

## REDESCRIPTION OF *PANTELOZETES CROSBYI* (BERLESE, 1908) (ACARI, ORIBATIDA, THYRISOMIDAE)

Sergey G. Ermilov

Tyumen State University, Tyumen, Russia

E-mail: ermilovacari@yandex.ru

ABSTRACT: The redescription of *Pantelozetes crosbyi* (Berlese 1908) (Oribatida, Thyrisomidae) is presented, based on material from Missouri, USA. The main morphological traits for this species are summarized.

KEY WORDS: Oribatid mite, *Pantelozetes*, systematics, morphology, redescription, USA.

DOI: 10.21684/0132-8077-2016-24-2-167-173

### INTRODUCTION

The oribatid mite *Pantelozetes crosbyi* (Berlese, 1908) (Acari, Oribatida, Thyrisomidae) was described as *Oribella crosbyi* from USA (Missouri) and Italia (Berlese 1908). At present, this species is recorded in the Holarctic region (Marshal *et al.* 1987; Subías 2004, online version 2016). Wen (1992) described the subspecies—*Pantelozetes crosbyi maoershanensis* (as representative of *Oribella*) from northern China.

The original description (Berlese 1908, see also Berlese 1910) and supplementary description (Fujikawa 1979) of *P. crosbyi* is incomplete, brief and poorly illustrated (lacking information about some morphological structures and their measures, leg setation and solenidia, morphology of gnathosoma). The main goal of the paper is to present redescription of this species, on the basis of topotypes from USA, and to summarize the main morphological traits, which will help with identification of *P. crosbyi* in the future.

### MATERIAL AND METHODS

**Material.** Four topotypes (two females and two males) of *Pantelozetes crosbyi* (Berlese 1908) were received from Prof. Dr. Roy A. Norton (personal collection). *Material examined:* USA, Missouri, Boone County, near Hinkson Creek, south of the University of Missouri campus, moss on the base of tree, 24 May 1985 (J. Kethley and R. A. Norton).

**Methods.** Specimens were mounted in lactic acid on temporary cavity slides for measurement and illustration. The body length was measured in lateral view, from the tip of the rostrum to the posterior edge of the ventral plate. Notogastral width refers to the maximum width in dorsal aspect. Lengths of body setae were measured in lateral aspect. All body measurements are presented in micrometers. Formulas for leg setation are given in

parentheses according to the sequence trochanter–femur–genu–tibia–tarsus (famulus included). Formulas for leg solenidia are given in square brackets according to the sequence genu–tibia–tarsus.

Morphological terminology used in this paper follows that of F. Grandjean: see Travé and Vachon (1975) for references, Norton (1977) for leg setal nomenclature, and Norton and Behan-Pelletier (2009) for overview.

Drawings were made with a camera lucida using a Carl Zeiss transmission light microscope “Axioskop-2 Plus”. Images were obtained with an AxioCam ICc3 camera using a Carl Zeiss transmission light microscope “Axio Lab.A1”.

### SYSTEMATICS

#### *Pantelozetes crosbyi* (Berlese, 1908)

Figs 1–19

**Description.** *Measurements.* Body length: 381–398 (four topotypes: two females and two males); notogaster width: 199–224 (four topotypes). No clear difference between females and males.

*Integument* (Figs. 3, 15). Body color light brown. Body surface, subcapitular mentum and genae, genital and anal plates punctate, visible only under high magnification ( $\times 1000$ ) in dissected specimens. Lateral sides of prodorsum (between acetabula and bothridia) tuberculate (diameter of tubercles up to 4).

*Prodorsum* (Figs. 1, 3, 13–15). Rostrum rounded, teeth absent. Costulae (*cos*) shorter than half of prodorsum length. Rostral (*ro*, 36–45), lamellar (*le*, 36–45) and exobothridial (*ex*, 24–28) setae thin, setiform; *ro* distinctly barbed, inserted dorsally, *le* almost smooth, sometimes with sparse, indistinct barbs, inserted on the costular ends, *ex* slightly barbed, located on small tubercles. Interlamellar setae (*in*, 36–45) thickened, blunted, erect,

