Acarologia 56(3): 379–391 (2016)
DOI: 10.1051/acarologia/20162252

Additions to the oppioid oribatid mite fauna of Peru (Acari, Oribatida, Oppioidea)

Sergey G. ERMILOV[1*] and Stefan FRIEDRICH[2]

(Received 16 March 2016; accepted 20 April 2016; published online 22 July 2016)

[1] *Tyumen State University, Tyumen, Russia. ermilovacari@yandex.ru (*Corresponding author)*
[2] *Zoologische Staatssammlung München, München, Germany. stefan.friedrich@zsm.mwn.de*

ABSTRACT — Two new species of oribatid mites (Acari, Oribatida) of the superfamily Oppioidea are described on the basis of adult specimens from upper soil and leaf litter in the primary evergreen lowland rainforest of Amazonian Peru. *Lasiobelba* (*Antennoppia*) *parachistyakovi* Ermilov **n. sp.** (Oppiidae) is similar to *L.* (*Antennoppia*) *chistyakovi* Ermilov and Kalúz, 2012, but differs by the thick bothridial setae with short cilia and longer notogastral setae. *Hammerella* (*Woasella*) *huanucoensis* Ermilov **n. sp.** (Granuloppiidae) is similar to *H.* (*Woasella*) *parasufflata* Ermilov, Sandmann, Marian and Maraun, 2013, but differs by the thin costulae, shorter notogastral setae, and the absence of one tubercle anterior to each lamellar seta. The taxonomic status of the genus *Varioppia* Mahunka, 1985 is discussed, resulting in the following taxonomic proposals: *Hammerella* (*Woasella*) J. and P. Balogh, 2002 (=*Varioppia* Mahunka, 1985 **n. syn.**), *Hammerella* (*Woasella*) *radiata* (Mahunka, 1985) **n. comb.** An identification key for known species of *Hammerella* (*Woasella*) is given. Two oppioid species, *Hammerella* (*Woasella*) *sufflata* (Franklin and Woas, 1992) and *Teratoppia* (*Teratoppiella*) *brevipectinata* Balogh and Mahunka, 1978, are recorded for the first time in Peru.

KEYWORDS — mites; *Lasiobelba*; *Hammerella*; *Varioppia*; morphology; systematics; new synonym; new combination; new records; South America

INTRODUCTION

This work is part of our continuing study of the Peruvian oribatid mites (Acari, Oribatida) collected during the German Expedition to Amazonian Peru in 2013 (see Ermilov and Friedrich 2016) and includes data on the superfamily Oppioidea.

During taxonomic identification, we found nine species; from these, two species are new to science, one belonging to the subgenus *Lasiobelba* (*Antennoppia*) Mahunka, 1983 (Oppiidae), and the other to the subgenus *Hammerella* (*Woasella*) J. and P. Balogh, 2002 (Granuloppiidae). The main goal of the paper is to describe these new species and to present a list of the registered oppioid taxa.

In addition, we discuss the taxonomic status of the genus *Varioppia* Mahunka, 1985 and give an identification key for known species of *Hammerella* (*Woasella*).

MATERIALS AND METHODS

Material — All mites were collected from: South America, Amazonian Peru, 09°37'S, 74°56'W, Huánuco Department, Puerto Inca Province, Yuyapichis District, Área de Conservación Pri-

vada, Panguana (biological field station), nearby Rio Yuyapichis (river), 230 – 260 m a.s.l., upper soil and leaf litter in the primary evergreen lowland rainforest, Winkler extraction, 20.IX.2013–07.X.2013 (S. Friedrich and F. Wachtel).

Methods — Specimens were mounted in lactic acid on temporary cavity slides for measurement and illustration. 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 general references, 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".

DESCRIPTIONS

Lasiobelba (*Antennoppia*) *parachistyakovi* Ermilov n. sp. (Figures 1–3)

Diagnosis — Body size: 431 – 464 × 265 – 298. Rostrum rounded. Lamellar setae shorter and thinner than rostral and interlamellar setae, inserted on large tubercles, all barbed. Exobothridial setae shortest. Bothridial setae long, thick, ciliate. Notogaster with nine pairs of setiform, barbed setae, dorsal setae inserted in two parallel rows, setae *c* absent, *la*, *lm* and *lp* longer and thicker than the other setae. Epimeral setae slightly barbed. Apodemes 4 present, semioval. Discidia absent. Anogenital setae indistinctly barbed.

Description — Measurements – Body length: 431 (holotype: female), 431 – 464 (51 paratypes: 28 females and 23 males); notogaster width 282 (holotype), 265 – 298 (51 paratypes). No differences between females and males in the body sizes.

Integument (Figs 1A, 2A) — Body color light brownish. Body surface punctate, lateral side and podosomal region with tuberculate cerotegument (diameter tubercle up to 4).

Prodorsum (Figs 1A, 2A) — Rostrum slightly protruding, rounded. Rostral (*ro*, 47 – 51), lamellar (*le*, 36 – 41), interlamellar (*in*, 49 – 55) and exobothridial (*ex*, 16 – 20) setae setiform, barbed; *le* and *ex* thinnest, *le* inserted on large tubercles (length 8 – 10), equal distanced from *ro* and *in*. Bothridial setae (*bs*, 176 – 188) setiform, thick, densely ciliate. Longitudinal row of muscle sigilla present anteriad to bothridia. Interbothridial region with three pairs of muscle sigilla. Interbothridial and postbothridial tubercles absent. Lateral ridges (*rl*) developed between bothridia and acetabula IV, distally expanded to form a scale, which is located posterior to each bothridium.

Notogaster (Figs 1A, 2A) — Anterior border convex medially. Nine pairs of notogastral setae setiform, barbed, inserted in two parallel rows (except posterior setae), setae *c* and their alveoli absent. Setae *la*, *lm* and *lp* (73 – 82) longer and thicker than h_2, h_3 (36 – 45), h_1 and p_1 (20 – 24), setae p_2 and p_3 shortest (16 – 18) and thinnest. Lyrifissures *ia*, *im* and *ip* well developed, *ih* and *ips* not visible. Opisthonotal gland openings (*gla*) located laterally and close to *im*.

