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NOTES ON TWO SPECIES OF THE DEEP-SEA SHRIMP GENUS *Nematocarcinus* A. Milne-Edwards, 1881 (DECAPODA: CARIDEA: NEMATOCARCINIDAE) COLLECTED BY THE THAI-DANISH BIOSHELF SURVEYS (1996–2000) FROM THE ANDAMAN SEA, OFF SOUTHWESTERN THAILAND

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ABSTRACT: The deep-sea shrimp genus *Nematocarcinus* A. Milne-Edwards, 1881 is known for its challenging species identification due to fragility of specimens and subtle morphological differences. While diagnostic characteristics for species discrimination have been improved, the identification of certain species, particularly in the Indo-West Pacific region, remains problematic. In this study, material of *Nematocarcinus* collected from the Andaman Sea off southwestern Thailand during the Thai-Danish BIOSHELF surveys (1996–2000). Our findings reveal that *Nematocarcinus chacei* Burukovsky, 2002, originally described on the basis of material from the Andaman Sea, is difficult to distinguish from *N. paucidentatus* Spence Bate, 1888 on the morphological bases, thereby proposing to relegate *N. chacei* to a junior subjective synonym of *N. paucidentatus*. Additionally, *Nematocarcinus undulatipes* Spence Bate, 1888 is recorded for the first time in the Andaman Sea, expanding its known range.

Key words: *Nematocarcinus paucidentatus*, *Nematocarcinus undulatipes*, synonym

INTRODUCTION

The caridean genus *Nematocarcinus* A. Milne-Edwards, 1881 is represented by species that live exclusively in the deep sea, extending from the continental slope to abyssal plains at depths greater than 5000 m (Burukovsky 2012). Currently 42 species are recognized in the genus (De Grave and Fransen 2011; Burukovsky 2012, 2013; Komai and Komatsu 2016; DecaNet 2024), of which 31 species have been recorded from the Indo-West Pacific region (Burukovsky 2012; Komai and Komatsu 2016; Gan and Li 2022). Specimens of uncertain status have also been recorded (Komai and Segonzac 2005; Komai and Collins 2009; Burukovsky 2012). The following four species of the genus have been recorded from the Bay of Bengal (Alcock 1901), although the identities of several of them remain to be verified: *N. chacei* Burukovsky, 2002 (= *N. cursor* var. *paucidentatus* sensu Alcock 1901), *N. cursor* A. Milne-Edwards, 1881, *N. tenuipes* Spence Bate, 1888, and *N. tenuirostris* Spence Bate, 1888. Diagnostic characters for species discrimination have been clarified by a series of studies by Dr. Rudolf N. Burukovsky (see Burukovsky 2012, 2013); however, identification of *Nematocarcinus* specimens is still often difficult due to the general fragility of specimens and minor or subtle differences for species discrimination.

This study deals with a collection of *Nematocarcinus* specimens collected from the Andaman Sea off southwestern Thailand during the Thai-Danish Bioshelf Surveys in 1996–2000 (Aungtonya *et al*. 2000). Most of the specimens examined were identified as *N. paucidentatus* Spence Bate, 1888, while a single young female was identified as *N. undulatipes* Spence Bate, 1888. After examination of the present specimens, it became clear that it is difficult to distinguish between *N. paucidentatus* and *N. chacei* on the basis of morphology. Consequently, *N. chacei* is relegated to the junior subjective synonym of *N. paucidentatus*. *Nematocarcinus undulatipes* is recorded for the first time from the Andaman Sea, the eastern extension of the Bay of Bengal.

MATERIAL AND METHODS

The specimens examined in this study were deposited in the Reference Collection of the Phuket Marine Biological Center, Thailand (PMBC) and the Natural History Museum and Institute, Chiba, Japan [CBM, with a taxon code of ZC (Zoology, Crustacea)]. All measurements are the postorbital carapace length (cl), measured from the posterior margin of the orbit to the midpoint of the posterodorsal margin. Some specimens were stained with methylene blue solution under binocular observation, a procedure that enhances accurate observation of the integument surfaces, particularly the ventral organ of the sixth pleomere (cf. Komai and Komatsu 2016). For a detailed description and information on the stations of the BIOSHELF survey, see Aungtonya *et al*. (2000). Specimens were initially fixed in 10% formalin solution (Aungtonya *et al*. 2000), but later transferred to 70% ethanol; therefore, no DNA extraction was attempted. A full synonymy is given for each species account (Note that no description is given for *N. undulatipes*). Other abbreviations used in the text are: NHM = The Natural History Museum, London, UK; USNM = National Museum of Natural History, Smithsonian Institution, USA.

TAXONOMIC ACCOUNT

Family Nematocarcinidae Smith, 1884
Genus *Nematocarcinus* A. Milne-Edwards, 1881
Nematocarcinus paucidentatus Spence Bate, 1888 (Figs. 1–3)

Nematocarcinus paucidentatus Spence Bate, 1888: 816, pl. 132, fig. 9 [type locality: off Kandavu, Fiji, 1098 m]; Burukovsky 2006: 897, fig. 2; 2012: 148, fig. 53; De Grave and Fransen 2011: 299.

Nematocarcinus cursor var. *paucidentatus* – Alcock, 1901: 90.