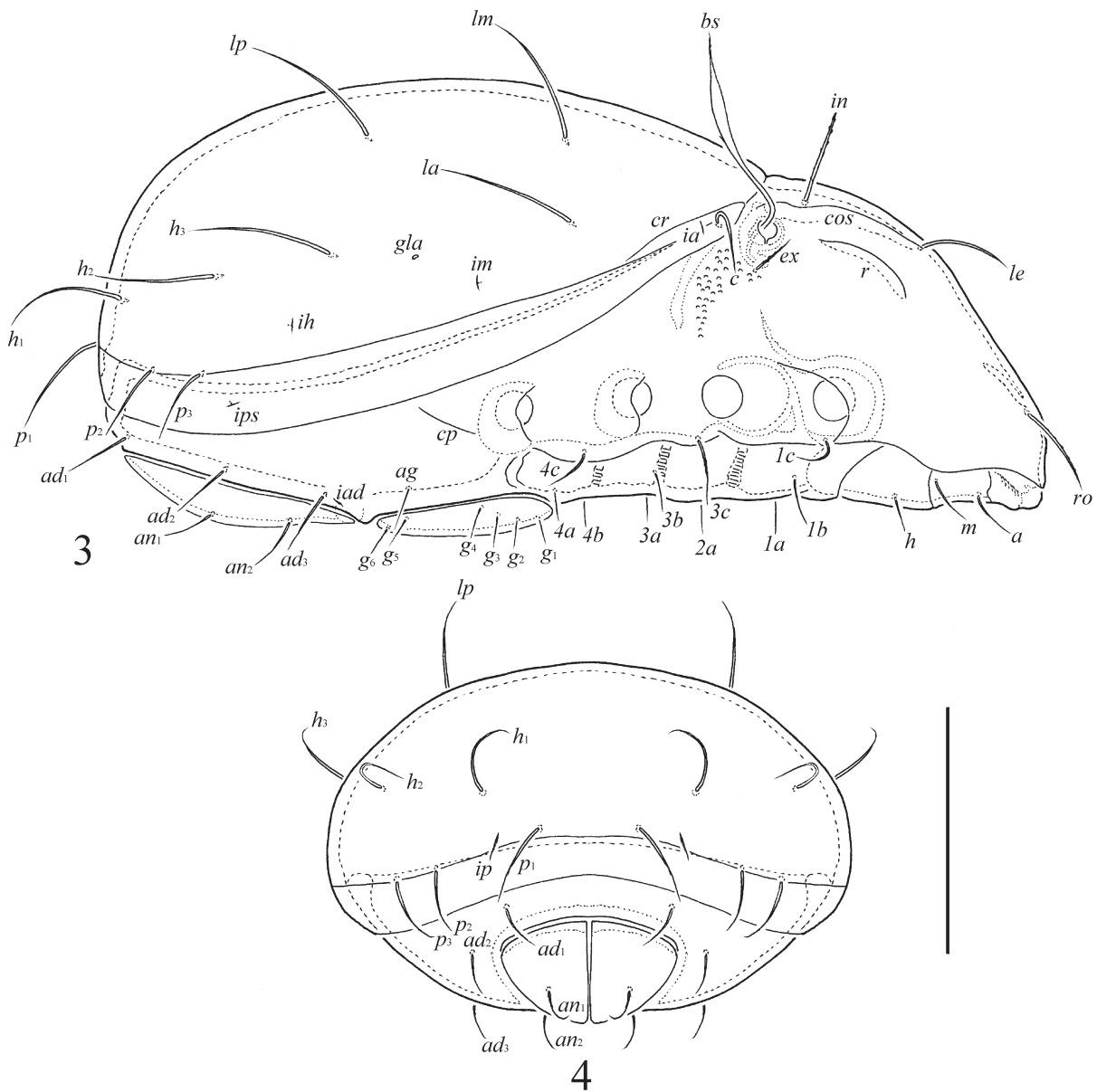


Figs. 1–2. *Pantelozetes crosbyi* (Berlese, 1908), adult: 1—dorsal view (legs except trochanters I, femora I and trochanters III not illustrated); 2—ventral view (gnathosoma and legs except trochanters III and IV not illustrated). Scale bar 100  $\mu$ m.

barbed. Bothridial setae (*bs*, 90–102) spindle-form, sparsely and indistinctly barbed, with long stalk, shorter head and well-developed thin apex. Bothridia (*bo*) with antero-lateral incision. Interboth-

ridial region without muscle sigillae. Dorso-lateral ridges (*r*) present, slightly developed.

