

## REDEFINITION OF THE GENUS *ASENSILLA* RACK (ACARI: HETEROSTIGMATA: PYGMEPHORIDAE) WITH REDESCRIPTION OF *A. PRASSEI*

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ABSTRACT: The genus *Asensilla* Rack, 1974 and its type species *A. prassei* Rack, 1974 (Acari: Pygmephoridae) are redefined and redescribed, respectively, based on materials from Turkey. The genus *Asensilla* has been recorded for the first time in Asia. In addition, the taxonomic position of the genus *Asensilla* is discussed.

KEY WORDS: Systematics, Pygmephoridea, Turkey, first record.

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### INTRODUCTION

The cosmopolitan family Pygmephoridae is the second largest in the superfamily Pygmephoridea and includes 31 genera and more than 300 species (Khaustov *et al.* 2017). Probably all pygmephorid mites are fungivorous (Kaliszewski *et al.* 1995).

The monotypic genus *Asensilla* Rack, 1974, with type species *Asensilla prassei* Rack, 1974, has been described from soil in Germany (Rack 1974). Since that time, the genus has never been reported from any other locality. The original description of *A. prassei* lacks information about its leg setation, shape of ventral plates and gnathosomal structures.

The junior author has collected a series of specimens of *A. prassei* from the garlic fields of Kastanou, Turkey. The mites were collected from the bulbs of garlic plants, which remain submerged in soil during the vegetation period. Based on this material we have redefined the genus *Asensilla* and redescribed *A. prassei*.

### MATERIAL AND METHODS

Specimens of *A. prassei* were extracted from garlic with soil samples with the help of a Berlese funnel. Mites were mounted on slides in Hoyer's medium. The terminology of idiosoma and legs follows that of Lindquist (1986); the nomenclature of subcapitular setae and the designation of cheliceral setae follow those of Grandjean (1944, 1947), respectively. The systematics of Pygmephoridea follows that of Khaustov (2004, 2008). All measurements are given in micrometers ( $\mu\text{m}$ ). For leg chaetotaxy, the number of solenidia is given in parentheses. Mite morphology was studied using a Carl Zeiss Axio Imager A2 compound microscope with DIC and phase contrast objectives. Photomi-

crographs were taken with an AxioCam ICc5 digital camera.

### RESULTS

#### Family Pygmephoridae Cross, 1965

Genus *Asensilla* Rack, 1974

Type species: *Asensilla prassei* Rack, 1974, by original designation

**Diagnosis.** *Female.* Body well sclerotized, oval. Gnathosomal capsule of about equal length and width dorsally, with one pair of cheliceral setae (*cha*), setae *chb* absent; postpalpal setae (*pp*) present; palps prominent, with two pairs of setae (*dFe*, *dGe*); tibial claw large; palpal solenidion well developed, accessory setigenous structure (*ass*) large, mushroom-like. Subcapitular setae (*m*) present. Subcapitulum with one pair of oval pits in posterior half. Pharyngeal pumps tripartite, situated on long and thin oesophagus; pump 1 butterfly-like, smooth, far separated from pump 2, pumps 2 and 3 subequal, oval, situated close to each other. Prodorsum with three pairs of setae ( $v_1$ ,  $v_2$ ,  $sc_2$ ) and one pair of oval stigmata; trichobothria absent; prodorsal shield not divided. Tracheal trunks thin, long. Posterior part of prodorsal shield covering anterior part of tergite C. Tergite C with two pairs of setae ( $c_1$ ,  $c_2$ ); tergite D with one pair of setae (*d*) and one pair of round cupules *ia*; tergite EF with two pairs of setae (*e*, *f*) and one pair of round cupules *im*; tergite H with two pairs of setae ( $h_1$ ,  $h_2$ ) and one pair of round cupules *ih*. Coxal fields I with two pairs of setae (*1a*, *1b*), setae *1b* not modified, setae *1c* absent; coxal fields II with two pairs of setae (*2a*, *2c*); coxal fields III with three

