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A NEW MONOTYPIC GENUS OF CHIGGERS  
AND FOUR NEW SPECIES OF *QUADRASETA* FROM VENEZUELA  
(ACARI: TROMBICULIDAE)<sup>1</sup>

M. L. Goff and J. M. Brennan<sup>2</sup>

ABSTRACT.—*Carebareia*, n. gen., and its type-species, *C. johnstoni*, n. sp., are described. The genus *Quadrasetta* Brennan, 1970, is redefined and a key to the 11 included species given. Four new species, *Quadrasetta tachirensis*, holotype ex *Akodon* sp., *Q. rotschkei*, ex *Proechimys guyanensis*, *Q. mirandae*, holotype ex *Oryzomys albigularis*, and *Q. falconensis*, ex *Sylvilagus floridanus*, are described.

Four new species of *Quadrasetta* Brennan, 1970, and a new monotypic genus, all from Venezuela, are described and illustrated below. Hosts are small mammals.

Collections were made under the direction of Dr. Charles O. Handley, Smithsonian Institution, Dr. Vernon J. Tipton, Brigham Young University, and Dr. Conrad E. Yunker, Rocky Mountain Laboratory. Holotypes are in the collection of the U.S. National Museum of Natural History (currently housed at the Bishop Museum, Honolulu, Hawaii) and paratypes are there and in the collection of the Bishop Museum. All measurements are given in micrometers of the holotypes followed in parentheses by the means and extremes of the type series.

*Quadrasetta* Brennan

*Quadrasetta* Brennan, 1970: 1695; Brennan & Reed, 1975: 62.

*Type-species*.—*Euschoengastia pazca* Brennan & Jones, 1964: 700.

*Diagnosis*.—Trombiculine larvae parasitic on small mammals and, occasionally, birds; legs 7-segmented; coxae unisetose; 2-3 genualae I, genuala II and III; tibiala III; subterminala and parasubterminala I; 6 branched setae in basal whorl of tarsus I. Scutum sparsely punctate; subrectangular, with sinuous anterior and posterior margins; 5 setae; sensilla clavate to capitate. Eyes

2/2. Cheliceral blades with tricuspid cap; palpal tarsus with 4B; palpal claw 3-pronged.

*Quadrasetta tachirensis*, n. sp.

Fig. 1

*Type data*.—Holotype and 7 paratypes from Tachira, San Cristobal, 21-III-1968, ex *Akodon* sp. (RML 53653); 2 paratypes, same data except 15-III-1968, ex *Akodon bogotensis* (RML 55933).

*Diagnosis*.—Palpal setal formula B/B/BBB/4B; palpal claw 3-pronged; galeala B; 3 genualae I; 54 dorsal body setae; 2 pairs of humeral setae; PL > AM > AL; PW/SD = 1.83.

*Description of species*.—Larvae. *Idiosoma*: Measuring 290 x 235 in engorged specimen. Eyes 2/2, anterior larger, on ocular plate. Two pairs of humeral setae, measuring 44-46; 54 dorsal body setae, measuring 32-40, arranged 6-10-14-10-6-6-2; 2 pairs of sternal setae, anterior 37-40, posterior 28-31; 42 preanal setae, 20-24; 20 postanal setae, 28-33; total body setae 124. *Gnathosoma*: Palpal setal formula B/B/BBB/4B; palpal claw 3-pronged; galeala B; chela (27) with tricuspid cap. *Scutum*: Sparsely punctate; anterior margin biconcave, posterior margin biconvex; AM base in line with AL bases; SB anterior to PL bases; PL > AM > AL; sensilla capitate, head with setules; PW/SD =

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1.83. Scutal measurements: AW 47 (48, 47-49); PW 66 (66, 62-69); SB 22 (19, 17-22); ASB 22 (22, 20-23); PSB 14 (14, 12-16); AP 25 (25, 24-27); AM 25 (29, 25-32); AL 23 (26, 23-30); PL 41 (45, 41-48); sens. 34 x 15 (35, 33-37 x 14-15). Legs: All 7-segmented terminating in a pair of claws and a claw-like empodium. IP = 670-710. Leg I: 225-238; coxa with 1 branched seta (1B); trochanter 1B; basifemur 1B; telofemur 5B; genu 4B, 3 genualae, microgenuala; tibia 8B, 2 tibialae, microtibiala; tarsus (56 x 21) 19B, tarsala (14-15), microtarsala, subterminala, parasubterminala, pretarsala. Leg