Gnathosoma (Figs 1B, 2A, 3A-C) — Morphology of subcapitulum, palp and chelicera typical for *Lasiobelba* (e.g. Ermilov *et al.* 2014). Subcapitulum longer than wide (110 – 114 × 73 – 82). Anteromedial parts of rutelli with very small tooth. Three pairs of subcapitular setae setiform, barbed; *h* and *m* (both 32 – 36) longer than *a* (20 – 24), *h* inserted in lateral part of mentum. Two pairs of adoral setae (or_1, or_2, 16 – 20) thin, smooth. Palps (53) with setation 0–2–1–3–8(+ω); solenidion of palptarsi as long as half of tarsi, thick, expanded distally, pressed to the surface, attached in distal parts to seta *ul"*. Chelicerae (110–114) with two setiform setae; *cha* (28 – 36) ciliate unilaterally, *chb* (18 – 22) barbed. Antiaxial sides with one long, semioval ridge (r_1) and one short ridge (r_2). Paraxial sides with one to two small teeth. Trägårdh's organ (Tg) tapered, slightly granulate.

FIGURE 1: *Lasiobelba* (*Antennoppia*) *parachistyakovi*Ermilov **n. sp.**: A – dorsal view (legs except basal parts not illustrated); B – ventral view (palps except basal parts and legs except trochanters not illustrated). Scale bar 100 μm.

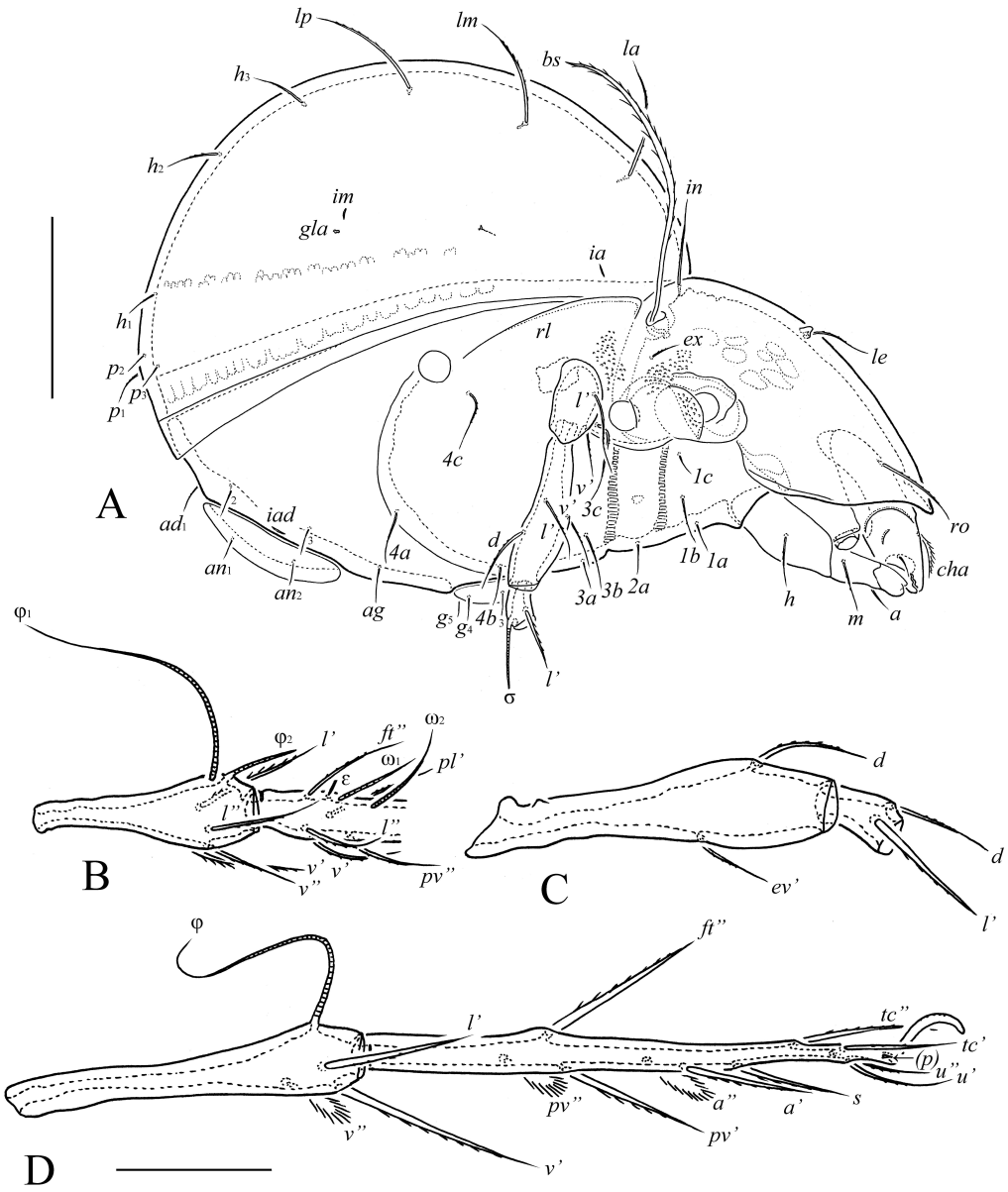

FIGURE 2: *Lasiobelba* (*Antennoppia*) *parachistyakovi* Ermilov **n. sp.**: A – lateral view, right side (palp except trochanter and legs except basal part of leg III not illustrated); B – tibia and basal part of tarsus of leg I, right, antiaxial view; C – femur and genu of leg IV, left, antiaxial view; D – tibia and tarsus of leg IV, left, antiaxial view. Scale bar (A) 100 μm, scale bar (B–D) 50 μm.