*Notogaster* (Figs. 1–4). Anterior margin slightly convex medially. Posterior margin broad-



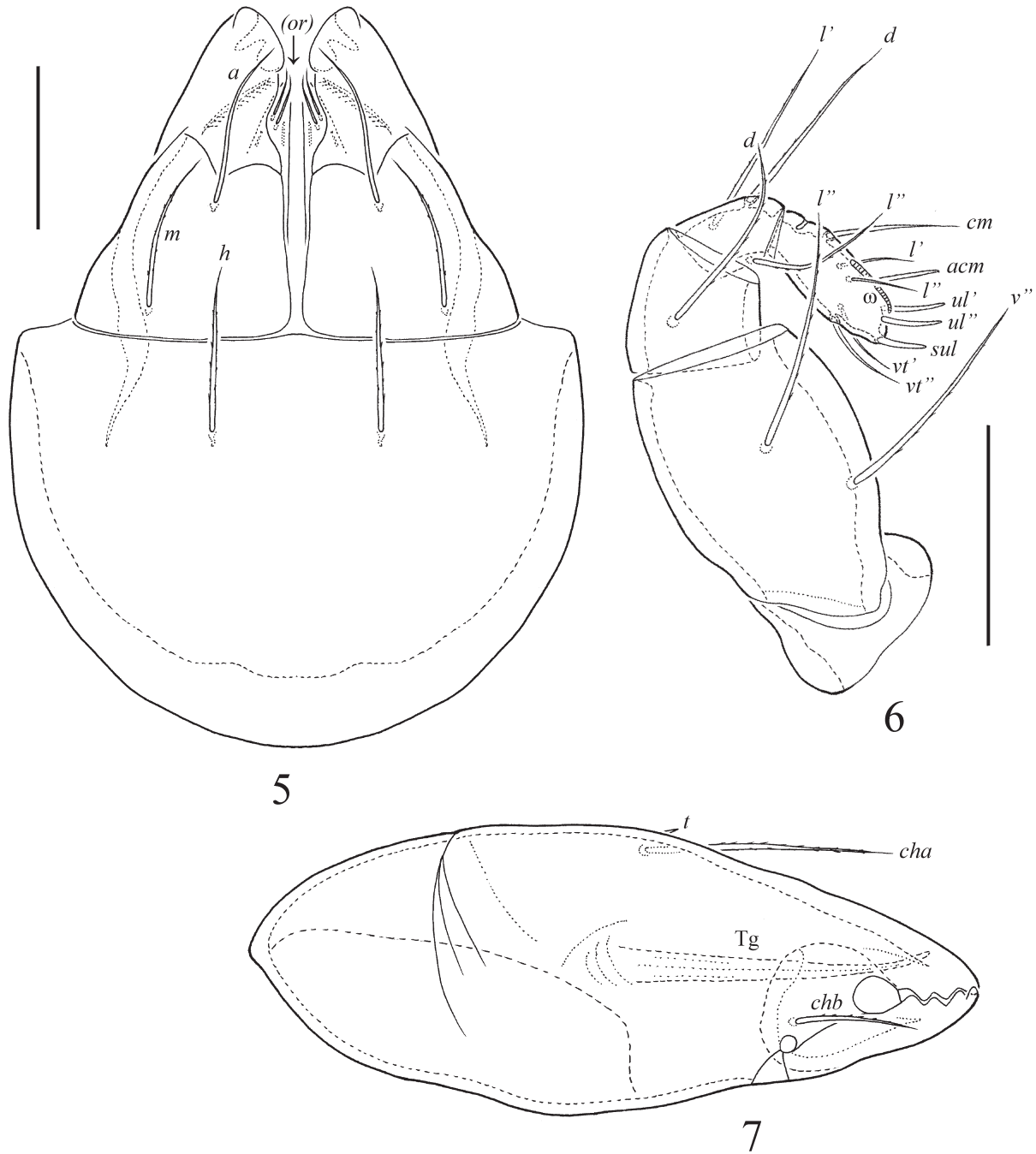
Figs. 3–4. *Pantelozetes crosbyi* (Berlese, 1908), adult: 3—lateral view (legs not illustrated); 4—posterior view. Scale bars 100  $\mu$ m.

ly rounded. One pair of humeral tubercles poorly visible. Ten pairs of notogastral setae setiform, smooth,  $p_3$  (28–32) shorter than  $p_2$  (32–36),  $c$ ,  $p_1$  (41–49), and others (53–61). Cristae ( $cr$ ) do not reach the level of insertions notogastral setae  $la$ . Circumgastric scissure clear. All lyrifissures ( $ia$ ,  $im$ ,  $ip$ ,  $ips$ ,  $ih$ ) distinct. Opisthonotal gland openings ( $gla$ ) located anterior to  $h_3$ .

