THE RAFFLES BULLETIN OF ZOOLOGY 2002 **50**(2): 389-394

FIRST RECORD OF THE GENUS *VELOPPIA* HAMMER FROM CHINA, WITH DESCRIPTION OF A NEW SPECIES (ACARI: ORIBATIDA: CALEREMAEIDAE)

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ABSTRACT. – A new species of the genus *Veloppia* collected from Beijing, China is described. Comparison between the new species and the two currently known species, viz., *V. pulchra* Hammer, 1955, and *V. kananaskis* Norton, 1978 is provided.

KEY WORDS. – Caleremaeidae, *Veloppia*, first record, new species.

INTRODUCTION

The genus *Veloppia* was proposed by Hammer in 1955, with the type species, *V. pulchra* Hammer, 1955, collected from Alaska. In the original description, Hammer did not indicate which family this genus belongs to. Travé (1960) compared this species against *Hungarobelba visnyai* (Balogh) from the family Damaeidae. Later, Balogh (1963) placed this genus into the family Damaeidae, probably influenced by Travé's studies.

In 1978, Norton described another new species of *Veloppia* - *V. kananaskis* collected from Alberta, Canada, in detail as well as amended and elaborated on the original description of *V. pulchra*. He also redefined this genus, commented its familial placement and tentatively placed it in Caleremaeidae. Balogh & Balogh (1992) accepted this placement in their monograph.

Thus far, there are only two species of *Veloppia* which have been described, both of which occurred in North America. The present paper reports the third species collected from Beijing, China. Type specimens are deposited in the museum of Institute of Zoology, Chinese Academy of Sciences, Beijing, China (IZCAS), and the Zoological Reference Collection (ZRC) of the Raffles Museum of Biodiversity Research, National University of Singapore.

TAXONOMY

Veloppia nortoni, new species
(Figs. 1-11)

Material examined. – Holotype - (in alcohol) (IZCAS)(W-93-37), from leaf litter from Xiaolongmen (39°58'N, 115°26'E), Beijing, China, coll. Mr. Yunqi Cui, 9 Sep.1993.

Paratypes – 53 ex. (36 in alcohol and 17 mounted, among them 7 dissected)(IZCAS)(W-93-37), 4 ex. (in alcohol)(ZRC.ARA.01), same data as holotype; 1 ex. (in alcohol) (IZCAS)(W-92-27), same locality as holotype, coll. Huifu Wang, 22 Jul.1992.

Description. – Adult:

General information – Mean total length 272μm (range 248-286μm, n=10); mean maximum notogastral width 143μm (range 134-159μm, n=10). Yellowish-brown colored. Body and legs covered with tuberculate cerotegument.

Prodorsum – Integument with large punctations. Rostrum broadly rounded, with distinct medial elevation. Propodolateral apophysis (*P*) well developed, digit form, distal end slightly obtuse. Anterior half of prodorsum with a pair of dim lateral ridges. An indistinct ridge extending forward from base of each bothridium. A dark-colored, obvious, inverted "Y"-shaped ridge located on medial part of posterior half of prodorsum. Rostral seta (*ro*) subequal to lamellar seta (*le*) in length, seta *le* situated on strong tubercle, which behind level of insertion of seta *ro* in dorsal view. Intelamellar seta (*in*) attenuate, curved. Exobothridial seta (*ex*) attenuate, slightly sinuous, almost same length as seta *in*. Sensillus relatively short, stem slender, distal end expanded strongly, raindrop-shaped, with short acute tip. Bothridium large, sclerotized strongly, external posterior margin extended backward, forming tubercle H_a of the humeral enantiophysis.

