



The Oweniidae (Annelida; Polychaeta) from Lizard Island (Great Barrier Reef, Australia) with the description of two new species of *Owenia* Delle Chiaje, 1844

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Abstract

Study of the Oweniidae specimens (Annelida; Polychaeta) from Lizard Island (Great Barrier Reef, Australia) stored at the Australian Museum, Sydney and newly collected in August 2013 revealed the presence of three species, namely *Galathowenia quelis* Capa *et al.*, 2012 and two new species belonging to the genus *Owenia* Delle Chiaje, 1844. *Owenia dichotoma* n. sp. is characterised by a very short branchial crown of about 1/3 of thoracic length which bears short, dichotomously-branched tentacles provided with the major division close to the base of the crown. *Owenia picta* n. sp. is characterised by a long branchial crown of about 4/5 of thoracic length provided with no major divisions, ventral pigmentation on thorax and the presence of deep ventro-lateral groove on the first thoracic chaetiger. A key of *Owenia* species hitherto described or reported in South East Asia and Australasia regions is provided based on characters of the branchial crown.

Key words: Polychaeta, Oweniidae, *Owenia*, *Galathowenia*, coral reef, new species, Australia

Introduction

Oweniidae is a small group of widely distributed suspension and detritivorous polychaetes that comprises four genera (*Galathowenia* Kirkegaard, 1959, *Myriochele* Malmgren, 1867, *Myriowenia* Hartman, 1960, and *Owenia* Delle Chiaje, 1844) and about 59 species (Capa *et al.* 2012). A fifth genus, *Myrioglobula* Hartman, 1967, is considered here a junior synonym of *Myriochele* (Capa *et al.* 2012).

Most findings of Oweniidae from Southern Asia, the Indo-Malay archipelago and Australia during the 19th and 20th century (Fig. 2) were reported as *Owenia fusiformis* Delle Chiaje, 1844, a species originally described from the Mediterranean Sea (Australian West: Hartmann-Schröder 1979, 1980, 1981; Indonesia: Caullery 1944; South Vietnam: Gallardo 1967, as cf.; Solomon Islands: Gibbs 1971; Singapore: Vohra (1972 in Tan & Chou 1993); Japan: Imajima & Morita 1987). In Indonesia, Kirkegaard (1956) also reports *Owenia lobopigidiata* Uschakov, 1950 (originally described from the Sea of Okhotsk). Other genera have also been recorded in the area. For instance, Imajima & Morita (1987) reported three species described from far geographical areas: *Myriochele heeri* Malmgren, 1867 (type locality: Spitsbergen, Norway), *Galathowenia oculata* (Zachs, 1923) (White Sea) and *Galathowenia wilsoni* Blake, 1984 (= *Galathowenia scotiae* (Hartman, 1978); Antarctic seas). New species of oweniids were nevertheless described during the past century, namely *Galathowenia eurystoma* (Caullery, 1944) (Indonesia), *Myriochele heruensis* Gibbs, 1971 (Solomon Islands) and *Galathowenia haplosoma* (Gibbs, 1972) (Cook Islands), but none corresponded to *Owenia*.

At the beginning of this century, the cosmopolitan distribution of *O. fusiformis* is rejected from critical revision of stored and newly collected material along the Indo-Pacific, which also results in the description of a substantial number of new taxa. For instance, *Owenia gomsoni* Koh & Bhaud, 2001 is described from South Korea and *Owenia petersenae* Koh & Bhaud, 2003 from New Zealand (Koh & Bhaud 2001, 2003). Three further species of *Owenia* are described in Australia by Ford & Hutchings (2005) from specimens previously referred to as *Owenia*

fusiformis by Dauvin & Thiébaud (1994); *O. australis* Ford & Hutchings, 2005, *O. bassensis* Ford & Hutchings, 2005 and *O. mirrawa* Ford & Hutchings, 2005. Martin *et al.* (2006) describe *Owenia persica* Martin *et al.*, 2006 from the Persian Gulf. Recently, three new species of *Galathowenia* (*G. annae* Capa *et al.*, 2012; *G. arafurensis* Capa *et al.*, 2012 and *G. quelis* Capa *et al.*, 2012), and one belonging to *Myriochele* (*M. australiensis* Capa *et al.*, 2012) have been described from material deposited in the Australian Museum.

In August 2013, a workshop on polychaete taxonomy was carried out in Lizard Island (NE Australia) after the 11th International Polychaete Conference held in Sydney. The study of the Oweniidae material obtained around the island during that workshop, together with that previously collected there and stored in the Australian Museum, revealed the presence of three species. Thus, *G. quelis* is newly recorded and two new species of *Owenia* are described herein and compared with other Australian and Indo-West Pacific species.

Material and Methods

This study is based on the Oweniidae specimens collected from several intertidal and subtidal locations in the immediate vicinity of Lizard Island (LI) and outer barrier in the Great Barrier Reef Lagoon (NE Australia) in August 2013, also including other previous sampling campaigns. Most of the sampling sites were distributed around LI lagoon and off west coast, which are protected from dominant SE winds (Fig. 1A). All the material belongs to the collections of the Australian Museum, Sydney (AM).

Sediment samples were taken directly from the bottom by means of snorkelling and scuba diving. Most specimens were fixed in 4% formaldehyde-seawater solution, and preserved in 70% ethanol. Selected specimens were fixed in 95% ethanol for eventual molecular studies. Light microscopy observations and drawings were made using an OLYMPUS SZX9 stereomicroscope and an OLYMPUS BX40 compound microscope. Specimens used for examination with Scanning Electron Microscopy (SEM) were dehydrated in a graded ethanol series, prepared by critical-point drying using CO₂, mounted on aluminium stubs, covered with gold in a BAL-TEC SCD 004 evaporator, and examined and photographed under a JEOL JSM-6400 scanning electron microscope at the Servicios de Apoyo á Investigación (SAI), University of A Coruña-UDC, Spain.

Materials are deposited at the Australian Museum, Sydney (AM). The list of the examined material provided for each species includes the museum registration number, the ID of sampling localities and locality descriptions. Locality descriptions of material collected during the August 2013 collection trip (MI QLD 2329 – MI QLD 2449) are listed in Ribas & Hutchings (2015). Number of specimens under each registration number is one unless otherwise specified.

Abbreviations used in the text, figures and figure legends:

bc—branchial crown; bx—biramous segment x; b1—biramous chaetiger 1; c-collar; CH-chaetiger; C/T ratio—crown/thorax length ratio; dl—lobe between first pair of crown tentacles in dorsal view; e.t.—empty tubes; g1—groove at base of uniramous segment 1; l—left tentacle; r—right tentacle; RLTS—relative length of thoracic segments; tpx—tentacle pair x; ux—uniramous segment x; u1-3—uniramous chaetigers 1-3; vl—lobe between fourth pair of crown tentacles in ventral view.

We follow here the terminology for segments and branchial crown features used by Ford & Hutchings (2005) and Capa *et al.* (2012).

