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TWO NEW SPECIES OF ORIBATID MITES (ACARI, ORIBATIDA) FROM MEXICO

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Based on adults collected from leaf litter of a secondary semi-evergreen tropical forest in Mexico, two new oribatid mites (Oribatida) are described: *Epilohmannia mexicana* sp. n. (Epilohmanniidae) and *Plateremaeus bifurcatus* sp. n. (Plateremaeidae).

Keywords: *Epilohmannia*, *Plateremaeus*, morphology, taxonomy, Neotropical Region

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The oribatid mite (Acari, Oribatida) fauna of Mexico is insufficiently studied (e.g., Palacios-Vargas, Iglesias, 2004; Vázquez-González et al., 2016; Subías, Shtanchaeva, 2021). During a taxonomic identification of species from the families Epilohmanniidae and Plateremaeidae collected from Mexico, I found two new species belonging to the genera *Epilohmannia* Berlese 1910 and *Plateremaeus* Berlese 1908. The main goal of this paper is to describe these new species.

Epilohmannia was proposed by Berlese (1916), with *Lohmannia cylindrica* Berlese 1904 as type species. At present, the genus comprises 47 species and nine subspecies, which have a cosmopolitan distribution except the Antarctic region (Subías, 2022, online version 2023; Liu et al., 2023). Subías (2022) included the subgenus *Neoepilohmannia* Bolen et McDaniel 1989 (species with aggenital neotrichy) into *Epilohmannia*. The main generic traits were summarized by Wallwork (1962), Shtanchaeva (1996), and Corpuz-Raros (2010). The identification keys to selected species of *Epilohmannia* were provided by Bayoumi and Mahunka (1976), Shtanchaeva (1996), Balogh and Balogh (2002), Akrami and Bayartogtokh (2022).

Plateremaeus was proposed by Berlese (1908), with *Damaeus ornatissimus* Berlese 1888 as type species. At present, the genus comprises 10 species, which are distributed in the Tropical and Subtropical areas (Ermilov, Yurtaev, 2023). The main generic traits were summarized by Paschoal (1987). An identification key to the known species of *Plateremaeus* was provided by Ermilov and Yurtaev (2023).

Prior to this study, three species of *Epilohmannia* and four species of *Plateremaeus* had been recorded from Mexico (Palacios-Vargas, Iglesias, 2004; Vázquez-

González et al., 2016; Subías, 2022, online version 2023): *E. lenkoi* Balogh, Mahunka 1977; *E. minuta* Berlese 1920; *E. sculpturata* Balogh, Mahunka 1980; *P. berlesei* Balogh, Mahunka 1978; *P. costulatus* Balogh, Mahunka 1978; *P. ornatissimus* (Berlese 1888); and *P. sedovi* Ermilov, Yurtaev 2023.

METHODS

Observation and documentation. For measurement and illustration, specimens were mounted in lactic acid on temporary cavity slides. All measurements are in micrometers. Body length was measured in lateral view, from the tip of the rostrum to the posterior edge of the notogaster; other structures were oriented to avoid parallax errors. Notogastral width refers to the maximum width in dorsal aspect. Setal lengths were measured perpendicular to their long axes, accounting for curvature. Formulas for leg solenidia are given in square brackets according to the sequence genu-tibia-tarsus. Drawings were made with a camera lucida using a Leica DM 2500 light microscope.

Terminology and conventions. Morphological terminology used herein mostly stems from the following papers on Epilohmanniidae and Plateremaeidae (e.g., Aoki, 1965; Norton et al., 1978; Ermilov, Starý, 2021; Ermilov, Yurtaev, 2023). Leg setal nomenclature follows Norton (1977); for overview see Norton and Behan-Pelletier (2009).

Abbreviations. *Prodorsum*: *P* = propodolateral apophysis; *ro*, *le*, *in*, *bs*, *ex* = rostral, lamellar, interlamellar, bothridial, and exobothridial setae, respectively. *Notogaster*: *c*, *d*, *e*, *f*, *lp*, *h*, *p* = setae; *ia*, *im*, *ip*, *ips* = notogastral lyrifissures; *gla* = opisthonotal gland opening. *Gnathosoma*: *a*, *m*, *h* = subcapitular