II: 205-220; coxa 1B; trochanter 1B; basifemur 2B; telofemur 4B; genu 3B, genuala; tibia 6B, 2 tibialae; tarsus (50 x 19) 14B, tarsala (12-14), microtarsala, pretarsala. Leg III: 240-255; coxa 1B; trochanter 1B; basifemur 2B; telofemur 3B; genu 3B, genuala; tibia 6B, tibiala; tarsus (65 x 16) 15B.

Remarks.—*Quadrasetta tachirensis* is similar to *Q. pazca* (Brennan & Jones, 1964) in having galeala B and 3 genualae I, but differs in having eyes on a distinct ocular plate, PW/SD = 1.83 (1.51 in *Q. pazca*), and arrangement of body setae.

Additional specimens examined (40).—

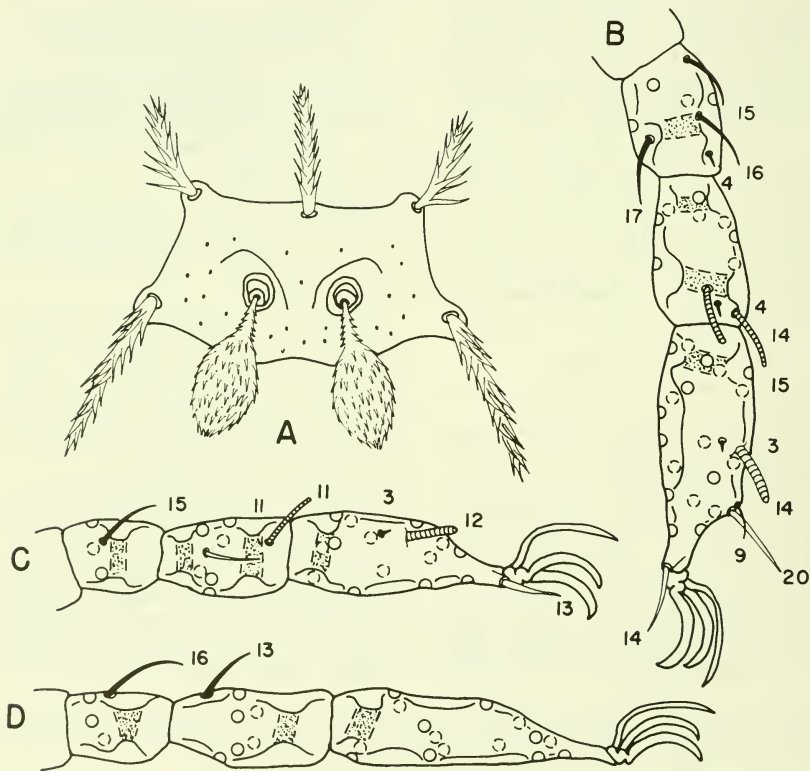


Fig. 1. Larva of *Quadrasetta tachirensis*: (a) scutum; (b) leg I distal 3 segments showing specialized setae (measurements in micrometers) and bases of branched setae; (c) leg II, as above; (d) leg III, as above.

Guarico, 6.I.1968, 1 *Zygodontomys* sp. (7). Tachira, San Cristobal, 2-17-III-1968, 2 *Akodon* sp. (20), 1 *Akodon bogotensis* (2), 1 *Oryzomys* sp. (3), 1 *Oryzomys albigularis* (1), 2 *Oryzomys minutus* (6). Yaracuy, W of San Felipe, 8-XII-1967, 1 *Oryzomys capito* (1).

*Quadraseta rotstieri*, n. sp.

Fig. 2

*Type data.*—Holotype and 8 paratypes from Falcón, E of Maracaibo, ex *Proechimys guyannensis* (RML 53271), 13-V-1968.

*Diagnosis.*—Palpal setal formula

B/B/BBB/4B; palpal claw 3-pronged; galeala N; 2 genualae I, genuala II and III; genu I with 5 branched setae; tibiala III; 58 dorsal body setae, arranged 8-8-10-6-10-4-6-6; sensilla clavate; PW/SD = 1.90-1.97.

