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THE ORIBATID MITE GENUS *CERATORCHESTES* (ACARI: ORIBATIDA: PELOPPIIDAE)

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ABSTRACT — The neotropical oribatid mite genus *Ceratorchestes* comprises four species. A new subgenus, *Ceratorchestes* (*Paraceratorchestes*) **n. subgen.**, is proposed. It is distinguishable from the nominate subgenus, *Ceratorchestes* (*Ceratorchestes*), by the length of the epimeres III + IV and the localization of setae on epimere IV. A new species, *Ceratorchestes* (*Paraceratorchestes*) *variabilis* **n. sp.**, is described and illustrated. The morphology of the gnathosoma and legs is presented and represents the first such data for a member of this genus. An identification key to all known species of *Ceratorchestes* is given.

KEYWORDS — oribatid mites; Peloppiidae; *Ceratorchestes*; new subgenus; new species; key; Ecuador

INTRODUCTION

Ceratorchestes (Acari: Oribatida: Peloppiidae) is a small oribatid mite genus that was proposed by Balogh and Mahunka (1969a) with *Ceratorchestes setosus* Balogh and Mahunka, 1969 as type species. Currently, this genus comprises four species, which are distributed in the Neotropical region: *C. baloghi* Mahunka, 1982 (see Mahunka 1982; recorded in the Neotropical region), *C. cornutus* Mahunka, 1983 (see Mahunka 1983; Costa Rica), *C. globosus* Balogh and Mahunka, 1969 (see Balogh and Mahunka 1969b; Bolivia), and *C. setosus* Balogh and Mahunka, 1969 (see Balogh and Mahunka 1969a; Brazil and Venezuela).

The main purpose of this paper is to propose a new subgenus and a new species of the genus *Ceratorchestes*. We present in detail the morphology of

the gnathosoma and legs, the first such data for any member of this genus. An identification key to all known *Ceratorchestes* is also presented.

MATERIALS AND METHODS

Material examined: Ecuador, 0°25'8.04"S, 79°0'14.04"W, Reserva de Bosque Integral Otonga, near San Francisco de las Pampas, 2000–2200 m a.s.l., sifted litter, 7.11.1996, collected by Giovanni Onore. The holotype (male) and nine paratypes were mounted in lactic acid on temporary cavity slides for measurement and illustration.

All body measurements are presented in micrometers. Body length was measured in lateral view, from the tip of the rostrum to the posterior edge of the ventral plate to avoid discrepan-

cies 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.

Terminology used in this paper follows that of Norton and Behan-Pelletier (2009).

Genus *Ceratorchestes* Balogh and Mahunka, 1969

Type species: *Ceratorchestes setosus* Balogh and Mahunka, 1969

Generic characters were proposed by Balogh and Mahunka (1969a), by J. Balogh and P. Balogh (1988), and also summarized by Balogh (1972), J. Balogh and P. Balogh (1988, 1992). The diagnosis is presented with our additions and changes below.

Generic diagnosis — Peloppiidae with the following combination of characters: prodorsal setae and sensilli well-developed, setiform; lamellae thin, long, with minute cusp; translamella present or absent; rostrum incised, pointed or truncate; tibia long, with short point, free tip; lateral sides of prodorsum with tooth; notogaster with 10 pairs of setiform notogastral setae (nine pairs long, one pair *c* minute or represented by alveoli); dorsal notogastral setae inserted in two subparallel rows; dorsophragmata and pleurophragmata present; epimeres III + IV unusually elongated or normal; sejugal apodeme interrupted medially; epimeral border IV transverse; epimeral setal formula 3-1-3-5; adanal setae setiform, *ad*₁ and *ad*₂ in paraanal position, *ad*₃ in preanal position; chelicerae chelate-dentate; legs with three claws.

Remark — Balogh and Mahunka (1969a) have proposed also following generic character - legs IV are jumping legs. In our opinion, this statement is an assumption and requires evidence, therefore we have not included it in the generic diagnosis.

Subgenera of the genus *Ceratorchestes*

Ceratorchestes (*Ceratorchestes*) Balogh and Mahunka, 1969

Type species: *Ceratorchestes setosus* Balogh and Mahunka, 1969

Diagnosis — Epimeres III + IV unusually elongated. Setae of epimere IV inserted anteriorly to genital aperture. Rostrum incised, pointed or truncate. Notogastral setae represented by nine pairs of long setae and one pair of alveoli or minute setae (*c*).

