



Marine water mites (Acari: Hydrachnidia: Pontarachnidae) from the Caribbean Sea, with description of one new species

Vladimir PEŠIĆ¹, Tapas CHATTERJEE² and Nikolaos V. SCHIZAS³

(¹) Department of Biology, University of Montenegro, Cetinjski put b.b., 81000 Podgorica, Montenegro.

E-mail: pesicv@cg.yu

(²) Department of Biology, Indian School of Learning, I.S.M. Annexe, P.O. – I.S.M., Dhanbad-826004, Jharkhand, India.

E-mail: drtchatterjee@yahoo.co.in

(³) Department of Marine Sciences, University of Puerto Rico, Mayagüez, Isla Magueyes Laboratories,

P.O. Box 908, Lajas. 00667 Puerto Rico, USA. E-mail: n_schizas@cima.uprm.edu

Abstract: *Litarachna caribica*, a new species of the predominantly marine water mite family Pontarachnidae (Acari: Hydrachnidia) is described from the Caribbean Sea (Curaçao, Netherlands Antilles). New records and the first description of the deutonymph are given for *Litarachna degiustii* Cook, 1958.

Résumé : *Acariens marins (Acari : Hydrachnidia : Pontarachnidae) de la Mer Caraïbe, description d'une nouvelle espèce.* *Litarachna caribica*, une nouvelle espèce de la famille des Pontarachnidae (Acari: Hydrachnidia) est décrite de la Mer Caraïbe (Curaçao, Antilles hollandaises). De nouveaux signalements et la première description de la deutonymphe sont donnés pour *Litarachna degiustii* Cook, 1958.

Keywords: *Litarachna* • New records • Curaçao • Bahamas.

Introduction

Water mites of the family Pontarachnidae Koenike have been reported from tropical and temperate littoral habitats bordering the Mediterranean Sea, Aral Sea, Caspian Sea, Atlantic Ocean, Pacific Ocean, Red Sea and Indian Ocean (Smit, 2002; Wiles et al., 2002; Pesic et al., 2008). Most species live in the marine littoral zone, but a few species are

known from freshwater or brackish habitats. The family is represented by two genera: *Pontarachna* Philippi, 1840 and *Litarachna* Walter, 1925. Only the species *Litarachna brasiliensis* Smit, 2007 is known from South America. Two species are known from North America: *Pontarachna cruciata* Hall, 1912 from California and *Litarachna degiustii* Cook, 1958 from Bimini, Bahamas.

In the present paper, a new species of *Litarachna* is described from the southern Caribbean Sea. In addition, new records are provided for *Litarachna degiustii*, including the first description of the deutonymph.

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Materials and methods

Material examined in the present study was collected among epiphytial algae from red mangrove roots while snorkeling. The collected algae were washed over a 500 μm sieve and all material retained on a 63 μm sieve was examined under a dissecting microscope. All material was preserved in 95% ethanol. The holotype and paratypes are deposited in the Museum of Natural History of Podgorica (MNHP).

All measurements are given in μm . The following abbreviations are used: L = length, %L = relative length, I/II/III/IV-Leg-1-6 = first to sixth segments of leg I/II/III/IV, P-1 to P-5 = palp segments 1 to 5, W = width.

Systematics

Genus *Litarachna* Walter, 1925

Litarachna caribica sp. nov.

(Figs 1-7)

Type series

Holotype: female, dissected and slide mounted in Hoyer's fluid. Caribbean Sea, Netherlands Antilles, Curaçao, Nieuwpoort, 12°02'50"N - 68°49'21"W, 24.x.2007 leg. Schizas & Torres-Pratts. Paratypes: one male, one deutonymph, dissected and slide mounted in Hoyer's fluid, same data and place as the holotype.

Diagnosis

First coxal plates fused, glandularium-like structure posterior to fourth coxal plates not fused with adjoining coxoglandularia 4, about 50 pairs of perigenital setae in male, female genital field more oval.

