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A NEW SPECIES OF LARVAL CHARLETONIA (PARASITENGONA: ERYTHRAEIDAE)
AND NEW RECORDS OF LARVAL ERYTHRAEIDAE PARASITIZING ORTHOPTERA
AND PHASMIDA FROM COSTA RICA

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ABSTRACT — A total of 36 larvae were captured parasitizing 4 species of Tettigoniidae (Orthoptera, Ensifera) and two phasmids (Phasmatodea) in the "Reserva Biológica Alberto Manuel Brenes" in Costa Rica. Here, we report the second capture of two species of mites since their original descriptions *Leptus nikanori* Haitlinger, 2000 (Erythraeidae) from Costa Rica and *Charletonia domawiti* Haitlinger, 2004 (Erythraeidae) from Brazil and each only known from a single specimen. We also describe and illustrate *Charletonia salazari* **sp. nov.** captured parasitizing *Scopiorinus mucronatus* (Saussure and Pictet, 1898) (Orthoptera, Tettigoniidae, Pseudophyllinae). A key for the species of the genus *Charletonia* from the New World is provided.

KEYWORDS — Acari; Erythraeidae; *Leptus nikanori*; *Charletonia domawiti*; *Charletonia salazari* **sp. nov.**; Central America

INTRODUCTION

We are presenting the data of mites parasitizing orthopteroids that were collected in a 15 days field trip in "Reserva Biológica Alberto Manuel Brenes (R.B.A.M.B.)" and the surrounding areas of the preserve. The preserve is located in Sierra de Tilarán, Cantón of San Ramón, Alajuela Province in Costa Rica. The specimens were captured under the auspices of the grant "Inventory of the arthropods of the Reserva Biológica Alberto Ml. Brenes" (INVAR-TRAB) and developed by the collaboration between the University of Costa Rica and I.N.I.A. (Instituto Nacional de Investigación y Tecnología Agraria y Alimentaria) (Spain).

Several orders of arthropods were collected by

different specialists. Approximately, five hundred orthopteroids were sampled, either manually from vegetation or using light traps. From over these orthopteroids sampled only six were parasitized. A total of 36 larvae were removed from 4 species of Tettigoniidae (Orthoptera, Ensifera) and two phasmids (Phasmatodea) (one *Planudes* sp. nymph and one *Brizoides* sp. adult): *Scopiorinus mucronatus* (Saussure and Pictet, 1898) (Tettigoniidae, Pseudophyllinae), *Lophaspis scabricula* Brunner von Wattenwyl, 1895 (Tettigoniidae, Pseudophyllinae) (Figure 1), *Idiarthron hammuliferum* (Saussure and Pictet, 1898) (Tettigoniidae, Pseudophyllinae), *Neoconoccephalus triops* Linnaeus, 1758 (Tettigoniidae, Conoccephallinae).



FIGURE 1: *Lophaspis scabricula* Brunner von Wattenwyl, 1895 (Tettigoniidae, Pseudophyllinae) parasitized by *Leptus nikanori* Haitlinger, 2000.

All the parasites captured belong to Erythraeidae Robineau-Desvoidy, 1828 and they are grouped into two genera, *Leptus* Latreille, 1796 and *Charletonia* Oudemans, 1910. These two genera are distributed world-wide but what is known for Central America is very scarce. Here, we report the second capture of two species since their original descriptions *Leptus nikanori* Haitlinger, 2000 from Costa Rica and *Charletonia domawiti* Haitlinger 2004 from Brazil and both known from a single specimen; also, we describe a new species belonging to *Charletonia* and parasitizing *Scopiorinus mucronatus*.

MATERIALS AND METHODS

Mites were captured during a sampling field trip in Costa Rica while they were parasitizing different species of orthopterans. The complete list of Orthoptera identified has been published in two papers (Barranco, 2010a; Barranco, 2010b). Katydidids were collected and identified, and the parasites were carefully removed in the laboratory un-

der a stereomicroscope. Measurements and illustrations were made after clearing the specimens in 50% lactic acid and mounting them in PVA medium (Krantz and Walter, 2009) using a Nikon Optiphot-2 compound microscope with a drawing attachment. All the measurements are given in micrometers. Terminology and abbreviations for the description of the new species follow Saboori *et al.*, (2009) and Sedghi *et al.*, (2010).