Nematocarcinus chacei Burukovsky, 2002: 5, fig. 1 [type locality: indicated originally as Gulf of Aden, 335 m, but later changed to the Andaman Sea, 335 m; see Burukovsky 2003, 2005]; 2003: 66, fig. 16a–g; 2004: 558 (key); 2005: 577, fig. 4a–d; 2012: 89, fig. 27; 2013: 166, fig. 3; De Grave and Fransen 2011: 298 (list); Chan *et al*. 2021: 133, fig. 7D.

Nematocarcinus gracilis – Burukovsky 2003: 100 (in part).

? *Nematocarcinus alisae* Burukovsky, 2000a: 903, fig. 4 [type locality: New Caledonia, 960–1100 m].

Material examined. PMBC 37675, 1 male (cl 13.6 mm), BIOSHELF St. J10, 07°20'N 97°14'E to 07°22'N 97°13'E, 655–651 m, trawl, 28 January 1999, coll. S. Bussarawit and C. Aungtonya; PMBC 37676, 1 ovigerous female (cl 18.6 mm; figured), PMBC 37677, 1 male (cl 16.1 mmm, figured), PMBC 37678, 3 females (cl 17.8–18.4 mm), 1 male (cl 16.5 mm) BIOSHELF St. L10, 06°45'N 97°23'E to 06°44'N 97°26'E, 707–651 m, Agassiz trawl, 21 February 2000, coll. C. Aungtonya and V. Vongpanich; PMBC 37679, 2 females (cl 16.1, 17.0 mm), 2 males (cl 12.3, 16.1 mm), CBM-ZC 17830, 2 females (cl 17.0, 21.3 mm), 3 males (cl 14.8–15.2 mm), PMBC 37680, 1 female (cl 17.4 mm, figured), BIOSHELF, St. C8, 09°00'N 96°15'E to 09°00'N 96°13'E, 478–480 m, Agassiz trawl, 3 February 2000, coll. C. Aungtonya and V. Vongpanich; PMBC 37681, 1 female (cl 17.0 mm), 1 ovigerous female (cl 17.7 mm, figured), 1 male (cl 11.1 mm), BIOSHELF, St. G8, 08°00'N 97°11'E to 08°00'N 97°13'E, 495–488 m, Agassiz trawl, 9 February 2000, coll. C. Aungtonya and V. Vongpanich; PMBC 37682, 1 female (cl 19.2 mm), 2 males (cl 16.6, figured; 16.7 mm), BIOSHELF St. J10, 07°15'N 97°15'E to 07°14'N 97°15'E, 689–687 m, Agassiz trawl, 19 February 2000, coll. C. Aungtonya and V. Vongpanich; PMBC 37683, 1 female (cl 15.4 mm), 1 male (cl 16.4 mm), BIOSHELF, St. L8, 06°45'N 97°36'E to 06°44'N 97°34'E, 482–507 m, 22 February 2000, Agassiz trawl, coll. C. Aungtonya and V. Vongpanich.

Description. Rostrum (Figs. 1A, 3A–C) anteriorly directed, straight or slightly curved dorsad, moderately slender, 0.25–0.35 times as long as carapace, varying from falling slightly short of dorsodistal margin of second article of antennular peduncle to reaching midlength of third article; dorsal margin armed with 9–12 teeth becoming more widely spaced anteriorly, including 4–7 teeth on rostrum proper and 4–6 postrostral, all but anterior 2 or 3 with basal suture; anteriormost tooth on distal 0.2–0.4 of rostrum, posteriormost tooth located at 0.10–0.15 of carapace length; ventral margin with 1 small subdistal tooth, located anterior to anteriormost

tooth of dorsal series (anterior 0.1–0.2 of rostral length); lateral carina clearly visible, merging into orbital margin of carapace. Carapace (Fig. 1A) with postrostral ridge falling short of mid-length of carapace; postorbital longitudinal groove distinct; cervical and branchiocardiac grooves faint or very shallow; hepatic depression deep. Antennal and pterygostomial teeth well developed, sharp; suborbital lobe obtuse, but clearly defined; anterolateral margin between antennal and pterygostomial teeth uniformly concave.

