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Contribution to the knowledge of the oribatid mite fauna of Bolivia, Zambia, Cambodia and Vietnam, with descriptions of two new species

(Acari, Oribatida)

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An annotated checklist of identified oribatid mite taxa from Bolivia, Zambia, Cambodia and Vietnam is presented. Nineteen Bolivian species, 25 Zambian and 37 Cambodian species are recorded for the first time from these countries. *Indotritia bellingeri*, *Trimalaconothrus crassisetosus fijiensis* and *Punctoribates hexagonus* are recorded for the first time from the Ethiopian region; *Trichoribates trimaculatus* is recorded for the first time from the Oriental region. Two new species, *Pergalumna boliviana* Ermilov spec. nov. (Galumnidae) and *Austrotritia parabellingeri* Niedbala spec. nov. (Oribotritiidae), are described from Bolivia and Zambia, respectively. *Galumna araujoi* Pérez-Íñigo & Baggio, 1994 is transferred to the genus *Neogalumna*.

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Introduction

The present study is based on oribatid mite material collected during expeditions 2010–2011 by the Polish collectors W. Niedbala and D. Diduszko in Bolivia (Neotropical region), Zambia (Ethiopian region), Cambodia and Vietnam (both Oriental region). The primary goal of this paper is to present an annotated checklist of identified oribatid mites, indicating which species are recorded from these countries and geographic regions for the first time. At present, the oribatid mite fauna of Bolivia is poorly known (Hammer 1958; Balogh & Mahunka 1969a,b,c, 1977, 1978; Sitnikova 1979; Balogh & Balogh 1985; Balogh 1986; Niedbala 2004), only six species are known from Zambia (Mwase & Baker 2006, Ermilov 2012) and none from Cambodia. The knowledge of oribatid mites from Vietnam is more extensive than from the countries listed above, but further study is needed

(Vu 2007; papers by Ermilov (and co-authors), for example: Ermilov & Anichkin 2010, 2011a,b, 2012; Ermilov et al. 2012).

In the course of taxonomic identification, two new species belonging to the genera *Pergalumna* Grandjean, 1936 (Galumnidae) and *Austrotritia* Sellnick, 1959 (Oribotritiidae), were found which were collected in Bolivia and Zambia, respectively. The secondary goal of this paper is to describe and illustrate these species under the name *Pergalumna boliviana* Ermilov spec. nov. and *Austrotritia parabellingeri* Niedbala spec. nov.

Pergalumna is a large genus that was proposed by Grandjean (1936) with *Oribata nervosa* Berlese, 1914 as type species. Currently, the genus comprises 118 species having a cosmopolitan distribution. Diagnostic characters of *Pergalumna* were listed earlier (e.g. Balogh & Balogh 1992, Ermilov & Anichkin 2011a). At present, only two species of this genus

were recorded in Bolivia (Balogh & Mahunka 1977): *Pergalumna curva* (Ewing, 1907) and *Pergalumna decorata* Balogh & Mahunka, 1977.

Austrotrititia is a genus that was proposed by Sellnick (1959) with *Austrotrititia quadricarinata* Sellnick, 1959 as type species. Currently, the genus comprises more than 20 species; the majority of species occur in Australasian and Oriental regions, some species have been introduced to the eastern and south-eastern border of the Palaearctic and unexpectedly, two species to the western Palaearctic, one species is known from South Africa. Diagnostic characters of *Austrotrititia* were listed earlier (e.g. Sellnick 1959, Niedbala 2000). At present, species of this genus are unrecorded in Zambia.

In addition, the taxonomic status of *Galumna araujoi* Pérez-Íñigo & Baggio, 1994 (see Pérez-Íñigo & Baggio 1994) is discussed.

Materials and methods

List of collecting sites

Bol	Bolivia, Maididi National Park, litter in rain forest at border of Beni river, 27.11.2010, collected by D. Didusko
Z-1-2	Zambia, environment of Livingstone, near Mukuni Village, litter under dry bush on the hill, 19.05.2011, coll. W. Niedbala
Z-3	Zambia, environment of Livingstone, Victoria Falls Gorge, rain forest, decayed material between rocks, 20.05.2011, coll. W. Niedbala
Z-4	Zambia, environment of Livingstone, Victoria Falls Gorge, rain forest, litter general sample, 20.05.2011, coll. W. Niedbala
Cam-1	Cambodia, Angkor complex, litter from rain forest at Bayon temple, 27.04.2011, coll. W. Niedbala
Cam-2	Cambodia, Angkor complex, litter from rain forest at Ta Kêa temple, 26.04.2011, coll. W. Niedbala
Vtn	Vietnam, Cu Chi tunnels near Ho Chi Minh, litter from rain forest, 20.04.2011, coll. W. Niedbala

Specimens were mounted in lactic acid on temporary cavity slides for measurement and illustration. All body measurements are presented in micrometers (µm). Body length was measured in lateral view, from the tip of the rostrum to the posterior edge of the ventral plate, to avoid discrepancies caused by different degrees of notogastral distortion. Notogastral width refers to the maximum width in dorsal aspect. Lengths of body setae were measured in lateral aspect. Formulae for leg setation are given in parentheses according to the sequence trochanter-femur-genu-tibia-tarsus (femulus included). Formulae for leg solenidia are given in square

brackets according to the sequence genu-tibia-tarsus. General terminology used in this paper is summarized by Norton and Behan-Pelletier (2009).

Also, we have used paratypes of *Pergalumna pasimpunctata* Balogh & Mahunka, 1969 (HNHM O-546-68; sample 357-1) from the collection of the Hungarian National History Museum (Hungary) for morphological comparison with *Pergalumna boliviana* Ermilov spec. nov.