FAMILY ERYTHRAEIDAE ROBINEAU-DESVOIDY, 1828

Subfamily Leptinae Southcott, 1957

Genus *Leptus* Latreille, 1796

Leptus nikanori Haitlinger, 2000

Material examined — Twelve larvae, Colonia Palmareña. San Ramón, Alajuela, Costa Rica. 21-IX-2006. P. Barranco leg. On *Scopiorinus mucronatus*. P. Barranco det. (R-249B-D, R-249G-I, R-249M-R); 3

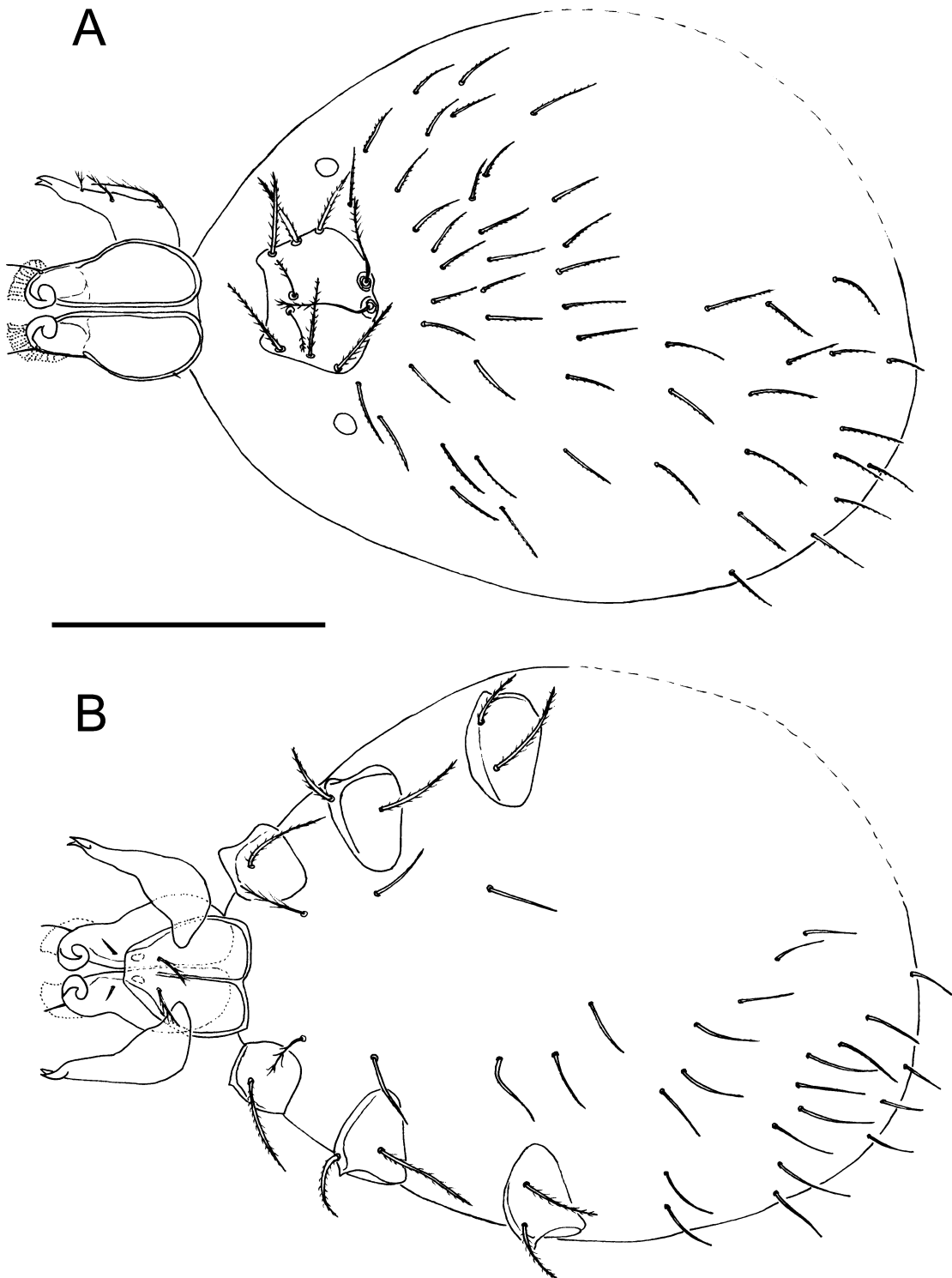


FIGURE 2: *Charletonia salazari* sp. nov. (larvae). A – idiosoma dorsal view; B – idiosoma ventral view. Scale bar 200 μ m.



FIGURE 3: *Charletonia salazari* sp. nov. (larvae). A – Leg I; B – Leg II; C – Leg III. Scale bar 100 μ m.

larvae, R.B.A.M.B. San Ramón, Alajuela, Costa Rica. 23-IX-2006. P. Barranco leg. On *Lophaspis scabricula*. P. Barranco det. (R-260A-C); 1 larva, R.B.A.M.B. San Ramón, Alajuela, Costa Rica. 23-IX-2006. P. Barranco leg. On *Idiarthron hammuliferum* Beier, 1960. P. Barranco det. (R-258); 1 larva, R.B.A.M.B. San Ramón, Alajuela, Costa Rica. 19-IX-2006. P. Barranco leg. On *Brizoides* sp. phasmid (R-261); 10 larvae, R.B.A.M.B. San Ramón, Alajuela, Costa Rica. 15-IX-2006. P. Barranco leg. On *Planudes* sp. phasmid nymph (R-259A-J).

Remarks — We found *L. nikanori* in two ar-

eas sampled, inside the R.B.A.M.B. and in the surrounding area of Colonia Palmareña. This species was relatively common inside of the preserve. These two areas differ in the type of vegetation and in the species of orthopterans present (Barranco, 2010a, 2010b). *Leptus nikanori* was found on the two different hosts Phasmida and Orthoptera. We captured a total of 16 larvae parasitizing 3 species of katydids and 11 larvae parasitizing 2 species of phasmids. This species was originally described from Irazú, Costa Rica on plants (Haitlinger, 2000) from a unique larva; since morphometric data is