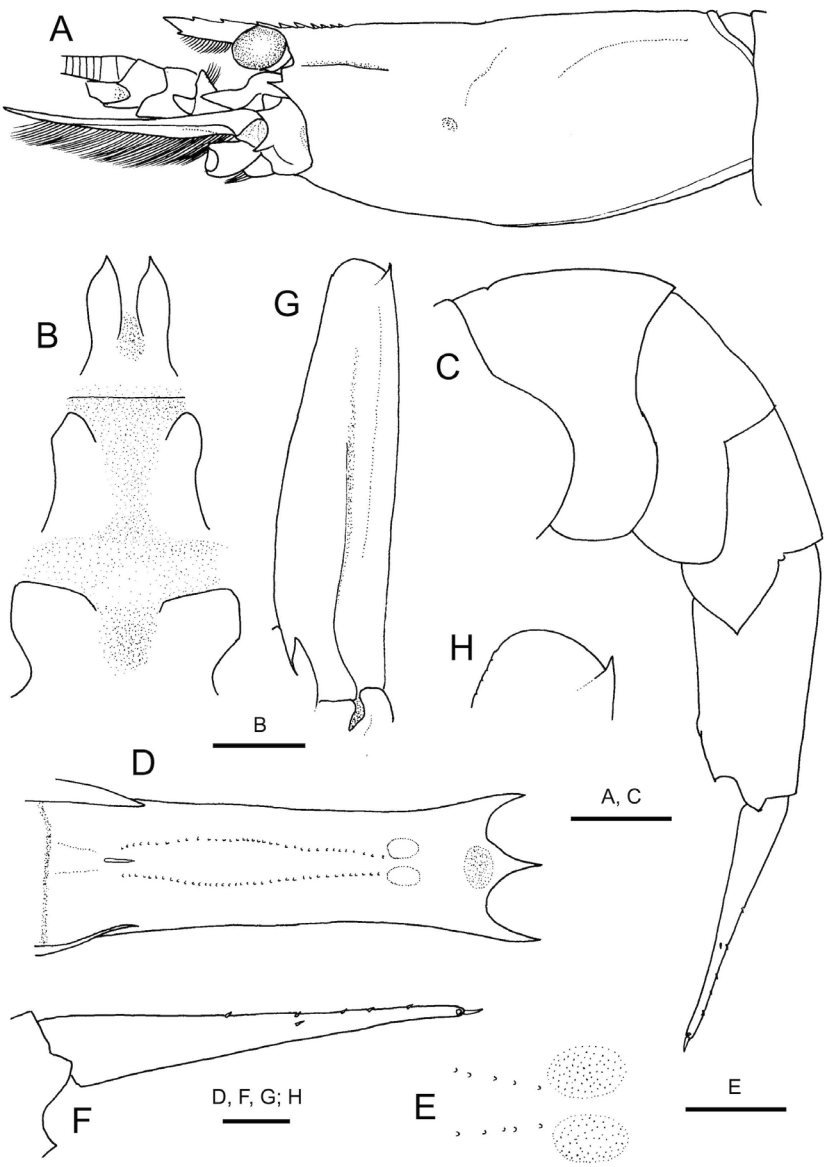

Figure 1. *Nematocarcinus paucidentatus* Spence Bate, 1888. A, C, D–H, PMBC 37674, ovigerous female (cl 18.6 mm); B, PMBC 37675, male (cl 16.1 mm). A, carapace and cephalic appendages, lateral view; B, sixth to eight thoracic sternites, ventral view; C, pleon and telson, lateral view; D, sixth pleomere, ventral view; E, detail of posteroventral spots and posterior setal pores of sixth pleomere; F, telson, lateral view; G, right antennal scale, dorsal view; H, same, closeup of distal part. Scale bar: 5 mm (A, C), 2 mm; 1 mm (D, F, G; H), 1 mm (B), 0.5 mm (E).