Results

Checklist of identified oribatid mites

Hypochthoniidae

Eohypochthonius crassisetiger Aoki, 1959

Locality: Cam-1 (2 ex.). The species is recorded for the first time from Cambodia.

Malacoangelia remigera Berlese, 1913

Locality: Vtn (1 ex.).

Cosmochthoniidae

Cosmochthonius lanatus (Michael, 1885)

Locality: Cam-1 (1 ex.). The species is recorded for the first time from Cambodia.

Epilohmanniidae

Epilohmannia pallida pacifica Aoki, 1965

Locality: Vtn (1 ex.).

Lohmanniidae

Papillacarus indistinctus Ermilov & Anichkin, 2012

Locality: Cam-2 (13 ex.). The species is recorded for the first time from Cambodia.

Meristacarus longisetosus Mahunka, 1978

Locality: Bol (2 ex.). The species is recorded for the first time from Bolivia.

Meristacarus sundensis Hammer, 1979

Locality: Cam-1 (9 ex.), Cam-2 (16 ex.), Vtn (10 ex.). The species is recorded for the first time from Cambodia.

Torpacarus omittens Grandjean, 1950

Locality: Bol (1 ex.), Z-1-2 (1 ex.). The species is recorded for the first time from Bolivia and Zambia.

Mesoplophoridae

Mesoplophora (Mesoplophora) gaveae Schuster, 1962

Locality: Bol (1 ex.). The species is recorded for the first time from Bolivia.

Oribotritiidae

Austrotritia parabellingeri Niedbala spec. nov.
Locality: Z-4 (1 ex.).

Indotritia bellingeri Niedbala & Schatz, 1996
Locality: Z-3 (1 ex.), Z-4 (3 ex.). The species is recorded for the first time from Zambia and the Ethiopian region.

Euphthiracaridae

Acrotritia ardua (Koch, 1841)
Locality: Z-1-2 (6 ex.), Z-3 (6 ex.), Z-4 (1 ex.). The species is recorded for the first time from Zambia.

Acrotritia clavata (Märkel, 1964)
Locality: Bol (2 ex.).

Acrotritia vestita (Berlese, 1913)
Locality: Z-4 (12 ex.). The species is recorded for the first time from Zambia.

Steganacaridae

Atropacarus (Hoplophorella) stilifer (Hammer, 1961)
Locality: Z-3 (5 ex.). The species is recorded for the first time from Zambia.

Atropacarus (Hoplophorella) vitrinus (Berlese, 1913)
Locality: Cam-2 (15 ex.), Z-1-2 (1 ex.), Z-4 (1 ex.). The species is recorded for the first time from Cambodia and Zambia.

Plonaphacarus kugohi (Aoki, 1959)
Locality: Cam-1 (1 ex.), Cam-2 (25 ex.). The species is recorded for the first time from Cambodia.

Plonaphacarus machadoi (Balogh, 1958)
Locality: Z-4 (5 ex.). The species is recorded for the first time from Zambia.

Trhypochthoniidae

Archeozetes longisetosus Aoki, 1965
Locality: Cam-1 (1 ex.), Cam-2 (1 ex.). The species is recorded for the first time from Cambodia.

Malaconothridae

Malaconothrus geminus Hammer, 1972
Locality: Cam-2 (11 ex.). The species is recorded for the first time from Cambodia.

Malaconothrus pilosellus Balogh & Mahunka, 1969
Locality: Bol (1 ex.). The species is recorded for the first time from Bolivia.

Malaconothrus variosetosus Hammer, 1971
Locality: Vtn (1 ex.).

Trimalaconothrus crassisetosus fijiensis Hammer, 1971
Locality: Z-4 (1 ex.). The species is recorded for the first time from Zambia and the Ethiopian region.

Hermanniellidae

Ampullobates nigriclavatus Grandjean, 1962
Locality: Bol (3 ex.). The species is recorded for the first time from Bolivia.

Gymnodamaeidae

Arthrodamaeus johanni Hugo, 2010
Locality: Z-1-2 (1 ex.). The species is recorded for the first time from Zambia.

Arthrodamaeus vietnamicus Ermilov & Anichkin, 2011
Locality: Cam-1 (2 ex.). The species is recorded for the first time from Cambodia.

Zetorchestidae

Zetorchestes ornatus Mahunka, 1985
Locality: Z-4 (2 ex.). The species is recorded for the first time from Zambia.

Basilobelbidae

Basilobelba retiaria (Warburton, 1912)
Locality: Cam-2 (3 ex.). The species is recorded for the first time from Cambodia.

Arceremaeidae

Tecteremaeus anoporosus Balogh & Mahunka, 1969
Locality: Bol (2 ex.). The species is recorded for the first time from Bolivia.

Oppiidae

Arcoppia arcualis (Berlese, 1913)
Locality: Cam-2 (2 ex.). The species is recorded for the first time from Cambodia.

Gittella insularis Mahunka, 1998
Locality: Bol (5 ex.). The species is recorded for the first time from Bolivia.

Hammerella (Parawoasella) bayartoghtokhi Ermilov, Shtanchaeva, Subías & Anichkin, 2012
Locality: Cam-1 (1 ex.). The species is recorded for the first time from Cambodia.

Lasiobelba kuehnelti (Csiszár, 1961)
Locality: Z-3 (3 ex.), Z-4 (18 ex.). The species is recorded for the first time from Zambia.

Multioppia (Multioppia) tamdao Mahunka, 1988
Locality: Cam-1 (3 ex.), Cam-2 (2 ex.). The species is recorded for the first time from Cambodia.