Description

Female. Idiosoma L/W 353/291. First coxal plates fused medially. Suture lines of second and third coxal plates and suture lines of third and fourth coxal plates incomplete. Lateral posterior apodemes of the fourth coxal plates short and broad, medial posterior apodemes of moderate length, extending to posterior margin of genital field (Fig. 1). Genital field L/W 59/44. Pregenital and postgenital sclerite strongly bowed and fused. Between the posterior apodemes of the fourth coxal plates a pair of glandularia-like structures and a pair of small platelets with (according to Wiles et al., 2002) coxoglandularia 4 and associated setae. Posterior to the genital field a pair of platelets with three pores and four pairs of wheel-like acetabula (*sensu* Cook, 1996) or specialized glandularia (*sensu* Tuzovskij, 1978). Three of these wheel-like structures large with many

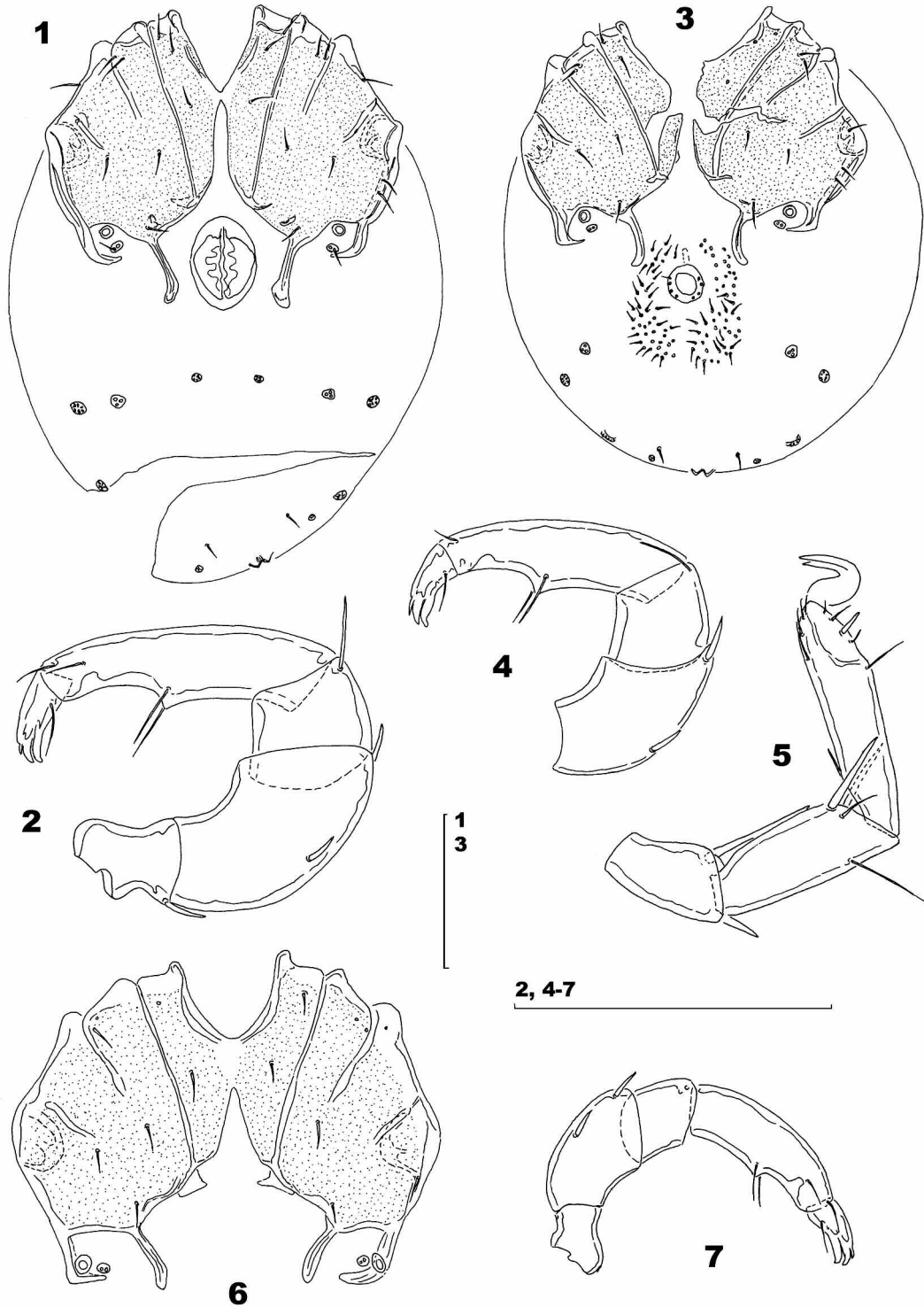
radiating spokes, the most posterior one small with relatively few radiating spokes. Excretory pore unsclerotized, near the posterior extremity. Palp (Fig. 2) total L 252, dorsal L and %L (given as % of total L): P-1 21 (8.3), P-2 77 (30.6), P-3 37 (14.7), P-4 92 (36.5), P-5 25 (9.9); P-2/P-4 ratio 0.84; ventral margin of P-2 somewhat concave without extension; ventral margin of P-4 with a strongly developed setal tubercle. Lengths of I-Leg-3-6: 44, 46, 67, 87; IV-Leg-3-6: 52, 85, 106, 102; III-Leg-5 and IV-Leg-5 with one and two swimming setae, respectively.

