

A NEW SPECIES OF PARAKALUMMIDAE (ACARI: ORIBATIDA) FROM SOUTHERN JAPAN

BY Y.-N. NAKAMURA¹

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PARAKALUMMIDAE
NEW SPECIES
ORIBATIDA
SOUTHERN JAPAN

SUMMARY: *Neoribates (Parakalumma) koshiensis* sp. n. was collected from Kumamoto Pref., southern Japan.

RÉSUMÉ : Une nouvelle espèce de Parakalummidae, *Neoribates (Parakalumma) koshiensis*, de Kumamoto, Japon est décrite.

Thirty-nine species and one subspecies of three genera and three subgenera have been known as members of the family Parakalummidae, according to SUBÍAS (2004) and FUJIKAWA (2007).

Recently in Japan, livestock grazing systems, particularly for cows and beef cattle, were re-examined from an economic and ecological standpoint. However, there are few reports on the effects of grazing on soil quality, in particular soil animals in Japan. Therefore, soil animals were investigated in pasture at National Agricultural Research Center for Kyushu Okinawa Region (Konarc; Kumamoto Pref., Japan), and a new oribatid species was discovered.

Neoribates (Parakalumma) koshiensis sp. n.

[Japanese name: Koshi-furisode dani]

(FIGS. 1 & 2; PHOTO 1)

MATERIAL EXAMINED: Holotype (Female) (NSMT-Ac 12918) from litter, humus and soil material at the

pasture (32.86 N; 130.73 E; 85 m a.s.l.) in Koshi-shi, Kumamoto Prefecture, July-19-2008, Y.-N. NAKAMURA; 1 paratype (NSMT-Ac 12919 and 12920 as the slides separated one depressed body for microscopic observation) (female): the same data as holotype.

ETYMOLOGY: After the local name of sampling area, Koshi

MEASUREMENTS AND BODY APPEARANCE: Female ($n = 2$): Body length, 679 μm ; width: 464 μm . Body color reddish-brown. The whole integument punctate, without the postero-lateral margins of propodosoma densely granulate, but with peripheral ring of light areas of weak chitinization.

PRODORSUM: Projecting rostral tip appearing to be trapezoidal, however, actually sharply pointed, bending to ventral side (FIG. 1B; PHOTO 1). Lamellae thick extending forwards from bothridia for a distance equal to about 0.7x as the length of the propodosoma at the lateral sides. Lamellar setae barbed

1. National Agricultural Research Center for Kyushu Okinawa Region (KONARC), NARO, Koshi-shi, Kumamoto Pref., 861-1192, JAPAN Tel: 81-96-242-7747, Fax: 81-96-249-1002, E-mail: yn1124@affrc.go.jp