Multioppia (Hammeroppia) wilsoni Aoki, 1964

Locality: Z-4 (1 ex.). The species is recorded for the first time from Zambia.

Neoamerioppia africana (Kok, 1967)

Locality: Z-3 (3 ex.). The species is recorded for the first time from Zambia.

Neoamerioppia vietnamica (Mahunka, 1988)

Locality: Cam-1 (6 ex.), Vtn (4 ex.). The species is recorded for the first time from Cambodia.

Oppiella (Oppiella) nova (Oudemans, 1902)

Locality: Z-3 (1 ex.), Cam-2 (32 ex.). The species is recorded for the first time from Zambia and Cambodia.

Oxyoppia (Oxyoppiella) polynesia (Hammer, 1972)

Locality: Cam-1 (1 ex.), Cam-2 (1 ex.). The species is recorded for the first time from Cambodia.

Pseudoamerioppia barrancensis (Hammer, 1961)

Locality: Bol (2 ex.). The species is recorded for the first time from Bolivia.

Ramusella (Sabahoppia) blattarum (Oudemans, 1911)

Locality: Cam-1 (1 ex.). The species is recorded for the first time from Cambodia.

Teratoppiidae

Teratoppia reducta Balogh & Mahunka, 1969

Locality: Bol (1 ex.). The species is recorded for the first time from Bolivia.

Rhynchoribatidae

Rhynchoribates spathulatus Balogh & Mahunka, 1969

Locality: Bol (3 ex.).

Suctobelbidae

Suctobelbella semiplumosa (Balogh & Mahunka, 1967)

Locality: Cam-2 (1 ex.). The species is recorded for the first time from Cambodia.

Suctobelbilla multituberculata Hammer, 1979

Locality: Cam-2 (1 ex.). The species is recorded for the first time from Cambodia.

Gustaviidae

Gustavia aethiopica Mahunka, 1982

Locality: Z-1-2 (1 ex.). The species is recorded for the first time from Zambia.

Eremulidae

Eremulus avenifer Berlese, 1913

Locality: Cam-1 (1 ex.), Cam-2 (1 ex.). The species is recorded for the first time from Cambodia.

Eremulus czuzdii Mahunka & Mahunka-Papp, 2009

Locality: Z-3 (1 ex.), Z-4 (2 ex.). The species is recorded for the first time from Zambia.

Eremobelbidae

Eremobelba bellicosa Balogh & Mahunka, 1967

Locality: Cam-1 (1 ex.). The species is recorded for the first time from Cambodia.

Tetracondylidae

Pseudotocepheus setiger (Hammer, 1972)

Locality: Vtn (1 ex.).

Otocepheidae

Otocepheus duplicornutus Aoki, 1965

Locality: Cam-1 (1 ex.). The species is recorded for the first time from Cambodia.

Tectocepheidae

Tectocepheus velatus (Michael, 1880)

Locality: Bol (1 ex.). The species is recorded for the first time from Bolivia.

Tegeozetes tunicatus Berlese, 1913

Locality: Cam-1 (5 ex.). The species is recorded for the first time from Cambodia.

Carabodidae

Carabodes excellens Balogh & Mahunka, 1969

Locality: Bol (11 ex.).

Phenopelopidae

Eupelops foveolatus Engelbrecht, 1975

Locality: Z-3 (2 ex.), Z-4 (6 ex.). The species is recorded for the first time from Zambia.

Microzetidae

Berlesezetes ornatissimus (Berlese, 1913)

Locality: Z-4 (2 ex.), Cam-1 (1 ex.), Cam-2 (3 ex.), Vtn (1 ex.). The species is recorded for the first time from Zambia and Cambodia.

Zetomotrichidae

Demisalto (Saltatrichus) magnus (Coetzee, 1993)

Locality: Z-3 (4 ex.), Z-4 (7 ex.). The species is recorded for the first time from Zambia.

Ceratozetidae

Trichoribates trimaculatus (Koch, 1835)

Locality: Cam-2 (1 ex.). The species is recorded for the first time from Cambodia and the Oriental region.

Mycobatidae

Lamellobates intermedius Nübel-Reidelbach & Woas, 1992

Locality: Bol (3 ex.). The species is recorded for the first time from Bolivia.

Lamellobates molecula (Berlese, 1916)

Locality: Z-1-2 (1 ex.), Z-3 (3 ex.), Z-4 (5 ex.), Cam-1 (2 ex.), Cam-2 (3 ex.), Vtn (2 ex.). The species is recorded for the first time from Zambia and Cambodia.

Paralamellobates misella (Berlese, 1910)

Locality: Z-3 (1 ex.). The species is recorded for the first time from Zambia.

Puntoribates hexagonus Berlese, 1908

Locality: Z-3 (1 ex.). The species is recorded for the first time from Zambia and the Ethiopian region.

Scheloribatidae

Fijibates rostratus Hammer 1971

Locality: Cam-2 (12 ex.). The species is recorded for the first time from Cambodia.

Scheloribates (Scheloribates) fimbriatus Thor, 1930

Locality: Bol (1 ex.), Cam-1 (16 ex.), Cam-2 (5 ex.). The species is recorded for the first time from Bolivia and Cambodia.

Scheloribates (Scheloribates) praeincisus (Berlese, 1910)
Locality: Bol (3 ex.). The species is recorded for the first time from Bolivia.

Scheloribates (Scheloribates) sp₁ (praeincisus-form)

Locality: Z-1-2 (21 ex.), Z-3 (21 ex.), Z-4 (10 ex.). The species is recorded for the first time from Zambia.