Results

Family Oweniidae Rioja, 1917

Genus *Galathowenia* Kirkegaard, 1959

Type-species. *Galathowenia africana* Kirkegaard, 1959

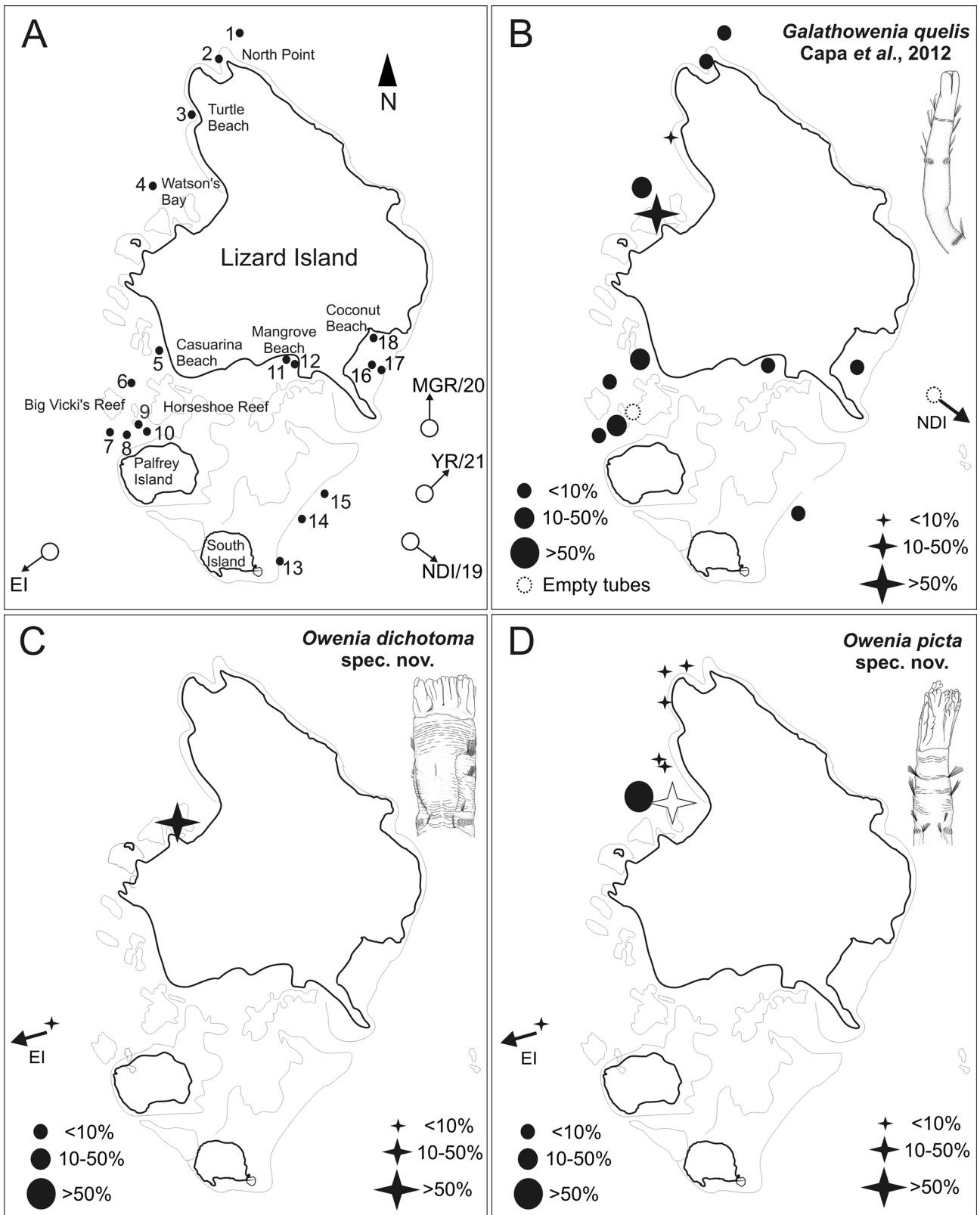


FIGURE 1. Map of the study area showing collecting sites of *Galathowenia* and *Owenia* species described or reported in this work. In (B–D) arrows facing to cross-shelf sampling sites: EI = Eagle Island; NDI = North Direction Island. Dots refer to material collected during LI Workshop held in August 2013; stars refer to AM material; white star refers to type locality of *O. picta* n. sp.

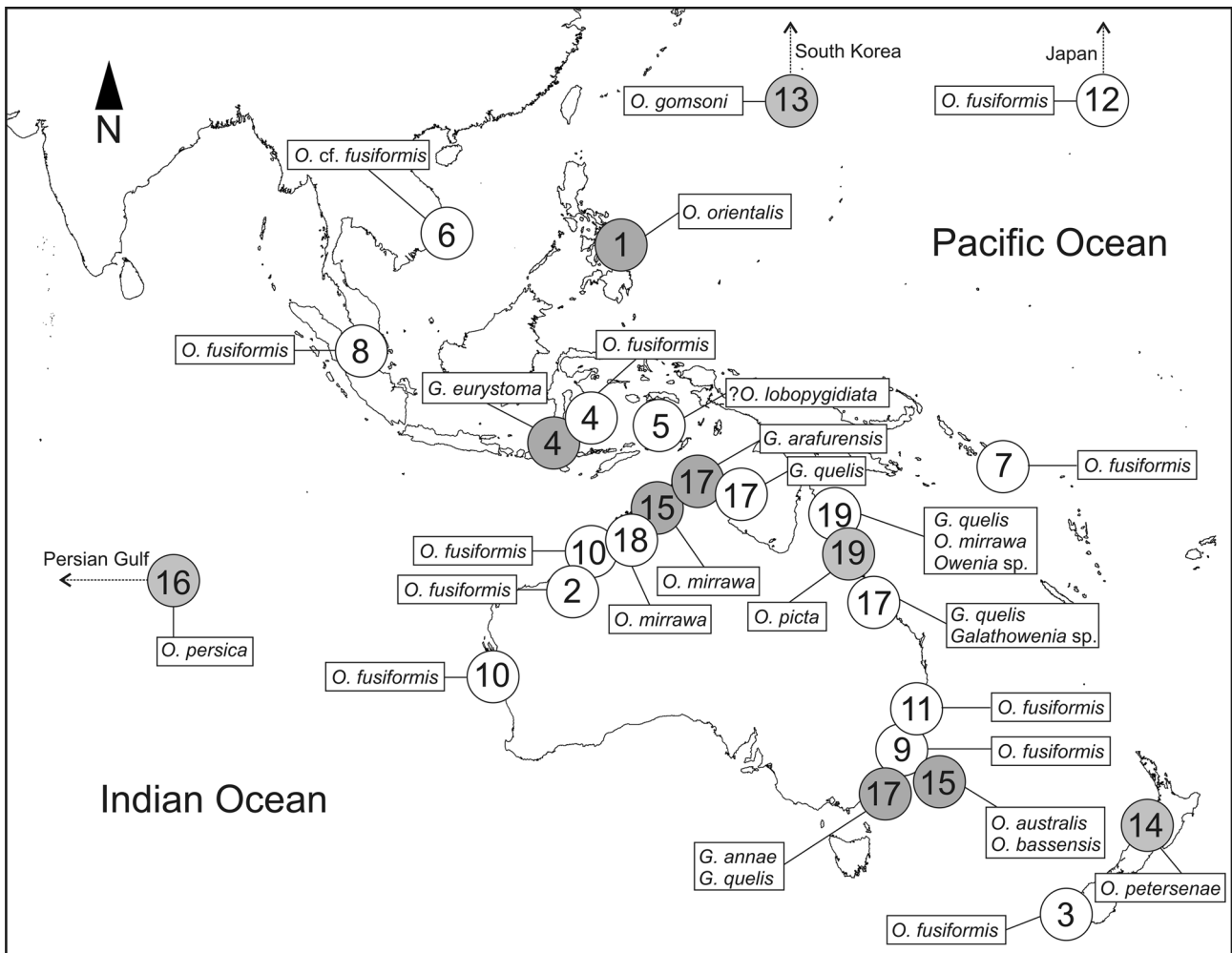


FIGURE 2. World map showing species of *Galathowenia* and *Owenia* described (grey circles) or reported (white circles) in East Asia, Australasia and nearby regions. 1. Grube (1878); 2. Augener (1922); 3. Augener (1926); 4. Caullery (1944); 5. Kirkegaard (1956); 6. Gallardo (1967); 7. Gibbs (1971); 8. Vohra (1972 in Tan & Chou 1993); 9. Hutchings & Rainer (1979); 10. Hartmann-Schröder (1979, 1980, 1981); 11. Hutchings & Murray (1984); 12. Imajima & Morita (1987); 13. Koh & Bhaud (2001); 14. Koh & Bhaud (2003); 15. Ford & Hutchings (2005); 16. Martin *et al.* (2006); 17. Capa *et al.* (2012); 18. Hutchings *et al.* (2014); 19. This study.

