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## Article

### Some Galumnidae (Acari, Oribatida) from Mexico

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#### ABSTRACT

A new species of the genus *Pergalumna*, *P. rooensis* **sp. nov.** is described from leaf litter in secondary semi-evergreen tropical forest in Mexico. The new species can be distinguished from the related species *P. makarovae* in the body size, the length of lamellar seta, the morphology of head of the bothridial seta, and the localization of notogastral lyrifissure *im.* *Pergalumna silvatica* Hammer, 1961 is recorded in Mexico for the first time.

**KEYWORDS:** Galumnid mites, morphology, Neotropical region, new record, taxonomy.

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#### INTRODUCTION

In the course of taxonomic identification of oribatid mites (Acari, Oribatida) of the family Galumnidae collected from Mexico, I found four species; of them, one species belonging to the genus *Pergalumna* Grandjean, 1936 (from nominate subgenus) is new to science. The main goal of this paper is to describe this new species under the name *P. (P.) rooensis* **sp. nov.** Additionally, a list of identified galumnid mites is presented.

The genus *Pergalumna* was proposed by Grandjean (1936), with *Oribata nervosa* Berlese, 1914 as type species. The nominate subgenus comprises about 180 species having a cosmopolitan distribution collectively (Subías 2022; Ermilov *et al.* 2023). The generic and subgeneric diagnoses were revised by Ermilov and Klimov (2017). An identification key to the Neotropical species of *Pergalumna* has been presented by Ermilov and Starý (2021).

Presently, about 30 species of Galumnidae have been registered in the oribatid fauna of Mexico (e.g., Palacios-Vargas 1994; Palacios-Vargas and Iglesias 2004; Subías 2022).

#### 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 (behind pteromorphs) 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

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the sequence genu-tibia-tarsus. Drawings were made with a camera lucida using a Leica DM 2500 light microscope.

**Terminology** – Morphological terminology used in this paper mostly follows that of Grandjean (1956, 1957), Norton and Ermilov (2017), Ermilov *et al.* (2023); Ermilov and Klimov (2017) for overview.

**Abbreviations** – The following morphological abbreviations are used: *Prodorsum*: *L* = lamellar line; *S* = sublamellar line; *N* = prodorsal leg niche; *E*, *T* = lateral ridges of body; *ro*, *le*, *in*, *bs* = rostral, lamellar, interlamellar, and bothridial setae, respectively; *Ad* = dorsosejugal porose area; *D* = dorsophragma; *P* = pleurophragma. *Notogaster*: *c*, *la*, *lm*, *lp*, *h*, *p* = setae; *ia*, *im*, *ip*, *ih*, *ips* = lyrifissures; *gla* = opisthonotal gland opening. *Gnathosoma*: *a*, *m*, *h* = subcapitular setae; *or* = adoral seta; *sup*, *inf*, *d*, *l*, *cm*, *acm*, *ul*, *su*, *vt*, *lt* = palp setae;  $\omega$  = palp solenidion; *sac* = axillary sacculae; *cha*, *chb* = cheliceral setae; *Tg* = Trägårdh's organ. *Epimeral and lateral podosomal regions*: *1b*, *3b*, *4a*, *4b*, *4c* = epimeral setae; *PdI*, *PdII* = pedotecta I, II, respectively; *dis* = discidium; *cir* = circumpedal carina. *Anogenital region*: *g*, *ag*, *an*, *ad* = genital, aggenital, anal, and adanal setae, respectively; *iad* = adanal lyrifissure; *Ap* = postanal porose area; *po* = preanal organ. *Legs*: *Tr*, *Fe*, *Ge*, *Ti*, *Ta* = trochanter, femur, genu, tibia, and tarsus, respectively;  $\omega$ ,  $\phi$ ,  $\sigma$  = solenidia;  $\varepsilon$  = famulus; *d*, *l*, *v*, *bv*, *ev*, *ft*, *tc*, *it*, *p*, *u*, *a*, *s*, *pv*, *pl* = setae; *pa* = porose area.