Male. Idiosoma L/W 297/270. Due to mounting the first coxal plates a little bit damaged. Suture lines of coxal plates II/III and III/IV medially incomplete. Lateral posterior apodemes of the fourth coxal plates short and broad, medial posterior apodemes of moderate length, not extending beyond anterior margin of genital field (Fig. 3). Genital field L/W 26/24, consisting of a sclerotized ring with four pairs of setae, many perigenital setae (45-54 pairs) free in integument around genital field. Between the posterior apodemes of the fourth coxal plates a pair of glandularia-like structures and a pair of small platelets with (according to Wiles et al. 2002) coxoglandularia 4 and associated setae. Posterior to the genital field a pair of platelets with three pores and three pairs of wheel-like acetabula (*sensu* Cook, 1996) or specialized glandularia (*sensu* Tuzovskij, 1978). Two of these wheel-like structures large with many radiating spokes, the most posterior one small with relatively few radiating spokes. Excretory pore unsclerotized, near the posterior extremity. Palp (Fig. 4) total L 213, dorsal L and %L (given as % of total L): P-1 18 (8.5), P-2 65 (30.5), P-3 29 (13.6), P-4 79 (37.1), P-5 22 (10.3); P-2/P-4 ratio 0.82; palp as in female. Lengths of I-Leg-3-6 (Fig. 5): 38, 39, 61, 79; IV-Leg-1-6: 59, 35, 44, 76, 93, 95; IV-Leg-5 with one swimming seta.

Deutonymph. As in adults, but lacking a genital field. Idiosoma L/W 208/150; Palp (Fig. 7) total L 159, dorsal L and %L (given as % of total L): P-1 12 (7.6), P-2 46 (28.9), P-3 24 (15.1), P-4 56 (35.2), P-5 21 (13.2); P-2/P-4 ratio 0.82.

Remarks

Litarachna caribica sp. nov. belongs to the "*duboscqi*"-species group characterized by the absence of a ventral tubercle on P-2 and presence of a ventral tubercle on P-4. So far, six species of this group are known: *Litarachna duboscqi* Walter, 1925 from the Mediterranean, *L. degiustii* Cook, 1958 from the Caribbean Sea, *L. amnicola* Cook, 1986 from Tasmania, *L. hongkongensis* Smit, 2002 from Hong Kong, *L. marshalli* Wiles, Chatterjee & De Troch, 2002 from South Africa, and *L. brasiliensis* Smit, 2007 from Brazil. The new species resembles *L. brasiliensis* due to the first coxal plates medially fused and the



Figures 1-7. *Litarachna caribica* sp. nov. (1-2 = female, 3-5 = male, 6-7 = deutonymph). **1 & 3.** Idiosoma, ventral view. **2 & 7.** Palp. **4.** Palp (P-2-5). **5.** I-Leg-5-6. **6.** Coxal field. Scale bars = 100 μ m.