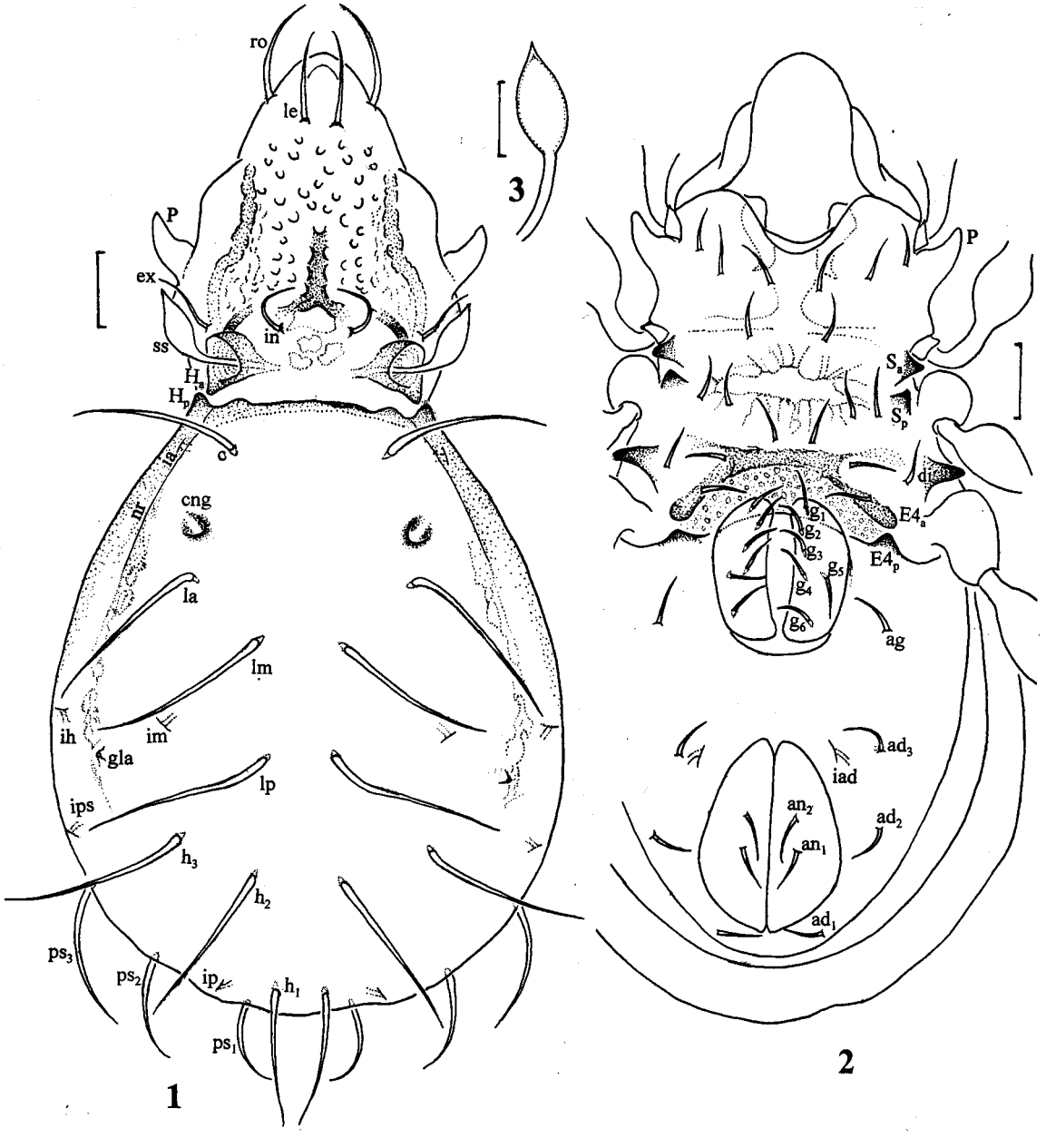
Notogaster – Oval-shaped in dorsal aspect, anterior margin almost truncate, posterior margin slightly sinuous. Integument smooth. Anterior margin with two pairs of tubercles: external at joint of anterior and lateral margins, large, forming tubercle H_p of humeral enantiophysis; internal smaller than external, distance between almost 4 times that

