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Two species of the deep-water shrimp genus *Nematocarcinus* A. Milne–Edwards, 1881 (Crustacea, Decapoda, Caridea, Nematocarcinidae) from the Mexican Pacific

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Abstract

The distribution of two species of the deep-water shrimp genus *Nematocarcinus* A. Milne-Edwards, 1881, occurring off the west coast of Mexico is analyzed based on a large series of recently collected material. *Nematocarcinus faxoni* Burukovsky, 2000, is by far the most common and abundant species in the area and it is distributed throughout the central and southern Gulf of California and off the entire Baja California Peninsula south to 17°10'15"N. Based on characteristics observed in the new samples and in the type material, *N. agassizii* Faxon, 1893, is reinstalled as a valid species, and no longer considered a junior of *N. gracilipes* A. Milne-Edwards, 1881, as proposed by Cardoso & Burukovsky (2014). Along the Pacific coast of Mexico, *N. agassizii* exhibits a more restricted distribution and it was collected only off the Baja California Peninsula. Previous records of this species in the Gulf of California, where *N. faxoni* was the only representative of the genus captured during this survey, are considered doubtful.

Key words: *Nematocarcinus*, western Mexico, distribution

Introduction

The family Nematocarcinidae Smith, 1884, is distributed exclusively in deep water worldwide. It includes 52 species distributed in six genera, five of which contain only one or two species (De Grave & Fransen 2011, Burukovsky 2012). The sixth nominotypical genus *Nematocarcinus* A. Milne-Edwards, 1881, is very diverse with 46 species recognized to date, including some probably representing undescribed taxa (Burukovsky 2012). Over half of these species (25) have been described in recent years (2000–2007) by the Rusian carcinologist Rudolf Burukovsky who has become without any doubt the expert on this group of Caridea and whose contributions are considered obligate references (e.g., Burukovsky 1991, 2003, 2012, 2013 and references therein).

Species of *Nematocarcinus* are found on the continental slopes to the abyssal plains exceeding 5000 m depth, and have also been spotted in hydrothermal vents, although they seem to be occasional visitors in these chemosynthetic habitats (Komai & Collins 2009, Burukovsky 2012). Specimens collected in trawl almost invariably loose their pereiopods, which are very long and thin, and often feature a broken rostrum. When entire, however, the rostrum relative length and numbers of dorsal/ventral spines are good diagnostic characters. Based on its long experience studying this genus, Burukovsky (2000a, 2000b) proposed the use of a new diagnostic character derived from the shape of the disto-ventral organ of the sixth abdominal somite and associated setae (Burukovsky 2000a, 2000b). He also proposed the use of protuberances or short ridge located on the inner side of the fifth pleonal pleuron (see Burukovsky 2012, 2013). Burukovsky (2003, 2012, 2013) presented a synoptic table summarizing 11 characters that allows to distinguish the known species of *Nematocarcinus*.

Although shrimps of *Nematocarcinus* species are often abundant in catches obtained with deep-water trawls during exploratory surveys in the eastern Pacific, little is known about their distribution, abundance and

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bathymetric occurrence in the region. Faxon (1893, 1895) described *N. agassizii* based on material collected by the U.S. coast survey steamer "Albatross" between Ecuador (0º16'S) and southern Mexico (16º33'N). This species was later cited by several authors (see synonymy) but often without reporting on newly collected material. Currently known geographical distribution includes the SE Gulf of California to Mancora Bank, Peru, with records off the oceanic islands Cocos (isla del Coco, Costa Rica), Malpelo (Colombia) and Galapagos (Ecuador) (Wicksten & Hendrickx 2003). Faxon (1895) also reported material of *N. ensifer* (Smith, 1882), a species occurring in the Atlantic and the Mediterranean Sea, from Ecuador (0º16'S), but part of the material reported by Faxon (1895) was later referred to a new species, *N. faxoni* Burukovsky, 2001 (Burukovsky 2001). This species has been represented only by the type material since the original description by Burukovsky (2001) in the eastern Pacific, but it was recently reported by Cardoso & Burukovsky (2014) from the southwestern Atlantic. Currently known distribution of *N. faxoni* in the eastern Pacific is from SW Mexico to the Galapagos Islands, but reports of *N. ensifer* (e.g., Wicksten 1989, Hendrickx 1995) should be verified as they probably belong to *N. faxoni* (Wicksten & Hendrickx 2003). In fact, the specimens reported as *N.* cf. *ensifer* by Hendrickx (2001) have been identified with *N. faxoni* and are included in present study. Another species, *Nematocarcinus proximatus* Spence Bate, 1888, has been reported from Chile (off Valparaiso and Valdivia) at depths of 2516–2654 m (Retamal 1981, Holthuis 1952, Wicksten 1989), while *N. longirostris* Spencer Bate, 1888, and *N. serratus* Spence Bate, 1888, have also been reported more recently from off Chile by Retamal & Guzman (2003). Two more species of this genus, *N. burukovsky* Komai & Segonzac, 2005, and *N. ovalis* Komai & Segonzac, 2005, have recently been described for the East Pacific Rise, the former more than 4000 km off the American continent (Komai & Segonzac 2005).

During extensive surveys on the deep-water invertebrates inhabiting below the Oxygen Minimum Zone (OMZ) off the west coast of Mexico, a large series of specimens of *Nematocarcinus* was collected. This material is reported here and represents the largest collection of material of this genus available for the eastern Pacific to date.

Material and methods

The material on which this study is based was collected by the R/V "El Puma" of the Universidad Nacional Autónoma de México (UNAM), between 1991 and 2014. Specimens of *Nematocarcinus* were captured during sampling operations off the west coast of the Baja California Peninsula (TALUD XV, July–August 2012; TALUD XVI-B, May–June 2014), in the Gulf of California (a total of nine cruises was conducted: TALUD III, September 1991; TALUD IV, August 2000; TALUD V, December 2000; TALUD VI, March 2001; TALUD VII, June 2001; TALUD VIII, April 2005; TALUD IX, November 2005; TALUD X, February 2007), and off the SW coast of Mexico, from Jalisco to Guerrero (TALUD XII, March-April 2009). During these cruises, a total of 228 localities were sampled, from 377 to 2394 m depth. Positional coordinates for each sampling station were obtained using a GPS navigation system. Depth was measured with an EdoWestern analogic recorder (TALUD III–VIII) or a digital recorder (TALUD IX–XVI-B). All the specimens were captured with benthic gear, including an Agassiz dredge (2.5 m width, 1 m high) and a standard benthic sledge (2.35 m width, 0.9 m high), both equipped with a modified shrimp net (ca 5.5 cm stretched mesh size) with a ca 2.0 cm (3/4") internal lining net. The material collected during this survey is deposited in the Regional Collection of Marine Invertebrates (ICML-EMU), at UNAM in Mazatlán, Mexico. The size (carapace length, CL) was measured to the nearest 0.1 mm with a digital caliper. Abbreviations are: St., sampling station; CL, carapace postorbital length; M, male; F, female; OF, ovigerous female; AD, Agassiz dredge; BS, benthic sledge.

Results

A total of 1596 specimens were collected, including 1431 of *N. faxoni* and 165 of *N. agassizii*. In addition, a significant amount of mutilated specimens were found in the net.

