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Three New Polychaete Species of *Platynereis* (Annelida, Polychaeta, Nereididae) from Taiwan

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The present study describes three new species of *Platynereis* Kinberg, 1865 from Taiwan to provide a better understanding of the diversity of *Platynereis* in the tropical Western Pacific. *Platynereis hemeiensis* sp. nov. is similar to *P. abnormis* (Horst, 1924), *P. australis* (Schmarda, 1861), *P. hutchingsae* de Leon-Gonzalez, Solis-Weiss and Valadez Rocha, 2001, and *P. sinica* Sun, Shen and Wu, 1978 in terms of having no notopodial homogomph falcigers in adults. However, *P. hemeiensis* sp. nov. differs from *P. australis* by having: 1) fewer transverse rows or diagonal lines in Areas III, IV, VI and VII–VIII (2–3, 6–8, 2 and 2 versus 5, 10, 4 and 4, respectively); 2) tapered dorsal cirri on anterior-most chaetigers (versus stout dorsal cirri); and 3) dorsal cirri always shorter than dorsal ligule in posterior chaetigers (versus always longer than dorsal ligule). *Platynereis hemeiensis* sp. nov. can be distinguished from *P. abnormis* and *P. sinica* by having transverse rows of pectinate paragnaths in Area III (versus no pectinate paragnaths). *Platynereis hemeiensis* sp. nov. can be readily differentiated from *P. hutchingsae* by having long-bladed heterogomph spinigers in neuropodia (versus short-bladed heterogomph spinigers). Both *P. jihueiensis* sp. nov. and *P. shihmenensis* sp. nov. are somewhat similar to *P. bicanaliculata* (Baird, 1863), because all have bifid tip of notopodial anchylosed falcigers. However, the two species differ from *P. bicanaliculata* by having either no pectinate paragnaths or rows of pectinate paragnaths in Area III (versus a broad, oval patch of pectinate paragnaths). *Platynereis jihueiensis* sp. nov. differs from *P. shihmenensis* sp. nov. by having: 1) three groups of pectinate paragnaths in Area III (versus no pectinate paragnaths); 2) six to seven transverse rows of pectinate paragnaths in Area IV (versus four transverse rows); 3) three parallel transverse rows of pectinate paragnaths in Area VI (versus three to four non-parallel rows); 4) seven groups of transverse rows of pectinate paragnaths in Areas VII–VIII, middle groups each with three rows and two outer most groups each with one and two paragnaths (versus five groups of transverse rows of pectinate paragnaths, middle groups each with 1–2 rows and two outer most groups each with one paragnath); and 5) each parapodium of chaetigers in anterior, mid-body and posterior regions with three, two and one notopodial homogomph falcigers, respectively (versus each parapodium with one notopodial homogomph falciger in all body regions). A key for identifying *Platynereis* species from East Asia is provided.

Key words: Nereidinae, *Platynereis*, Polychaetes, Taxonomy, Taiwan.

BACKGROUND

Polychaeta Grube, 1850 is the largest and most diverse group in the Phylum Annelida, which has been classified to 25 orders, 87 families, with over 10,000 species described (Brusca and Brusca 1990). Of these families, the family Nereididae Blainville, 1818 is one of the most diverse polychaete families with 43 valid genera and about 770 valid species, many of which are most common and species rich in shallow marine

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habitats (Bakken et al. in press).

The genus *Platynereis* Kinberg, 1865 is characterized by having parallel rows of pectinate paragnaths on both maxillary and oral rings of the pharynx (Bakken and Wilson 2005; Read 2007). Thirty-two valid species are known to the genus worldwide (Read and Fauchald 2021). Of these species, only six were reported from East Asia, and they are: *P. abnormis* (Horst, 1924) (type locality: Indonesia), *P. bicanaliculata* (Baird, 1863) (type locality, Canada), *P. australis* (Schmarda, 1861) (type locality, New Zealand), *P. dumerilii* (Audouin et Milne-Edwards, 1834) (type locality, France), *P. pulchella* Gravier, 1901 (type locality, Djibouti), and *P. sinica* Sun, Wu and Shen, 1978 (type locality, China) (Imajima 1972; Sun and Yang 2004). In Taiwan, two *Platynereis* species were reported: *P. bicanaliculata* and *P. dumerilii* (Wu 1967; Imajima 1972; Wu et al. 1981; Sun and Yang 2004). However, with many new species of nereidids recently described for other genera in the family from Taiwan (Hsueh 2019a b 2020 2021), the diversity of *Platynereis* in this geographic region has been overlooked. In the present study, the author examines three unidentified *Platynereis* species collected from ecological surveys in coasts of Taiwan. The results indicate the three species have unique morphological characters that are not seen in other congeners reported from East Asia. Three new species are herein described, and a key for the species of *Platynereis* in East Asia is also provided.

MATERIALS AND METHODS

Specimens in the present study were collected from various ecological surveys in coasts of Taiwan. They were fixed with 10% buffered formalin and later transferred into 70% alcohol for storage. In the laboratory, worms were examined using stereo (Leica MZ12.5) and compound microscopes (Leica DM2500). Images of the worms and their body parts were taken using digital camera. Some images were stacked using computer software (Helicon Focus 7.0.2) to improve their depth of field. Terminology of prostomium region and chaetal morphology followed Bakken and Wilson (2005); description of parapodia followed Villalobos-Guerrero and Bakken (2018); and description of pattern of areas VI–V–VI followed Villalobos-Guerrero (2019). Length measurements of dorsal ligule and dorsal cirrus followed Conde-Vela (2018: 257, fig. 6C–F). All specimens of this study were deposited into the National Museum of Natural Science (NMNS), Republic of China. Numbers in parentheses represent the variations in a given morphological character.

TAXONOMY

Family Nereididae Blainville, 1818
Subfamily Nereidinae Blainville, 1818
Genus *Platynereis* Kinberg, 1865

Platynereis hemeiensis sp. nov.

(Figs. 1A–C, 2A–F, 3A–E)
urn:lsid:zoobank.org:act:05DBCFA0-D0A7-4797-B485-8BF223C3729B

Material examined: Holotype, NMNS8390-1, Hemei (25°2.6'N 121°55.8'E), Gongliao District, New Taipei City, Taiwan, intertidal rocky habitats, coll. S.-M. Chao, 12 Mar. 1989. Paratype: 1 specimen, NMNS8390-2, Longdong (25°5.1'N 121°55.2'E), Gongliao District, New Taipei City, Taiwan, intertidal rocky habitats, coll. H.-T. Hong, 3 Jun. 1996.

Etymology: The name is derived from the name of the nearby village, Hemei, in northeastern Taiwan where the holotype was collected.

Diagnosis: *Platynereis* with longest tentacular cirri reaching chaetiger 4. Dark brown jaws, each with 4 lateral teeth; paragnath pattern: I = 0; II = 0; III = 5 groups of pectinate paragnaths, each group with 2–3 parallel transverse rows; IV = 6–8 parallel diagonal lines of pectinate paragnaths, innermost 2–3 lines incomplete in the middle; V = 0; VI = 2 parallel transverse rows of pectinate paragnaths on each side; VII–VIII = 5 groups of pectinate paragnaths, each group with 2 parallel transverse rows. Notopodial prechaetal lobe present on anterior to mid-body chaetigers. Neuropodial postchaetal lobe present throughout. Notochaetae with homogomph spinigers throughout, without homogomph falcigers. Neurochaetae with homogomph spinigers throughout; dorsal fascicle with heterogomph spinigers on chaetigers 1–4, short-bladed heterogomph falcigers with recurved tip and serrations present throughout except chaetigers 1–4; ventral fascicle with heterogomph spinigers on chaetigers 1–4 and mid-body to posterior chaetigers, short-bladed heterogomph falcigers with recurved tip and serrations present throughout except chaetigers 1–4.