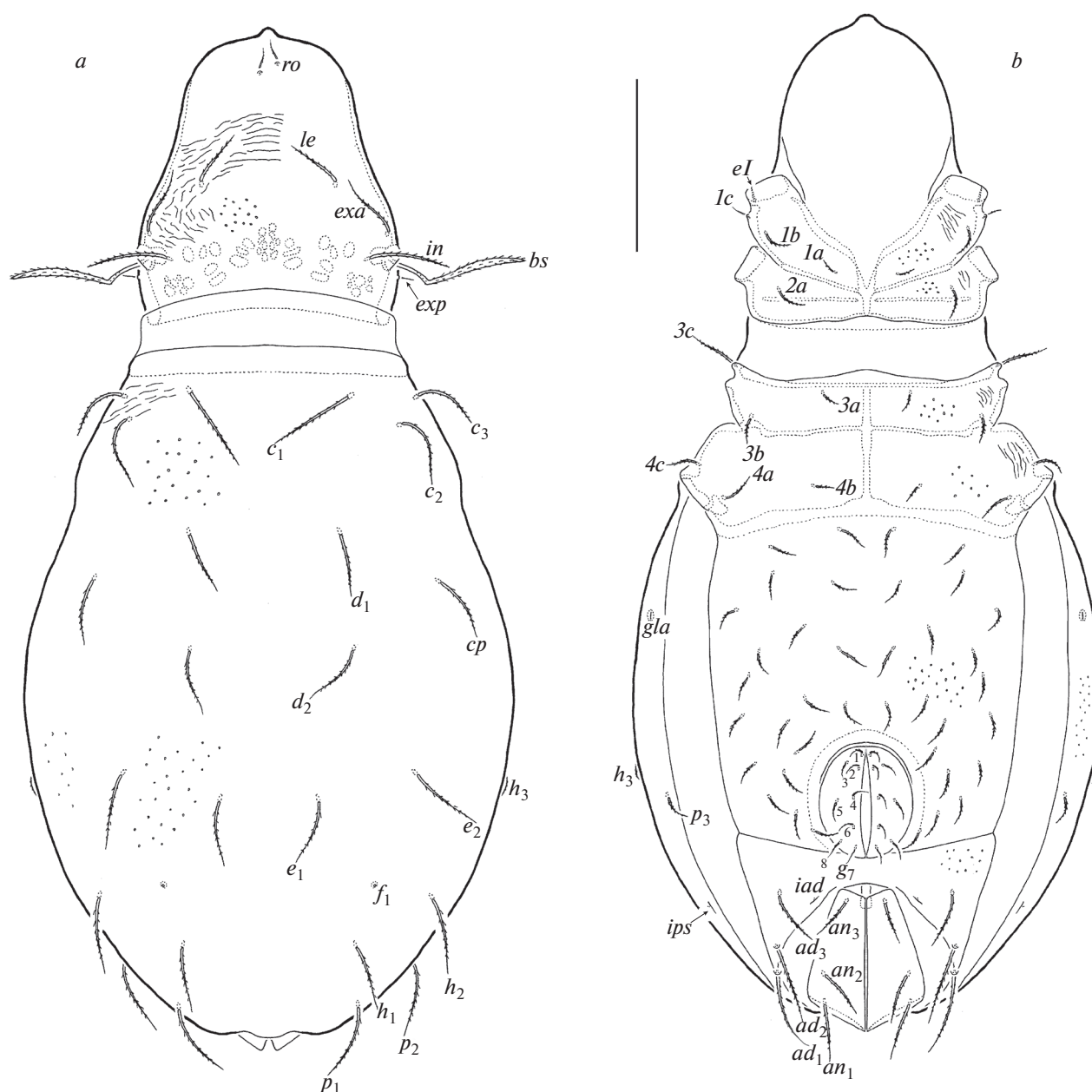


Fig. 1. *Epilohmannia mexicana* sp. n., adult (not shown: gnathosoma, legs): a – dorsal view, b – ventral view. Scale bar 100 μ m.

setae; *or* = adoral seta; *d*, *l*, *sup*, *inf*, *cm*, *acm*, *ul*, *su*, *vt*, *lt* = palp setae; ω = palp solenidion; *cha*, *chb* = cheliceral setae; *Tg* = Trägårdh's organ. *Epimeral and lateral podosomal regions*: *1a–1j*, *2a–2g*, *3a–3g*, *4a–4k* = epimeral setae; *eI* = supracoxal seta; *Sp* = posterior tubercle of parastigmatic enantiophysis; *dis* = discidium. *Anogenital region*: *g*, *ag*, *an*, *ad* = genital, ag-genital, anal, and adanal setae, respectively; *ian*, *iad* = anal and adanal lyrifissure, respectively. *Legs*: *Tr*, *Fe*, *Ge*, *Ti*, *Ta* = trochanter, femur, genu, tibia, and tarsus, respectively; *d*, *l*, *v*, *bv*, *ev*, *ft*, *tc*, *it*, *p*, *u*, *a*, *s*, *pv*, *pl* = setae; ω , σ , φ = solenidia.