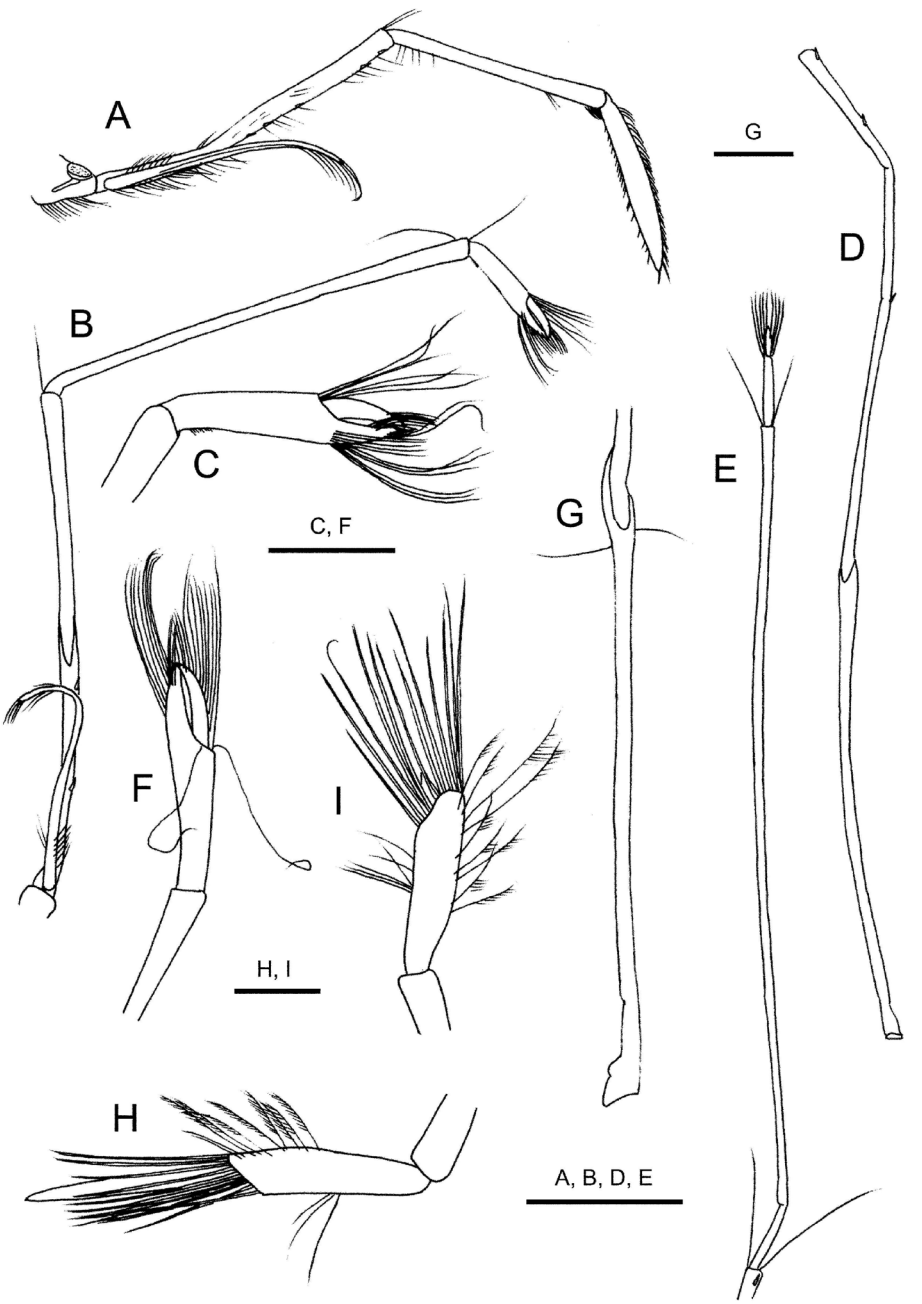

Figure 2. *Nematocarcinus paucidentatus* Spence Bate, 1888. A–F, PMBC 37674, ovigerous female (cl 18.6 mm); G–I, female (cl 17.4 mm). A, right third maxilliped, lateral view; B, right first pereopod, lateral view; C, same, chela, lateral view; D, left second pereopod, ischium and merus, lateral view; E, same, carpus and chela, lateral view; F, same, chela, lateral view; G, fourth pereopod, ischium; H, same, propodus and dactylus, lateral view; I, fifth pereopod, propodus and dactylus, lateral view. Scale bar: 5 mm (A, B, D, E; G), 2 mm (C, F), 1 mm (H, I)

Posterior thoracic sternites (Fig. 1B) each with paired prominences. Prominences on sixth thoracic sternite in males with lateral margins slightly sinuous, distal parts each tapering to a slender spine; in females general shape of prominences similar to that of males, but terminal spines absent. Prominences on seventh sternites produced anteriorly in rounded lobes, with gently sinuous lateral margins. Prominences on eighth sternites forming subtriangular lobes somewhat widened anterolaterally, each with blunt anterolateral corner.

Pleon (Fig. 1C) with first through fourth pleura rounded, fifth pleuron with small, but distinct, acute posteroventral tooth directed posteriorly. Third pleomere with posterodorsal margin of tergum weakly produced posteriorly. Fifth pleuron without ridge or tubercle on inner surface. Sixth pleomere 1.8 times as long as fifth, 2.0 times as long as high, with tiny posteroventral tooth; posterolateral process subtriangular, with pointed tip; sternite with ventral organ (Fig. 1D, E) consisting of pairof subovate fields of minute pits (= postero-ventral spots) and pair of single rows of setal pores extending to level of anterior end of each posteroventral spot; rows of setal pores subparallel, but distance between them greatest at mid-point of row; posteroventral spots low blister-like, moderately well separated; preanal tooth spiniform; distinct, rounded depression present anterior to base of preanal tooth. Telson (Fig. 1C, F) exceeding posterior margin of uropodal endopod, but not reaching exopod, subequal in length to sixth pleomere, usually armed with 6–8 small dorsolateral spiniform setae on each side (including 1 seta at each posterolateral angle), arranged in a single row, and 1 accessory spiniform seta on lateral surface located slightly posterior to midlength; posterior margin produced into small blunt triangular process, armed with 2 pairs of spiniform setae, lateral pair more than twice as long as mesial pair.

Eye (Fig. 1A) with darkly pigmented cornea, its width slightly more than 0.1 of carapace length.

Antennular peduncle (Fig. 1A) stout, reaching distal third of antennal scaphocerite. First article with stylocerite vertically compressed, reaching approximately to dorsodistal margin of first article, its dorsal margin deeply notched dorsally in lateral view. Distal two articles subequal in length to first article.

Antennal scaphocerite (Fig. 1A, G, H) about 0.7 times as long as carapace, 3.8 times as long as wide, widest at proximal 0.3; lateral margin faintly sinuous; distal margin of lamella roundly truncate, slightly exceeding small distolateral tooth; dorsal surface with distinct median sulcus. Carpocerite short, stout, falling below level of dorsodistal margin of first article of antennular peduncle.

Third maxilliped endopod (Fig. 2A) moderately slender, reaching almost to end of antennal scaphocerite. Coxa with lateral plate. Antepenultimate article slightly flattened proximally; lateral surface with row of about 10 spiniform setae adjacent to lower margin. Penultimate article (= carpus) 0.7 times as long as antepenultimate article, slightly widened distally. Ultimate article 0.8 times as long as penultimate article, laterally compressed, broadest at midlength, tapering to blunt apex with few minute spiniform setae. Exopod almost reaching distal 0.3 of antepenultimate segment.