*Description of species.*—Larvae. *Idiosoma*: Measuring 400 x 305 in engorged specimen. Eyes 2/2, of equal size, on ocular plate. Two pairs of humeral setae, measuring 46-48; 58 dorsal body setae, measuring 32-41, arranged 8-8-10-6-10-4-6-6; 2 pairs of sternal setae, 30; 28 preanal setae, 20-26; 30 postanal setae, 30-35; total body setae 124.

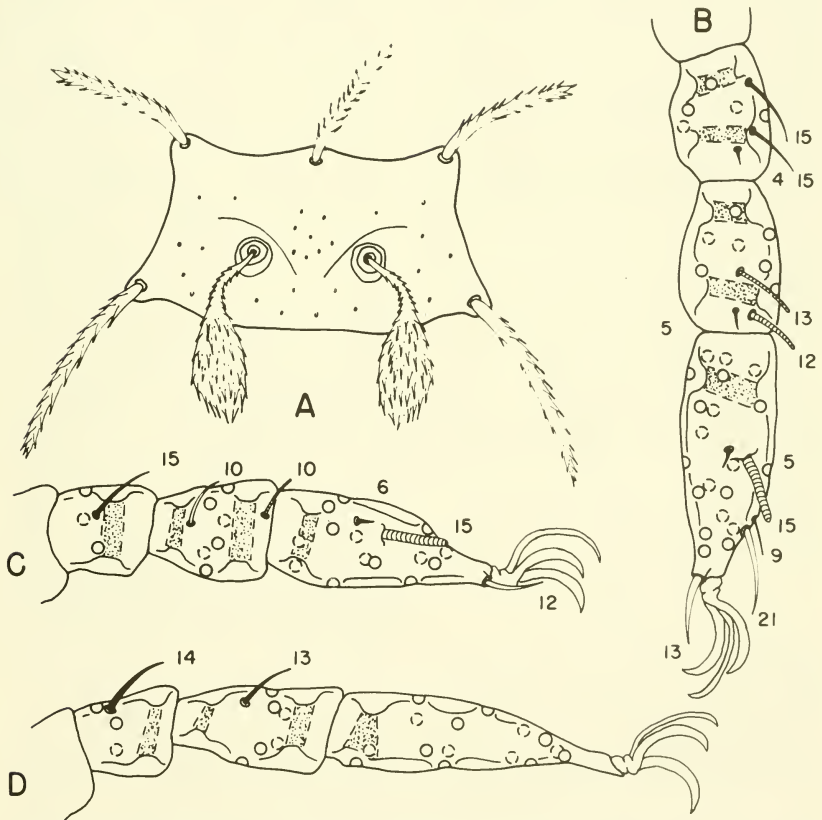


Fig. 2. Larva of *Quadraseta rotstieri*: (a) scutum; (b) leg I distal 3 segments showing specialized setae (measurements in micrometers) and bases of branched setae; (c) leg II, as above; (d) leg III, as above.

*Gnathosoma*: Palpal setal formula B/B/BBB/4B; palpal claw 3-pronged; galeala N; chela (35-38) with tricuspid cap. *Scutum*: Sparsely punctate; anterior margin biconcave, posterior margin biconvex; AM base posterior to AL bases; SB anterior to PL bases; PL>AL>AM; sensilla clavate, head with setules; PW/SD = 1.90-1.97. Scutal measurements: AW 56 (56, 52-59); PW 73 (76, 73-80); SB 22 (24, 22-27); ASB 23 (24, 20-27); PSB 14 (16, 14-17); AP 28 (30, 28-35); AM 36 (36, 33-38); AL 38 (38, 34-40); PL 55 (52, 48-56); sens. missing in holotype (43 x 13, 42-45 x 13). *Legs*: All 7-segmented, terminating in a pair of claws and a clawlike empodium. Onychotricetes absent. IP = 690-717. *Leg I*: 235-245; coxa 1B; trochanter 1B; basifemur 1B; telofemur 5B; genu 5B, 2 genualae, microgenuala; tibia 8B, 2 tibialae, microtibiala; tarsus (57 x 20) 20B, tarsala (15), microtarsala, subterminala, parasubterminala, pretarsala. *Leg II*: 218-220; coxa 1B; trochanter 1B; basifemur 2B; telofemur 4B; genu 3B, genuala; tibia 6B, 2 tibialae; tarsus (51 x 19) 14B; tarsala 15; microtarsala, pretarsala. *Leg III*: 238-252; coxa 1B; trochanter 1B; basifemur 2B; telofemur 3B; genu 3B, genuala; tibia 6B, tibiala; tarsus (67 x 17) 15B.

