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A NEW GENUS AND SPECIES OF AMEROBELBIDAE (ACARI: ORIBATIDA) FROM VIETNAM

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ABSTRACT — A new genus, *Roynortonia* **n. gen.**, with its type species, *Roynortonia vietnamica* **n. sp.**, belonging to the family Amerobelbidae, is proposed and described from dark loamy soil of *Lagerstroemia* forest of Cat Tien National Park (southern Vietnam). An identification key to the known genera of Amerobelbidae is presented.

KEYWORDS — oribatid mites; new genus; new species; Amerobelbidae; Vietnam

INTRODUCTION

In the course of faunistic studies of oribatid mite fauna of Cat Tien National Park (southern Vietnam), I found a new species of the family Amerobelbidae (Amerioidea). This small family includes five genera with 11 species distributed in the Holarctic region (Subías 2004, online version 2010), but no species was known from Vietnam. On the basis of analysis of generic character states, I propose a new genus, *Roynortonia* **n. gen.**, with *Roynortonia vietnamica* **n. sp.** as type species.

MATERIALS AND METHODS

Collection locality and habitat of the new species are characterized in the "Material examined" section. Specimens were studied in lactic acid, mounted in temporary cavity slides, then stored in 70% alcohol in vials. All body measurements are presented in micrometers. Body length was mea-

sured 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 distension. Notogastral width refers to the maximum width in dorsal aspect. Length of body setae was measured in lateral aspect.

FAMILY AMEROBELBIDAE

Genus *Roynortonia* **n. gen.**

Diagnosis

General characters of the family Amerobelbidae (Grandjean 1965). Rostrum rounded in dorsal view. Lamellar lines absent. Rostral (*ro*) and lamellar (*le*) setae setiform, short. Interlamellar (*in*) setae setiform, long. Lamellar setae inserted closer to interlamellar setae than to rostral setae. Sensilli (*ss*) with short cilia. Bothridia modified, with long, rigid projection posteriorly. Dorsosejugal scissure complete,

slightly convex. Notogaster with one pair of short, thin spines anterolaterally. Epimeral setal formula 3-1-3-3. Aggenital neotrichy absent, one pair of aggenital setae present. Epimeral setae *3b* modified, long, thorn-like. Epimeral setae *3b*, *3c*, *4b* and *4c* positioned adjacent to each other, so that epimeres III and IV without setae laterally.

Type species — *Roynortonia vietnamica* **n. sp.**

Etymology — The genus is named in honor of Prof. Dr. Roy A. Norton (State University of New York, College of Environmental Science and Forestry, Syracuse, USA), the distinguished acarologist, for his extensive contributions to our knowledge of the oribatid mites.

Remarks — The family Amerobelbidae comprises five genera: *Amerobelba* Berlese, 1908, *Berndamerus* Mahunka, 1977, *Hellenamerus* Mahunka, 1974, *Mongaillardia* Grandjean, 1961, *Rastellobata* Grandjean, 1961. Two other genera, *Yambaramerus* and *Grypoceramerus*, have been included in Amerobelbidae, but I question this placement.

Aoki (1996) described *Yambaramerus* including it in Amerobelbidae. However both known representative of *Yambaramerus*, *Y. arcuatus* Aoki and Yamamoto, 2000 and *Y. itoi* Aoki, 1996, differ from other Amerobelbidae by body proportions (prodorsum and notogaster approximately equal in length in *Yambaramerus*; prodorsum obviously shorter than notogaster in other Amerobelbidae), lamellar setae inserted on well-developed apophyses, close to each other (not inserted on well-developed apophyses, and not close each other in other Amerobelbidae), lamellar lines well-developed (lamellar lines absent or slightly developed in other Amerobelbidae), presence of ring-like structures adjacent to interlamellar setae (absent in other Amerobelbidae), notogaster with two pairs of long and strongly developed thorn-like processes in humeral region (thorn-like structures absent or only one pair of small tubercles or spines present in other Amerobelbidae).

Suzuki and Aoki (1970) described *Grypoceramerus* and included it in Amerobelbidae. However, the representative of *Grypoceramerus*, *G. acutus* Suzuki and Aoki, 1970, strongly differs from other Amerobelbidae by body proportions (prodorsum

and notogaster approximately equal in length in *Grypoceramerus*; prodorsum obviously shorter than notogaster in other Amerobelbidae), notogastral setae *c* and *la* adjacent to each other and separated from other setae (not adjacent to each other or removed from other setae in other Amerobelbidae).