Description: Holotype complete, 39.0 mm long, 86 chaetigers, chaetiger 10 width 2.0 mm (2.5, n = 1), excluding parapodia; beige in alcohol (Fig. 1A). Prostomium slightly longer than wide, lateral antennae separated basally, as long as palps; palpophores globose, palpostyles half as long as palpophores, blunt, medially widest, four pairs of tentacular cirri, longest one reaching chaetiger 4. Two pairs of eyes, in trapezoidal arrangement, separated from each other, subequal in size; anterior eyes 1/7–1/8 as wide as prostomium. Tentacular belt about 1.2 times (1.5 times, n = 1) longer

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than chaetiger 1. Pharynx with dark brown jaws, each with 4 lateral teeth; paragnath pattern: I = 0; II = 0; III = 5 groups of pectinate paragnaths, each group with 2–3 parallel transverse rows; IV = 6–7 (7–8, *n* = 1) parallel diagonal lines of pectinate paragnaths, innermost 2–3 lines incomplete in the middle; V = 0; VI = 2 parallel transverse rows of pectinate paragnaths on each side; VII–VIII = 5 groups of pectinate paragnaths, each group with 2 parallel transverse rows (Fig. 1B–C). Ridge pattern of Areas VI–V–VI, ʊ-shaped (Fig. 1A–B).

Dorsal cirri tapered, basally attached to dorsal ligule throughout, about as long as dorsal ligule on anterior chaetigers, about 0.7–0.8 times as long as dorsal ligule on mid-body to posterior chaetigers (Fig. 2A–F). Notopodial prechaetal lobe present on anterior to mid-body chaetigers (Fig. 2C, D).

Dorsal ligule narrow conical on anterior-most chaetigers, conical from chaetiger 5 to 11 (5 to 12, *n* = 1), narrow conical with blunt tip on second-half portion of anterior to posterior chaetigers (Fig. 2A–F); base of dorsal ligule slightly bulged on anterior chaetigers, elongate and broader on mid-body chaetigers, markedly elongate and broader on posterior chaetigers (Fig. 2A–F); small, beige glandular patches present on anterior chaetigers, glandular patches becoming light yellow, enlarged and fused into large mass on mid-body to posterior chaetigers (Fig. 2A–F).

Median ligule subconical on anterior-most chaetigers, about 0.9 as long as dorsal ligule; conical from chaetiger 5 to 11 (5 to 12, *n* = 1), subconical with blunt tip on posterior portion of anterior to posterior chaetigers, about 0.8 times as long as dorsal ligule (Fig. 2A–F).

Neuroacicular ligule subconical acute on anterior chaetigers, subconical blunt tip on mid-body to posterior chaetigers, about 0.4–0.5 times as long as ventral ligule (Fig. 2A–F). Neuropodial postchaetal lobe present throughout, subconical on anterior-most chaetigers, about 1.8 times longer than neuroacicular ligule; conical on chaetiger 5 to 11 (5 to 12, *n* = 1), about 0.5 times as long as neuroacicular ligule; subconical on mid-body to posterior chaetiger, about as long as neuroacicular ligule (Fig. 2A–F).

Ventral ligule narrow conical on anterior-most chaetigers, conical on chaetiger 5 to 11 (5 to 12, *n* = 1), narrow conical on mid-body to posterior chaetigers (Fig.

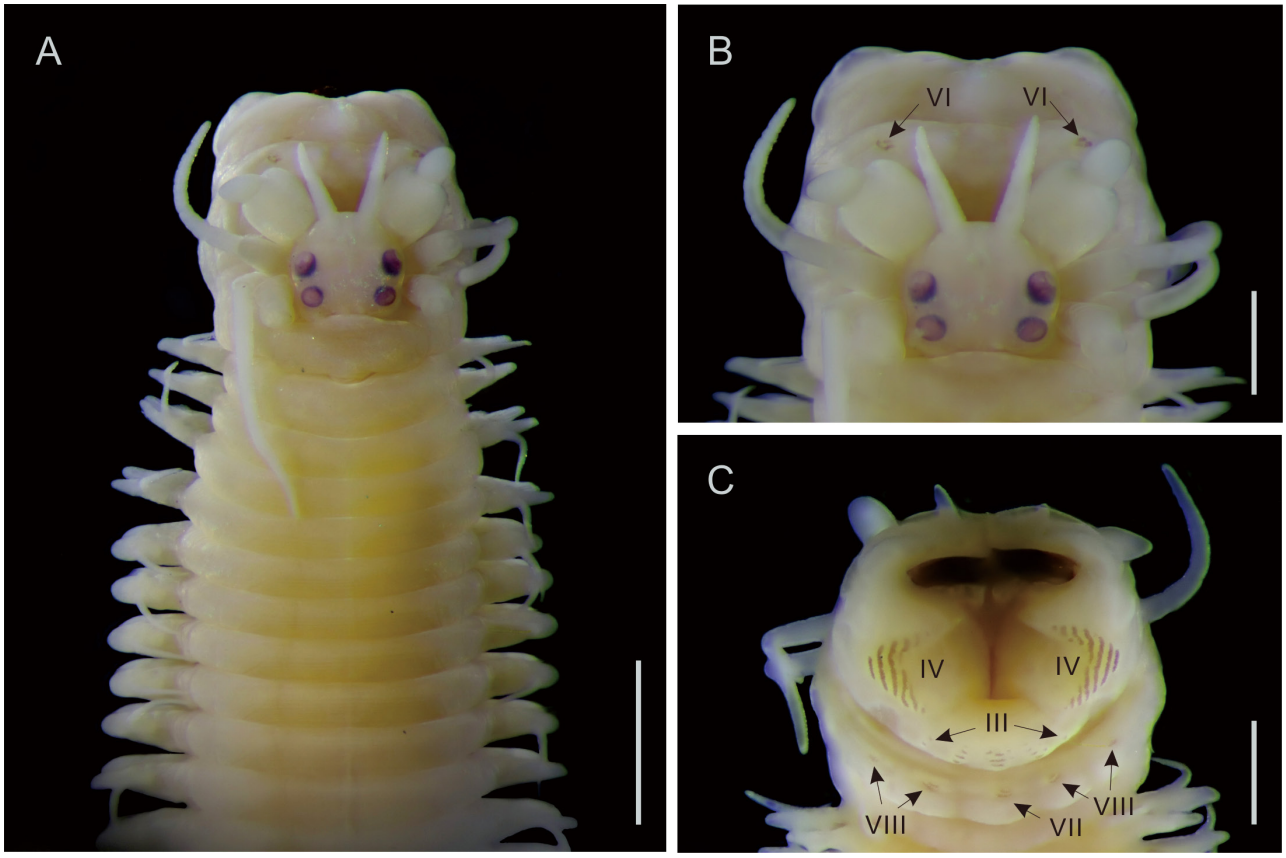

Fig. 1. *Platynereis hemeiensis* sp. nov.; holotype (NMNS 8390-1): A, anterior region, dorsal view; B, dorsal view of the pharynx; C, frontal view of the pharynx. Roman numerals indicate Area number of the pharynx. Scale bars: A = 1.0 mm; B–C = 0.5 mm.

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2A–F). Ventral cirri basally attached to ventral edge of parapodia, about as long as ventral ligule on anterior-most chaetigers, about 1.5 times longer than ventral ligule on chaetiger 5 to 11 (5 to 12, n = 1), about 0.8 times as long as ventral ligule on mid-body to posterior chaetigers (Fig. 2A–F).

Notochaetae present from chaetiger 3 to posterior chaetigers, homogomph spinigers present throughout, homogomph falcigers absent. Neurochaetae dorsal fascicle: homogomph spinigers present throughout, heterogomph spinigers present on chaetigers 1–4, short-bladed heterogomph falcigers with recurved tip and serrations present throughout except chaetigers 1–4. Neurochaetae ventral fascicle: heterogomph spinigers present on chaetigers 1–4 and mid-body to posterior chaetigers, short-bladed heterogomph falcigers with recurved tip and serrations present throughout except chaetigers 1–4 (Fig. 3A–E).