Systematic section

Nematocarcinidae Smith, 1884

***Nematocarcinus* A. Milne-Edwards, 1881**

***Nematocarcinus agassizii* Faxon, 1893**
Figures 1, 2A, 3, 4A, 5A–C

Nematocarcinus agassizii Faxon, 1893: 204; 1895: 158, pl. 42; Del Solar 1972: 9; 1987: 79, fig. 7; Méndez 1981: 76, pl. XXXIV, figs. 255–257; Wicksten 1989: 312; 1991: 154; Burukovsky, 2001: 1432, fig. 3. Vélez et al. 1992: 7, textfig. 5; Wicksten & Hendrickx 1992: 7 (list); 2003: 59 (list); Hendrickx 1993: 307 (table); 1995: 454 (key), fig. 1, 455, textfig.; 1996: 946; 2005: 163; Kameya et al. 1997: 20; 1998: 89 (list); Moscoso 2012: 42.
Nematocarcinus gracilipes. Cardoso & Burukovsky 2014: 440 (part; records from the eastern Pacific).

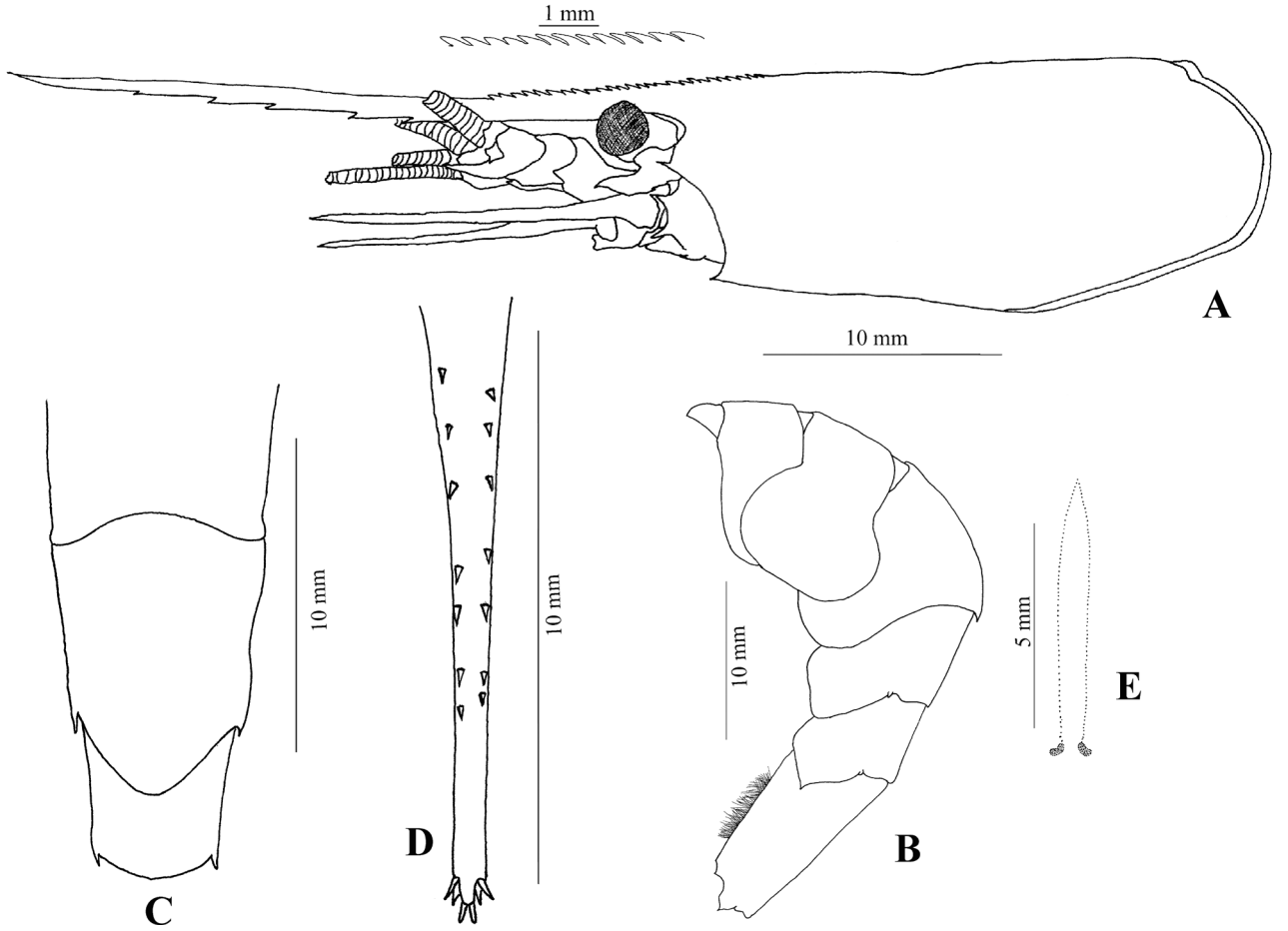

FIGURE 1. *Nematocarcinus agassizii* Faxon, 1893 (female, CL 18.89 mm, ICML–EMU–10775). A. Carapace, lateral (inset, dorsal teeth partly enlarged). B. Pleon, lateral. C. Pleomeres 2–4, dorsal. D. Telson, posterior part, dorsal. E. Rows of setae and spots consisting of the distoventral organ of pleomere 6.

Characteristics. Rostrum distinctly longer than carapace in males (1.06 times CL; n = 10), shorter in females (0.86 CL; n = 10), elongate, almost horizontal from its base to 2/5 of its length, remaining portion without dorsal teeth and gently curved upwards, ending in a sharp point, numerous closely set teeth (23–32) (up to 38 in material examined; n=10) on the dorsal margin in proximal 1/3 to 1/2 of its length; 3–4 ventral teeth in the distal half. Flagella of both antennas long, that of antennule almost twice the antennal flagellum length and more than twice the length of the whole body. Antennal scale with lamella distally truncated. Spines on pereiopods 1–5 as follows: first pereiopod, ischium 2, merus 1; second, ischium 2, merus 1; third, ischium 1, merus 5 + 7; fourth, ischium 1, merus 4 + 4; fifth, ischium 1, merus 3 + 5. Carpus of all pereiopods without spine. Pereiopods 3–5 greatly elongate, of about the same length, carpus of these legs 5–7 length of propodus, combined length of ischium, merus and carpus about 4 times as long as carapace length. Third pleomere with posterodorsal margin of tergum somewhat extended over fourth pleomere, tip of margin rounded. Pleura of fifth pleomere without bump on inner sides, ending in a sharp spine curved slightly downward. Spots of ventral organ of sixth pleomere small, hardly

discernible, kidney-shaped, slightly narrowing forward, 2–2.5 times as long as wide, distance between the spots about 2.1 times spots width (n = 10); setal pits arrange in single line on each side, nearly parallel. Length of telson barely exceeding length of sixth pleomere in females (telson/6th pleomere ratio, 1.05; n = 10), proportionally longer in males (telson/6th pleomere ratio, 1.21; n = 10), armed with 7 pairs of dorsolateral spines, and 3 pairs of spines on posterior tip (modified and completed from Burukovsky 2003, 2013) (Figures 1, 2A, 3, 4A, 5A–C).