pairs of setae (3a, 3b, 3c); coxal fields IV with three pairs of setae (4a, 4b, 4c). Pseudanal segment with three pairs of setae ( $ps_{1-3}$ ). Apodemes 1 (ap1) well developed, thick, apodemes 2 (ap2) well developed, joined with well-developed prosternal apodeme (appr); appr joined with sejugal apodeme (apsej); secondary transverse apodeme (sts) present; apodemes 3 (ap3) weak, diffuse, represented by two curved separated lines; poststernal apodeme (appo) well developed, fused with long apodemes 4 (ap4). Posterior margin of posterior sternal plate entire. Anterior (ags) and posterior (pgs) genital sclerites situated close to each other. Leg I 4-segmented, with massive tibiotarsus and large tarsal claw. Unguinal setae fused to form structure opposing the tarsal claw. Tibiotarsus without pinaculum. Seta *d* of femur I unmodified. Seta *k* smooth, pointed. Seta *l''* of femur absent. Legs II–IV each with one pair of claws and elongated

empodium. Claws on tarsi II and III padded, on tarsus IV simple. Genu II without seta *l''*. Tibia IV without solenidion. Femora III and IV divided into basi- and telofemur. Leg setation: leg I: tr 1 (*v'*), fe 3 (*d, l', v''*), ge 3 (*l', l'', v''*), tita 17(4) (*d, l', l'', v', v'', k, tc', tc'', p', p'', ft', ft'', pv', pv'', pl', pl'', s, \omega\_1, \omega\_2, \varphi\_1, \varphi\_2*); leg II: tr 1 (*v'*), fe 3 (*d, l', v''*), ge 2 (*l', v'*), ti 4(1) (*d, l', v', v'', \varphi*), ta 6(1) (*tc', tc'', pl'', pv', pv'', u', \omega*); leg III: tr 1 (*v'*), fe 2 (*d, v'*), ge 2 (*l', v'*), ti 4(1) (*d, l', v', v'', \varphi*), ta 6 (*tc', tc'', pl'', pv', pv'', u'*); leg IV: tr 1 (*v'*), fe 2 (*d, v'*), ge 1 (*v'*), ti 4 (*d, l', v', v''*), ta 6 (*pl'', tc', tc'', u', pv', pv''*).

*Male and larva unknown.*

**Species included.** The genus *Asensilla* includes one species, *A. prassei* Rack, 1974.

**Distribution and habitat.** *A. prassei* inhabits soils in Germany (Rack 1974) and Turkey (present data). This is a new record of the genus *Asensilla* in Asia.