Type locality: Hemei, New Taipei City, Taiwan.

Distribution: Only known from the type locality and Longdong, New Taipei City, Taiwan.

Remarks: *Platynereis hemeiensis* sp. nov. is similar to *P. abnormis* (Horst, 1924), *P. australis* (Schmarda, 1861), *P. hutchingsae* de Leon-Gonzalez, Solis-Weiss & Valadez Rocha, 2001, and *P. sinica* Sun, Wu and Shen, 1978 in term of lacking notopodial homogomph falcigers in adults (Horst 1924: 164; Read 2007: 6; de Leon Gonzalez et al. 2001: 390–391; Sun and Young 2004: 220; Fig. 3). Of the latter four species, only *P. australis* has paragnath patterns somewhat similar to that of *P. hemeiensis* sp. nov. However, *P. hemeiensis* sp. nov. differs from *P. australis* by having fewer transverse

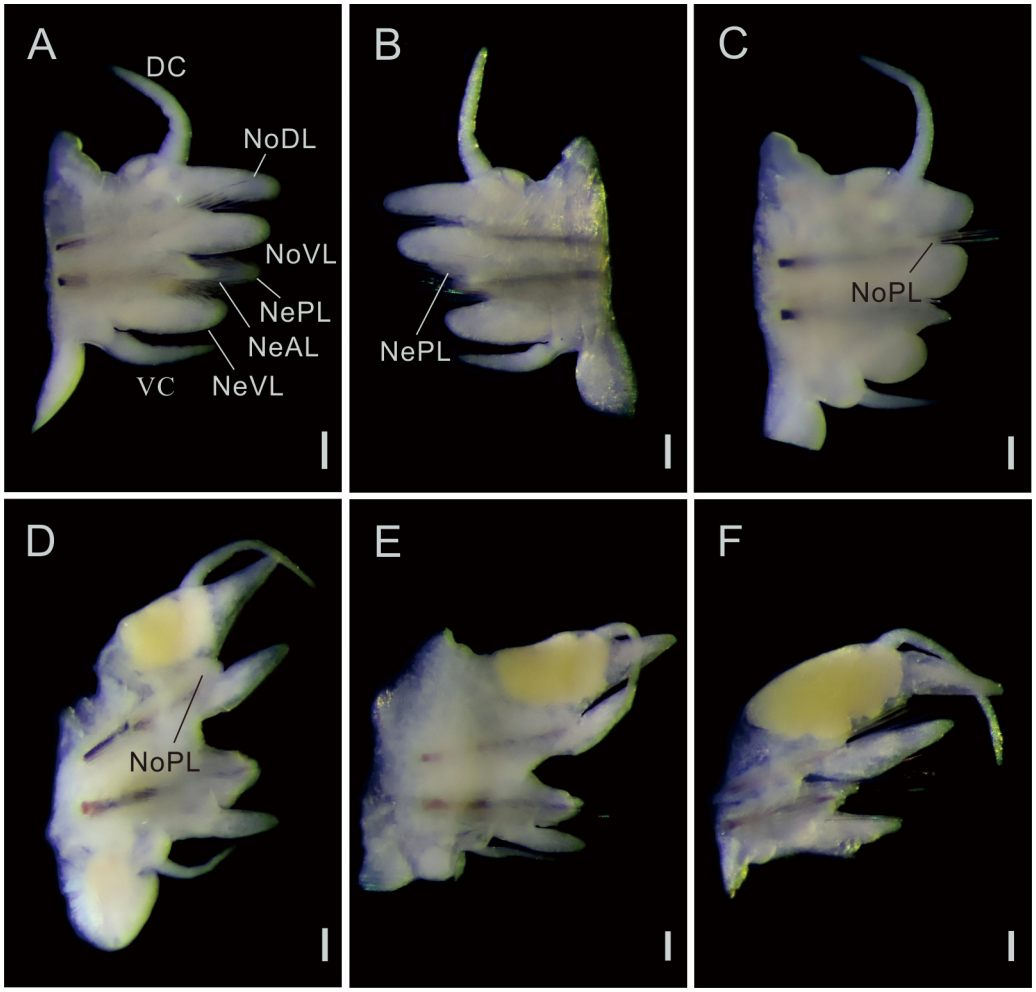

Fig. 2. *Platynereis hemeiensis* sp. nov.; holotype (NMNS 8390-1): A, left parapodium, anterior view, chaetiger 4; B, left parapodium, posterior view, chaetiger 4; C, left parapodium, anterior view, chaetiger 10; D, left parapodium, anterior view, chaetiger 29; E, left parapodium, anterior view, chaetiger 50; F, left parapodium, anterior view, chaetiger 70. Abbreviations: DC, dorsal cirrus; NeAL, neuropodial acicular lobe; NePL, neuropodial postchaetal lobe; NeVL, neuropodial ventral ligule; NoDL, notopodial dorsal ligule; NoPL, notopodial prechaetal lobe; NoVL, notopodial ventral ligule; VC, ventral cirrus. Scale bars: A–F = 0.1 mm.

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rows or diagonal lines in Areas III, IV, VI and VII–VIII (2–3, 6–8, 2 and 2 versus 5, 10, 4 and 4, respectively), in addition to the shape of dorsal cirri on anterior-most chaetigers and the length of dorsal cirri to dorsal ligule in posterior chaetigers (see the Key) (Read 2007: 6–7, fig. 1A–D, F; Fig. 1A–C, F). *Platynereis hemeiensis* sp. nov. can be distinguished from *P. abnormis* and *P. sinica* by having parallel transverse rows of pectinate paragnaths in Area III (versus no pectinate paragnaths) (Horst 1924: 20; Wu et al. 1981; Sun and Young 2004: 210; Fig. 1B–C). *Platynereis hemeiensis* sp. nov. can be readily differentiated from *P. hutchingsae* by having long-bladed heterogomph spinigers (versus short-bladed heterogomph spinigers) and short-bladed heterogomph falcigers with recurved tip and serrations (versus short-bladed heterogomph falcigers without recurved tip) in dorsal fascicle of neuropodia (de Leon Gonzalez et al. 2001: 390–391, fig. 1e, g; Fig. 3C).

***Platynereis jihueiensis* sp. nov.**

(Figs. 4A–F, 5A–F, 6A–F)
urn:lsid:zoobank.org:act:AE4C0ACA-A334-4674-95BA-18AEB2CD8D4F

Material examined: Holotype (NMNS 8390-3), Jihuei (23°6.97'N 121°24.31'E), Taitung County, Taiwan, intertidal rocky habitats, coll. Li, Y.-H., 7 October 2010.

Etymology: The name is derived from the name of the nearby village, Jihuei, where the worm was collected.