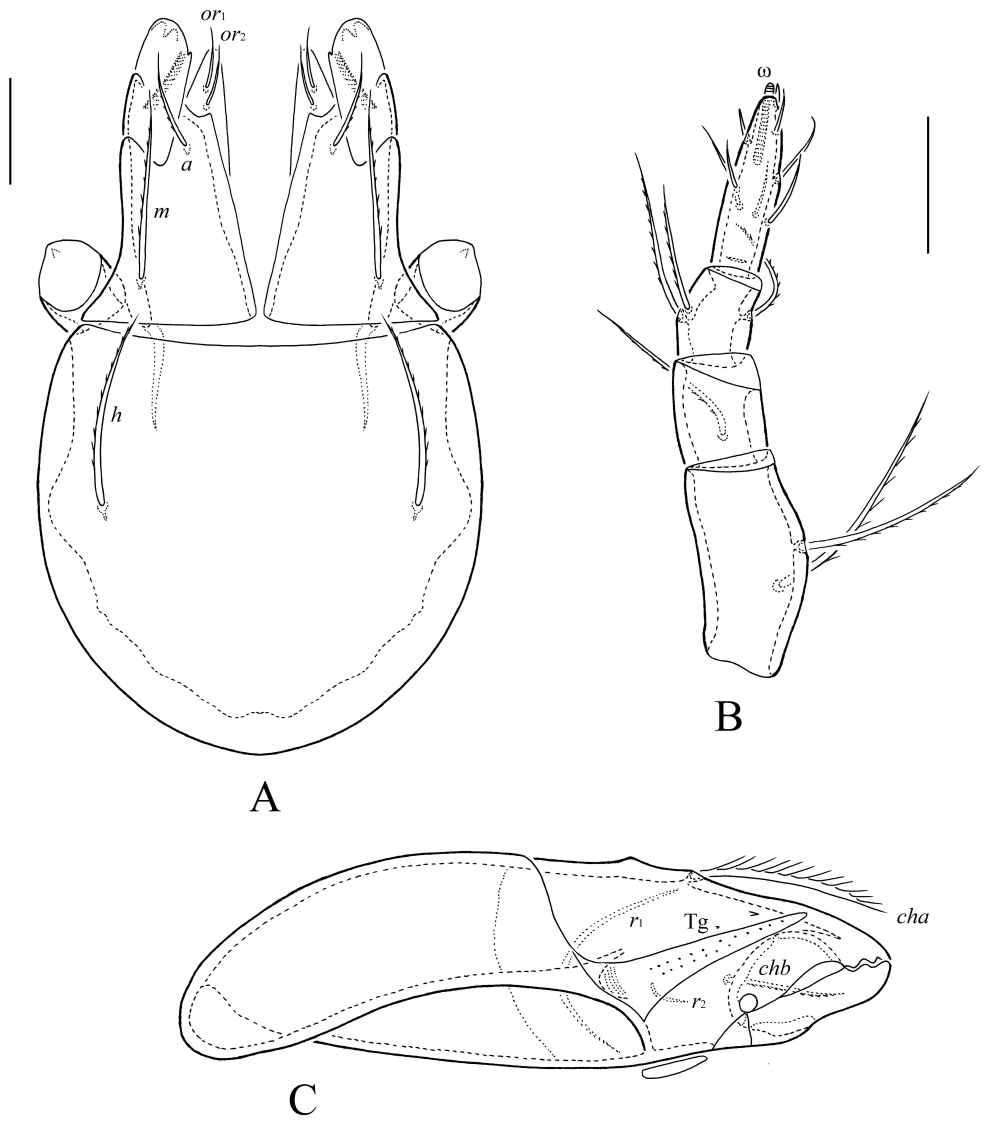

FIGURE 3: *Lasiobelba* (*Antennoppia*) *parachistyakovi* Ermilov **n. sp.**: A – subcapitulum, ventral view, and palptrochanter; B – palp (trochanter not illustrated), left, paraxial view; C – chelicera, left, paraxial view. Scale bar (A, C; B) 16 μm.

TABLE 1: Leg setation and solenidia of adult *Lasiobelba* (*Antennoppia*) *parachistyakovi* Ermilov **n. sp.** and *Hammerella* (*Woasella*) *huanucoensis* Ermilov **n. sp.**

Leg	Tr	Fe	Ge	Ti	Ta
I	*v'*	*d, (l), bv'', v''*	*(l),* σ	*(l), (v),* φ_1, φ_2	*(ft), (tc), (it), (p), (u), (a), s, (pv), v', (pl), l'',* ε, ω_1, ω_2
II	*v'*	*d, (l), bv'', v''*	*(l),* σ	*(l), (v),* φ	*(ft), (tc), (it), (p), (u), (a), s, (pv), l'',* ω_1, ω_2
III	*l', v'*	*d, l', ev'*	*l',* σ	*l', (v),* φ	*(ft), (tc), (it), (p), (u), (a), s, (pv)*
IV	*v'*	*d, ev'*	*d, l'*	*l', (v),* φ	*ft'', (tc), (p), (u), (a), s, (pv)*

Note: Roman letters refer to normal setae, Greek letters to solenidia (except ε = famulus). Single prime (') marks setae on the anterior and double prime (") setae on the posterior side of a given leg segment. Parentheses refer to a pair of setae. Tr – trochanter, Fe – femur, Ge – genu, Ti – Tibia, Ta – tarsus.

Epimeral and lateral podosomal regions (Figs 1B, 2A) — Sejugal apodemes slightly longer than apodemes 2, both of medium size, apodemes 4 complete, semioval, strong. Epimeral setal formula: 3–1–3–3; all setae setiform, slightly barbed, *1a*, *1c*, *2a*, *3a* and *4b* (20 – 24) shorter than *1b*, *4a* and *4c* (35 – 45), *3c* longest (53 – 61), inserted on tubercles. Seta *1c* distanced from pedotecta I. Discidia absent.

Anogenital region (Figs 1B, 2A) — Five pairs of genital (g_1, 20 – 24; g_2–g_5, 16 – 20), one pair of aggenital (*ag*, 16 – 20), three pairs of adanal (ad_1–ad_3, 18 – 22) and two pairs of anal (an_1, an_2, 16 – 20) setae setiform, indistinctly barbed. Adanal lyrifissures (*iad*) distinct, located parallel and very close to anal aperture.