only known for the holotype, we are presenting the metric information for the 27 exemplars we captured from San Ramón, Alajuela, Costa Rica (Table 1). This is the second time that this species is captured and it is only known from Costa Rica.

TABLE 1: Metric data (in micrometers) for *Leptus nikanori* (larvae) from Costa Rica.

| Character | <i>L. nikanori</i> | Character | <i>L. nikanori</i> |
|-----------|--------------------|-----------|--------------------|
| L | 90-116 | TFe I | 99-148 |
| W | 108-135 | Ge I | 135-193 |
| AW | 85-99 | Ti I | 203-280 |
| PW | 99-121 | Ta I | 158-216 |
| AA | 14-18 | Cx II | 97-117 |
| SB | 14-18 | Tr II | 54-72 |
| ISD | 63-74 | BFe II | 99-135 |
| AP | 18-27 | TFe II | 90-135 |
| AL | 72-87 | Ge II | 117-166 |
| PL | 77-99 | Ti II | 176-256 |
| AM | 43-54 | Ta II | 144-175 |
| S | 54-77 | Cx III | 95-112 |
| DS | 45-70 | Tr III | 54-81 |
| GL | 216-256 | BFe III | 104-157 |
| 1b | 90-108 | TFe III | 108-162 |
| 2b | 32-52 | Ge III | 126-180 |
| 3b | 45-67 | Ti III | 248-351 |
| Cx I | 72-99 | Ta III | 158-202 |
| Tr I | 50-67 | IP | 2558-3306 |
| BFe I | 108-162 | | |

Subfamily Callidosomatinae Southcott, 1957

Genus *Charletonia* Oudemans, 1910

Charletonia domawiti Haitlinger, 2004

Material examined — Three larvae, R.B.A.M.B. San Ramón, Alajuela, Costa Rica. 16-IX-2006. P. Barranco leg. On *Neoconocephalus triops*. P. Barranco det. (R-247A-C).