Diagnosis: *Platynereis* with longest tentacular cirri reaching chaetiger 7. Light brown jaws, each with 5–6 lateral teeth; paragnath pattern: I = 0; II = 0; III = 3 groups of pectinate paragnaths, each group with 1 or 2 parallel transverse rows; IV = 6 parallel transverse rows and one oblique row of pectinate paragnaths (left), 7 parallel transverse rows and one oblique row of pectinate paragnaths (right); V = 0; VI = 3 parallel transverse rows of pectinate paragnaths on each side; VII–VIII = 7 groups of transverse rows, middle groups each with 3 parallel rows of pectinate paragnaths and 2 outer most groups each with 1 or 2 paragnaths. Notopodial prechaetal lobe present from about chaetiger 15 to posterior end. Neuropodial postchaetal lobe present throughout. Notochaetae with homogomph spinigers throughout, anchylosed falcigers present from chaetiger 12 to posterior end with three anchylosed falcigers on anterior chaetigers, two on mid-body chaetigers and one along posterior chaetigers. Neurochaetae with homogomph spinigers throughout; dorsal fascicle with heterogomph spinigers on chaetigers 1–4, short-bladed heterogomph falcigers with recurved tip and serrations present throughout except chaetigers

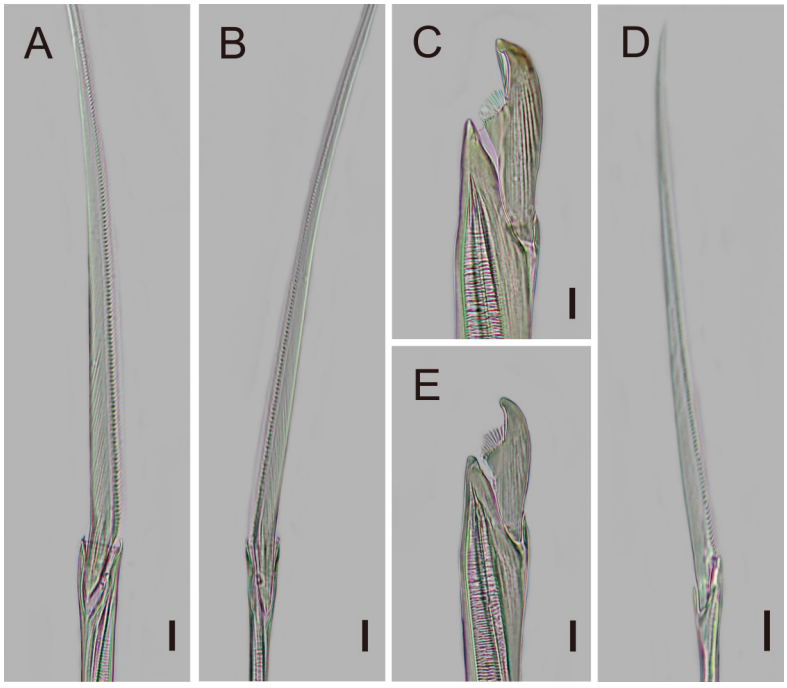

Fig. 3. *Platynereis hemeiensis* sp. nov.; A–C, E, paratype (NMNS 8390-2); D, holotype (NMNS 8390-1): A, notochaeta, homogomph spiniger, chaetiger 38; B, neurochaeta of dorsal fascicle, homogomph spiniger, chaetiger 38; C, neurochaeta of dorsal fascicle, short-bladed heterogomph falciger, chaetiger 38; D, neurochaeta of ventral fascicle, heterogomph spiniger, chaetiger 70; E, neurochaeta of ventral fascicle, short-bladed heterogomph falciger, chaetiger 38. Scale bars: A–E = 0.01 mm.

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1–4; ventral fascicle with heterogomph spinigers on chaetigers 1–4 and mid-body to posterior chaetigers, short-bladed heterogomph falcigers with recurved tip and serrations present throughout except chaetigers 1–4.

Description: Holotype complete, 39.0 mm long, 79 chaetigers mm, chaetiger 10 width 1.5 mm, excluding parapodia; beige in alcohol (Fig. 4A, B). Prostomium as long as wide, lateral antennae as long

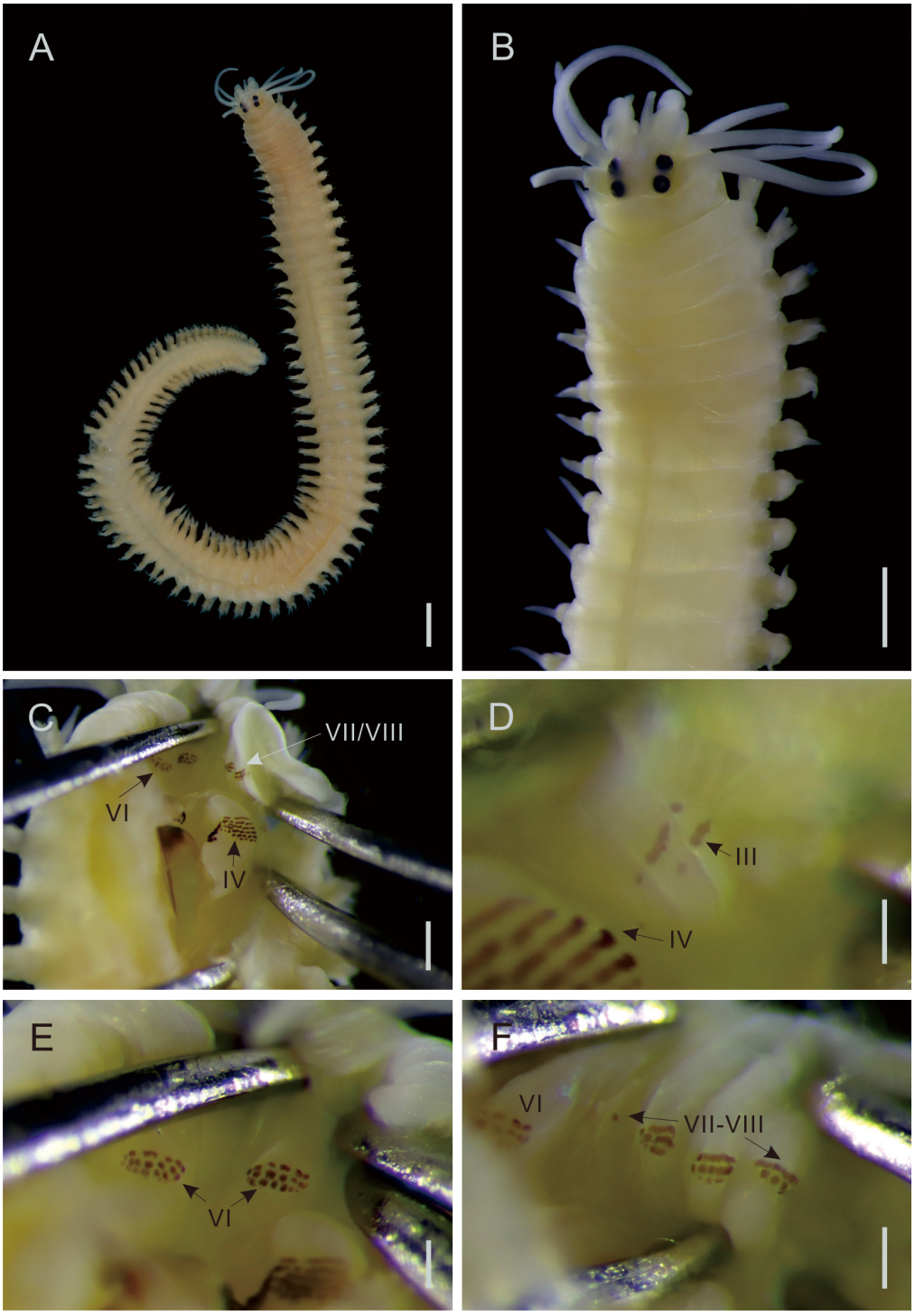

Fig. 4. *Platynereis jihueiensis* sp. nov.; holotype (NMNS 8390-3): A, whole animal; B, anterior body; C, paragnaths of the maxillary and oral rings; D, close-up of Area III; E, close-up of Area VI; F, close-up of Area VII/VIII. Roman numerals indicate Area of the pharynx. Scale bars: A = 2.0 mm; B = 1.0 mm; C = 0.5 mm; D = 0.1 mm; E–F = 0.2 mm.