*Remarks*.—*Quadraseta rotstieri* is similar to *Q. antillarum* (Brennan, 1967) in having 2 genualae I and 4 humeral setae, but differs in having palpal tibia BBB (BNB in *Q. antillarum*), PL>AL, and 5 branched setae on genu I.

*Additional specimens examined* (18).—Falcón, E of Maracaibo, 13-15-V-1968, 3 *Akodon urichi* (18).

#### *Quadraseta mirandae*, n. sp.

Fig. 3

*Type data*.—Holotype and 9 paratypes from Miranda, 1 km N of Caracas, Quebrada Chacaito, ex *Oryzomys albigularis* (RML 52518), 18-V-1967.

*Diagnosis*.—Palpal setal formula B/B/BBB/4B; palpal claw 3-pronged; galeala N; 3 genualae I; 68 dorsal body setae; 2 pairs of humeral setae; PL>AM>AL; PW/SD = 1.80.

*Description of species*.—Larvae. *Idiosoma*:

Measuring 290 x 225 in engorged specimen. Eyes 2/2, anterior larger, on ocular plate. Two pairs of humeral setae, measuring 49-55; 68 dorsal body setae, measuring 40-50, arranged 10-6-8-10-10-6-10-6-2; 2 pairs of sternal setae, 34-40; 38 preanal setae, 30-35; 22 postanal setae, 34-42; total body setae 136. *Gnathosoma*: Palpal setal formula B/B/BBB/4B; palpal claw 3-pronged; galeala N; chela (37-40) with tricuspid cap. *Scutum*: Sparsely punctate; anterior margin shallowly biconcave; posterior margin shallowly convex; AM base slightly posterior to AL bases; SB anterior to PL bases; PL>AM>AL; sensilla clavate, head with coarse setules; PW/SD = 1.80. Scutal measurements: AW 61 (62, 60-64); PW 80 (81, 73-90); SB 28 (28, 23-31); ASB 29 (28, 26-29); PSB 17 (17, 14-18); AP 38 (37, 34-39); AM 44 (48, 44-52); AL 35 (35, 33-37); PL 55 (60, 55-64); sens. 55 x 13 (50, 47-55 x 12-14). *Legs*: All 7-segmented, terminating in a pair of claws and a clawlike empodium. IP = 883-910. *Leg I*: 300-312; coxa 1B; trochanter 1B; basifemur 1B; telofemur 5B; genu 4B, 3 genualae, microgenuala; tibia 8B, 2 tibialae, microtibiala; tarsus (75 x 22) 19B, tarsala (18-20), microtarsala, subterminala, parasubterminala, pretarsala. *Leg II*: 270-280; coxa 1B; trochanter 1B; basifemur 2B; telofemur 4B; genu 3B, genuala; tibia 6B, tibiala; tarsus (68 x 22) 16B, tarsala (18-20), microtarsala, pretarsala. *Leg III*: 305-317; coxa 1B; trochanter 1B; basifemur 2B; telofemur 3B; genu 3B, genuala; tibia 6B, tibiala; tarsus (82 x 18) 15B.

*Remarks*.—*Quadraseta mirandae* is similar to *Q. flochi* in having 3 genualae I, clavate sensillae and PL>AL, but differs in having tarsalae I and II longer (18-20, 14 and 15, respectively, in *Q. flochi*), posterior scutal margin evenly convex (biconvex in *Q. flochi*) and longer dorsal body setae (40-50 in *Q. mirandae* and 25-30 in *Q. flochi*).