In my opinion, based on these character states *Yambaramerus* and *Grypoceramerus* are dissimilar to other genera of Amerobelbidae, and should not be considered members of this family. I do not discuss a place of *Yambaramerus* and *Grypoceramerus* in Ameroidea herein, their placement should be addressed in a separate publication.

Roynortonia **n. gen.** clearly differs from all other genera of Amerobelbidae by the following characters: 1) epimeral setae *3b* modified, long, thorn-like, 2) epimeral setae *3b*, *3c*, *4b* and *4c* positioned adjacent to each other, 3) absence of aggenital neotrichy. Modified epimeral seta *3b* is unique in Ameroidea and as far as I know it is unknown in Brachypylyina. The presence of one pair of aggenital setae is unique in Amerobelbidae, all other genera express aggenital neotrichy; the type species of the new genus has an unusual structure – a long, rigid projection posterior to the bothridium. This is the first record of a bothridia bearing projection in Brachypylyina. However, there are a small number of oribatid species with short bothridial projections in a same position in the Ameroidea, for example, *Staurobates schusteri* Grandjean, 1966 and *Stauroma cephalotum* Grandjean, 1966 in Staurobatidae.

The new genus is most similar to *Amerobelba* in morphology of lamellar setae, absence of lamellar lines, absence of well-developed notogastral tubercles in humeral region (absent in *Amerobelba*, only very short spines developed in *Roynortonia* **n. gen.**), position of notogastral setae.

Key to known genera of Amerobelbidae

1. Epimeral setae *3b* modified, thorn-like; aggenital neotrichy absent *Roynortonia* **n. gen.**
— Epimeral setae *3b* not modified, setiform; aggenital neotrichy present 2
2. Dorsal notogastral setae located medially on notogaster, setae *c*₁ and *la* inserted adjacent to each

FIGURE 1: *Roynortonia vietnamica* n. sp.: A – dorsal view, legs not shown, B – ventral view, gnathosoma and legs partly not shown, C – lateral view, gnathosoma and legs partly not shown. Scale bar (A+B, C) 50 μ m.

- other *Hellenamerus*
 — Dorsal notogastral setae located both medially and laterally on notogaster 3
3. Sensilli with very long cilia; notogastral setae long, *la* and *lm* reaching insertions *h*₃ and *lp*, accordingly *Rastellobata*
 — Sensilli with short cilia; notogastral setae shorter 4
4. Sexual dimorphism present: males with hook-shaped lamellar setae *Mongaillardia*
 — Sexual dimorphism absent: males with normal lamellar setae 5
5. Prodorsum with well-developed lamellar lines; notogastral tubercles in humeral region present *Berndamerus*
 — Prodorsum without well-developed lamellar lines; notogastral tubercles in humeral region absent *Amerobelba*

DESCRIPTION OF NEW SPECIES

Roynortonia vietnamica n. sp. (Figures 1 – 3)

Diagnosis

Body size 196 – 229 × 108 – 123; rostral and lamellar setae short, minute barbed; interlamellar setae long, barbed. Bothridial projections long, rigid, directed posterolaterally, 20 – 24, smooth. Notogastral spines very short (2 – 4), conical. Notogastral setae, 10 pairs, heterotrichous: anterior five pairs of medium long, posterior five pairs shorter. Setae *3b* (41), thorn-like.

Description

Measurements — Body length 217 (holotype, male), 196 – 229 (six paratypes; two males and four females); body width 114 (holotype, male), 108 – 123 (six paratypes; two males and four females).

Integument — Body color light brown. Surface of body smooth. Granular and cloud-like cerotegument covers lateral parts of body and regions of

dorsosejugal scissure and sejugal apodemes. Granules very small (diameter less than 1 μm).

Prodorsum — (Figure 1A, C; Figure 2A–D). Rostral and lamellar setae 10 – 12, minute barbed. Interlamellar setae 36 – 45, barbed. Sensilli long, 57 – 65, setiform, with more than 20 cilia unilaterally. Bothridial projections long, rigid, directed posterolaterally, 20 – 24, smooth. Exobothridial setae very short (4), thin, smooth.

Notogaster — (Figure 1A, C; Figure 2D). Notogastral spines very short (2 – 4), conical. Notogastral setae with indistinct barbs; setae *c*, *la*, *lm*, *lp* and *h*₃ (24 – 28) longer than others (12 – 16). Notogastral setae inserted on all notogaster surface. All lyrifissures and opisthonotal gland opening distinct; lyrifissures *ia* located posteriorly to notogastral spines.