## TAXONOMY

### Family Galumnidae

#### *Pergalumna* Grandjean, 1936

#### Subgenus *Pergalumna* (*Pergalumna*) Grandjean, 1936

**Type species:** *Oribata nervosa* Berlese, 1914

#### *Pergalumna rooensis* sp. nov. (Figs. 1–12)

<http://zoobank.org/urn:lsid:zoobank.org:act:AEA2C361-9B6C-4BBA-B310-4DD2663B8296>

#### *Type material*

Holotype (male) and eight paratypes (four males and four females): Mexico, 20° 33' N, 87° 13' W, Quintana Roo, Municipio de Solidaridad, vicinities of Playa del Carmen, leaf litter under trees and bushes in secondary semi-evergreen tropical forest (data and collector unknown; collection of the Tyumen State University Museum of Zoology, Tyumen, Russia).

#### *Type deposition*

The holotype is deposited in the collection of the Senckenberg Museum of Natural History, Görlitz, Germany; eight paratypes are deposited in the collection of the Tyumen State University Museum of Zoology, Tyumen, Russia. All specimens are preserved in ethanol with a drop of glycerol.

#### *Diagnosis*

Body length: 465–555. Rostrum rounded. Rostral seta long, setiform, barbed; lamellar and interlamellar setae minute, setiform, smooth; bothridial seta long, clavate or fusiform, barbed. Dorsosejugal suture and porose area present. Three pairs of rounded notogastral porose areas; *Aa* located near to pteromorphal hinge. Median pore absent. Lyrifissure *im* located close and anteromedially or anteriorly to *Al*. Circumpedal carina medium-sized. Epimeral and anogenital setae comparatively short or minute, roughened or smooth. Postanal porose area elongate oval. Solenidion on tibia IV inserted in anterior part of the segment.