TAXONOMY

Epilohmannia mexicana Ermilov sp. n. (Figs 1, 2)

Material. Holotype (♀) and one paratype (♀): Mexico, 20°41'20.3" N, 87°02'54.3" W, Quintana Roo, Municipio de Solidaridad, vicinities of Playa del Carmen, leaf litter under trees and bushes in secondary semi-evergreen tropical forest (unknown data and collector; collection of the Tyumen State University Museum of Zoology, Tyumen, Russia).

The holotype and one paratype are deposited in the collection of the Tyumen State University Museum of



Fig. 2. *Epilohmannia mexicana* sp. n., adult: *a* – subcapitulum, ventral view; *b* – palp, left, antiaxial view; *c* – chelicera, right, antiaxial view; *d* – leg I, right, antiaxial view; *e* – leg IV, left, antiaxial view. Scale bar, μm : *a*–*c* – 20; *d*, *e* – 50.

Table 1. Leg setation and solenidia of adult *Epilohmannia mexicana* sp. n.

Leg	Tr	Fe	Ge	Ti	Ta
I	v'	$d, l'_a, l'_b, (v), bv''$	$(l), (v), \sigma', d\sigma''$	$(l), l'_b'', (v), d\phi$	$(ft), (tc), (p), (u), (a), s, (pv), (v_1), (v_2), (pl), (l), l'_b'', \varepsilon, \omega_1, \omega_2, \omega_3$
II	v'	$d, l'_a, l'_b, (v), bv''$	$(l), (v), d\sigma$	$(l), l'_b'', (v), d\phi$	$(ft), (tc), (u), (a), s, (pv), (v), (l), \omega_1, \omega_2$
III	l', v'	d, l', ev'	$(l), (v), d\sigma$	$(l), (v), d\phi$	$(ft), (tc), (u), (a), s, (pv), (v)$
IV	l', v'	d, l', ev'	$l', (v), d\sigma$	$(l), (v), d\phi$	$(ft), (tc), (u), (a), s, (pv)$

Notes. Roman letters refer to normal setae (except ε – famulus); Greek letters refer to solenidia; $d\phi$ and $d\sigma$ – seta and solenidion coupled; single prime (') designates seta on the anterior and double prime (") – seta on the posterior side of a given leg segment; parentheses refer to a pair of setae.

Zoology, Tyumen, Russia. All specimens are preserved in 70% solution of ethanol with a drop of glycerol.

Diagnosis. Body length: 615–645. Body surface sparsely foveolate; additionally, median and lateral surfaces of prodorsum striate. Rostral seta short, setiform, roughened; lamellar, interlamellar and anterior exobothridial setae medium-sized, setiform, barbed; posterior exobothridial seta short, needleform; bothridial seta long, with slightly observed fusiform head, barbed. Notogastral setal alveolus f_1 present, the remaining setae setiform, barbed (h_3 shortest, p_3 short, other setae medium-sized). Palp trochanter + femur + genu + tibia with two setae, tarsus with seven setae. Epimeral and anogenital setae setiform, barbed; 19 pairs of aggenital setae.

Description. Measurements. Body length: 645 (holotype), 615 (paratype); body width: 300 (holotype), 285 (paratype).

Integument. Body color medium brown. Surface densely microporose and sparsely foveolate; additionally, median and lateral surfaces of prodorsum, anterolateral surface of notogaster, lateral surface of all epimeres, and anterodorsal surface of chelicera with striae.

Prodorsum. Rostrum protruding, narrowly rounded. Rostral seta (15) setiform, thin, roughened; lamellar (45–52), interlamellar (82–86) and anterior exobothridial (45–49) setae setiform, barbed; posterior exobothridial seta (11) needleform; bothridial seta (90–94) with slightly observed fusiform head, barbed.