Remarks — These exemplars captured from Costa Rica (247A–C) are identical to the specimen known of *C. domawiti* (Haitlinger, 2004). This species was described from a single specimen from plants and no further captures have been reported. Here, we provide metric data for the three specimens captured in Costa Rica (Table 2). The only dif-

ferences found between the specimens from Costa Rica and Brazil are a slightly shorter BFe I (148-158 *vs.* 172) and BFe III (153-166 *vs.* 180). This is the second report of *C. domawiti*, the first out of Brazil. The host is also wide-spread from south of North America to Peru and Brazil (Barranco, 2010a).

Charletonia salazari sp. nov.

Figs. 2-4, Table 2

Material examined — Holotype, larva, Colonia Palmareña, San Ramón, Alajuela, Costa Rica. 21-IX-2006. P. Barranco leg. On *Scopiorinus mucronatus*. P. Barranco det. (R-249A); Paratypes, 5 larvae, same location, collector and host as holotype (R-249E, F, J, K, L). Holotype and one paratype are deposited in the Museum of Universidad de Costa Rica, two paratypes are deposited in "Museo Nacional de Ciencias Naturales de Madrid" (MNCN-CSIC) in Spain; two paratypes are deposited in the author's collection.

Description based on holotype — Color in life red. Idiosoma ovoid, 560 μm long and 420 μm wide, total length of the animal from the tip of the chelicerae to posterior pole of idiosoma 682 μm .

Dorsum — Bears 52 idiosomalae, apically pointed, lightly barbed and arranged in transverse rows across idiosoma (Figure 2). One eye on each side of the idiosoma, cornea circular, 20 μm across. Dorsal scutum wider than long, with a concave anterior border, convex posterior border and anterolateral and posterolateral angles rounded. Three pairs of scutalae (AL > ML = PL) and two pairs of sensillae with fine setules in only distal half. Anterior pair of sensillae (AM) shorter than the posterior ones (S).

Venter — Idiosoma with a pair of setae between coxae I, with long ciliations as figured; between coxae II a pair of pointed ciliate setae; in the area between coxae II and III four setae, tapering, pointed and ciliate (Figure 2). Measurements for these setae are included in Table 2. Behind coxae III, 20 setae, arranged approximately in three rows 8 (2+4+2), 8 (3+2+3), 4.

Gnathosoma — Galeala spiniform, nude, 31 μm long. Anterior hypostomala slender, nude, 16 μm long; posterior hypostomala with setules, 34 μm