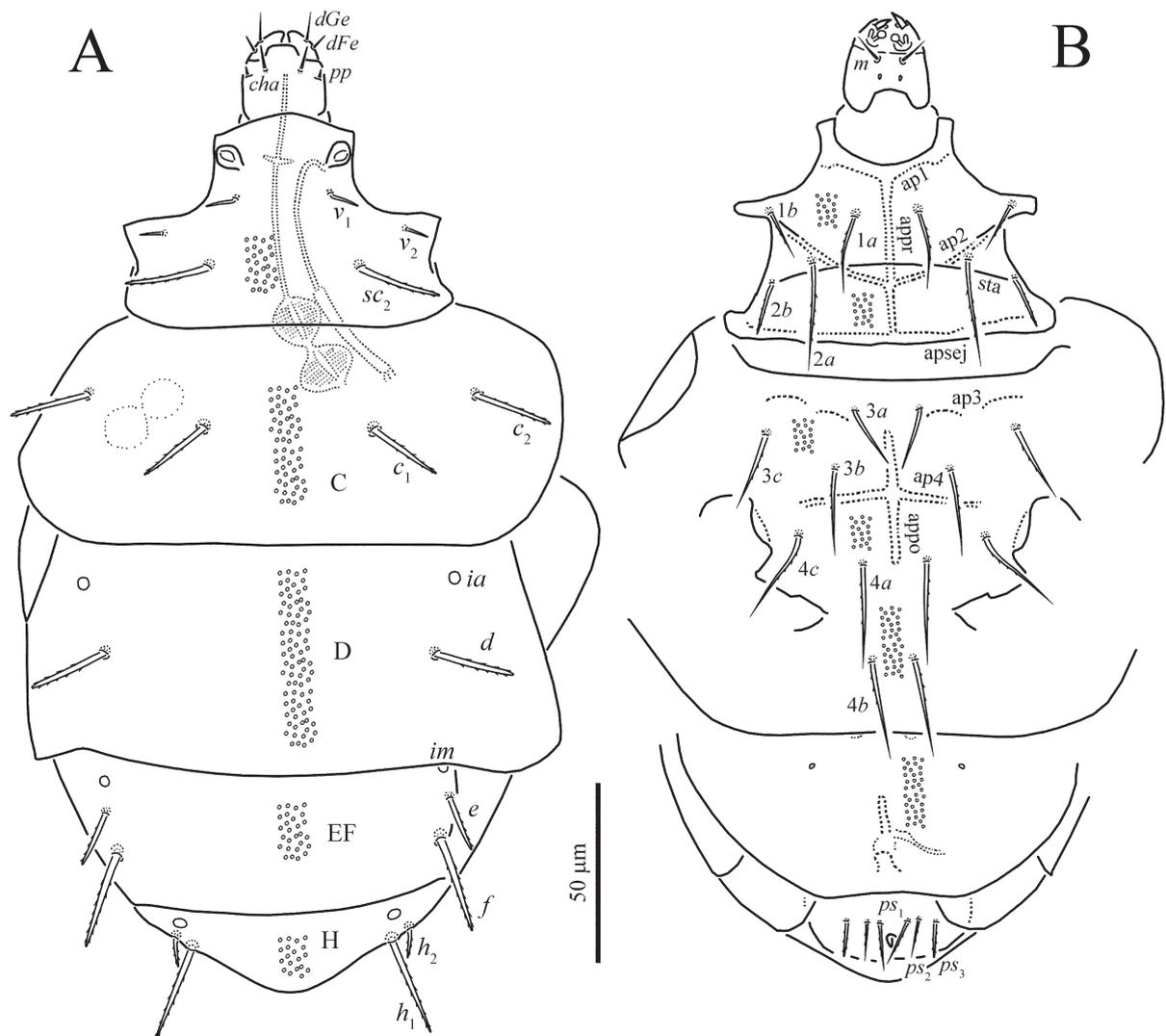


Fig. 1. *Asensilla prassei* Rack, 1974, female: A—dorsum of the body, B—venter of the body. Legs omitted.

***Asensilla prassei* Rack, 1974**

(Figs. 1–4)

**Redescription.** *Female* (Figs. 1–4). Length of idiosoma 230–250, width 145–155.

*Gnathosoma.* Length of gnathosoma 21–23, width 23–24. Dorsal median apodeme absent. All gnathosomal setae smooth. Setae *cha* 7–8, *dFe* and *pp* needle-like. Setae *dGe* pointed, distinctly longer than *dFe*. Postpalpal setae situated laterally to setae *cha*. Subcapitular setae *m* 6 pointed.

*Idiosomal dorsum* (Figs. 1A, 4A–E). All dorsal shields with numerous and rather large dimples (Figs. 4C, D). All dorsal setae blunt-ended. Setae  $v_1$  and  $v_2$  smooth, other dorsal setae weakly barbed.

Cupules *ia* on tergite D, *im* on tergite EF, and *ih* on tergite H large, round. Setae *e* situated distinctly anteriorly to *f*. Prodorsum with one pair of oval subcuticular areas (Fig. 4E), located between setae  $sc_2$ ; tergite C with two pairs of oval subcuticular areas (Fig. 4E) located between setae  $c_1$  and  $c_2$ . Lengths of dorsal setae:  $v_1$  8–10,  $v_2$  6–7,  $sc_2$  23–25,  $c_1$  20–24,  $c_2$  22–24, *d* 22–23, *e* 15–17, *f* 27–30,  $h_1$  28–31,  $h_2$  10–11. Distances between setae:  $v_1$ – $v_1$  25–26,  $v_2$ – $v_2$  62–67,  $sc_2$ – $sc_2$  38–42,  $c_1$ – $c_1$  43–47,  $c_1$ – $c_2$  30–34, *d*–*d* 90–94, *e*–*f* 11–11, *f*–*f* 88–92,  $h_1$ – $h_1$  52–57,  $h_1$ – $h_2$  6–7.