Notogaster. Notogastral seta f_1 represented by alveolus, other setae (h_3 : 11; p_3 : 19–22; c_1, c_2, c_3 : 49–52; others: 41–45) setiform, barbed.

Gnathosoma. Subcapitulum size: 124 × 101; subcapitular setae (26–30) setiform, barbed; adoral seta or_1 (26–30) bifurcate, barbed; or_2 (26–30) and or_3 (34–37) setiform, barbed. Palp length: 67; trochanter, femur, genu, and tibia fused, with two setae; genutibial suture completely absent; tarsus with seven setae and one solenidion; postpalpal seta (4) spiniform. Cheli-

cera length: 139; seta *cha* (6) needleform, *chb* (22) setiform, smooth.

Epimeral and lateral podosomal regions. Epimeral setal formula: 3–1–3–3; setae (*3c*: 32–34; *1a, 1c, 2a, 3a*: 11–15; others: 19–26) setiform, barbed. Supracoxal seta (7) simple.

Anogenital region. Genital (17–19), aggenital (19–22), anal (an_1, an_2 : 34–37; an_3 : 28–30), and adanal (ad_1, ad_2 : 45–49; ad_3 : 37–41) setae setiform, barbed; *3c* inserted on strong tubercle; 19 pairs of aggenital setae.

Legs. Claw of pretarsi large, slightly barbed dorsally, with small ventral spine at base. Formulas of leg setation and solenidia: I (1–6–5–6–23) [2–1–3], II (1–6–5–6–15) [1–1–2], III (2–3–5–5–13) [1–1–0], IV (2–3–4–5–11) [1–1–0]; homologues of setae and solenidia indicated in Table 1. Famulus spiniform, inserted posterolaterally to solenidion ω_1 ; both setae *p* absent on tarsi II–IV; solenidia ω_1 on tarsus I, ω_1, ω_2 on tarsus II and σ' on genu I bacilliform, ω_3 on tarsus I rod-like, other solenidia setiform or subflagellate.

Remarks. In having strong aggenital neotrichy (more than 10 pairs) *Epilohmannia mexicana* sp. n. is similar to the following species: *E. crassisetosa* Ermilov et Anichkin 2012; *E. jacoti* Liu et J. Chen 2023; *E. maurii* Fernández 1978; *E. ovata* Aoki 1961; *E. pilosa* Li et Chen 1990; *E. taeda* (Bolen et McDaniel 1989); and *E. vicina* Fujikawa 2008. However, the new species differs from the previously known ones in the presence of striae on the median and lateral surfaces of the prodorsum.

Etymology. The species name (*mexicana*) refers to the country of origin, Mexico.

***Plateremaeus bifurcatus* Ermilov sp. n.**
(Figs 3, 4)

Material. Holotype (♂) and six paratypes (♂♂): Mexico, 20°41'26.2" N 87°03'35.9" W, Quintana Roo, Municipio de Solidaridad, vicinities of Playa del Carmen, leaf litter under trees and bushes in secondary semi-evergreen tropical forest (unknown data and col-