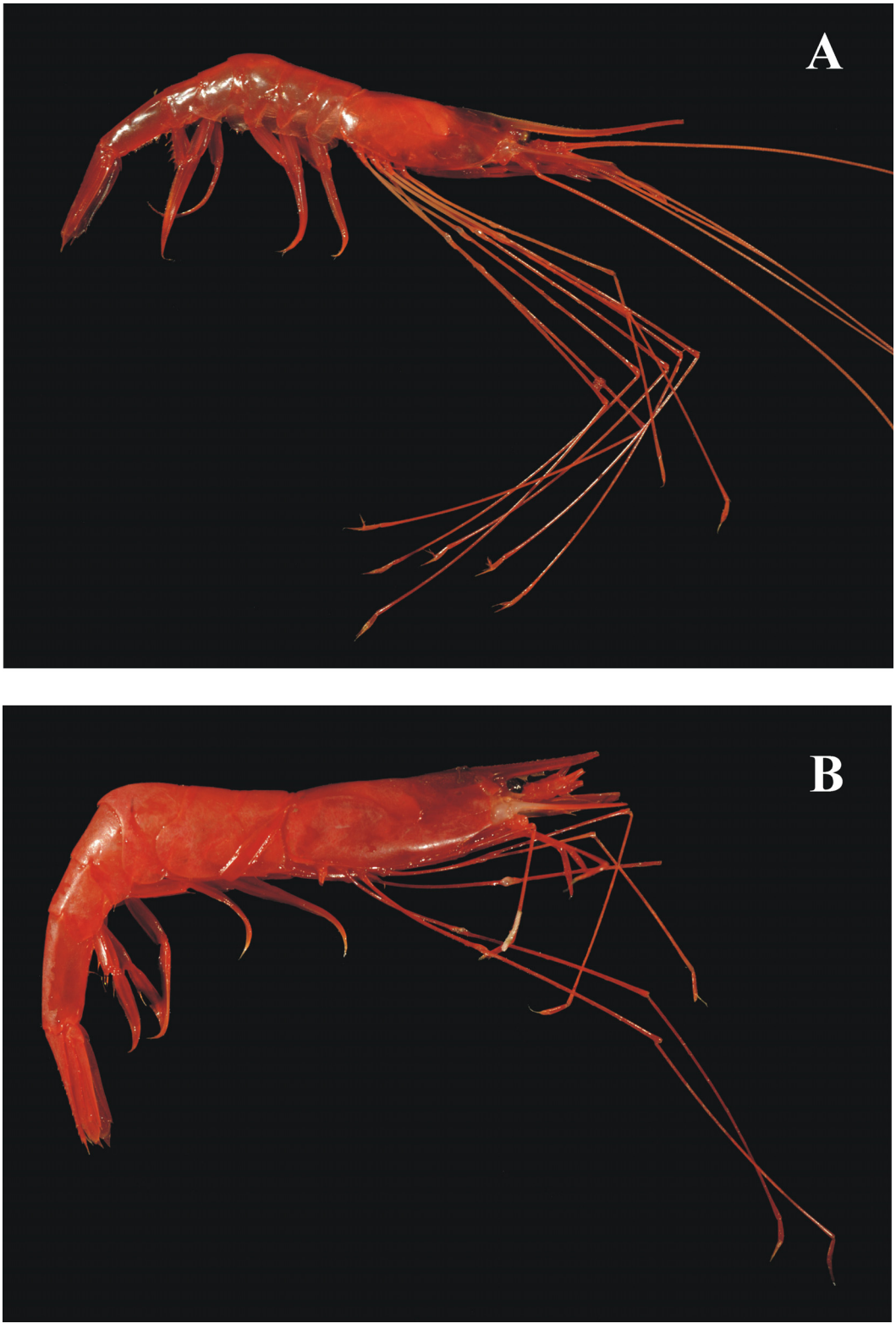

FIGURE 2. Photographs showing fresh coloration of the two species of *Nematocarcinus* collected during this survey. A. *Nematocarcinus agassizii* Faxon, 1893 (male, CL 21.34 mm, ICML-EMU-10789). B. *Nematocarcinus faxoni* Burukovsky, 2001 (male, CL 23.34 mm, ICML-EMU-10769).

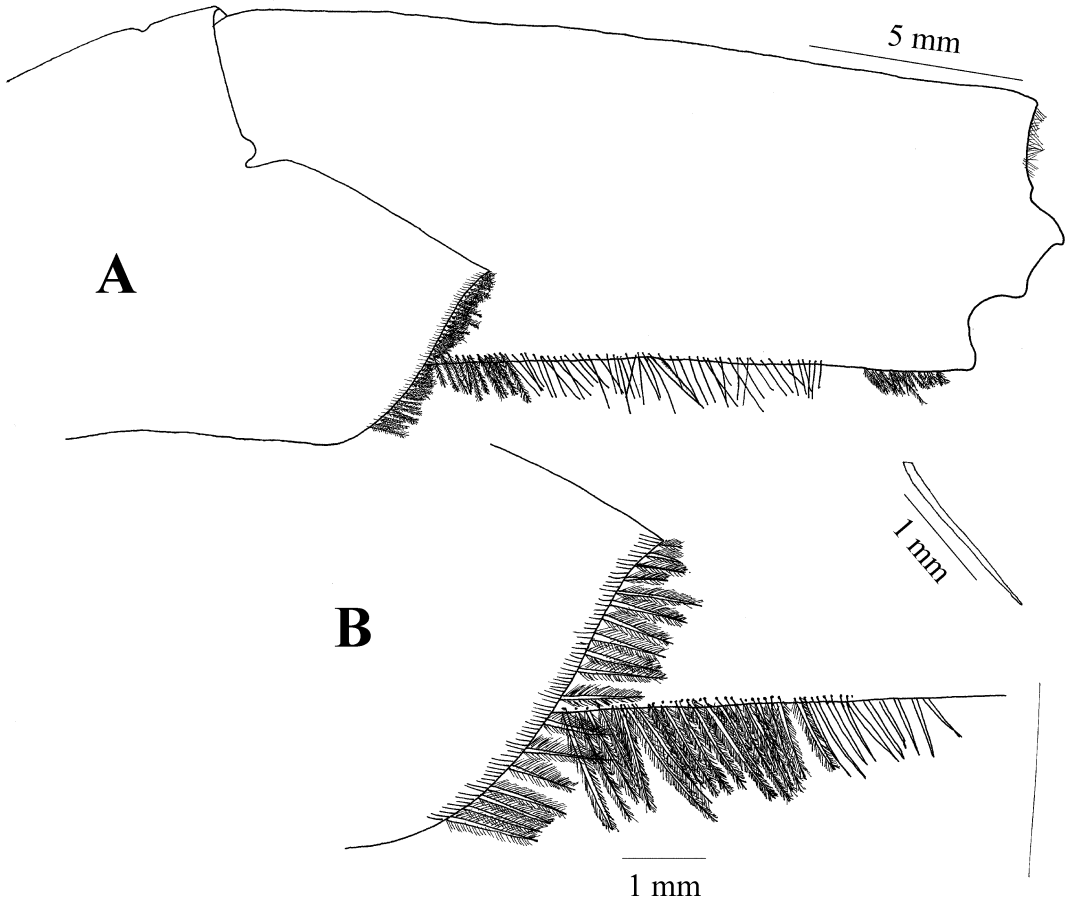

FIGURE 3. *Nematocarcinus agassizii* Faxon, 1893 (female, CL 18.89 mm, ICML-EMU-10775). A. Setae on ventral region of sixth abdominal somite. B. Same, close up of setae in anterior part, lateral.

Colour. Crimson red (Figure 2A).

Material examined. TALUD XV, St. 1 (23°18'40"N; 111°19'37" W), Ago 4, 2012, 10 M (CL 21.51–25.42 mm), 4 F (CL 20.49–24.74 mm), 26 OF (CL 23.32–31.21 mm), BS, 750–850 m (ICML-EMU-10773, 10787); St. 24 (27°05'42"N; 114°35'30"W), Ago 1, 2012, 34 M (CL 18.36–27.04 mm), 4 F (CL 20.48–25.39 mm), BS, 772–786 m (ICML-EMU-10774); TALUD XVI–B, St. 5 (28°48'N; 115°24'06"W), May 24, 2014, 16 M (CL 13.59–27.89 mm), 35 F (CL 13.59–29.61 mm), 17 OF (CL 27.23–30.22 mm), BS, 772–776 m (ICML-EMU-10775, 10788); St. 7 (20°21'12"N; 115°39'08"W), May 31, 2014, 2 M (CL 14.28–14.95 mm), 4 F (CL 13.75–16.38 mm), 1 OF (CL 28.56 mm), BS, 750–710 m (ICML-EMU-10776); St. 10 (29°07'50"N; 116°15'30"W), May 30, 2014, 2 M (CL 12.03–21.34 mm), 4 F (CL 20.79–28.96 mm), 4 OF (CL 29.03–31.90 mm), BS, 860–910 m (ICML-EMU-10777, 10789); St. 23 (30°56'24"N; 116°40'45"W), May 27, 2014, 1 M (CL 23.48 mm), 1 F (CL 21.10 mm), BS, 1296–1340 m (ICML-EMU-10778).

