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## Two new quill mite species of the family Syringophilidae (Acari: Prostigmata) parasitising the house sparrow *Passer domesticus* (L.) (Aves: Passeriformes)

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### Abstract

Two new quill mite species of the family Syringophilidae, *Picobia passeri* sp. nov. and *Krantziaulonastus dubinini* sp. nov., are described from quills of the body feathers of the house sparrow *Passer domesticus* (L.) (Passeriformes: Passeridae) from the European part of Russia.

**Key words:** Acari, Syringophilidae, quill mites, ectoparasites of birds, *Passer domesticus*

### Introduction

The quill mites of the family Syringophilidae (Acari: Prostigmata: Cheyletoidea) are taxonomically diverse group of obligatory and permanent ectoparasites of bird. They live inside the quill cavities of the flight and body feathers and feed on soft tissue fluids of their hosts by piercing the calamus wall with their long and flexible chelicerae (Kethley 1970, 1971). This family currently includes about 280 species grouped in 56 genera and two subfamilies (Skoracki 2011; Skoracki *et al.* 2012; Skoracki & Hromada 2013). Presently, syringophilids are known from hosts of 23 orders belonging both to neognathous and palaeognathous birds (Skoracki *et al.* 2012, 2013a, b). These mites show a high degree of host specificity; monoxenous or narrowly oligoxenous species (i.e. mites parasitising different host species belonging to the same genus or family) constitute about 86% of the world fauna of syringophilids (Skoracki *et al.* 2012).

To present time, two quill mite species have been described from the house sparrow, *Syringophiloidus minor* (Berlese) inhabiting quills of secondaries, coverts, rectrices, and tertials, and *Syringophilopsis passericus* Skoracki living in quills of secondaries and primaries (Skoracki 2011). In the present paper, two new syringophilid species belonging to the genera *Picobia* Haller and *Krantziaulonastus* Skoracki are described from quills of the body feathers of the house sparrows from Russia.

### Material and methods

The material used in the present study was collected by V.V. Abramov (Suvorov, Russia) and placed in tubes with 75% ethanol. Then, in laboratory conditions (AMU), the infected quills were dissected; individual mites were removed and mounted on slides in Hoyer's medium. The mite material was examined under an Olympus BH-2 light microscope with differential interference contrast (DIC) optics. Drawings were made with the aid of a drawing attachment. All measurements are given in micrometers. Measurements (ranges) for paratypes are given in brackets following the data on holotype. In the descriptions below, the idiosomal setation follows Grandjean (1939) as adapted for Prostigmata by Kethley (1990); the leg setation follows Grandjean (1944); the morphological terminology follows Skoracki (2011). Specimen depositories and reference numbers are cited using the following abbreviations: AMU—Adam Mickiewicz University, Department of Animal Morphology, Poznan, Poland; ZISP—Zoological Institute, Russian Academy of Sciences, St. Petersburg, Russia.

## Systematics

### Family Syringophilidae Lavoipierre

#### Subfamily Picobiinae Johnston et Kethley

#### Genus *Picobia* Haller

##### *Picobia passeri* sp. nov.

(Figs. 1–3)