Scheloribates (Scheloribates) sp₂ (praeincisus-form)

Locality: Z-1-2 (2 ex.), Z-3 (3 ex.), Z-4 (66 ex.). The species is recorded for the first time from Zambia.

Scheloribates (Bischeloribates) mahunkai (Subías, 2010).

Locality: Cam-1 (8 ex.), Cam-2 (30 ex.), Vtn (8 ex.). The species is recorded for the first time from Cambodia.

Haplozetidae

Indoribates microsetosus Ermilov & Anichkin, 2011

Locality: Cam-2 (6 ex.). The species is recorded for the first time from Cambodia.

Indoribates panabokkei (Balogh, 1970)

Locality: Cam-1 (25 ex.), Vtn (13 ex.). The species is recorded for the first time from Cambodia.

Lauritzenia minimicoma (Beck, 1964)

Locality: Bol (4 ex.). The species is recorded for the first time from Bolivia.

Peloribates kaszabi Mahunka, 1988

Locality: Cam-1 (80 ex.), Vtn (21 ex.). The species is recorded for the first time from Cambodia.

Protoribates capucinus Berlese, 1908

Locality: Bol (14 ex.). The species is recorded for the first time from Bolivia.

Protoribates maximus (Mahunka, 1988)

Locality: Cam-1 (3 ex.), Cam-2 (4 ex.). The species is recorded for the first time from Cambodia.

Protoribates paracapucinus (Mahunka, 1988)

Locality: Vtn (12 ex.).

Trachyoribates ovulum Berlese, 1908

Locality: Cam-2 (33 ex.), Vtn (3 ex.). The species is recorded for the first time from Cambodia.

Galumnidae

Allogalumna borhidii Balogh & Mahunka, 1979

Locality: Bol (2 ex.). The species is recorded for the first time from Bolivia.

Galumna acutirostrum Ermilov & Anichkin, 2010

Locality: Vtn (1 ex.).

Galumna flabellifera Hammer, 1958

Locality: Bol (2 ex.), Cam-1 (2 ex.), Cam-2 (1 ex.). The species is recorded for the first time from Bolivia and Cambodia.

Galumna pseudokhoii Ermilov & Anichkin, 2011

Locality: Cam-1 (4 ex.), Vtn (9 ex.). The species is recorded for the first time from Cambodia.

Neogalumna araujoii (Pérez-Íñigo & Baggio, 1986) comb. nov.

Locality: Bol (3 ex.). The species is recorded for the first time from Bolivia.

Remark. Pérez-Íñigo and Baggio (1994) described *Galumna araujoii* from Brazil. However, this species differs from the other representatives of *Galumna* by the position of the adanal lyrifissures (distanced from anal plates in *Galumna araujoii*; close to anal plates in *Galumna* species). The position of the adanal lyrifissures in *Galumna araujoii* clearly corresponds to the generic character of the genus *Neogalumna* Hammer, 1973. Thus, we propose the new combination *Neogalumna araujoii* (Pérez-Íñigo & Baggio, 1994) comb. nov.

Pergalumna boliviana Ermilov spec. nov.

Locality: Bol (7 ex.).

Pergalumna decoratissima Pérez-Íñigo & Baggio, 1986

Locality: Bol (1 ex.). The species is recorded for the first time from Bolivia.

Pergalumna hauseri Mahunka, 1995.

Locality: Cam-1 (4 ex.), Cam-2 (2 ex.), Vtn (8 ex.). The species is recorded for the first time from Cambodia.

Trichogalumna africana Ermilov, Sidorchuk & Rybalov, 2011.

Locality: Z-4 (1 ex.). The species is recorded for the first time from Zambia.

We have registered 75 Bolivian specimens, which belong to 22 species, 21 genera and 15 families; 233 Zambian specimens, which belong to 26 species, 23 genera and 16 families; 405 Cambodian specimens, which belong to 37 species, 34 genera and 20 families; 96 Vietnamese specimens, which belong to 16 species, 15 genera and 11 families. Nineteen Bolivian species, and all Zambian and Cambodian species are recorded for the first time from these countries. *Indotritia bellingeri*, *Trimalaconothrus crassisetosus fijiensis* and *Punctoribates hexagonus* are recorded for the first time from the Ethiopian region. *Trichoribates trimaculatus* is recorded for the first time from the Oriental region.

Descriptions of new species

Pergalumna boliviana Ermilov spec. nov.

Figs 1–11

Material examined. Holotype: female, locality Bol. – Paratypes: three males and three females, same locality and date as holotype (see Material and methods).

Type deposition. The holotype (alcohol) is deposited in the collection of the Zoological Institute of the Russian Academy of Sciences, St. Petersburg, Russia; three paratypes (alcohol) are deposited in the collection of the Siberian Zoological Museum, Novosibirsk, Russia; three paratypes (alcohol) are in the personal collection of the first author.

Diagnosis. Body size 415–464 × 282–332. Body surface microfoveolate; prodorsum, posterior part of notogaster and ano-adanal region with striate bands. Rostrum with tooth. Interlamellar setae only by

alveoli represented. Sensilli long, setiform, ciliate. Anterior margin of notogaster not developed. Three pairs of porose areas present (*Aa* weakly transverse oval; *A1* rounded; *A2*+*A3* oblong), sometimes *A2*+*A3* divided into two oval porose areas (*A2* and *A3*). Median pore and postanal porose area absent.

Description

Measurements. Body length 448 (holotype), 415–464 (mean 442; six paratypes); body width 315 (holotype), 282–332 (mean 312; six paratypes). There are no obvious distinctions between females and males.

