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Two new species of *Aricidea* (*Aricidea*) (Annelida: Paraonidae) from the Andaman coast and the Gulf of Thailand

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Abstract

Two new species of Paraonidae, *Aricidea (Aricidea) pacharaphoni* **sp. nov.**, and *A. (A.) sathingpra* **sp. nov.**, are described from the Southwestern Pacific. *Aricidea (A.) pacharaphoni* **sp. nov.**, collected in the Andaman Coast and the Gulf of Thailand, is clearly distinguished from other species of *Aricidea (Aricidea)* by having an elongate, faintly annulated median antenna extending to chaetigers 3–7; chaetiger 3 with distinctive globose notopodial postchaetal lobes with long digitiform terminal tips; two types of branchiae, strap-like and foliaceous; and two types of modified neurochaetae, pseudocompound and stout acicular. *Aricidea (A.) sathingpra* **sp. nov.**, was collected in the Gulf of Thailand and belongs to the articulated antenna group, being separated from all other species of this subgenus by having a triarticulated antenna; pair of distinctive round furrow protuberances on the prostomium; and 6–7 pairs of wide foliaceous branchiae. We suggested that the modification and shape of the notopodial postchaetal lobes in chaetiger 3 are an important morphological character to differentiate the species of this subgenus. Molecular phylogenetic and genetic distance analyses, based on cytochrome oxidase subunit I (*COI*) gene sequences support the recognition of *Aricidea (A.) pacharaphoni* **sp. nov.**, as a distinct species. A taxonomic key for all world species of *Aricidea (Aricidea)* is included.

Key words: *Aricidea*, Paraonids, Polychaeta, *COI*, taxonomy

Introduction

Up to now, twelve species of genus *Aricidea* Webster, 1879 from family Paraonidae Cerruti, 1909 have been described from Phuket, Andaman Sea and the Gulf of Thailand (Lovell 2002; Plathong *et al.* 2020). In the Andaman Sea, Lovell (2002) reported ten species belonging to *Aricidea*: subgenus *Acmira* Hartley, 1981 (3 species): *A. (A.) assimilis* Tebble, 1959, *A. (A.) catherinae* Laubier, 1967, and *A. (A.) simplex* Day, 1963; subgenus *Aedicira* Hartman, 1957 (one species): *A. (Aedicira)* sp.; subgenus *Aricidea* [Webster, 1879, sensu stricto] (3 species): *A. (A.) fragilis* Webster, 1879, *A. (A.) multiantennata* Lovell, 2002, and *A. (A.) thailandica* Lovell, 2002; subgenus *Strelzovia* Aguirrezabalaga, 2012 (3 species): *A. (Strelzovia) hartleyi* Blake, 1996, *A. (Strelzovia)* sp. 1, and *A. (Strelzovia)* sp. 2. On the other hand, in the Gulf of Thailand, Plathong *et al.* (2020) described two species of *Aricidea*: *A. (Acmira) anusakdii* and *A. (Aricidea) thammapinanae* from Songkhla Sea. Despite these wide occurrences of paraonid

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species on both coasts of Thailand, our studies across this marine region have shown that many species could be still unknown, so, we now described two new species belonging to subgenus *Aricidea* (*Aricidea*).

Currently, the subgenus *Aricidea* comprises 16 valid species (Read & Fauchald 2026), which can be grouped into two main groups, based on the median antenna characteristics: the group of species bearing **branched antenna** included two species: *A. (A.) multiantennata* Lovell, 2002, and *A. (A.) thailandica* Lovell, 2002; and the group with **unbranched antenna** comprises 16 species (including two new species and *A. (A.) longobranchiata* Day, 1961), not including *A. (A.) albatrossae* Pettibone, 1957 (Table 1).

TABLE 1. *Aricidea (Aricidea)* unbranched antenna species, grouping by the median antenna characteristics (modified from Plathong *et al.* 2020).

Species name	Type of median antenna	Distribution
Group I: Articulated antenna		
A. (A.) bansei Laubier & Ramos, 1974	4–5 articulations, to chaetiger 2	Mediterranean Sea
A. (A.) minuta Southward, 1956	Biarticulate; to chaetiger 1	Isle of Man
A. (A.) thammapinanae Plathong, Hernández-Alcántara, Harris & Plathong, 2020	Biarticulate; to chaetiger 1	Gulf of Thailand
A. (A.) wassi Pettibone, 1965	3–12 articulations; to chaetigers 3–6	Northwestern Atlantic
A. (A.) sathingpra **sp. nov.**	Triarticulate; to chaetigers 1–2	Gulf of Thailand
Group II: Unarticulated antenna		
A. Short antenna (≤ chaetiger 2)		
A. (A.) capensis Day, 1961	Faintly annulated near the tip	South Africa
A. (A.) curviseta Day, 1963	Short; not reaching to tip of prostomium	South Africa
A. (A.) fragilis Webster, 1879	Subulate; to chaetiger 2	Virginia to western Florida
A. (A.) longicirrata Hartmann-Schröder, 1965	Short; to chaetiger 1	Chile, southeast Pacific
A. (A.) minima Strelzov, 1973	Short; to chaetiger 1	South Atlantic
A. (A.) petacalcoensis de León-González, Hernández-Guevara & Rodríguez-Valencia, 2006	Bifurcate; to chaetiger 1	Mexican Pacific
A. (A.) pseudoarticulata Hobson, 1972	Clavate; to chaetiger 1	Southern California, USA
A. (A.) rosea Reish, 1968	Slender; to chaetiger 2	Gulf of California, Pacific Ocean
B. Long antenna (> chaetiger 3)		
A. (A.) longobranchiata Day, 1961	Long; to chaetiger 5	Off Saldanha Bay, Southern Africa
A. (A.) sanmartini Aguado & López, 2003	Long; to chaetiger 9	Panama, Pacific coast
A. (A.) pacharaphoni **sp. nov.**	Long, faintly annulated; to chaetigers 3–7	Andaman Coast and the Gulf of Thailand

This is the second paper in a series of taxonomic studies conducted to known the presence of Paraonidae in the Thailand waters, aimed to describe two new species of *Aricidea (Aricidea)* distributed in the Andaman Sea and Gulf of Thailand, to pointed out that the new species presented two morphological structures not previously observed in this subgenus: one having notopodial postchaetal lobes in chaetiger 3 globose with long digitiform terminal tip, and other with a pair of distinctive rounded protuberances on prostomium. In this study, genetic analyses of the mitochondrial cytochrome c oxidase subunit I (*COI*) gene were conducted for *A. (A.) pacharaphoni* **sp. nov.**, alongside a molecular phylogenetic analysis to clarify its evolutionary placement within the genus *Aricidea*. These molecular data complement the recognized morphological diagnostics and provide robust support for species delimitation. To support the identification of paraonids, a taxonomic key to all world species of *Aricidea (Aricidea)* is included.

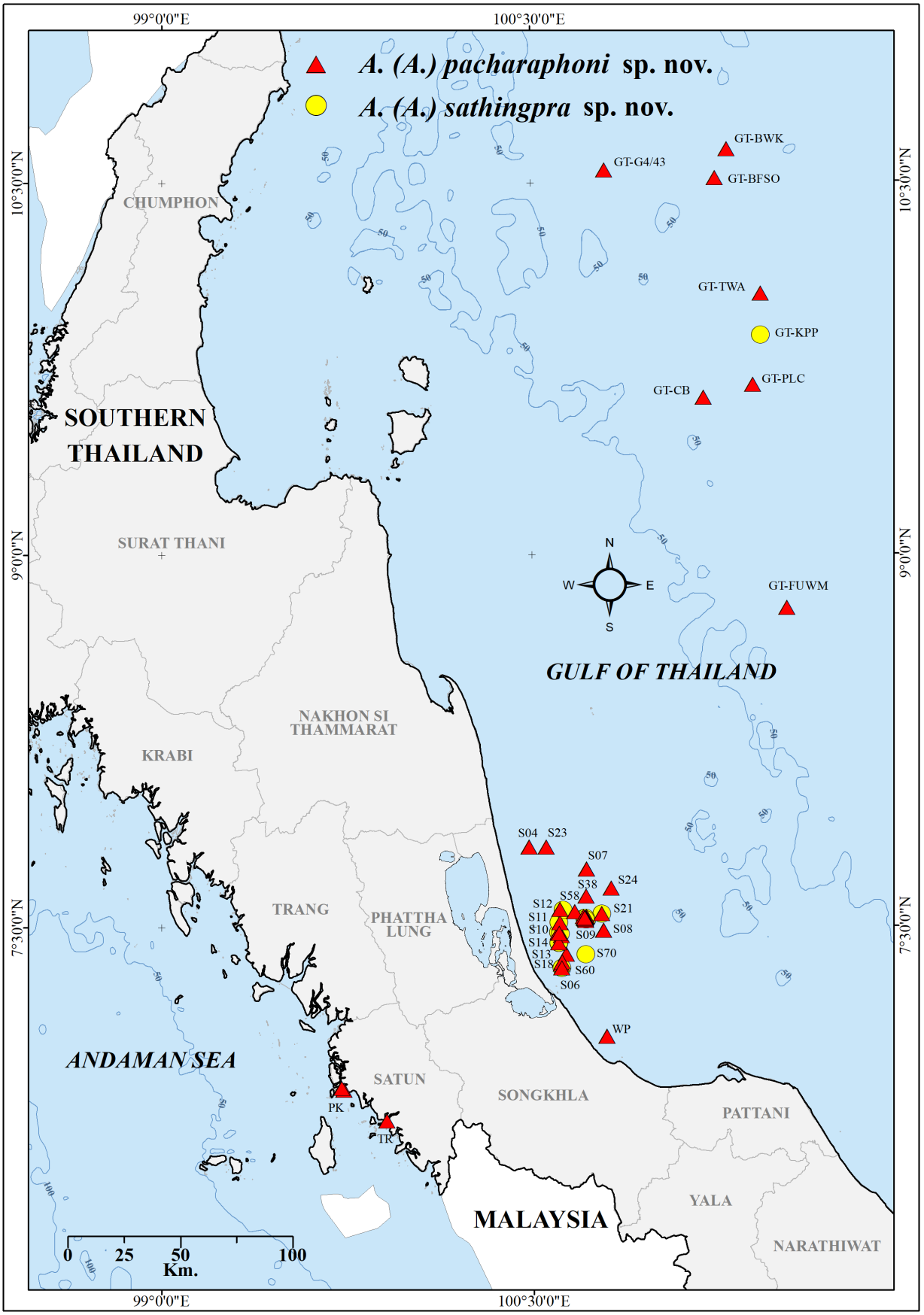

FIGURE 1. Sampling sites in the Andaman Sea and Gulf of Thailand, showing stations where specimens *Aricidea (A.) pacharaphoni* **sp. nov.** (triangulars) and *A. (A.) sathingpra* **sp. nov.** (circles) were collected.

Materials and methods

The biological material was collected as part of various research projects carried out by the Marine Ecosearch Management Co., Ltd. and the Marine Science Learning Center, Prince of Songkla University, Hat Yai, Songkhla, Thailand, between 2011 and 2024. In Songkhla Sea (7°14'21"–7°49'21"N; 100°24'42"–100°49'0"E), the sediment samples were taken with a Van Veen grab (0.1 m^2) at 9 to 27 m depth, while in the offshore Petroleum Concession area (8°21'–10°48'N, 100°46'–102°07'E), the sediment samples were taken with a Van Veen grab (0.04 m^2) at 50 to 80 m depth (Fig. 1).

The collected sediments were sieved in the field with 2.0 mm, 1.0 mm and 0.5 mm mesh screens. Later, seawater and sediment from the sieved grab samples were passed through a 300 µm filter bag and the retained specimens were fixed with a 10% formalin solution in seawater. In the laboratory, the biological samples were washed with freshwater and preserved in 70% ethanol.

Polychaetes were initially identified to family level using a stereo microscope, and those paraonids belonging to both new species were examined in detail under a light stereo microscope and a compound microscope. Light photographs and measurements of the specimens were made with a stereo microscope (Olympus SZX16) bearing a digital camera (DP74). Photographs of multifocal shots were merged into a single photograph with the Helicon Focus digital image processing software. The specimens used to Scanning electron microscope (SEM) were critical-point dried, mounted on stubs and coated with gold; their images were made with a JEOL JSM-5800LV microscope and a field emission scanning electron microscope (Apreo, FEI).

Morphological measurements of the holotype and the variability observed in paratypes were included in the taxonomic description of each species. The descriptions of the new species were based on the diagnostic characters and terminology suggested by Strelzov (1973), Blake (1996), Lovell (2002), Aguado & López (2003), Erdoğan-Dereli & Çinar (2020) and Plathong *et al.* (2020) to subgenera *Aricidea (Aricidea)*. For comparative purposes, tables with the main diagnostic characters of the new species and the most closely related ones were included.

The type material was deposited in the Princess Maha Chakri Sirindhorn Natural History Museum, Prince of Songkla University (PSUZC), Thailand, and in the Australian Museum (AM), Sydney, Australia. Additional material is maintained in the personal collections of JP and SP at Marine Ecosearch Management.

Molecular taxonomy and analysis

For the molecular analysis of *COI*, two specimens identified as *A. (A.) pacharaphoni* **sp. nov.**, were collected separately and fixed in 95% ethanol: one specimen was collected in Pak Bara mudflat, Mu Ko Phetra National Park, Satun Province, 1 December 2020 and other in Songkhla Sea, Gulf of Thailand, 19 May 2022. Both specimens used for paratypes.