Additional material examined. Lectotype USNM 291472 (ex 21233). R/V "Albatross" St. 3358, Coiba Island, Panama, February 24, 1891. Paralectotypes: 1 ovigerous female, CL 29.4 mm, USNM 21233, and 2 ovigerous female, CL 30.1 and 34.5 mm, USNM 21152.

Geographical distribution. From off Ahome, Sinaloa, Mexico, to Mancora Bank, Peru; Coco (del Coco) (Costa Rica), Malpelo (Colombia) and Galápagos (Ecuador) islands (Wicksten & Hendrickx 2003). Based on the material examined, the distribution of *N. agassizii* extends to the west coast of the Baja California Peninsula (Figure 6). The Scripps Institution of Oceanography invertebrates collection contains one lot of *Nematocarcinus agassizii* (Id. M.K. Wicksten) (C-10435) captured by the R/V "New Horizon" (ROSA cruise, March 24, 1993) in 503–795 m depth, at 30°36.36'N, 117°12.14'W.

Remarks. While reviewing species of *Nematocarcinus* collected in the southwestern Atlantic, Cardoso & Burukovsky (2014) compared material of *N. gracilipes* Fihol, 1884 with that of *N. agassizii* and came to the conclusion that the latter is a junior subjective synonym of the former. They pointed out that *N. agassizii* and *N.*

gracilipes are very similar and the only two species within the genus featuring a distoventral organ of the sixth pleomere with non-plumose, spindle-shaped setae. In their account of *N. gracilipes*, Cardoso & Burukowsky (2014) noted: "Distoventral organ at sixth abdominal somite formed by two single parallel rows of setae that begins with long plumose setae and at the proximal third of sixth abdominal somite length turns to short spindle-shaped setae (not plumose) that extends to more than a half of spot length". The lectotype (USNM-291472) and paralectotypes (USNM-21233 and 21152) of *N. agassizi* were carefully examined during our study (Figures 3, 4A, 5A–C). None of the specimens examined has ventral splindle-shaped setae on the sixth pleomere as illustrated by Cardoso & Burukovsky (2014) for *N. gracilipes*, reproduced herein (Figure 4 B, C). Instead, all setae are long, slender, and those in the middle part of the somite are similar to those found on the distal and proximal section of the somite, although slightly different in length (Figures 3, 4A, 5A, B). Moreover, all the setae are plumose (Figures 4A, 5 B), although in some cases many setules have been lost and setae might appears as non-plumose at first glance. In several cases, however, setules are clearly visible under high magnification (Figure 5B). In addition to the slight differences observed in the structure of the distoventral organ between the two species (see Cardoso & Burukovsky, 2014), we believe that the clear difference of setae type (both in shape and in size) between *N.agassizii* and *N. gracilipes* is sufficient to reinstate *N. agassizii* as a valid species. In addition to the morphology, the disjunct distribution between the two remote populations would seem to suggest that they are specifically distinct. As in other closely resembling species with allopatric or almost allopatric distribution, a comparison of genetic material based on freshly collected material of both species is highly desirable to define how close they are and how they relate to other species within the genus.

Despite of the numerous samples available, *N. agassizii* was not collected during the present survey within the Gulf of California and only *N. faxoni* was found in that area (see below). Therefore, any material from the Gulf of California available in collections and identified as *N. agassizii* should be carefully re-examined.

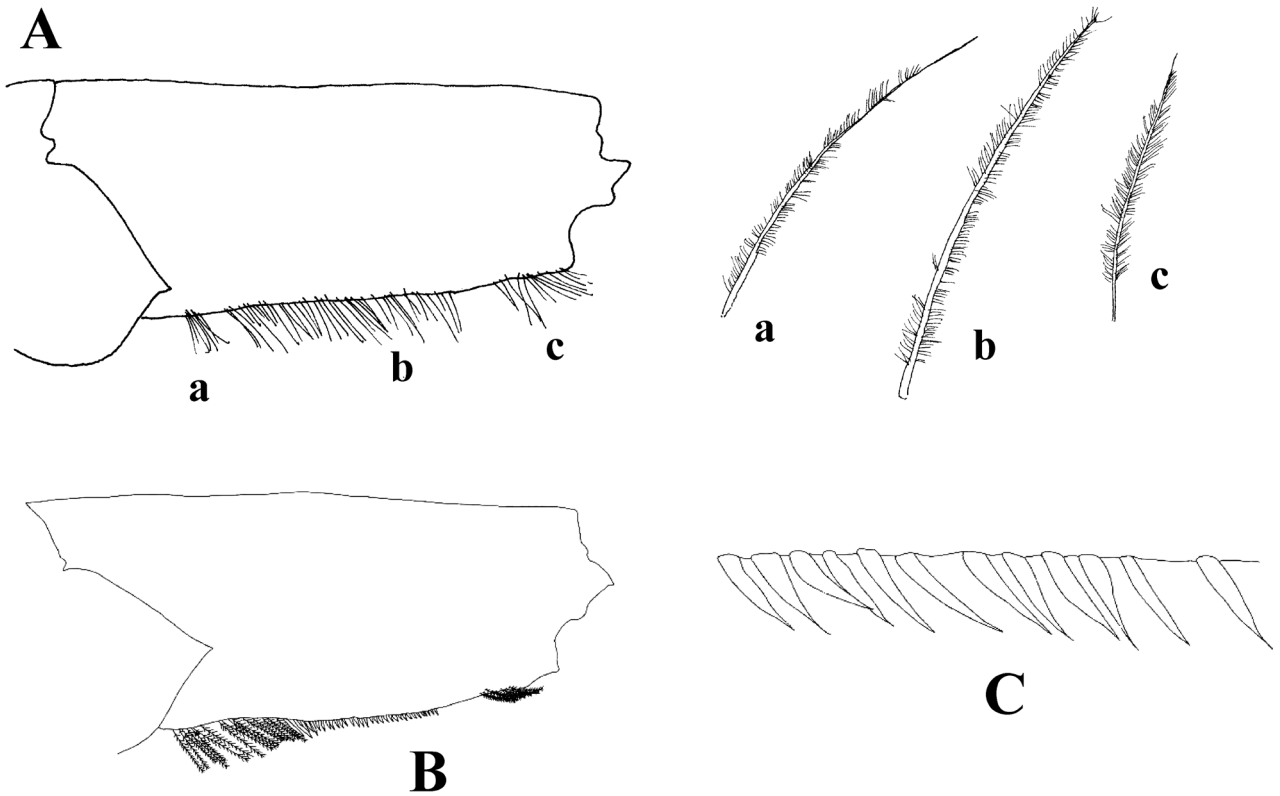

FIGURE 4. *Nematocarcinus agassizii* Faxon, 1893. Paralectotype (ovig. female, CL 34.5 mm, USNM 21152). A. Pleomere 6, lateral; a, b, c, setae from three parts on ventral surface. *Nematocarcinus gracilipes* Fihol, 1884. B. Pleomere 6, lateral. C. Enlarged spindle-shaped setae (B, C, reproduced from Cardoso & Burukovsky, 2014).