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as palps; palpophores globose, palpostyles globose, as long as wide, four pairs of tentacular cirri, longest one reaching chaetiger 7. Two pairs of eyes, in trapezoidal arrangement, subequal in size, almost fused to each other laterally; anterior eyes 1/6 as long as prostomial width. Tentacular belt about as long as chaetiger 1. Pharynx with light brown jaws, with 5–6 lateral teeth; paragnath pattern: I = 0; II = 0; III = 3 groups of pectinate paragnaths, each group with 1 or 2 parallel transverse rows (Fig. 4C–D); IV = 6 parallel transverse rows and one oblique row of pectinate paragnaths (left), 7 parallel transverse rows and one oblique row of pectinate paragnaths (right) (Fig. 4C); V = 0; VI = 3 parallel transverse rows of pectinate paragnaths on each side (Fig. 4C, E); VII–VIII = 7 groups of transverse rows, middle groups each with 3 parallel rows of pectinate paragnaths and 2 outer most groups each with 1 or 2 paragnaths (Fig. 4F). Ridge pattern of Areas VI–V–VI, υ-shaped (Fig. 4E).

Dorsal cirri tapered, basally attached to dorsal ligule throughout, about 1.2–1.4 times longer than dorsal ligule on anterior chaetigers, about 1.1 times longer than dorsal ligule on mid-body chaetigers, about 0.9–1.0 times as long as dorsal ligule on posterior chaetigers; dorsal cirrus lamellae present on chaetiger 17 to about chaetiger 70 (Fig. 5A–F). Notopodial prechaetal lobe present from about chaetiger 15 to posterior end (Fig. 5D–F).

Dorsal ligule conical on chaetigers 1–10, subconical thereafter (Fig. 5A–F); base of dorsal ligule slightly bulged on anterior chaetigers, elongate and broader on mid-body chaetigers, markedly elongate and

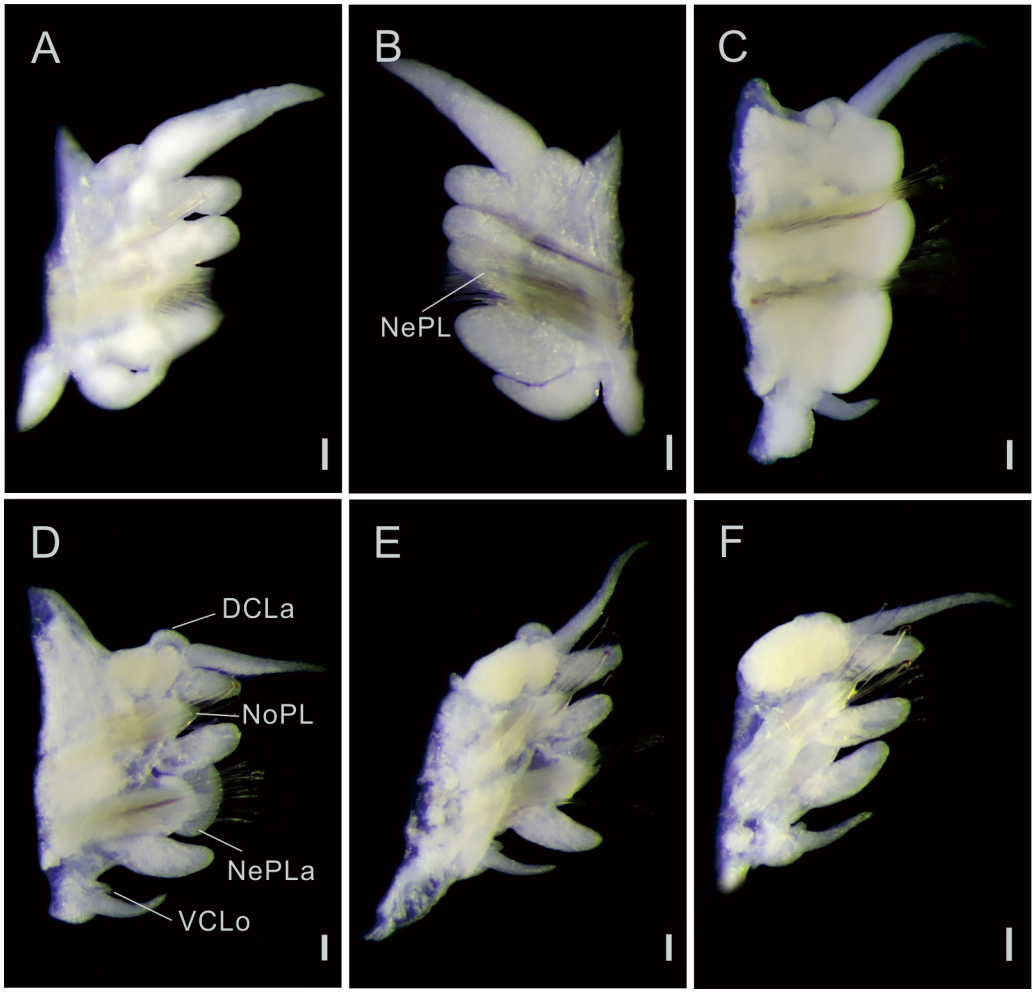

Fig. 5. *Platynereis jihueiensis* sp. nov.; holotype (NMNS 8390-3): A, left parapodium, anterior view, chaetiger 3 (notopodial postchaetal lobe hindered by notopodial ventral ligule); B, left parapodium, posterior view, chaetiger 3; C, left parapodium, anterior view, chaetiger 10; D, left parapodium, anterior view, chaetiger 30; E, left parapodium, anterior view, chaetiger 50; F, left parapodium, anterior view, chaetiger 68. Abbreviations: DCLa, dorsal cirrus lamellae; NePL, neuropodial postchaetal lobe; NePLa, neuropodial postchaetal lamellae; NoPL, notopodial prechaetal lobe; VC, ventral cirrus; VCLo, ventral cirrus lobe. Scale bars: A–F = 0.1 mm.

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broader on posterior chaetigers; small, beige glandular patches present on anterior chaetigers, glandular patches becoming light yellow, enlarged and partially or complete fused into large mass on mid-body to posterior chaetigers (Fig. 5A–F).

Median ligules conical on chaetigers 1–10, subconical thereafter (Fig. 5A–F).

Neuroacicular ligules subequal throughout. Neuropodial postchaetal lobe present throughout, about 2.0 times than neuroacicular ligules on anterior most chaetigers, about as long as, or shorter than neuroacicular ligules thereafter; neuropodial postchaetal lamellae present on chaetiger 17 to about chaetiger 65 (Fig. 5A–F).

Ventral ligule conical on chaetigers 1–10, subconical thereafter. Ventral cirri mid-ventrally attached to ventral edge of parapodia, about as long as ventral ligule on chaetigers 1–10, about 1.2 times longer than ventral cirri thereafter; ventral cirrus lobe present on dorsal surface of ventral cirrus from chaetiger 17 to about chaetiger 65 (Fig. 5A–F).

Notochaetae present from chaetiger 3 to posterior chaetigers, homogomph spinigers present throughout, anchylosed falcigers present from chaetiger 12 to posterior end with three anchylosed falcigers on anterior chaetigers, two on mid-body chaetigers and one along posterior chaetigers. Neurochaetae dorsal fascicle: homogomph spinigers present throughout, heterogomph spinigers present on chaetigers 1–4, short-bladed heterogomph falcigers with recurved tip and serrations present throughout except chaetigers 1–4. Neurochaetae ventral fascicle: heterogomph spinigers present on chaetigers 1–4 and mid-body to posterior chaetigers, short-bladed heterogomph falcigers with recurved tip and serrations present throughout except chaetigers 1–4 (Fig. 6A–F).

Type locality: Jihuei, Taitung City, Taiwan.

Distribution: Known only from the type locality.