**Description.** NON-PHYSOGASTRIC FEMALE, holotype. Total body length, 670 (650–700 in 5 paratypes). *Gnathosoma*. Hypostomal apex with pair of protuberances. Infracapitulum apunctate. Each medial branch of peritremes with 4 chambers, each lateral branch with clearly visible 7 chambers. Movable cheliceral digit dentate in posterior part. Stylophore 185 (185–195) long. *Idiosoma*. Propodonal shield divided into 2 narrow shields bearing bases of setae *ve*, *si* and *se*. Setae *vi* situated distinctly posterior to level of setae *ve*. All propodonal setae delicately knobbed. Length ratio of setae *vi:ve:si* 1.1–1.3:1:1.6–1.9. Setae *c1* located distinctly anterior to level of setae *se*. Setae *d2* 1.6–1.8 times longer than *e2*. Pygidial shield well sclerotized, not divided longitudinally, apunctate. Setae *f2* 1.3–1.5 times longer than *f1*. Setae *h1* 3.2–4.2 times longer than *f1*. Alveoli of setae *3a* not coalesced. Genital plate well sclerotized, apunctate. Aggenital setae *ag1* situated anterior to level of setae *ag2*, both pairs of setae located on genital plate. Length ratio of setae *ag1:ag2:ag3* 1.4–1.7:1:1.9–2.8. Setae *ps1* and *ps2* subequal in length. Setae *g1* hair-like, situated on genital lobes, 2–3 times longer than pseudanal setae. Coxal fields I–IV well developed, I and II densely punctate, III and IV apunctate. Setae *3c* 4 times longer than *3b*. *Legs*. Most of dorsal setae of legs I and II delicately knobbed. Antaxial and paraxial members of claw pairs III and IV unequal in size and shape. Setae *tc''* of legs III and IV slightly (1.1–1.2 times) longer than *tc'''III–IV*. *Lengths of setae*: *vi* 160 (145–155), *ve* 120 (120–130), *si* 230 (200–230), *c1* 245 (250–270), *c2* 240 (240–245), *se* 245 (230–245), *d1* (180–190), *d2* 205 (190–205), *e2* (115–120), *f1* 55 (55–75), *f2* 80 (80–95), *h1* 230 (205–230), *h2* 270 (260–275), *ps1* 25 (25), *ps2* 25 (20–25), *g1* 50 (50–75), *ag1* 75 (80–100), *ag2* 45 (45–70), *ag3* 125 (125–135), *l'RIII* and *l'RIV* 25 (25), *tc'''III–IV* (55–65), *tc'''III–IV* (70–75), *3b* (25), *3c* (100).

PHYSOGASTRIC FEMALE. Body worm-shaped, 820–950 long (in 9 paratypes). Morphology of body and legs as in non-physogastric form.

MALE. Total body length 430–455 (in 4 paratypes). *Gnathosoma*. Infracapitulum apunctate. Hypostomal apex tapering. Each medial branch of peritremes with 3 chambers, each lateral branch with clearly visible 5–6 chambers. Stylophore 90–95 long. *Idiosoma*. Propodonal shield divided longitudinally into 2 narrow lateral shields, apunctate, bearing bases of setae *ve*, *si* and *se*. Setae *vi* situated slightly posterior to level of setae *ve*. Length ratio of setae *vi:ve:si* 1:1:1.3–1.4. Setae *c1* located slightly anterior to level of setae *se*. Hysteronotal shield apunctate, bearing bases of setae *d1* and *e2*. Length ratio of setae *d2:d1:e2* 7–10:1.3–2.3:1. Pygidial shield well developed, apunctate. Setae *h2* about 10 times longer than *f2*. Alveoli of setae *3a* coalesced. Two aggenital plates bearing bases of setae *ag1* in posterior part. Setae *ag1* about twice as long as *ag2*. Coxal fields I–II punctate, III and IV apunctate. Setae *3c* 2–2.7 times longer than *3b*. *Legs*. Setae *tc'* and *tc''* of legs III and IV subequal in length. *Lengths of setae*: *vi* 90–95, *ve* 90–95, *si* 25, *se* 140, *c1* 135–145, *c2* 130, *d1* 20–35, *d2* 105–120, *e2* 10–15, *h2* 150, *f2* 10–15, *ag1* 40–45, *ag2* 15–20, *l'RIII* and *l'RIV* 15–20, *3b* 15, *3c* 30–40, *tc'''III–IV* and *tc'''III–IV* 45.

**Type material.** Female holotype (non-physogastric form) and paratypes: 5 females (non-physogastric form), 9 females (physogastric form) and 4 males, from *Passer domesticus* (Linnaeus) (Passeriformes: Passeridae); **RUSSIA**, Tula district, Suvorov, 28 May 2013, coll. V.V. Abramov.