Legs (Figs 1A, B, 2A–D) — Morphology of leg segments, setae and solenidia typical for *Lasiobelba* (e.g. Ermilov and Kalúz 2012). Claw of each leg indistinctly serrate on dorsal side. Formulas of leg setation and solenidia: I (1–5–2–4–20) [1–2–2], II (1–5–2–4–16) [1–1–2], III (2–3–1–3–15) [1–1–0], IV (1–2–2–3–12) [0–1–0]; homology of setae and solenidia indicated in Table 1. Setae *p* setiform on tarsus I, and very short, conical on tarsi II–IV. Famuli (ε) of tarsi I short, thin, swollen and truncated distally, inserted posteriorly to solenidion ω_2.

Type deposition — The holotype is deposited in the collection of the Museo de Historia Natural, Universidad Nacional Mayor de San Marcos, Lima, Peru; five paratypes are deposited in the collection of the Bavarian State Collection of Zoology, Munich, Germany; five paratypes are deposited in the collection of the Senckenberg Institution Frankfurt, Germany; 41 paratypes are deposited in the collection of the Tyumen State University Museum of Zoology, Tyumen, Russia.

Etymology — The specific name *parachistyakovi* refers to the similarity between the new species and *Lasiobelba* (*Antennoppia*) *chistyakovi* Ermilov and Kalúz, 2012.

Remarks — The genus *Lasiobelba* comprises two subgenera and 32 species, and is distributed in the tropics (Subías 2004, updated 2016). The main morphological traits for these genus and subgenera and an identification key for all species of *Lasiobelba* were presented by Ermilov *et al.* (2014).

The new species is morphologically most similar to *Lasiobelba* (*Antennoppia*) *chistyakovi* Ermilov and Kalúz, 2012 from Ecuador (see Ermilov and Kalúz 2012) in having long bothridial setae, differences of notogastral setae in length, localization of dorsal notogastral setae in two longitudinal rows and insertion of lamellar setae on large tubercles, and the absence of discidia. However, the new species differs from the latter by the morphology of bothridial setae (thick, with short cilia *vs*. thin, with long cilia) and longer notogastral setae (*vs*. comparatively shorter).

Also, *Lasiobelba* (*Antennoppia*) *parachistyakovi* Ermilov **n. sp.** is morphologically similar to *Trapezop-*

pia nova Franklin and Woas, 1992 from Brazil (see Franklin and Woas 1992) in having long, thick and ciliate bothridial setae, difference of notogastral setae in length and localization of dorsal notogastral setae in two longitudinal rows. However, it differs from the latter by the localization of adanal lyrifissures (paraanal vs. inverse apoanal), insertion of lamellar setae on large tubercles (vs. tubercle absent) and longer notogastral setae (*vs*. comparatively shorter).

Hammerella (*Woasella*) *huanucoensis* Ermilov n. sp. (Figures 4–6)

Diagnosis — Body size: 298 – 332 × 166 – 182. Rostrum with median indentation. Costulae slightly developed. Transcostula absent. Lamellar setae shorter and thinner than rostral and interlamellar setae, all barbed. Exobothridial setae shortest. Bothridial setae with long stalk and shorter head, having five to six long cilia and some short barbs unilaterally. Ten pairs of notogastral setae present, setae *c* minute, other setae of medium size, smooth. Epimeral setae setiform, slightly barbed. Discidia absent. Anogenital setae smooth.

Description — Measurements – Body length: 332 (holotype: female), 298 – 332 (16 paratypes: seven females and nine males); notogaster width 182 (holotype), 166 – 182 (16 paratypes). No differences between females and males in the body sizes.

Integument (Figs 4A, 5A) — Body color light brownish. Body surface punctate, lateral side and podosomal region with sparse tuberculate cerotegument (diameter tubercle up to 4).

Prodorsum (Figs 4A, 5A) — Rostrum with small median indentation (*ind*; well visible in frontal view). Costulae short, thin, parallel. Transcostula absent. Rostral (28), lamellar (18 – 20), interlamellar (32) and exobothridial (16 – 20) setae setiform, barbed; *le* and *ex* thinnest, *le* located nearer to interlamellar setae, than to rostral setae. Transverse thin ridge (r) located posteriorly to insertions of rostral setae. Bothridial setae (53 – 57) with long stalks and shorter, elongate, rounded distally heads, having five to six of long (45 – 53) cilia and three to five of short barbs unilaterally. Longitudinal row of muscle sigilla present anteriad to bothridia and lateral to costulae. Interbothridial region with two pairs of muscle sigilla. Interbothridial tubercles absent. Postbothridial tubercles present.

Notogaster (Figs 4A, 5A) — Anterior border straight. Humeral tubercles indistinct, directed to postbothridial tubercles. Ten pairs of notogastral setae present, setae *c* minute (2), other setae setiform, smooth, inserted in four parallel rows (except posterior setae). Setae p_2 and p_3 (20–24) shorter than p_1 (24–28), other setae longest (32–41) and thickest. All lyrifissures clearly visible. Opisthonotal gland openings located posterior to *im* and distanced from it.

Gnathosoma (Figs 4B, 5A, 6A–C) — Morphology of subcapitulum, palp and chelicera typical for *Hammerella* (e.g. Franklin and Woas 1992; Ermilov *et al.* 2012). Subcapitulum longer than wide (73 – 77 × 53 – 57). Antero-medial parts of rutelli with thin tooth. Three pairs of subcapitular setae setiform; *m* longest (28) barbed, *h* (24) sparsely ciliate on dorsal side, *a* shortest (16), barbed. Two pairs of adoral setae (6) thin, smooth. Palps (41 – 45) with setation 0–2–1–3–8(+ω); solenidion of palptarsi as long as one third of tarsi, thick, expanded distally, pressed to the surface, attached in mediodistal parts to seta *ul"*. Chelicerae (69 – 73) with two setiform, barbed setae; *cha* (20) longer than *chb* (12) barbed. Trägårdh's organ tapered, slightly granulate.

Epimeral and lateral podosomal regions (Figs 4B, 5A) — Sejugal apodemes and apodemes 2 short, similar in length, apodemes 4 absent, substituted by muscle sigilla. Epimeral setal formula: 3–1–3–3; all setae setiform, slightly barbed, *1a*, *2a* and *3a* (16–20) shorter than *1b*, *3b*, *3c*, *4a*, *4b* and *4c* (32 – 41), *1c* longest (45 – 53), inserted on pedotecta I, *3c* inserted on tubercles. Discidia absent.