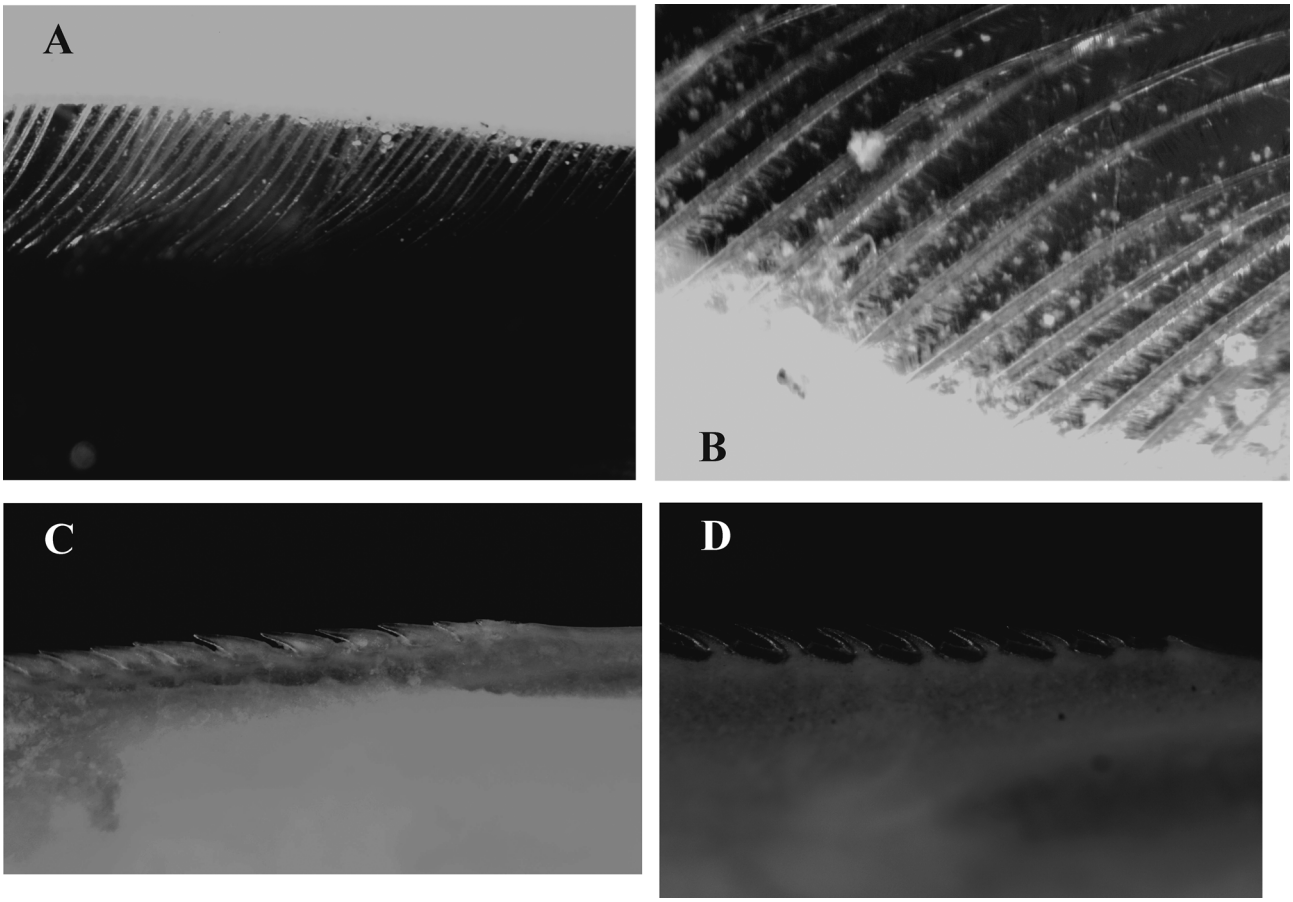

FIGURE 5. *Nematocarcinus agassizii* Faxon, 1893. Paralectotype (ovig. female, CL 34.5 mm, USNM 21152). A. Ventral setae on middle part of pleomere 6. B. Same, magnified, with setules visible on most setae. C. Dorsal teeth on anterior part of carapace. *Nematocarcinus faxoni* Burukovsky, 2001. Holotype (female, CL 25 mm, USNM 1073696). D. Dorsal teeth on anterior part of carapace.

Nematocarcinus faxoni Burukovsky, 2001

Figures 2B, 5D, 7

Nematocarcinus ensifer. Faxon 1895: 156–157 (part); Crosnier & Forest 1973: 116 (part); Wicksten 1989: 312 (list); Wicksten & Hendrickx 1992: 7 (list); 2003: 59 (list); Hendrickx 1995: 454 (key), fig. 2.

Nematocarcinus cf. *ensifer.* Hendrickx, 2001: 99, fig. 1, tables 3, 4.

Nematocarcinus faxoni Burukovsky, 2001: 1429, figs. 1, 2; 2003: 92–95, fig. 25 a–g; 2004: 558 (key); 2012: 112–115, figs. 36, 37. Komai & Segonsac 2005: 361, fig. 11.

Characteristics. Rostrum curving up into the shape of a sword, as long as 0.7 times of the length of the carapace, postrostral crest usually with 20–32 dorsal teeth, often between 25 and 27 widely separated teeth (23 to 30 teeth in material examined; n = 10); ventral teeth 0–5, usually 2–3. Spines on pereiopods 1–5 as follows: first pereiopod, ischium 4, merus 2; second, ischium 3, merus 6 + 1; third, ischium 1, merus 5 + 5; fourth, ischium 1, merus 3; fifth, ischium 0, merus 2. Carpus of all periopods without spines. Pereiopods 3–5 greatly elongate, of about the same length, carpus of these legs 7–8 length of propodus; combined length of ischium, merus and carpus about 3 times as long as carapace length. Dorsal posterior protrusion of the 3rd pleomere moderately developed. Fifth pleomere with a low conspicuously elongated protrusion whose length is aimed at a very sharp angle to the front side of the pleura and crosses just above the tooth which is well developed; anteroventral margin of the pleura slightly recurved. Pleura of 5th pleomere with an elongate protuberance on the inner side. Spots of the ventral organ of 6th pleomere widely rounded, 1.5–2 times longer than wide, distance between these spots not exceeding the width of the spots; one row of setae on each side, rows aligned and nearly parallel to each other. Length of telson barely

exceeding length of sixth pleomere in females (telson/6th pleomere ratio, 1.05; n = 10), proportionally longer in males (telson/6th pleomere ratio, 1.13; n = 10), armed with 6–9 pairs of spines on the dorsal margin, and 3 pairs of spines on posterior tip (adapted from Burukovsky 2003, 2013) (Figures 2B, 5D, 7).