Galathowenia quelis Capa, Parapar & Hutchings, 2012

(Figs 1B, 2–5)

Material examined. Thirty-two specimens in 24 samples plus a number of empty tubes. AM W.41287 (20), sand, 6.5 m; AM W.41322, MI QLD 2144 (10+ fixed in EtOH), sand, 6.5 m; AM W.43729 (4), 3.6 m; AM W.43897, MI QLD 2334 (3); AM W.43899, MI QLD 2333, e.t.; AM W.44106, MI QLD 2345, fixed in EtOH; AM W.44108, MI QLD 2355; AM W.44110, MI QLD 2340 (3); AM W.44116, MI QLD 2347; AM W.44239, MI QLD 2374, e.t.; AM W.44240, MI QLD 2373 (4); AM W.44242, MI QLD 2367, e.t.; AM W.44245, MI QLD 2363, e.t.; AM W.44295, MI QLD 2376 (4); AM W.44297, MI QLD 2373; AM W.44549, MI QLD 2391; AM W.44698, MI QLD 2414; AM W.44700, MI QLD 2415; AM W.44703, MI QLD 2419; AM W.45128, MI QLD 2432; AM W.45132, MI QLD 2439, fixed in EtOH; AM W.45134, MI QLD 2433; AM W.45135, MI QLD 2437, fixed in EtOH; AM W.47383, MI QLD 2440 (2 fixed in EtOH); AM W.45400, MI QLD 2441; AM W.45401, MI QLD 2441, fixed in EtOH; AM W.45406, MI QLD 2443, e.t.; AM W.45410, MI QLD 2444; AM W.45466, MI QLD 2445; AM W.45860 (6), sand, 3 m; AM W.45863 (50), sand, 3 m; AM W.45866 (7), medium to fine sediment, 18 m; AM W.45867 (7), sand, 3 m; AM W.45869 (6), 3 m; AM W.45870 (10), sand, 3m; AM W.45872 (25), medium sand, 3 m; AM W.45874 (7), sand, 3 m; AM W.45907 (5), organic material, 1.8 m; AM W.45908 (4), 3 m; AM W.45909, 3 m; AM W.45910 (2),

medium sand, 3 m; AM W.45911 (2), seagrasses, 21.2 m; AM W.45914, fine sediment, 10.6 m; AM W.45915, medium sand, 3 m; AM W.45916, fine sediment, 10.6 m; AM W.45920 (3), medium sand, 3 m; AM W.45921 (3), medium sand, 3 m; AM W.45922, fragments, filamentous algae; AM W.45923 (10), medium sand, 3 m; AM W.45911 (2), seagrass, 21.2 m; AM W.45912 (4), organic material, 1.8 m; AM W.45913, coarse to medium sand, 4.5 m; AM W.45918 (2), coarse to medium sand, 3 m; AM W.45919, fine sticky sediment, 12 m; AM W.47384, sand, 3 m, on SEM stub; AM W.47385, sand, 6.5 m, on SEM stub; AM W.47386, muddy sand, 5 m, on SEM stub.

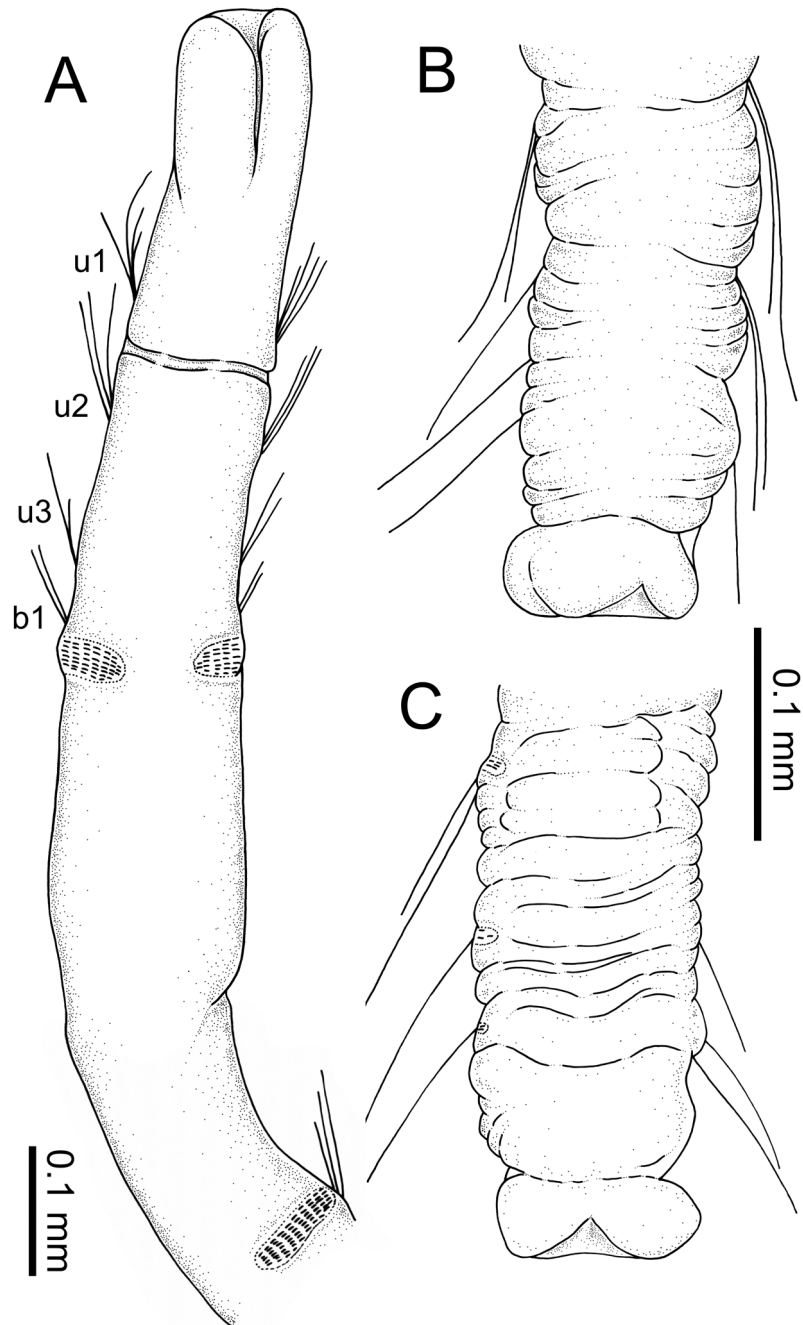


FIGURE 3. *Galathowenia quelis* Capa *et al.*, 2012 (AM W.45866). A. Anterior end, ventral view; B. Posterior end, dorsal view; C. Posterior end, ventral view.

Remarks. Specimens collected were small sized but still showing clearly the most diagnostic characters of *G. quelis*: body slender and thread-like, about 0.2 mm wide, with eyespots, and anterior region with three uniramous segments being the second chaetiger (u2) twice as long as u1 and u3 (RLTS: 1–2–1) (Figs 3A, 4A–B, D). The terminal mouth extends midventrally as an elongated slit which is profusely ciliated (Fig. 4C); its length is quite variable (cfr. Fig. 4B, D–E). The ventral surface of some specimens has a rough appearance which is likely due to

the presence of glandular cells (Fig. 4F). The size of the first biramous segments is as follows: b1 about 1.5 of all anterior uniramous segments (u1–u3) (Fig. 3A); b2 is the longest segment (near b1); b3 is about 3/4 of b2. Several specimens were regenerating both the anterior and posterior ends, while others were not; in the latter it could be distinguished the characteristic two blunt lobes located each side of anus (Figs 3C–D, 5D–E). These lobes are particularly visible ventrally (Figs 3C, 5D) and less marked dorsally, showing a low rim (Fig. 5E) as referred by Capa *et al.* (2012; Fig. 4K–M). Fine ornamentation of notochaetae (scale covering of capillary chaetae; Fig. 5A) and neuropodial uncini (bifid uncinus with two nearly equally convex teeth, one offset slightly higher than the other and arranged in an oblique row; Fig. 5B–C) agrees with that of the original description (Capa *et al.* 2012). The tube is composed by a thin secreted layer encrusted with sand grains (Fig. 5F). Unlike Capa *et al.* (2012), no parasitic copepods were observed in the Lizard Island specimens.