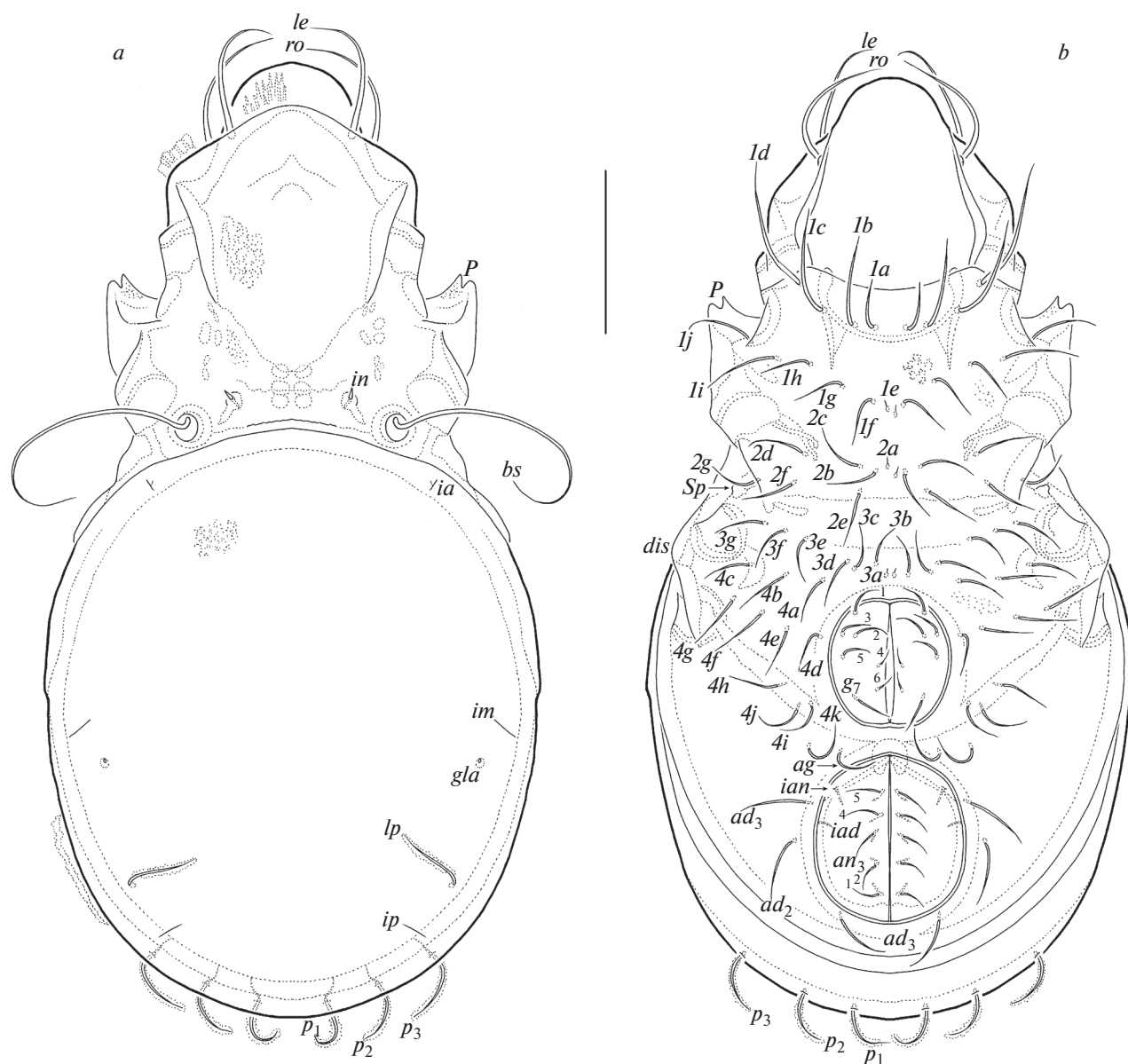


Fig. 3. *Plateremaeus bifurcatus* sp. n., adult (not shown: gnathosoma, legs): *a* – dorsal view, *b* – ventral view. Scale bar 100 μ m.

lector; collection of the Tyumen State University Museum of Zoology, Tyumen, Russia).

The holotype and six paratypes are deposited in the collection of the Tyumen State University Museum of Zoology, Tyumen, Russia. All specimens are preserved in 70% solution of ethanol with a drop of glycerol.

Diagnosis. Body length: 570–600. Cerotegument thick, comprising microgranular, bacillar and shortly filamentous structures; surface with dense granulate microsculpturing. Prodorsal enantiophysis absent. Propodolateral apophysis bifurcate. Bothridial seta very long, subflagellate. Notogaster with four pairs of setiform, indistinctly roughened setae (*lp*, *p*₁,

*p*₂, *p*₃). Epimeral setal formula: 10–7–7–11; setae medium-sized, setiform, indistinctly roughened (except minute, needleform *le*, *2a*, *3a*). Anogenital setae medium-sized (except short medial genital setae) setiform, indistinctly roughened; seven pairs of genital setae present; five or six pairs of anal setae; adanal setae *ad*₂ and *ad*₃ located close to anal aperture. Leg tibiae III, IV with small dorsodistal triangular tooth.

Description. Measurements. Body length: 568 (holotype), 570–600 (paratypes); body width: 315 (holotype), 300–315 (paratypes).