**Type material deposition.** All type material is deposited in the ZISP (Reg. No. ZISP-AVB-011-2908-068), except 2 female (non-physogastric form), 2 female (physogastric form) and 2 male paratypes in the AMU (Reg. No. AMU-SYR.441)

**Etymology.** The specific epithet derives from the generic name of the host, and is a noun in the genitive case.

**Differential diagnosis.** *Picobia passeri* sp. nov. is morphologically most similar to *P. chloris* Bochkov, Mironov and Kravtsova, 2000 described from *Carduelis chloris* (Linnaeus) (Passeriformes: Fringillidae) from Kirghizia (Bochkov *et al.* 2000). In females of both species the hypostomal apex is ornamented by a pair of

protuberances; the hysteronotal shield is absent; setae *hl* are distinctly longer than *fl*; agenital setae *ag1* are situated anterior to the level of setae *ag2*; the antiaxial and paraxial members of the claws pairs III and IV are unequal in size and shape. This new species differs from *P. chloris* by the following features: in females of *P. passeri*, the pygidial shield is well developed; the genital lobes are present; setae *ag1* are 1.4–1.7 times longer than *ag2*; the length of setae *si* is 200–230. In females of *P. chloris*, the pygidial shield and the genital lobes are absent; setae *ag1* and *ag2* are subequal in length; the length of setae *si* is 125.