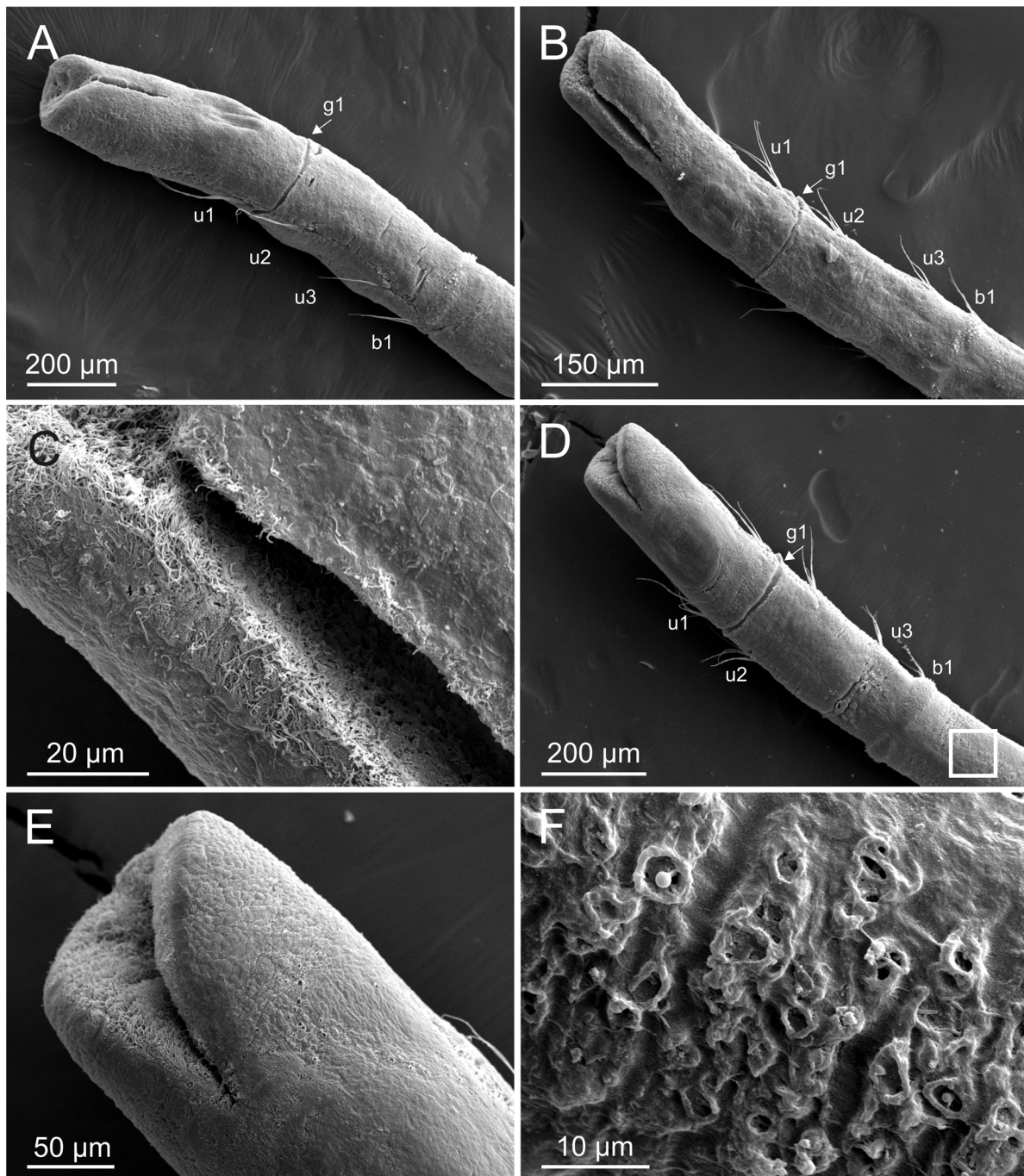


FIGURE 4. *Galathowenia quelis* Capa *et al.*, 2012 SEM micrographs (AM W.47386, AM W.41287 and AM W.45867). A–B. Anterior end, latero-ventral view; C. Detail of mouth ciliature of (B); D. anterior end, latero-ventral view; E. Detail of mouth ciliature of (D); F. Detail of body surface.

Habitat. From intertidal to 25 m depth, mostly on sandy and muddy sand, widely distributed in the studied area (Fig. 1B).

Distribution. *Galathowenia quelis* shows a wide distribution across Australia, along the eastern coast in Botany Bay to the North up to Brisbane, being also present in the Arafura Sea (Capa *et al.* 2012). This record in Lizard Island confirms its presence in the Coral Sea north of Cairns.

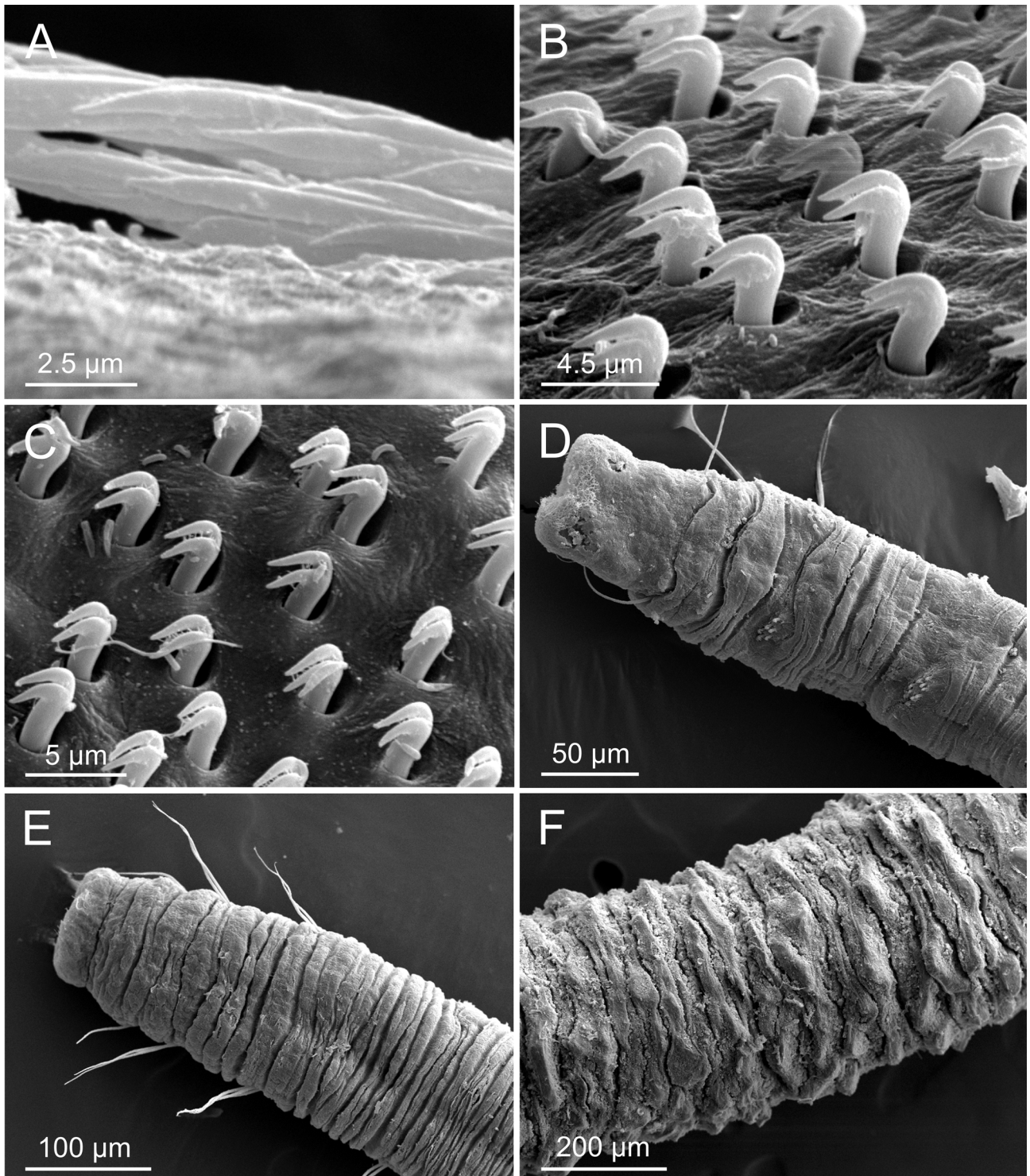


FIGURE 5. *Galathowenia quelis* Capa *et al.*, 2012. SEM micrographs (AM W.47386, AM W.41287 and AM W.45867). A. Scale covering of thoracic notopodial capillary chaetae; B–C. Abdominal neuropodial hooks, oblique view; D. Posterior region, ventral view; E. Posterior region, dorsal view; F. Tube covering.