Figures 1-7. *Litarachna caribica* sp. nov. (1-2 = femelle, 3-5 = mâle, 6-7 = deutonymphe). **1 & 3.** Idiosome, vue ventrale. **2 & 7.** Palpe. **4.** Palpe (P-2-5). **5.** Patte-I-5-6. **6.** Zone coxale. Echelle = 100 μ m.

glandularium-like structure posterior to fourth coxal plates not fused with adjoining coxoglandularia 4. *L. caribica* sp. nov. can be distinguished from *L. brasiliensis* in the presence of a higher number of perigenital setae in male (45-54 pairs vs. only 2-3 pairs in *L. brasiliensis*), and the female genital field more oval, L/W ratio 1.36 (more elongated in *L. brasiliensis*, L/W ratio 1.7).

Two further *Litarachna* species have their first coxal plates fused, i.e., *L. degiustii* and *L. amnicola*. *L. degiustii* (see below) differs in the fusion of coxoglandularia 4 and the glandularia-like structure, the large fusion of the first coxal plates, the presence of three pairs of perigenital setae in male and the genital sclerites of the female not fused (Cook, 1958). *L. amnicola* has the large glandularia-like structure fused with the fourth coxal plates and 22-24 pairs of perigenital setae in male (Cook, 1986). According to Cook (1986) first coxal plates may fuse medially to various degree.

Litarachna duboscqi has the glandularium-like structure posterior of fourth coxal plates fused with adjoining coxoglandularia 4, and about 10 pairs of perigenital setae in male (Walter, 1925). *L. hongkongensis* is very similar to *L. duboscqi* but differs in the glandularium-like structure posterior to fourth coxal plates not fused with adjoining coxoglandularia 4 (Smit, 2002). *L. marshalli* is characterized by glandularium-like structure posterior of fourth coxal plates not fused with coxoglandularia 4, and the male genital field having only three pairs of perigenital setae (Wiles et al., 2002).

Etymology

The species is named after the sea of the type locality.

Litarachna degiustii Cook, 1958 (Figs 8-12)

Material

Caribbean Sea: Netherlands Antilles, Curaçao, Nieuwpoort, 12°02'50"N 68°49'21"W, 24.x.2007 leg. Schizas & Torres-Pratts (1/4/0), one male and one female dissected and slide mounted in Hoyer's fluid; Bahamas - near Lee Stocking Island, Norman's Pond Cay, 23°46'08" N 76°07'49"W, 23.ix.2005 leg. Schizas & Torres-Pratts (3/0/2), two deutonymphs dissected and slide mounted in Hoyer's fluid.