*Gnathosoma* (Figs. 3, 5–7). Subcapitulum longer than wide (94–102 $\times$ 73–82). Subcapitular setae setiform,  $a$  (20–24) and  $m$  (20–24) longer than  $h$  (16–20),  $a$  smooth,  $m$  and  $h$  slightly barbed. Two pairs of adoral setae ( $or_1$ ,  $or_2$ , 8) thin, smooth.

Palps (length 57–61) with setation 0–2–1–3–9(+ $\omega$ ), solenidia thickened, blunted, pressed to the surface of palptarsi. Postpalpal setae (6) spiniform. Chelicerae (length 94–98) with two setiform, barbed setae;  $cha$  (28–34) straight, longer than curved  $chb$  (16–20). Trägårdh's organ (Tg) long, narrowly triangular, slightly serrate.

*Epimeral and lateral podosomal regions* (Figs. 2, 3, 17). Epimeres and apodemes 2 separated medially, sternal apodeme absent. Apodemes III and sejugal apodemes fused medially. Apodemes II and sejugal apodemes with posterior tubercle-like structures. Epimeral setal formula: 3–1–3–3. All



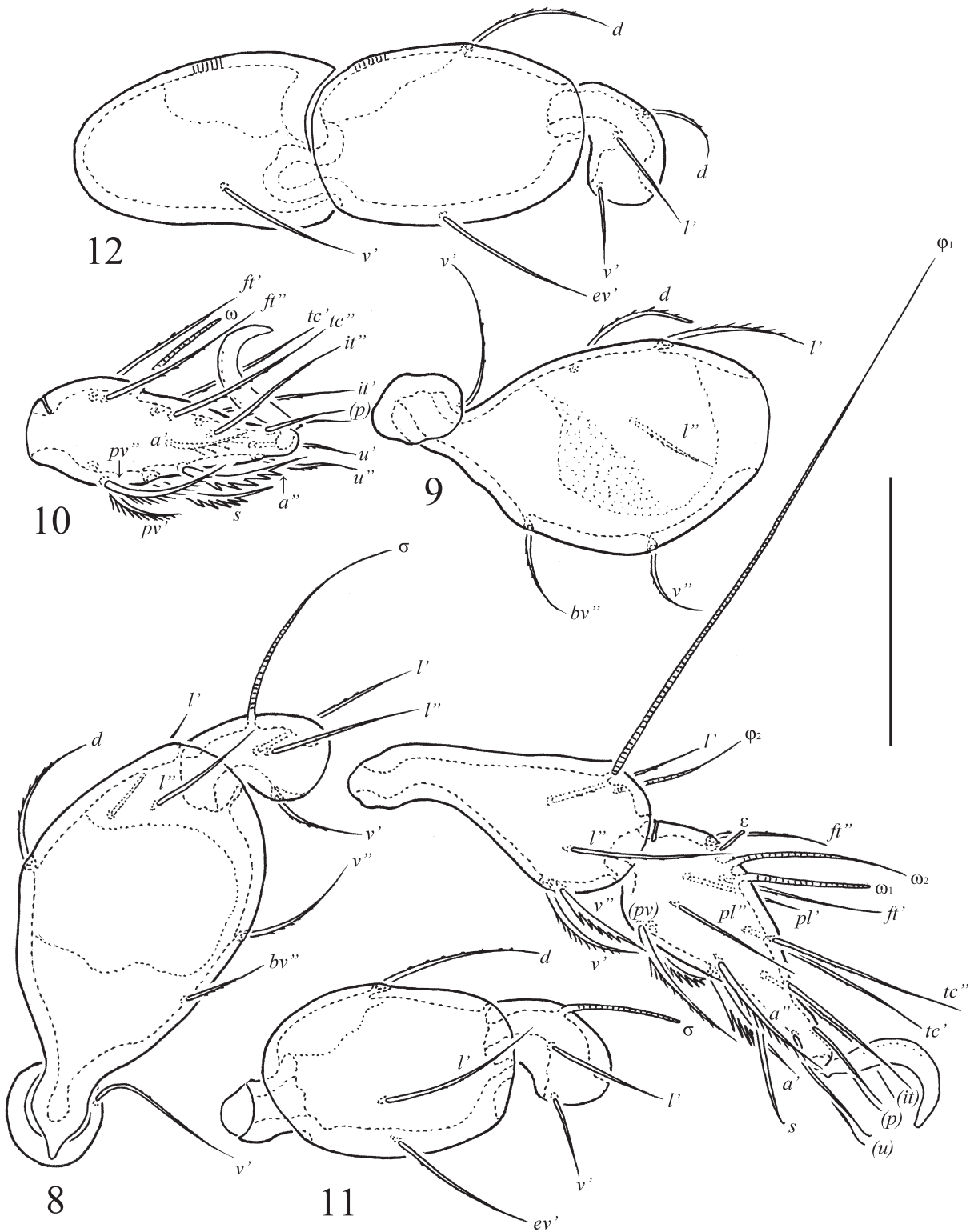
Figs. 5–7. *Pantelozetes crosbyi* (Berlese, 1908), adult: 5—subcapitulum, ventral view; 6—palp, right, antiaxial view; 7—chelicera, right, antiaxial view. Scale bars 20  $\mu\text{m}$  (5, 7; 6).