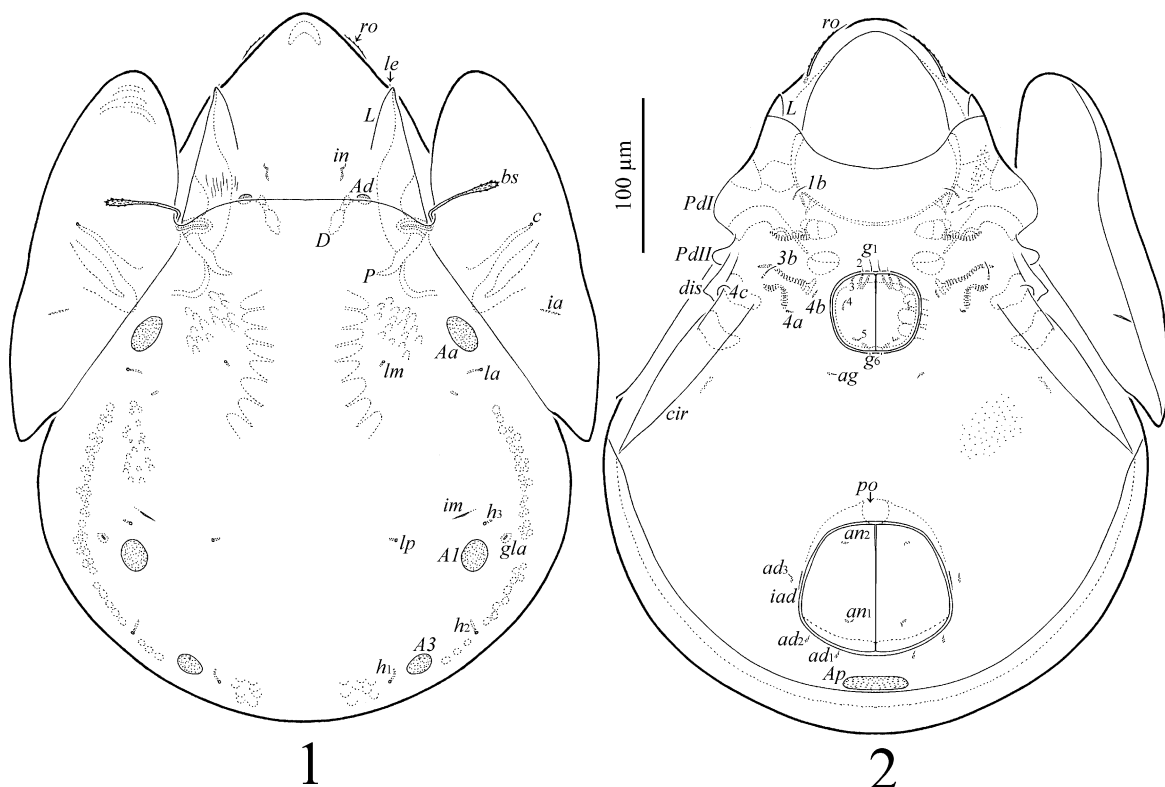
### Description

**Measurements** – Body length: 495 (holotype), 465–490 (male paratypes), 540–555 (female paratypes); notogaster width: 375 (holotype), 330–375 (male paratypes), 390–405 (female paratypes).

**Integument** – Body color brown. Body surface microgranulate sculpturing (visible under high magnification,  $\times 1000$ ). Rostrum, laterobasal part of prodorsum and anterior and lateral parts of pteromorph slightly striate; lateral part of epimere I with longitudinally elongate microtuberculate area; antiaxial side of leg femora I–IV and trochanters III, IV partially tuberculate. Lateral part of body partially with microgranulate cerotegument.

**Prodorsum** – Rostrum rounded. Lamellar and sublamellar lines thin, parallel, curving backwards mediolaterally. Rostral seta (41–45) setiform, barbed; lamellar and interlamellar setae (4) setiform, smooth; *le* located very close to *L*; bothridial seta (75–86) with long stalk and shorter clavate or fusiform, barbed head. Dorsosejugal porose area oval ( $13\text{--}15 \times 7\text{--}11$ ), located posterolaterally to insertion of *in*. Dorsophragma comparatively long, oblique.

**Notogaster** – Dorsosejugal suture present. All notogastral setae represented by setal alveoli. Three pairs of rounded porose areas developed (*Aa*: 26–34; *A1*, *A3*: 15–22); *Aa* located near to pteromorph hinge, anteriorly to *la*. Median pore absent. Opisthonotal gland opening and all lyrifissures distinct: *gla* located laterally to *A1*; *im* located close and anteromedially or anteriorly to *A1*; *ih* anteromedially to *p3*; *ip* between *p1* and *p2*; *ips* posterolaterally to *p3*.