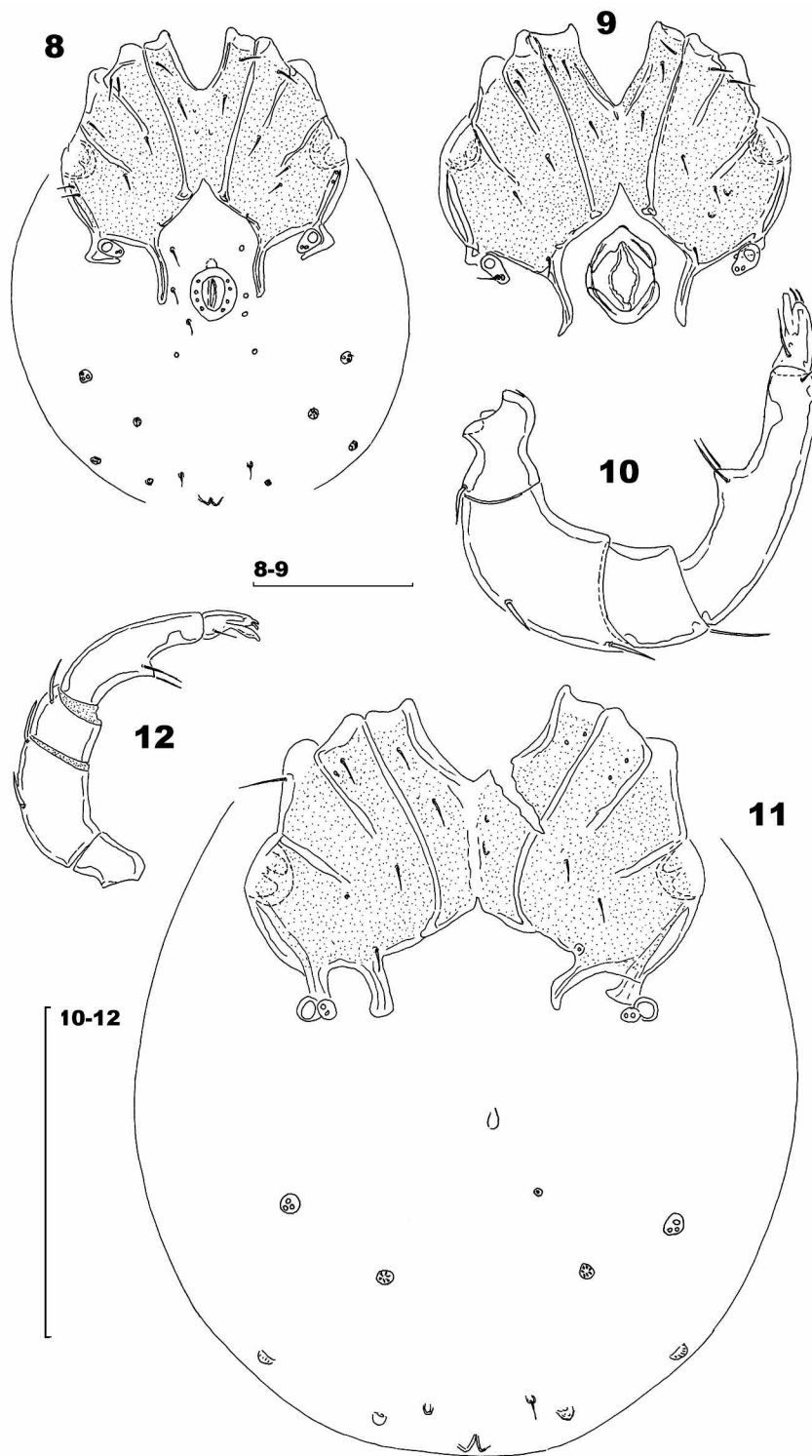
Morphology

Female. From Curaçao, Netherlands Antilles: Idiosoma L/W 294-306/209-234. First coxal plates fused. Suture lines of first and second coxal plates complete, suture lines of second and third coxal plates and suture lines of third and fourth coxal plates incomplete. Lateral posterior

apodemes of the fourth coxal plates short and broad, medial posterior apodemes of moderate length, extending to posterior margin of genital field (Fig. 9). Genital field L/W 62/44. Between the posterior apodemes of the fourth coxal plates a pair of glandularia-like structures fused with a pair of small platelets with (according to Wiles et al., 2002) coxoglandularia 4 and associated setae. Posteriorly to the genital field a pair of platelets with three pores and three pairs of wheel-like acetabula (*sensu* Cook, 1996) or specialized glandularia (*sensu* Tuzovskij, 1978). Two of these wheel-like structures large with many radiating spokes, the most posterior one small with relatively few radiating spokes. Excretory pore unsclerotized, near the posterior extremity. Palp (Fig. 10) total L 226, dorsal L and %L (given as % of total L): P-1 18 (8.0), P-2 71 (31.4), P-3 32 (14.2), P-4 83 (36.7), P-5 22 (9.7); P-2/P-4 ratio 0.86; ventral margin of P-2 somewhat concave without extension; ventral margin of P-4 with a strongly developed setal tubercle. Lengths of I-Leg-4-6: 44, 63, 80; IV-Leg-1-6: 59, 49, 52, 82, 92, 100; IV-Leg-4 and IV-Leg-5 with one and two swimming setae, respectively.