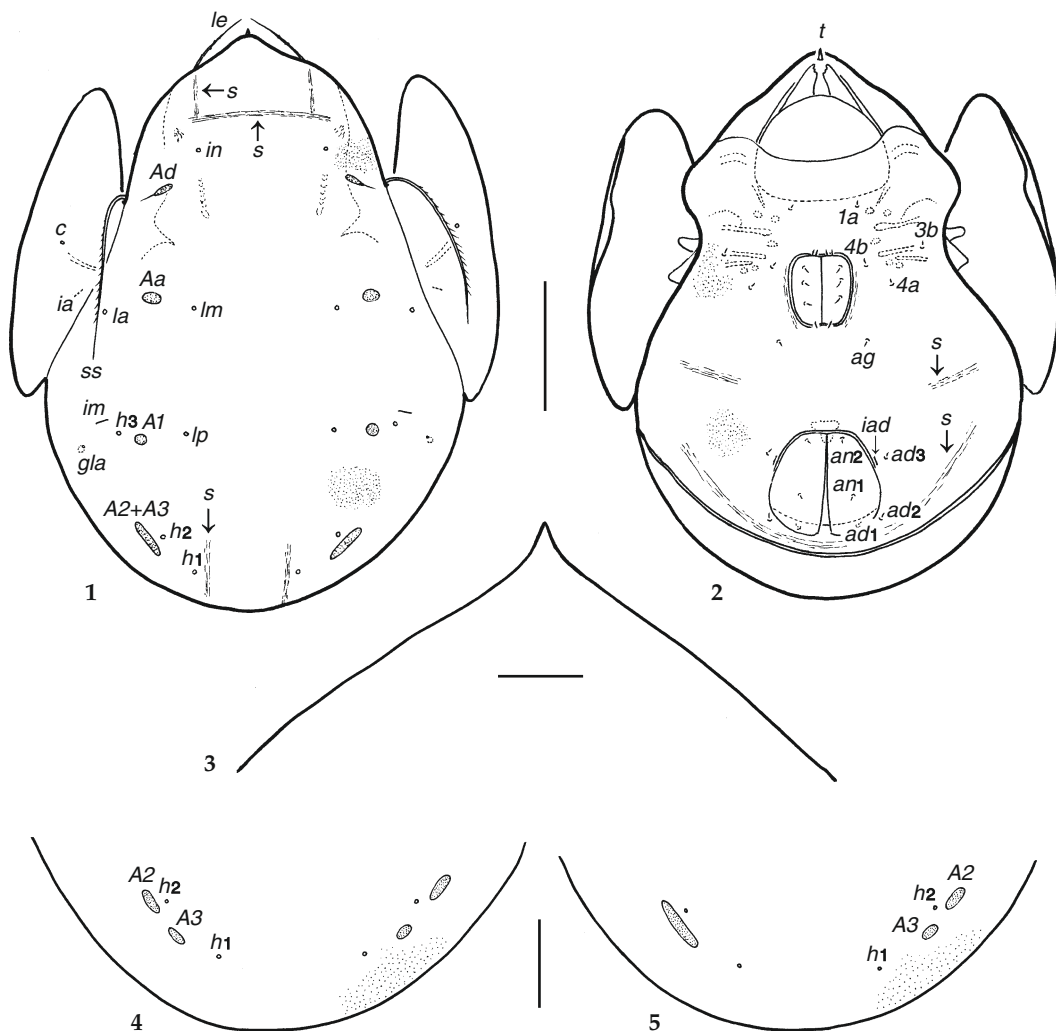
Integument (Figs 1, 2, 6, 7). Body colour brown. Body surface microfoveolate, only visible under high magnification. Prodorsum with one transverse and two longitudinal striate bands (*s*): transverse band located anterior to interlamellar alveoli; longitudinal bands parallel, each located from the transverse band to insertions of lamellar setae. Posterior part of notogaster with two parallel, longitudinal striate bands located from notogastral alveoli *p*₁ to level to the position of porose areas *A3*. Between the longitudinal bands are two arcuate bands, which are fused medially. Ventral body side with two lateral, transversal striate bands, which are located between genital and anal plates, and one arcuate striate band, which is located posteriorly to anal plates, extending marginally into the ano-adanal region.

Prodorsum (Figs 1, 3, 6, 9–11). Rostrum with strong tooth (*t*, length 8–12). Rostral (*ro*, 32–41) and lamellar (*le*, 49–53) setae setiform, sparsely barbed. Rostral setae usually not visible in dorsal view. Interlamellar setae (*in*) absent, only their alveoli present. Sensilli long (*ss*, 143–151), setiform, with short cilia unilaterally. A pair of oval porose areas *Ad* present posterolaterally to interlamellar setae. Lamellar (*L*) and sublamellar (*S*) lines distinct, parallel. Exobothridial setae absent.

Notogaster (Figs 1, 4–8). Anterior margin of notogaster not developed. Pteromorphs with poorly visible straight wrinkles. Notogastral setae represented by 10 pairs of alveoli. Three pairs of porose areas: *Aa* weakly transverse oval (16 × 10–12); *A1* rounded (10–12 in diameter); *A2*+*A3* oblong (36–

Table 1. Leg setation and solenidia of adult *Pergalumna boliviana* spec. nov. Roman letters refer to normal setae (*e* to famulus), Greek letters to solenidia. Single prime (') marks setae on anterior and double prime (") setae on posterior side of the given leg segment. Parentheses refer to a pair of setae.