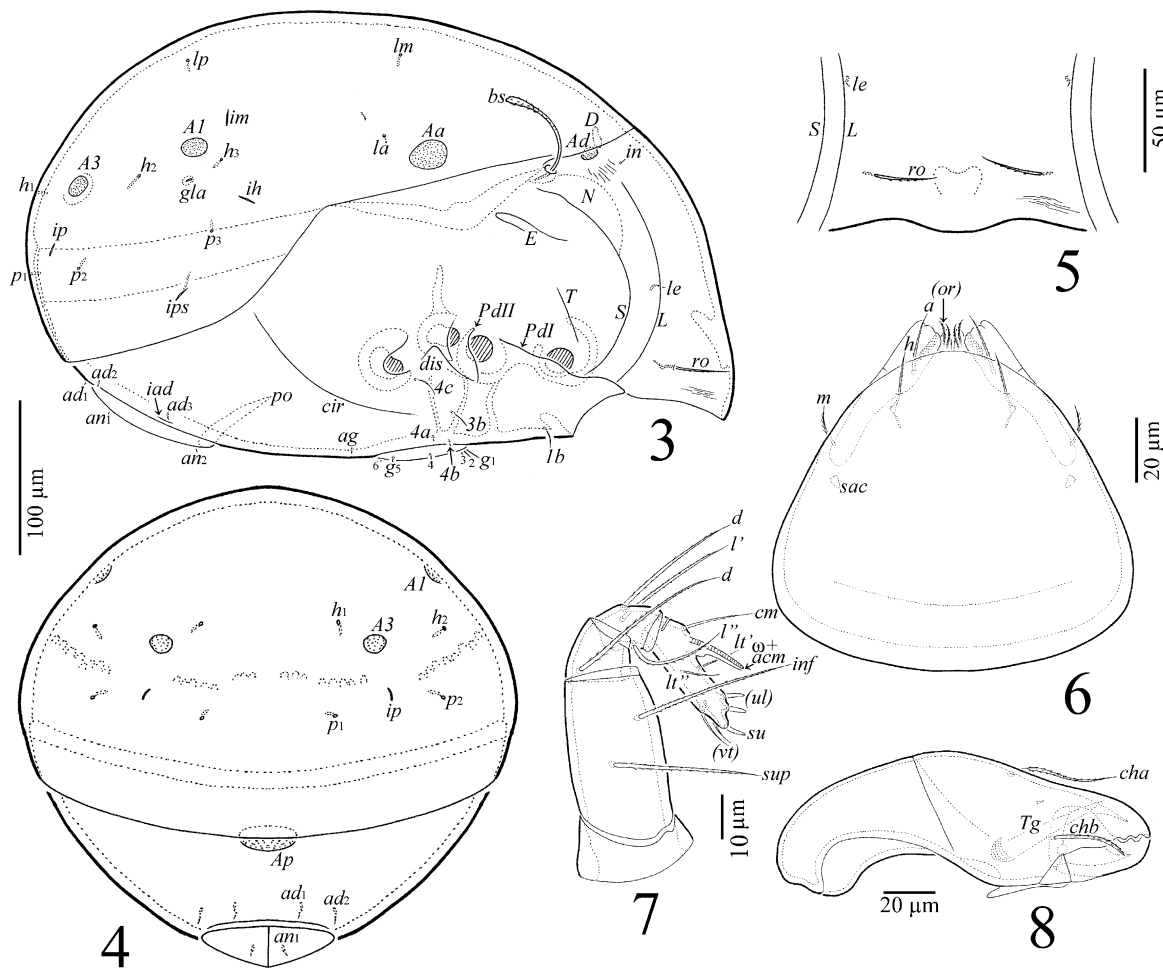


**Figures 1–2.** *Pergalumna rooensis* sp. nov. (adult; legs not shown) – 1. Dorsal view; 2. Ventral view (gnathosoma, legs and right pteromorph not shown).

**Gnathosoma** – Size of subcapitulum:  $116\text{--}124 \times 101\text{--}109$ ; subcapitular (*a*: 19; *m*, *h*: 13) and adoral (7–9) setae setiform, barbed. Length of chelicera: 154–161; setae (*cha*: 45–49; *chb*: 30–32) setiform, barbed. Length of palp: 97–105; postpalpal seta (7) spiniform, smooth.