Male. (from Curaçao, Netherlands Antilles): Idiosoma L/W 288/241. First coxal plates fused. Suture lines of second and third coxal plates and suture lines of third and fourth coxal plates incomplete. Posterior margin of the fourth coxal plates strongly concave, with two pairs of apodemes not extending beyond posterior margin of genital field (Fig. 8). Genital field L/W 32/27, consisting of a sclerotized ring with four pairs of setae, only three pairs of setae free in integument lateral to the gonopore. Between the posterior apodemes of the fourth coxal plates a pair of glandularia-like structures fused with a pair of small platelets with (according to Wiles et al., 2002) coxoglandularia 4 and associated setae. Posterior to of the genital field a pair of platelets with three pores and three pairs of wheel-like acetabula (*sensu* Cook, 1996) or specialized glandularia (*sensu* Tuzovskij, 1978). Two of these wheel-like structures large with many radiating spokes, the most posterior one small with relatively few radiating spokes. Excretory pore unsclerotized, near the posterior extremity. Palp total L 187, dorsal L and %L (given as % of total L): P-1 17 (9.1), P-2 58 (31.0), P-3 23 (12.3), P-4 68 (36.4), P-5 21 (11.2); P-2/P-4 ratio 0.85; palp as in female. Lengths of I-Leg-3-6: 35, 42, 62, 79.

Deutonymph. (based on two specimens, from the Bahamas): As in adults, but lacking a genital field (Fig. 11): Idiosoma L/W 222-236/188-195. Palp (Fig. 12) total L 133-139, dorsal L and %L (given as % of total L): P-1 12-13 (9.0-9.4), P-2 42 (30.2-31.6), P-3 15-17 (11.3-12.2), P-4 49-52 (36.8-37.4), P-5 15 (10.8-11.3); P-2/P-4 ratio 0.81-0.86.



Figures 8-12. *Litarachna degiustii* Cook. (8 = male, 9-10 = female, 11-12 deutonymph). **8 & 11.** Idiosoma, ventral view. **9.** Coxal field. **10 & 12.** Palp. Scale bars = 100 μ m.

Figures 8-12. *Litarachna degiustii* Cook. (8 = mâle, 9-10 = femelle, 11-12 = deutonymphe). **8 & 11.** Idiosome, vue ventrale. **9.** Zone Coxale. **10 & 12.** Palpe. Echelle = 100 μ m.