Known species:

- *C. (C.) baloghi* Mahunka, 1982
- *C. (C.) cornutus* Mahunka, 1983
- *C. (C.) globosus* Balogh and Mahunka, 1969
- *C. (C.) setosus* Balogh and Mahunka, 1969

Ceratorchestes (*Paraceratorchestes*) n. subgen.

Type species: *Ceratorchestes variabilis* n. sp.

Diagnosis — Epimeres III + IV not unusually elongated. Setae of epimere IV inserted at level of lateral to genital aperture. Rostrum incised. Notogastral setae represented by nine pairs of setae and one pair of alveoli (*c*).

Etymology — The prefix *para* is Latin meaning "near" and refers the similarity between the new subgenus and the subgenus *Ceratorchestes* (*Ceratorchestes*).

Remarks — *Ceratorchestes* (*Paraceratorchestes*) n. subgen. is distinguishable from the other subgenus *Ceratorchestes* (*Ceratorchestes*) by the normal proportion of the epimeres III + IV and the localization of setae on epimere IV (see above diagnoses to subgenera).

Known species:

- *C. (P.) variabilis* n. sp.

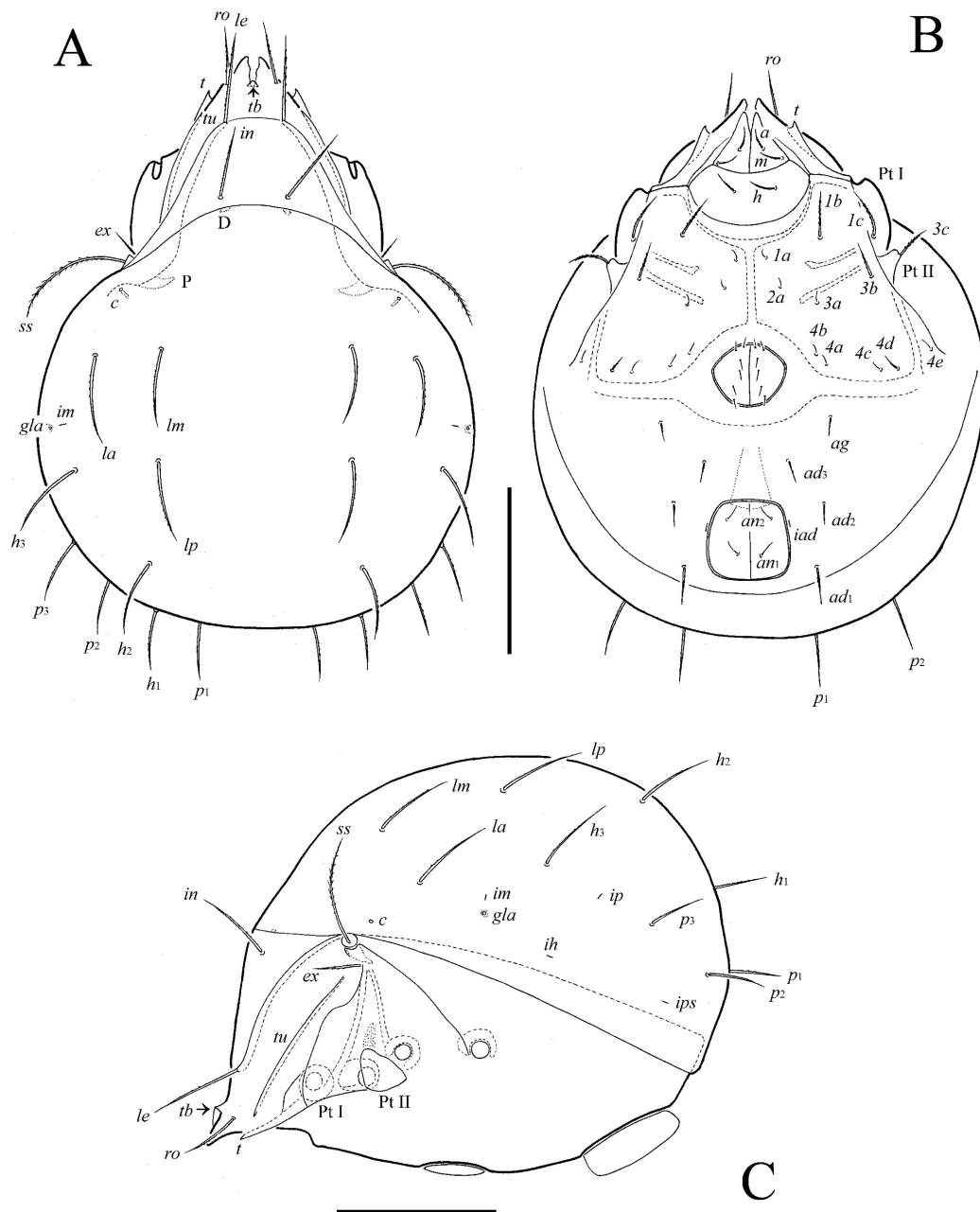


FIGURE 1: *Ceratorchestes (Paraceratorchestes) variabilis* n. sp.: A – dorsal view, legs not shown; B – ventral view, legs and palps not shown; C – lateral view, legs, gnathosoma, apodemes, epimeral and anogenital setae not shown. Scale bars 200 µm.