Genus *Owenia* Delle Chiaje, 1844

Type-species. *Owenia fusiformis* Delle Chiaje, 1844

The study of the Lizard Island material allowed to provide additional information to the still confused situation of the actual diversity of the genus *Owenia* in NE Australia. Ford & Hutchings (2005) stated that “The material from Lizard Island exhibit a combination of features of the three species described in the article ... The nature of the material from Lizard Island could not be resolved and additional material is needed to resolve this status.” Thus, our examination of this and newly collected material has revealed that none of the three species reported by Ford & Hutchings (2005) is apparently present in Lizard Island, belonging, in turn, to two formally undescribed species.

Owenia dichotoma n. sp.

(Figs 1C, 2, 6, 7)

Material examined. Holotype: AM W.45857, fine sediment, 12 m. Paratypes: AM W.424, 2 m; AM W.45858, sand, 9 m; AM W.45859, fine sand, 12 m; AM W.45861, medium sand, 3 m; AM W.47387, median abdominal fragment on SEM stub.

Description. Based on holotype. Body elongated; 16 mm long, 1.0 mm wide, incomplete, with 9 chaetigers. Branchial crown very short; provided with four pairs of tentacles, each tentacle with larger ramification close to crown base thus appearing as if eight pairs of short tentacles present (Fig. 6A); second dichotomy very close to distal end. Total length of crown about 1/3 of thorax length (C/T ratio \approx 0.33). A pair of very small eye spots located at the base of the crown (Fig. 6B). Junction between thorax and tentacle crown marked by a distinct, straight collar, closely aligned with body wall, slightly overlapping base of crown. Crown and thorax of similar width. RLTS: 1–2–1. Thorax with three pairs of poorly developed notopodia with capillary chaetae. Notochaetae with shafts composed of densely packed scales. Thoracic neuropodia absent. Width of each abdominal segment decreasing posteriorly, being posterior segments short and compact. Abdominal notopodia poorly developed with capillary chaetae similar to thoracic notochaetae. Abdominal notochaetae arranged dorsally. Neuropodia consisting of wide sessile podia with several rows of neurochaetal hooks; tori almost encircling body except on dorsal surface between notochaetal bundles. First abdominal segment (b1) slightly longer than total thoracic length. Neurochaetal uncini similar through, consisting of hooks with shaft ending in two teeth side by side.

Preserved animals creamy white with no pigmentation. Tube coated by quartz grains and shell fragments piled on top of one another like roof tiles.

Variations. The holotype and the paratype W.424 were the only specimens still having a well-preserved crown of tentacles (Fig. 6). This paratype is a large incomplete specimen (25 mm long, 1.2 mm wide, with 9 chaetigers) which shows more irregular ramifications on branchial crown (Fig. 6C–D) than those of the holotype (Fig. 6A–B). The paratype W. 45858 is wider (1.3 mm) than holotype and incomplete but still having 25 abdominal segments. On the other hand, paratype W.45861 is complete and showing the conspicuous decrease of the width of abdominal segments backwards, being posterior segments short and compact; it bears 22 abdominal segments and the pygidium is multilobed (ca. 6 lobes). Unfortunately, lack of specimens has led to use only one abdominal fragment for SEM study which allowed to study the morphology of chaetae but did not provide suitable images.

Remarks. The closest species to *O. dichotoma* n. sp. are *O. mirrawa* and *O. fusiformis sensu* Imajima & Morita (1987). The most remarkable character of *O. dichotoma* n. sp. agrees with that highlighted by Ford & Hutchings (2005) for *O. mirrawa* (Fig. 7F): “the most distinguishable character is positioning of the ramifications close to the base of the tentacles, giving the impression of many pairs of tentacles, much more than the four pairs present”. However, the ratio between the total length of the branchial crown and the total thorax length (C/T ratio: 0.6) of *O. mirrawa* is higher than that of *O. dichotoma* n. sp. (C/T ratio: 0.3). Furthermore, *O. mirrawa* bears fewer abdominal chaetigers (11) than those of paratype W.45861 of *O. dichotoma* n. sp.

The new species also resembles *Owenia fusiformis sensu* Imajima & Morita (1987) (Fig. 7B) in the size and shape of the branchial crown. Thus, the crown of *O. fusiformis sensu* Imajima & Morita (1987) shows a similar C/T ratio and bears dichotomously branched tentacles; this species differs, however, from *O. dichotoma* n. sp. in having coloration both in the tentacles and in the dorsal anterior region (cfr. Fig. 2b–c in Imajima & Morita 1987).

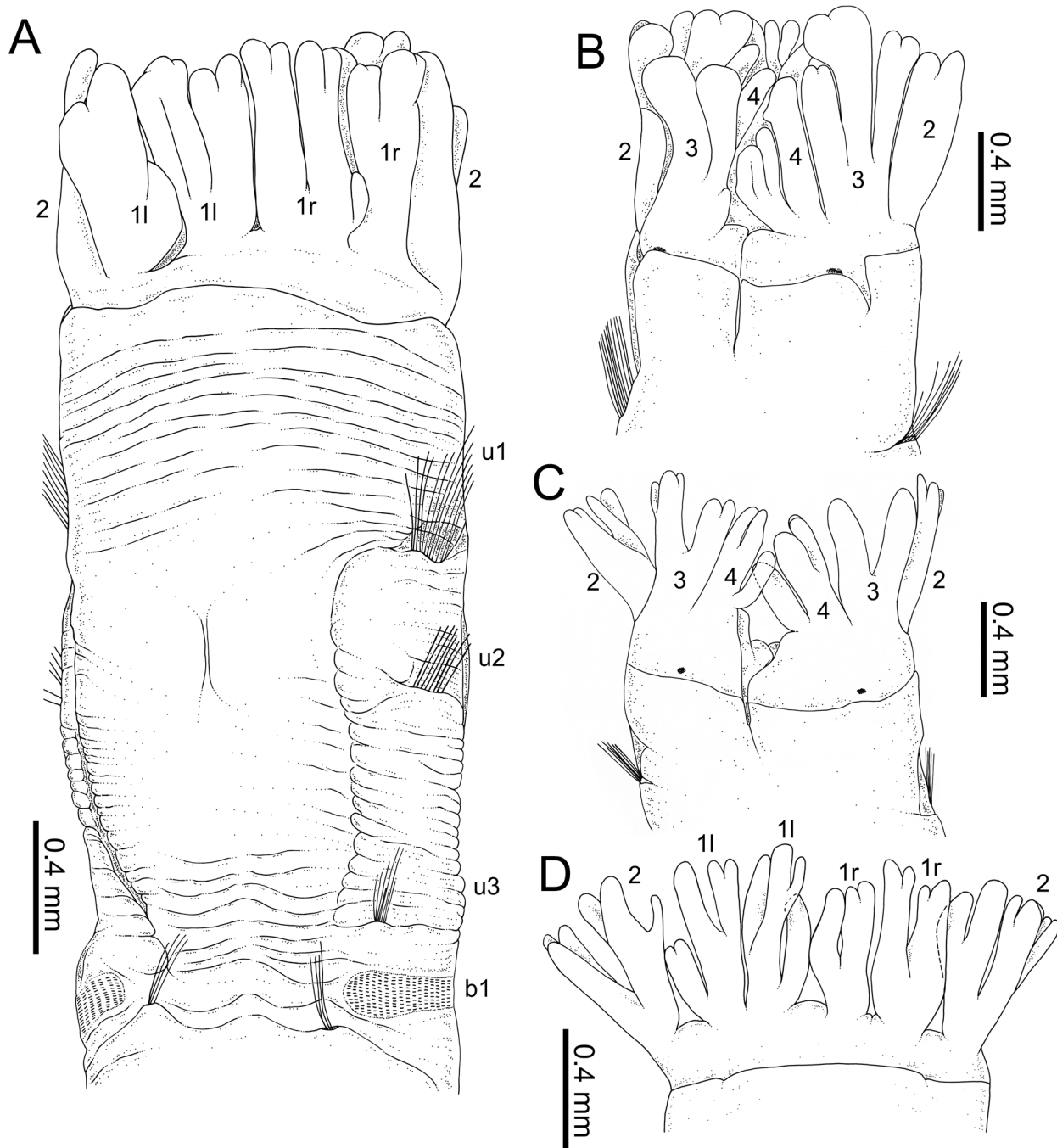


FIGURE 6. *Owenia dichotoma* n. sp. (A–B. holotype AM W.45857; C–D. paratype AM W.424). A. Anterior end, right dorso-lateral view; B. Detail of the branchial crown and u1, ventral view; C. Detail of the branchial crown and u1, ventral view; D. Detail of the branchial crown, dorsal view.