Integument. Body color dark brown. Body and legs covered by thick layer of gel-like cerotegument comprising microgranular, bacillar and shortly filamen-

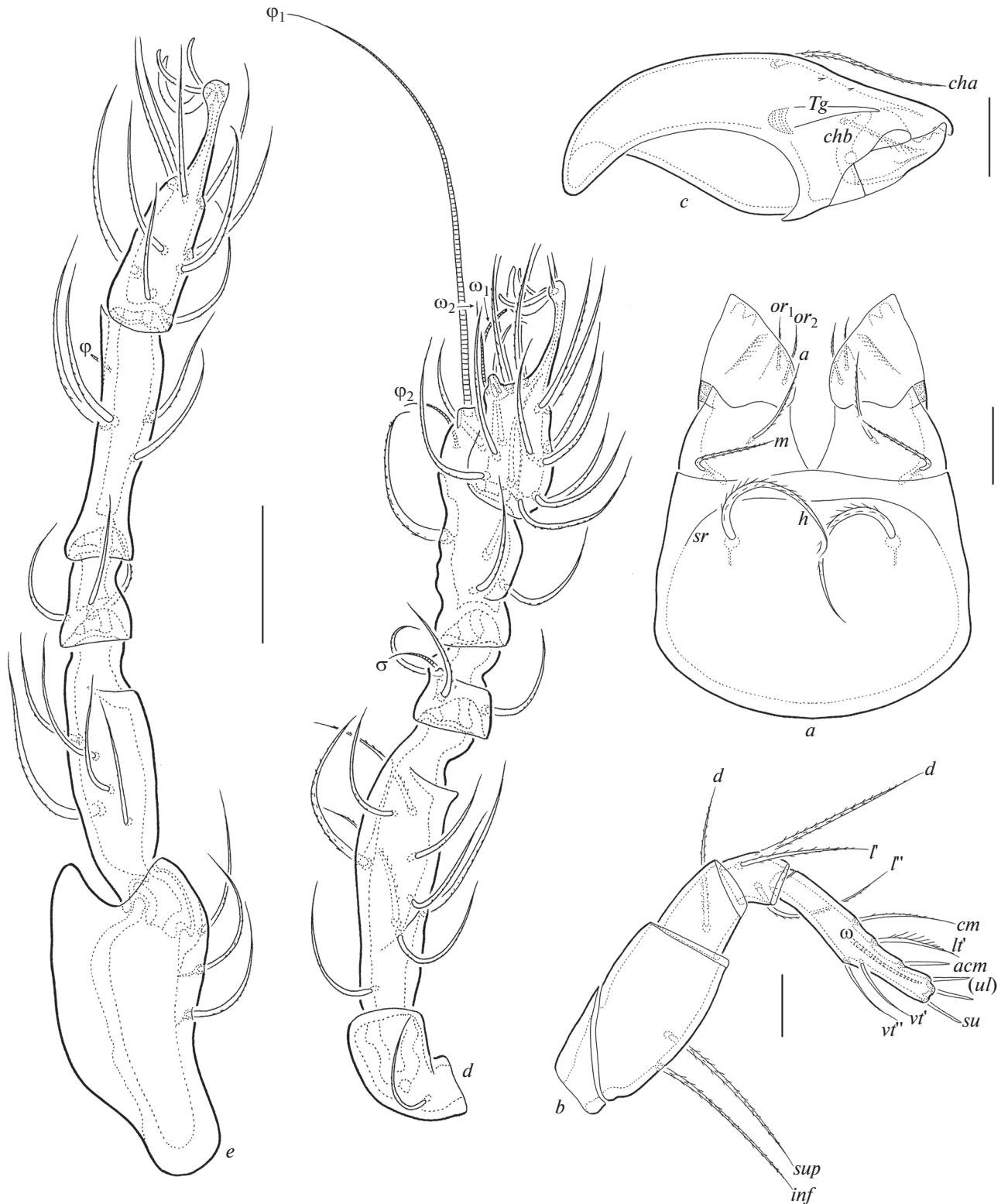


Fig. 4. *Plateremaeus bifurcatus* sp. n., adult: *a* – subcapitulum, ventral view; *b* – palp, left, paraxial view; *c* – chelicera, left, paraxial view; *d* – leg I, right, antiaxial view; *e* – leg IV, left, antiaxial view. Scale bar, μm : *a*, *c* – 25; *b* – 10; *d*, *e* – 50.

Table 2. Leg setation and solenidia of adult *Plateremaeus bifurcatus* sp. n.