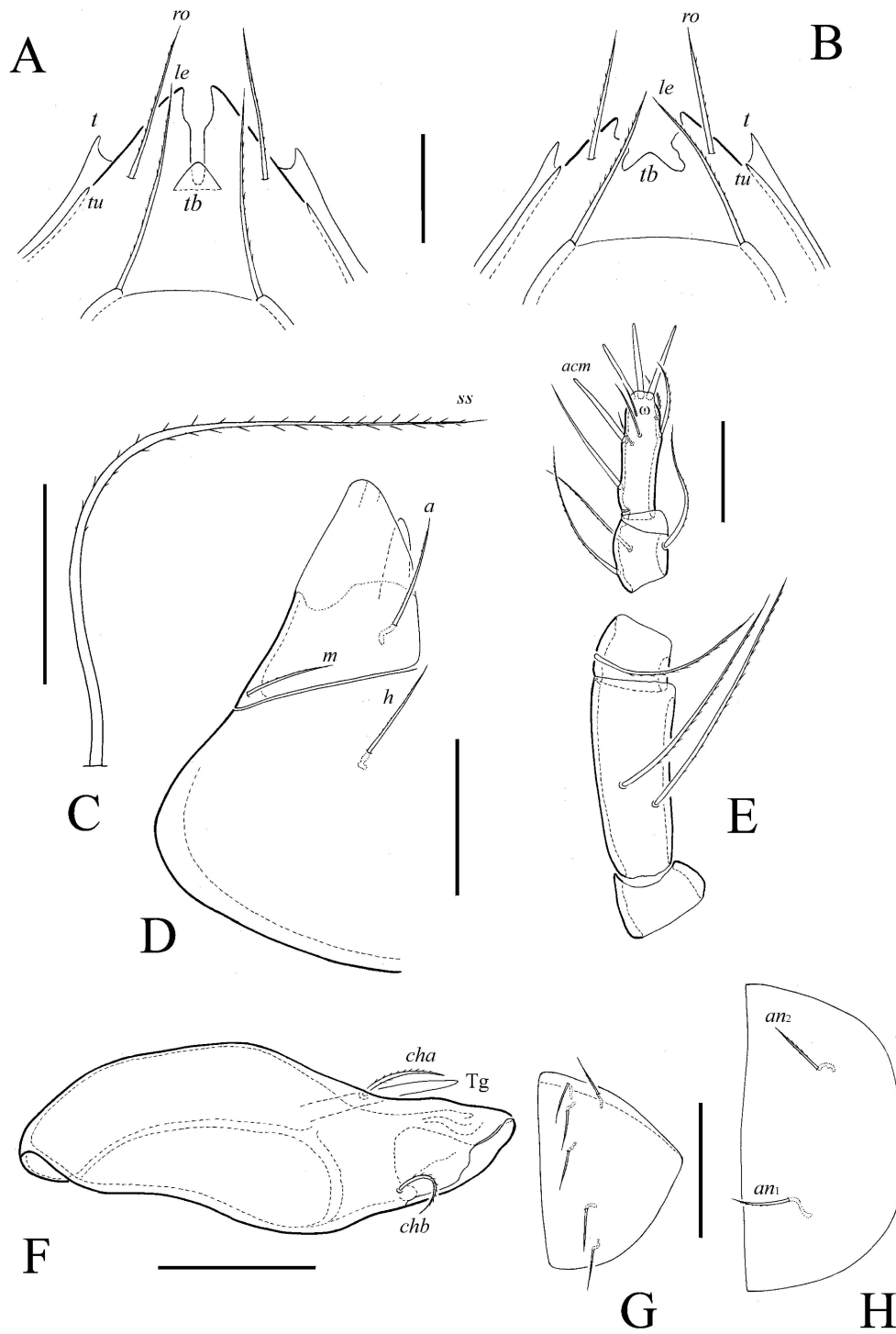


FIGURE 2: *Ceratorchestes (Paraceratorchestes) variabilis* n. sp.: A – rostrum; B – rostrum; C – sensillus; D – subcapitulum, right half; E – palp; F – chelicera; G – genital plate, left; H – anal plate, left. Scale bars (A+D, F+H) 50 μ m, scale bar (E) 20 μ m.

DESCRIPTION OF NEW SPECIES

Ceratorchestes (Paraceratorchestes) variabilis

n. sp.

(Figures 1-3)

Diagnosis — Body size 481 – 813 × 431 – 664. Rostrum with deep indentation. Tubercle inserted near base of the indentation. Translamella present (rarely absent). Lamellar setae longer than rostral and interlamellar setae. Apodemal borders IV straight. Setae 3*c* inserted on pedotectum II. Setae *pv*'' and *s* on leg IV modified.

Measurements — Body size varied considerable: body length 697 (holotype), 481 – 813 (mean 608; nine paratypes); notogaster width 514 (holotype), 431 – 664 (mean 521; nine paratypes).

Integument — Body color light brown to brown. Body surface smooth.

Prodorsum — (Figure 1A, C; Figure 2A-C). Rostrum with deep indentation. Width of indentation variable; tubercle (*tb*) inserted near base of indentation. Lamellae longer than half the length of prodorsum, slightly converging. Translamella thin, mostly clearly visible, sometimes poorly visible, rarely absent. Rostral (*ro*, 61 – 82), lamellar (*le*, 82 – 123) and interlamellar (*in*, 73 – 110) setae setiform, barbed. Sensilli (*ss*, 147 – 172) setiform, ciliate.