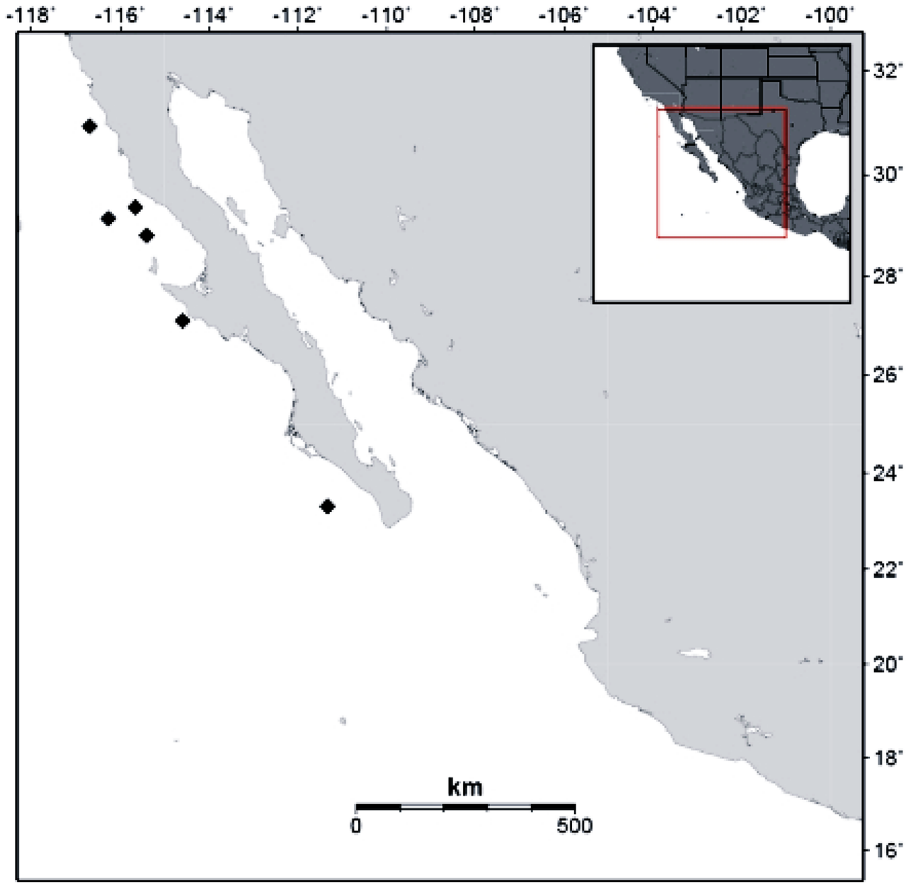

FIGURE 6. Localities in the Mexican Pacific where *Nematocarcinus agassizii* Faxon, 1893 was collected during this survey.

Color. Crimson red (Figure 2B).

Material examined. TALUD III, St. 14-A (24º38'48"N; 108º26'54"W), Aug 19, 1991, 12 M (CL 13.05–18.88 mm), 25 F (CL 16.09–20.73 mm), 9 OF (CL 19.53–22.4 mm), AD, 1016–1020 m (ICML-EMU-4038); St. 14-B (24º39'12"N; 108º19'12"W), Aug 19, 1991, 1 M (CL 19.82 mm), 3 F (CL 19.22–24.7 mm), 1 OF (CL 24.31 mm), AD, 1188–1208 m (ICML-EMU-4039); St. 24 (25º33'36"N; 109º42'01"W), Aug 21, 1991, 1 M (CL 19.87 mm), AD, 1043 m (ICML-EMU-4040); St. 24-B (25º45'12"N; 109º46'54"W), Aug 21, 1991, 6 M (CL 16.4–19.17 mm), 6 F (CL 13.52–19.28 mm), 2 OF (CL 20.4–21.21 mm), AD, 1027–1060 m (ICML-EMU-4041).

TALUD IV, St. 13 (23º17'30"N; 107º29'51"W), Aug 29, 2000, 3 M (CL 11.43–16.16 mm), 2 F (CL 15.92–17.5 mm), BS, 860 m (ICML-EMU-6590); St. 26 (24º56'24"N; 109º05'36"W), Aug 26, 2000, 1 M (CL 11.2 mm), 3 F (CL 11.53–13.78 mm), 1 OF (CL 22.36 mm) BS, 1200–1264 m (ICML-EMU-6581-A); St. 33 (25º45'54"N; 109º48'06"W), Aug 27, 2000, 2 M (CL 17.92–19.74 mm), BS, 1060–1080 m (ICML-EMU-6588); St. 34 (25º40'42"N; 109º54'24"W), Aug 27, 2000, 1 M (CL 17.71 mm), BS, 1240 m (ICML-EMU-6589).

TALUD V, St. 12 (23º18'00"N; 107º26'59"W), Dec 14, 2000, 2 F (CL 21.2–21.56 mm), BS, 1160–1170 m (ICML-EMU-6587); St. 26 (24º56'18"N; 109º11'48"W), Dec 16, 2000, 2 M (CL 15.48–20.58 mm), 1 F (CL 12.65 mm), BS, 1280–1310 m (ICML-EMU-6581-B).

TALUD VI, St. 20 (24º14'48"N; 108º35'11"W), Mar 15, 2001, 1 OF (CL 26.76 mm), BS, 1250–1440 m (ICML-EMU-6691); St. 34 (25º43'50"N; 109º53'59"W), Mar 17, 2001, 33 M (CL 14.35–24.93 mm), 27 F (CL 12.88–28.00 mm), 6 OF (CL 23.20–26.61 mm), BS, 1210–1270 m (ICML-EMU-6576).

TALUD VII, St. 4 (22º03'18"N; 106º34'42"W), Jun 5, 2001, 1 OF (CL 21.63 mm), BS, 1200–1230 m (ICML-EMU-6586); St. 12 (23º18'18"N; 107º26'48"W), Jun 6, 2001, 1 F (CL 24.61 mm), BS, 1040–1120 m (ICML-EMU-6584); St. 13-B (23º30'18"N; 107º44'00"W), Jun 6, 2001, 12 M (CL 15.31–21.05 mm), 6 F (CL 18.64–25.1

mm), 1 OF (CL 25.37 mm), BS, 1400–1450 m (ICML-EMU-6580); St. 19 (24º16'12"N; 108º23'42"W), Jun 7, 2001, 19 M (CL 10.88–21.26 mm), 31 F (CL 9.05–23.26 mm), 1 OF (CL 24.63 mm), BS, 1160–1180 m (ICML-EMU-6696, 6577).

TALUD VIII, St. 3 (24º32'36"N; 109º30'30"W), Apr, 16, 2005, 19 M (CL 9.04–22.86 mm), 30 F (CL 9.40–22.91 mm), 4 OF (CL 20.73–21.66 mm), BS, 1600 m (ICML-EMU-10732A, 10732B); St. 10 (24º58'12"N; 110º16'06"W), 3 M (CL 18.66–21.80 mm), BS, 1500 m (ICML-EMU-10733).