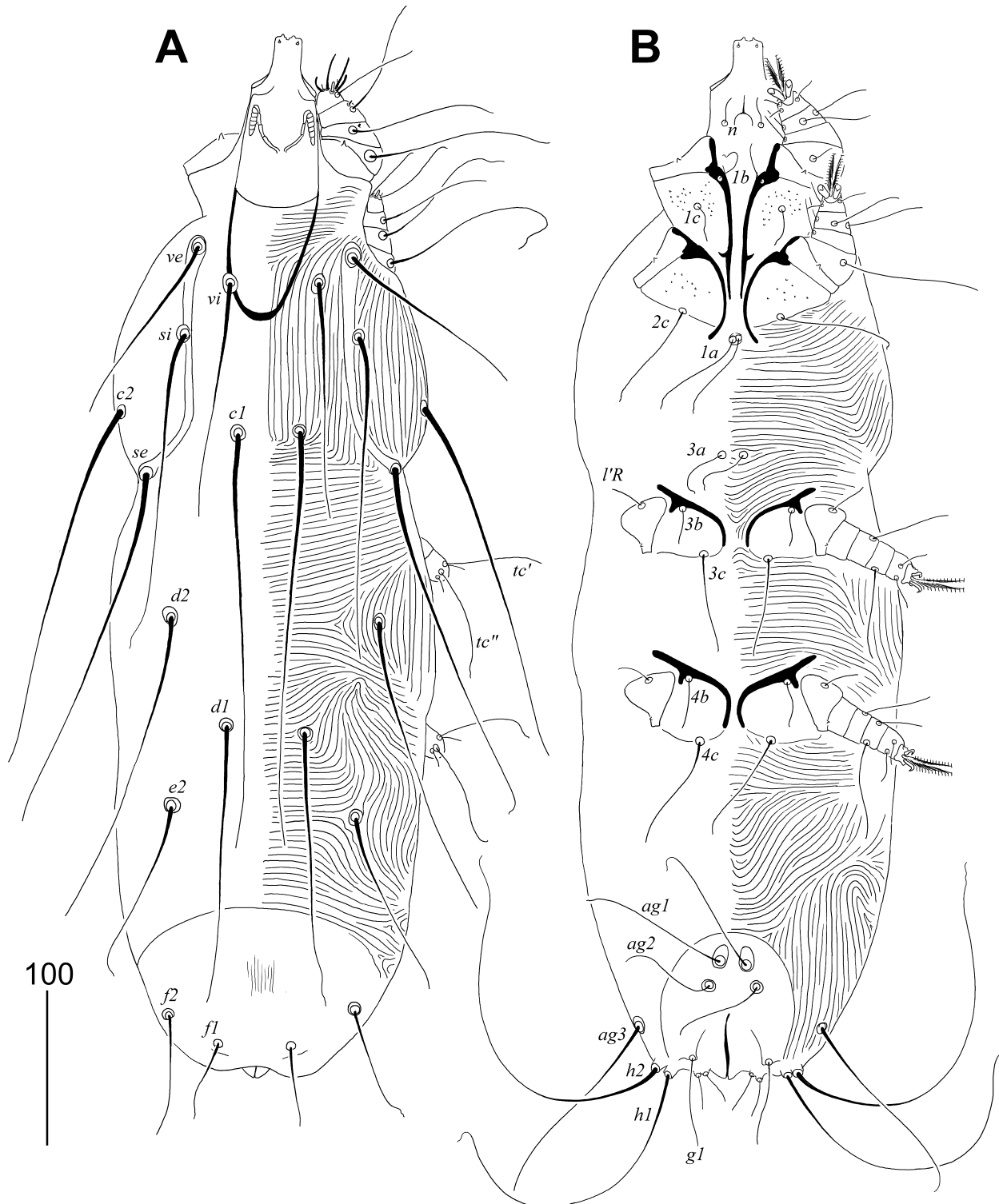
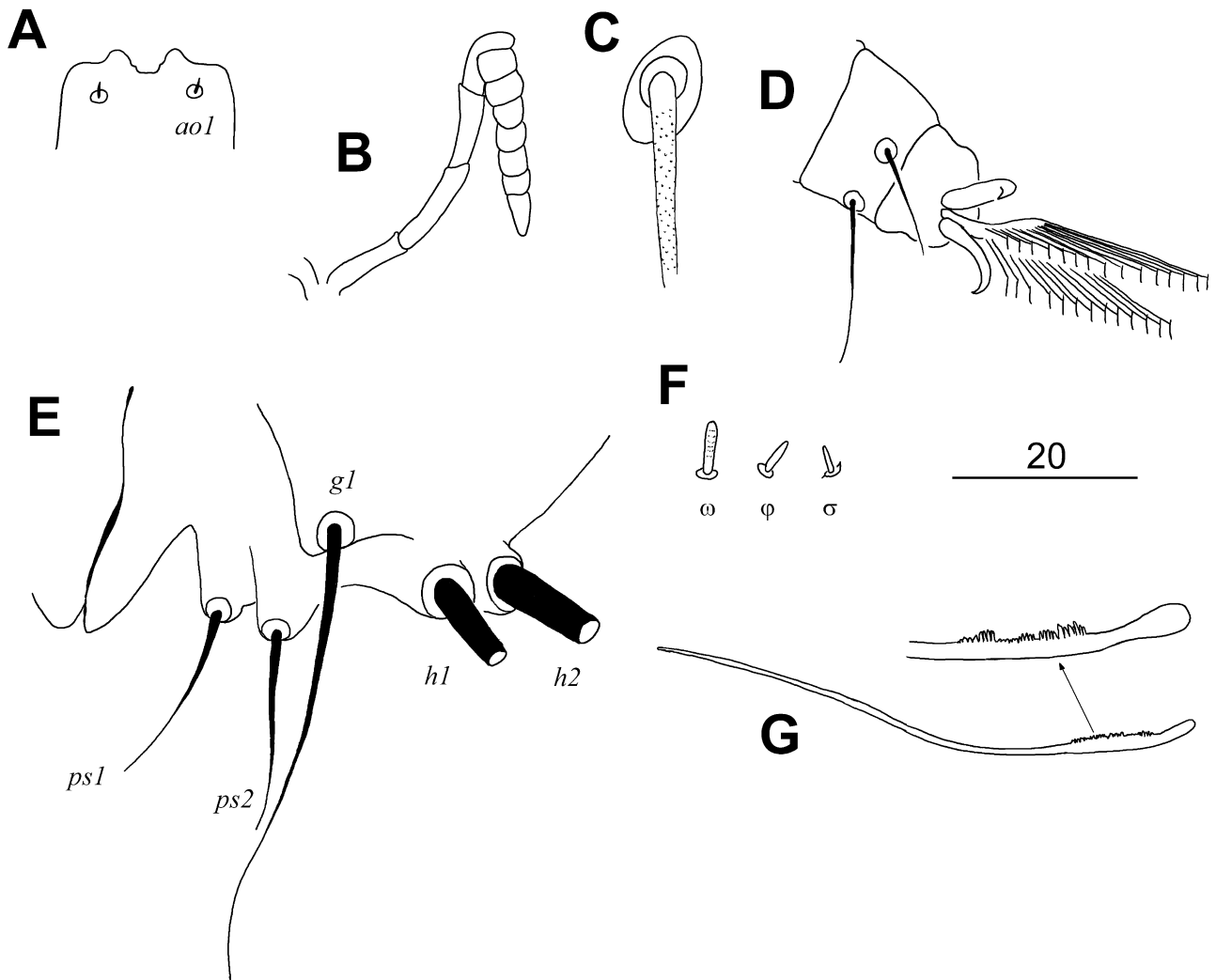