First pereopod (Fig. 2B, C) exceeding antennal scale by 0.2–0.3 length of carpus. Ischium armed with 2 or 3 spiniform setae on lateral surface adjacent to lower margin, setae widely spaced. Merus slightly longer than ischium. Carpus elongate, slightly widened distally, slightly shorter than ischium-merus combined. Chela 0.3 times as long as carpus, with grooming apparatus consisting of small patch of short setae proximally on flexor margin and with tuft of long setae at base of dactylus; fingers with tufts of setae; dactylus 0.6 times as long as palm.

Second pereopod (Fig. 2D–F) thin, elongate, about twice as long as first pereopod. Ischium unarmed. Merus distinctly longer than ischium, armed with 3 dorsomesial spiniform setae in distal 0.4, these spiniform setae widely spaced. Carpus shorter than ischium-merus combined, slightly broader distally, unarmed. Chela about 0.1 times as long as carpus; palm slightly widened distally, with prominent tuft of long setae at dactylar articulation; fingers gently curved, leaving narrow hiatus, each with a few tufts of long setae; dactylus 0.7 times as long as palm.

Third pereopod detached or damaged in all specimens. Ischium unarmed.

Fourth pereopods thin, elongate. Ischium (Fig. 2G), merus and carpus all unarmed. Propodus (Fig. 2H) short, slightly widened distally, obliquely truncate distally; extensor surface with row of

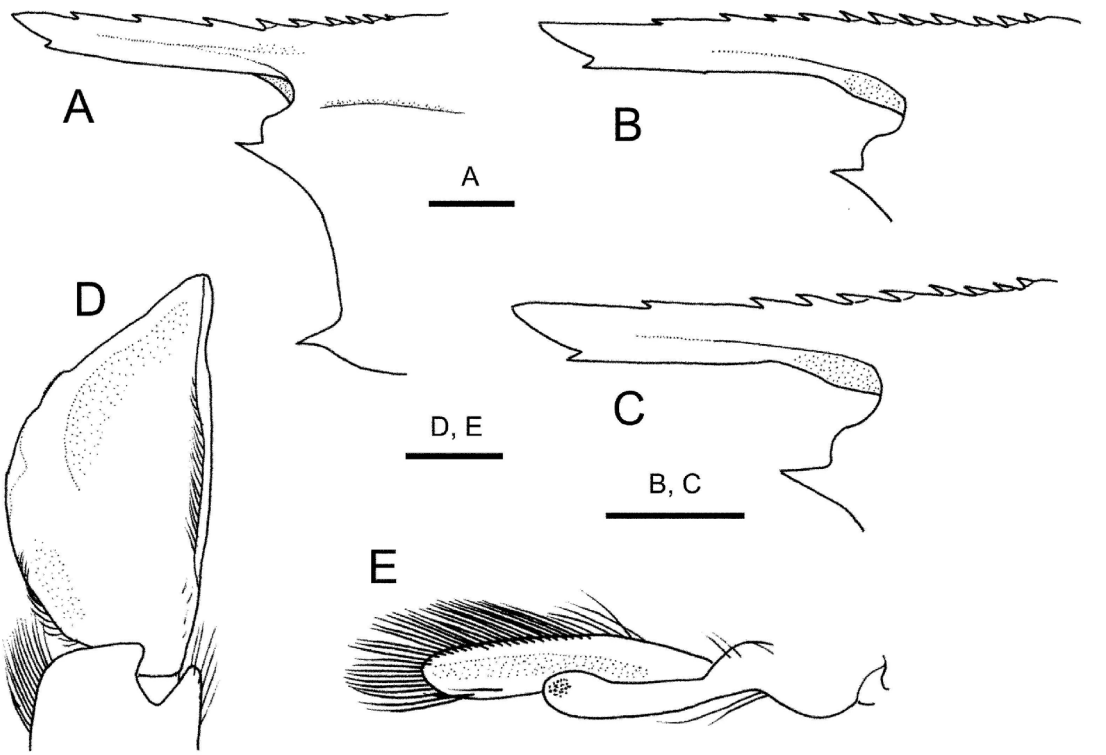

Figure 3. *Nematocarcinus paucidentatus* Spence Bate, 1888. A, PMBC 37674, ovigerous female (cl 18.6 mm); B, PMBC 37681, male (cl 16.6 mm); C, PMBC 37679, ovigerous female (cl 17.7 mm); D, E, PMBC 37675, male (cl 16.1 mm). A, rostrum and anterior part of carapace, lateral view; B, C, rostrum, lateral view; D, first pleopod, endopod, ventral (posterior) view; E, second pleopod, appendices interna and masculina, mesial view. Scale bar: 2 mm (A; B, C), 1 mm (D, E).

long plumose setae on distal half, terminal margin with long stiff setae, partially obscuring dactylus. Dactylus (Fig. 2H) uniformly tapering to subacute apex, slightly longer than terminal setae on propodus.

Fifth pereopod generally similar to fourth pereopod. Dactylus (Fig. 2I) very short, lanceolate, terminating in acute tip, obscured by propodal terminal setae.

