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AMBOROPPIA BAYARTOGTOKHI GEN. N., SP. N. (ACARI, ORIBATIDA, OPPIIDAE, ARCOPPIINAE) FROM BOLIVIA

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We propose a new oribatid mite genus, *Amboroppia* gen. n. (Oribatida, Oppiidae, Arcoppiinae), with *Amboroppia bayartogtokhi* sp. n. as type species. The genus is described based on adults from Bolivia. It can be distinguished from similar genera (*Mimoppia* Balogh 1983 and *Similoppia* Mahunka 1983) by the structure of the bothridial seta (spindle-shaped, narrowly elongate, dilated in mediodistal part, without cilia) atypical of Arcoppiinae, as well as by the position of the lamellar seta (before the translamella).

Keywords: oppiid mite, new genus, new species, taxonomy, morphology, Neotropical Region

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The oribatid mite family Oppiidae (Acari, Oribatida, Oppioidea) comprises 1073 species (with 53 subspecies) distributed across 131 genera (Subías 2021). During our study of Bolivian oppiids, we found a new genus of the subfamily Arcoppiinae. Herein we describe and illustrate *Amboroppia* gen. n., with *A. bayartogtokhi* sp. n. as type species, based on adults.

In Bolivia, the family Oppiidae has been studied briefly: only a few species have been recorded (e.g. Hammer, 1958; Balogh, Mahunka, 1969; Ermilov, Niedbała, 2013).

MATERIALS AND METHODS

Specimens. The specimens of the new species were kindly provided by the Institute of Soil Biology, České Budějovice, Czech Republic. The type material is distributed among two institutions: the Senckenberg Museum of Natural History, Görlitz, Germany (SMNH); and the Tyumen State University Museum of Zoology, Tyumen, Russia (TSUMZ).

Observation and documentation. 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 notogaster. Notogastral width refers to the maximum 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. Drawings were made with a camera lucida using a Leica transmission light microscope "Leica DM 2500".

Terminology and conventions. Morphological terminology used in this paper mostly 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.

Abbreviations and notations. Prodorsum: *ctc* = costular-transcostular complex; *con* = concavity; *ro*, *le*, *in*, *bs*, *ex* = rostral, lamellar, interlamellar, bothridial, and exobothridial seta, respectively; *lpr* = lateral prodorsal ridge. Notogaster: *c*, *la*, *lm*, *lp*, *h*, *p* = notogastral setae; *ia*, *im*, *ip*, *ih*, *ips* = notogastral lyrifissures; *gla* = opisthonotal gland opening. Gnathosoma: *a*, *m*, *h* = subcapitular setae; *or* = adoral seta; ω = palp solenidion; *cha*, *chb* = cheliceral setae; *Tg* = Trägårdh's organ. Epimeral and lateral podosomal regions: *1a–c*, *2a*, *3a–c*, *4a–c* = epimeral setae; *PdI* = pedotectum I; *dis* = discidium. Anogenital region: *g*, *ag*, *an*, *ad* = genital, aggenital, anal, and adanal seta, respectively; *iad* = adanal lyrifis-

sure; *po* = preanal organ. Legs: ω, φ, σ = leg solenidia; ε = leg famulus.

TAXONOMY

Family Oppiidae Sellnick 1937

Subfamily Arcoppiinae Balogh 1983

Genus ***Amboroppia*** Ermilov et Starý gen. n.

Type species *Amboroppia bayartogtokhi* Ermilov et Starý sp. n.