*Additional specimens examined* (134).—NW of Orania, 1 *Proechimys guyannensis* (1). Bolívar, E of Caicara, 1 *P. guyannensis* (2). Falcón, E of Mirimire, 2 *Heteromys anomalous* (2), 3 *Monodelphis brevicaudata* (20), 1 *Zygodontomys* sp. (2). Lora, N of El Tucuyo, 1 *Echymys* sp. (1). Miranda, Ca-

racas Country Club, 4 *Didelphis marsupialis* (36); 1 km N of Caracas, Quebrada Chacaito, 1 *H. anomalus* (8), 6 *Oryzomys albigularis* (18). Suere, E of Carupano, 1 *H. anomalus* (11), 1 *M. brevicaudata* (5), 1 *P. guyannensis* (4), 1 *Zygodontomys microtinus* (1). Yaracuy, W of San Felipe, 2 *M. brevicaudata* (8). Zulia, Sierra de Perija, 1 *P. guyannensis* (2), 2 *Proechimys* sp. (3).

*Quadraseta falconensis*, n. sp.

Fig. 4

*Type data*.—Holotype and 12 paratypes from Falcón, W of Coro, 17-VII-1968, ex *Sylvilagus floridanus* (RML 53360).

*Diagnosis*.—Palpal setal formula B/B/BNB/4B; palpal claw 3-pronged; galeala N; 3 genualae I; 34 dorsal body setae; 2 pairs of humeral setae; AL>PL>AM; PW/SD = 1.84.

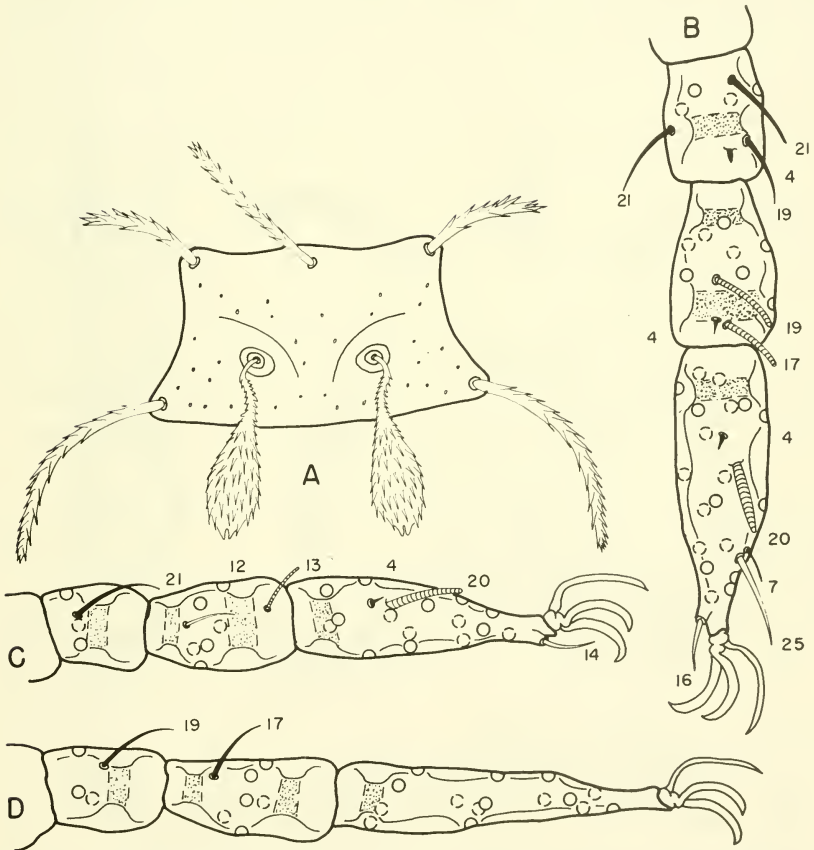


Fig. 3. Larva of *Quadraseta mirandae*: (a) scutum; (b) leg I distal 3 segments showing specialized setae (measurements in micrometers) and bases of branched setae; (c) leg II, as above; (d) leg III, as above.