The Pacific species *Owenia collaris* Hartman, 1955, from Southern and Central California was recently re-described and illustrated by Blake (2000); the species resembles somehow to *O. dichotoma* n. sp. However, the former species seems closer to *O. gomsoni* (Fig. 7C) and *O. mirrawa* according to the size of the branchial crown (C/T ratio: 0.5; see key below). In addition, *O. collaris* differs in the body pigmentation and in the pattern of ramification of the branchial crown (cfr. Fig. 5.9.A in Blake 2000).

Etymology. The species name (“*dichotoma*”) refers to the dichotomous divisions of the tentacles of the branchial crown.

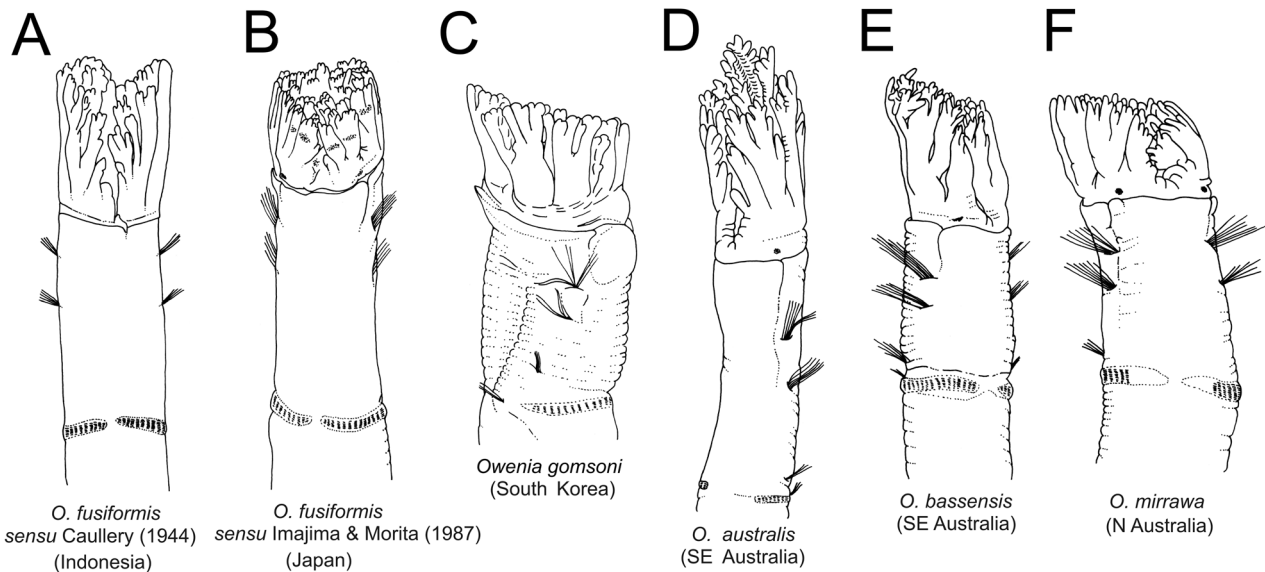


FIGURE 7. Anterior end in ventral view, of species of *Owenia* described or reported in the South East Asia and Australia, all redrawn from original; between brackets the collecting locality (A and B) or type locality (C–F). Organized alphabetically and by date. A. *O. fusiformis* (in Caullery 1944); B. *O. fusiformis* (in Imajima & Morita 1987); C. *O. gomsoni* (redrawn from a SEM micrograph in Koh & Bhaud 2001); D. *O. australis* (in Ford & Hutchings 2005); E. *O. bassensis* (in Ford & Hutchings 2005); F. *O. mirrawa* (in Ford & Hutchings 2005). *O. petersenae* Koh & Bhaud, 2003 was not included because it could not be redrawn from original pictures.

Habitat. From 2 to 12 m depth, on fine to medium sand in Watson’s Bay (Fig. 1C). Paratype W.424 was collected in Eagle Island, about 4 nautical miles SW from LIRS with no data available about sediment characteristics.

***Owenia picta* n. sp.**

(Figs 1D, 2, 7–11)

Material examined. Holotype: AM W.45875, stn. 2.4.2., coarse to medium sand, 4.5 m. Paratypes: AM W.36972, MI QLD 2198, sand, 9 m, fixed in EtOH; AM W.36973, MI QLD 2205, coral rubble, 14.5 m, fixed in EtOH; AM W.36974, MI QLD 2148, sediment, 9 m, in 95% EtOH; AM W.41320, MI QLD 2205, coral rubble, 14.5 m, fixed in EtOH; AM W. 41321, MI QLD 2198 (6 fixed in EtOH), sand, 9 m; AM W.45219, MI QLD 2440, fixed in EtOH; AM W.45403, MI QLD 2441 (2 fixed in EtOH); AM W.45856 (4), medium sand, 3 m; AM .45864, coarse to medium sand, 4.5 m; AM W.45865, medium to fine sand, 18 m; AM W.45868, coarse to medium sand, 4.5 m; AM W.45873, coarse to medium sand, 4.5 m; AM W.45876 (3), filamentous algae, 12 m; AM W.45862, filamentous algae, 12 m; AM W.45917, filamentous algae, 12 m; AM W.47388 (5), sand, 6.5 m; AM W.47385 (3), 2 m; AM W.47390, filamentous algae, 12 m, on SEM stub; AM W.47391, medium sand, 3 m, on SEM stub; AM W.47392, sand, 6.5 m, on SEM stub.

Description. Based on holotype. Body elongated; 26 mm long, 0.5 mm wide, with 22 chaetigers. Branchial crown with four pairs of tentacles (Figs 8A, 9A–C). Each tentacle with no major divisions; tips of tentacles with multiple small lobes provided with a distal sulcus (Fig. 10A–B) separating inner ciliated side from outer non-ciliated side. Crown almost as long as thorax (C/T ratio \approx 0.85). Pair of pale eye spots at ventral base of crown (Fig. 8B). Junction between thorax and tentacle crown marked by a distinct, straight collar closely aligned with body wall, slightly overlapping base of crown. Thorax and crown of similar width. Thorax with three pairs of poorly developed notopodia with capillary chaetae. Collar sometimes expanded in a large dorsal lobe (Fig. 9B–D); a short bilobed ventral projection present in all specimens (Figs 8B, 9A, 10C–D). RLTS: 1–2.5–0.5. A deep groove at base of first thoracic uniramous chaetiger (u1) present in all specimens (Figs 8A–C, 9B–D). Notochaetae with shafts composed of densely packed scales (Fig. 11A). Thoracic neuropodia absent. Abdomen of uniform width, with

about 16 chaetigerous segments with noto- and neuropodia; width of abdominal segments decreasing posteriorly, being posterior segments short and compact. First abdominal chaetiger (b1) about as long as all thoracic segments (u1–u3) together. Second abdominal chaetiger (b2) about 1.5 times b1; b3 = b4 and both about $\frac{3}{4}$ of b2; following segments progressively shorter. Abdominal notopodia poorly developed with capillary chaetae similar to thoracic notochaetae. Abdominal notochaetae arranged dorsally. Neuropodia consisting of wide sessile podia with several rows of neurochaetal hooks (Fig. 11B); tori almost encircling body except on dorsal surface between notochaetal bundles. Neurochaetal uncini similar through, consisting of hooks with shaft ending in two teeth side by side (Fig. 11C–D). Pygidium multilobed (Figs 8D, 11F).