Extraction, gene amplification, and sequencing

Whole specimens were used for DNA extraction to ensure sufficient yield from the small-sized samples. Genomic DNA was extracted using the DNeasy Blood & Tissue kit (Qiagen; Germantown, USA), following the manufacturer's protocol. A 655 bp amplicon was amplified using the universal primers HCO2198 (5'-GGTCAAC AAATCATAAAGATATTGG-3') and LCO1490 (5'-TAAACTTCAGGGTGACCAA AAAATCA-3') (Folmer *et al.* 1994). The 20 µl PCR reaction mixture included 10 µl of 2X MyTaq HS Mix (Bioline, USA), 2 µl of 10 pmol/µl forward and reverse primers and 1–2 µl of genomic DNA template. The PCR protocol began with an initial denaturation at 94 °C for 5 minutes, followed by 35 cycles consisting of 94 °C for 45 seconds, annealing at 40 °C for 60 seconds, and an extension at 72 °C for 90 seconds. A final extension was then performed at 72 °C for 5 minutes. The quality and quantity of PCR products were checked by electrophoresis in 1.5% gel. PCR products were purified and sequenced by Gibthai Co., Ltd. (Thailand). Nucleotide sequences were checked and trimmed using the CodonCode Aligner software v. 6.0.2 (CodonCode Corp., Dedham, Massachusetts). *COI* sequences from the assembled transcriptomes were deposited in the NCBI.

Molecular analyses

Phylogenetic relationships among *Aricidea (A.)* spp., were inferred based on nucleotide sequence data from *COI* genes. DNA sequences for all currently recognized *Aricidea (A.)* species were obtained from the NCBI database, and sequences from *Aricidea (A.) pacharaphoni* **sp. nov.**, generated in this study, were included in the analysis. The polychaete *Eulalia viridis* (Phyllodocidae) was designated as the outgroup. Multiple sequence alignments and trimmed were conducted using the ClustalW algorithm implemented in MEGA11 (Kumar *et al.* 2018). The optimal nucleotide substitution model was determined using MEGA11 (Kumar *et al.* 2018). The General Time Reversible model with invariable positions and Gamma distribution (GTR+I+G) was identified as the best-fit model and subsequently applied to phylogenetic reconstruction using the Maximum Likelihood (ML) approach in MEGA11. Node support was evaluated through 1,000 bootstrap replicates. Genetic distance analysis was performed using the Tajima-Nei model on all available species retrieved from the database via MEGA11 (Kumar *et al.* 2018).

Results

Systematics

Family Paraonidae Cerruti, 1909

Genus *Aricidea* Webster, 1879

Subgenus *Aricidea* (Webster, 1879, sensu stricto)

Diagnosis. Prostomium elongate; prostomial antenna cirriform, often articulate. Posterior lip of the mouth extending onto the ventral sides of two anterior setigerous segments. Parapodia of the branchial region bear well-developed notopodial lobes, typical for genus. Modified neurochaetae pseudo-compound or hooked typically with subterminal spine attached on concave side of shaft (after Blake 2019).

Aricidea (Aricidea) pacharaphoni sp. nov.

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Figs 2–8

Material examined. Thailand, Andaman coast and Gulf of Thailand. Holotype: PSUZC-POL-0073, Songkhla Sea, Gulf of Thailand, Sta. S09-1 (7°32'13"N, 100°42'41"E), 17 Aug. 2018, 24 m, coll. Marine Ecosearch Management Co., Ltd. Paratypes: PSUZC-POL-0074 (1 spec), Sta. S10 (7°28'15"N, 100°36'39"E), 2 Mar. 2011, 19 m; PSUZC-POL-0075 (2 specs), Sta. S10 (same as paratype), 3 Mar. 2011; PSUZC-POL-0076 (1 spec on SEM stub), Sta. S10 (same as paratype), 5 May 2018; PSUZC-POL-0077 (1 spec), Sta. S13 (7°23'27"N, 100°38'06"E), 4 Mar. 2011, 18 m; PSUZC-POL-0078 (1 spec), Sta. S13 (same as paratype), 26 Mar. 2017; PSUZC-POL-0079 (1 spec), Sta. S38 (7°37'29"N, 100°42'53"E), 27 Sep. 2011, 22 m; PSUZC-POL-0080 (1 spec), Sta. S58 (7°33'43"N, 100°40'10"E), 30 Sep. 2011, 20 m; PSUZC-POL-0081 (1 spec), Sta. S60 (7°21'01"N, 100°36'54"E), 1 Oct. 2011, 14 m; PSUZC-POL-0082 (1 spec), Sta. S07 (7°44'01"N, 100°43'02"E), 30 Jan. 2012, 26.5 m; PSUZC-POL-0083 (1 spec), Sta. S07 (same as paratype), 1 Jun. 2013; PSUZC-POL-0084 (1 spec), Sta. S07 (same as paratype), 16 Oct. 2013; PSUZC-POL-0085 (2 specs), Sta. S08 (7°29'10"N, 100°47'06"E), 10 Oct. 2012, 25 m; PSUZC-POL-0086 (2 specs), Sta. S08 (same as paratype), 16 Oct. 2013; PSUZC-POL-0087 (1 spec), Sta. S21 (7°33'17"N, 100°46'43"E), 15 Mar. 2013, 24 m; PSUZC-POL-0088 (1 spec), Sta. S04 (7°49'22"N, 100°29'11"E), 16 Oct. 2013, 17.5 m; PSUZC-POL-0089 (2 specs, 1 on SEM stub), Sta. S09-16 (7°32'30"N, 100°42'59"E), 17 Mar. 2013, 24 m; PSUZC-POL-0090 (1 spec), Sta. S06 (7°20'10"N, 100°36'59"E), 13 Jun. 2015, 15.5 m; Sta. S09-11 (7°31'52"N, 100°42'42"E), 23 m: PSUZC-POL-0091 (1 spec), 7 Mar. 2014; PSUZC-POL-0092 (1 spec on SEM stub), 25 Mar. 2017; PSUZC-POL-0093 (1 spec), Sta. S09-14 (7°32'30"N, 100°42'13"E), 07 Mar. 2014, 24 m; PSUZC-POL-0094 (1 spec on SEM stub), Sta. S09-24 (7°32'19"N, 100°42'47"E), 7 Mar. 2014, 24.5 m; PSUZC-POL-0095 (1 spec), Sta. S09-5 (7°32'01"N,

100°42'30"E), 8 Mar. 2014, 24 m; PSUZC-POL-0096 (1 spec on SEM stub), Sta. S09-5 (same as paratype), 23 Mar. 2017; PSUZC-POL-0097 (2 specs, 1 spec on SEM stub), Sta. S09-5 (same as paratype), 17 Aug 2018; PSUZC-POL-0098 3 specs, 2 spec on SEM stub), Sta. S09-5 (same as paratype), 23 Aug. 2019; PSUZC-POL-0099 (1 spec fixed for DNA analyses, used), Sta. S09-5 (same as paratype), 19 May 2022; PSUZC-POL-0100 (1 spec), Sta. S09-1 (7°32'13"N, 100°42'42"E), 17 Aug. 2018, 24 m; PSUZC-POL-0101 (2 specs on SEM stub), Sta. S09-1 (same as paratype), 23 Aug. 2019; PSUZC-POL-0102 (1 spec), Sta. S09-3 (7°32'01"N, 100°42'42"E), 24 Mar 2017, 24 m; PSUZC-POL-0103 (1 spec), Sta. S09-22 (7°32'13"N, 100°42'30"E), 16 Aug. 2018, 24 m; PSUZC-POL-0104 (1 spec), Sta. S14 (7°26'14"N, 100°36'13"E), 20 Feb 2015, 15.5 m; PSUZC-POL-0105 (1 spec), Sta. S18 (7°21'34"N, 100°37'06"E), 3 Jun 2015, 16 m; PSUZC-POL-0106 (1 spec), Sta. S24 (7°39'22"N, 100°49'01"E), 15 Jul. 2015, 27 m; PSUZC-POL-0107 (1 spec on SEM stub), Sta. S11 (7°31'07"N, 100°36'34"E), 25 Mar. 2017, 18.9 m; PSUZC-POL-0108 (1 spec), Sta. GT-CB (9°38'N, 101°12'E), 12 Sep. 2015, 60 m; PSUZC-POL-0109 (1 spec), Sta. GT-BWK (10°38'N, 101°18'E), 26 Jun. 2018, 60 m; PSUZC-POL-0110 (1 spec), Sta. GT-TWA (10°03'N, 101°26'E), 2 Apr. 2019; PSUZC-POL-0111 (1 spec), Sta. GT-FUWM (8°47'N, 101°32'E), 25 Sep. 2021, 65 m; PSUZC-POL-0112 (1 spec), Sta. WP21-Ben1 (17°03'33"N, 100°47'50"E), 17 Jun. 2024, 15 m; PSUZC-POL-0113 (1 spec), Sta. WP21-Ben2 (same as paratype); PSUZC-POL-0114 (1 spec), Sta. PAK-S2 (6°51'09"N, 99°43'34"E), 4 Jul. 2019; PSUZC-POL-0115 (1 spec), Sta. PAK-C3 (6°51'07"N, 99°43'37"E), 15 Nov. 2019; PSUZC-POL-0116 (1 spec fixed for DNA analyses, used), Sta. PAK-C2 (6°51'08"N, 99°43'38"E), 1 Dec. 2020; PSUZC-POL-0117 (1 spec), Sta. PAK1 (6°50'39"N, 99°44'08"E), 7 Aug. 2020; PSUZC-POL-0118 (1 spec), Sta. PAK2 (6°50'39"N, 99°44'08"E), 7 Aug. 2020; Had PSUZC-POL-0119 (1 spec), Sta. TR1 (6°43'10"N, 99°54'33"E), 7 Aug. 2020; PSUZC-POL-0120 (1 spec on SEM stub), Sta. TR2 (6°43'10"N, 99°54'33"E), 7 Aug. 2020; AM W.52901 (1 spec), Sta. S04 (7°49'22"N, 100°29'11"E), 18 May 2016, 17.5 m. AM W.52900 (1 spec), Sta. S23 (7°49'20"N, 100°33'17"E), 14 Jul. 2015, 20.5 m.

Additional material. Songkhla Sea: one specimen, Sta. S07 (same as paratype), 10 Oct. 2012; one specimen, Sta. S09-5 (same as paratype), 18 Feb. 2015); one specimen, Sta. S09-5 (same as paratype), 17 Aug. 2018; one specimen, Sta. S09-19 (7°31'37"N, 100°42'48"E), 17 Mar. 2013, 24 m; one specimen, Sta. S10 (same as paratype), 16 Feb 2015; one specimen, Sta. S12 (7°34'19"N, 100°36'34"E), 26 Mar. 2017, 20 m. Offshore Petroleum Concession Area the Gulf of Thailand, 60 m: one specimen, Sta. GT-PLC (9°41'N, 101°24'E), 16 Sep. 2012; one specimen, Sta. GT-G4/43 (10°33'N, 100°48'E), 19 Jun. 2015; one specimen, Sta. GT-G4/43 (10°33'N, 100°48'E), 30 Jun. 2016; one specimen, Sta. GT-BFSO (10°31'N, 101°15'E), 24 Feb. 2018.

Diagnosis. Prostomium, anteriorly rounded with a thin, elongate antenna reaching to chaetiger 3–7. Chaetiger 3 with notopodial postchaetal lobes much larger than any one: basally globular and distally digitiform. Neurochaetae of two types: pseudo-compound and unidentate curved hook, without arista.

Description. All specimens incomplete, lacking posterior end. Holotype with 46 chaetigers, 4.5 mm long, 0.5 mm wide (at chaetiger 10, not include parapodia) (Fig. 2A–C). Paratypes with 28–69 chaetigers, 2.9–10.4 mm long, 0.4–0.9 mm wide. Body elongate, dorsal and ventrally flattened anteriorly, widest in mid-branchial region, narrow to tapering in post branchial region, coiled posteriorly and easily breaking. Body semi-transparent, small dots of brown pigments on the prostomium, above nuchal organs and on branchial margins (Fig. 2A–D). Color in alcohol white to light tan, semi-transparent.

Prostomium trilobed (Figs 2C–D, 3B–C), anteriorly rounded, wider than longer (189 μm length, 215 μm wide); with small cilia spots (circular shape) on dorsal and ventral sides; a pair of small epidermal black eyespot (fade in alcohol) (Fig. 2D). Median antenna inserted on half of prostomium, thin, elongated, and faintly annulated, with a thick basal ring, reaching to chaetiger 6 (459 μm long) (chaetigers 3–7 in paratypes) (Figs 2A, 2C, 3A–B, 4A–B, 8A). One pair of deep oblique nuchal organs, with rounded patches of long cilia above them (Fig. 4A–B). Mid-posterior region of prostomium with two lobes extending to base of median antenna (Figs 2A–C, 3A–B, 8B). Posterior lip of mouth with three folds extending to chaetiger 1–2 (Fig. 3C).

Notopodial postchaetal lobes well developed, long and digitate in first two chaetigers. Chaetiger 3 with notopodial postchaetal lobes clearly much larger than any on as basally globular with long and digitiform extension; distal region with cilia irregularly distributed; longer than notopodial postchaetal lobes of chaetigers 1, 2 and 4 (Figs 3A, 4A–B, 5A–B). Branchial chaetigers with notopodial postchaetal lobes long, digitiform, ciliated, those postbranchial cirriform (Figs 3A, 4A–B, 5C, 6A–B). Neuropodial postchaetal lobes from chaetiger 1 very short, rounded (Fig. 4B); absent in posterior region.