Remarks: *Platynereis jihueiensis* sp. nov. is similar to *P. bicanaliculata* (Baird, 1863) and *P. shihmenensis* sp. nov., which have bifid tip of notopodial anchylosed falcigers (Imajima 1972: 77–78, fig. 18i; Sun and Young 2004: 212, fig. 122H; Fig. 6B). However, *P. jihueiensis* sp. nov. differs from *P. bicanaliculata* by having: 1) one to two parallel transverse rows of pectinate paragnaths in Area III (versus a broad oval patch); 2) six to seven parallel transverse rows and one oblique row of pectinate paragnaths in Area IV (versus a crescentic group of four or five rows); 3) seven groups of pectinate paragnaths, middle groups each with three parallel transverse rows and two outer most groups each with one or two paragnaths in Areas VII–VIII (versus seven groups, each group with two transverse rows); and 4) dorsal cirrus shorter than dorsal ligule in

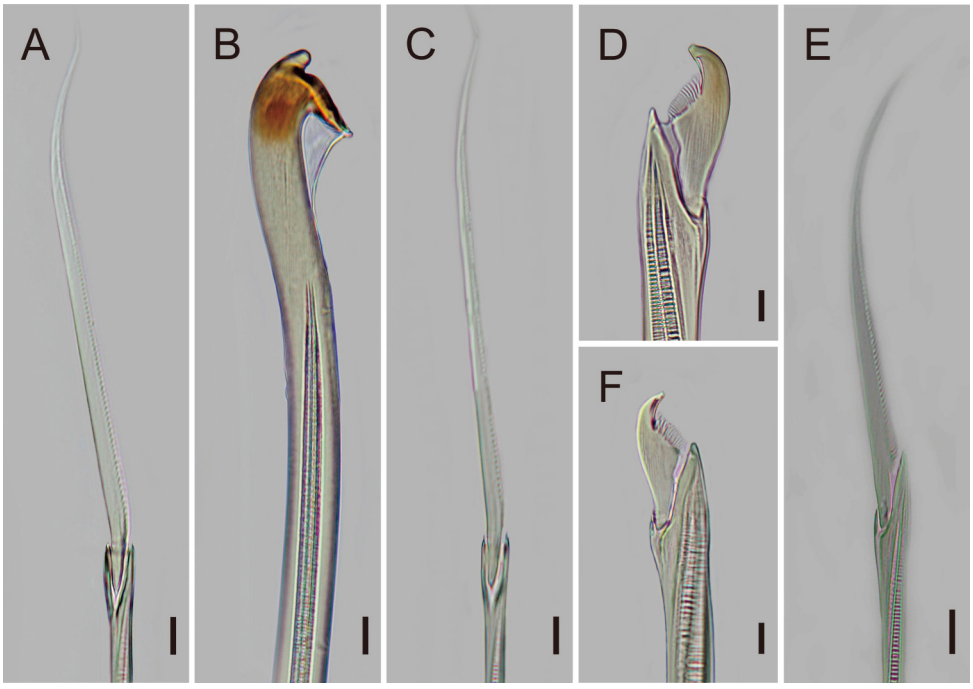

Fig. 6. *Platynereis jihueiensis* sp. nov.; holotype (NMNS 8390-3): A, notochaeta, homogomph spiniger, chaetiger 50; B, notochaeta, anchylosed falciger, chaetiger 30; C, neurochaeta of dorsal fascicle, homogomph spiniger, chaetiger 50; D, neurochaeta of dorsal fascicle, short-bladed heterogomph falciger, chaetiger 50; E, neurochaeta of ventral fascicle, heterogomph spiniger, chaetiger 69; F, neurochaeta of ventral fascicle, short-bladed heterogomph falciger, chaetiger 50. Scale bars: A–F = 0.01 mm.

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posterior chaetigers (versus longer than dorsal ligule) (Imajima 1972: 77–78, fig. 18d, h; Fig. 4C, D, F). The morphological differences between *P. jihueiensis* sp. nov. and *P. shihmenensis* sp. nov. are discussed below.

***Platynereis shihmenensis* sp. nov.**

(Figs. 7A–C, 8A–F, 9A–F)
urn:lsid:zoobank.org:act:2DFD4A22-7215-4F0A-A01B-323223F7F76E

Material examined: Holotype: NMNS8390-4, Shihmen (25°17.84'N 121°34.23'E), New Taipei City, Taiwan, intertidal rocky habitats, coll. P.-W. Hsueh, 2 Nov. 2003.

Etymology: The name is derived from the name of the nearby village, Shihmen, where the worm was collected.

Diagnosis: *Platynereis* with longest tentacular cirri reaching chaetiger 9. Light brown jaws, each with 5–6 lateral teeth; paragnath pattern: I = 0; II = 0; III = 0; IV = 4 parallel transverse rows and one oblique row of pectinate paragnaths toward jaws (left), 4 parallel transverse rows and one oblique row of pectinate paragnaths toward jaws (right); V = 0; VI = 3 non-parallel rows of pectinate paragnaths (left), 4 non-parallel transverse rows of pectinate paragnaths (right); VII–VIII = 5 groups of parallel transverse rows of pectinate paragnaths, middle groups each with 1–2 rows and 2 outer most groups each with 1 paragnath. Notopodial prechaetal lobe present throughout. Neuropodial postchaetal lobe present throughout. Notochaetae with homogomph spinigers throughout, anchylosed falciger present from chaetiger 11 to posterior end with one anchylosed falciger on each chaetiger throughout. Neurochaetae with homogomph spinigers throughout; dorsal fascicle with heterogomph spinigers on chaetigers 1–4, short-bladed heterogomph falcigers with recurved tip and serrations present throughout except chaetigers 1–4; ventral fascicle with heterogomph spinigers on chaetigers 1–4 and mid-body to posterior chaetigers, short-bladed heterogomph falcigers with recurved tip and serrations present throughout except chaetigers 1–4.

Description: Holotype complete, 37.0 mm long, 75 chaetigers, chaetiger 10 width 1.5 mm, excluding parapodia; beige in alcohol (Fig. 7A–B). Prostomium longer than wide, lateral antennae as long as palps; palpophores globose, palpostyles conical, four pairs of