*Idiosomal venter* (Figs. 1B, 4B, F). Ventral plates with numerous rather large dimples (Fig. 4F). Setae 3*a* smooth, other ventral setae weakly

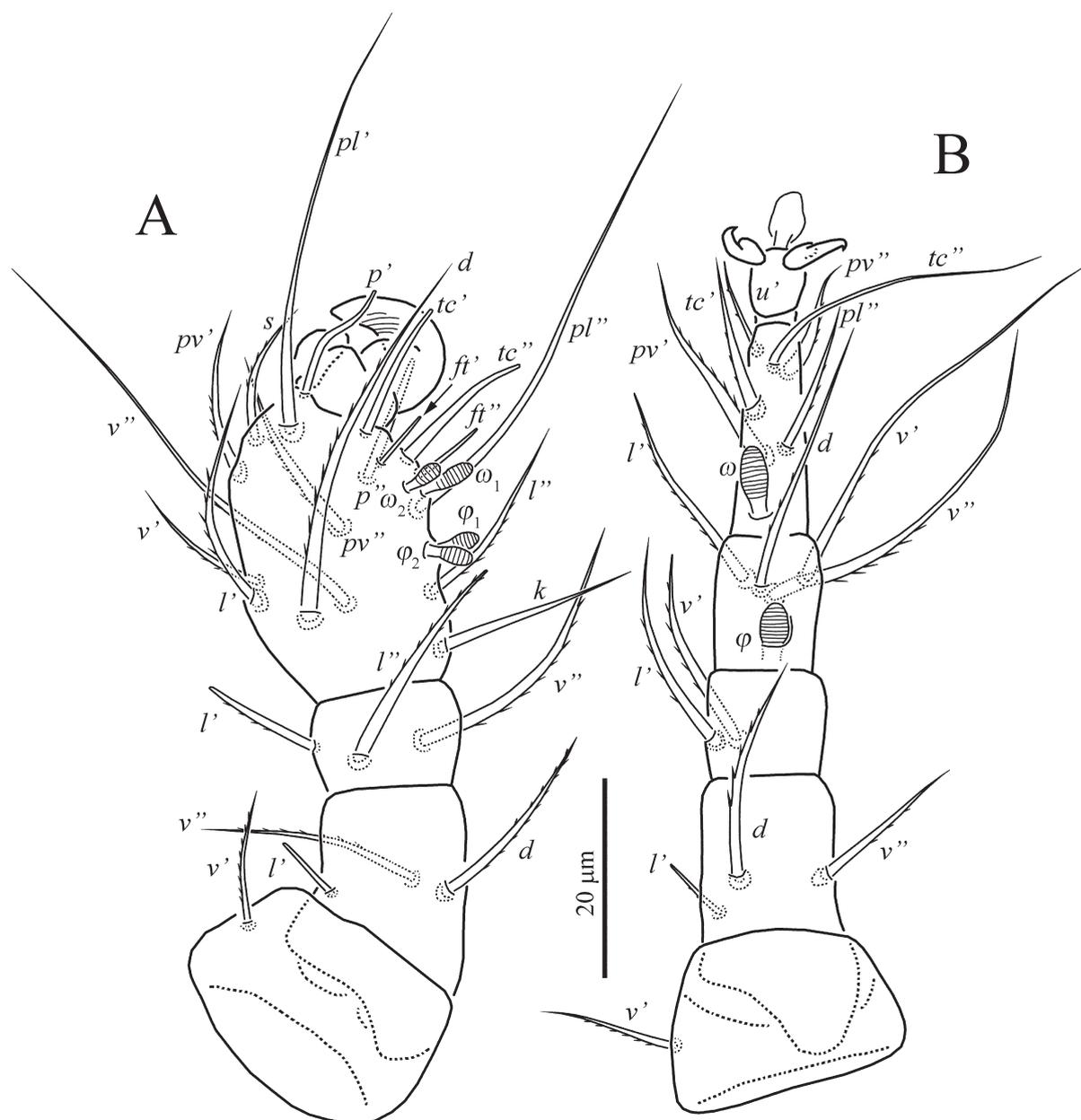


Fig. 2. *Asensilla prassei* Rack, 1974, female: A—right leg I in dorsal view, B—right leg II in dorsal view.