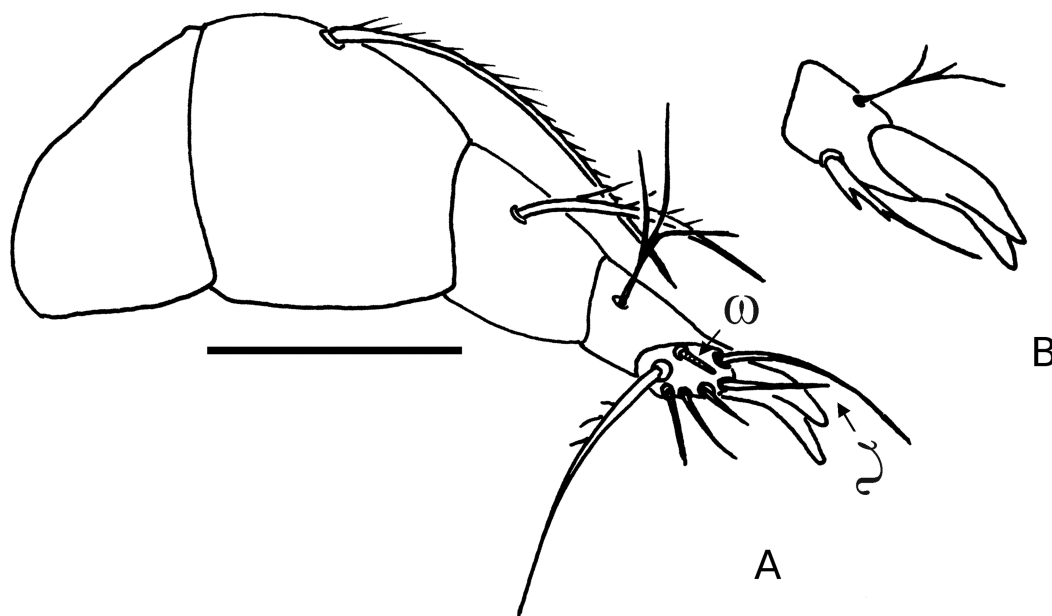


FIGURE 4: *Charletonia salazari* sp. nov. (larvae). A – palp dorsal view; B – palp tibia ventral view. Scale bar 15 μ m.

long. Chelicerae bases rounded, chelicerae blades curved with a tiny secondary tooth at the apical end. Palpal supracoxala present, 9 μ m long. Palpal setal formula: 0-B-B-BBB₂-4NB ω ζ (Figure 4).

Leg setal formula — Leg I: Ta-1 ω , 2 ζ , 1 ϵ , 1Cp, 25B, 2N; Ti-2 φ , 1 κ , 1 Cp, 15B; Ge-1 σ , 1 κ , 12B; TFe-5B; BFe-4B; Tr-1B, Cx-1B, Sx (Figure 3A). Leg II: Ta-1 ω , 1 ζ , 26B, 2N; Ti-2 φ , 16B; Ge-1 κ , 12B; TFe-5B; BFe-4B; Tr-1B, Cx-2B (Figure 3B). Leg III: Ta-, 1 ζ , 28B, 2N; Ti-1 φ , 16B; Ge-12B; TFe-5B; BFe-2B; Tr-1B, Cx-2B (Figure 3C).

$$IP=775+721+854=2350$$

Measurements for the holotype and paratypes are given in Table 2.

Remarks — *Charletonia salazari* sp. nov. belongs to the group of species with four setae between coxae II-III. This group includes species described from Europe, Africa, Asia, Australia and America. The genus *Charletonia* is barely known from the New World and there are 7 species reported, one from Central America, two from South America and 4 from North America (Southcott, 1991; Haitlinger, 2000; Haitlinger, 2004; Treat and Flechtmann, 1979).

All of them belong to the group with four setae between coxae II-III. The new species belongs to the species group with four setae between coxae II-III, two hypostomatae, solenidion placed distally on Ge I, fn Ge 12,12,12 and Ti III 200 – 255 μ m. In this group the following species are included, *C. enhoffi* Southcott, 1991, *C. froggatti* Oudemans, 1910, *C. feideri* Southcott, 1966, *C. rageaui* Southcott 1966, *C. paolii* Southcott, 1966, *C. aerolata* (Tra-gardh 1908), *C. banksi* Southcott, 1966, *C. grand-popensis* Hailinger, 2007 and *C. humanensis* Zheng, 1996 (Southcott, 1966; Southcott, 1991; Zheng, 1996; Haitlinger, 2007). It is possible to distinguish all these species from *C. salazari* sp. nov. because of its unique tibia setae formula (fn Ti). Also, they differ from the new species in the following characters.

It differs from *C. enhoffi* in the number of dorsal setae (52 vs. 76), ventral setae (28 vs. 40), the number of barbed seta on Ti I (15 vs. 17), Ti II (16 vs. 18) or Ti III (16 vs. 18) and posterior hypostomata with setules vs. nude; by shorter AW (72 – 81 vs. 86 – 91), ISD (54 – 63 vs. 73 – 77), L (86-97 vs. 105 – 110), AM (42 – 52 vs. 70 – 75), S (72 – 90 vs. 116 – 129), Ti I (162

TABLE 2: : Metric data (in micrometers) for *Charletonia salazari* sp. nov. (larvae) and *C. domawiti* (larvae). H: holotype, P1-P5: paratypes 1-5.