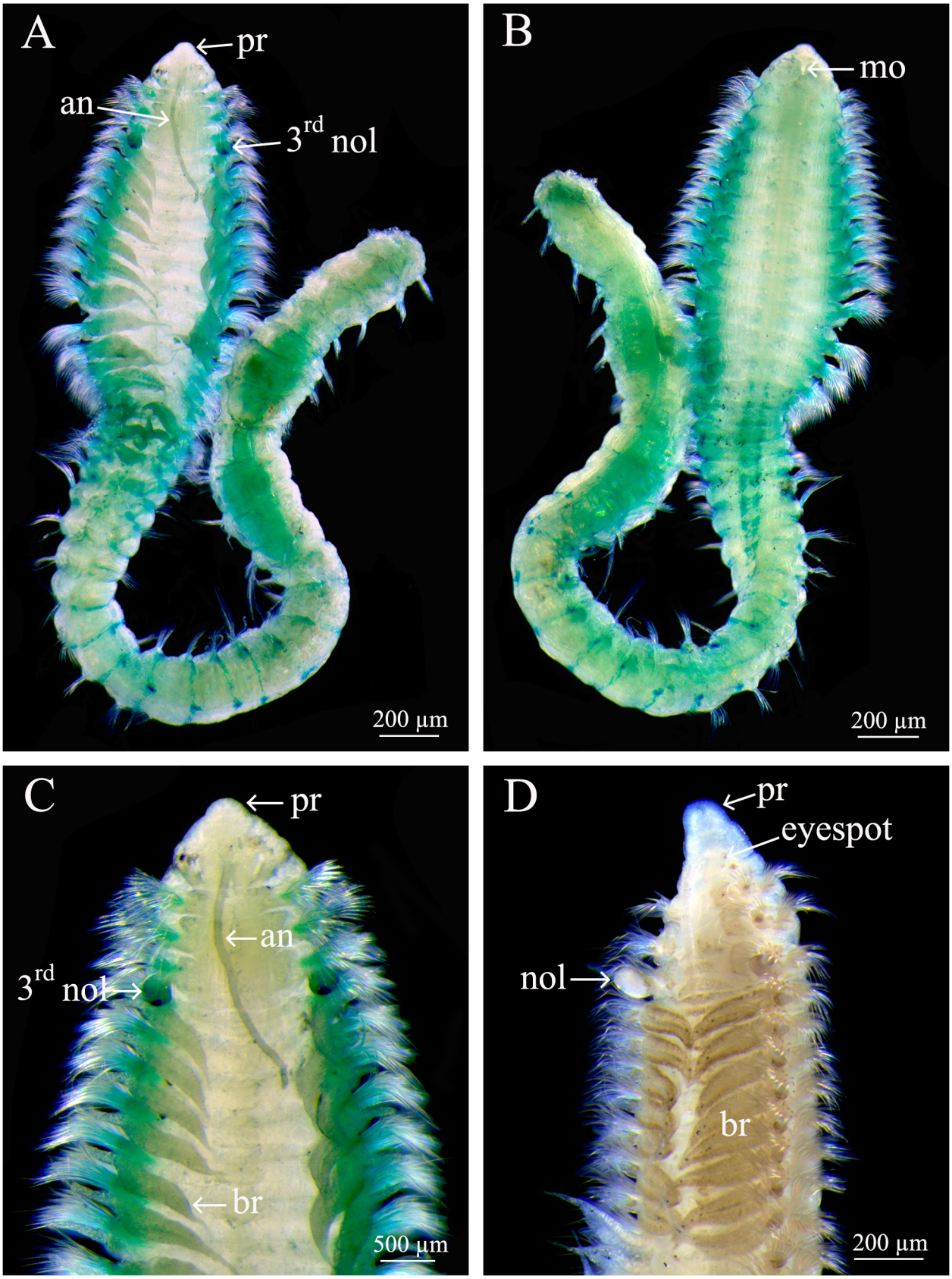

FIGURE 2. *Aricidea (Aricidea) pacharaphoni* **sp. nov.** Light micrographs (A–C, PSUZC-POL-0073, holotype, methyl green stained; D, PSUZC-POL-0098, paratype). A. Dorsal view; B. Ventral view; C. Anterior end, dorsal view; D. Dorsolateral view. Abbreviations: 3rd nol, chaetiger 3 notopodial postchaetal lobe, an, antenna; br, branchiae; mo, mouth; nol, notopodial postchaetal lobe; pr, prostomium.

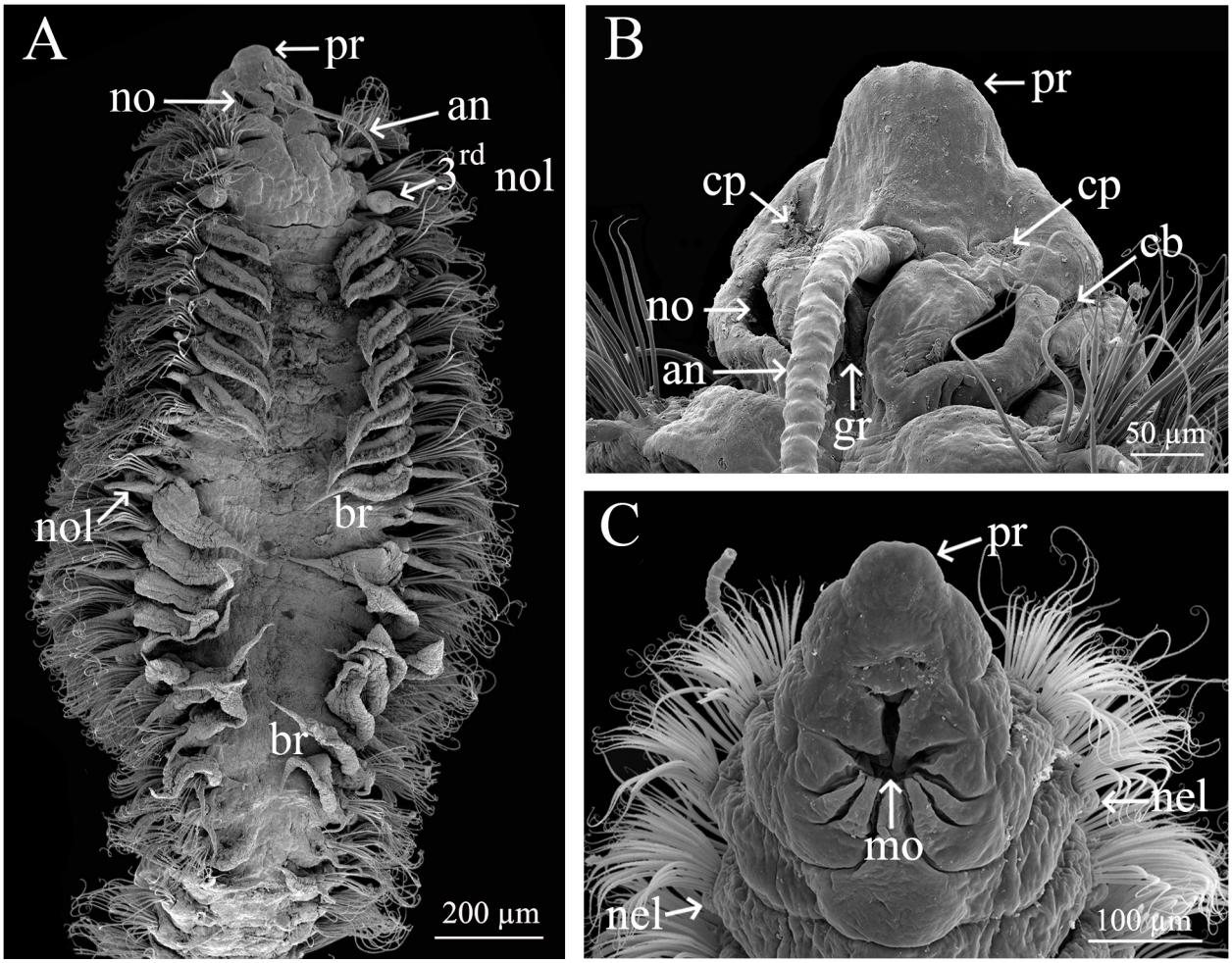

FIGURE 3. *Aricidea (Aricidea) pacharaphoni* **sp. nov.** Paratypes (A, PSUZC-POL-0089; B, PSUZC-POL-00101; C, PSUZC-POL-0094). A. Anterior region, dorsal view; B. Prostomium, dorsal view; C. Prostomium, ventral view. Abbreviations: an, antenna; br, branchiae; cb, cilia band; cp, cilia patch; gr, groove; mo, mouth; nel, neuropodial postchaetal lobe; no, nuchal organ; nol, notopodial postchaetal lobe; pr, prostomium.

Prebranchial and branchial region divided by a wedge-shaped band on the dorsal end of chaetiger 3 (Figs 2D, 3A). Chaetigers 4–10 with dorsal transversal bands of thick cilia (Figs 3A, 4A, 8A). Notopodial papillae absent. Branchiae from chaetiger 4, 17 pairs (13–20 in paratypes), first branchial pair short, then slightly longer, with long fine tip up to chaetigers 9–10. Two kinds of branchiae, first 7 pairs (chaetigers 4–10) thick, ciliated, elongate, strap-like, tapering to fine tips; around chaetiger 11, branchiae foliaceous with long tapering distal end; last pair smallest and shortest (Figs 2A, 2C–D, 3A, 4A–B, 6A–B, 8A).

Noto- and neuropodia in anterior region with numerous long and fringe capillaries, longer from chaetiger 2; notochaetae longer than neurochaetae. Prebranchial chaetigers with chaetae arranged in three rows; 4–6 rows in branchial chaetigers (Figs 4A–B, 5A). Superior fascicles and posterior rows of both noto- and neuropodia with very long capillaries (Figs 4B, 5A). Postbranchial notopodia with thinner capillaries; neuropodia with two rows of chaetae.

Two kinds of modified neurochaetae from chaetiger 27 (22–30 in paratypes): up to 11 pseudo-compound, long, thick and slightly curved, with pubescence on the subdistal convex side and a long, slender arista beyond the curved tip; and one-two stout, short, curved hooks, surrounded by pubescence on its convex side, without arista located on the lower fascicle (Figs 6C–E, 8C); accompanied by 12 long, slender simple capillary chaetae.

Pygidium unknown.

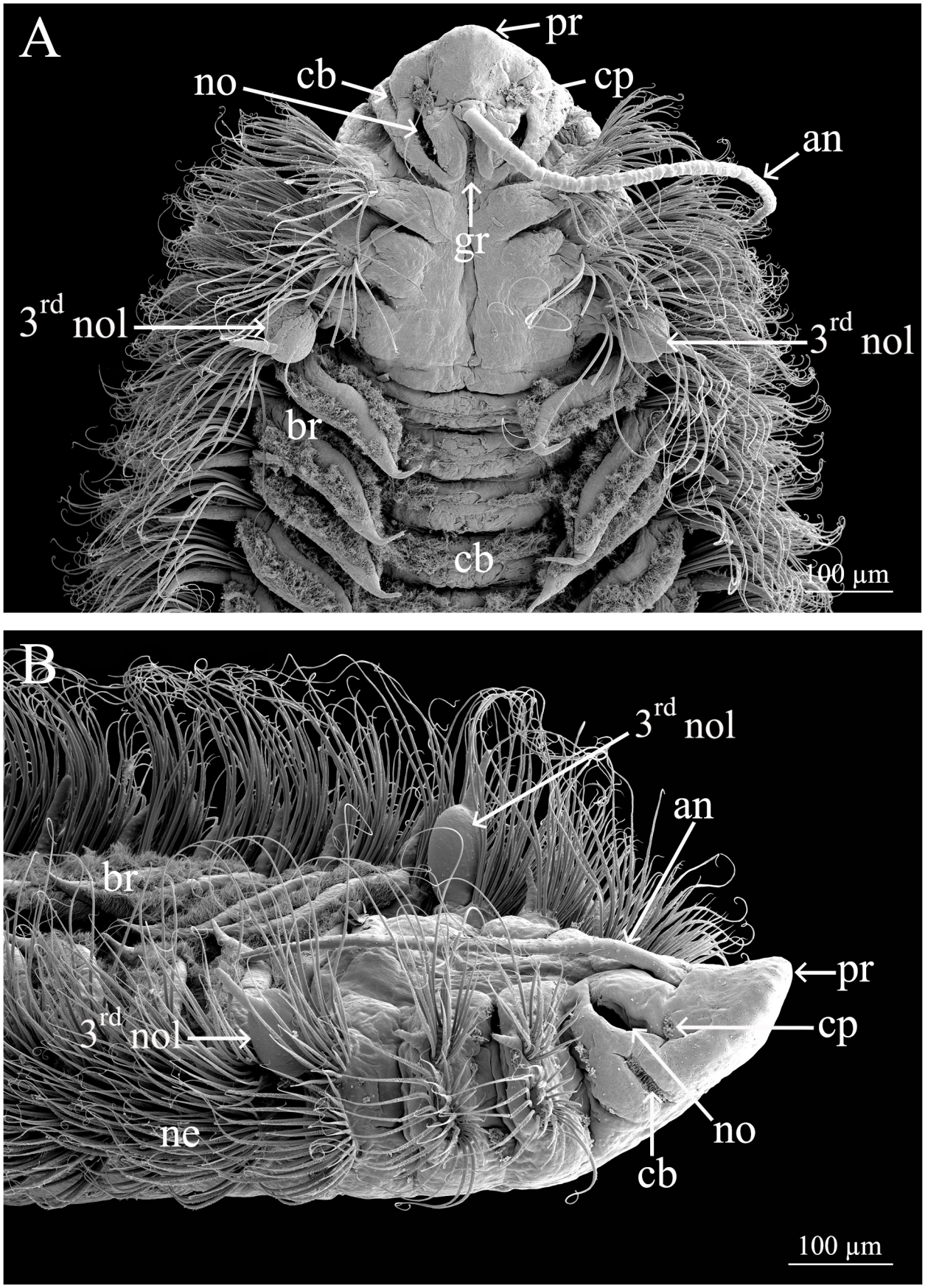

FIGURE 4. *Aricidea (Aricidea) pacharaphoni* **sp. nov.** Paratypes (A, PSUZC-POL-0101 B, PSUZC-POL-0098) A. Anterior end, dorsal view; B. Same, lateral view. Abbreviations: an, antenna; br, branchiae; cb, cilia band; cp, cilia patch; gr, groove; ne, neurochaetae; no, nuchal organ; nol, notopodial postchaetal lobe; pr, prostomium.