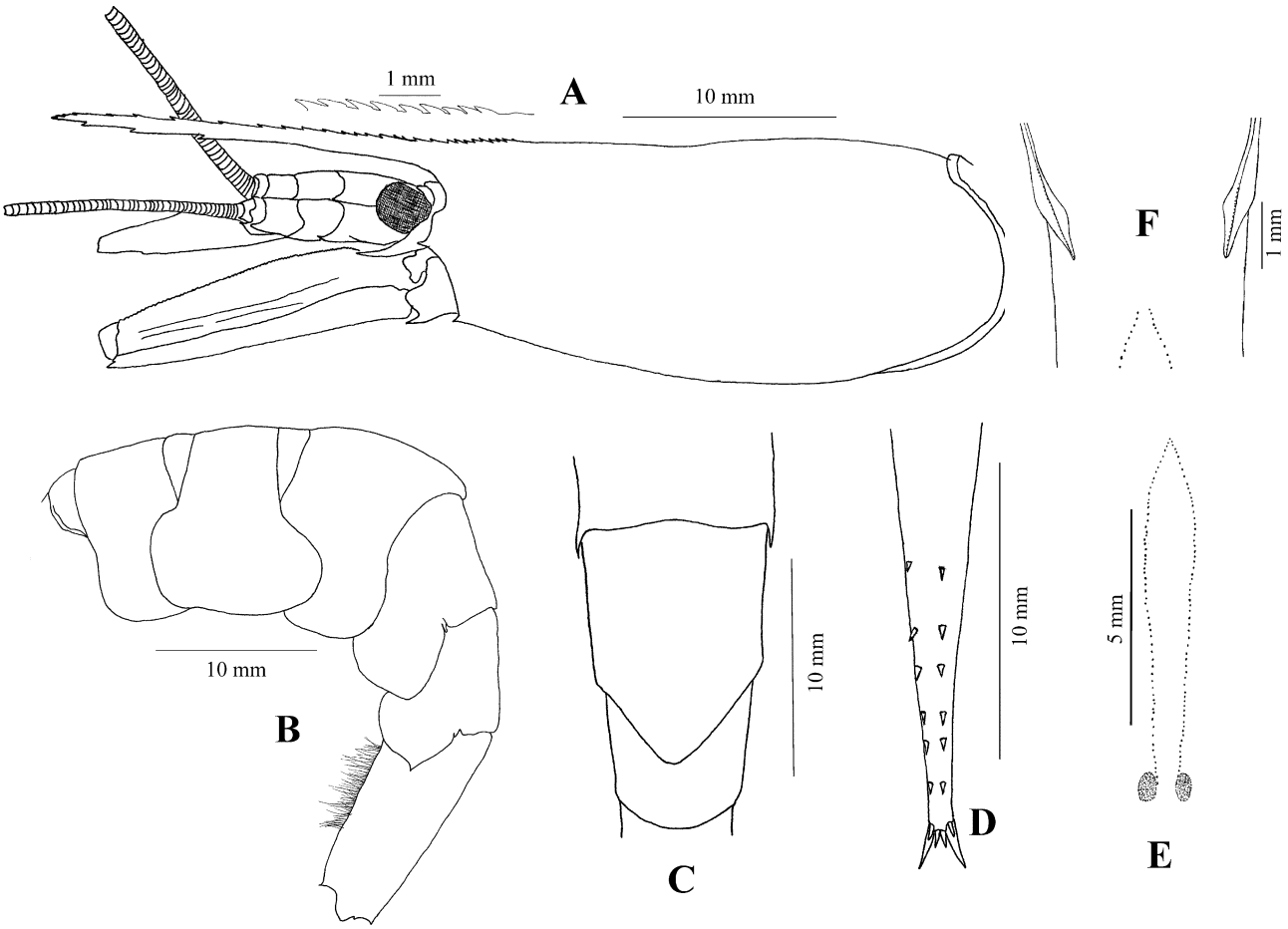

FIGURE 7. *Nematocarcinus faxoni* Burukovsky, 2001 (ICML-EMU-10765). A. Carapace, lateral (inset, dorsal teeth enlarged). B. Pleon, lateral. C. Pleomeres 2–5, dorsal. D. Telson, posterior part, dorsal. E. Rows of setae and posterior spots consisting of the distoventral organ of pleomere 6. F. Inner protuberances on pleuron of pleomere 5, ventral.

TALUD IX, St. 10 (24º56'24"N; 110º16'42"W), Nov 12, 2005, 1 M (CL 16.26 mm), 3 F (CL 11.26–22.91 mm), BS, 969–1225 m (ICML-EMU-10734); St. 21–B (26º04'42"N; 110º34'48"W), Nov 14, 2005, 2 M (CL 13.51– 14.97 mm), 3 F (CL 17.79–25.09 mm), 1 OF (CL 24.34 mm), BS, 1349–1369 m (ICML-EMU-10735).

TALUD X, St. 10 (27º48'30"N; 112º17'12"W), Feb 10, 2007, 2 M (CL 14.07–19.58 mm), BS, 1396–1422 m (ICML-EMU-8095); St. 18 (27º09'06"N; 111º46'54"W), Feb 12, 2007, 1 M (CL 19.72 mm), 1 F (CL 20.62 mm), BS, 1526 m (ICML-EMU-10736-A, 10736-B); St. 21 (27º14'31"N; 111º14'39"W), Feb 13, 2007, 1 F (CL 25.00 mm), BS, 1864–1865 m (ICML-EMU-10737); St. 22 (27º02'46"N; 110º52'57"W), Feb 13, 2007, 8 M (CL 13.28–24.89 mm), 6 F (CL 14.93–27.18 mm), 5 OF (CL 21.46–26.27 mm), BS, 1575–1586 m (ICML-EMU-10738); St. 29 (26º35'36"N; 110º35'44"W), Feb 15, 2007, 1 F (CL 17.1 15.07 mm), BS, 1383–1439 m (ICML-EMU-10739); St. 30 (26º36'50"N; 110º21'10"W), Feb 15, 2007, 2 F (CL 14.00–20.96 mm), BS, 1203–1213 m (ICML-EMU-10740).

TALUD XII, St. 9 (17º10'15"N; 101º37'23"W), Mar 29, 2008, 3 M (CL 18.70–21.44 mm) 4 F (CL 20.72–27.42 mm), BS, 1392–1420 m (ICML-EMU-10779); St. 10 (17º11'03"N; 101º28'05"W), Mar 28, 2008, 7 F (CL 13.32–27.62 mm), BS, 1180–1299 m (ICML-EMU-10741); St. 13 (17º45'16"N; 102º00'29"W), Mar 30, 2008, 5 M (CL 18.63–21.11 mm), 3 F (CL 17.34–17.35 20.75–25.43 mm), BS, 1199–1100 m (ICML-EMU-10742); St. 23

(18º33’43”N; 103º57’45”W), Apr 1, 2008, 84 M (CL 11.46–21.97 mm), 279 F (CL 13.47–26.27 mm), 3 OF (CL 21.43–24.80 mm), BS, 1058–1088 m (ICML-EMU-10743, 10744, 10745); St. 24 (18º28’00”N; 104º14’10”W), Apr 1, 2008, 7 M (CL 13.95–22.2 mm), 4 F (CL 15.65–23.83 mm), 1 OF (CL 23.3 mm), BS, 1535–1542 m (ICML-EMU-10746); St. 25 (18º26’45”N; 104º16’10”W), Apr 1, 2008, 2 M (CL 23.87–25.66 mm), 1 F (CL 18.95 mm), BS, 1858–1879 m (ICML-EMU-10747); St. 27 (18º40’28”N; 104º35’51”W), Apr 2, 2008, 5 M (CL 14.00–16.93 mm), 10 F (CL 10.36–19.44 mm), BS, 1040–1095 m (ICML-EMU-10748); St. 28 (18º50’19”N; 104º34’14”W), Apr 2, 2008, 23 M (CL 13.05–24.18 mm), 35 F (CL 9.31–24.88 mm), BS, 1101–1106 m (ICML-EMU-10749); St. 29 (19º19’37”N; 105º26’20”W), Apr 2, 2008, 12 M (CL 13.28–23.97 mm), 17 F (CL 15.50–27.98 mm), 4 OF (CL 21.51–28.33 mm), BS, 1609–1643 m (ICML-EMU-10750).