setae setiform, thin, *3b* barbed, other setae smooth, *3c* and *4c* (24–28) longer than *1b* and *1c* (20) and others (14–16). Pedotecta I represented by small lamina. Discidia (*dis*) triangular, rounded distally. Taenidia and minitecta well visible. Circumpedal carinae (*cp*) short, directed to acetabula IV.

*Anogenital region* (Figs. 2–4, 16, 18). Six pairs of genital ( $g_1$ – $g_6$ , 16–20), one pair of aggenital (*ag*, 16–20), two pairs of anal ( $an_1$ ,  $an_2$ , 16), and three

pairs of adanal ( $ad_1$ , 32;  $ad_2$ ,  $ad_3$ , 24) setae setiform, smooth. Adanal lyrifissures (*iad*) distinct, located parallel and near to anal aperture.

*Legs* (Figs. 8–12, 19). Monodactylous. Claw of each leg slightly barbed on dorsal side. Trochanters III with one small antiaxial tooth (*t*). Formulae of leg setation and solenidia: I (1–5–3–4–18) [1–2–2], II (1–5–3–4–15) [1–1–1], III (2–3–2–3–15) [1–1–0], IV (1–2–3–3–12) [0–1–0]; homology of

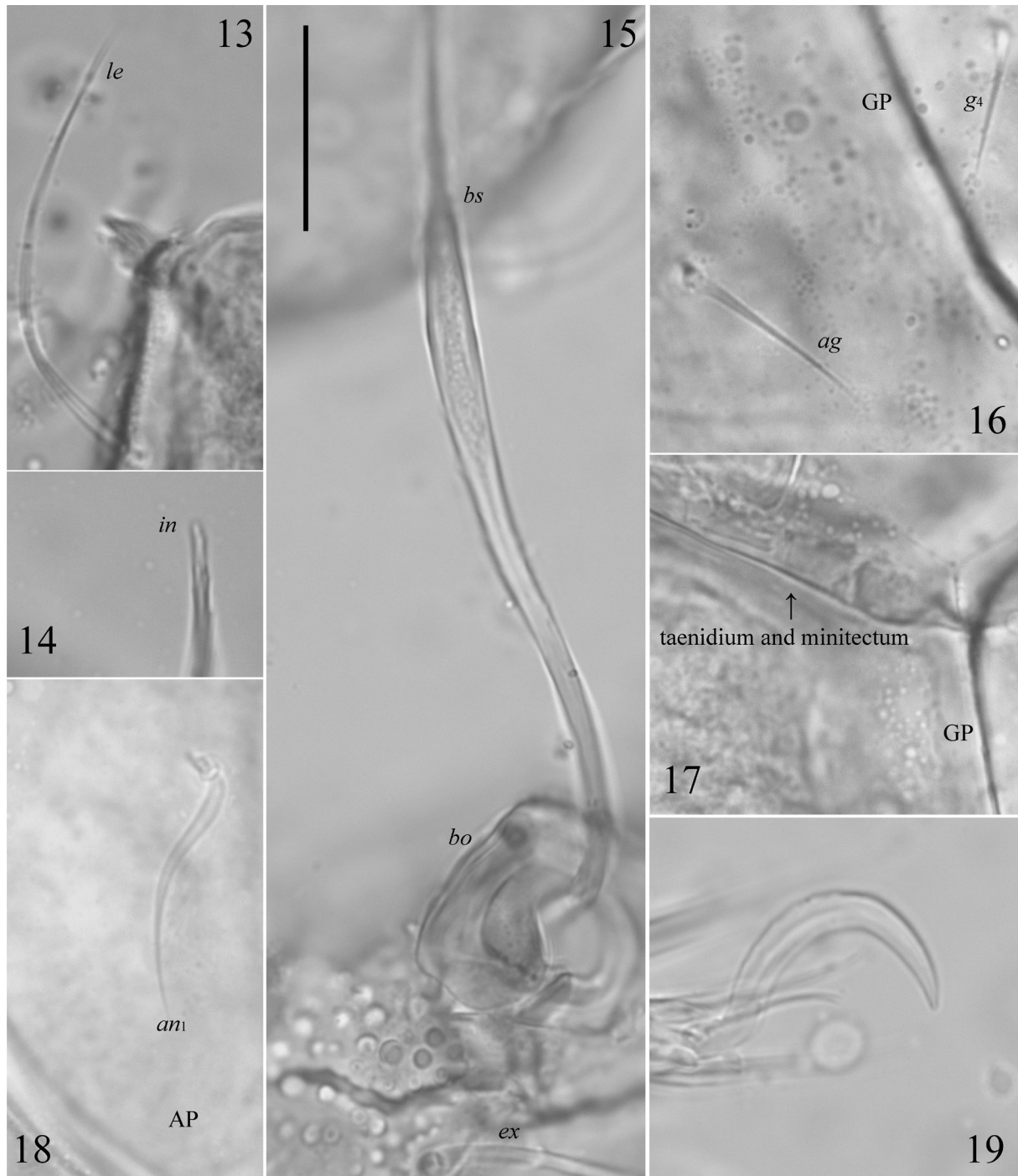


Figs. 8–12. *Pantelozetes crosbyi* (Berlese, 1908), adult: 8—leg I, right, antiaxial view; 9—trochanter and femur of leg II, left, paraxial view; 10—tarsus of leg II, right, antiaxial view; 11—femur and genu of leg III, left, antiaxial view; 12—trochanter, femur and genu of leg IV, left, antiaxial view. Scale bar 50  $\mu$ m.

setae and solenidia indicated in Table 1. Solenidia  $\omega_1$  on tarsi I,  $\omega$  on tarsi II and  $\sigma$  on genua II and III thickened, blunted; others solenidia thin, setiform. Famulus ( $\epsilon$ ) short, straight, weakly dilated distally,