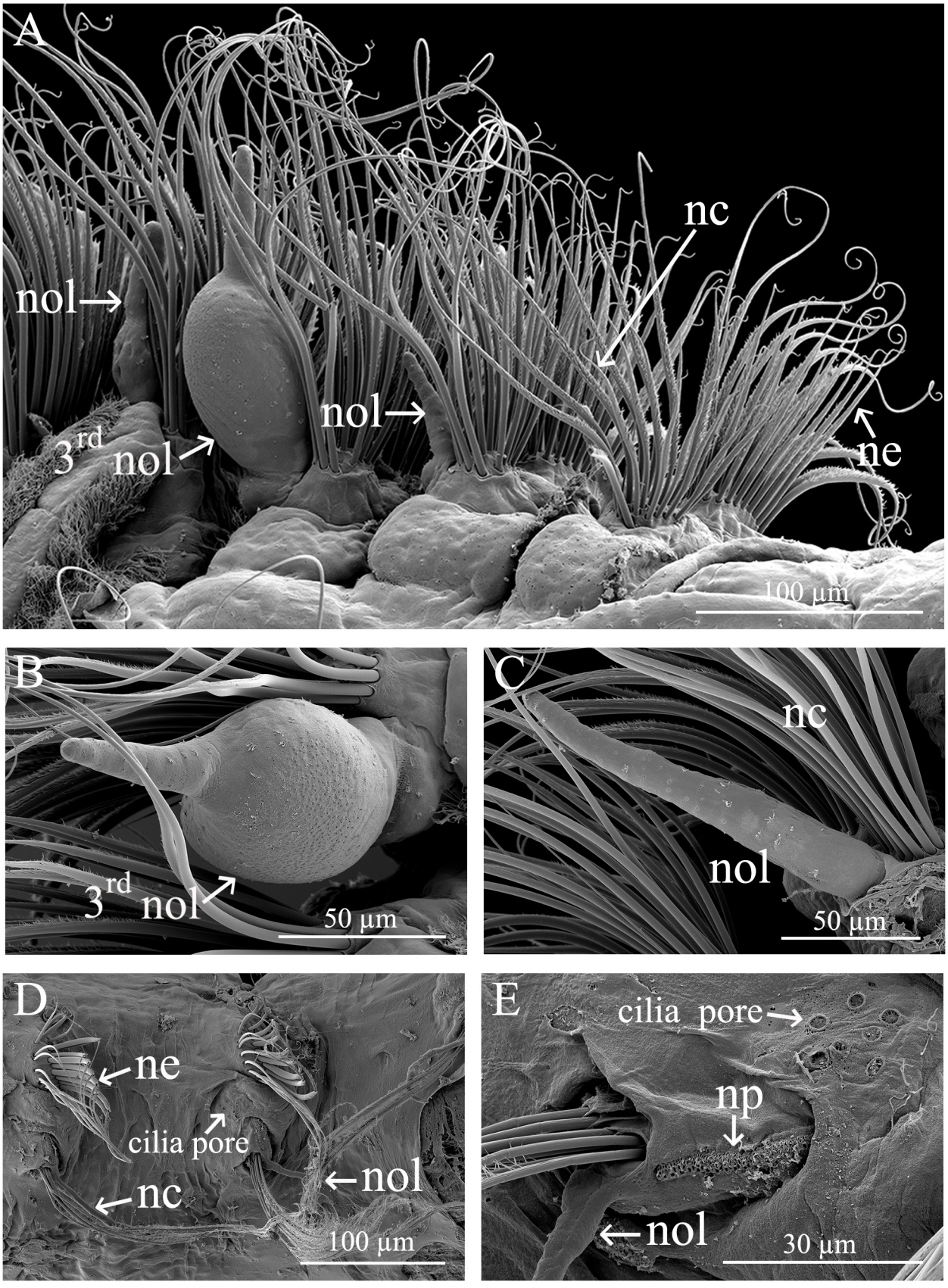

FIGURE 5. *Aricidea (Aricidea) pacharaphoni* **sp. nov.** (A–E, PSUZC-POL-0098). A. Left chaetigers 1–4, dorsal view; B. Notopodial postchaetal lobe of chaetiger 3, top view; C. Notopodial postchaetal lobe of branchial region, lateral view; D. Posterior parapodia, lateral view; E. Notopodial pores, lateral view. Abbreviations: nc, notochaetae; ne, neurochaetae; nol, notopodial postchaetal lobe; np, notopodial pores.

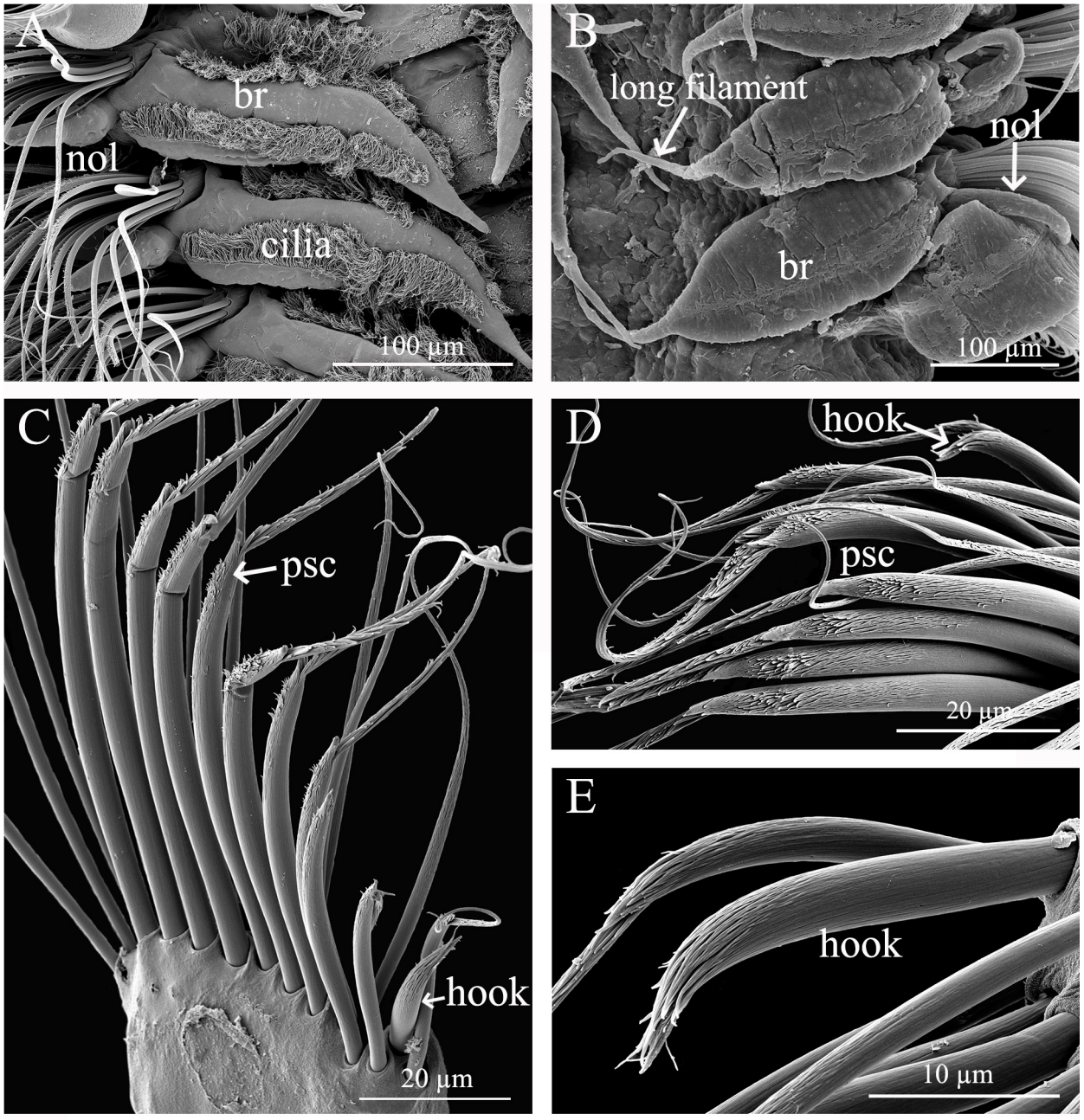

FIGURE 6. *Aricidea (Aricidea) pacharaphoni* **sp. nov.** Paratypes (A, PSUZC-POL-0097; B, PSUZC-POL-0107; C–E, PSUZC-POL-0098). A. Anterior branchiae, dorsal view; B. Posterior branchiae, dorsal view; C. Modified neurochaetae; D. Pseudocompound chaetae, lateral view; E. Short curved, hook. Abbreviations: br, branchiae; nol, notopodial postchaetal lobe; psc, pseudocompound chaeta.

Reproduction. One dissected SEM specimen from Andaman coast with numerous mature and immature spermatozoa in postbranchial chaetigers (Fig. 7A–C). Mature spermatozoa are long and spherical shape with tapering tips (chilli pepper-like shape), each about 4.0–4.7 µm in length (Fig. 7C–D).

Etymology. The new species is named in honor of Mr. Pacharaphon Plathong, the middle son of JP and SP authors.

Habitat. Found in intertidal zone, Andaman Sea and 15.5–60 m depth, muddy sediment mixed with sand, Gulf of Thailand.

Distribution. Andaman Coast and the Gulf of Thailand with wide spread in Songkhla Sea (Fig. 1).

Genetic data. GenBank PX097694–PX097695 for *COI* —no identical matches on GenBank.

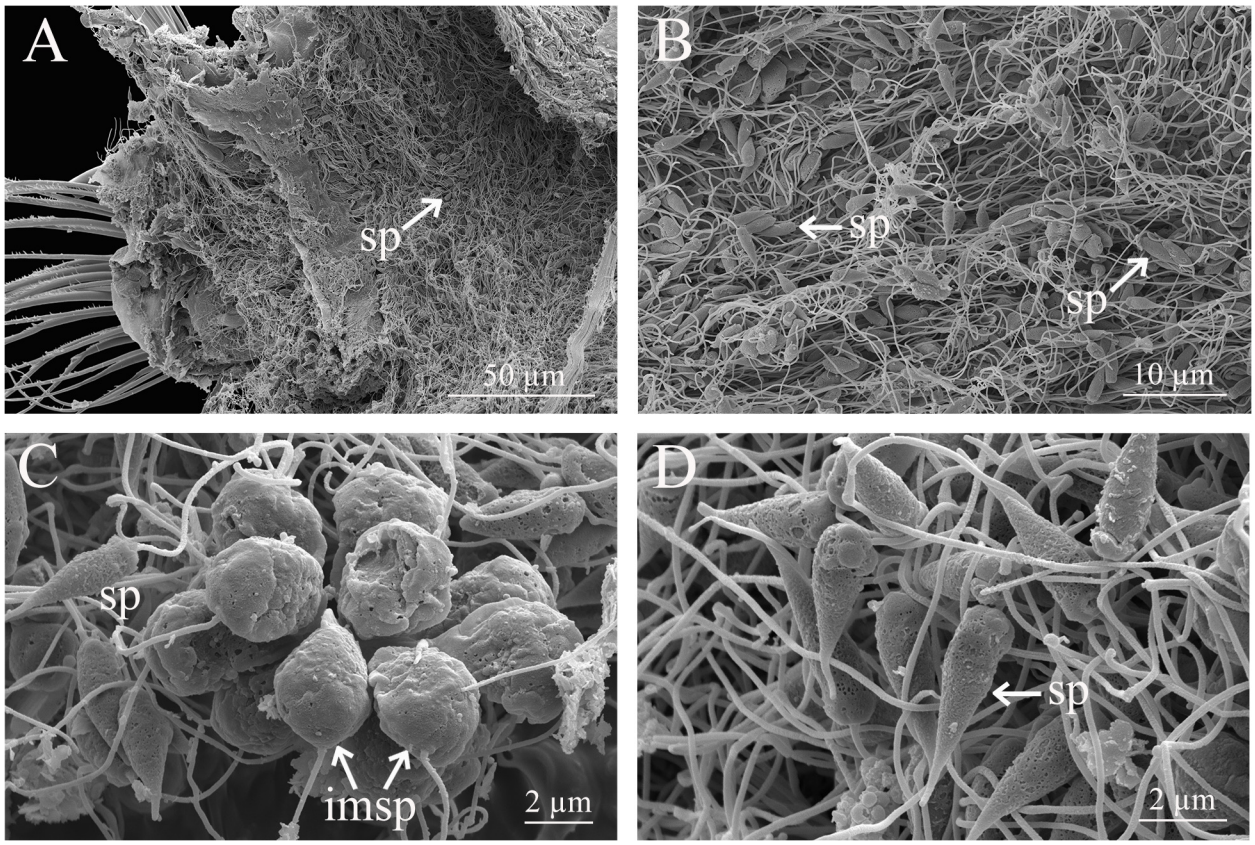

FIGURE 7. *Aricidea (Aricidea) pacharaphoni* **sp. nov.** (PSUZC-POL-0120) A–B. Spermatozoa, lateral view; C–D. Close-up of spermatozoon, lateral view. Abbreviations: imsp, immature spermatozoon; sp, spermatozoon.