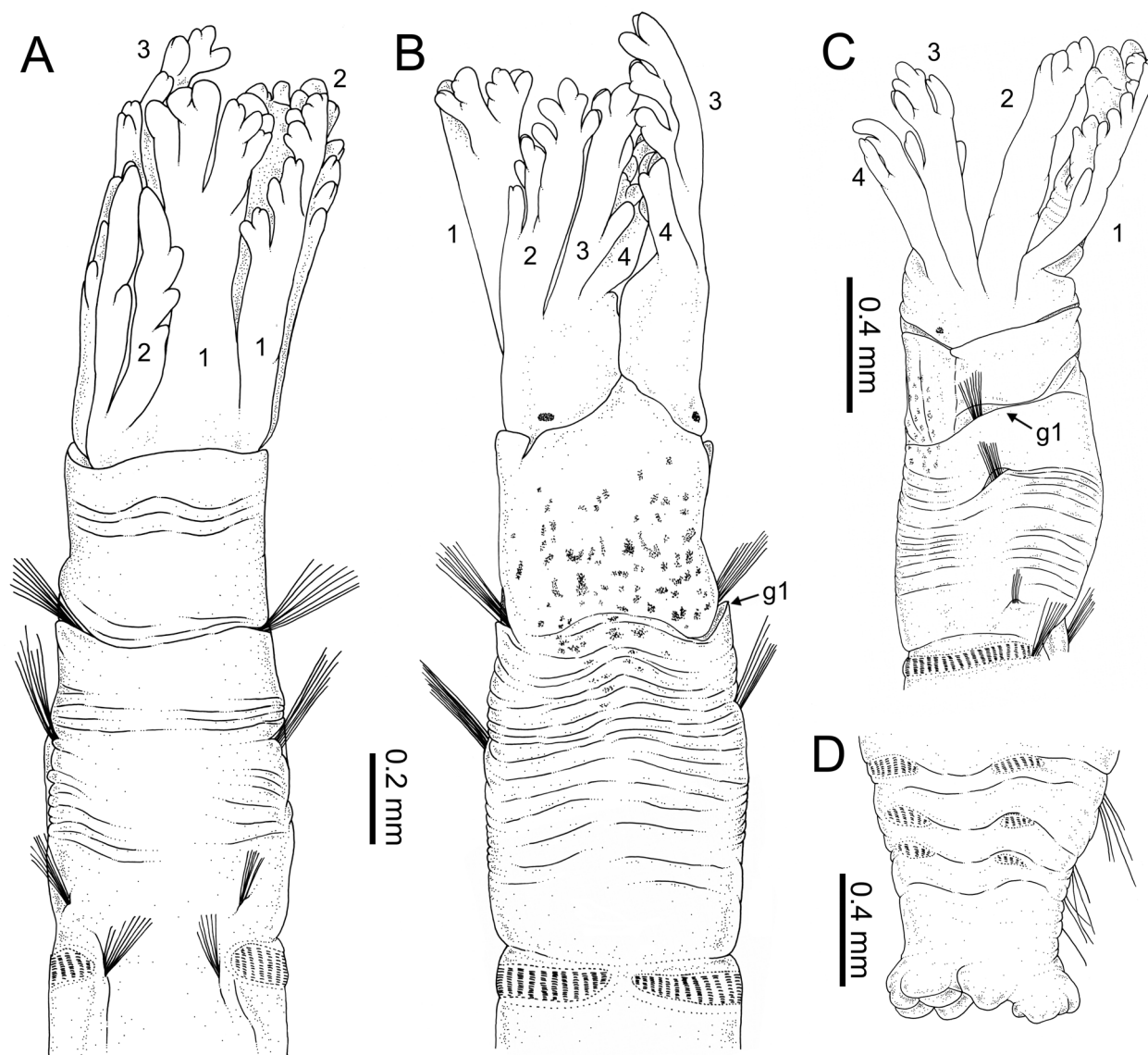


FIGURE 8. *Owenia picta* n. sp. (holotype AM W.45875). A. Anterior end, dorsal view; B. Anterior end, ventral view; C. Anterior end, left lateral view; D. Posterior end, ventral view.

Preserved animals creamy white with distinctive pigment marks consisting of diffuse brown speckles covering most of ventral part of peristomium and anterior part of first thoracic chaetiger (u1) (Fig. 8B). Tube coated by quartz grains and shell fragments.

Variations. One paratype of sample W.45403 is complete measuring 6 mm in length, 0.3 mm in width with 15 abdominal chaetigers. In one specimen of W.41321, RLTS is 1–3–0.5. Some paratypes show pigmentation more extended than in the holotype. For instance, in W.45219 coloration is also present dorsally in the peristomium and u1, but less marked than in the dorsal area. In paratype W. 36972 there is also coloration in the base of the branchial

crown. One paratype of W.45856 shows the anterior end in process of regeneration; in the other the total length of the branchial crown is similar to that of thorax (C/T ratio ≈ 1.0).