Generic diagnosis. Adult. *Size*. Length about 400. *Integument*. Prodorsum partially densely tuberculate. *Prodorsum*. Rostrum tripartite. Costula and transcostula forming arch-like ridge. Medioanterior part of prodorsum with longitudinally elongate concavity. Interbothridial and postbothridial tubercles absent. Interbothridial muscle sigillae present. Rostral, lamellar and interlamellar setae well developed, setiform; *le* located before translamella. Bothridial seta very long, spindle-form, narrowly elongate dilated in mediodistal part, without cilia. *Notogaster*. Without humeral tooth and crista. Ten pairs of setiform setae, *c* distinctly shorter than others, *la* inserted posterolaterally to *lm*. *Gnathosoma*. Subcapitulum diarthric. Adoral seta present. Palp setation: 0-2-1-3-8(+1ω); solenidion long, bacilliform, pressed to the tarsus surface. Chelicera chelate-dentate. *Epimeral and lateral podosomal regions*. Epimeral border IV present. Epimere III + IV longitudinally elongated. Epimeral setal formula: 3-1-3-3; setae setiform. Epimeral and ventrosejugal tubercles absent. Pedotectum I represented by small lamina. Discidium slightly developed. *Anogenital region*. With six pairs of genital, one pair of aggenital, two pairs of anal, and three pairs of setiform adanal setae. All adanal setae lateral to anal plate, distance between ad_3–ad_3 longer than *ag*–*ag* and ad_2–ad_2. Adanal lyrifissure parallel and close to anal aperture. *Legs*. Setae *l*'' and *v*' present on tarsus I, *l*'' present on tarsus II. Tarsus II with two solenidia. Juvenile instars. Unknown.

Differential diagnosis. Among Arcoppiinae, *Amboroppia* gen. n. is similar to the genera *Mimoppia* Balogh 1983 and *Similoppia* Mahunka 1983 from the Ethiopian and Neotropical regions (see Balogh, 1983; Mahunka, 1983; Subías, 2021). The three aforementioned genera are similar in having a tripartite rostrum, an arch-like costular-transcostular complex, and long dorsal notogastral setae. They are also similar in the absence of long apical branch(es) on the bothridial head. However, the new genus differs from *Mimoppia* and *Similoppia* in the atypical (for Arcoppiinae) morphology of bothridial seta (spindle-form, narrowly elongate, dilated in mediodistal part, without cilia versus pectinate in *Mimoppia* and globular or lanceolate in *Similoppia*). Also, in *Amboroppia*, the lamellar seta is located before translamella (versus behind translamella in *Mimoppia* and *Similoppia*). In addition, in *Similoppia*, adanal seta ad_1 is in postanal position (versus in lateral position in *Amboroppia*) and *Similoppia*'s epimere III + IV is comparatively short (versus longitudinally elongate in *Amboroppia*).

Etymology. The generic name refers to the Amboró National Park, near which the type material was collected + '*oppia*', a common suffix for generic names in Oppiidae.

Amboroppia bayartogtokhi Ermilov et Starý sp. n. (Figs 1–3)

Material. Holotype (♀) and two paratypes (2♀♀): Bolivia, Espejillos environs near Amboró National Park, 17°53′22″ S, 63°26′48″ W, 562 m a.s.l., sifting leaf litter in rain forest, 29.XI.2009 (collected by B. Greenway).

The holotype is deposited in the SMNH; two paratypes are deposited in the TSUMZ. All specimens are preserved in ethanol with a drop of glycerol.

Diagnosis. Body size: 398–415 × 223–232. Prodorsum partially densely tuberculate. Tripartite rostrum with short median tooth and longer, connected forwards lateral parts. Costular-transcostular complex small, arch-like. Prodorsal setae long, setiform, barbed; *in* longest, *ex* shortest and thinnest. Bothridial seta very long, spindle-form, narrowly elongate dilated in mediodistal part, barbed. Notogastral setae setiform, barbed; *c* short, others long. Epimeral and anogenital setae setiform, barbed. Discidium rounded.

Description. *Measurements*. Body length: 398 (holotype), 398, 415 (paratypes); notogaster width: 223 (holotype), 223, 232 (paratypes).

Integument (Figs 1*a*, 1*c*; 3*a*, 3*c*). Body color light brown. Body surface microporose (visible only under high magnification in dissected specimens, ×1500). Dorsal and lateral (between bothridium and acetabula I–III) parts of prodorsum densely tuberculate (diameter of tubercles up to 4).

