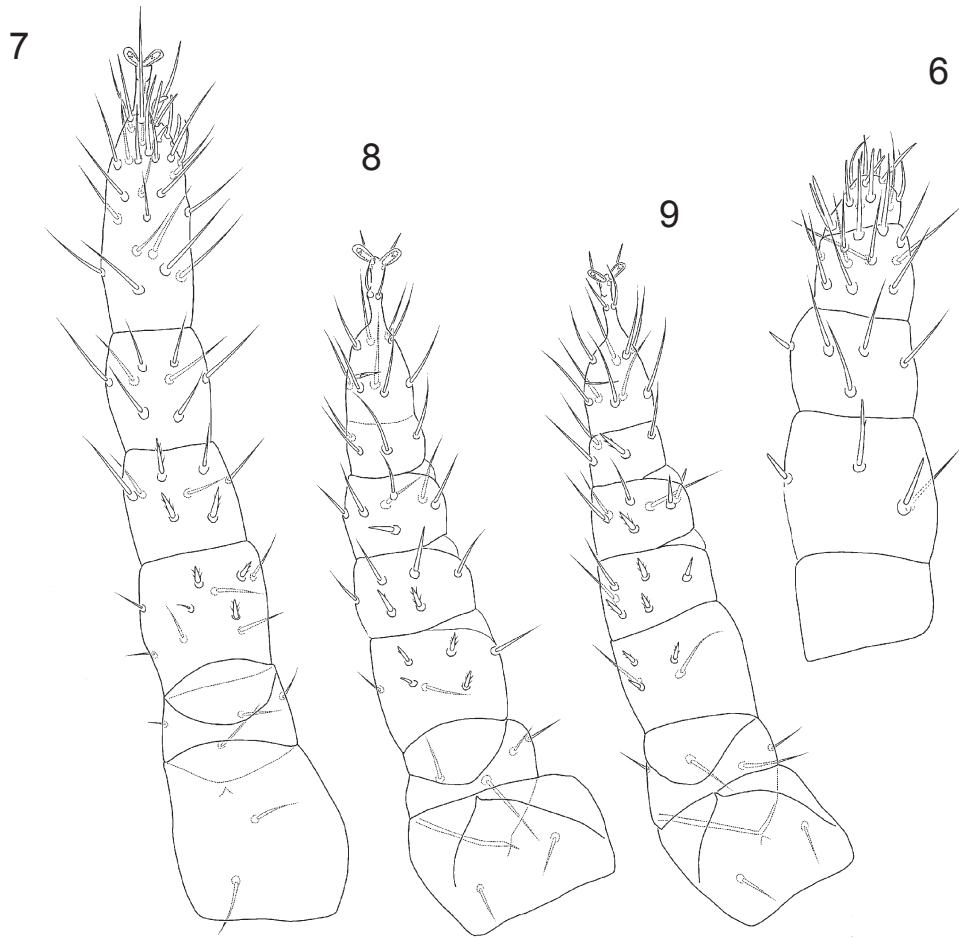
Figs 1–2. *Thinoseius spinosus* (Willmann, 1939), larva: 1 — dorsum of idiosoma, 2 — venter of idiosoma.