between internal and external on same side. Chitinous ridge (*nr*) extended posteriorly on each side from tubercle H_p to level between setae h_2 and h_3, anterior part to level of seta *la* thick, distinct, posterior obscure, almost invisible in dorsal view. A pair of deep pit-like cavities (*cng*) located between setae *c* and *la*. Notogastral setae 10 pairs, arranged as shown in Fig. 1, inserted points of *lm*, *lp*, h_2 and h_1 almost on a longitudinal straight line, distance between *lm*s shorter obviously than that between internal tubercles on anterior margin; all setae elongate, attenuate and smooth. Seta *c* directed antero-laterally, setae *la*, *lm*, *lp*, h_3 and h_2 postero-laterally, seta h_1 backward, setae ps_1, ps_2 and ps_3 curved ventrally. Lyrifissures *ia*, *im*, *ip*, *ih*, *ips* and latero-opisthosomal gland (*gla*) visible.

Ventral region – Ventral surface rather smooth, mentotectum without punctuation. Enantiophyses *S* and E_4 distinguishable. Epimeral groove IV very deep, broad, nearly trapezoid, anterior and lateral margins thickened obviously. Discidium (*di*) large, directed laterally. Epimeral setation (epimeres I to IV) 3-1-3-3; all setae smooth.

Genital aperture sub-quadrate, anterior part broader obviously than posterior region. Genital plates with six pairs of setae, g_5 almost at same level as g_4. Anal aperture almost an inverted pear-shaped, each plate with two setae. Aggenital setae one pair (*ag*) and adanal setae three pairs (ad_1, ad_2, ad_3). Lyrifissure *iad* present.

Gnathosoma – Infracapitulum ovate, anarthric, labiogenal suture absent. Anterior and lateral portion of gena expanded, forming a tectum covering palpal trochanter and base of rutellum. Rutellum (*R*) narrow, distal end digit-shaped, curved on ventral view. Palpal setation (trochanter to tarsus,