Remarks. *Aricidea (A.) pacharaphoni* **sp. nov.**, is a small species belonging to a group of 10 species having unarticulated antennae (Table 1). However, most of them present short antennae and only three species have long antenna reaching, at least, to chaetiger 3: *A. (A.) longobranchiata* Day, 1961 from Off Saldanha Bay, Southern Africa and *A. (A.) sanmartini* Aguado & López, 2003 from Coiba Island, Panama, and now also *A. (A.) pacharaphoni* **sp. nov.**, described herein (Table 1). These three species can be clearly separated among them, because *A. (A.) pacharaphoni* **sp. nov.**, presents a modified notopodial postchaetal lobes on chaetiger 3, basally globular and distally digitiform, which is absent in both *A. (A.) longobranchiata* and *A. (A.) sanmartini* (Table 3). Further, *A. (A.) pacharaphoni* **sp. nov.**, bears two types of modified neurochaetae: ones pseudo-compound and other short, stout hooked; and also, two types of branchiae, ones long, slender, strap-like, and others foliaceous with long tips. In contrast, *A. (A.) longobranchiata* and *A. (A.) sanmartini* only bear one type modified neurochaetae; unidentate hook with long subdistal arista the former, and pseudo-articulated chaetae, respectively; and both having only one type of branchiae.

So, *Aricidea (A.) pacharaphoni* **sp. nov.**, can be characterized by their basally globular and distally digitiform notopodial postchaetal lobes on chaetiger 3. However, the presence of stout notopodial lobes on chaetiger 3 is not unusual in this subgenus and they were previously reported *A. (A.) wassi* Pettibone, 1965 from Northwestern Atlantic, *A. (A.) bansei* Laubier & Ramos, 1974 from Mediterranean Sea and in the species with shorter antenna *A. (A.) thammapinanae* Plathong, Hernández-Alcántara, Harris & Plathong, 2020 from the Gulf of Thailand. In these three species the notopodial postchaetal lobe of chaetiger 3 is clearly larger than of the chaetigers 1–2, but there is no great differences with of the next chaetigers. In contrast, the notopodial postchaetal lobe of the chaetiger 3 of *A. (A.) pacharaphoni* is much larger than all the others. Among the species with longer antennae, *A. (A.) pacharaphoni* **sp. nov.**, has its notopodial lobes on chaetiger 3 basally globular and distally digitiform, totally different to those observed in *A. (A.) wassi* and *A. (A.) bansei*, tuberculated, in bottle-shaped or broadly triangular, respectively. In addition, the modified neurochaetae in these last two species are bidentate hook with subdistal long arista (Laubier & Ramos 1974; Pettibone 1965; Plathong *et al.* 2020), clearly different from the pseudoarticulate and short and stout hooked chaetae present in the new species. Thus, we suggested that the presence and shape of the modified notopodial postchaetal lobes of chaetiger 3 are an important feature to separate the species in this subgenus.

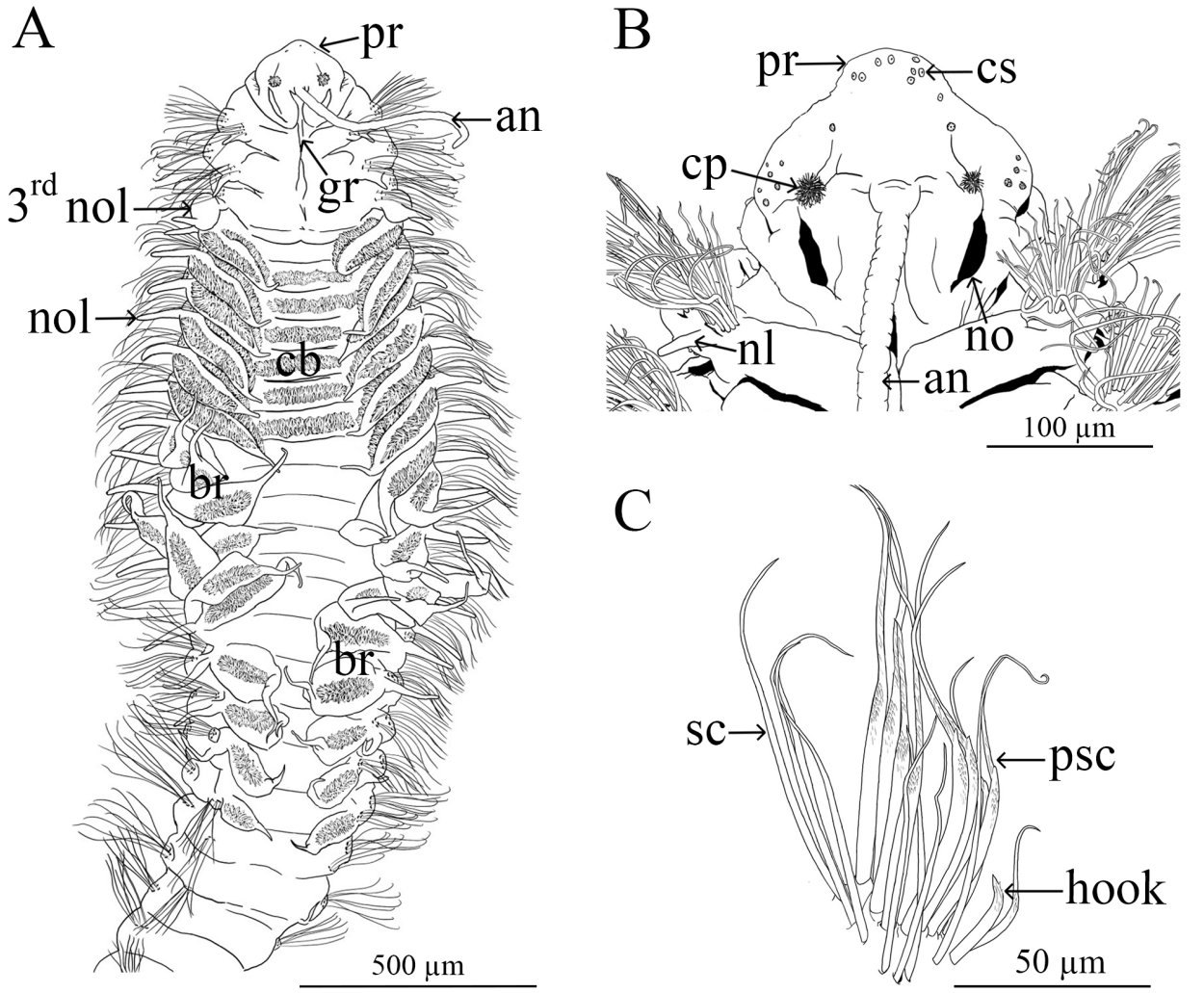

FIGURE 8. *Aricidea (Aricidea) pacharaphoni* **sp. nov.** Paratypes (A, PSUZC-POL-0097; B, PSUZC-POL-0101; C, PSUZC-POL-0107) A. Anterior region, dorsal view; B. Close up prostomium, dorsal view; C. Modified neurochaetae. Abbreviations: an, antenna; br, branchiae; cb, cilia band; cp, cilia patch; cs, cilia spot; gr, groove; nol, notopodial postchaetal lobe; no, nuchal organ; pr, prostomium; psc, pseudo-compound chaeta; sc, simple capillary chaeta.

Phylogenetic analysis and Genetic distance

Phylogenetic analyses based on concatenated *COI* sequences placed *A. (A.) pacharaphoni* **sp. nov.**, within the *Aricidea* clade, forming a distinct lineage with high bootstrap support, indicative of strong molecular divergence. The *A. (A.) pacharaphoni* **sp. nov.**, was recovered as the sister taxon to *A. (A.) bansei* Laubier & Ramos, 1974 suggesting a close evolutionary relationship (Fig. 9).

The intraspecific genetic divergence among reference species of *Aricidea*, including *A. (Acmira) assimilis* Tebble, 1959, *A. (Acmira) cerrutii* Laubier, 1966, *A. (Aricidea) fragilis* Webster, 1879, and *A. (Aricidea) minuta* Southward, 1956, ranged from 0.000 to 0.085 (Table 2). The observed intraspecific variation within *A. (A.) pacharaphoni* **sp. nov.**, was 0.005, which falls well within the range reported for other *Aricidea* species. This level of divergence suggests low genetic variation among individuals of *A. (A.) pacharaphoni* **sp. nov.**, consistent with conspecificity, and supports its status as a genetically cohesive and distinct species. The interspecific genetic distances among *Aricidea* reference species ranged from 0.112 to 0.263, while the genetic distances between *A. (A.) pacharaphoni* **sp. nov.**, and other *Aricidea* species ranged from 0.187 to 0.237. The genetic distance between the two sister taxa, *A. (A.) pacharaphoni* **sp. nov.**, and *A. (Aricidea) bansei* (0.187–0.188) supports the recognition of *A. pacharaphoni* as a distinct species. Additionally, the genetic distances between *Aricidea* and the outgroup *Eulalia viridis* were considerably higher, ranging from 0.300 to 0.345, indicating deep divergence at the intergeneric level.

TABLE 2. Pairwise genetic distances (Tajima–Nei model) among *Aricidea* spp., including *A. (A.) pacharaphoni* **sp. nov.**, based on *COI* sequences.

No.	Species name	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	*A. (Aricidea) pacharaphoni* 1																				
2	*A. (Aricidea) pacharaphoni* 2	0.005																			
3	*A. (Aricidea) bansei* (MH688936)	0.188	0.187																		
4	*A. (Aricidea) fragilis* (KX901445)	0.216	0.214	0.209																	
5	*A. (Aricidea) fragilis* (MH688935)	0.214	0.212	0.209	0.002																
6	*A. (Aricidea) minuta* (MH688930)	0.212	0.211	0.228	0.193	0.192															
7	*A. (Aricidea) minuta* (MH688931)	0.212	0.211	0.216	0.190	0.190	0.085														
8	*A. (Aricidea) pseudoarticulata* (MH688924)	0.190	0.188	0.202	0.199	0.197	0.192	0.192													
9	*A. (Acmira) assimilis* (MF434061)	0.207	0.204	0.216	0.199	0.197	0.200	0.211	0.209												
10	*A. (Acmira) assimilis* (OM416209)	0.207	0.204	0.216	0.199	0.197	0.200	0.211	0.209	0.000											
11	*A. (Acmira) catherinae* (MH688934)	0.212	0.212	0.214	0.185	0.183	0.185	0.195	0.228	0.187	0.187										
12	*A. (Acmira) cerrutii* (MH688921)	0.192	0.193	0.199	0.202	0.200	0.195	0.193	0.187	0.183	0.183	0.195									
13	*A. (Acmira) cerrutii* (MH688922)	0.193	0.195	0.197	0.200	0.199	0.193	0.192	0.185	0.181	0.181	0.193	0.002								
14	*A. (Acmira) mirifica* (MH688926)	0.211	0.212	0.221	0.202	0.200	0.174	0.173	0.171	0.216	0.216	0.181	0.190	0.188							
15	*A. (Acmira) meridionalis* (MH688918)	0.190	0.188	0.192	0.211	0.209	0.199	0.206	0.192	0.180	0.180	0.187	0.178	0.176	0.176						
16	*A. (Acmira) simplex* (MH688938)	0.233	0.237	0.231	0.257	0.257	0.231	0.226	0.244	0.245	0.245	0.263	0.223	0.225	0.242	0.233					
17	*A. (Strelzovia) mariannae* (MH688929)	0.211	0.207	0.245	0.216	0.218	0.202	0.204	0.209	0.211	0.211	0.209	0.197	0.195	0.190	0.204	0.252				
18	*A. (Strelzovia) claudiae* (MH688917)	0.174	0.171	0.188	0.187	0.185	0.199	0.206	0.185	0.183	0.183	0.178	0.176	0.174	0.178	0.159	0.235	0.192			
19	*A. (Strelzovia) roberti* (MH688920)	0.212	0.212	0.211	0.231	0.230	0.216	0.204	0.193	0.202	0.202	0.206	0.181	0.180	0.195	0.193	0.238	0.214	0.183		
20	*A. (Acmira) rubra* (MH688925)	0.221	0.219	0.225	0.216	0.214	0.164	0.173	0.178	0.225	0.225	0.190	0.171	0.169	0.112	0.185	0.235	0.200	0.178	0.187	
21	*Eulalia viridis* (AY996122)	0.329	0.329	0.325	0.336	0.336	0.340	0.315	0.324	0.311	0.311	0.324	0.300	0.300	0.333	0.329	0.345	0.338	0.302	0.311	0.320