Leg	Trochanter	Femur	Genu	Tibia	Tarsus
I	<i>v'</i>	<i>d</i> , (<i>I</i>), <i>bv''</i>	(<i>I</i>), <i>v'</i> , σ	(<i>I</i>), (<i>v</i>), ϕ_1 , ϕ_2	(<i>ft</i>), (<i>tc</i>), (<i>it</i>), (<i>p</i>), (<i>u</i>), (<i>a</i>), <i>s</i> , (<i>pv</i>), <i>v'</i> , (<i>pl</i>), <i>l''</i> , <i>e</i> , ω_1 , ω_2
II	<i>v'</i>	<i>d</i> , (<i>I</i>), <i>bv''</i>	(<i>I</i>), <i>v'</i> , σ	(<i>I</i>), (<i>v</i>), ϕ	(<i>ft</i>), (<i>tc</i>), (<i>it</i>), (<i>p</i>), (<i>u</i>), (<i>a</i>), <i>s</i> , (<i>pv</i>), ω_1 , ω_2
III	<i>v'</i>	<i>d</i> , <i>ev'</i>	<i>l'</i> , σ	<i>l'</i> , (<i>v</i>), ϕ	(<i>ft</i>), (<i>tc</i>), (<i>it</i>), (<i>p</i>), (<i>u</i>), (<i>a</i>), <i>s</i> , (<i>pv</i>)
IV	<i>v'</i>	<i>d</i> , <i>ev'</i>	<i>d</i> , <i>l'</i>	<i>l'</i> , (<i>v</i>), ϕ	<i>ft''</i> , (<i>tc</i>), (<i>p</i>), (<i>u</i>), (<i>a</i>), <i>s</i> , (<i>pv</i>)



Figs 1–5. *Pergalumna boliviana* Ermilov spec. nov., adult. 1. Dorsal view. 2. Ventral view, gnathosomal setae and legs not illustrated. 3. Rostrum, dorso-anterior view. 4,5. Dorsal view of posterior part of notogaster. Scale bars: 1,2 = 100 μ m; 3 = 20 μ m; 4,5 = 50 μ m.

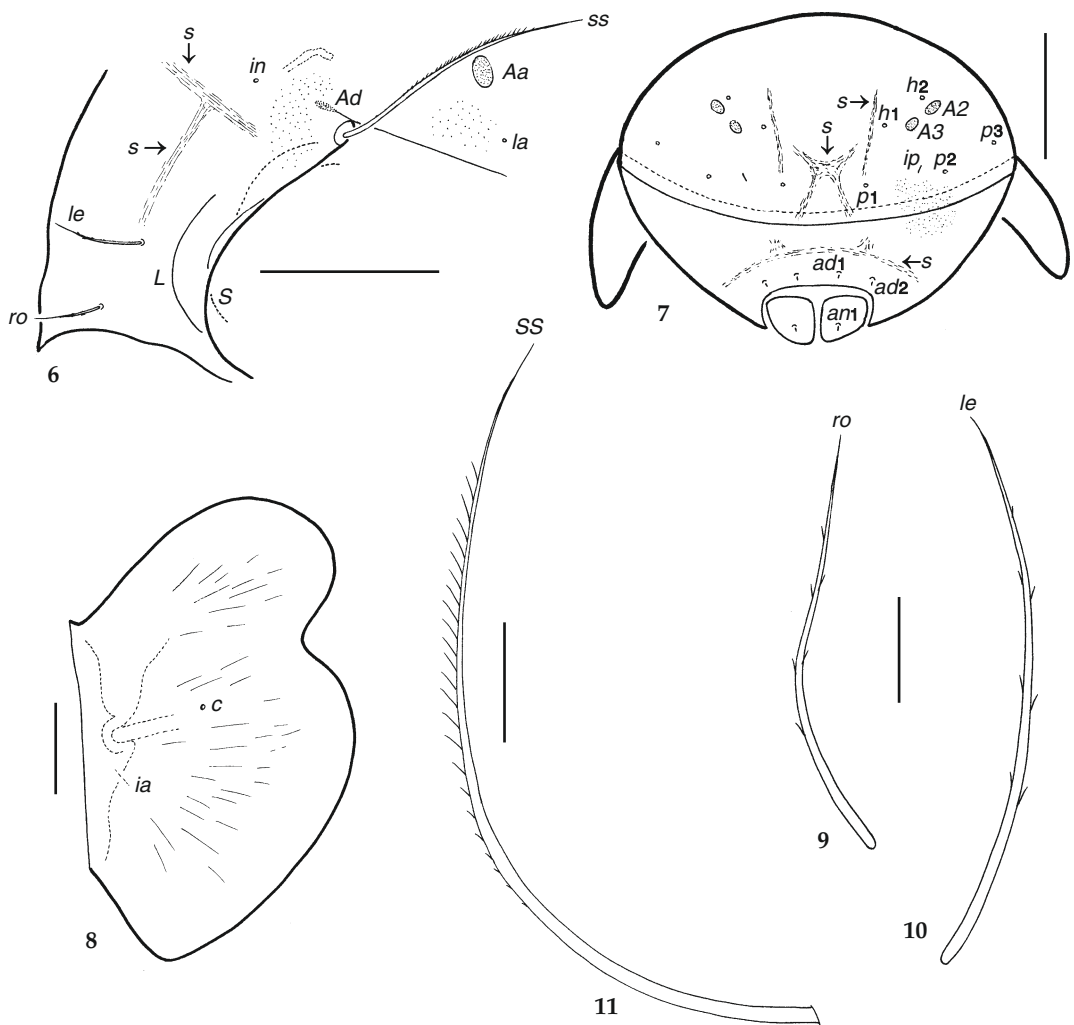
41 \times 8–12), but sometimes divided (asymmetrically in some specimens) into two oval porose areas – A2 (16 \times 8–10) and A3 (12 \times 8–10). Median pore absent in all specimens. Lyrifissures *im* transversely oriented, located lateral to A1.