Anogenital region (Figs 4B, 5A) — Six pairs of genital setae minute (g_1–g_6, 8). One pair of aggenital (32), three pairs of adanal (32) and two pairs of anal (16 – 20) setae setiform, smooth. Adanal lyrifissures distinct, inverse apoanal, distanced from the anal aperture.

Legs (Figs 4A, B, 5A–C) — Morphology of leg segments, setae and solenidia typical for *Hammerella*

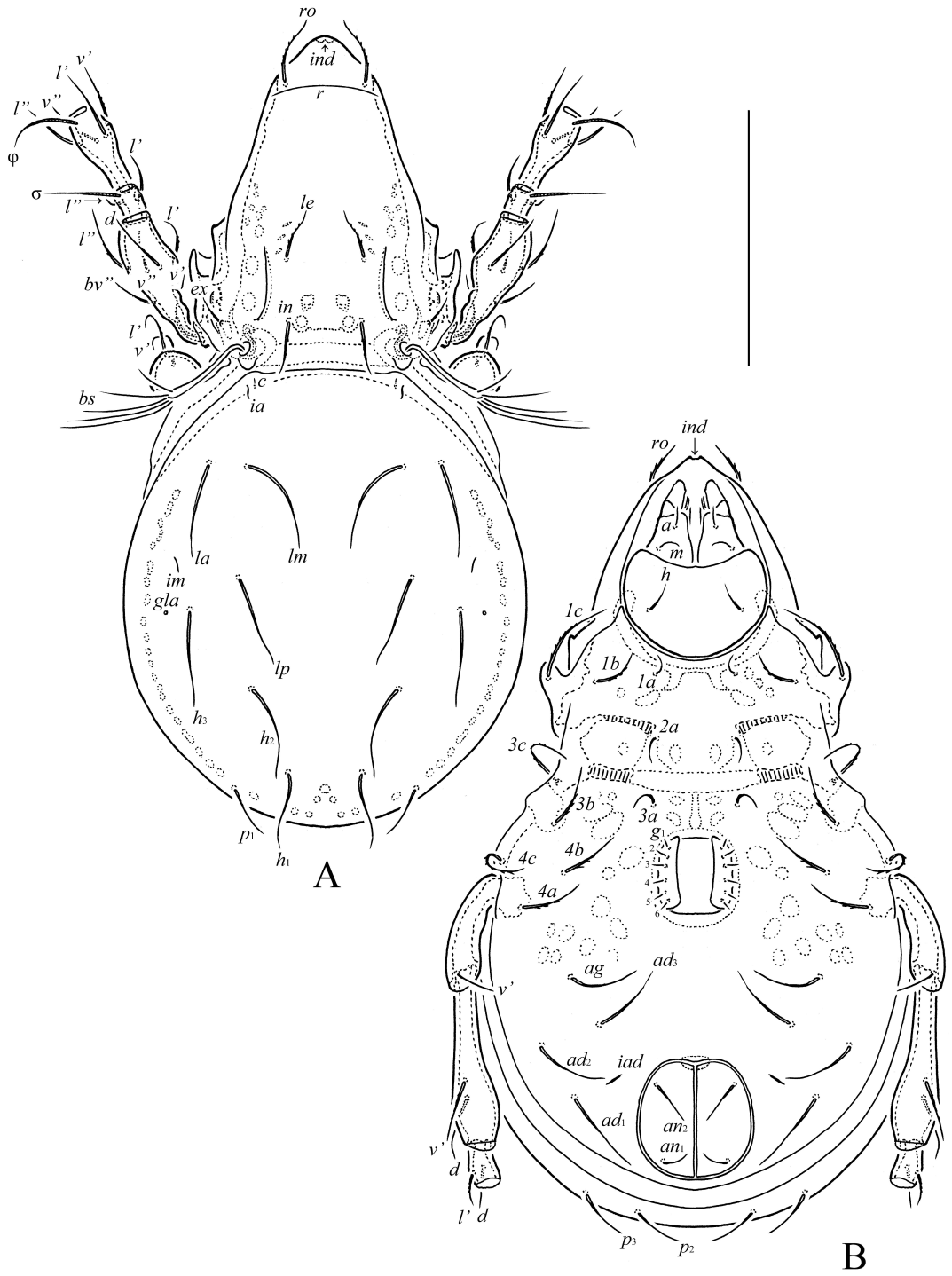

FIGURE 4: *Hammerella* (*Woasella*) *huanucoensis* Ermilov **n. sp.**: A – dorsal view (legs except basal parts of legs II and III not illustrated); B – ventral view (palps and legs except basal parts of legs IV not illustrated). Scale bar 100 μm.