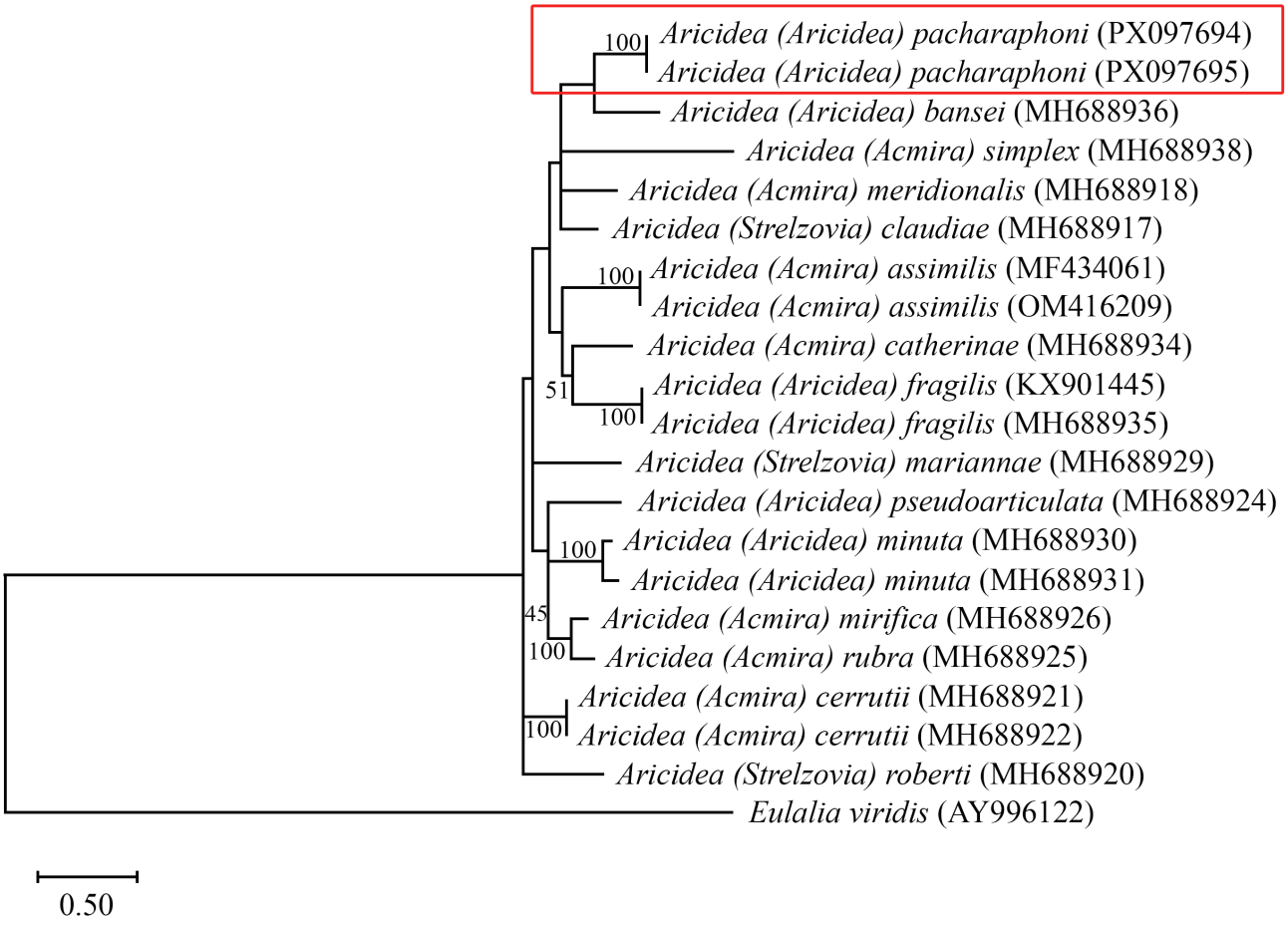

FIGURE 9. Maximum Likelihood phylogenetic tree of *Aricidea* species based on concatenated *COI* gene sequences. *Aricidea (A.) pacharaphoni* **sp. nov.**, is highlighted and shown forming a distinct clade. *Eulalia viridis* was used as the outgroup.

TABLE 3. Morphological characteristics of species of subgenus *Aricidea* (*Aricidea*) having unbranched antenna, reaching at least to chaetiger 3.

	***A. (A.) longobranchiata* Day, 1961**	***A. (A.) sanmartini* Aguado & López, 2003**	***A. (A.) pacharaphoni* sp. nov.**
Prostomium	Bluntly triangular, as broad as long	Triangular, equal in length and wide	Trilobed, distally rounded, wider than long
Median antenna extending to chaetiger	5	9	3–7
Eyes	Absent	Present two pairs, posterior pair large	Present pair of small dot of black subdermal eyespot (fade in alcohol)
First two notopodial postchaetal lobes shape	Long, digitate	Papilla form	Long digitiform
chaetiger 3 notopodial postchaetal lobes shape	Long, digitate	Long, tapering tips	Globose with long digitiform terminal tip
Number of branchiae (pairs)	15–19	16	13–20
Modified neurochaetae	One type: unidentate curved hook with long subterminal arista	One type: pseudoarticulated	Two type: pseudoarticulated and short curved hook chaetae without long arista

***Aricidea* (*Aricidea*) *sathingpra* sp. nov.**

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Figs 10–14

Material examined. Thailand, Gulf of Thailand. Holotype: PSUZC-POL-0121, Sta. S09-22 (7°32'13"N, 100°42'30"E), 16 Aug. 2018, 24 m. Paratypes: PSUZC-POL-0122 (1 spec), Sta. S06 (7°20'10"N, 100°36'59"E), 21 Sep. 2016, 15.5 m; PSUZC-POL-0123 (1 spec), Sta. S07 (7°44'01"N, 100°43'02"E), 24 May 2012, 26.5 m; PSUZC-POL-0123 (1 spec), Sta. S07 (same as paratype), 10 Oct. 2012; PSUZC-POL-0125 (1 spec), Sta. S08 (7°29'10"N, 100°47'06"E), 24 May 2012, 25 m; PSUZC-POL-0126 (2 specs), Sta. S08 (same as paratype), 21 Sep. 2016; PSUZC-POL-0127 (1 spec on SEM stub), Sta. S09-3 (7°32'01"N, 100°42'42"E), 24 Mar. 2017, 24 m; PSUZC-POL-0128 (1 spec on SEM stub), Sta. S09-11 (7°31'52"N, 100°42'42"E), 25 Mar. 2017, 23 m; PSUZC-POL-0129 (1 spec) Sta. S10 (7°28'21"N, 100°36'33"E), 5 May 2018, 19 m; PSUZC-POL-0130 (1 spec), Sta. S10-4 (7°28'15"N, 100°36'33"E), 5 May 2018, 19 m; PSUZC-POL-0131 (1 spec), Sta. S10-8 (7°28'44"N, 100°36'11"E), 5 May 2018, 18.5 m; PSUZC-POL-0132 (1 spec), Sta. S11-9 (7°31'11"N, 100°36'18"E), 27 Mar. 2017, 18.7 m; PSUZC-POL-0133 (1 spec), Sta. S12 (7°34'19"N, 100°36'34"E), 16 Mar. 2013, 20 m; PSUZC-POL-0134 (1 spec), Sta. S14 (7°26'14"N, 100°36'13"E), 6 Mar. 2013, 15.5 m; PSUZC-POL-0135 (1 spec on SEM stub), Sta. S14 (same as paratype), 3 Oct. 2013; PSUZC-POL-0136 (1 spec on SEM stub), Sta. S21 (7°33'17"N, 100°46'43"E), 16 Aug. 2016, 24 m; PSUZC-POL-0137 (1 spec), Sta. S70 (7°23'27"N, 100°42'48"E), 6 Mar. 2013, 22 m; PSUZC-POL-0138 (1 spec on SEM stub), Sta. GT-KPP (9°53'N, 101°26 E), 18 Sep. 2024, 60 m; AM W.52902 (1 spec), Sta. S09-17 (7°31'55"N, 100°43'06"E), 23 Mar. 2017, 24 m; AM W. 52903 (1 spec), Sta. S12-2 (7°34'13"N, 100°37'16"E, 26 Mar. 2017, 20 m.

Diagnosis. Prostomium triangular, rounded anteriorly, with a pair of distinctive rounded protuberances on prostomium, over each nuchal organ. Median antenna short, tri-articulated, reaching to chaetigers 1–2; 6–7 pairs of broad and foliaceous branchiae. Two types modified neurochaetae: pseudo-articulated capillaries and short, curved with long tips chaetae.

Description. Holotype complete (Fig.10) with 42 chaetigers, 3.9 mm long, 0.22 mm wide (chaetiger 10 without parapodia). Paratypes complete with 31–46 chaetigers, 0.11–0.22 mm wide; incomplete specimens with 15–32 chaetigers, 1.1–3.3 mm long. Body cylindrical, wider in prebranchial and branchial regions, tapering posteriorly. Prostomium and anterior region light brown to red-orange in color (color may fade in preserved specimens); posterior region lacking pigmentation (Fig. 10).

Prostomium triangular, rounded anteriorly, slightly longer than wide; a pair of nuchal organs as deep slit, bearing a pair of a distinctive rounded ciliated protuberances on their anterior margins (Fig. 11B–C). Median antenna articulated, with 3 articles, ciliated, inserted in middle prostomium, reaching to chaetiger 1 (posterior end of prostomium or up to middle of chaetiger 2 in paratypes) (Figs 11A–B, 14A–B). Posterior lip of mouth with 6 longitudinal folds reaching to chaetiger 1 (Fig. 11D).

Seven branchial pairs (6–7 pairs in paratypes) from chaetiger 4, broad and foliaceous with short digitate distal tip, last pair smaller and shorter than other branchiae (Figs 11A, 12B–C, 14A).

Notopodial postchaetal lobes short, tuberculate on chaetigers 1–2, chaetiger 3 long, digitiform; increasing their length in branchial region; cirriform posteriorly (Figs 11A, 12A, D, 14A). In one paratype (SEM specimen), notopodial postchaetal lobes long, digitiform on chaetiger 2 (Fig. 12A). Lateral sense organs located between noto- and neuropodia, with clustered of ciliated pores present on all chaetigers; from mid- to postbranchial chaetigers, pores bear thick and elongate cilia (Fig. 12D–E). Notopodial papillae absent.

Prebranchial and branchial chaetigers with capillaries, fringed. Modified neurochaetae from chaetiger 14 (12–16 in paratypes), two kinds: ones pseudo-compound capillaries with long arista, fringed on its convex side, located in the inferior ramus; others short, stout hooks, greatly curved with long tips; both chaetae kinds with pubescence on their convex margin (Figs 13B–E, 14C).

Pygidium (Fig. 10A–C) with two lateral cirri (Fig. 10B) and one short ventral cirrus (Fig. 10C), tip with long cilia (about 23 μm in length).

Reproduction. Holotype and paratypes of *A. (A.) sathingpra* **sp. nov.**, collected in March, May and August have eggs in the celomic cavities of postbranchial chaetigers (Fig. 13A).

Etymology. The specific epithet "sathingpra" is associated with the type locality where the new species was collected: Sathingpra District, Songkhla Province.

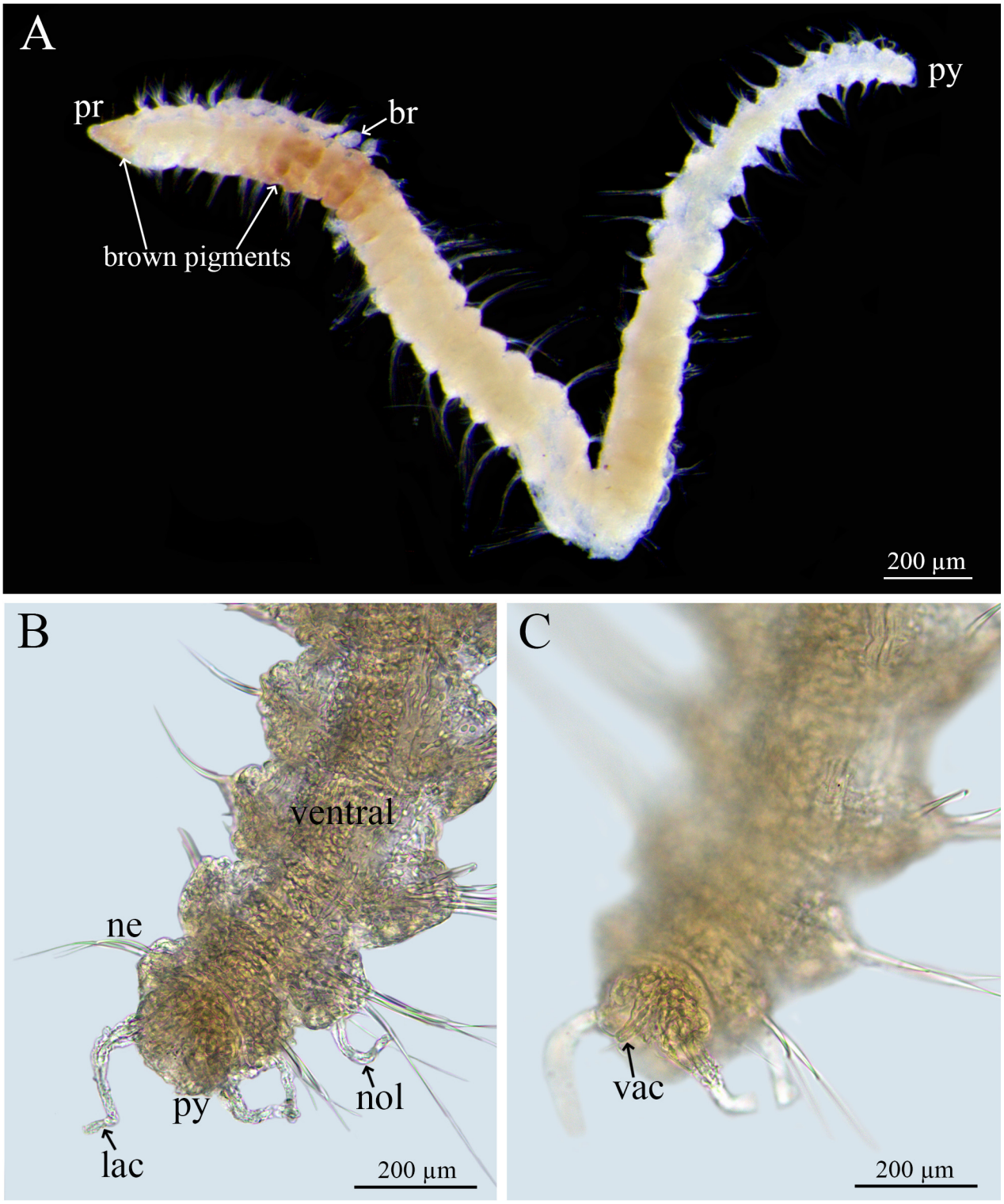

FIGURE 10. *Aricidea (Aricidea) sathingpra* **sp. nov.** Light micrograph, holotype (PSUZC-POL-0121). Whole specimen, dorsolateral view; B. Pygidium, ventral view; C. Ventral cirrus, ventral view. Abbreviations: br, branchiae; lac, lateral anal cirrus; ne, neurochaetae; nol, notopodial postchaetal lobe; pr, prostomium; py, pygidium; vac, ventral anal cirrus.