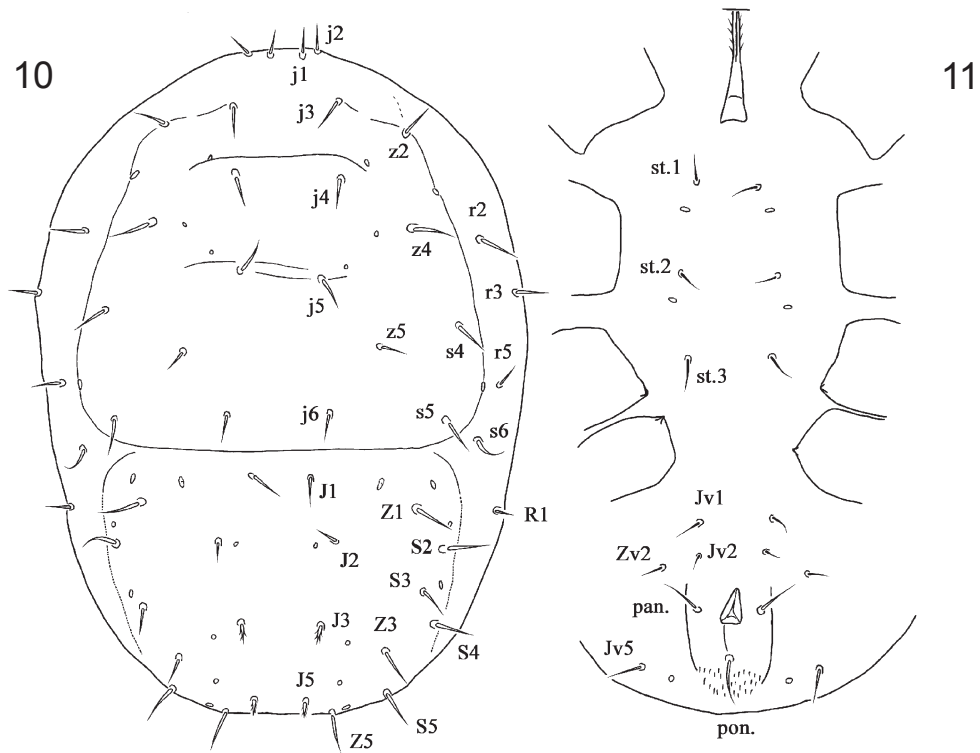
Figs 3–5. *Thinoseius spinosus* (Willmann, 1939), larva: 3 — subcapitulum, 4 — chelicerae, 5 — tectum.

coxae with 2 filiform setae, trochanter with 4 filiform setae, femur with 3 barbed spine-like setae and 7 filiform setae, genu with 3 barbed spine-like setae and 5 filiform setae, tibia with 8 filiform setae, tarsus with 17 filiform setae and 13 solenidia of different shape. Leg II (Fig. 8): coxae with 2 filiform setae, trochanter with 4 filiform setae, femur with 3 barbed spine-like setae, 1 smooth

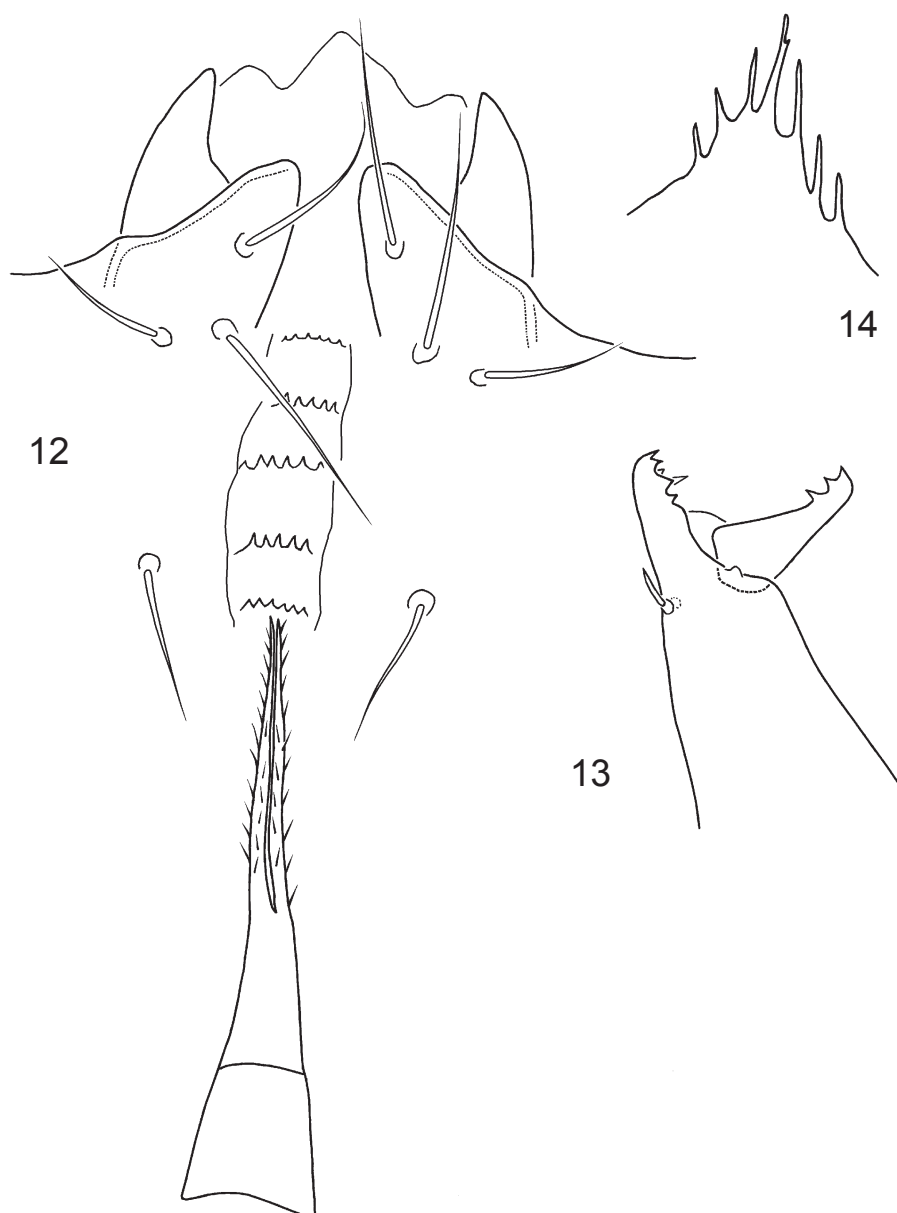
spine-like seta and 3 filiform setae, genu with 2 barbed spine-like setae, 1 smooth blunt-ended seta and 3 filiform setae, tibia with 1 smooth spine-like seta and 6 filiform setae, tarsus with 4 filiform setae on basitarsus and 13 on telotarsus. Leg III (Fig. 9): coxae with 2 filiform setae, trochanter with 4 filiform setae, femur with 2 barbed spine-like setae, 1 smooth spine-like seta and 2 filiform setae,