Notogaster — (Figure 1A, C). Anterior margin medially convex. Dorsophragmata (D) present, small, but sometimes indistinct. Pleurophragmata (P) always distinct. Alveoli of setae *c* poorly visible. Nine pairs of notogastral setae long (*h*₁, *p*₁-*p*₃ 73 – 94, others 110 – 139) setiform, barbed. Opisthonotal gland openings (*gla*) small, located antero-laterally to notogastral setae *h*₃. Lyrifissures *ia* not visible, *im* located medially to *gla*.

Lateral part of body — (Figure 1A, C). Pedotecta I, II (Pt I, Pt II) and tutoria (*tu*) well developed, morphology typical for genus. Large lateral tooth (*t*) present on each side of the prodorsum. Exobothridial setae (*ex*, 49 – 57) setiform, straight, barbed. Thin, sclerotized line present between each bothridium and acetabulum IV. Lyrifissures *ih*, *ip* and *ips* short, distinct.

Gnathosoma — (Figure 2D-F). Proportions of the subcapitulum variable: longer or shorter than

width (114 – 176 × 123 – 164). Hypostomal setae setiform, slightly barbed; *h* (28 – 36) little shorter than *m* (32 – 41) and *a* (36 – 41). Adoral setae and their alveoli absent. Palp 94 – 98, with setation 0-2-1-3-9(+1 ω). Solenidion setiform, not connected with *acm*. Chelicera 155-164. Fixed and movable digits smooth, only one distal tooth developed on each digit. Cheliceral setae long, setiform, barbed; *cha* (28 – 32) longer, than *chb* (20 – 28). Trägårdh's organ (Tg) distinct.

Epimeral region — (Figure 1B). Epimeral borders IV straight, connected to lateral sides of genital plates. Sternal longitudinal border present. Epimeral setae setiform, slightly or strongly barbed, differs in length: *1a*, *2a*, *3a*, *4a-4e* 16 – 24; *1b* 41 – 106; *1c* 41 – 114; *3b* 24 – 28; *3c* 32 – 53; *4d* 28 – 32. Setae 3*c* inserted on pedotecta II.