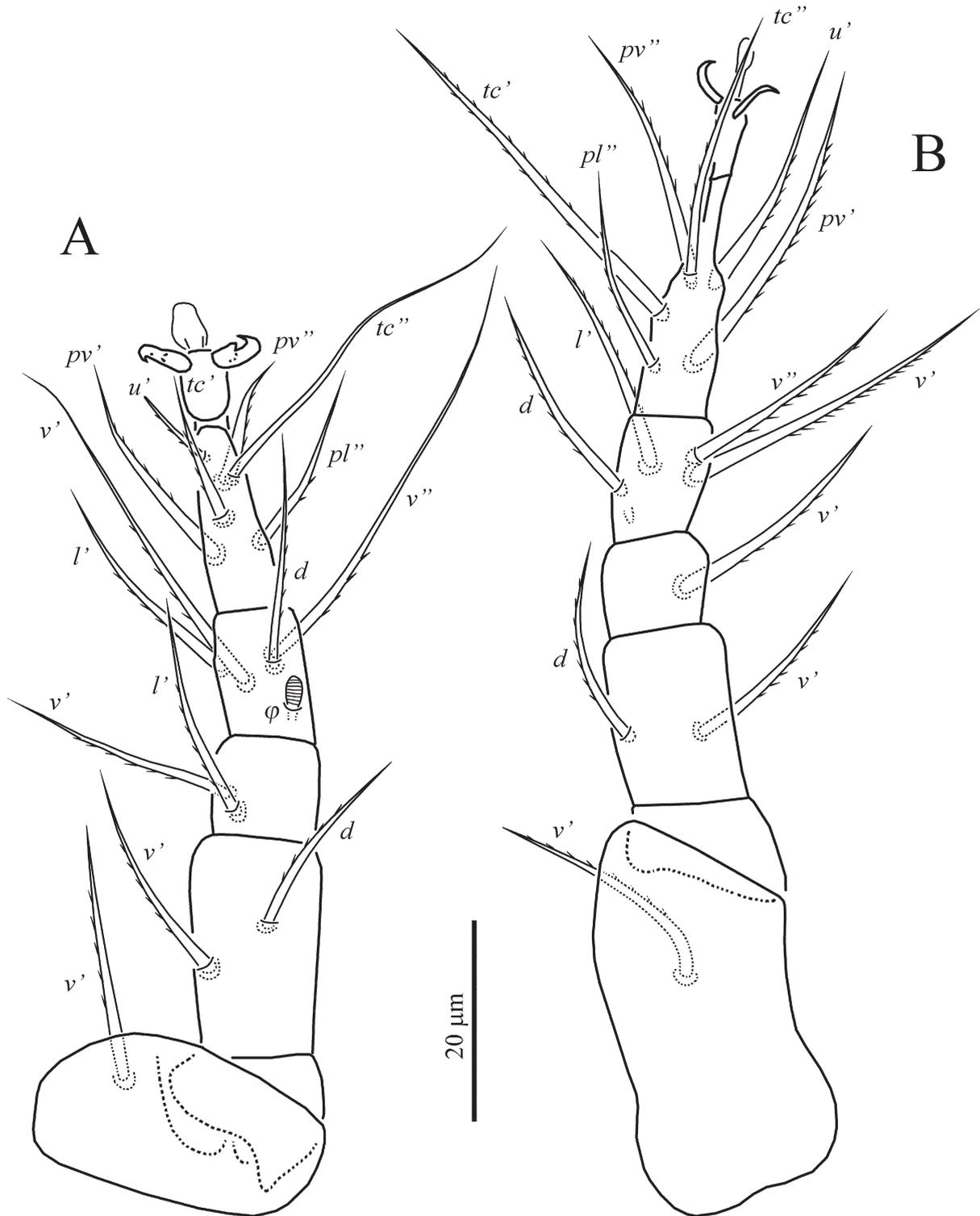


Fig. 3. *Asensilla prassei* Rack, 1974, female: A—right leg III in dorsal view, B—right leg IV in dorsal view.