Prodorsum (Figs 1*a*, 1*c*; 3*a*, 3*c*). Rostrum tripartite; median tooth short, lateral parts long, connected forward tooth (illusory, median tooth sunken). Costulae and transcostula forming small arch-like ridge. Region between rostrum and costular-transcostular complex with elongate concavity; additional oval concavity located behind complex. Rostral (41–45), lamellar (41–45), interlamellar (57–61), and exobothridial (30–32) setae setiform, barbed; *ex* thinner than others. Bothridial seta (114–118) spindle-form, narrowly elongate dilated in mediodistal part, barbed. Interbothridial region with three pairs of muscle sigillae. Interlamellar

Fig. 1. *Amboroppia bayartogtokhi* sp. n., adult: *a* – dorsal view, *b* – ventral view (legs not shown), *c* – lateral view (gnathosoma and legs not shown). Scale bar 100 μm.

Fig. 2. *Amboroppia bayartogtokhi* sp. n., adult: *a* – subcapitulum, ventral view; *b* – palp, right, antiaxial view; *c* – chelicera, left, paraxial view; *d* – leg I, right, antiaxial view; *e* – leg II, without tarsus, right, antiaxial view, *f* – leg III, without tarsus, right, ventral view, *g* – leg IV, left, antiaxial view. Scale bar (μm): *a*, *c*–*g* – 20; *b* – 10.

Fig. 3. *Amboroppia bayartogtokhi* sp. n., adult, microscope images: *a* – dorsal view, *b* – ventral view, *c* – lateral view.

Table 1. Leg setation and solenidia of adult *Amboroppia bayartogtokhi* sp. n.

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*), *l"*, *v'*, (*pl*), 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*)

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.

and postbothridial tubercles absent. Longitudinal row, comprising several muscle sigillae, present in front of the bothridium. Lateral prodorsal ridge strong, arch-like.

Notogaster (Figs 1*a*, 1*c*; 3*a*, 3*c*). Anterior border convex medially. Ten pairs of notogastral setae (*c*, 22–24; others 73–77) setiform, barbed. Opisthonotal gland opening and all notogastral lyrifissures distinct.

Gnathosoma (Figs 2*a*–2*c*). Subcapitulum longer than wide (86–94 × 61–65). Subcapitular setae *m* (28–32) and *h* (32–36) setiform, shortly ciliate; a (20–24) setiform, barbed. Adoral seta (8) setiform, thin, smooth. Palp (49–53) with typical setation: 0-2-1-3-8(+1ω). Postpalpal seta (4) spiniform, roughened. Chelicera (86–94) with two setiform, barbed setae (*cha*, 24–28; *chb*, 16–20).

Epimeral and lateral podosomal regions (Figs 1*b*, 1*c*; 3*b*, 3*c*). Epimeral border IV well developed, semi-oval. With typical epimeral setal formula: 3-1-3-3. All epimeral setae (*1a*, *2a*, *3a*, *4b*, 20–24; others 45–53) setiform, barbed; *1b* and *1c* located close to each other. Discidium rounded.

Anogenital region (Figs 1*b*, 1*c*; 3*b*, 3*c*). Genital (20–24), aggenital (45–53), adanal (45–53), and anal (24–32) setae setiform, barbed. Adanal lyrifissure distinct.

Legs (Figs 2*d*–2*g*; 3*c*). Claw of legs roughened on dorsal side. Trochanter III with two or three posterior teeth. All femora with large ventral porose area. 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.

E t y m o l o g y. The species name is dedicated to our friend and colleague, acarologist Prof. Dr. Badamdorj Bayartogtokh (National University of Mongolia, Ulaanbaatar, Mongolia), for his extensive contributions to our knowledge of the taxonomy and ontogeny of oribatid mites.

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AMBOROPPIA BAYARTOGTOKHI GEN. N., SP. N. (ACARI, ORIBATIDA, OPPIIDAE, ARCOPPIINAE) ИЗ БОЛИВИИ

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Предложен и описан новый род панцирных клещей *Amboroppia* gen. n. (Oribatida, Oppiidae, Arcoppiinae) с типовым видом *A. bayartogtokhi* sp. n., собранным в Боливии. От близких родов *Mimoppia* Balogh 1983 и *Similoppia* Mahunka 1983 отличается нетипичной морфологией трихоботрии (веретеновидная, с узко продолговатой медиодистальной частью, без ресничек) и расположением ламеллярной щетинки перед трансламеллой.

Ключевые слова: клещи-оппииды, новый род, новый вид, таксономия, морфология, Неотропическая область