FIGURE 1. *Picobia passeri* sp. nov., female. A, dorsal view; B, ventral view.



**FIGURE 2.** *Picobia passeri* sp. nov., female. **A**, hypostomal apex; **B**, peritreme; **C**, propodonotal seta *ve*; **D**, tarsus of leg III in ventral view; **E**, genito-anal region in ventral view; **F**, solenidia of leg I; **G**, movable cheliceral digit.

## Subfamily Syringophilinae Lavoipierre

### Genus *Krantziaulonastus* Skoracki

#### *Krantziaulonastus dubinini* sp. nov.

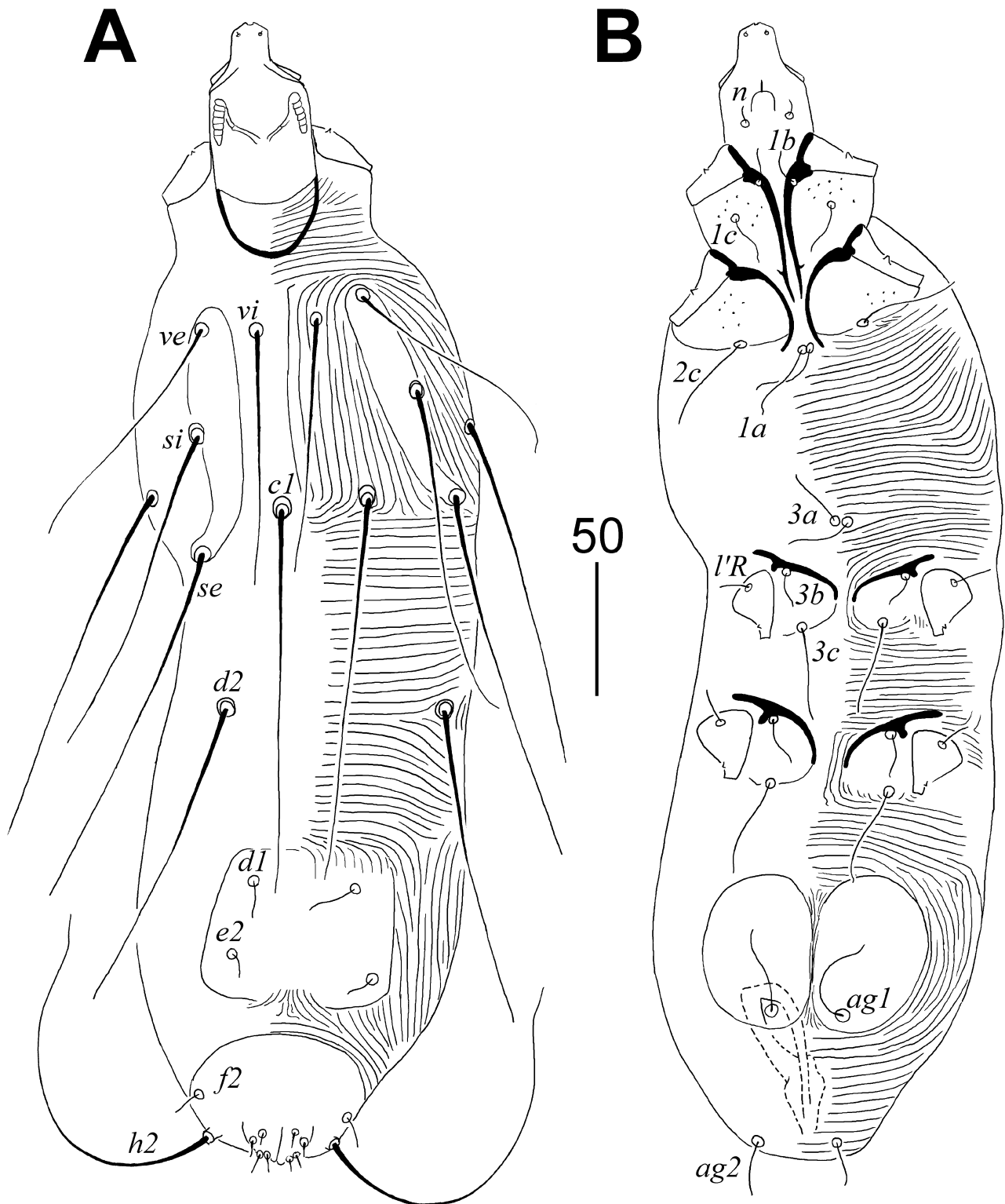
(Fig. 4)