TALUD XV, St. 1 (23º18’40”N; 111º19’37”W), Ago 4, 2012, 44 M (CL 12.52–21.48 mm), 66 F (CL 12.27–23.94 mm), 11 OF (CL 17.96–22.60 mm), BS, 750–850 m (ICML-EMU-10751, 10752, 10781); St. 2 (23º12’02”N; 111º20’50”W), Ago 5, 2012, 21 M (CL 14.07–21.51 mm), 29 F (CL 10.62–27.43 mm), 3 OF (CL 22.83–24.47 mm), BS, 1118–1150 m (ICML-EMU-10753, 10754, 10784); St. 3 (23º09’55”N; 111º20’0”W), Ago 6, 2012, 2 M (CL 18.94–23.96 mm), 2 F (CL 17.30–21.82 mm), BS, 1395–1465 m (ICML-EMU-10755); St. 5C (23º16’42”N; 110º54’55”W), Ago 5, 2012, 79 M (CL 12.32–26.60 mm) (ICML-EMU-10756), 145 F (CL 13.05–26.27 mm), 16 OF (CL 19.75–26.14 mm), BS, 980–1036 m (ICML-EMU-10757, 10780); St. 5E (23º05’22”N; 110º27’54”W), Ago 6, 2012, 42 M (CL 13.54–22.02 mm), 64 F (CL 13.52–23.11 mm), 13 OF (CL 18.10–25.00 mm), BS, 948–954 m (ICML-EMU-10758, 10759); St. 8 (25º02’12”N; 112º54’06”W), Jul 30, 2012, 7 M (CL 18.81–24.85 mm), 4 F (CL 17.34–20.9 mm), 1 OF (CL 21.56 mm), BS, 1210–1245 m (ICML-EMU-10760); St. 9 (24º25’12”N; 112º52’48”W), Jul 30, 2012, 10 M (CL 17.67–24.54 mm), 1 F (CL 20.59 mm), BS, 1425–1494 m (ICML-EMU-10782); St. 24 (27º05’42”N; 114º35’30”W), Ago 1, 2012, 4 M (CL 15.63–18.6 mm), 10 F (CL 14.54–23.36 mm), BS, 772–786 m (ICML-EMU-10761).

TALUD XVI, St. 3 (28º39.0N; 115º49.0W), Jul 31, 2013, 5 M (CL 18.21–24.87 mm), 4 F (CL 17.79–20.92 mm), BS, 1397–1408 m (ICML-EMU-10762, 10785).

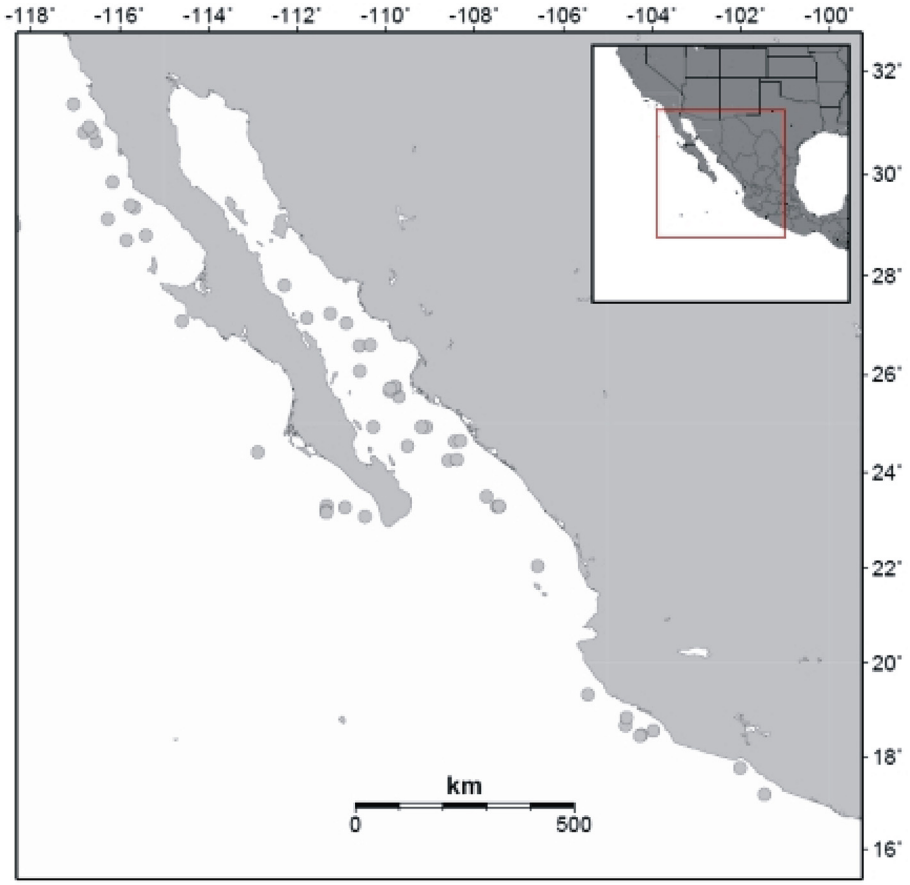

FIGURE 8. Localities in the Mexican Pacific where *Nematocarcinus faxoni* Burukovsky, 2001, was collected during this survey.

TALUD XVI–B, St. 3 (28°42’36’’N; 115°50’42’’W), May 23, 2014, 4 M (CL 18.08–21.95 mm), 1 OF (CL 20.54 mm), BS, 1350–1365 m (ICML-EMU-10763); St. 8 (29°23’48’’N; 115°45’12’’W), May 31, 2014, 2 M (CL 16.21–16.50 mm), 3 F (CL 10.61–17.93 mm), BS, 1416–1480 m (ICML-EMU-10764); St. 9 (29º20’53’’N; 115º51’), May 31, 2014, 2 M (CL 20.79–23.39 mm), 1 F (CL 20.77 mm), BS, 1848–1860 m (EMU-10765); St. 16 (29º51’24’’N; 116º09’06’’W), May 29, 2014, 2 M (CL 19.51–21.14 mm), 3 F (CL 15.44–18.60 mm), BS, 1425–1360 m (ICML-EMU-10766); St. 19 (30º38’N; 116º31’40’’W), May 25, 2014, 2 M (CL 13.97–14.67 mm), 1 F (CL 26.99 16.03 mm), BS, 1385–1433 m (ICML-EMU-10767); St. 21 (30º49’24’’N; 116º47’48’’W), May 28, 2014, 2 F (CL 17.80–27.78 mm), BS, 2018–2093 m (EMU–10768); St. 22 (30º49’47’’N; 116º35’54’’W), May 28, 2014, 1 M (CL 23.34 mm), 1 F (CL 24.05 mm), BS, 1480–1560 m (ICML-EMU-10769); St. 23 (30º56’2’’N; 116º40’55’’W), May 27, 2014, 4 M (CL 14.82–20.06 mm), 3 F (CL 12.97–20.00 mm), BS, 1296–1340 m (EMU-10770, 10786); St. 28 (31º22’N; 117º02’W), May 27, 2014, 1 F (CL 21.97 mm), BS, 1461–1532 m (EMU-10772).

Additional material examined. Holotype, female, CL 25 mm, USNM 1073696. R/V "Albatross", St. 3418, off Acapulco, Mexico, April 11, 1891.

Geographical distribution. Previously known from Guaymas basin, central Gulf of California to Acapulco (16º33’N, 99º52’W), Mexico (Wicksten & Hendrickx 2003); West Atlantic, roughly from 27º58’N, 78º27’W to 23º47’N, 78º46’W (Cardoso & Burukowki 2014). The Atlantic record is questionable, because the distribution is vicariant. Based on the material examined herein, *Nematocarcinus faxoni* distribution is extended to 27º48’30”N in the Gulf of California and off the west coast of the Baja California Peninsula to 31º22’ N (Figure 8).

Remarks. *Nematocarcinus faxoni* is clearly the dominant species of the genus in deep-water off the Pacific coast of Mexico. The combination of the structure of the ventral organ of the sixth pleomerer (Figure 7E), the shape and size of the rostrum (Figures 2B, 7A), the presence of an inner protuberance on the pleura of fifth pleomere (Figure 7F), and the larger space between proximal rostral teeth (Figures 7A) allow to separate this species from *N. agassizii*.

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