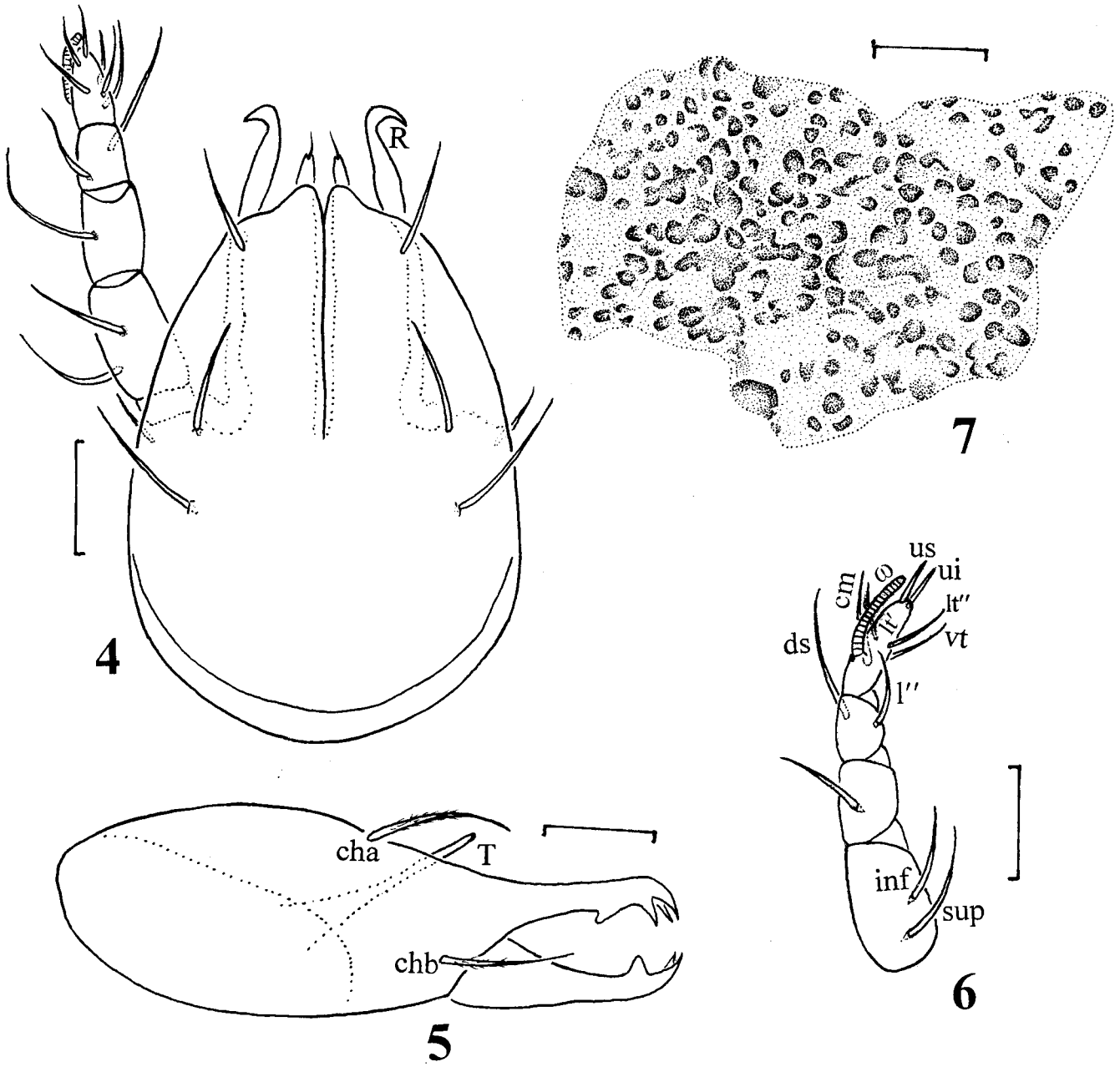


Figs. 1-3 *Veloppia nortoni*, new species. 1. Dorsal aspect; 2. Ventral aspect; 3. Sensillus. Scale bar: Figs. 1-2 = 20μm; Fig. 3 = 10μm.