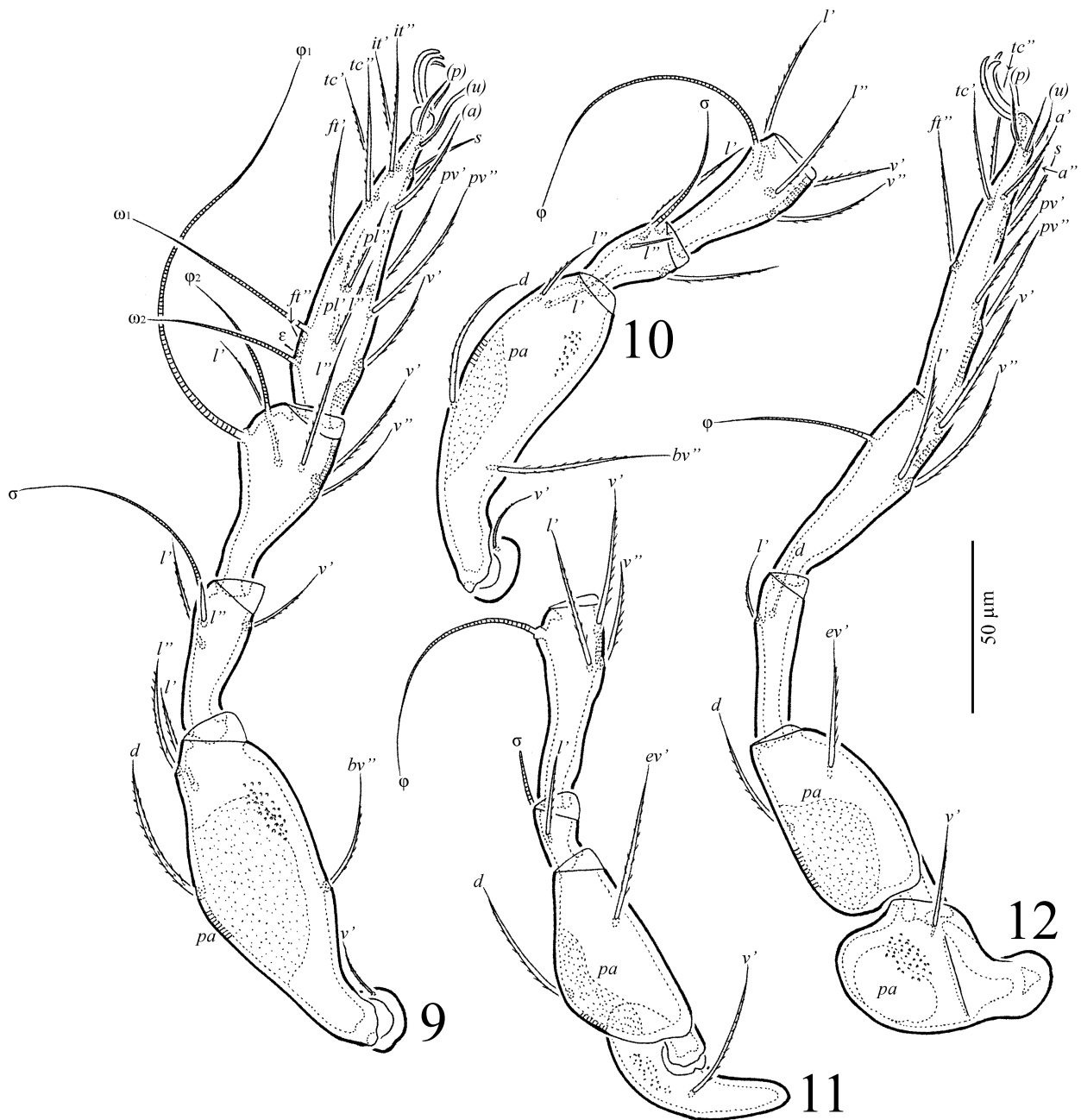
**Epimeral and lateral podosomal regions** – Anterior margin of ventral plate smooth. Epimeral setal formula: 1–0–1–3. Setae *1b*, *3b* (13–15) and *4c* (15–17) setiform, roughened; *4a*, *4b* (4) setiform, smooth. Circumpedal carina medium-sized, directed to insertion of *3b* but distinctly not reaching it.

**Anogenital region** – Genital setae *g*<sub>1</sub> (11) and *g*<sub>2</sub> (5–7) setiform, roughened, others (*g*<sub>3</sub>–*g*<sub>6</sub>: 4) setiform, smooth; aggenital, anal and adanal setae (4) setiform, smooth. Anterior edge of genital plate with two setae but *g*<sub>3</sub> inserted close to it. Aggenital seta located between genital and anal apertures, closer to the former. Adanal lyrifissure located close and parallel to the middle of anal plate. Adanal setae *ad*<sub>1</sub> and *ad*<sub>2</sub> posteriorly, *ad*<sub>3</sub> laterally to anal plate; distance *ad*<sub>1</sub>–*ad*<sub>2</sub> shorter than *ad*<sub>2</sub>–*ad*<sub>3</sub>. Postanal porose area elongate oval (30–41 × 17–19).



**Figures 3–8.** *Pergalumna rooensis* sp. nov. (adult) – 3. Right lateral view (gnathosoma, legs and right pteromorph not shown); 4. Posterior view; 5. Anterior view or prodorsum. 6. Subcapitulum, ventral view; 7. Palp, right, antiaxial view; 8. Chelicera, right, antiaxial view.