barbed. Setae  $2c$ ,  $3a$  and  $ps_3$  blunt-ended, other ventral setae pointed. Lengths of ventral setae:  $1a$  22–26,  $1b$  14–15,  $2a$  29–31,  $2c$  15–16,  $3a$  16–17,  $3b$  23–26,  $3c$  25–27,  $4a$  28–32,  $4b$  28–30,  $4c$  27–29,  $ps_1$  13–15,  $ps_2$  10–11,  $ps_3$  10–11.

*Legs* (Figs. 2, 3). Leg I (Fig. 2A). Tarsal claw with blunt tip. Inner surface of tarsal claw weakly

striated. Lengths of solenidia  $\omega_1$  6,  $\omega_2$  5,  $\phi_1$  5,  $\phi_2$  5; all solenidia clavate. Seta  $l'$  of femur,  $l'$  and  $l''$  of genu blunt-ended, other leg setae (except eupathidia) pointed. Setae  $l'$  of femur,  $k$  and ( $pl$ ) of tibio-tarsus smooth, other setae (except eupathidia) weakly barbed. Leg II (Fig. 2B). Solenidion  $\omega$  7–8 and solenidion  $\phi$  6 weakly clavate. Setae  $l'$  of fe-

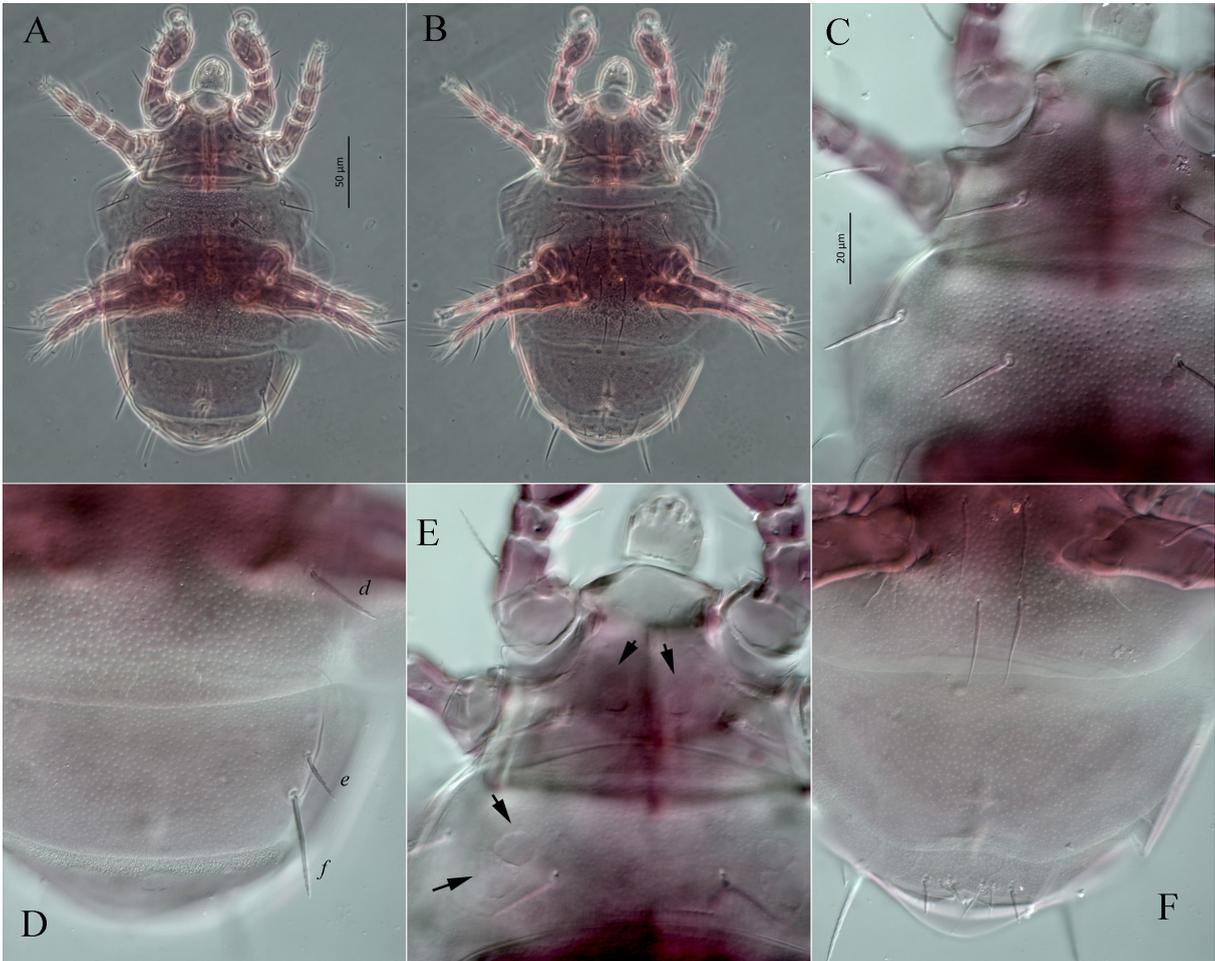


Fig. 4. Phase contrast (A, B) and DIC micrographs (C-F) of *Asensilla prassei* Rack, 1974, female: A—general view dorsally, B—general view ventrally, C—prodorsum and tergite C, D—tergites D and EF, E—oval subcuticular areas (arrowed), F—opisthosoma in ventral view.

mur,  $v'$  of genu,  $l'$  of tibia, and  $u'$  of tarsus weakly blunt-ended, other setae pointed. Seta  $tc''$  of tarsus smooth, other setae weakly barbed. Leg III (Fig. 3A). Solenidion  $\phi$  5 weakly clavate. Seta  $u'$  of tarsus weakly blunt-ended, other setae pointed. Seta  $tc''$  of tarsus smooth, other setae weakly barbed. Leg IV (Fig. 3B). All setae pointed and weakly barbed. Solenidion  $\phi$  absent, but internal invagination visible on its typical insertion point.