Male first pleopod with endopod (Fig. 3D) sub-semicircular in shape, tapering to rounded tip; lateral margin nearly straight, ventrally folded; mesial margin uniformly convex, with cluster of cincinnli located slightly distal to midlength; ventral surface generally shallowly concave. Male second pleopod with appendix masculina (Fig. 3E) relatively slender for genus, nearly twice as long as appendix interna, with numerous, closely spaced, stiff setae distal to lower margin; appendix interna widened distally.

Uropod without distinctive features.

Eggs small, numerous, measuring about 0.5 mm in major diameter.

Distribution. Currently known with certainty from the Bay of Bengal, Java (Indonesia), Taiwan and Fiji, at depths of 344–1098 m (Burukovsky 2006, this study).

Remarks. *Nematocarcinus paucidentatus* was originally described on the basis of a single specimen from Fiji at a depth of 1098 m (Spence Bate 1888). Alcock (1901) referred specimens from the Bay of Bengal (including the Andaman Sea) and off Sri Lanka to *N. cursor* var. *paucidentatus*. Burukovsky

(2002) described a new species *N. chacei* based on two specimens that Alcock (1901) had referred to as *N. cursor* var. *paucidentatus* (see Burukovsky 2005). Burukovsky (2003) placed *N. paucidentatus* under the synonymy of *N. gracilis* Spence Bate, 1888, but later Burukovsky (2006) resurrected it as a separate species after examination of the holotype. At the same time, Burukovsky (2006) synonymized *N. alisae* Burukovsky, 2000a, originally described from New Caledonia, with *N. paucidentatus.* Burukovsky (2012) recorded *N. paucidentatus* from New Caledonia and Tonga with new samples. *Nematocarcinus chacei* has also been recorded from Taiwan (Burukovsky 2013) and Java, Indonesia (Chan *et al.* 2021).

The present specimens are in good agreement with the holotype of *N. paucidentatus* as redescribed and illustrated by Burukovsky (2006), especially in the following points: the rostrum does not reach the dorsodistal margin of the third article of the antennal peduncle; the dorsal margin of the rostrum bears no more than 14 teeth (including four to six postrostral), of which those on the rostrum proper are clearly more widely spaced than those on the postrostral; the anteriormost tooth of the dorsal series is located anterior to one-third of the length of the rostrum; the single ventral tooth is located subterminally anterior to the anteriormost dorsal tooth; the posterodorsal margin of the third pleomere is weakly to moderately produced; the fifth pleuron is armed with a tiny but distinct posteroventral tooth; the ventral organ of the sixth pleomere consists of two longitudinal rows of setal pores arranged in a single row and generally oval posteroventral spots that are moderately well separated.

As mentioned above, *N. chacei* was established on the basis of two specimens identified as *N. cursor* var. *paucidentatus* from the Andaman Sea, and indeed, the taxon is very similar to *N. paucidentatus.* According to Burukovsky (2003, 2012, 2013), *N. chacei* is distinguished from *N. paucidentatus* by (1) the relatively shorter rostrum (not overreaching the distal margin of the second article of the antennular peduncle in *N. chacei* versus protruding beyond it in *N. paucidentatus*; (2) the different positions of the rostral ventral tooth (ventral tooth subapical, directed anteriorly or slightly upwardly in *N. chacei* versus midway between the tip of the rostrum and the distalmost dorsal tooth of the rostrum in *N. paucidentatus*); and (3) the structure of the posteroventral spots on the sixth pleomere, viz. “Spots on common eminence, not forming a blister, or spots on ventral surface of somite forming or not forming protuberances; distance between them about half of spot width” in *N. chacei* versus “Spots together on nearly semi-spherical blister, distance between them less than half spot width” in *N. paucidentatus*; (4) the different position of the posteriormost setal pores adjacent to the posteroventral spots, viz., “Rows of setae in one line each, starting as separate rows very close to each other between spots, at level of midlength of spots, rows diverging anteriorly” in *N. chacei* versus “Rows of setae in one line each, starting as separate rows very close to each other at anterior side of spots, rows diverging anteriorly” in *N. paucidentatus*. However, examination of the present material has shown that none of the above characters are clearly present. The rostrum falls slightly short of the dorsodistal margin of the second article of the antennular peduncle or reaches the mid-length of the third article of the antennular peduncle in the present specimens. According to the figure of the holotype of *N. chacei*, the apical part of the rostrum is damaged (Burukovsky 2002: fig. 1a, b; 2003, fig. 16a, b); according to the figure of the paratype, the ventral tooth is missing (Burukovsky 2002: fig. 1v; 2003: fig. 16v). The rostral ventral tooth is located at the anterior 0.1–0.2 of the rostral length in the present specimens. The third and fourth characters are not real (cf. Burukovsky 2002: fig. 1; 2003: fig. 16e, j; 2012: fig. 27v), and are not useful as diagnostic characters for species discrimination. In fact, there is no clear difference between the figures of *N. paucidentaus* (cf. Burukovsky 2006) and those of *N. chacei* (Burukovsky 2002, 2003, 2012). Consequently, we propose to relegate *N. chacei* to be a junior subjective synonym of *N. paucidentatus*.