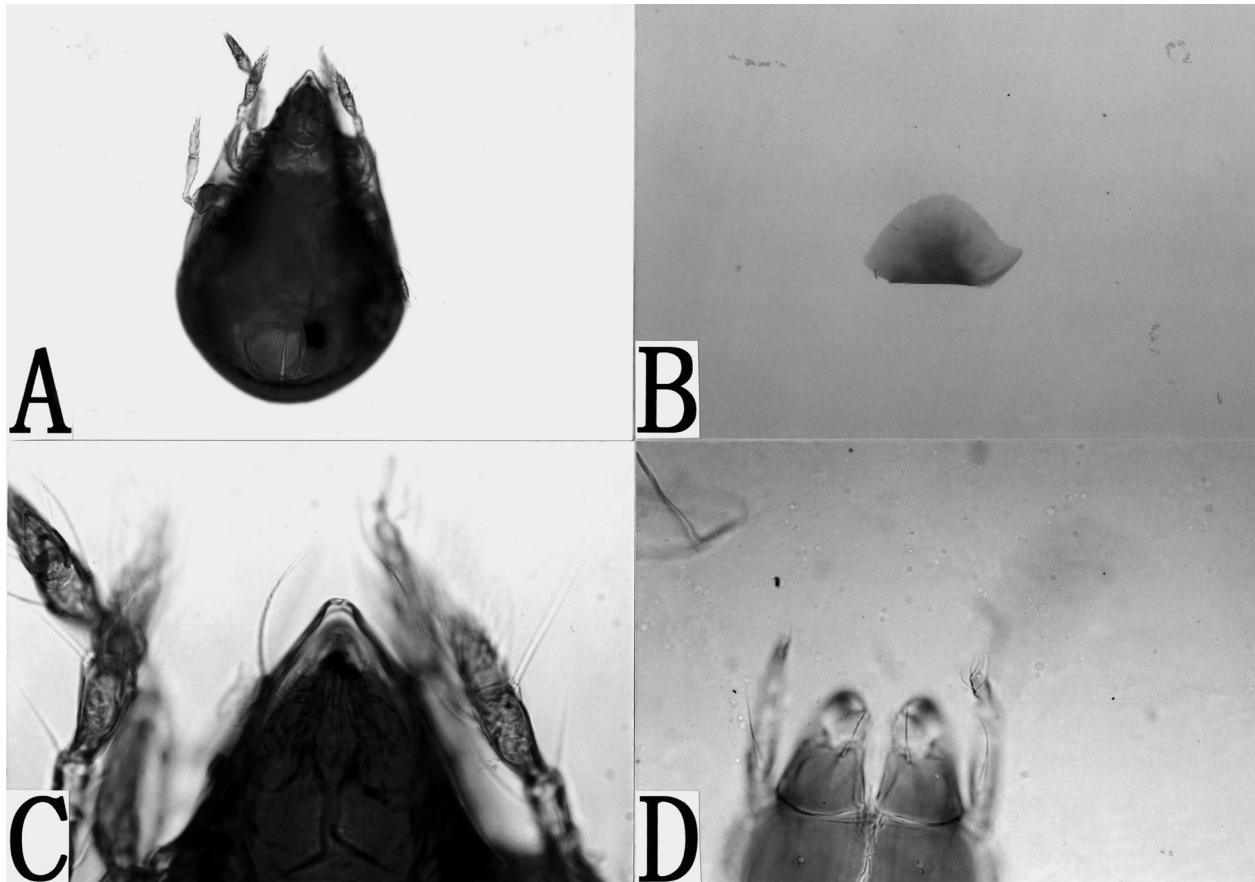


PHOTO 1. *Neoribates (Parakalumma) koshiensis* sp. n. A. — Dorsal view ($\times 100$); B. — Pteromorpha ($\times 400$); C. — Rostral region from ventral side ($\times 400$); D. — Pedipalpal region ($\times 400$).

through the length, arising on lamellar surface at the tip. Prolamella reaching the insertion of rostral setae. Translamellar and transllamellar ridge absent. Setae, *ro*, unilaterally barbed; other prodorsal setae, *le*, *in*, *ex* and *ss* minutely barbed through the length. Setae *ro*, *le* and *in* extending beyond the rostrum; Setae *le* extending beyond the tip of setae *ro*. Setae *in* as a level of the tip of setae *ro*. Bothridium directed laterally. Sensillus like fusiform, ciliate throughout the length except for proximal portion. Relative lengths and distances: *in*>*le*>*ss*>*ro*; (*le-le*)>(*in-in*)>(*ro-ro*)>(*le-in*)>(*ro-le*); *ro* : *le* : *in* = 1.0 : 2.0 : 2.3 ; (*ro-ro*):(*le-le*):(*in-in*) = 1.0 : 1.4 : 1.1.

NOTOGASTER: Pteromorphae movable, veining; emarginate and pointed, extending at the level of half distance between base of setae *le* and *in*. Notogastral anterior margin hard discernible but present, faintly

undulating. Ten pairs of notogastral setae smooth, short, same in length. Four pairs of sacci and three pairs of lyrifissures (*ia*, *im* and *ip*) discernible. Setae *c* inserted antero-laterally to *la*; *Sa* situated antero-laterally to *lm*; *S1* situated posterial to *lp*; *S2* posterial to *S1*; *S3* slightly latero-posterior to *h_j*. Lyrifissures *ia* situated on pteromorpha; antero-laterally to *Sa*; *im* situated between *lp* and *S1*; *ip* situated latero-posterior to *S3*. Relative distances: (*S2-S2*)/(*S1-S1*) = 1.1, (*h₃-h₃*)/(*h₂-h₂*) = 2.0.