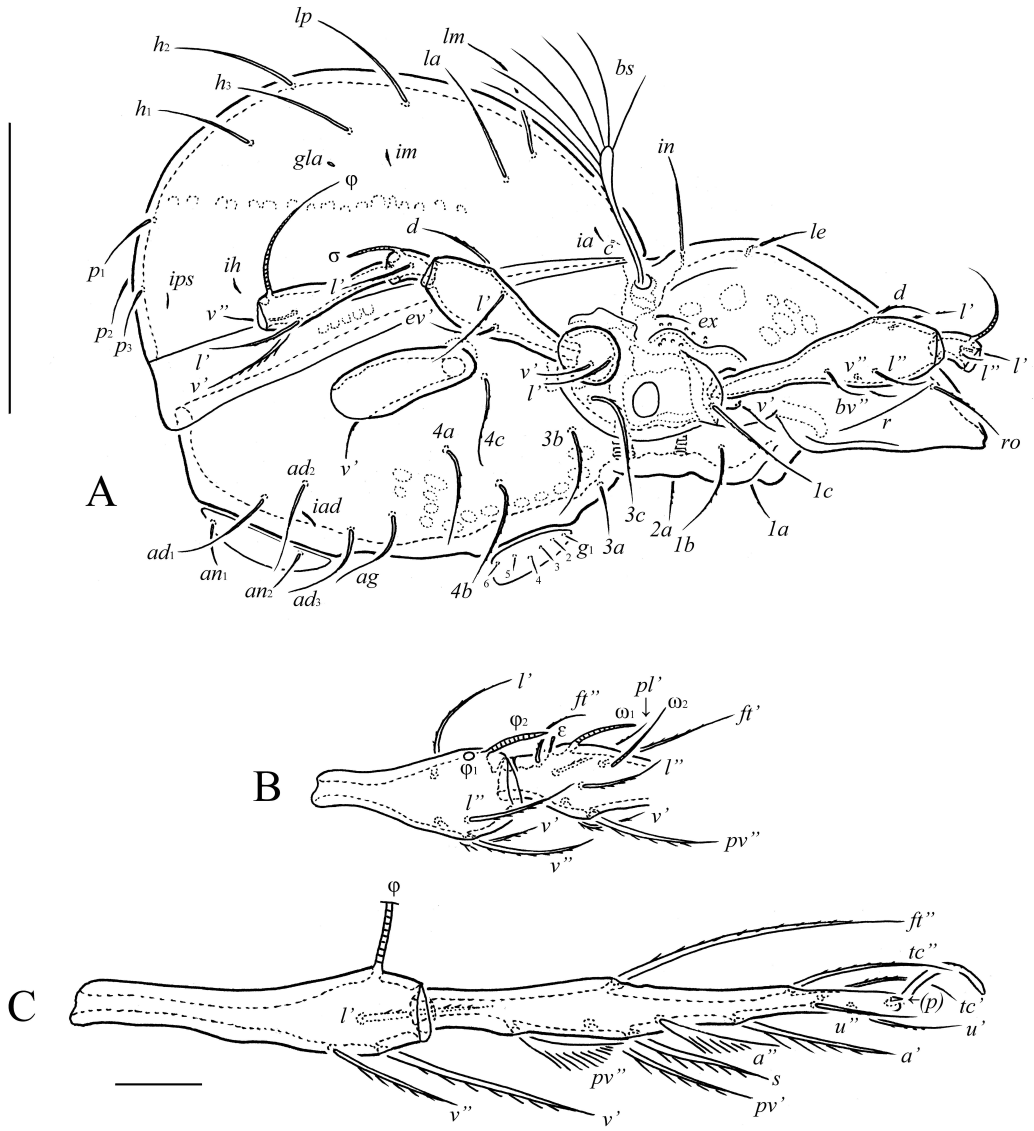

FIGURE 5: *Hammerella* (*Woasella*) *huanucoensis* Ermilov **n. sp.**: A – lateral view, right side (gnathosoma and legs except basal part of legs I, III and IV not illustrated); B – tibia (solenidion not illustrated) and basal part of tarsus of leg I, right, antiaxial view; C – tibia (solenidion except basal part not illustrated) and tarsus of leg IV, right, paraxial view. Scale bar (A) 100 μm, scale bar (B, C) 20 μm.

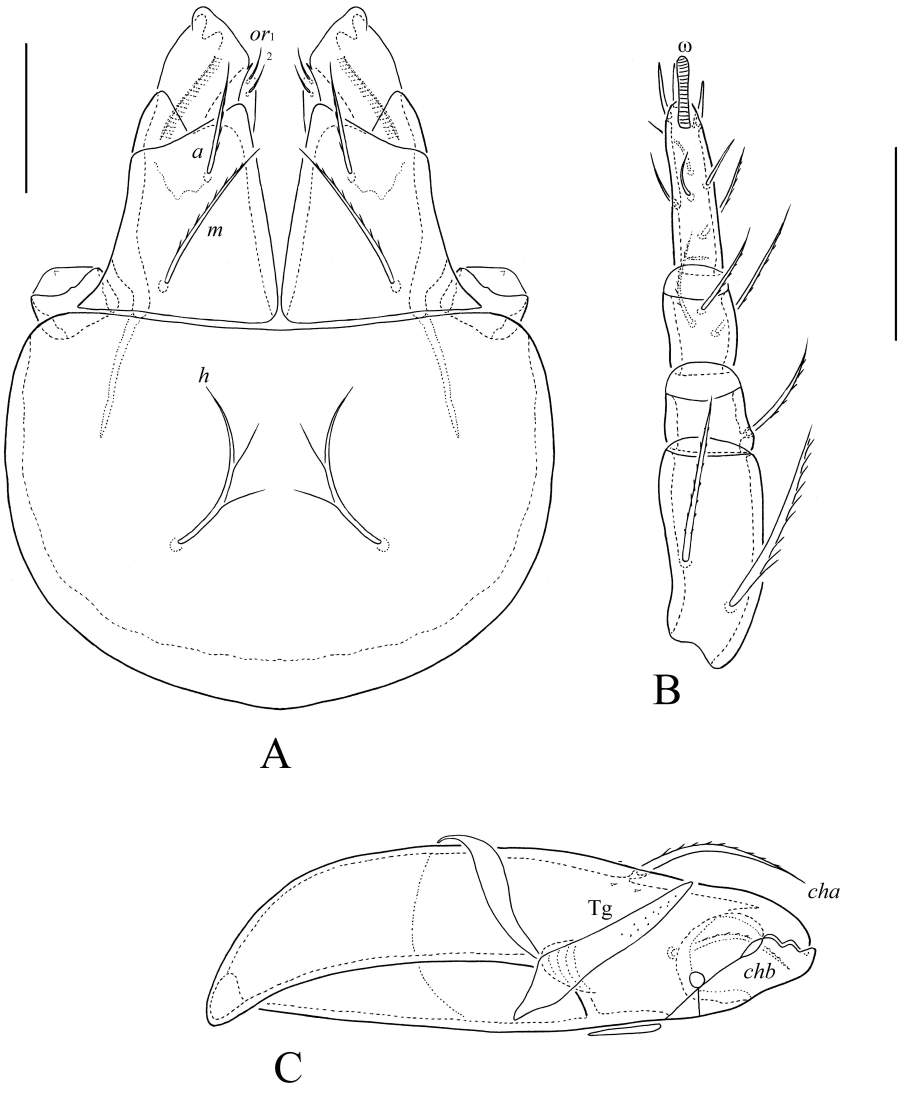

FIGURE 6: *Hammerella* (*Woasella*) *huanucoensis* Ermilov **n. sp.**: A – subcapitulum, ventral view, and palptrochanter; B – palp (trochanter not illustrated), left, ventral view; C – chelicera, left, paraxial view. Scale bar (A, C; B) 16 μm.