*Description of species.*—Larvae. *Idiosoma*: Measuring 430 x 300 in engorged specimen. Eyes 2/2, anterior larger, on ocular plate. Two pairs of humeral setae, measuring 25-28; 34 dorsal body setae, measuring 19-26, arranged 8-10-8-6-2; 2 pairs of sternal setae, 25-27; 18 preanal setae, 15-18; 18 postanal setae, 21-23; total body setae 78. *Gnathosoma*: Palpal setal formula B/B/BNB/4B; palpal claw 3-pronged; galeala N; chela (25) with tricuspid cap. *Scutum*: Sparsely punctate; anterior margin deeply biconcave, posterior margin biconvex; AM base in line

with or slightly posterior to AL bases; SB anterior to PL bases;  $AL > PL > AM$ ; sensilla capitate, head with fine setules;  $PW/SD = 1.84$ . Scutal measurements: AW 44 (41, 37-44); PW 61 (57, 52-61); SB 12 (12, 10-13); ASB 22 (22, 20-25); PSB 9 (9, 8-10); AP 26 (25, 22-27); AM 20 (19, 18-20); AL 37 (36, 34-38); PL 32 (31, 28-32); sens. missing in holotype (24, 21-26, head 15 x 16). *Legs*: All 7-segmented, terminating in a pair of claws and a clawlike empodium. IP = 540-560. *Leg I*: 190-195; coxa 1B; trochanter 1B; basifemur 1B; telofemur 5B; genu 4B, 3

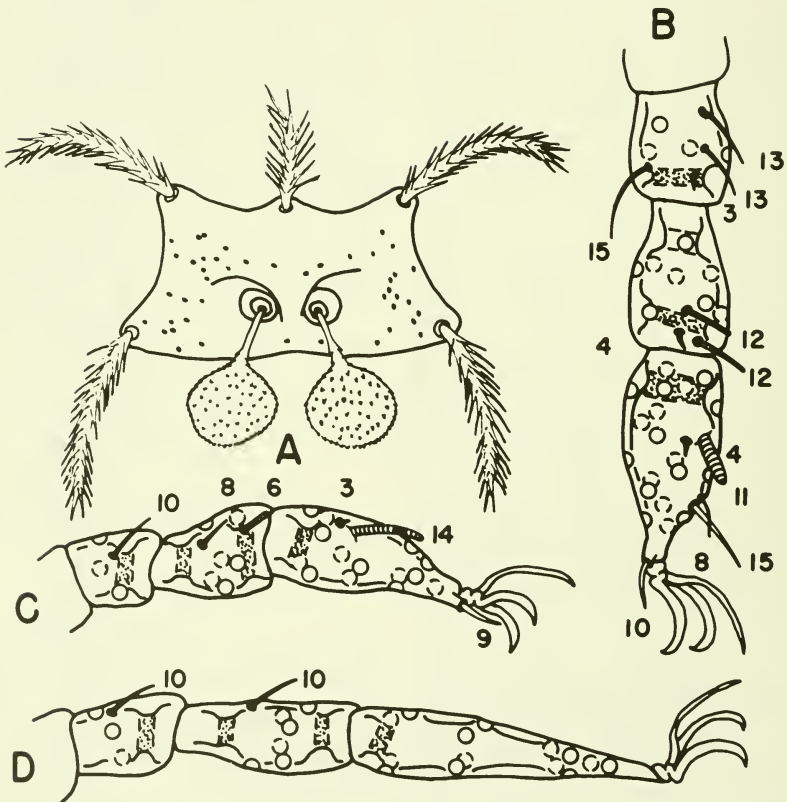


Fig. 4. Larva of *Quadraseta falconensis*: (a) scutum; (b) leg I distal 3 segments showing specialized setae (measurements in micrometers) and bases of branched setae; (c) leg II, as above; (d) leg III, as above.

genualae, microgenuala; tibia 8B, 2 tibialae, microtibialae; tarsus (43 x 17) 19B, tarsala (10-11), microtarsala, subterminala, parasubterminala, pretarsala. *Leg II*: 160; coxa 1B, trochanter 1B; basifemur 2B; telofemur 4B; genu 3B, genuala; tibia 6B, 2 tibialae; tarsus (37 x 15) 14B, tarsala (13-14), microtarsala, pretarsala. *Leg III*: 190-205; coxa

1B; trochanter 1B; basifemur 2B; telofemur 3B; genu 3B, genuala; tibia 6B, tibialae; tarsus (55 x 12) 14B.