| Character | <i>C. salazari</i> sp. nov. | | | | | | <i>C. domawiti</i> | |
|-----------------|-----------------------------|-------|-----|------|-------|-------|--------------------|-------------|
| | H | P1 | P2 | P3 | P4 | P5 | Range | Range |
| IL | 560 | - | - | - | - | - | 560 | 822-910 |
| IW | 420 | - | - | - | - | - | 420 | 420-507 |
| AW | 77 | 81 | 77 | 77 | 77 | 72 | 72-81 | 81-95 |
| MW | 93 | 99 | 90 | 90 | 90 | 88 | 88-93 | 100-117 |
| PW | 112 | 117 | 112 | 108 | 112 | 106 | 106-117 | 117-135 |
| AA | 14 | 14 | 14 | 12 | 12 | 12 | déc-14 | 16-18 |
| SB | 20 | 20 | 20 | 20 | 20 | 18 | 18-20 | 23-30 |
| AAS | 27 | 27 | 23 | 29 | 27 | 25 | 23-29 | 32-36 |
| ISD | 60 | 63 | 54 | 58 | 60 | 54 | 54-63 | 83-90 |
| L | 92 | 95 | 86 | 97 | 96 | 86 | 86-97 | 121-130 |
| W | 119 | 126 | 117 | 115 | 117 | 115 | 115-126 | 120-144 |
| AP | 48 | 49 | 45 | 49 | 45 | 45 | 45-49 | 59-72 |
| AL | 70 | 70 | 67 | 67 | 72 | - | 67-72 | 77-85 |
| ML | 59 | 59 | 59 | 60 | 60 | 54 | 54-60 | 63-72 |
| PL | 59 | 54 | 59 | 59 | 60 | 56 | 54-60 | 63-65 |
| AM | 50 | 50 | - | 45 | 50 | 52 | 45-52 | 68-70 |
| S | 74 | 90 | - | 76 | 72 | 78 | 72-90 | 99 |
| DS | 40-59 | 40-56 | - | - | 40-60 | 36-56 | 36/40-56/60 | 36/45-67/81 |
| Oc | 20 | 22 | - | 18 | 18 | 18 | 18-22 | 18-20 |
| GL | 148 | 148 | 148 | 148 | 148 | 148 | 148 | 176-184 |
| 1a | 45 | 45 | - | 45 | 45 | - | 45 | 68-72 |
| 2a | 65 | 63 | - | 67 | 63 | - | 63-67 | 85-90 |
| 1b | 92 | 90 | 90 | 86 | 90 | 90 | 86-92 | 100-117 |
| 2b ₁ | 81 | 85 | 81 | 77 | 85 | 77 | 77-85 | 85-94 |
| 2b ₂ | 45 | - | 45 | 52 | 52 | 50 | 45-52 | 54-63 |
| 3b ₁ | 72 | 70 | - | - | 68 | 63 | 63-72 | 81-90 |
| 3b ₂ | 45 | 45 | - | 45 | 45 | 45 | 45 | 56-63 |
| Cx I | 81 | 85 | - | 77 | 72 | 78 | 72-85 | 86-95 |
| Tr I | 54 | 54 | 54 | 58 | 54 | 54 | 54-58 | 72 |
| BFe I | 99 | 112 | 95 | 104 | 99 | 90 | 90-112 | 148-158 |
| TFe I | 72 | 81 | 76 | 77 | 72 | 76 | 72-81 | 108-126 |
| Ge I | 140 | 135 | 135 | 133 | 135 | 126 | 126-140 | 194-211 |
| Ti I | 167 | 168 | 175 | 166 | 171 | 162 | 162-175 | 288-315 |
| Ta I | 162 | 162 | 162 | 158 | 162 | 158 | 158-162 | 202-207 |
| Cx II | 86 | 86 | 90 | 81 | 81 | 90 | 81-90 | 104-108 |
| Tr II | 54 | 58 | 58 | 54 | 58 | 58 | 54-58 | 77 |
| BFe II | 90 | 94 | 90 | 94 | 94 | 90 | 90-94 | 121-140 |
| TFe II | 68 | 76 | - | 72 | 68 | 68 | 68-76 | 99-113 |
| Ge II | 117 | 126 | - | 117 | 121 | 113 | 113-126 | 162-189 |
| Ti II | 153 | 157 | - | 149 | 153 | 140 | 140-157 | 243-275 |
| Ta II | 153 | 157 | - | 153 | 153 | 144 | 144-157 | 194-203 |
| Cx III | 85 | 94 | - | 94 | 94 | 81 | 81-94 | 112-117 |
| Tr III | 63 | 67 | - | 69 | 68 | 63 | 63-69 | 81-90 |
| BFe III | 103 | 95 | - | 99 | 95 | 99 | 98-103 | 153-166 |
| TFe III | 90 | 99 | - | 94 | 90 | 90 | 90-99 | 133-144 |
| Ge III | 140 | 144 | - | 140 | 144 | 135 | 135-144 | 185-211 |
| Ti III | 211 | 225 | - | 211 | 211 | 203 | 203-225 | 365-405 |
| Ta III | 162 | 162 | - | 166 | 162 | 150 | 150-162 | 203-207 |
| IP | 2350 | 2437 | - | 2366 | 2357 | 2268 | 2268-2437 | 3349-3604 |