Leg	<i>Tr</i>	<i>Fe</i>	<i>Ge</i>	<i>Ti</i>	<i>Ta</i>
I	v'	$d, (l_1), (l_2), (v_1), v_2'', bv''$	$(l), v', \sigma$	$(l), (v), \phi_1, \phi_2$	$(ft), (tc), (it), (p), (u), (a), s, (pv), (pl), v', l'', \varepsilon, \omega_1, \omega_2$
II	v'	$d, (l_1), (l_2), (v_1), v_2'', bv''$	$(l), v', \sigma$	$d, (l), (v), \phi$	$(ft), (tc), (it), (u), (a), s, (pv), l'', \omega_1, \omega_2$
III	d, l'_1, l'_2, v'	d, l'_a, l'_b, v', ev'	d, l', v', σ	$d, l', (v), \phi$	$(ft), (tc), (it), (u), (a), s, (pv)$
IV	v'_1, v'_2, v'_3	d, l'_a, l'_b, v', ev'	d, l', v'	$d, l', (v), \phi$	$ft'', (tc), (u), (a), s, (pv)$

Notes. See Table 1 for explanation.

tous structures; notogastral setae with cerotegument. Surface with dense granulate microsculpturing.

Prodorsum. Rostrum broadly rounded. Enantio-physis absent. Propodolateral apophysis large, thorn-like, bifurcate. Rostral (94–101) and lamellar (75–86) setae setiform, indistinctly roughened; interlamellar seta (7–9) spiniform, smooth; bothridial seta (165–177) subflagellate, indistinctly roughened; exobothridial seta absent.

Notogaster. Dorsal side flat. Exuvial scalps absent in all specimens. Humeral process not developed. Four pairs of setiform, indistinctly roughened setae (lp, p_1, p_2, p_3 : 45–49) present.

Gnathosoma. Subcapitulum size: 131–135 × 94; mentum with transverse ridge; subcapitular (a, m : 34–37; h : 64–67) and adoral (19–22) setae setiform, barbed; h thickest. Palp length: 94–97; setation: 0–2–1–3–8(+ ω); postpalpal seta (7) spiniform, indistinctly roughened. Chelicera length: 131–135; seta cha (64–67) setiform, barbed, chb (30–32) setiform, shortly ciliate in mediodistal part.

Epimeral and lateral podosomal regions. Epimeral setal formula: 10–7–7–11; setae $1e, 2a, 3a$ (6) needle-form, others ($1b$: 60–67; $1c$: 77–86; $1d$: 86–94; others: 34–45) setiform, indistinctly roughened. Parastigmatic tubercle Sa absent, Sp slightly developed. Discidium broadly rounded.

Anogenital region. Genital (two pairs of median setae: 11; others: 22–26), aggenital (24–26), anal (24–26), and adanal (45–49) setae setiform, indistinctly roughened; seven pairs of genital setae present; five pairs (two paratypes with six pairs) of adanal setae present; adanal setae ad_2 and ad_3 located close to anal aperture.

Legs. Median claw large, lateral claws thin, all slightly barbed dorsally. Trochanter IV with large dorsodistal triangular process; tibiae III, IV with small dorsodistal triangular tooth. Porose area and saccule not observed on segments. Formulas of leg setation and solenidia: I (1–9–3–4–20) [1–2–2], II (1–9–3–5–14) [1–1–2], III (4–5–3–4–13) [1–1–0], IV (3–5–3–4–10) [0–1–0]; homologues of setae and solenidia indicated in Table 2. Famulus on tarsus I sunk in cup-like cuticular deepening; both setae p absent

on tarsi II–IV; solenidion ϕ_1 on tibia I subflagellate; other solenidia rod-like or thickened.

Remarks. *Plateremaeus bifurcatus* sp. n. differs from all other species of the genus in having a bifurcate (versus simple) propodolateral apophysis and in the absence (versus presence) of notogastral setae of h -row.

Etymology. The species name (*bifurcatus*) refers to the bifurcate propodolateral apophysis.

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ДВА НОВЫХ ВИДА ПАНЦИРНЫХ КЛЕЩЕЙ (ACARI, ORIBATIDA) ИЗ МЕКСИКИ

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Описаны два новых вида панцирных клещей (Oribatida), *Epilohmannia mexicana* sp. n. (Epilohmanniidae) и *Plateremaeus bifurcatus* sp. n. (Plateremaeidae), собранных из листовного опада тропического леса в Мексике.

Ключевые слова: *Epilohmannia*, *Plateremaeus*, морфология, таксономия, Неотропическая область