**Description.** FEMALE (holotype). Total body length 445 (440–495 in 7 paratypes). *Gnathosoma*. Infracapitulum densely punctate. Each medial branch of peritremes with 2 chambers, each lateral branch with 4–5 chambers. Stylophore apunctate, 125 (125) long. *Idiosoma*. Propodonotal shield punctate, weakly sclerotized in anterior and posterior parts, bearing bases of setae *ve*, *si* and *c1*. Setae *ve* and *si* subequal in length. Setae *c1* slightly (1.1–1.3 times) longer than *se*. Setae *se* and *c1* situated at same transverse level. Hysteronotal shield present, situated between bases of setae *d1* and *e2*. Setae *d1*, *d2* and *e2* subequal in length or setae *e2* 1.3–1.5 times longer than *d2*. Pygidial shield apunctate, well sclerotized. Setae *f2* 1.8–2 times longer than *f1*. Setae *ag1–3* subequal in length. Both pairs of genital setae subequal in length. Genital plate absent. All coxal fields densely punctate. *Legs*. Setae *p'* and *p''* of legs III and IV with 7–8 tines. Setae *tc'''III–IV* 1.3–1.5 times longer than *tc'III–IV*. *Lengths of setae*: *ve* 20 (20–25), *si* 20 (20–25), *se* 170 (150–170), *c1* 180 (180–190), *c2* 125 (115–125), *d1* 20 (20–30), *d2* 20 (20–30), *e2* 20 (20–35), *f1* 20 (20–25), *f2* 35 (35–40), *h1* 25 (25–30), *h2* 235 (225–240), *ag1* 65 (60–70), *ag2* 60 (55–65), *ag3* 60 (50–65), *g1* and *g2* 30 (30), *ps1* 20 (20), *tc'''III–IV* 30 (30), *tc'III–IV* 40 (40–45).