*Remarks.*—*Quadrasetta falconensis* shares the character of a nude lateral palpotibial seta with *Q. antillarum* (Brennan, 1967) but differs in having 3 genualae I.

#### Key to Species of *Quadrasetta*

1. Two genualae I ..... 2
- Three genualae I ..... 5
- 2(1). Palpal setal formula B/B/BNB ..... *antillarum* (Brennan, 1967)
- Palpal setal formula B/B/BBB ..... 3
- 3(2). Galeala branched ..... *azulae* (Brennan & Jones, 1964)
- Galeala nude ..... 4
- 4(3). Genu I with 5 branched setae ..... *rotstieri*, n. sp.
- Genu I with 4 branched setae ..... *trapezoides* (Brennan & Jones, 1964)
- 5(1). Galeala branched ..... 6
- Galeala nude ..... 7
- 6(5). PW/SD > 1.75 ..... *tachirensis*, n. sp.
- PW/SD < 1.55 ..... *pazca* (Brennan & Jones, 1964)
- 7(5). Two humeral setae ..... *mackenziei* (Yunker & Brennan, 1964)
- Four humeral setae ..... 8
- 8(7). Sensilla clavate; more than 60 dorsal body setae ..... 9
- Sensilla capitate, fewer than 50 dorsal body setae ..... 10
- 9(8). Tarsala I 18-20; dorsal body setae measuring 40-50 ..... *mirandae*, n. sp.
- Tarsala I 14; dorsal body setae measuring 25-30 ..... *flochi* (Brennan & Jones, 1960)
- 10(9). Lateral palpotibial seta nude ..... *falconensis*, n. sp.
- Lateral palpotibial seta branched ..... *macarenae* (Brennan & Jones, 1964)

#### *Carebareia*, n. gen.

*Type-species.*—*Carebareia johnstoni* Goff & Brennan, n. sp.

*Diagnosis.*—Trombiculine larvae. Palpal tarsus 4B; palpal subterminala absent; palpal claw 3-pronged; galeala N; chela with tricuspid cap; sensilla capitate; genuala I, genuala II and III absent; tibiala III; subterminala and parasubterminala I; no mastisetae on leg III.

*Remarks.*—*Carebareia* is similar to *Quadrasetta* Brennan, 1970, but may be separated by having only 1 genuala I (2-3 in *Quadrasetta*), lacking genuala II and III and having slightly expanded dorsal body setae. Single genuala I and absence of genuala II and III also serve to separate *Carebareia* from *Aitkenius* Brennan, 1970, *Ectonyx*

Brennan, 1960, *Cheladonta* Lipovsky, Crossley & Loomis, 1955, and *Trombevingia* Fonseca, 1955. *Carebareia* is similar to *Kayella* Vercammen-Grandjean, 1960, in having 1 genuala I and lacking genuala II and III, but differs in having both subterminala and parasubterminala I.

#### *Carebareia johnstoni*, n. sp.

Fig. 5

*Type data.*—Holotype and 5 paratypes from Venezuela, Falcón, W of Coro, ex *Marmosa robinsoni* (RML 53544), 25.VII.1968.

*Diagnosis.*—Palpal setal formula B/B/BBB/4B; palpal claw 3-pronged; galeala N; chela with tricuspid cap; eyes 2/2; 1 genuala I; tibiala III; subterminala and



parasubterminala I; 54 slightly expanded dorsal body setae; capitate sensilla; PW/SD = 2.10-2.30.

*Description of species.*—Larvae. *Idiosoma*: Measuring 315 x 220 in partially engorged specimen. Eyes 2/2, anterior larger, on ocular plate. Two pairs of humeral setae, slightly expanded, measuring 26-29; 54 slightly expanded dorsal body setae, measuring 20-22, arranged 8-8-8-6-8-6-6-4; 2 pairs of sternal setae, 28-30; 22 preanal setae, 20-

22; 20 postanal setae, similar in form to dorsal body setae, 23; total body setae 104. *Gnathosoma*: Palpal setal formula B/B/BBB/4B; palpal claw 3-pronged; chela (25) with tricuspid cap; galeala N; gnathobase lightly punctate, bearing a pair of branched setae. *Scutum*: Sparsely punctate; anterior margin shallowly biconcave, posterior margin biconvex; AM base in line with AL bases; SB slightly anterior to PL bases; PL > AM > AL; sensilla capitate, head with