Gnathosoma. Typical for *Pergalumna* (for example, see Engelbrecht 1972; Ermilov & Anichkin 2011a, 2011b). Subcapitulum little longer than wide: 106–110 \times 102. Three pairs of subcapitular setae thin, smooth: *a* (20) longer than *m* and *h* (both 8). Two pairs of adoral setae short (12), hook-like, smooth. Length of palp 73, with standard setation 0–2–1–3–9(+ ω). Solenidion attached with eupathidium. Length of

chelicera 151. Cheliceral setae long, setiform, barbed: *cha* (41) longer, than *chb* (28). Trägårdh's organ distinct.

Epimeral region (Fig. 2). Several muscle sigilla present. Apodemes 1, 2, sejugal and 3 well visible. Epimeral setal formula: 1–0–1–2. Epimeral setae (1*a*, 3*b*, 4*a*, 4*b*) short (8–10), thin, smooth.

Anogenital region (Figs 2, 7). Six pairs of genital (*g*₁, *g*₂, 10–12, *g*₃–*g*₆, 8–10), one pair of aggenital (*ag*, 8–10), three pairs of adanal (*ad*₁–*ad*₃, 8–10) and two pairs of anal (*an*₁, *an*₂, 8–10) setae thin, smooth. Anterior part of each genital plate with two setae (*g*₁, *g*₂). Lyrifissures *iad* paranal, located close to anal plates.



Figs 6-11. *Pergalumna boliviana* Ermilov spec. nov., adult. 6. Lateral view of prodorsum. 7. Posterior view. 8. Pteromorpha. 9. Rostral seta. 10. Lamellar seta. 11. Sensillus. Scale bars: 6, 7 = 100 μ m; 8 = 50 μ m; 9, 10 = 10 μ m; 11 = 20 μ m.

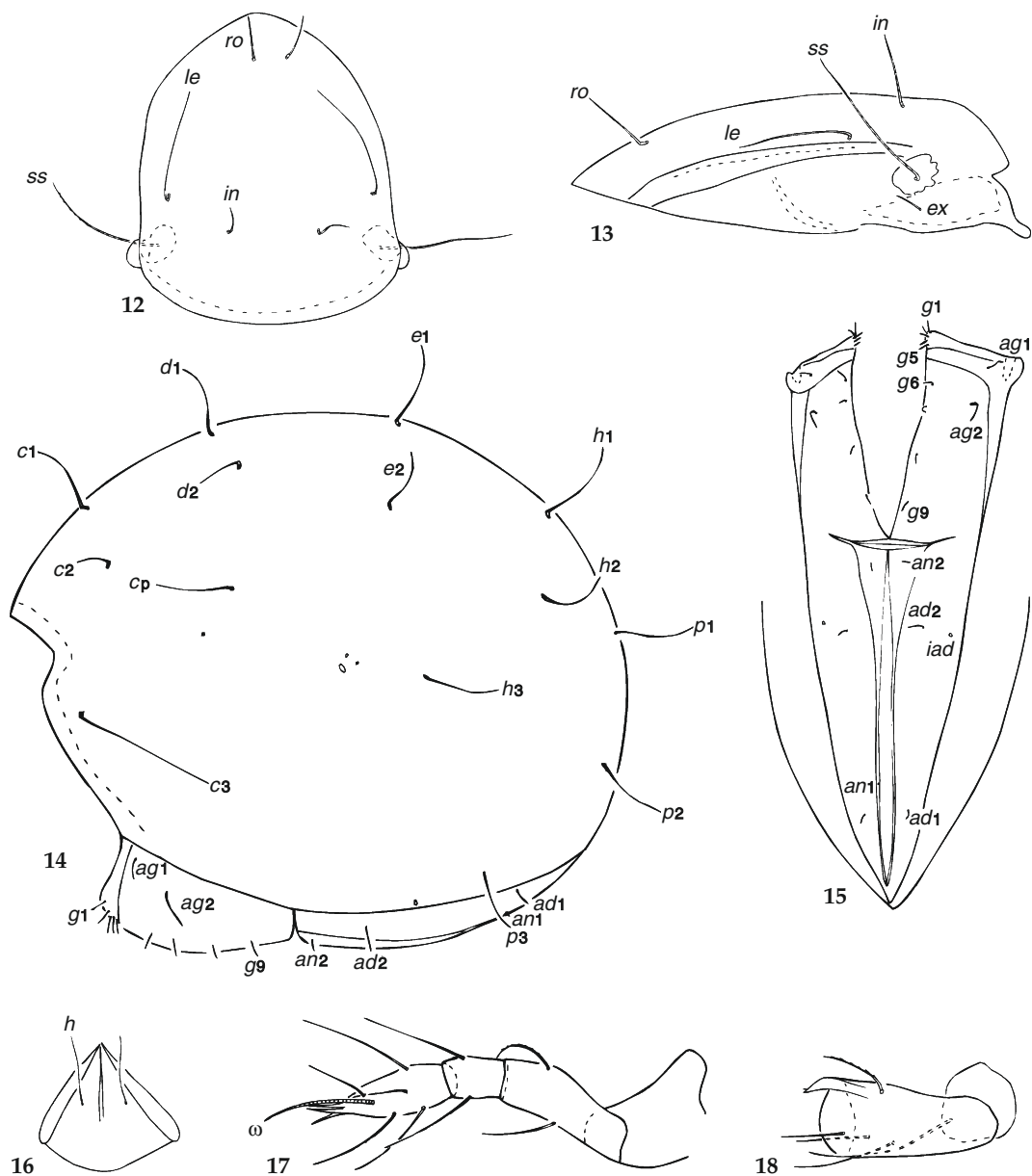
Adanal setae ad_3 inserted laterally to iad . Postanal porose area absent.

