A New Species of *Bakerdania* (Acari: Pygmephoridae) from the Burying Beetle, *Nicrophorus concolor* (Coleoptera: Silphidae), in Japan.

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(Received 26 March 1999; Accepted 12 April 1999)

ABSTRACT

A new species of the genus *Bakerdania* Sasa, 1961 (Acari, Pygmephoridae) is described and illustrated from Japan under the name of *B. nicrophori*. It is known from the adult female and found attached to the membrane between pro- and mesothorax of the burying beetle, *Nicrophorus concolor* Kraatz. This new species closely resembles *B. decumanus decumanus* (Krczal, 1959) from Europe and *B. decumanus gobiensis* (Mahunka, 1969) from Mongolia, but is distinguished from them by the relative length of some dorsal body setae. Further, *B. nicrophori* differs from *B. d. decumanus* in the shape and position of stigma, the position of body seta h_1 relative to h_2 , and the shape of apodeme IV and claw of leg I.

Key words: Pygmephoridae, new species, *Bakerdania nicrophori*, insect-associated mite, *Nicrophorus concolor*, Japan

Bakerdania Sasa, 1961, is the largest genus of Pygmephoridae (Acari: Heterostigmata), comprising more than 90 species at present. A few of them are known to be associates of beetles such as carabids and cerambycids (Kurosa, 1980, 1995; Sevastianov, 1967, 1981). I found an adult female of *Bakerdania* on the burying beetle, *Nicrophorus concolor* Kraatz, collected in Central Japan. The specimen proved to represent a new species of the genus, which is described below under the name of *Bakerdania nicrophori*. This is the first report of *Bakerdania* associated with the beetle of the family Silphidae.

The terminology of the structures and the setal notation used in this paper mainly follow those of Lindquist (1986). All measurements are given in micrometers (μm). The holotype of the new species is to be deposited in the collection of the National Science Museum (Nat. Hist.), Tokyo, Japan.

***Bakerdania nicrophori* sp. nov.**

(Figs.1-5)

Female: Length of idiosoma 191, width of idiosoma 112, distance between anterior coxo-trochanteral condyles III 79. Cuticle moderately sclerotized.

Gnathosoma (Figs. 1-2): Gnathosomal capsule nearly as long as wide (length 21, width 22) in forward oriented state, with 2 pairs of dorsal and 1 pair of ventral setae; solenidion and setigerous accessory structure on palpal femurogenu not visible in the single available specimen due to the poor condition. Pharyngeal muscular structure also invisible.

Idiosomal dorsum (Fig. 1): Prodorsal shield medium in size, irregularly trapezoidal, 36 long medially, much shorter than prosternal apodeme, little covered posteriorly by anterior

Figs. 1-2. *Bakerdania nicrophori* sp. nov., female. 1, Dorsum; 2, venter. Scale: 50 μ m.

margin of opisthosomal plate C, with posterior margin moderately emarginated; lateral margins in front of setae v_2 deeply emarginated; stigmata located a little before the mid-level, rather large, subcircular; enlarged tracheal atrium and main trunk leading to it barely visible; sensilla (setae sc_1) inserted on posterior half of the shield, rather narrowly clavate; setae sc_2 close to, and anteromesad of, bases of sensilla, rather long, subequal to their mutual distance or a little longer, somewhat blunt-tipped, with barbs; v_2 just anterior to base of sensillus, only 3.5 apart from the latter, rather short, somewhat blunt-tipped, with barbs. Opisthosomal dorsum ovoid in dorsal view, with 7 pairs of barbed setae; they are generally long except for e and somewhat blunt-tipped except for c_2 (?) and h_2 which are fine apically; c_1 nearly on the same level with, and subequal in length to c_2 ; f anteromesad of, and 8.5 apart from, e ; e much less than half the length of f ; h_2 slightly posterior to, and ca. 10 apart from h_1 ; h_1 and h_2 subequal in length; 2 pairs of cupules, ia and ih , present. Lengths and mutual distances (in parentheses) of idiosomal dorsal setae: sc_1 30-31(49), sc_2 46-48(42), v_2

Figs. 3-4. *Bakerdania nicrophori* sp. nov., female; left legs, dorsal view. 3, Leg I; 4, leg II. Scale: 25 μ m.