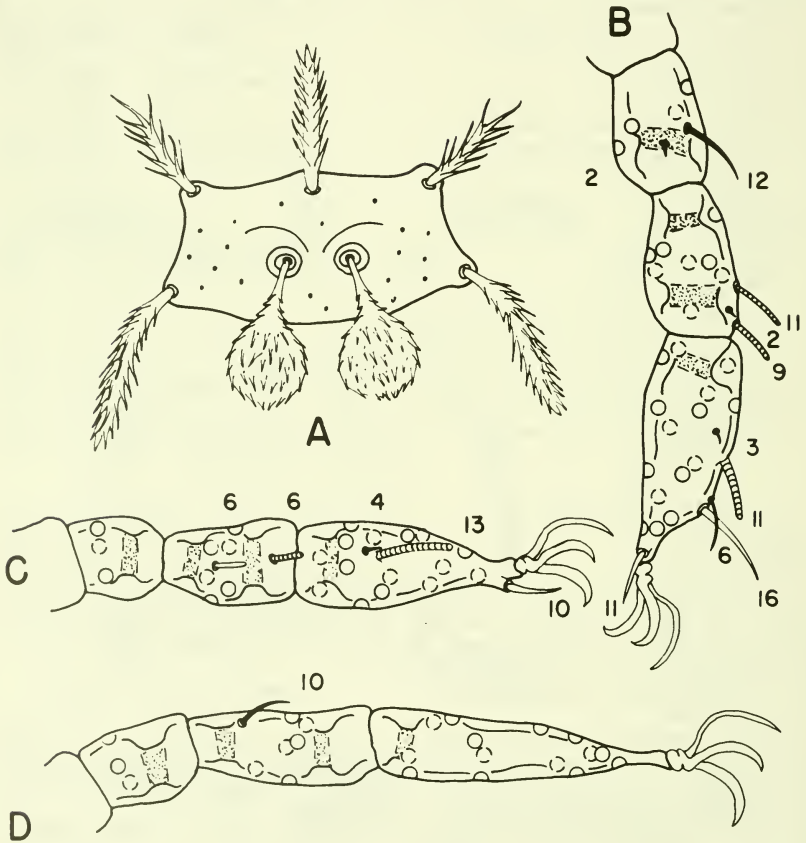


Fig. 5. Larva of *Carebarcia johnstoni*: (a) scutum; (b) leg I distal 3 segments showing specialized setae (measurements in micrometers) and bases of branched setae; (c) leg II, as above; (d) leg III, as above.

coarse setules; PW/SD = 2.10-2.30. Scutal measurements: AW 45 (45, 40-50); PW 55 (59, 55-60); SB 10 (15, 10-16); ASB 16 (17, 16-20); PSB 10 (11, 10-12); AP 18 (20, 18-23); AM 26 (27, 26-29); AL 23 (22, 20-24); PL 30 (33, 30-35); sens. 23 x 15 (26 x 15, 23-28 x 15). *Legs*: All 7-segmented, terminating in a pair of claws and a clawlike empodium. Onychotrictes absent. IP = 559-604. *Leg I*: 192-204; coxa with 1 branched seta (1B); trochanter 1B; basifemur 1B; telofemur 5B; genu 4B, genuala, microgenuala; tibia 8B, 2 tibialae, microtibiala; tarsus (47 x 18) 15B; tarsala (10-11), microtarsala, subterminala, parasubterminala, pretarsala. *Leg II*: 170-190; coxa 1B; trochanter 1B; basifemur 2B; telofemur 4B; genu 3B; tibia 6B, 2 tibialae; tarsus (38 x 16) 15B,

tarsala (13), microtarsala, pretarsala. *Leg III*: 197-210; coxa 1B; trochanter 1B; basifemur 2B; telofemur 3B; genu 3B; tibia 6B, tibiala; tarsus (52 x 14) 14B.

*Remarks*.— This species is named in honor of Dr. Donald E. Johnston, Acarology Laboratory, Ohio State University, in recognition of his many significant contributions to acarology.

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