**Material examined.** Five females, 09.07.2015 (code No. B-207) Taşköprü-Yukarı Ermece Village; one female, 23.06.2015 (code No. B-228) Hanönü Kuyluş Village, from Garlic Bulbs, from garlic growing fields, Kastamonu, Turkey.

**Deposition of material.** The voucher specimens of species redescribed here are deposited in the mite collection of the Department of Plant Protection, University of Ankara, Turkey (five specimen) and Tyumen State University, Russia (one specimen).

**Remarks.** The redescription of *A. prassei* is based on the material from Turkey. The Turkish

specimens agree with original description of this species in all details and undoubtedly conspecific with the specimens from Germany.

## DISCUSSION

The genus *Asensilla* is similar to the genus *Dudichiana* Mahunka, 1970 in the absence of setae  $1c$  and the presence of unmodified seta  $d$  of femur I. However, in *Dudichiana* trichobothria are well developed (they are absent in *Asensilla*). Unfortunately, since the leg setation has not been described for *Dudichiana*, we were not able to compare it to that of *Asensilla*. The leg setation of the genus *Asensillar* is most similar to that of the genus *Pseudopygmephorellus* Khaustov, 2008 (setae  $v'$  of genu I and  $l''$  of genu II absent), however, in *Asensilla* seta  $l''$  of femur I is absent (present in *Pseudopygmephorellus*) and seta  $d$  of femur I is not modified (hook-like in *Pseudopygmephorellus*). The complete absence of trichobothria in Pygmephoridae is known only in the genus *Micropygme-*

*phorus* Khaustov, Hugo-Coetzee and Ermilov, 2017. Khaustov *et al.* (2017) suggested that *Asensilla* and *Micropygmephorus* are very similar to each other by the absence of setae on trochanters I–III. In fact, the present study has revealed that setae on trochanters I–III are present in *Asensilla*. Most probably, the reduction of trichobothria in *Asensilla* and *Micropygmephorus* is a result of homoplasy.

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