9.5(51), c_1 57-57(53), c_2 ca.62-ca.64(93), d 60-62(60), e 26-26(72), f 73-78(60), h_1 63-63(36), h_2 54-60 (36).

Idiosomal venter (Fig.2): Apodemes 2 weakly developed, together forming an evenly arcuate fine line, crossing prosternal apodeme near its midpoint; secondary transverse apodeme and apodeme 5 lacking; other apodemes moderately developed; apodeme 4 straight and horizontal, extending to the thickening along ventral margin of coxal foramen III. Posteromedial margin of coxisternal plate IV entirely continuous with posterolateral margins of plate IV, never trilobed. Posterior genital sclerite irregular in shape, not plate-like. Coxal setae moderately long, rather thin, more or less barbed, with fine tips; $1a$ inserted a little posterior to the posteriormost point of camerostome, moderately apart from prosternal apodeme; $1c$ somewhat posterior to, and a little shorter than $1a$, weakly widened and distinctly hollowed in distal half; $2c$ posterolaterad of, and ca. 6-7 apart from $2a$; $3b$ situated on apodeme 4; mutual distance $3b-3b$ only a little larger than $3a-3a$. Caudal (=pseudanal) setae moderately long and fine, with barbs; ps_1 and ps_2 not very different in length, ps_3 a

Fig. 5. *Bakerdania microphori* sp. nov., female; left leg IV, ventral view. Scale: 30 μ m.

little shorter than ps_2 ; alveolus of ps_2 posterolaterad of, and almost adjoining to, that of ps_1 ; ps_3 well apart from ps_2 . Lengths and mutual distances (in parentheses) of coxal and caudal setae: $1a$ 32-33(26), $1c$ 26-27(51), $2a$ 34(40), $2c$ 19-21(50), $3a$ 28-32(27), $3b$ 26-27(31), $3c$ 23(65), $4a$ 25-26(17), $4b$ 34-35(31), $4c$ ca.25-ca.30(60), ps_1 25-ca.25(8.5), ps_2 27-29(14), ps_3 ca.21(38).

Legs: All legs well developed, successively longer from leg I to leg IV; number of setae and solenidia (in parentheses) on segments (trochanter, femur, genu, tibia and tarsus) of legs I-IV: I 1-3-4-6(2 ϕ)+10(2 ω), II 1-3-3-4(1 ϕ)-6(1 ω), III 1-2-2-4(1 ϕ)-6, IV 1-2-1-4(1 ϕ)-6; most of leg setae more or less barbed. Leg I (Fig. 3) much thicker than leg II; femoral seta d semi-membraneous, blade-like, reflexed in distal half, sharply pointed at the tip; femoral seta l' short, blunt-tipped, appearing nude; tibiotarsus short, moderately thickened, distinctly wider than genu, with a pinnaculum apicolaterally; internal tibiotarsal thickening present; claw sessil, stout, not attenuated distally; process opposable to claw also well developed,

distinctly arcuate laterad, weakly widened apicad, somewhat truncate at apex, with a strong spine apicolaterally; pinnaculum medium in size, subcylindrical or frustum-shaped, protruding obliquely anterolaterad; 4 solenidia subequal in length (ca. 5.5-6.0); ϕ_2 and ω_2 fusiform; ϕ_1 nearly on the same level with ϕ_2 , clavate; ω_1 situated slightly proximal to ω_2 , much thicker than other solenidia, ellipsoidal; tibial seta k setiform, with barbs; 5 eupathidia (probably p' , p'' , tc' , tc'' and ft'') present; tc'' arising from base of pinnaculum, very short; order in length of eupathidia as follows: $p'' > p' > ft'' > tc' > tc''$. Leg II (Fig. 4): femoral seta d rather poorly tapered, blunt at the tip; tibial solenidion ϕ situated a little apart from base of the segment, ca. 3 long, fusiform; tarsal solenidion ω subbasal in position, ca. 5.5 long, elliptic-fusiform, rather thick; claws medium in size, dilated ventrobasally; empodium subquadrate. Leg III: femoral seta d , tibial solenidion ϕ , claws and empodium as in leg II. Leg IV (Fig. 5): trochanter rectangular, without distinct constriction; pretarsus short; tarsus including pretarsus half (0.50-0.51) as long as 4 preceding segments combined; femoral seta d fairly long (62-67), poorly tapered, blunt-tipped; tibial solenidion ϕ small, barely visible; tibial seta d (70-71) subequal in length to femoral d , with fine tip; tibial seta v'' medium in length; tarsal seta tc'' much shorter than tibial d ; claws and empodium as in legs II and III, but the claws are finer and devoid of basal dilation. Length of legs I-IV (measured along longitudinal axis of legs from the basalmost point of femur (legs I-III) or trochanter (leg IV) to the base of claw(s)): I 49-49, II 76-77, III 82-84, IV 123-124. Length of tibiotarsus I (excluding claw and its opposite process) 22-24.