(e.g. Franklin and Woas 1992; Ermilov *et al.* 2012). Claw of each leg indistinctly serrate on dorsal side. Formulas of leg setation and solenidia: I (1–5–2–4–20) [1–2–2], II (1–5–2–4–16) [1–1–2], III (2–3–1–3–15) [1–1–0], IV (1–2–2–3–12) [0–1–0]; homology of setae and solenidia indicated in Table 1. Setae *p* setiform on tarsi I, and very short, conical on tarsi II–IV. Famuli (ε) of tarsi I short, thin, swollen and truncated distally, inserted posteriorly to solenidion ω_1.

Type deposition — The holotype is deposited in the collection of the Museo de Historia Natural, Universidad Nacional Mayor de San Marcos, Lima, Peru; two paratypes are deposited in the collection of the Bavarian State Collection of Zoology, Munich, Germany; two paratypes are deposited in the collection of the Senckenberg Institution Frankfurt, Germany; 12 paratypes are deposited in the collection of the Tyumen State University Museum of Zoology, Tyumen, Russia.

Etymology — The specific name *huanucoensis* refers to the Peruvian Department, Huánuco, where the new species was collected.

Remarks — The genus *Hammerella* comprises five subgenera and 13 species, and is distributed in the tropics (Subías 2004, updated 2016). The main morphological traits for these genus and subgenera and an identification key for all species (known to 2012) of *Hammerella* were presented by Ermilov *et al.* (2012).

The new species is morphologically most similar to *Hammerella* (*Woasella*) *parasufflata* Ermilov, Sandmann, Marian and Maraun, 2013 from Ecuador (see Ermilov *et al.* 2013) in having an indentate rostrum and ciliate unilaterally bothridial seta. However, it differs from the latter by the thin costulae (*vs*. thick), shorter notogastral setae (*vs*. comparatively longer), and the absence of tubercles anterior to lamellar setae (*vs*. present).

Remarks on taxonomic status of the genus *Varioppia* Mahunka, 1985

The genus *Varioppia* was proposed by Mahunka (1985) with *Varioppia radiata* Mahunka, 1985 (=*Pulchroppia curarii* Franklin and Woas, 1992) as type species, and he placed it in the family Oppiidae. It is possible that Mahunka did not include *Varioppia* in the family Granuloppiidae based on the lack of well-developed costulae on the prodorsum (see generic diagnosis in Mahunka 1985, p. 160). The problem is he incorrectly called "costula" "a sharp line", when in fact costulae are present (not lines), but they are only slightly developed (see Mahunka 1985; Franklin and Woas 1992) as in *H.* (*W.*) *huanucoensis* Ermilov **n. sp.**

We also note that *V. radiata* is morphologically most similar to representative of the subgenus *Hammerella* (*Woasella*), *H.* (*W.*) *parasufflata* Ermilov, Sandmann, Marian and Maraun, 2013 (see Ermilov *et al.* 2013), which have thick costulae, and there are no doubt, that these two species belong to one genus/subgenus. The thickness of the costulae is an intrasubgeneric character in this case. In addition, the other main generic characters of *Varioppia* correspond to *Hammerella* (*Woasella*) (see Ermilov *et al.* 2012, 2013), therefore based on the above explanations, we do not support the systematic placement of *Varioppia* in Oppiidae. We also do not accept the taxonomic status of this genus, and propose the following changes: a) *Hammerella* (*Woasella*) J. and P. Balogh, 2002 (=*Varioppia* Mahunka, 1985 **n. syn.**), b) *Hammerella* (*Woasella*) *radiata* (Mahunka, 1985) **n. comb.**

Key to known species of the subgenus *Hammerella* (*Woasella*)

1. Costulae connected by two transcostulae; rostrum truncate; body size: 470 × 280..... .....*H.* (*W.*) *sufflata* (Franklin and Woas, 1992) (see Franklin and Woas 1992). Distribution: Brazil and Peru.
— Transcostulae absent; rostrum with median indentation or rounded 2

2. Large tubercles not developed before lamellar setae; dorsal notogastral setae comparatively shorter, *lm* not reaching the insertions of *lp*; discidia absent; body size: 298 – 332 × 166 – 182..... .....*Hammerella* (*Woasella*) *huanucoensis* Ermilov **n. sp.** Distribution: Peru.
— Large tubercles developed before lamellar setae;

dorsal notogastral setae comparatively longer, *lm* reaching the insertions of *lp*; discidia present 3

3. Costulae slightly developed, thin; rostrum rounded; sensillar branches inserted radially on heads; body size: 330 – 390 × 186 – 220..... .....*H.* (*W.*) *radiata* (Mahunka, 1985) **n. comb.** (see Mahunka 1985; Franklin and Woas 1992). Distribution: Neotropical region.
— Costulae well-developed, thick; rostrum with median indentation; sensillar branches inserted unilaterally on heads; body size: 498 – 531 × 265 – 298 .....*H.* (*W.*) *parasufflata* Ermilov, Sandmann, Marian and Maraun, 2013 (see Ermilov *et al.* 2013). Distribution: Ecuador.

Other records of Oppioidea from Peru[3]

Besides two new species described above, we found 7 additional species, belonging to 5 genera and 3 families:

Granuloppiidae — *Hammerella* (*Woasella*) *sufflata* (Franklin and Woas, 1992), 20 specimens. Distribution: Brazil. First record for Peru.

Teratoppiidae — *Teratoppia* (*Teratoppia*) *reducta* Balogh and Mahunka, 1969, 6 specimens. Distribution: Neotropical region. Species was recorded earlier in Peru (e.g. Wunderle 1992; Franklin *et al.* 2006). — *Teratoppia* (*Teratoppiella*) *brevipectinata* Balogh and Mahunka, 1978, 2 specimens. Distribution: Neotropical region. First record for Peru.