Figs 6–9. *Thinoseius spinosus* (Willmann, 1939), larva: 6 — palp, 7–9 — legs I–III, respectively.



Figs 10–11. *Thinoseius spinosus* (Willmann, 1939), protonymph: 10 — dorsum of idiosoma, 11 — venter of idiosoma.



Figs 12–14. *Thinoiseius spinosus* (Willmann, 1939), protonymph: 12 — subcapitulum and tritosternum, 13 — chelicerae, 14 — tectum.

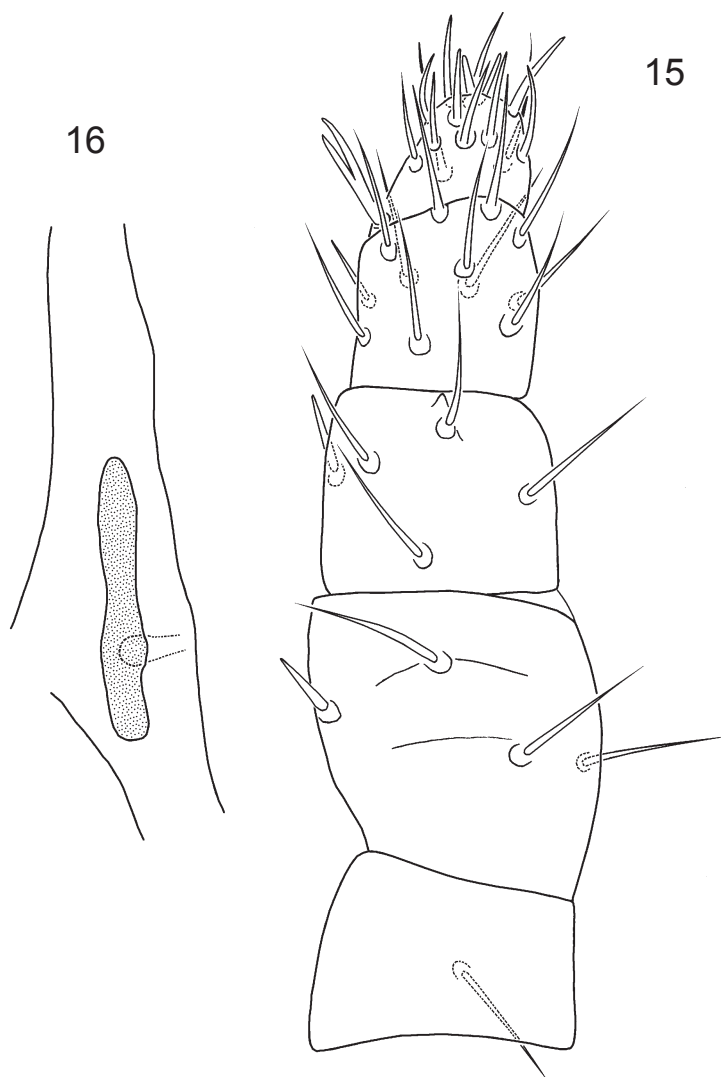
genus with 3 barbed spine-like, 1 smooth spine-like seta and 2 filiform setae, tibia with 2 smooth spine-like setae, 1 barbed spine-like seta and 4 filiform setae, tarsus with 1 barbed spine-like seta and 3 filiform setae on basitarsus and 13 on telotarsus.