Male and immature stages: Unknown.

Host: The unique specimen studied was discovered from the intersegmental membrane between pro- and mesothorax of an adult *Nicrophorus concolor* Kraatz (Coleoptera, Silphidae). For the purpose of obtaining additional materials of this mite, I examined fairly many individuals of Japanese *Nicrophorus* beetles including about 50 *N. concolor*, but the efforts bore no fruit.

Type specimen: Holotype: ♀ (rather poor specimen), River Tonegawa by Toride-shi, Ibaraki Pref., Central Japan, ex *Nicrophorus concolor*, 17-IX-1973, K. Kurosa leg.

Remarks: The present new species closely resembles *Bakerdania decumanus decumanus* (Krczal, 1959) from Europe in many features, especially in the position of prodorsal setae sc_1 , sc_2 and v_2 , the position of coxal setae, the position and shape of pinnaculum on tibiotarsus I, and in the position, shape and size of 4 solenidia on tibiotarsus I, but can readily be distinguished from the latter in the following characteristics: 1) stigma subcircular and located moderately apart from anterior border of prodorsal shield (in *d. decumanus*, stigma drop-shaped and located rather close to anterior border of prodorsal shield), 2) body setae c_1 and c_2 subequal in length (in *d. decumanus*, c_1 a little longer than c_2), 3) body seta h_1 inserted anteromesad of h_2 (in *d. decumanus*, h_1 and h_2 longitudinally aligned), 4) coxal seta $1c$ a little shorter than $1a$ (in *d. decumanus*, $1c$ about half the length of $1a$), 5) apodeme 4 extending to near ventral margin of coxal foramen III (in *d. decumanus*, apodeme 4 not extending beyond insertion of seta $3b$), 6) claw of leg I not attenuated distally (in *d. decumanus*, claw of leg I strongly attenuated distally). Judging from the brief original description accompanied by an illustration, *Bakerdania decumanus gobiensis* (Mahunka, 1969) from Mongolia seems to bear closer resemblance to the present new species than the

nominotypical subspecies does. Apart from the shape and position of stigma and the shape of claw of leg I which were not mentioned by Mahunka, however, *B. d. gobiensis* differs from the new species at least in the following respects: 1) body seta c_1 longer than c_2 (in *nicrophori*, c_1 not longer than c_2), 2) body seta e more than half the length of f (in *nicrophori*, e much less than half the length of f), 3) body seta h_1 considerably shorter than h_2 (in *nicrophori*, h_1 and h_2 subequal in length).

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摘 要

日本産クロシデムシに見いだされた *Bakerdania* 属(ダニ目, ヒナダニ科)の1新種 黒佐和義 (東京都豊島区西池袋5-21-15)

茨城県で採集したクロシデムシ(甲虫目, シデムシ科)の成虫の前・中胸間の膜質部に見いだされた雌成虫に基づいて *Bakerdania* 属の1新種を記載し, *B. nicrophori* と命名した. 本種は欧州産の *B. decumanus decumanus* (Krczal, 1959) とモンゴル産の *B. decumanus gobiensis* (Mahunka, 1969) によく似ているが, 後体部背面の一部の毛の長さの比が異なり, 特に *B. d. decumanus* とは毛 h_1 の h_2 に対する相対的位置と気門, 第4基条および第1脚の爪の形状によって容易に区別することができる.