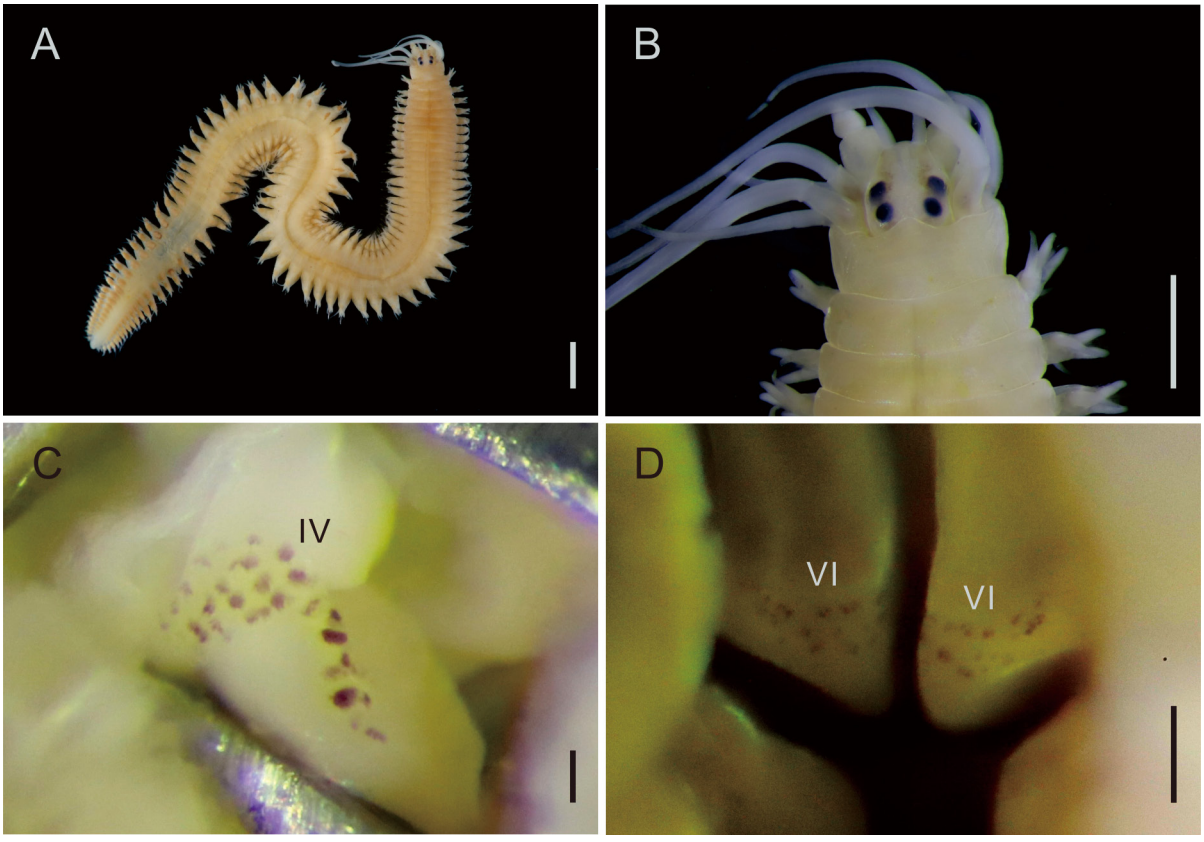

Fig. 7. *Platynereis shihmenensis* sp. nov.; holotype (NMNS 8390-4): A, whole animal; B, anterior body; C, close-up of Area IV, right side; C, close-up of Area VI. Scale bars: A = 2.0 mm; B = 1.0 mm; C–D = 0.1 mm.

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tentacular cirri, longest one reaching chaetiger 9. Two pairs of eyes, in trapezoidal arrangement, subequal in size. Tentacular belt about twice longer than chaetiger 1. Pharynx with light brown jaws, each with 5–6 teeth; paragnath pattern: I = 0; II = 0; III = 0; IV = 4 parallel transverse rows and one oblique row of pectinate paragnaths toward jaws (left), 4 parallel transverse rows and one oblique row of pectinate paragnaths toward jaws (right) (Fig. 7C); V = 0; VI = 3 non-parallel rows of pectinate paragnaths (left), 4 non-parallel transverse rows of pectinate paragnaths (right) (Fig. 7D); VII–VIII = 5 groups of parallel transverse rows of pectinate paragnaths, middle groups each with 1–2 rows and 2 outer most groups each with 1 paragnath. Ridge pattern of Areas VI–V–VI, υ-shaped (Fig. 7D).

Dorsal cirri tapered, basally attached to dorsal ligule throughout, about 1.0–1.1 times longer than dorsal ligule on anterior to mid-body chaetigers, about 0.9 times as long as dorsal ligule on posterior chaetigers (Fig. 8A–F). Small glandular patches present along the inner surface of dorsal cirri on mid-body to posterior chaetigers (Fig. 8E). Notopodial prechaetal lobe present throughout (Fig. 8A–F).

Dorsal ligule subconical on chaetigers 1–4, conical on chaetigers 5–10, triangular, blunt thereafter (Fig. 8A–F); base of dorsal ligule slightly elongate, broader on mid-body to posterior chaetigers; small, beige glandular patches present on anterior chaetigers, glandular patches becoming light yellow, enlarged and fused into large mass on mid-body to posterior chaetigers (Fig. 8A–F).

Median ligule subconical on chaetigers 1–4, conical on chaetigers 5–10, subconical with round tipped thereafter (Fig. 8A–F).

Neuroacicular ligules subequal in length

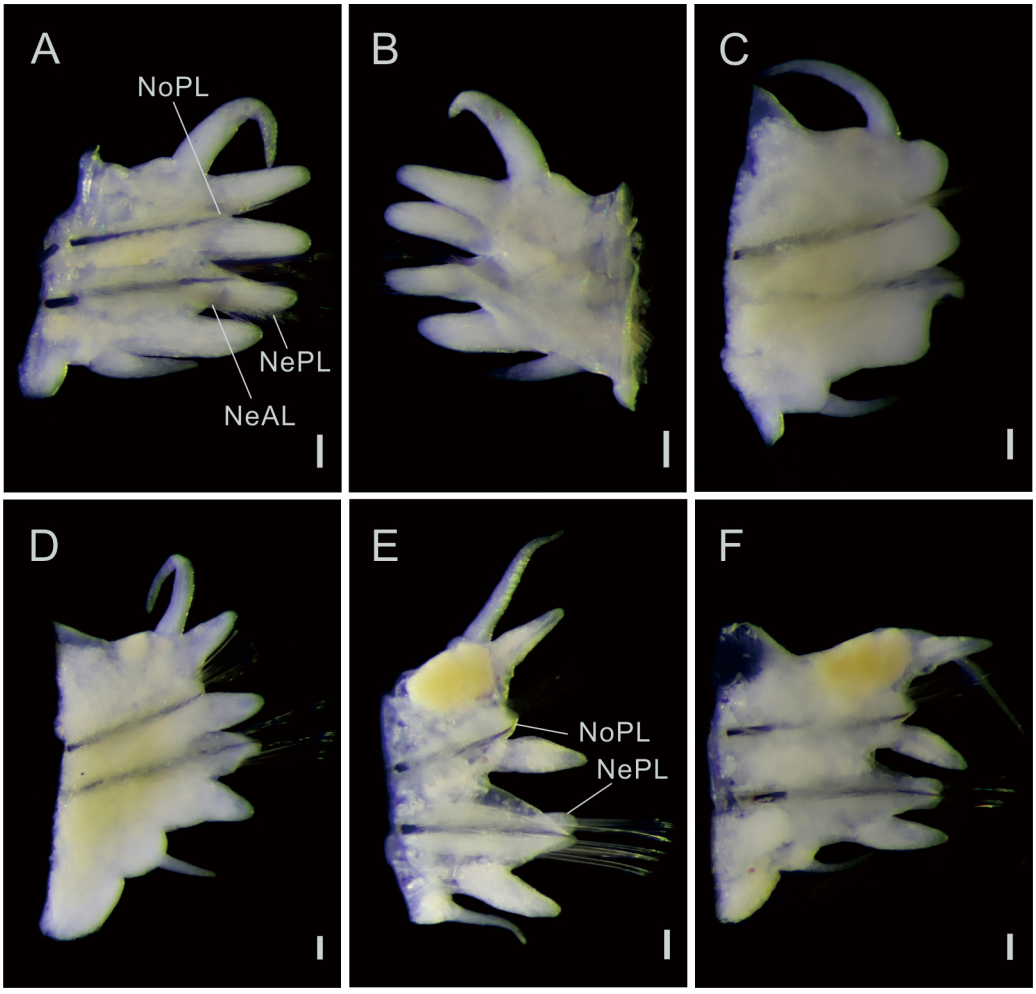

Fig. 8. *Platynereis shihmenensis* sp. nov.; holotype (NMNS 8390-4): A, right parapodium, anterior view, chaetiger 4; B, right parapodium, posterior view, chaetiger 4; C, right parapodium, anterior view, chaetiger 8; D, right parapodium, anterior view, chaetiger 11; E, right parapodium, anterior view, chaetiger 35; F, right parapodium, anterior view, chaetiger 50. Abbreviation: NeAL, neuropodial acicular lobe; NePL, neuropodial postchaetal lobe; NoPL, notopodial prechaetal lobe. Scale bars: A–F = 0.1 mm.

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throughout. Neuropodial postchaetal lobe present throughout, about 2.5 times longer than neuroacicular ligule on chaetigers 1–4, as long as neuroacicular ligule thereafter (Fig. 8A–F).