Burukovsky (2006) synonymized *N. alisae* with *N. paucidentatus*. However, comparison of the description of *N. alisae* by Burukovsky (2000; 2003) and the redescription of *N. paucidentatus* by Burukovsky (2006) with the present material does not support conspecificity between the two taxa. In *N. alisae*, the rostrum extends beyond the distal end of the antennular peduncle (cf. Burukovsky 2000a: fig. 4a), whereas in *N. paucidentatus* it does not reach it (Burukovsky 2006: fig. 2a). Posterovental spots on the sixth pleomere are contiguous in *N. alisae* (cf. Burukovsky 2000a: fig. 4), rather than clearly separated in *N. paucidentatus* (Burukovsky

2006: fig. 2; Fig. 1E). It is strongly recommended to reassess the status of *N. alisae*, and consequently *N. alisae* is only questionably retained in the synonymy of *N. paucidentatus.*

***Nematocarcinus undulatipes* Spence Bate, 1888**
(Fig. 4)

Nematocarcinus undulatipes Spence Bate, 1888: 801, pl. 80, fig. 1; Chace 1986: 76 (in part), figs. 41a–s, 42a–g, i–p; Burukovsky 2000b: 1159, figs. 4, 5; 2002: 7, fig. 2a, b; 2003: 168, fig. 50a–e; 2004: 558.

? *Nematocarcinus undulatipes* – Baba *et al*. 1986: 91 (Japanese text), 256 (English text), fig. 51; 1988: 445, figs. 156f, 157a, b; 2007: 92, figs. 37e, 38a, c, e, f; Kensley *et al*. 1987: 291; Li 2008: 724 (list); Gan and Li 2008: 6, fig. 1G, H.

Not *Nematocarcinus undulatipes* – De Man 1920: 83, pl. 8, fig. 20–20h. = *Nematocarcinus richeri* Burukovsky, 2000c.

Not *Nematocarcinus undulatipes* – Chace 1986: 76 (in part). = *Nematocarcinus kaiensis* Burukovsky, 2000b.

Not *Nematocarcinus undulatipes* – Chace 1986, 76 (in part), fig. 42h. = *Nematocarcinus subtilis* Burukovsky, 2000b.

Not *Nematocarcinus undulatipes* – Burukovsky 1990: 195. = *Nematocarcinus gracilis* Spence Bate, 1888, *N. pseudocursor* Burukovsky, 1990 and *N. pseudogracilis* Burukovsky, 2007.

Not *Nematocarcinus undulatipes* – Hanamura and Evans 1996: 3. = N*ematocarcinus evansi* Burukovsky, 2000d and *N. hanamuri* Burukovsky, 2000d.

Not *Nematocarcinus undulatipes* – Lin *et al*. 2000: 1. = *Nematocarcinus combensis* Burukovsky, 2000b.

Material examined. PMBC 37684, 1 young female (cl 11.3 mm), BIOSHELF St. L10, 06°45'N 97°23'E to 06°44'N 97°26'E, 707–651 m, Agassiz trawl, 21 February 2000, coll. C. Aungtonya and V. Vongpanich.

Remarks. *Nematocarcinus undulatipes* was originally described on the basis of material from four different localities in the western Pacific (Spence Bate, 1888), including the western Moro Gulf, Mindanao, Philippines, at a depth of 457 m (H.M.S. Challenger station 200, 15 specimens), the southern Philippine Sea off Talaud Island at a depth of 914 m (H.M.S. *Challenger* station 214, three specimens, one female), Banda Sea off Banda Island, Indonesia, at a depth of 366 m (H.M.S. *Challenger* station 194, one female) and off the Kermadec Islands, New Zealand, at a depth of 1097 m (H.M.S. *Challenger* station 171, three males). Since the original description, there have been several records under the name *N. undulatipes* from various localities in the Indo-West Pacific (De Man 1920; Chace 1986; Burukovsky 1990; Baba *et al*. 1986; Hayashi 1988, 2007; Kensley *et al.* 1987; Hanamura and Evans, 1996; Li 2008; Lin *et al.* 2000). Burukovsky (2000b, 2000c), who examined specimens including some of the syntypes and those referred to by previous workers as *N. undulatipes*, concluded that several species (*i.e*., *N. evansi* Burukovsky, 2000d, *N. gracilis* Spence Bate, 1888, *N. hanamuri* Burukovsky, 2000d, *N. kaiensis* Burukovsky, 2000b, *N. pseudocursor* Burukovsky, 1990, *N. pseudogracilis* Burukovsky, 2007, and *N. richeri* Burukovsky, 2000b) were confounded under *N. undulatipes* (see also synonymy above). Burukovsky (2000b) selected one of the two specimens from *Challenger* Station 200 in the Philippines deposited in USNM as the lectotype of *N. undulatipes* in the interest of nomenclatural stability, but it appears that he may not have examined other paralectotypes deposited at NHM. Burukovsky (2000b) showed that the shape and armature of the rostrum show considerable variation in *N. undulatipes*.