Protonymph (Figs 10–20). Body poorly sclerotized. Idiosoma 420–450 long, maximum width 320–343.

Idiosomal dorsum (Fig. 10) with poorly sclerotized podonotal and opisthotal shields with weak reticulate ornamentation. Podonotal shield with 11 short, smooth pointed setae. Opisthotal shield with 11 setae; setae J3 and J5 barbed, other setae on opisthotal shield smooth. Soft cuticle around dorsal shields with 4–5 pairs of setae (setae

R1 absent in some specimens). Length of dorsal setae: j1 20–23, j2 18–20, j3 23–27, j4 21–22, j5 22–23, j6 21–26, z2 25–26, z4 29–32, z5 17–22, s4 31–33, s5 28–29, s6 23–28, r2 25–28, r3 23–25, r5 23–25, J1 24–25, J2 15–16, J3 13–14, J5 9–10, Z1 24–28, Z3 20–21, Z5 27–29, S2 28–30, S3 18–22, S4 26–27, S5 23–24, R1 18.

Idiosomal venter (Fig. 11) with poorly sclerotized anal shieldbearing 1 pair of paraanal and unpaired postanal setae, cribrum well developed. All ventral setae smooth, pointed. Sternal region with 2 pairs of large oval sternal pores. Length of ventral setae: st.1 20–23, st.2 22–23, st.3 21–23, Jv1 21–22, Jv2 14–17, Jv5 21–22, Zv2 14–15, pan. 24–25, pon. 29–39. Peritremes (Fig. 16) short



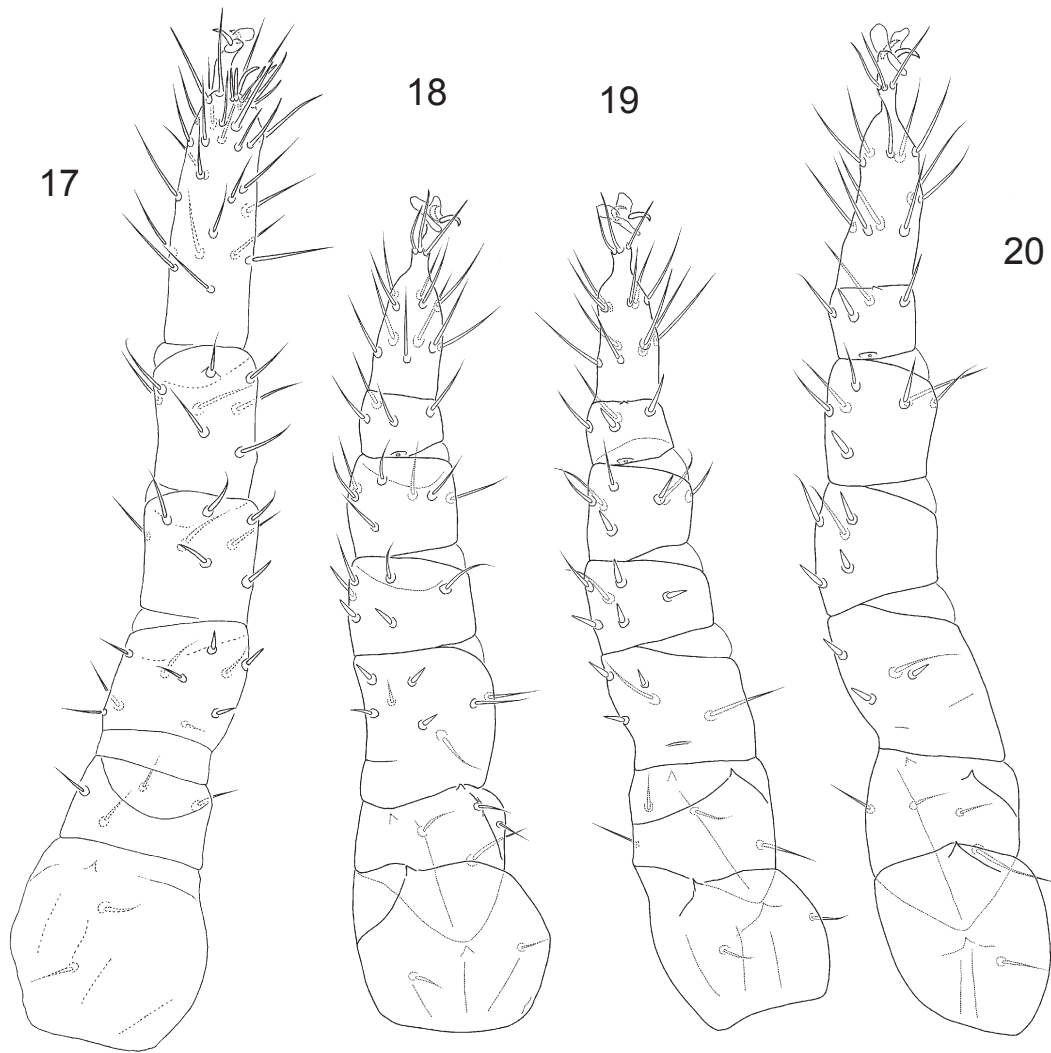
Figs 15–16. *Thinoseius spinosus* (Willmann, 1939), protonymph: 15 — palp, 16 — peritreme.