Ventral ligule subconical throughout, truncate along chaetigers 5–10. Ventral cirri mid-ventrally attached to ventral edge of parapodia, about 0.7–0.8 times as long as ventral ligule throughout (Fig. 8A–F).

Notochaetae present from chaetiger 3 to posterior chaetigers, homogomph spinigers present throughout, anchylosed falcigers present from chaetiger 11 to posterior end with one anchylosed falciger on each chaetiger throughout. Neurochaetae dorsal fascicle: homogomph spinigers present throughout, heterogomph spinigers present on chaetigers 1–4, short-bladed heterogomph falcigers with recurved tip and serrations present throughout except chaetigers 1–4. Neurochaetae ventral fascicle: heterogomph spinigers present on chaetigers 1–4 and mid-body to posterior chaetigers, short-bladed heterogomph falcigers with recurved tip and serrations present throughout, except chaetigers 1–4 (Fig. 9A–F).

Type locality: Shihmen, New Taipei City, Taiwan.

Distribution: Known only from the type locality.

Remarks: Of the nine currently known *Platynereis* to East Asia, *P. jihueiensis* sp. nov. is the only species with Area IV paragnath pattern somewhat similar to that of *P. shihmenensis* sp. nov., which both species have several parallel transverse rows and one oblique row of pectinate paragnaths in Area IV (Figs. 4C, 7C). *Platynereis shihmenensis* sp. nov., however, can be distinguished from *P. jihueiensis* sp. nov. by having: 1) no pectinate paragnaths in Area III (versus three groups of pectinate paragnaths, each group with one or two transverse rows); 2) four transverse rows of pectinate paragnaths in Area IV (versus 6–7 transverse rows); 3) three to four non-parallel transverse rows of pectinate paragnaths in Area VI (versus three parallel transverse rows); 4) five groups of transverse rows of pectinate paragnaths in Areas VII–VIII, middle groups each with 1–2 rows and two outer most groups each with one paragnath (versus seven groups of pectinate paragnaths, middle groups each with three rows and two outer most groups each with one and two paragnaths); and 5) one notopodial homogomph falciger present in each parapodium of all body regions (versus three, two and one notopodial homogomph falciger present in each parapodium of anterior, mid-body and posterior chaetigers, respectively) (Figs. 4C–F, 7C–D).

DISCUSSION

Villalobos-Guerrero (2019) proposed using

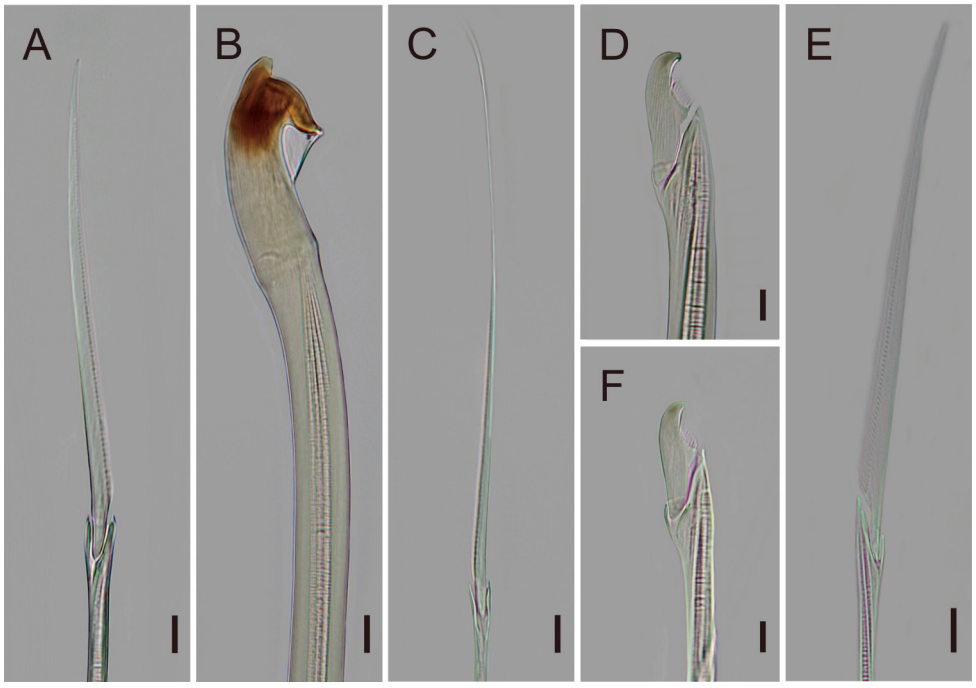

Fig. 9. *Platynereis shihmenensis* sp. nov.; holotype (NMNS 8390-4): A, notochaeta, homogomph spiniger, chaetiger 35; B, notochaeta, anchylosed falciger, chaetiger 65; C, neurochaeta of dorsal fascicle, homogomph spiniger, chaetiger 65; D, neurochaeta of dorsal fascicle, short-bladed heterogomph falciger, chaetiger 65; E, neurochaeta of ventral fascicle, heterogomph spiniger, chaetiger 65; F, neurochaeta of ventral fascicle, short-bladed heterogomph falciger, chaetiger 65. Scale bars: A–F = 0.01 mm.

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the ridge pattern of Areas VI–V–VI as an additional character for separating congeners in the *Perinereis nuntia* complex. Hsueh (2021) noted that the above-mentioned character is also useful for differentiating *Pseudonereis jihueiensis* Hsueh, 2021 from *P. kihawensis* Hsueh, 2021. However, this character cannot be applied to distinguish the three new *Platynereis*, which all have the same type of υ-shaped ridge pattern in Areas VI–V–V.

CONCLUSIONS

Three new species of *Platynereis* are described in present study. The total number of *Platynereis* described and reported from East Asia are increased to four and nine, respectively. The results of this study provide new information for a better understanding of the diversity of *Platynereis* in Taiwan, which has been overlooked.

Key to *Platynereis* reported from East Asia (modified from Sun and Yang 2004)

1. Notopodial homogomph or anchylosed falcigers present in adults 2
- Notopodial homogomph or anchylosed falcigers absent in adults 6
2. Notopodial with homogomph falcigers, recurved tip 3
- Notopodial with anchylosed falcigers, bifid tip 4
3. Area VI and Areas VII–VIII with two transverse rows of pectinate paragnaths ..... *P. dumerilii* (Audouin et Milne-Edwards, 1834)
- Area VI and Areas VII–VIII with one transverse row of pectinate paragnaths ..... *P. pulchella* Gravier, 1901
4. Area III with a broad, oval patch of pectinate paragnaths ..... *P. bicanaliculata* (Baird, 1863)
- Area III without a broad, oval patch of pectinate paragnaths 5
5. Area III with three groups of pectinate paragnaths, Area VI with three parallel transverse rows of pectinate paragnaths ..... *P. jihueiensis* sp. nov.
- Area III without pectinate paragnaths, Area VI with three to four non-parallel rows of pectinate paragnaths ..... *P. shihmenensis* sp. nov.
6. Area III with pectinate paragnaths 7
- Area III without pectinate paragnaths 8
7. Tapered dorsal cirri on anterior-most chaetigers; dorsal cirri always shorter than dorsal ligule in posterior chaetigers ..... *P. hemeiensis* sp. nov.
- Stout dorsal cirri on anterior-most chaetigers; dorsal cirri always longer than dorsal ligule in posterior chaetigers ..... *P. australis* (Schmarda, 1861)
8. Pectinate paragnaths of Areas VI–VIII in clusters ..... *P. sinica* Sun, Shen and Wu, 1978
- Pectinate paragnaths of Areas VI–VIII in transverse rows ..... *P. abnormis* (Horst, 1924)

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Competing interests: PWH declares that he has no conflict of interests.

Availability of data and materials: Holotypes are deposited in the National Museum of Natural Sciences, Taiwan.

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Ethics approval consent to participate: Not applicable.

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