VENTRAL REGION: Genital opening small; smaller than half length of interspace between genital and anal openings (FIG. 1B). Genito-anal setae: 5-1-2-3; setae *g*, barbed sparsely; sete *ag*, *an* and *ad*, smooth. Genital setae *g₁* inserted on anterior inner margin of each plate; setae *g₄* remoting from *g₁*, *g₂*, *g₃*. Lyrifissures *iad* aligned in paraanal position, almost at the

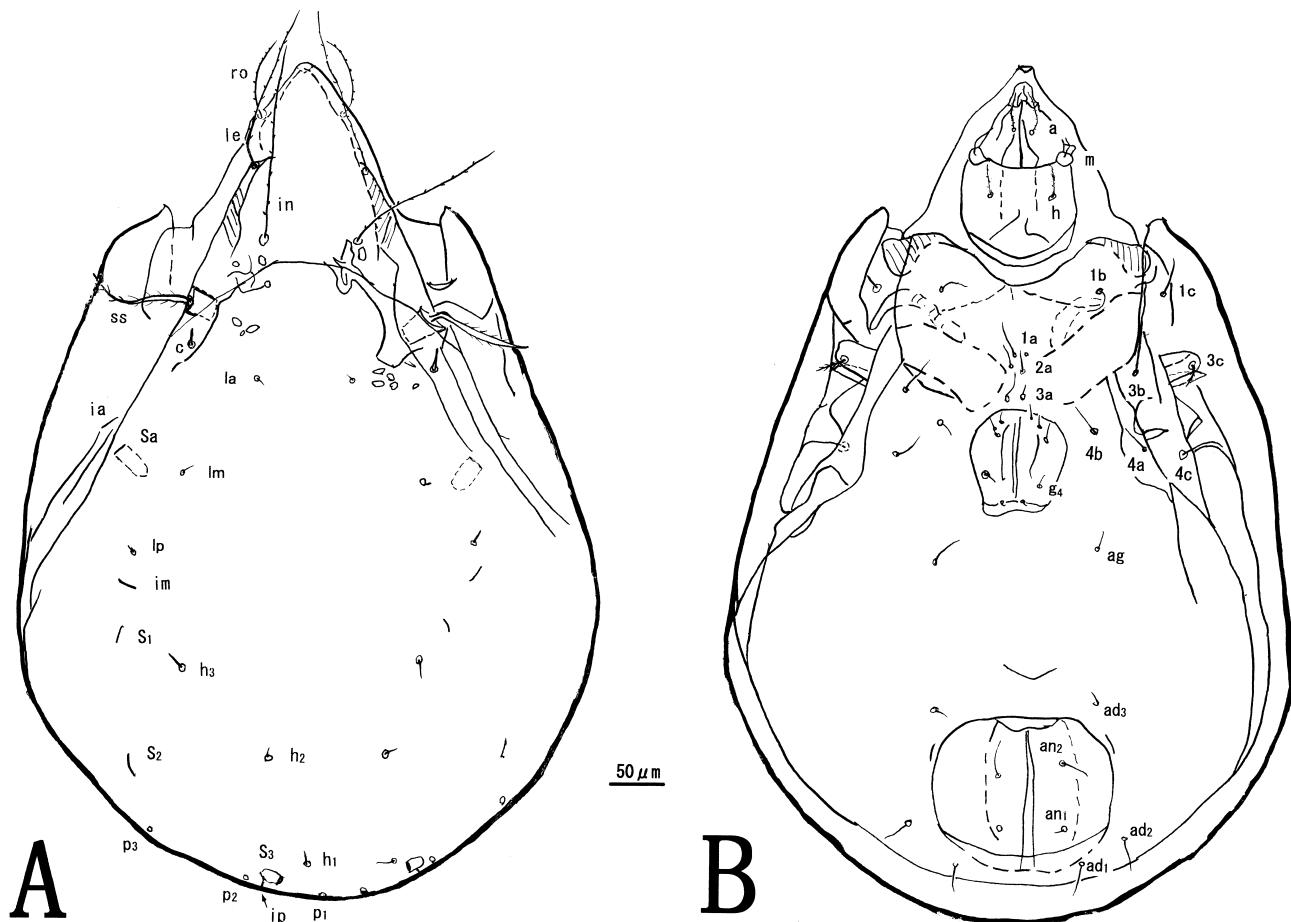


FIG. 1 *Neoribates (Parakalumma) koshiensis* sp. n. (Holotype NSMT-Ac 12918, ♀). A. — Dorsal view; B. — Ventral view. *ro*, *le*, *in*: Rostral, lamellar, interlamellar setae, respectively; *ss*: Sensillus; *c*, *la*, *lm*, *lp*, *h*₁₋₃, *p*₁₋₃: Dorsal setae; *Sa*, *S*₁₋₃: Sacculi; *ia*, *im*, *ip*: Lyrifissures; *a*, *m*, *h*: Anterior, medial and posterior subcapitular setae, respectively; *1a-c*, *2a*, *3a-c*, *4a-c*: Epimeral setae; *g*₄, *ag*, *an*₁₋₂, *ad*₁₋₃: Genital, agenital, anal and adanal setae, respectively.

level of insertion of anal setae *an*₂. Adanal setae *ad*₁ postanal, *ad*₂ postero-lateral, *ad*₃ preanal to anal apature. The relative distances: (*ad*₂-*ad*₁)>(*ag*-*ag*)≥(*ad*₃-*ad*₁)>(*ag*-*ad*₃)>(*ad*₂-*ad*₃)>(*ad*₁-*ad*₁)>(*ad*₁-*ad*₂). Sternal