Oppiidae — *Aeroppia* sp_1, 12 specimens. The study of type materials of some species in the genus *Aeroppia* is necessary for final identification. — *Aeroppia* sp_2, 3 specimens. The study of type materials of some species in the genus *Aeroppia* is necessary for final identification. — *Brachioppia cuscensis* Hammer, 1961, 9 specimens. Distribution: Neotropical region, India and Japan. Species was recorded earlier in Peru (e.g. Hammer 1961; Ermilov and Gwiazdowicz 2015). — *Gittella variabilis* Ermilov, Sandmann, Marian and Maraun, 2013, 7 specimens. Distribution: Neotropical region. Species was recorded earlier in Peru (Ermilov and Gwiazdowicz 2015).

Acknowledgements

We cordially thank two anonymous reviewers for the valuable comments; Dr. Juliane and Erich Diller for kindly inviting one of us (Stefan Friedrich) to Panguana; Franz Wachtel (Grünwald, Germany) for expertise and assistance in the field and allocation of the Winkler extractors; Dr. Gerardo Lamas Müller and Dr. Diana Silva Dávila (both Museo de Historia Natural, Universidad Nacional Mayor de San Marcos, Lima, Peru) for cooperation; and the Dirección General Forestal y de Fauna Silvestre for issuing a collecting permit (# 0276-2013-AG-DGFFS-DGEFFS) and export permit (# 000521-MINAGRI-DGFFS).

This project was supported by Prof. Dr. Roland Melzer (Zoologische Staatssammlung München, München, Germany) and the "Freunde der Zoologischen Staatssammlung". An overarching project, study of South American mites, was supported by the Russian Science Foundation (project 14-14-01134).

References

Balogh J., Balogh P. 2002 — Identification keys to the oribatid mites of the Extra-Holarctic regions. Vol. 1 — Miskolc, Well-Press Publishing Limited, 453 pp.

Balogh J., Mahunka S. 1969 — The scientific results of the Hungarian soil zoological expeditions to South America. 10. Acari: Oribatids, collected by the second expedition. I — Acta Zoologica Academiae Scientiarum Hungaricae, 15(1-2): 1-21.

Balogh J., Mahunka S. 1978 — New data to the knowledge of the oribatid fauna of the Neogaea (Acari). III — Acta Zoologica Academiae Scientiarum Hungaricae, 24(3-4): 269-299.

Ermilov S.G., Friedrich S. 2016 — New *Pergalumna* (Acari, Oribatida, Galumnidae) from Peru — Zootaxa, 4088(4): 571-582.

[3]Material collected: see "Material and methods" section. All specimens are deposited in the collection of the Tyumen State University Museum of Zoology, Tyumen, Russia.

Ermilov S.G., Gwiazdowicz D.J. 2015 — Peruvian oribatid mites (Acari: Oribatida) from the German Biological Expedition, with description of a new species of the genus *Pergalumna* — ZooKeys, 487: 87-96.

Ermilov S.G., Kalúz S. 2012 — Two new species of Oppiidae (Acari: Oribatida) from Ecuador — International Journal of Acarology, 38(6): 521-527. doi:10.1080/01647954.2012.687499

Ermilov S.G., Sandmann D., Marian F., Maraun M. 2013 — Oribatid mites of the superfamily Oppioidea from Ecuador (Acari: Oribatida) — Systematic and Applied Acarology, 18(3): 218-224. doi:10.11158/saa.18.3.3

Ermilov S.G., Shtanchaeva U.Ya., Subías L.S., Anichkin A.E. 2012 — The oribatid mite genus *Hammerella*, with description of a new subgenus and species from Vietnam (Acari: Oribatida: Granuloppiidae) — Acarina, 20(2): 159-166.

Ermilov S.G., Shtanchaeva U.Ya., Subías L.S., Martens J. 2014 — Two new species of oribatid mites of *Lasiobelba* (Acari, Oribatida, Oppiidae) from Nepal, including a key to all species of the genus — ZooKeys, 424: 1-17.

Franklin E., Woas S. 1992 — Some oribatid mites of the family Oppiidae (Acari, Oribatei) from Amazonia — Andrias, 9: 5-56.

Franklin E., Santos E.M.R., Albuquerque M.I.C. 2006 — Diversity and distribution of oribatid mites (Acari: Oribatida) in a lowland rain forest in Peru and in several environments of the Brazilians States of Amazonas, Rondônia, Roraima and Pará — Brazilian Journal of Biology, 66(4): 999-1020. doi:10.1590/S1519-69842006000600007

Hammer M. 1961 — Investigations on the oribatid fauna of the Andes Mountains. II. Peru — Det Kongelige Danske Videnskabernes Selskab Biologiske Skrifter, 13(1): 1-157.

Mahunka S. 1983 — Oribatids from the eastern part of the Ethiopian region. II — Acta Zoologica Academiae Scientiarum Hungaricae 29(1-3): 151-180.

Mahunka S. 1985 — Mites (Acari) from St. Lucia (Antilles). 2. Oribatida — Acta Zoologica Hungarica, 31(1-3): 119-178.

Norton R.A., Behan-Pelletier V.M. 2009 — Oribatida. Chapter 15. In: Krantz G.W., Walter D.E. (eds.). A Manual of Acarology — Texas Tech University Press, Lubbock, 430-564.

Subías L.S. 2004 — Listado sistemático, sinonímico y biogeográfico de los ácaros oribátidos (Acariformes: Oribatida) del mundo (excepto fósiles) — Graellsia, 60 (número extraordinario): 3-305. Online version accessed in February 2016, 593 pp.

Travé J., Vachon M. 1975 — François Grandjean. 1882-1975 (Notice biographique et bibliographique) — Acarologia, 17(1): 1-19.

Wunderle I. 1992 — Die baum- und bodenbewohnenden Oribatiden (Acari) im Tieflandregenwald von Panguana, Peru — Amazoniana, 12(1): 119-142.

COPYRIGHT