– 175 vs. 200 – 216) and Ti II (140 – 157).

It differs from *C. froggati* in the number of dorsal setae (52 vs. 64), ventral setae (28 vs. 37), the number of barbed seta on Ti I (15 vs. 14), Ti II (16 vs. 14) or Ti III (16 vs. 18); by larger PW (106 – 117 vs. 99 – 100), AAS (23 – 29 vs. 16 – 17), W (115 – 126 vs. 107 – 109), ML (54 – 60 vs. 42 – 49), Ta I (158 – 162 vs. 129); by shorter ISD (54 – 63 vs. 61 – 71), short DS (36 – 40 vs. 54 – 60), long DS (56 – 60 vs. 73 – 77).

It differs from *C. feideri* in the number of dorsal setae (52 vs. 86), ventral setae (28 vs. 44), the number of barbed seta on Ti I (15 vs. 18), Ti II (16 vs. 18), Ti III (16 vs. 19) and the number of setae on palpal tarsus (8 vs. 7); by larger PW (106 – 117 vs. 98 – 99), W (115 – 126 vs. 104), AL (67 – 72 vs. 57 – 59), ML (54 – 60 vs. 48 – 54), Ge I (126 – 140 vs. 112 – 125), Ti I (162 – 175 vs. 138 – 159), Ta I (158 – 162 vs. 129 – 140) and Ge III (135 – 144 vs. 121)

It differs from *C. rageaui* in the number of dorsal setae (52 vs. 94), ventral setae (28 vs. 54), the number of barbed seta on Ti I (15 vs. 17), Ti II (16 vs. 17), Ti III (16 vs. 19) and the number of setae on palpal tarsus (8 vs. 7); by larger PW (106 – 117 vs. 97 – 102), W (115 – 126 vs. 103 – 107), PL (54 – 60 vs. 44 – 47) and Ta I (158 – 162 vs. 142 – 149).

It differs from *C. paolii* in the number of dorsal setae (52 vs. 98), ventral setae (28 vs. 62), the number of barbed seta on Ti I (15 vs. 18), Ti II (16 vs. 18) or Ti III (16 vs. 19), the number of setae on palpal tarsus (8 vs. 7), nude galeala vs. galeala with ciliations, posterior hypostomala with setules vs. nude; by larger PW (106 – 117 vs. 91), W (115 – 126 vs. 98), PL (54 – 60 vs. 36 – 43), Ta I (158 – 162 vs. 137) and Ta III (150 – 162 vs. 133).

It differs from *C. aerolata* in the number of dorsal setae (52 vs. 97), ventral setae (28 vs. 42), the number of barbed seta on Ti I (15 vs. 18), Ti II (16 vs. 18) or Ti III (16 vs. 19), the number of setae on palpal tarsus (8 vs. 7), nude galeala vs. galeala with several ciliations; AM (45 – 52 vs. 51 – 66), Ge I (126 – 140 vs. 157), Ti I (162 – 175 vs. 199), Ge III (135 – 144 vs. 167), Ti III (203 – 225 vs. 259), Ta III (150 – 162 vs. 173) and by longer AP (67 – 72 vs. 39 – 46).