ridge indistinct; apodemata II and III weekly recognizable. Epimeral setal formula: 3-1-3-3; setae barbed through the length. Epimetral setae 3c originated on a small pointed projection of pedotecta II. Diarthric subcapitulum bearing 3 pairs of setae; *a* barbed through the length; *m* smooth; *h* roughened, extending at the level of mental anteril margin. Pedipalpal chaetotaxy: 0-2-1-3-9; tarsus with a solenidion coupled to anteroculinal seta. Relative lengths of some of the ventral setae: *ad*>*1a*>*g*>*a*>*m*>*an*>*h*>*ag*.

LEGS: All tarsi heterotridactylous; claws dentate. Setal formula of legs including famulus but excluding solenidia: I (1-5-3-4-22), II (1-5-3-3-15), III (2-3-1-3-15), IV (1-2-2-4-12). Solenidiotaxy; I (1-2-2), II (1-1-2), III (1-1-0), IV (0-0-0). Famulus on tarsus I spiniform situated between ω_2 and *ft*" (FIG. 2E). Solenidion ψ_1 bacilliform; ω_2 setiform, longer than ω_1 ; inserted anteriorly to famulus. Each of solenidion ψ_1 and ψ_2 arising from small apophysis; ψ_2 inserted anteriorly to ψ_1 .

REMARKS: In the members of the subgenus *Neoribates* (*Parakalumma*) by SUBÍAS (2004), the subgenus *N. (P.)* included three species, and one subspecies:

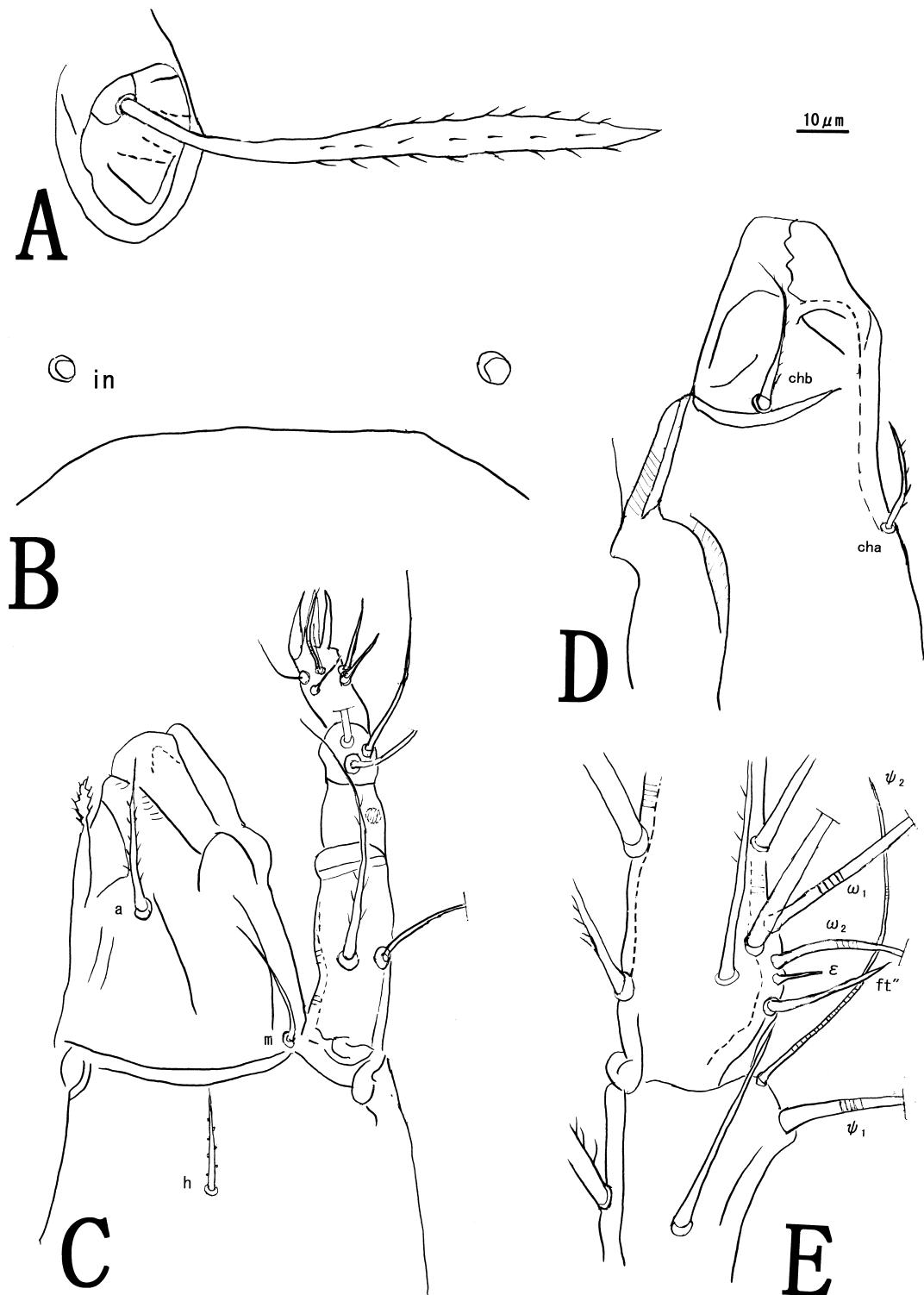


FIG. 2 *Neoribates (Parakalumma) koshiensis* sp. n. A. — Sensillus; B. — Notogastral anterior margin; C. — Parts of the gnathosoma; D. — Chelicera; E. — Solenidial region on tarsus I. *in*: Base of interlamellar seta; *a*, *m*, *h*: Anterior, medial and posterior subcapitular setae, respectively; *cha*, *chb*: Cheliceral setae; *e*: Famulus; ω_{1-2} , ψ_{1-2} : Solenidia; *ft''*: Fastidial seta.

Parakalumma headlandi Starý 1996; *N. (P.) lydia* (Jacot, 1923); *N. (P.) robustum* (Banks, 1895) and *N. (P.) robustum floridanum* (Jacot, 1935). *N. (P.) robustum* has been recorded by AOKI (1984) from Japan. The new species differs from the congeners in body size, length and form of ss or in, rostral structure, situation of Sa, adanal seta ad₃ or lyrifissure. The new species has a sharp rostrum tip, notogaster bearing short dorsal setae, long interlamella setae and sensillus, barbed epimeral setae, pedotectum II with projecting, and tibia of leg IV without solenidion.

KEY TO THE SPECIES AND SUBSPECIES
OF *NEORIBATES* (*PARAKALUMMA*).

1. Rostrum rounded..... 2
1. Rostrum protruding 4
2. Body smaller size (length: 610 μm).....
..... *N. (P.) robustum floridanum* (Jacot, 1935)
2. Body larger size (length: more than 680 μm) 3
3. Relative distances between (S1-S1) and (S2-S2): (S2-S2)/(S1-S1) = 1.6 *N. (P.) robustum* (Banks, 1895)
3. Relative distances between (S1-S1) and (S2-S2): (S2-S2)/(S1-S1) = 1.3 *N. (P.) lydia* (Jacot, 1923)
4. Rostrum protrusion rounded.....
..... *N. (P.) headlandi* (Starý, 1996)
4. Rostrum sharply pointed *N. (P.) koshiensis* sp. n.

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