Habitat. At 15.5–27 m depth, in muddy sediment mixed with sand and shells.

Distribution. Gulf of Thailand (Fig. 1).

Remarks: *Aricidea* (*A.*) *sathingpra* **sp. nov.**, belongs to a group of species having articulated antennae, including to *A. (A.) bansei* Laubier & Ramos, 1974 from Mediterranean, *A. (A.) thammapinanae* Plathong, Hernández-

Alcántara, Harris & Plathong, 2020 from the Gulf of Thailand and, *A. (A.) minuta* Southward, 1956 and *A. (A.) wassi* Pettibone, 1965, both from Northern Atlantic (Table 1). At first, the new species can be differentiated from *Aricidea (A.) minuta* and *A. (A.) thammapinanae* because their median antenna have only two articulations, while the antennae of *A.* (*A.*) *sathingpra* **sp. nov.**, bear at least three articulations. Although *A. (A.) capensis bansei* and *A. (A.) wassi* show high variability, in general, their antennae have higher number of articulations, 4–5 and 3–12, respectively, than *A.* (*Aricidea*) *sathingpra* **sp. nov.**, (3 articulations). In addition, they have more branchiae, 9–10 and 10–18 pairs, respectively, than the 6–7 branchial pairs found in the new species (Table 4). Apart from the different type of modified chaetae, *A.* (*A.*) *sathingpra* **sp. nov.**, can be also characterized by its prostomium which has a pair of distinctive rounded protuberances, which had no reported in other species.

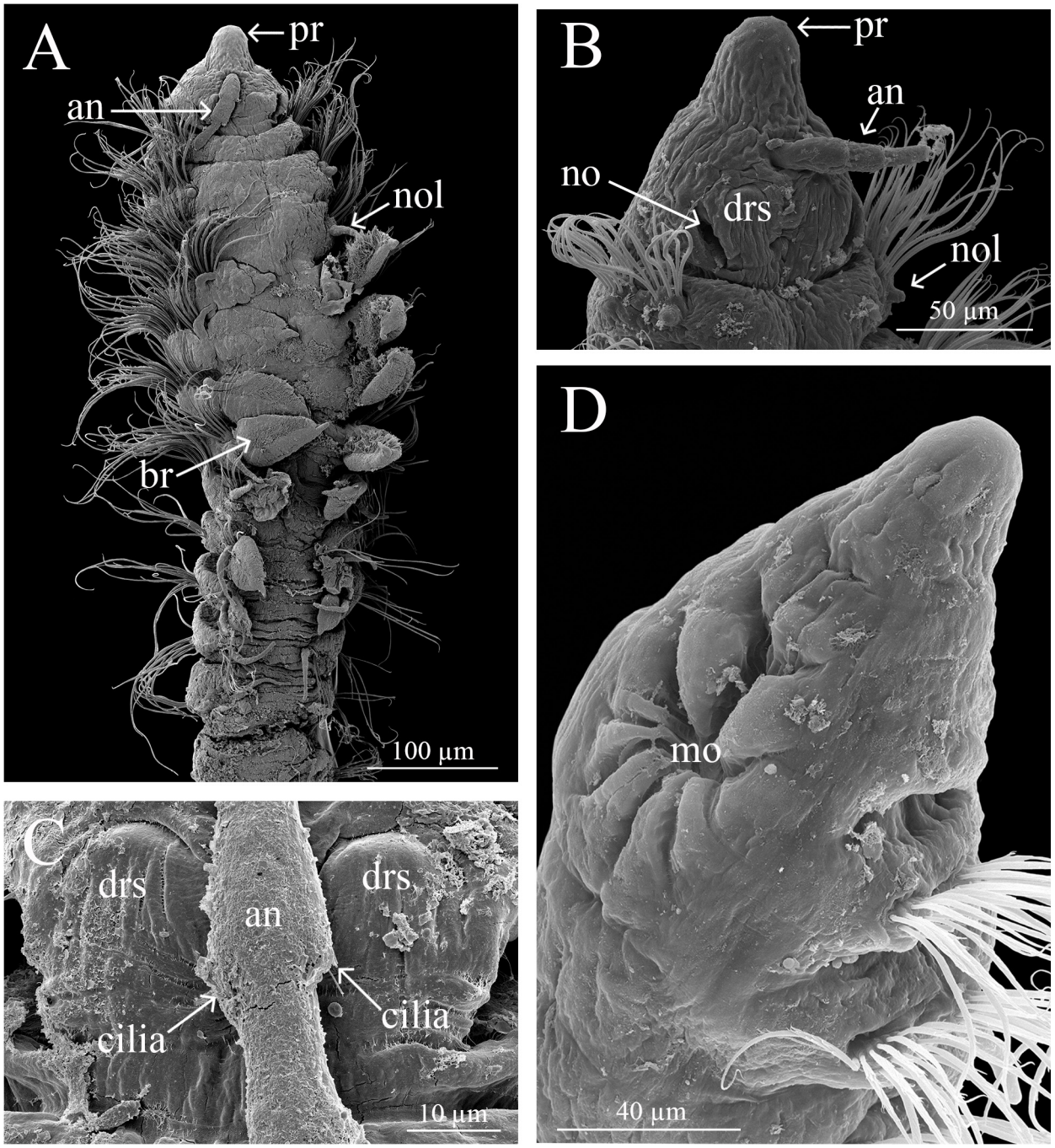

FIGURE 11. *Aricidea (Aricidea) sathingpra* **sp. nov.** Paratypes (A, PSUZC-POL-0127; B, PSUZC-POL-0136; C–D, PSUZC-POL-0128). A. Anterior region, dorsal view; B. Prostomium, dorsal view; C. Distinctive round protuberances, dorsal view; D. Prostomium, ventrolateral view. Abbreviations: an, antenna; br, branchiae; drs, distinctive round prouberances; mo, mouth; no, nuchal organ; nol, notopodial postchaetal lobe; pr, prostomium.

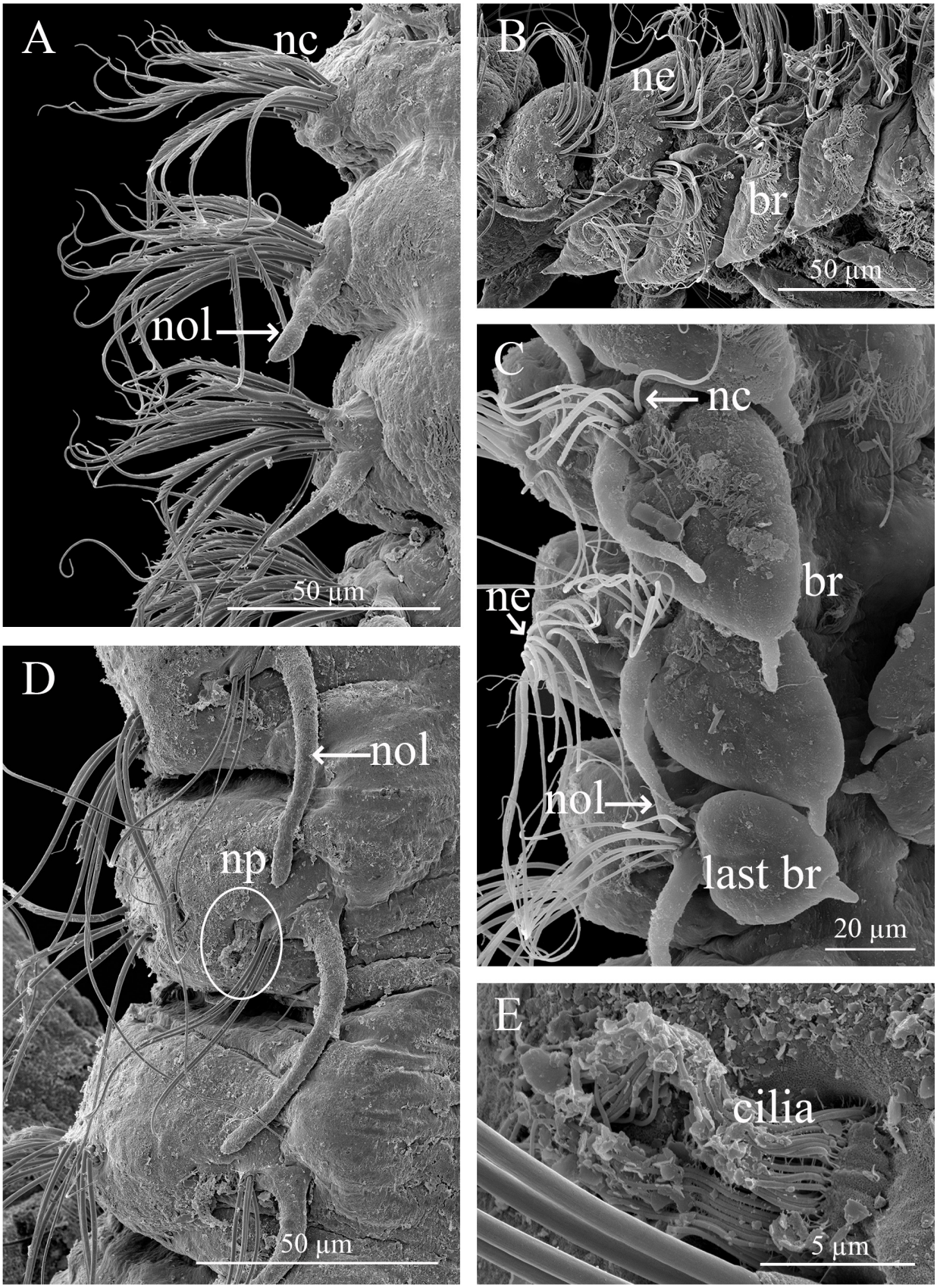

FIGURE 12. *Aricidea (Aricidea) sathingpra* **sp. nov.** Paratypes (A, C, PSUZC-POL-0128; B, D, E, PSUZC-POL-0135). A. Left postbranchial chaetigers, dorsal view; B. Anterior chaetigers, lateral view; C. Last three branchiae, dorsal view; D. Left branchial chaetigers, dorsal view; E. Notopodial pores, top view. Abbreviations: br, branchiae; nc, notochaetae; ne, neurochaetae; nol, notopodial postchaetal lobe; np, notopodial pores.