It differs from *C. banksi* in the number of dorsal setae (52 vs. 97), ventral setae (28 vs. 46), the number of barbed seta on Ti I (15 vs. 18), Ti II (16 vs. 19)

or Ti III (16 vs. 19), the number of setae on palpal tarsus (8 vs. 7), nude galeala vs. galeala moderately ciliated; by larger AL (67 – 72 vs. 52 – 60), PL (54 – 60 vs. 43 – 52), Ta I (158 – 162 vs. 146), Ge III (135 – 144 vs. 125), Ta III (150 – 162 vs. 142), Leg I (744 – 797 vs. 725), Leg II (703 – 754 vs. 660), Leg III (821 – 866 vs. 790) and by shorter S (72 – 90 vs. 90 – 95).

It differs from *C. grandpopensis* in the number of dorsal setae (52 vs. 60), ventral setae (28 vs. 43), the number of barbed seta on Ti I (15 vs. 18), Ti II (16 vs. 17) or Ti III (16 vs. 17), the number of setae on palpal tarsus (8 vs. 6) and AM with fine setules in distal half vs. nude; by larger W (115 – 126 vs. 100 – 104), GL (148 vs. 96 – 108), long DS (40 – 60 vs. 68 – 72), 2a (63 – 67 nvs 52 – 56), 1b (82 – 92 vs. 62 – 76), 2b₁ (77 – 85 vs. 54 – 72), Cx I (72 – 85 vs. 58 – 68), Cx II (81 – 90 vs. 64 – 72), Cx III (81 – 94 (62 – 72), BFe I (90 – 112 vs. 76 – 86), BFe II (90 – 94 vs. 58 – 64), BFe III (98 – 103 vs. 82 – 88), Ta I (158 – 162 vs. 130 – 134), Ta II (144 – 157 vs. 118 – 126), Ta III (150 – 162 vs. 138), Tr III (63 – 69 vs. 48 – 54) and Ge III (135 – 144 vs. 112 – 122).

It differs from *C. hunanensis* in the number of dorsal setae (52 vs. 73), ventral setae (28 vs. 47), the number of barbed seta on TFe I (5 vs. 6), on Ti I (15 vs. 18), Ti II (16 vs. 21), Ti III (16 vs. 18), the presence of solenoidala on Ti II (2 vs. 0), the presence of solenoidala on Ti III (1 vs. 0), the number of vestigiala on genu I (1 vs. 2), the presence of vestigiala on tibia I (1 vs. 0), the presence of vestigiala on Ti I (1 vs. 0) and the absence of vestigiala on Ti II (0 vs. 1); by larger W (115 – 126 vs. 106), 2a (63 – 67 vs. 59), 3b₁ (63 – 72 vs. 54), Ge III (134 – 144 vs. 125) and by shorter 3b₂ (45 vs. 52).

Key to the *Charletonia* species of the New World (Neotropic and Nearctic)

1. Ti I with 15 normal setae 2
 — Ti I with 17 normal setae *C. cardinalis* (USA, Europe, Turkey, Malasia, Australia)
 — Ti I with 18 normal setae 3
2. Ti II, III with 16, 16 normal setae
 *C. salazari* sp. nov. (Costa Rica)
 — Ti II, III with 18, 18 normal setae
 *C. philometra* (USA)

3. Ti III with 18 normal setae 4
 — Ti III with 19 normal setae 5
4. Ti I < 200 µm/ IP=1795 *C. rocciai* (Brazil)
 — Ti I > 200 µm/ IP=3594. *C. domawiti* (Costa Rica)
5. Ti II with 18 normal setae *C. alvedae* (Peru)
 — Ti II with 19 normal setae 6
6. Ge I with 11 normal setae/ Ti I < 200 µm
 *C. wrighti* (USA)
 — Ge I with 12 normal setae/ Ti I > 200 µm
 *C. nishidai* (USA)

Etymology — The new species is named after Mr. Alberto Hámer Salazar Rodríguez, director of the biological preserve in Costa Rica "Reserva Biológica Alberto Manuel Brenes" at the time that the captures were performed.

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