blunted, inserted posteriorly to  $\omega_1$ . Setae  $v'$  present on genua II–IV.

**Remarks.** Thus, based on the redescription of *Pantelozetes crosbyi* (Berlese 1908) and known



Figs. 13–19. *Pantelozetes crosbyi* (Berlese, 1908), dissected adult, microscope images: 13—lamellar seta; 14—distal part of interlamellar seta; 15—bothridium and bothridial seta; 16—aggenital seta and genital seta  $g_4$ ; 17—taenidium and minitectum; 18—anal seta  $an_1$ ; 19—claw of leg I, right, antiaxial view. Scale bar 20  $\mu$ m.

literature data (Berlese 1908; Fujikawa 1979), the following diagnostic morphological traits for this species are proposed: body size 381–410×199–224; rostrum rounded, without teeth; costulae shorter than half of prodorsum length; rostral, lamellar and interlamellar setae of medium size, *ro* thin, distinctly barbed, *le* thin, indistinctly barbed, *in* thickened, blunted, erect, barbed; both-

ridial setae spindle-form, sparsely and indistinctly barbed, with long stalk, shorter head and well-developed thin apex; dorso-lateral ridges present; notogastral setae setiform, smooth, the majority setae of medium size, *c* and  $p_1$  shorter,  $p_3$  and  $p_2$  shortest; subcapitular setae *a* smooth, *m* and *h* slightly barbed, two pairs of adoral setae present; epimeral (except barbed *3b*) and ano-

genital setae thin, smooth,  $ad_1$  longer than  $ad_2$  and  $ad_3$ ; monodactylous; leg genua II–IV with three setae ( $v'$  present).