Anogenital region — (Figure 1B; Figure 2G, H). Six pairs of genital (*g*₁-*g*₆, 16 – 24), one pair of aggenital (*ag*, 24 – 32), two pairs of anal (*an*₁, *an*₂, 20 – 41) and three pairs of adanal (*ad*₁ 45 – 61, *ad*₂, *ad*₃, 32 – 45) setae present; setae setiform, slightly barbed. Size of genital plates variable; in many specimens smaller than anal plates, rarely similar in size. Asymmetric number of genital setae on genital plates is presented in two specimens (six on one plate, and seven on another plate). Lyrifissures *iad* paranal.

Legs — (Figure 3A-D). Median claw slightly thicker than lateral claws. Formulae of leg setation and solenidia: I (1-5-3-4-20) [1-2-2], II (1-4-3-4-15) [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. Setae mostly setiform, barbed. Some setae on tarsi IV modified: *pv*'' thick, weakly dilated medio-distally with dense cilia unilaterally; *s* thick, setiform, with dense cilia unilaterally. On tarsi I setae *ft*''short, inserted near to solenidion ω_1 . Famulus setiform, straight, dilated distally, blunt-ended, inserted anterior to solenidion ω_2 . Solenidia ω_1 , ω_2 on tarsi II and σ on genua III rod-like, blunt-ended. Other solenidia setiform. Solenidia φ_1 and φ_2 on tibiae I inserted close to each other.

Type deposition — The holotype is deposited in the collection of the Zoological Institute of the Russian Academy of Sciences, St. Petersburg, Russia;