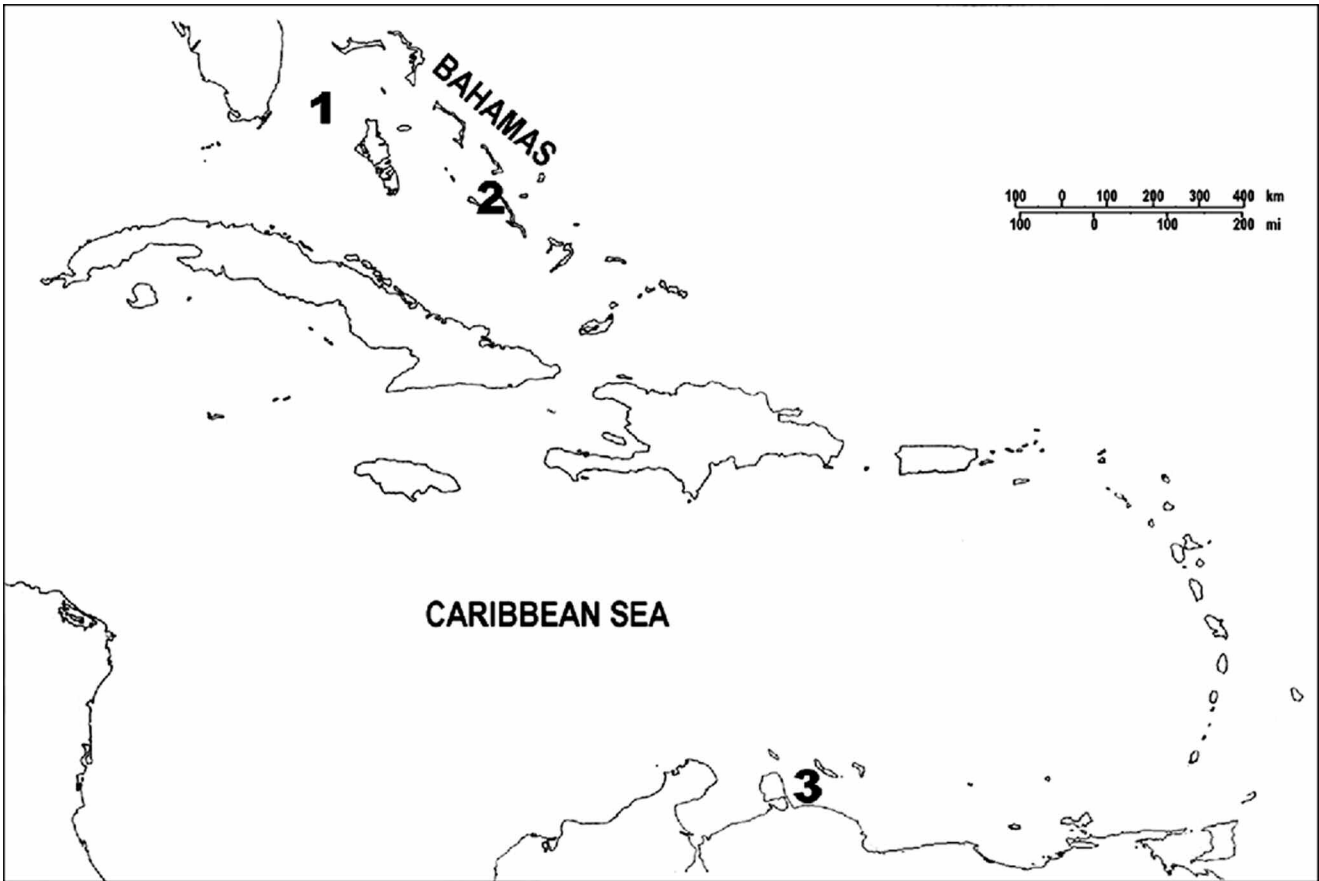


Figure 13. Recorded distribution of *Litarachna caribica* sp. nov. (loc. 3) and *L. degiustii* Cook (loc. 1-3). **1.** Bimini Island. **2.** Lee Stocking Island. **3.** Curaçao, Netherlands Antilles. Scale bar = 400 km.

Figure 13. Distribution de *Litarachna caribica* sp. nov. (3) et *L. degiustii* Cook (1-3). **1.** Bimini Island. **2.** Lee Stocking Island. **3.** Curaçao, Antilles hollandaises. Echelle = 400 km.

Remarks

This is the first description of the deutonymph and the first record of the species from Curaçao.

Distribution

Caribbean Sea (Bahamas and Curaçao) (Fig. 13).

Key to species of Litarachna belonging to the “duboscqi”-species group

- 1. First coxal plates fused.....2
- First coxal plates not fused.....5
- 2. Glandularium-like structure fused with the fourth coxal plates; 22-24 pairs of perigenital setae in male*L. amnicola*
- Glandularium-like structure not fused with the fourth coxal plates3
- 3. Glandularium-like structure posterior to fourth coxal plates fused with adjoining coxoglandularia 4; three pairs of perigenital setae in male*L. degiustii*
- Glandularium-like structure posterior to fourth coxal plates not fused with adjoining coxoglandularia4

- 4. 45-54 pairs of perigenital setae in male*L. caribica* nov. sp.
- 2-3 pairs pairs of perigenital setae in male*L. brasiliensis*
- 5. Glandularium-like structure posterior to fourth coxal plates not fused with adjoining coxoglandularia.....6
- Glandularium-like structure posterior to fourth coxal plates fused with adjoining coxoglandularia 4; about 10 pairs of perigenital setae in male*L. duboscqi*
- 6. Three pairs of perigenital setae in male*L. marshalli*
- About 10 pairs of perigenital setae in male ..*L. hongkongensis*

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