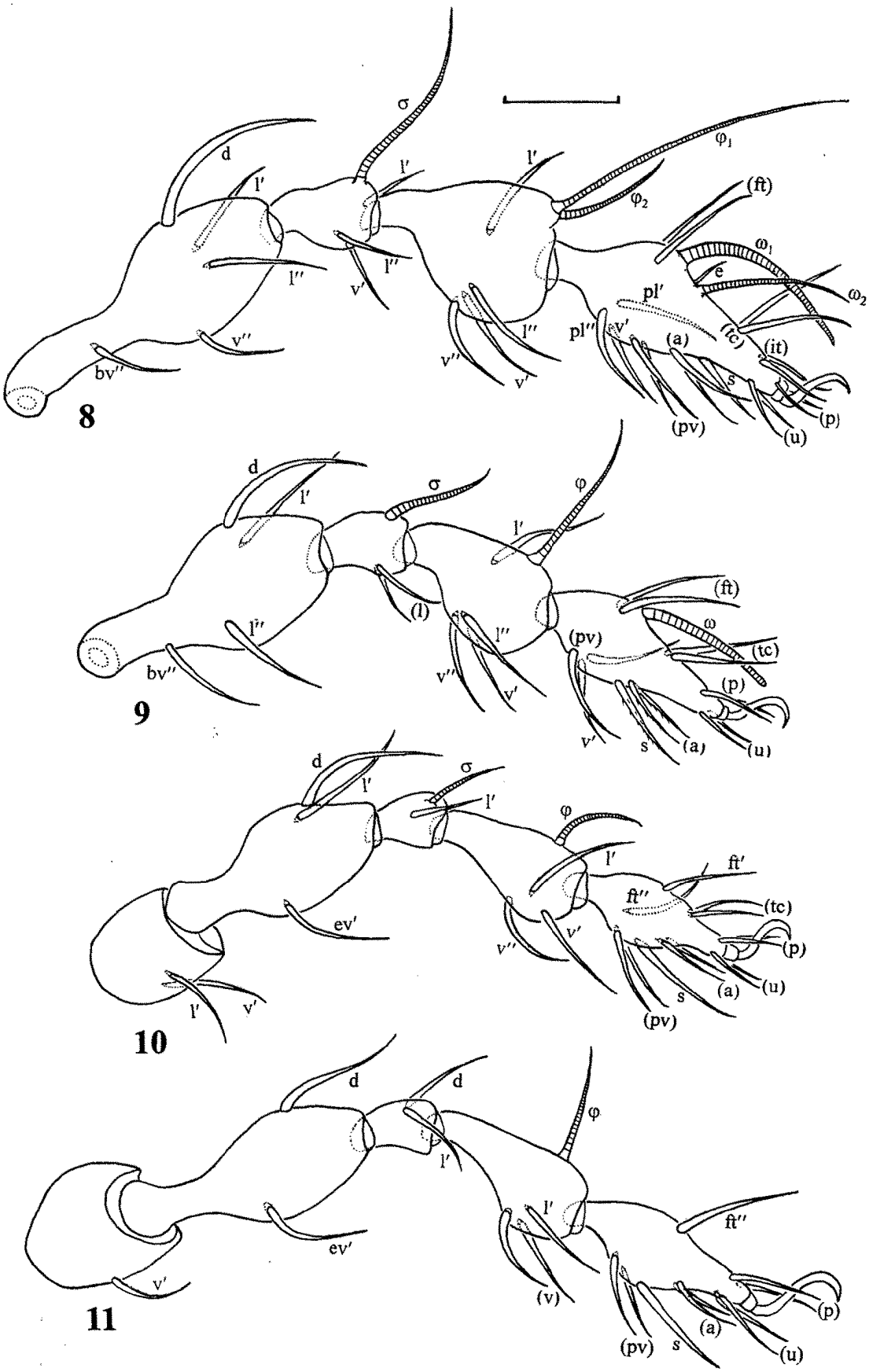
number of solenidion in parentheses) 0-2-1-2-6(1). Tarsal solenidion ω narrow, baculiform, extending far beyond tip of tarsus.

Chelicera weakly sclerotized, elongated. Movable digit with two rather slender terminal teeth and one strong subterminal tooth; fixed digit with three terminal teeth and one subterminal tooth. Trägårdh's organ (*T*) distinct, elongated. Setae *cha* and *chb* attenuate, barbed.

Legs – All legs monodactyle. General trends in segmental shape from legs I to IV as follows: tarsus and tibia becoming thinner and more elongated; genu slightly shorter; femur shorter, especially in proximal stalk region. Setal formulae (trochanter to tarsus) as follow (famulus included, number of solenidia in parentheses): leg I, 1-5-3(1)-4(2)-19(2); leg II, 1-4-2(1)-4(1)-14(1); leg III, 2-3-1(1)-3(1)-13; leg IV, 1-2-2-3(1)-10. All leg setae attenuate and smooth, except *s*, *a'* and *a''* of tarsus II barbed obviously. All solenidia free-standing, not coupled to normal setae. Famulus (*e*) normal, thin and short. Genual solenidion σI tactile, almost two times the length of segment; σII and σIII smaller, slightly longer than segment. Tibial solenidion φ_1I tactile, inserted on a tubercle, about 1.7 times the length of segment; φ_2I thin, shorter than segment slightly; φII subequal to segment in length; φIII curved, shorter than segment obviously; φIV shorter than segment. Tarsal solenidion ω_1I thick, curving anteriorly, extending slightly beyond tip of tarsus; ω_2I thin, distal part curved, shorter than segment; ωII thick, extending slightly beyond tip of tarsus.