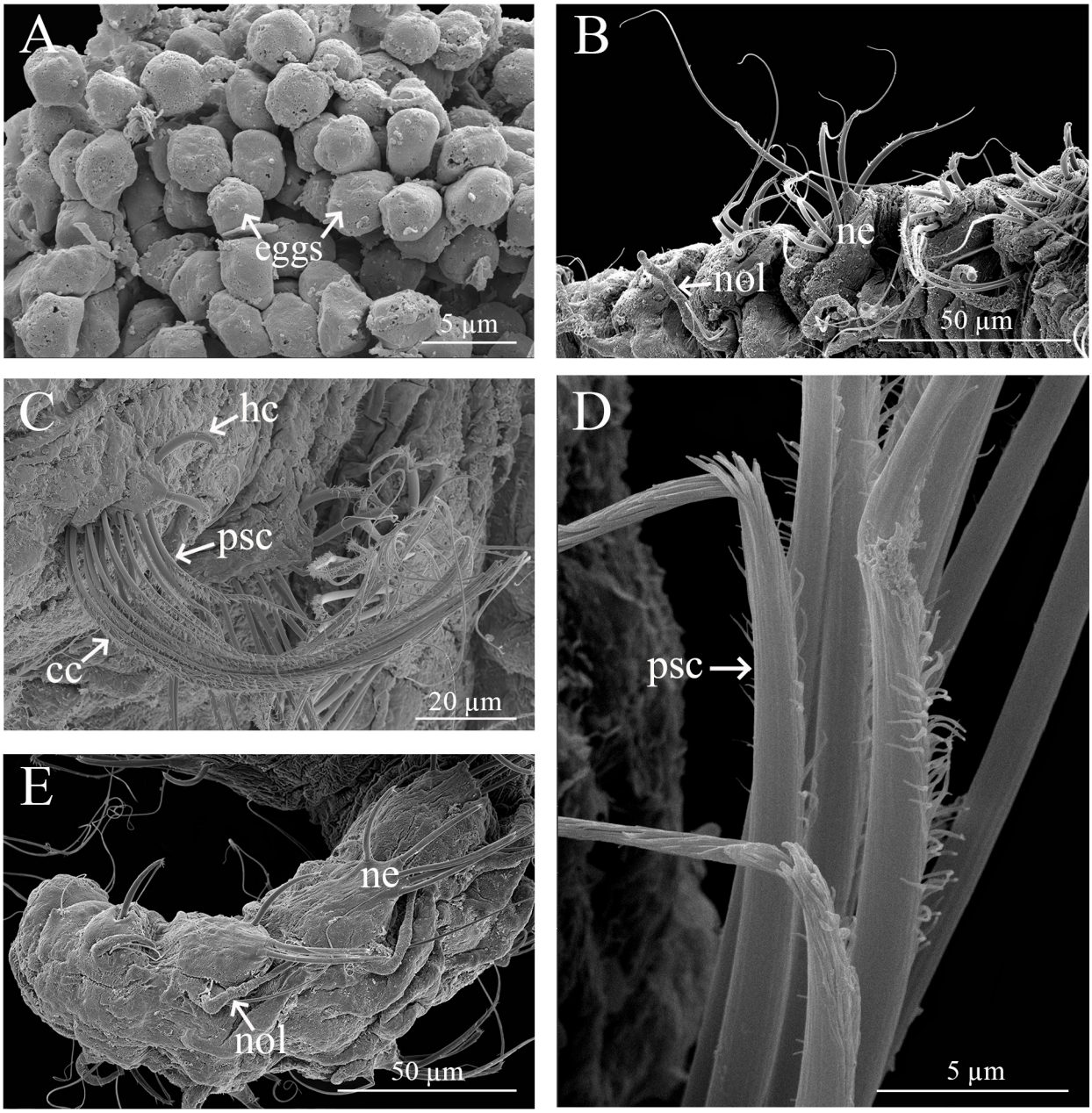

FIGURE 13. *Aricidea (Aricidea) sathingpra* **sp. nov.** Paratypes (A, C, PSUZC-POL-0138; B, D, PSUZC-POL-0135; E, PSUZC-POL-0127) A. Close up oocytes in the body, lateral view; B. Posterior parapodia, lateral view; C. Postbranchial neuropodium, lateral view; D. Pseudo-articulate modified neurochaetae, lateral view; E. Posterior region, dorsal-lateral view. Abbreviations: cc, capillary chaeta; hc, hook chaeta with long tip; ne, neurochaetae; nol, notopodial postchaetal lobes; psc, pseudo-articulate chaeta.

TABLE 4. Morphological characteristics of species of subgenus *Aricidea* (*Aricidea*) having articulated median antenna.

Character/Species	***A. (A.) bansei* Laubier & Ramos, 1974**	***A. (A.) wassi* Pettibone, 1965**	***A.* (*A.*) *sathingpra* sp. nov.**
Prostomium	Elongated, longer than wide	Conical, elongated	Triangular, rounded anteriorly
Median antenna	4–5 joints, extending to chaetiger 2	3–6 joints, extending to chaetigers 3–6	3 joints, ciliated, extending to chaetigers 1–2
Color in alcohol	Pale, yellow or white	Light tan	Red-orange in anterior (fade in alcohol)
Eyes	When present, one pair (red)	Absent	A pair, small, black or brown ((fade in alcohol)
Number of branchiae (pairs)	9–10	10–18	6–7

.....continued on the next page

TABLE 4. (Continued)

Character/Species	*A. (A.) bansei* Laubier & Ramos, 1974	*A. (A.) wassi* Pettibone, 1965	*A.* (*A.*) *sathingpra* sp. nov.
Branchial form	Cirriform	Cirriform	Foliaceous with extra wide form
Modified neurochaetae start from chaetiger	22–27	22–40	12–16
Modified neurochaetae	Hooked, with 1–3 secondary teeth on main tooth; with a subterminal spine on concave side of stem	Acicular, hooked, with enlarged Subterminal spine on concave side of stem	Pseudoarticulate capillaries with long arista, fringed on its convex side; short, stout hooks, greatly curved, with long tips
Notopodial postchaetal lobes	Chaetigers 1–2 rudimentary; well development from chaetigers 3; posteriorly very long	Prebanchial: tuberculate. Branchial: cirriform. Posterior: very slender, threadlike	First–two short; third long, digitate; cirriform on postbranchial region to body end
Complete specimens (No. chaetigers)	32–64	Up to 200	42–48
Distribution	Mediterranean Sea	Southern California, Gulf of Mexico	Gulf of Thailand

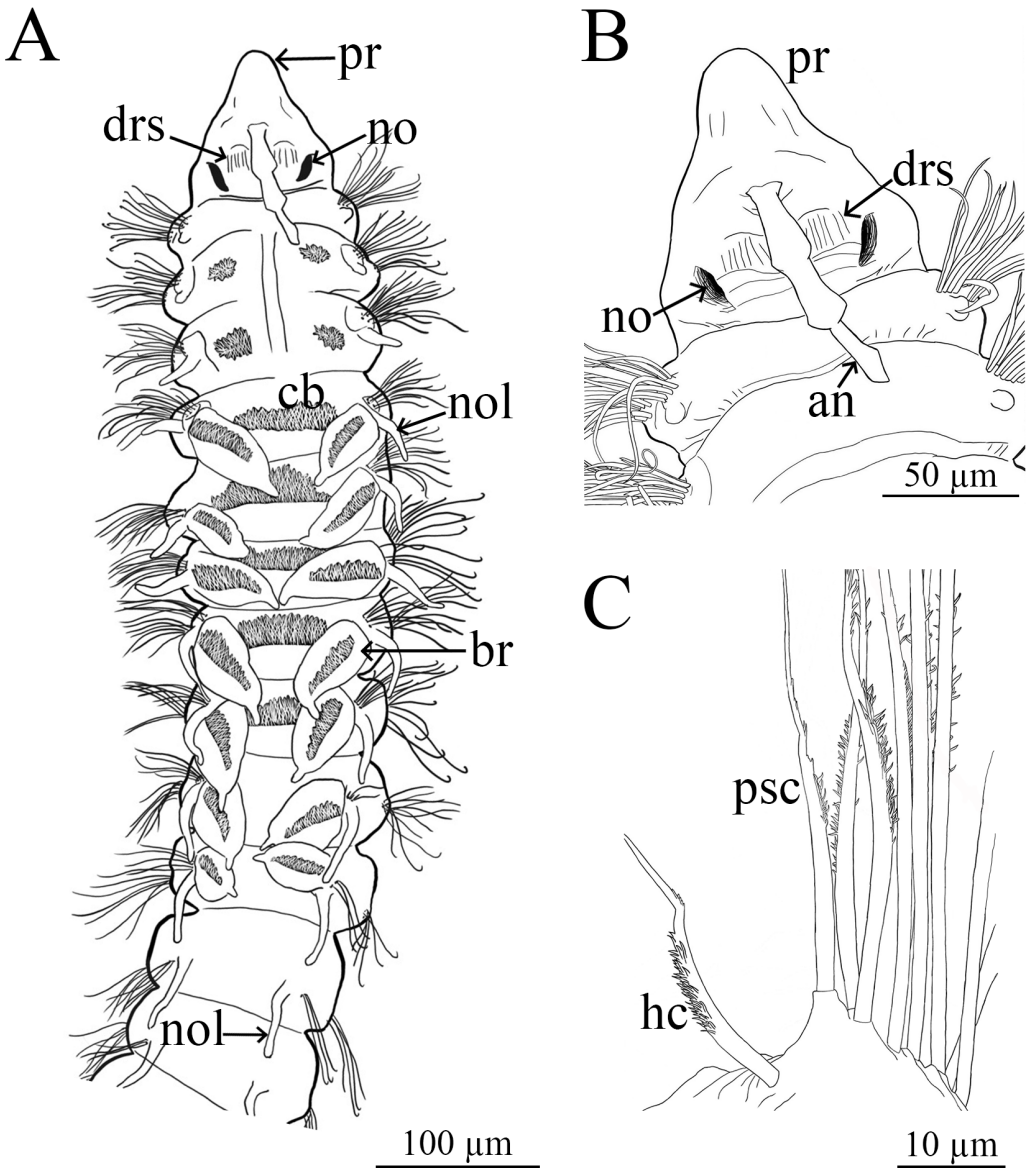

FIGURE 14. *Aricidea (Aricidea) sathingpra* **sp. nov.** (PSUZC-POL-0128) A. Anterior region, dorsal view; B. Prostomium, dorsal view; C. Posterior modified neurochaetae. Abbreviations: an, antenna; br, branchiae; cb, cilia band; drs, distinctive round structure; hc, hook chaeta with long tip; no, nuchal organ; nol, notopodial postchaetal lobe; pr, prostomium; psc, pseudo-articulate chaeta.

Key to species of Subgenus *Aricidea* (Webster, 1879)

1. Median antenna branched 2
- Median antenna unbranched 3
2. Antenna with 2–3 pseudo-articulate branches; modified neurochaetae as acicula with recurved tip . . . . . ***A. (A.) thailandica*** Lovell, 2002 (Andaman Sea, Thailand)
- Median antenna with 5 short tapering digitiform branches; modified neurochaetae pseudo-articulate capillaries; prostomium triangular with bulbous end . . . . . ***A. (A.) multiantennata*** Lovell, 2002 (Andaman Sea, Thailand)
3. Articulate antenna 4
- Unarticulate antenna 8
4. Antenna short, with 2–3 joints, reaching to chaetigers 1–2 5
- Antenna long, with 3–12 joints, reaching to chaetigers 2–6 7
5. Modified neurochaetae bidentate hooked; antenna biarticulate . . . . . ***A. (A.) thammapinanae*** Plathong, Hernández-Alcántara, Harris & Plathong, 2020 (Gulf of Thailand, Western Pacific)
- Modified neurochaetae not bidentate 6
6. Modified neurochaetae one type: pseudo-articulate; antenna bi- or triarticulate; branchiae foliaceous, 10–13 pairs. . . . . ***A. (A.) minuta*** Southward, 1956 (Irish Sea and Baltic Sea)
- Modified neurochaetae two types: pseudo-articulated and greatly curved with slender distal extension; antenna triarticulate; branchiae wide, foliaceous, 6–7 pairs . . . . . ***A. (A.) sathingpra* sp. nov.** (Gulf of Thailand, Western Pacific)
7. Modified neurochaetae bidentate hooked; antenna with 4–5 joints, reaching to chaetiger 2 . . . . . ***A. (A.) bansei*** Laubier & Ramos, 1974 (Mediterranean Sea)
- Modified neurochaetae acicular, hooked, with enlarged subterminal spine on concave side of stem. Antenna long with 3–12 joints, reaching to chaetiger 3–6 . . . . . ***A. (A.) wassi*** Pettibone, 1965 (Northwestern Atlantic Ocean)
8. Short antenna, reaching to chaetiger 2 as maximum 9
- Long antenna, reaching at least to chaetiger 3 16
9. Antenna reaching to chaetiger 1 as maximum 10
- Antenna reaching to chaetiger 2 12
10. Branchiae 10–14 pairs 11
- Branchiae 37 pairs; modified neurochaetae thick stem ending in slender spine . . . . . ***A. (A.) curviseta*** Day, 1963 (South Africa)
11. Antenna bifurcate; 10–11 branchial pairs; prostomium conical, rounded anteriorly; notopodial postchaetal lobes chaetiger 1–2 absent, chaetiger 3 digitate; modified neurochaetae distally curved, with a subterminal spine . . . . . ***A. (A.) petacalcoensis*** de León-González, Hernández-Guevara & Rodríguez-Valencia, 2006 (Western Mexico)
- Antenna simple; 14 branchial pairs; prostomium pin-shaped, tapered anteriorly; modified neurochaetae acicular, hooked, with slender subterminal spine . . . . . ***A. (A.) longicirrata*** Hartmann-Schröder, 1965 (Chile)
12. Branchiae less than 15 pairs 13
- Branchiae 50–60 pairs; antenna subulate; modified neurochaetae pseudo-articulate . . . . . ***A. (A.) fragilis*** Webster, 1879 (Chesapeake Bay, off Eastern shore, Virginia)
13. Modified neurochaetae hooked, not bidentate 14
- Modified neurochaetae bidentate hooked . . . . . ***A. (A.) capensis*** Day, 1961 (South Africa)
14. Modified neurochaetae one kind, pseudo-articulate; antenna thickened, prostomium elongated, conical, tapered anteriorly . . . . . ***A. (A.) minima*** Strelzov, 1973 (Patagonian, South America)
- Modified neurochaetae 2–3 kinds 15
15. Modified neurochaetae two types: curved acicular with a subterminal spine on the concave side; other with pointed hood; antenna slender . . . . . ***A. (A.) rosea*** Reish, 1968 (Los Angeles Bay, Gulf of California)
- Modified neurochaetae three types: pseudo-articulate; hooked with hair-like tip; hooked without hair-like tip; antenna clavate with terminal papilla . . . . . ***A. (A.) pseudoarticulata*** Hobson, 1972 (Southern California)
16. Modified neurochaetae one type 17
- Modified neurochaetae two types: pseudo-compound and stout hooked curved chaetae; modified notopodial postchaetal lobes of chaetiger 3 with a globular basis and long, digitiform distal; antenna long, reaching to chaetigers 3–7 . . . . . ***A. (A.) pacharaphoni* sp. nov. (**Andaman coast and the Gulf of Thailand)
17. Modified neurochaetae unidentate hooked with long subterminal arista; lacking eyes; antenna reaching to chaetiger 5 . . . . . ***A. (A.) longobranchiata*** Day, 1961 (Off Saldanha Bay, Southern Africa)
- Modified neurochaetae pseudo-articulated; eyes present; antenna reaching to chaetiger 9 . . . . . ***A. (A.) sanmartini*** Aguado & López, 2003 (Coiba Island, Panama)

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