(41–42) situated on poorly sclerotized peritremal plates.

Gnathosoma (Figs 12–15). Tectum as in Fig. 14. Chelicerae (Fig. 13) as in larva. Subcapitulum with 4 pairs of setae. Deutosternum with 5 transverse rows of denticles (Fig. 12). Corniculi relatively short and wide. Palp apotele 2-tined (Fig. 15). Chaetotaxy of palps (from trochanter to tarsus): 1–4–5–12–14. Palptrochanter with 1 filiform ventral seta; palpfemur with 1 spine-like and 3 filiform setae; palpgenu with 4 filiform and 1 spine-like setae; palptibia with 2 solenidia and 10 filiform setae, palptarsus with 12 solenidia and 2 filiform setae. Length of palps 132–140.

Legs (Figs 17–20). All legs with 2 pairs of claws and well developed pulvilli. Length of legs: I — 385–397, II — 304–308, III — 308–313, IV — 369–374. Leg I (Fig. 17): coxae with 2 filiform setae, trochanter with 4 filiform setae, femur with 3 spine-like setae and 7 filiform setae,

genu with 2 spine-like setae and 6 filiform setae, tibia with 8 filiform setae, tarsus with 19 filiform setae and 14 solenidia of different shape. Leg II (Fig. 18): coxae with 2 filiform setae, trochanter with 4 filiform setae, femur with 4 spine-like setae and 4 filiform setae, genu with 3 spine-like and 3 filiform setae, tibia with 7 filiform setae, tarsus with 4 filiform setae on basitarsus and 14 on telotarsus. Leg III (Fig. 19): coxae with 2 filiform setae, trochanter with 4 filiform setae, femur with 3 spine-like setae and 2 filiform setae, genu with 4 spine-like and 2 filiform setae, tibia with 2 spine-like setae and 5 filiform setae, tarsus with 1 spine-like, 1 blunt-ended, and 2 filiform setae on basitarsus and 14 on telotarsus. Leg IV (Fig. 20): coxae with 1 filiform seta, trochanter with 4 filiform setae, femur with 3 spine-like setae and 1 filiform seta, genu with 3 spine-like and 2 filiform setae, tibia with 2 spine-like setae and 5 filiform setae, tarsus with 1 spine-like, 1 blunt-



Figs 17–20. *Thinoiseius spinosus* (Willmann, 1939), protonymph: 17–20 — legs I–IV, respectively.

ended, and 2 filiform setae on basitarsus and 14 on telotarsus.

Material examined. Five larvae, 6 protonymphs, UKRAINE, Crimea, “Cape Martyan” Nature Reserve, algal debris on seashore of Black Sea, 40°30' N, 34°16' E, 10 April 2012, coll. S.I. Maslov.

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