Figs. 4-7 *Veloppia nortoni*, new species. 4. Infracapitulum (ventral aspect); 5. Chelicera (antiaxial aspect); 6. Palp (antiaxial aspect); 7. Cerotegument (part). Scale bar: Figs. 4-6 = 10μm; Fig. 7 = 20μm.



Figs. 8-11 *Veloppia nortoni*, new species. 8. Leg I; 9. Leg II; 10. Leg III; 11. Leg IV (all antiaxial aspect). Scale bar: Figs. 8-11 = 20μm.

Table 1. Comparison of the three species of *Veloppia* Hammer, 1955.

	V. nortoni, new species	*V. pulchra Hammer*	*V. kananaskis Norton*
Sensillus	Distal end expanded strongly, raindrop-shaped	Distal end slightly expanded, spindle-shaped	Distal end slightly expanded, spindle-shaped
Isotropic tip of sensillus	Short and acute	Attenuate	Narrowly rounded
Prodorsal enantiophysis and costulae	Reduced or absent	Absent	Both present
Anterior notogastral margin	Two pairs of tubercles	One pair of tubercles	Two pairs of tubercles
If two pairs of tubercles on anterior notogastral margin	Internal tubercle smaller than external, distance between almost 4 times that between internal and external on same side		Internal almost same size as external one, distance between almost 3 times that between internal and external on same side
Notogastral cavity	Obvious in dorsal aspect	Indistinct in dorsal aspect	Steep sided, well-defined in dorsal aspect
Notogastral integument	Smooth	Anteromedially punctate, laterally and posteriorly with raised irregular pattern of elliptical tubercles and small ridges arranged parallel to margin	Essentially smooth
Notogastral setae	Smooth	Relatively thick, with very small, regularly spaced barbs	Smooth (except ps_1)
Arrangement of notogastral setae	Inserted points of *lm*, *lp*, h_2 and h_1 almost on a longitudinal straight line, distance between *lm*s shorter obviously than that between internal tubercles of anterior margin;	Inserted points of *c*, *la*, *lm*, *lp*, h_3, h_2 and h_1 almost on a longitudinal arched line	Not as *V. nortoni*, distance between *lm*s slightly longer than that between internal tubercles of anterior margin;
Femural setae of leg II	Four, *v'* absent	Five, *v'* present	Four, *v'* absent
Genual setae of Leg II	Two, *v'* absent	Three, *v'* present	Two, *v'* absent
Setae on palpal tibia	Two, *l''* absent	Three, *l''* present	Two, *l''* absent
Palpal solenidion ω	Thick, extending distinctly beyond tip of tarsus	Thick, extending distinctly beyond tip of tarsus	Narrow, ending at tarsal tip
Setae on palpal tarsus	*lt'* and *lt''* present	*lt'* and *lt''* absent	*lt'* and *lt''* present

Immatures: Unknown.

Etymology. – This new species is named in honor of Dr. Roy A. Norton, State University of New York, who has published an important research paper on this genus, and examined the materials of this new species in our laboratory in 1997.

Remarks. – The three known species of *Veloppia* can be distinguished from each other in some morphological characters. The differences among them are listed in Table 1.

Distribution. – China (Beijing).

ACKNOWLEDGMENTS

We would like to express our deepest thanks to Dr. Roy A. Norton, SUNY, for his patience and consistent help in our taxonomic study of Chinese oribatids. We thank Mr. Yunqi Cui, IOZ, CAS, for his collecting the materials for this study. Our thanks are also given to Mr. Yixiong Cai and Dr. Ngan Kee Ng, Dept. Biological Sciences, Faculty of Science, National University of Singapore, for reviewing the manuscript. This work was supported by CAS Innovation Program.

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