**ACKNOWLEDGEMENTS**

I cordially thank Prof. Dr. R. A. Norton (State University of New York, College of Environmental Science and Forestry, Syracuse, USA) for loaning the topotypes of *Pantelozetes crosbyi* (Berlese 1908) from the personal collection.

The present study was supported by the Russian Science Foundation, project no. 14-14-01134.

**REFERENCES**

Berlese, A. 1908. Elenco di generi e specie nuovi di Acari. *Redia*, 5: 1–15.  
 Berlese, A. 1910. Acari nuovi. Manipulus V–VI. *Redia*, 6: 199–234.  
 Fujikawa, T. 1979. Revision of the family Banksinomiidae (Acari, Oribatei). *Acarologia*, 20(3): 433–467.  
 Marshall, V. G., Reeves, R. M., and Norton, R. A. 1987. Catalogue of the Oribatida (Acari) of Continental

United States and Canada. *Memoirs of the Entomological Society of Canada*, 139: 1–418.  
 Norton, R. A. 1977. A review of F. Grandjean's system of leg chaetotaxy in the Oribatei (Acari) and its application to the family Damaeidae. In: D. L. Dindal (Ed.). *Biology of oribatid mites*. Syracuse: SUNY College of Environmental Science and Forestry, pp. 33–61.  
 Norton, R. A. and Behan-Pelletier, V. M. 2009. *Oribatida*. In: G. W. Krantz and D. E. Walter (Eds.). *A Manual of Acarology* (TX) Lubbock, Texas University Press. Chapter 15, pp. 430–564.  
 Subías, L. S. 2004. Listado sistemático, sinónimo y biogeográfico de los ácaros oribátidos (Acari-formes: Oribatida) del mundo. *Graellsia*, 60: 3–305. Online version updated in February 2016, 593 pp; [http://escalera.bio.ucm.es/usuarios/bba/cont/docs/RO\\_1.pdf](http://escalera.bio.ucm.es/usuarios/bba/cont/docs/RO_1.pdf)  
 Travé, J. and Vachon, M. 1975. François Grandjean. 1882–1975 (Notice biographique et bibliographique). *Acarologia*, 17(1): 1–19.  
 Wen, Z. 1992. Description of new and unrecorded soil oribatid mites from China (Acari: Oribatida). *Acta Arachnologica Sinica*, 1(1): 31–38.

Table 1.

Leg setation and solenidia of *Pantelozetes crosbyi* (Berlese, 1908)

Leg	Tr	Fe	Ge	Ti	Ta
I	$v'$	$d, (l), bv'', v''$	$(l), v', \sigma$	$(l), (v), \phi_1, \phi_2$	$(ft), (tc), (it), (p), (u), (a), s, (pv), (pl), \epsilon, \omega_1, \omega_2$
II	$v'$	$d, (l), bv'', v''$	$(l), v', \sigma$	$(l), (v), \phi$	$(ft), (tc), (it), (p), (u), (a), s, (pv), \omega$
III	$l', v'$	$d, l', ev'$	$l', v', \sigma$	$l', (v), \phi$	$(ft), (tc), (it), (p), (u), (a), s, (pv)$
IV	$v'$	$d, ev'$	$d, l', v'$	$l', (v), \phi$	$ft'', (tc), (p), (u), (a), s, (pv)$

Note: Roman letters refer to normal setae, Greek letters refer to solenidia (except  $\epsilon$ —famulus). One apostrophe (') marks setae on anterior and double apostrophe (") setae on posterior side of the given leg segment. Parentheses refer to a pair of setae. Tr—trochanter, Fe—femur, Ge—genu, Ti—Tibia, Ta—tarsus.