The present specimen was identified as *Nematocarcinus undulatipes* because it appears to best match the lectotype of the species described and illustrated by Burukovsky (2012) in the following characters (Burukovsky 2012, 2013): (1) rostrum slender, not reaching distal margin of second article of antennular peduncle, dorsal margin with no more than 14 teeth (Fig. 4A, B); (2) posterodorsal margin of third pleomere moderately produced (Fig. 4C); (3) fifth pleuron without tubercle or ridge on inner surface, with normally developed, acute posteroventral tooth (Fig. 4D); (4) telson with a lateral accessory spiniform setae in addition to dorsolateral spiniform setae (Fig. 4E). The structure of the posteroventral spots on the sixth pleomere was barely observable, but each row of setal pores was arranged in a single row.

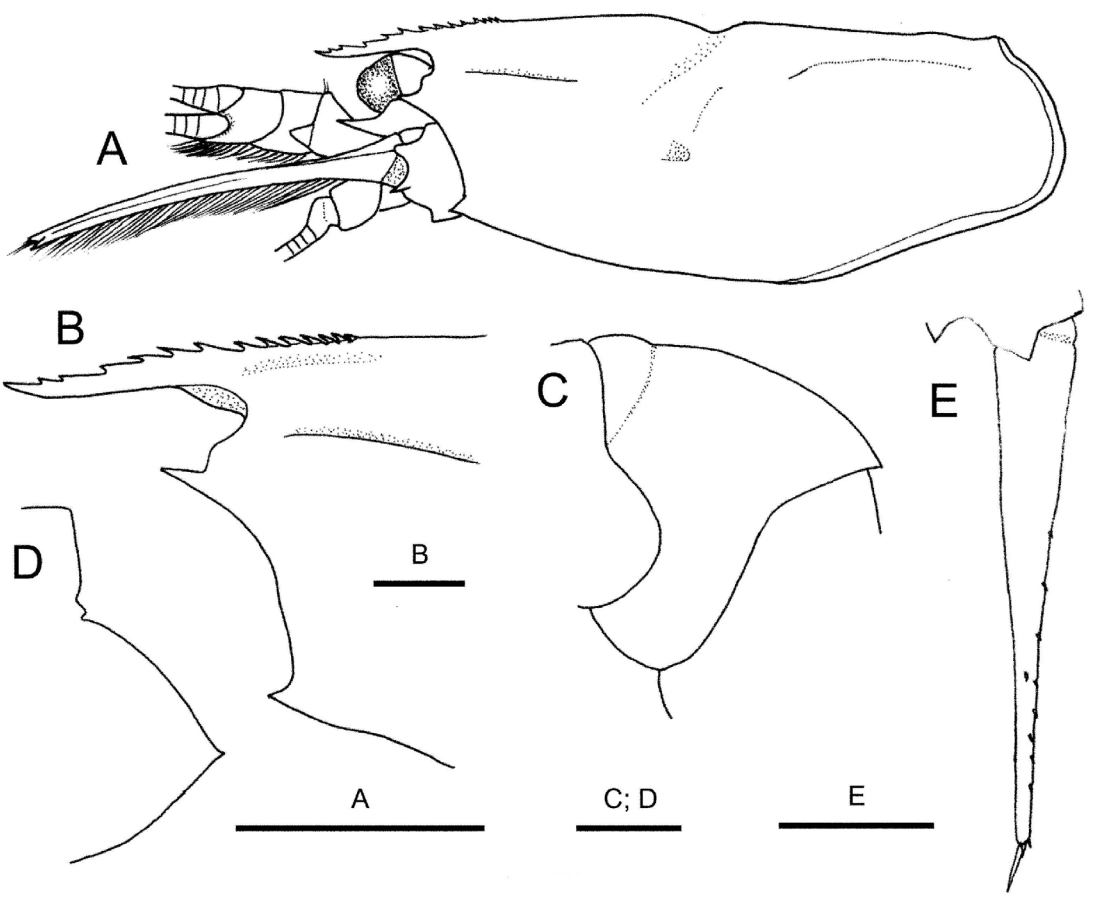

Figure 4. *Nematocarcinus undulatipes* Spence Bate, 1888, PMBC 37682, young female (cl 11.3 mm). A, carapace and cephalic appendages, lateral view; B, rostrum and anterior part of carapace, lateral view; C, third pleomere, lateral view; D, posterior part of fifth pleomere, lateral view; E, telson, lateral view. Scale bar: 5 mm (A), 2 mm; 1 mm (C; D), 1 mm (B).

The identities of specimens reported as *N. undulatipes* from Japan (Baba *et al*. 1986; Hayashi 1988, 2007) and New South Wales, Australia (Kensley et al. 1987) remain to be confirmed. Li (2008) listed *N. undulatipes* from China seas, but this record also needs to be verified.

Differentiation among the above specific taxa described by Dr. Burukovsky is not always easy because the differences offered for species discrimination are sometimes subtle and not clear (see discussion in Chan *et al*. 2021). Gan and Li (2022) attributed a single specimen from the South China Sea to *N. undulatipes* that was collected with specimens identified as *N. evansi*. The specimen identified as *N. undulatipes* by Gan and Li (2022) differs from the reports of Burukovsky and the present specimen in having fewer postrostral teeth on the carapace (four versus more than four). The future availability of DNA sequence data will help to clarify the identities of the taxa of *Nematocarcinus*.

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