**Legs** – Median claw distinctly thicker than lateral claws, all slightly barbed on dorsal side. Porose area on all femora and on trochanters III, IV well visible; proximoventral porose area on tarsi and distoventral porose area on tibiae present but poorly observed. Formulas of leg setation and solenidia: I (1–4–3–4–20) [1–2–2], II (1–4–3–4–15) [1–1–2], III (1–2–1–3–15) [1–1–0], IV (1–2–2–3–12) [0–1–0]; homology of setae and solenidia indicated in Table 1. Famulus on tarsi I inserted between solenidia  $\omega_1$  and  $\omega_2$ . Solenidion on tibia IV inserted in anterior part of the segment.



**Figures 9–12.** *Pergalumna roensis* sp. nov. (adult) – 9. Leg I, right, antiaxial view; 10. Leg II, without tarsus, right, antiaxial view; 11. Leg III, without tarsus, left, antiaxial view; 12. Leg IV, left, antiaxial view.

**Table 1.** Leg setation and solenidia of adult *Pergalumna roensis* sp. nov.

Leg	Tr	Fe	Ge	Ti	Ta
I	v'	d, (l), bv''	(l), v', σ	(l), (v), φ <sub>1</sub> , φ <sub>2</sub>	(ft), (tc), (it), (p), (u), (a), s, (pv), v', (pl), l'', ε, ω <sub>1</sub> , ω <sub>2</sub>
II	v'	d, (l), bv''	(l), v', σ	(l), (v), φ	(ft), (tc), (it), (p), (u), (a), s, (pv), ω <sub>1</sub> , ω <sub>2</sub>
III	v'	d, 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 quotation mark (') designates setae on the anterior and double quotation mark (') setae on the posterior side of a given leg segment; parentheses refer to a pair of setae.

### Comparison

*Pergalumna rooensis* **sp. nov.** is most similar to *P. makarovae* Ermilov, Sidorchuk & Rybalov, 2010 from Ethiopia in main morphological traits: rostrum rounded; bothridial seta with developed head; dorsosejugal suture present; three pairs of rounded notogastral porose areas, with *Aa* located near to pteromorphical hinge; interlamellar seta minute or absent. However, the new species differs from the latter by the larger body size (length: 465–555 versus 336–348), minute (versus medium-sized) lamellar seta, narrowly elongate head (versus rounded) of the bothridial seta, and the localization of notogastral lyrifissures *im* (close and anteromedial or anterior to porose area *A1* versus between setal alveoli *lm* and *lp*) and *ia* (atypically distant from pteromorphical hinge versus typically close).

### Etymology

The species name *rooensis* refers to the place of origin, the Free and Sovereign State of Quintana Roo.

## OTHER RECORDS OF GALUMNIDAE FROM MEXICO

### Material

Species locality: as for *P. rooensis* **sp. nov.** All specimens deposited in the collection of the Tyumen State University Museum of Zoology, Tyumen, Russia, and are preserved in ethanol with a drop of glycerol.

### Taxa

1. *Galumna flabellifera* Hammer, 1958: 13 ex. Distribution: Tropical, Subtropical.
2. *Pergalumna ekaterinae* Páez, Villagómez & Palacios-Vargas, 2019: 2 ex. Distribution: Mexico.
3. *Pergalumna silvatica* Hammer, 1961: 17 ex. Distribution: Neotropical. First record of the species in Mexico.

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## برخی Galumnidae (Acari, Oribatida) مکزیک

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### چکیده

گونه جدیدی از جنس *Pergalumna* **sp. nov.** *P. rooensis* از بستر برگ در جنگل‌های استوایی نیمه همیشه سبز ثانویه در مکزیک توصیف می‌شود. گونه جدید را می‌توان از گونه *P. makarovae* با اندازه بدن، طول موهای لاملائی، ظاهر نوک موی بوتریدیومی و محل قرار گرفتن لیریفیشور نوتوگاستری *im* متمایز کرد. گونه *Pergalumna silvatica* Hammer, 1961 برای نخستین بار از مکزیک گزارش می‌شود.

**واژگان کلیدی:** کنه‌های گالومنید، ریخت‌شناسی، ناحیه نئوتروپیکال، گزارش جدید، آرایه‌شناسی.

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