Legs. Morphology of leg segments, setae and solenidia typical for *Pergalumna* (for example, see Engelbrecht 1972; Ermilov & Anichkin 2011a,b). Formulae 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.

Etymology. The new species is named after the country Bolivia, where the material was collected.

Comparison. *Pergalumna boliviana* spec. nov. is distinguishable from all species of the genus *Pergalumna* by the presence of striate bands, which are located on prodorsum, posterior part of the notogaster and the ano-adanal region.

In having the following combination: absence of anterior margin of notogaster and interlamellar setae, long and setiform sensilli, line bands on prodorsum, the morphology of the ventral plate (including presence of line bands and position of setae) and microfoveolate body surface, *Pergalumna boliviana* spec. nov. is similar to *Pergalumna passimpunctata* Balogh & Mahunka, 1969 from Brazil (see Balogh &



Figs 12–18. *Austrotrititia parabellingeri* Niedbala spec. nov., adult. 12. Dorsal view of prodorsum. 13. Lateral view of prodorsum. 14. Lateral view of opisthosoma. 15. Ventral region. 16. Mentum of subcapitulum. 17. Palp. 18. Trochanter and femur of leg I. See sizes of body and body structures in text.

Mahunka 1969a; also our data), but it differs from the latter by the larger body size (415–464 × 282–332 in *P. boliviana* spec. nov.; 278 × 213 (data of our research) in paratype of *P. passimpunctata*), rostrum with tooth (rounded in *P. passimpunctata*), longer lamellar setae (shorter in *P. passimpunctata*), thick line bands on

prodorsum (thin in *P. passimpunctata*), presence of line bands on posterior part of notogaster (absent in *P. passimpunctata*).

In having the following combination: absence of anterior margin of notogaster and interlamellar setae, setiform sensilli, three pairs of porose areas

and pointed rostrum, *Pergalumna boliviana* spec. nov. is similar to *Pergalumna bifissurata* Hammer, 1972 from Polynesia and Galapagos Islands (see Hammer 1972), but it differs from the latter by the presence of specific striate bands (absent in *P. bifissurata*), smaller body length (415–464 versus 620 in *P. bifissurata*), longer sensilli (shorter in *P. bifissurata*), oblong porose areas A3 or sometimes divided A3 (oval, not divided in *P. bifissurata*) and two pairs of genital setae on anterior parts of genital plates (three in *P. bifissurata*).

***Austrotritria parabellingeri* Niedbala spec. nov.**

Figs 12–18

Material examined. Holotype: locality Z-4 (see Material and methods).

Type deposition. The holotype (alcohol) is deposited in the collection of the Adam Mickiewicz University, Poznań, Poland.

Diagnosis. Double lateral carinae of prodorsum. Very long, smooth setae c_3 of notogaster. Aggenital setae ag_2 longer than setae ag_1 . Two pairs of anal and two pairs of adanal setae present.

Description

Measurements. Prodorsum: length 341, width 293, height 105. Prodorsal setae: rostral setae 58, lamellar setae 91, sensilli 212, interlamellar setae 56, exobothrodial setae 13. Notogaster: length 687, width 545, height 535. Notogastral setae: c_1 91, c_3 172, h_1 99, p_1 104. Ventral region: genitoaggenital plate 202×50 , anal and adanal plates 328×60 .

Integument. Integumental surface of body micropunctate.

Prodorsum (Figs 12, 13). With two pairs of long lateral carinae reaching lateral margins of rostrum. Rostral and interlamellar setae short, erect, rough. Lamellar setae longer, procumbent and smooth. Sensilli long, filiform, attenuate, rough.

Notogaster (Fig. 14). With short ($c_1 < \frac{1}{2}c_1 - d_1$), rough setae except c_3 setae very long and smooth; setae c_1 and c_2 remote from anterior border; setae c_3 at border. Opisthonotal gland openings and five pairs of lyrifissures present.

Gnathosoma (Figs 16, 17). Setae h of mentum considerably longer than their mutual distance. Palps three-segmented with setal formula: 2–2–8(+0).

Anogenital region (Figs 14, 15). Genitoaggenital plates each with nine pairs of setae, setae g_5 distanced from setae g_6 . Aggenital setae ag_2 longer than setae ag_1 . Two pairs of anal and two pairs of adanal setae present. Anal setae an_1 placed in posterior part of

anal plates anteriorly of setae ad_1 . Lyrifissures *iad* placed at the level of ad_2 setae.

Legs (Fig. 18). Tarsi heterotridactylous. Femora I with distinct distal spine. Formulae of leg setation and solenidia (without tarsi): I (1–4–5–5) [2–1], II (1–4–4–3) [1–1], III (3–2–3–3) [1–1], IV (3–2–2–3) [1–1].

Etymology. The prefix *para* is Latin meaning “near” and refers to the similarity of the new species with *Indotritia bellingeri* Niedbala & Schatz, 1996.

Comparison. All morphological characters are similar to *Indotritia bellingeri* Niedbala & Schatz, 1996 except the generic character – incomplete furrow present between genital and aggenital plates in *Indotritia*.

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