Anogenital region — (Figure 1B, C; Figure 2E, F). Two pairs anal (*an*₁, *an*₂, 10 – 12), three pairs adanal (*ad*₁–*ad*₃, 12 – 20), one pair aggenital (*ag*, 10 – 20) and six pairs genital (*g*₁–*g*₆, 4 – 6) setae setiform, smooth. Lyrifissures *iad* in direct apoanal position.

Epimeral region — (Figure 1B, C; Figure 2G). Only apodemes 1, 2 and complete sejugal apodeme well-developed. Setae *3b* longest (41), thorn-like, smooth, inserted on large apophyses; setae *1a*, *2a*, *4a* shortest (12 – 16), setiform, slightly barbed; other setae 20 – 32, setiform, with short barbs.

Gnathosoma — (Figure 2H–J). Subcapitulum longer than wide (45 – 49 × 32 – 34). Hypostomal setae setiform, smooth; *h* (8 – 10) little longer than *m* (6 – 8) and *a* (6). One pair of adoral setae (*or*₁, *or*₂) minute (1). Palp (length 32) with setation 0-2-1-3-9(+1ω). Solenidion pressed to surface of palptarsus. Chelicera (57) chelate-dentate. Cheliceral setae setiform, barbed; *cha* (18) longer, than *chb* (12).

Legs — (Figure 3A–D). Formulae of leg setation including famulus and solenidia (in square brackets): I (1-5-3-4-20) [1-2-2], II (1-5-3-4-16) [1-1-2], III (2-3-1-3-15) [1-1-0], IV (2-3-2-3-12) [0-1-0]; homology of setae and solenidia indicated in Table 1. All setae setiform. Famulus short, conical. Solenidia ω₁ on tarsi I, ω₁ and ω₂ on tarsi II, σ on genua III thickened, rod-like; solenidia ω₂ on tarsi I, φ₁ and φ₂ setiform; other solenidia thickened, strongly curved in median part.

FIGURE 2: *Roynortonia vietnamica* n. sp.: A – rostral setae, B – interlamellar seta, C – sensillus, D – postbothridial and anterio-lateral notogastral regions, E – genital plate, left, F – anal plate, left, G – epimeral seta 3b, H – subcapitulum, I – palp, J – chelicera. Scale bar (A+B, C-G, I) 10 μ m, scale bar (H, J) 20 μ m.

TABLE 1: Leg setation and solenidia of *Roynortonia vietnamica* n. sp.

Leg	Trochanter	Femur	Genu	Tibia	Tarsus
I	<i>v'</i>	<i>d, (l), bv'', v''</i>	<i>(l), v', σ</i>	<i>(l), (v), φ₁, φ₂</i>	<i>(ft), (tc), (it), (p), (u), (a), s, (pv), v', (pl), l'', e, ω₁, ω₂</i>
II	<i>v'</i>	<i>d, (l), bv'', v''</i>	<i>(l), v', σ</i>	<i>(l), (v), φ</i>	<i>(ft), (tc), (it), (p), (u), (a), s, (pv), l'', ω₁, ω₂</i>
III	<i>l', v'</i>	<i>d, l', ev'</i>	<i>l', σ</i>	<i>l', (v), φ</i>	<i>(ft), (tc), (it), (p), (u), (a), s, (pv)</i>
IV	<i>l', v'</i>	<i>d, l', ev'</i>	<i>d, l'</i>	<i>l', (v), φ</i>	<i>ft'', (tc), (p), (u), (a), s, (pv)</i>

Roman letters refer to normal setae (*e* – famulus), Greek letters refer to solenidia. One apostrophe (') marks setae on anterior and double apostrophe (") setae on posterior side of the given leg segment. Parentheses refer to a pair of setae.

Material examined — Holotype (male) and one paratype (male) were obtained from Cat Tien National Park, in southern Vietnam, 11°25' N, 107°25' E, 149 m a.s.l., in dark loamy soil of *Lagerstroemia* forest, February-March 2009, collected by A.E. Anichkin. Five paratypes (one male and four females) were obtained *ibid*, but: 11°26' N, 107°25' E, 145 m a.s.l., 20 November 2006, collected also by A.E. Anichkin.

Type deposition — The holotype is deposited in the collection of the Center for Biodiversity Resources Education and Development (CEBRED), Hanoi National University of Education, Vietnam; four paratypes are deposited in the collection of the Siberian Zoological Museum, Novosibirsk, Russia; two paratypes (dissected) are in the personal collection of the author.

Etymology — The specific name "*vietnamica*" refers to the country of origin, Vietnam.

Distribution. — At present, this species is only known from Cat Tien National Park, in southern Vietnam.

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