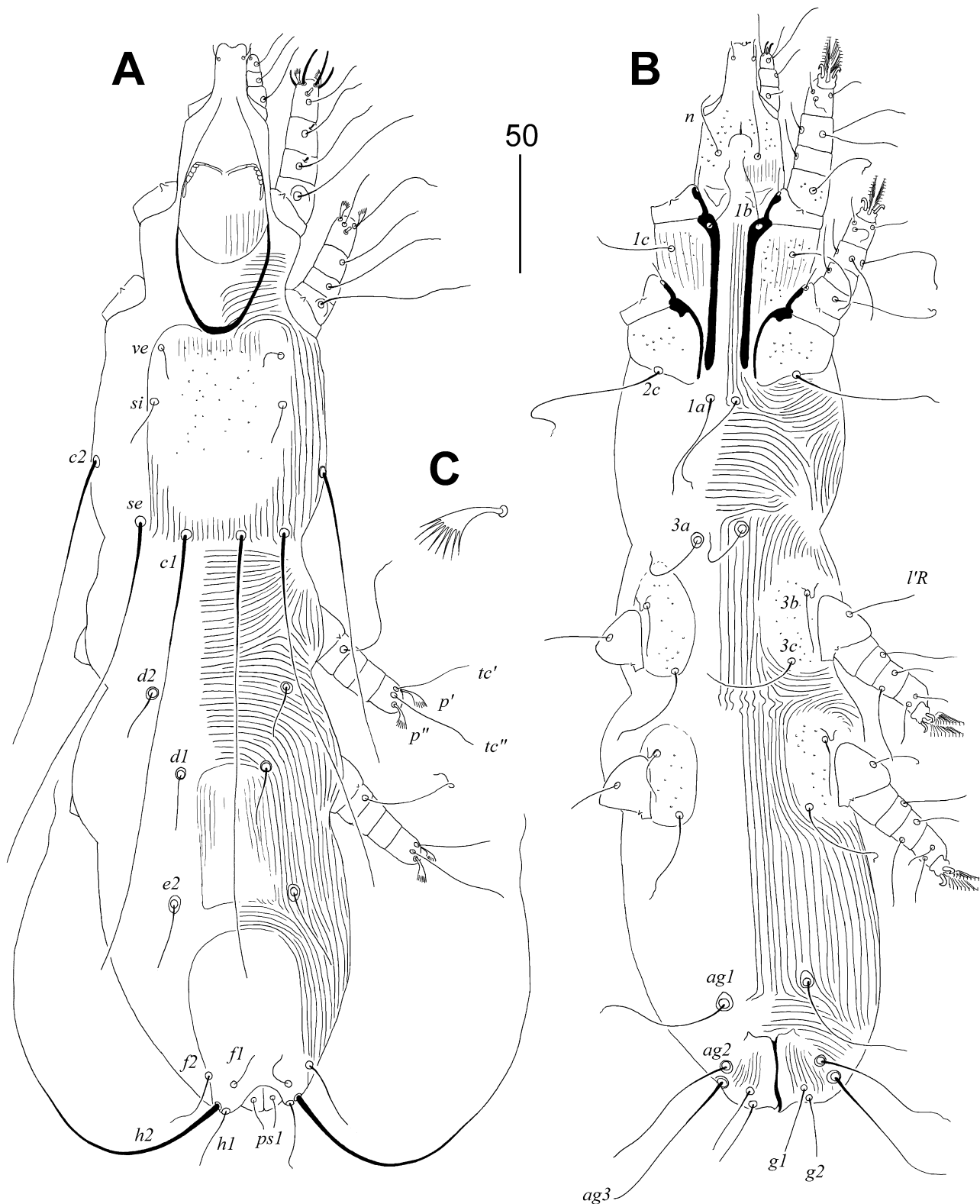
MALE. Unknown.

**Type material.** Female holotype and 7 female paratypes from *Passer domesticus* (Linnaeus) (Passeriformes: Passeridae); **RUSSIA**, Tula district, Suvorov, 28 May 2013, coll. V.V. Abramov.

**Type material deposition.** All type material is deposited in the ZISP (Reg. No. ZISP-AVB-011-2908-069), except 4 female paratypes in the AMU (Reg. No. AMU-SYR.472).



**FIGURE 3.** *Picobia passerii* sp. nov., male. **A**, dorsal view; **B**, ventral view.



**FIGURE 4.** *Krantziaulonastus dubinini* sp. nov., female. **A**, dorsal view; **B**, ventral view; **C**, fan-like seta *p'III*.

**Etymology.** This species is named in honor of the great Russian acarologist, Prof. V.B. Dubinin.

**Differential diagnosis.** *Krantziaulonastus dubinini* sp. nov. is similar to *K. buczekae* (Skoracki, 2002) described from *Sturnus vulgaris* Linnaeus (Passeriformes: Sturnidae) from Poland (Skoracki 2002). In females of both species, the hysteronotal shield is present; the genital plate is absent, hysteronotal setae *d1* and *d2* are subequal in length. Females of these species differ from each other by the following features: in females of *K. dubinini*, the

hysteronotal shield is not fused with the pygidial shield; the infracapitulum and all coxal fields are densely punctate; the length of the stylophore is 125; setae *ag2* and *ag3* are subequal in length. In females of *K. buczekae*, the hysteronotal shield is fused with the pygidial shield; the infracapitulum and all coxal fields are sparsely punctate; the length of stylophore is 145–150; setae *ag3* are twice as long as *ag2*.

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