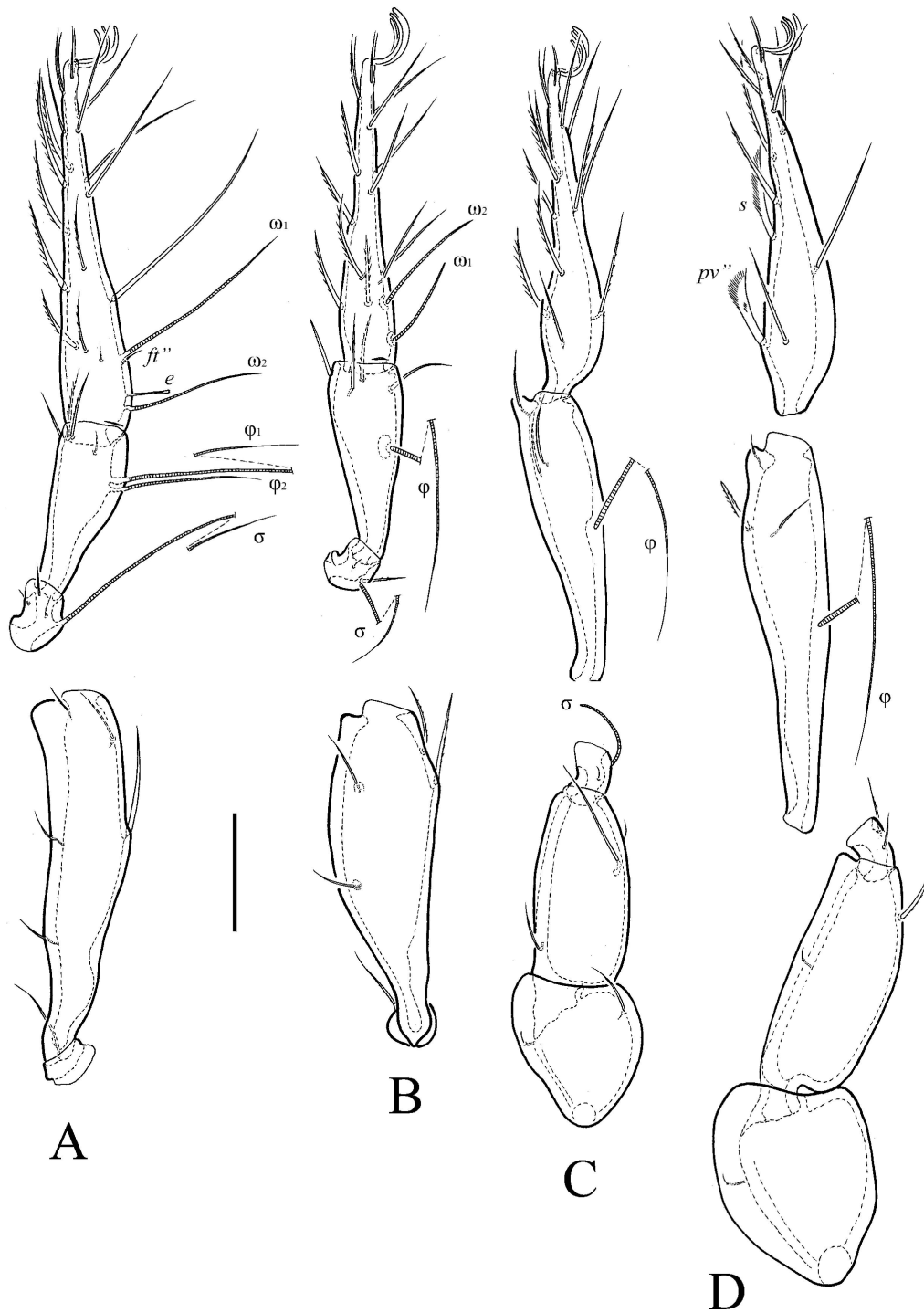


FIGURE 3: *Ceratorchestes (Paraceratorchestes) variabilis* n. sp.: A – leg I, left, antiaxial view; B – leg II, left, antiaxial view; C – leg III, right, antiaxial view; D – leg IV, right, antiaxial view. Scale bars 50 μ m.

TABLE 1: Leg setation and solenidia of adult *Ceratorchestes* (*Paraceratorchestes*) *variabilis* n. sp.

Leg	Trochanter	Femur	Genu	Tibia	Tarsus
I	v'	$d, (l), bv'', v''$	$(l), v', \sigma$	$(l), (v), \phi_1, \phi_2$	$(ft), (tc), (it), (p), (u), (a), s, (pv), v', (pl), l'', e, \omega_1, \omega_2$
II	v'	d, l', bv'', v''	$(l), v', \sigma$	$(l), (v), \phi$	$(ft), (tc), (it), (p), (u), (a), s, (pv), \omega_1, \omega_2$
III	l', v'	d, l', ev'	l', σ	$l', (v), \phi$	$(ft), (tc), (it), (p), (u), (a), s, (pv)$
IV	v'	d, ev'	d, l'	$l', (v), \phi$	$ft'', (tc), (p), (u), (a), s, (pv)$

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.

four paratypes are deposited in the collection of the Siberian Zoological Museum, Novosibirsk, Russia; five paratypes are in the personal collection of the first author.

Etymology — The specific name "*variabilis*" refers to the strong variability of morphological characters (sizes of body and genital plates; form of rostrum; proportions of subcapitulum; presence or absence of translamella and epimeral border IV).

Remarks — *Ceratorchestes* (*Paraceratorchestes*) *variabilis* n. sp. can be distinguished from all known species of the genus *Ceratorchestes* by the key which is presented below.

Key to known species of the genus *Ceratorchestes*

1. Epimeres III + IV unusually elongated; setae of epimere IV inserted at lateral level of genital aperture.....
.... *Ceratorchestes* (*Paraceratorchestes*) *variabilis* n. sp.
— Epimeres III + IV not unusually elongated; setae of epimere IV inserted anteriorly to level of genital aperture 2
2. Rostrum truncate; body size large (500 – 627 × 416 – 419).....
Ceratorchestes (*Ceratorchestes*) *globosus* Balogh and Mahunka, 1969
— Rostrum not truncate; body size smaller than 500 (in length) and 350 (in width) 3

3. Rostrum with incision apically; lamellar apices close together; translamella present.....
..... *Ceratorchestes* (*Ceratorchestes*) *setosus* Balogh and Mahunka, 1969
— Rostrum pointed apically; lamellar apices not close together; translamella absent 4

4. Interlamellar setae much longer than lamellar setae; minute notogastral setae *c* present.....
..... *Ceratorchestes* (*Ceratorchestes*) *baloghi* Mahunka, 1983
— Interlamellar and lamellar setae similar in length; notogastral setae *c* represented by alveoli.....
..... *Ceratorchestes* (*Ceratorchestes*) *cornutus* Mahunka, 1982

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