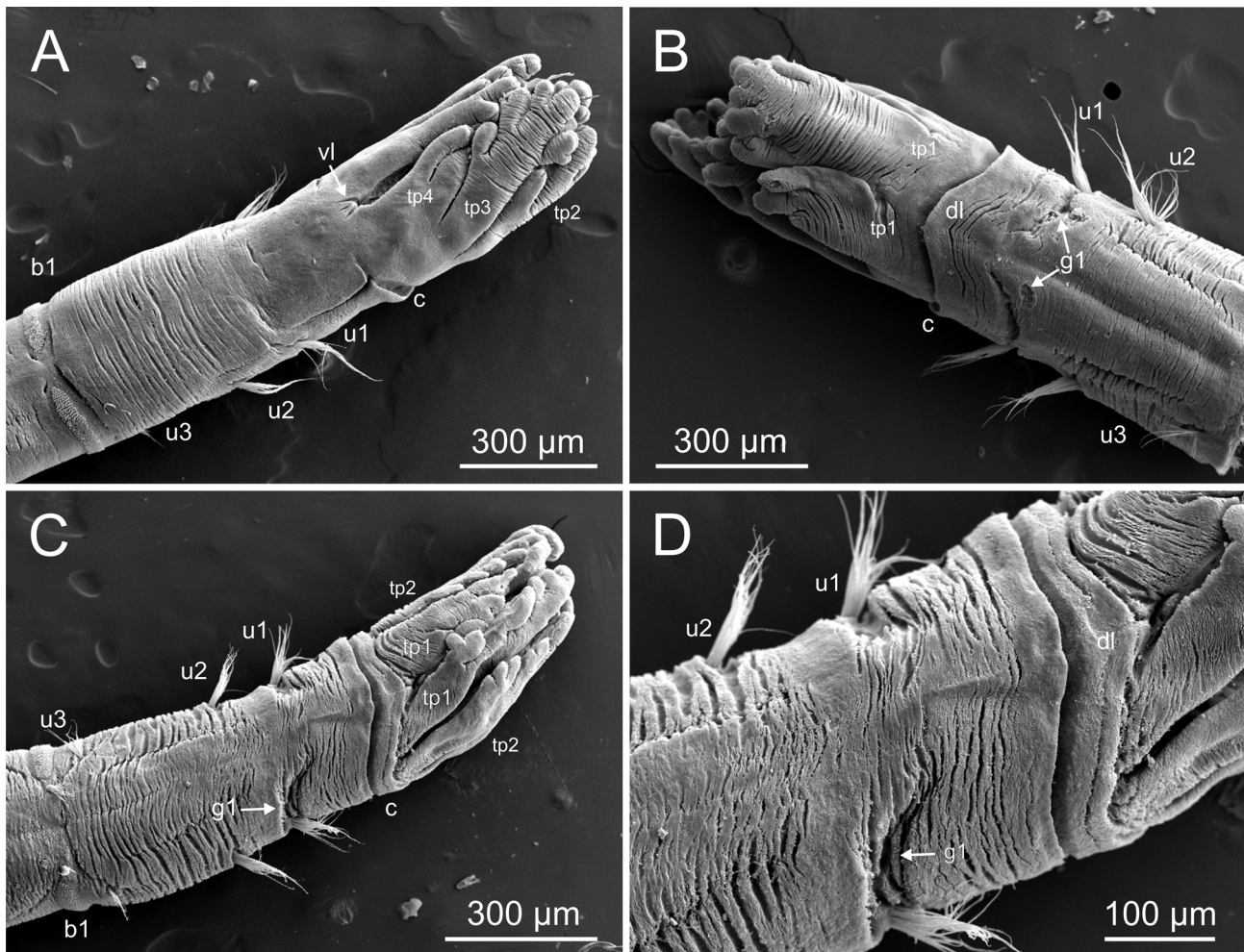


FIGURE 9. *Owenia picta* n. sp. SEM micrographs (AM W.47392, W.45876 and W.45856). A. Anterior end, ventral view; B–C. Anterior end, dorsal view; D. Detail of u1 and u2 of (C).

Remarks. *Owenia picta* n. sp. mostly resembles *O. australis* from SE Australia (Fig. 7D); both differ from any other *Owenia* in the region by the following features: 1) the larger size of the branchial crown when compared to the thorax (C/T ratio ≈ 0.85), 2) four pairs of branchial lobes, and 3) by lacking conspicuous major ramifications in the crown. However, *O. picta* n. sp. differs from *O. australis* in having conspicuous coloration in the anterior end and a deep dorsolateral groove behind notochaetal bundle of u1, which has not been reported in *O. australis*.

Specimens from Indonesia identified by Caullery (1944) as *O. fusiformis* (Fig. 7A) show likewise a large branchial crown but of a lesser C/T ratio. According to the description and illustrations by Caullery (1944), its length is about half of the thorax length, about $5/8$ of the distance from the base to the first uncinigerous torus (C/T ratio ≈ 0.63 ; Caullery 1944). Furthermore, *O. picta* n. sp. and *O. fusiformis sensu* Caullery differ from each other in the pattern of branchial coloration; in *O. fusiformis sensu* Caullery, there are whitish spots in the tips of the branchial ramifications (see Fig. 41A–C in Caullery 1944) and dorsal white spots sometimes (not explicitly mentioned or illustrated in the description). Caullery (1944) also states that the lateral sides of thorax are uniformly reddish brown. On the contrary, in *O. picta* n. sp. the branchial and thoracic coloration is reddish and the pattern of pigmentation in the branchial crown is different.

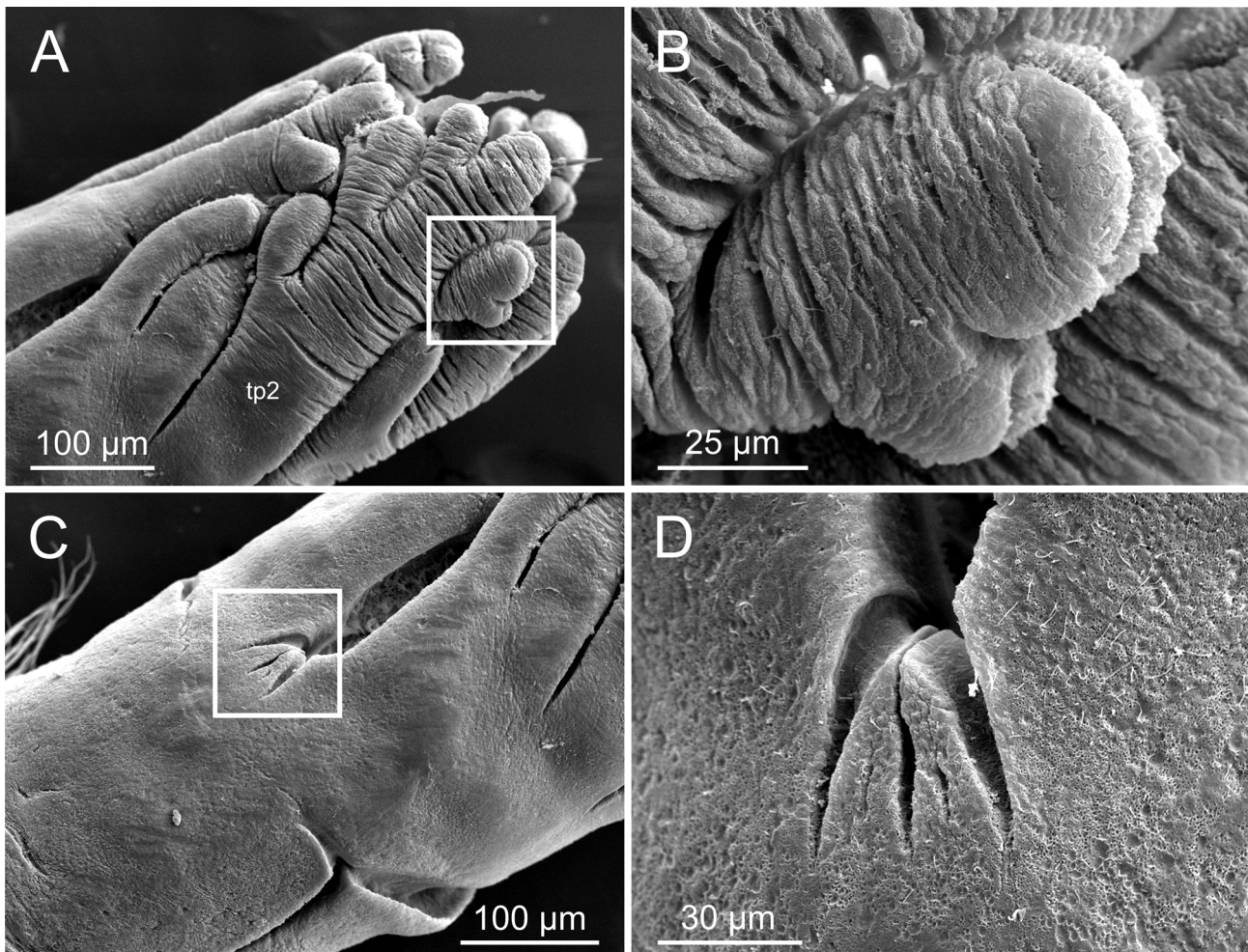


FIGURE 10. *Owenia picta* n. sp. SEM micrographs (AM W.47392, W.45876 and W.45856). A. Branchial crown, ventral view; B. Distal end of a lobe (framed on A), showing distal groove; C. Crown base, ventral view; D. Detail of bilobed structure (framed on C) between first pair of branchial lobes.

Other oweniid species show a smaller C/T ratio (0.6) than that of *O. picta* n. sp., namely *O. bassensis* (Australia), *O. mirrawa* (Australia), *O. petersenae* (New Zealand) and *O. gomsoni* (South Korea) (Fig. 7). Furthermore, *O. bassensis* has three branchial lobes instead of four as it happens in *O. picta* n. sp., *O. mirrawa* has conspicuous major divisions in the branchial crown close to its base, *O. petersenae* has major divisions in the branchial crown only at the distal end, and *O. gomsoni* has white dorsolateral bands of coloration in u1 and u2.

The Pacific species *Owenia johnsoni* Blake, 2000, from the Gulf de California, has also a high C/T ratio \approx 0.75. However, this species is colourless and the branchial crown has only one major ramification and each lobe end is divided in several (4–5) fine slender bifid tips of same length (see Fig. 5.10. in Blake 2000).

Etymology. The species name (“*picta*”) refers to the conspicuous brown pigmentation present in the anterior part of the body.

Habitat / Distribution. Species apparently restricted to NW of Lizard Island, Watson’s Bay to North Point from 3 to 15 m depth, on sandy bottoms (Fig. 1D). Three specimens were found at 5 m depth at Eagle Island, about 4 nautical miles SW from LIRS.

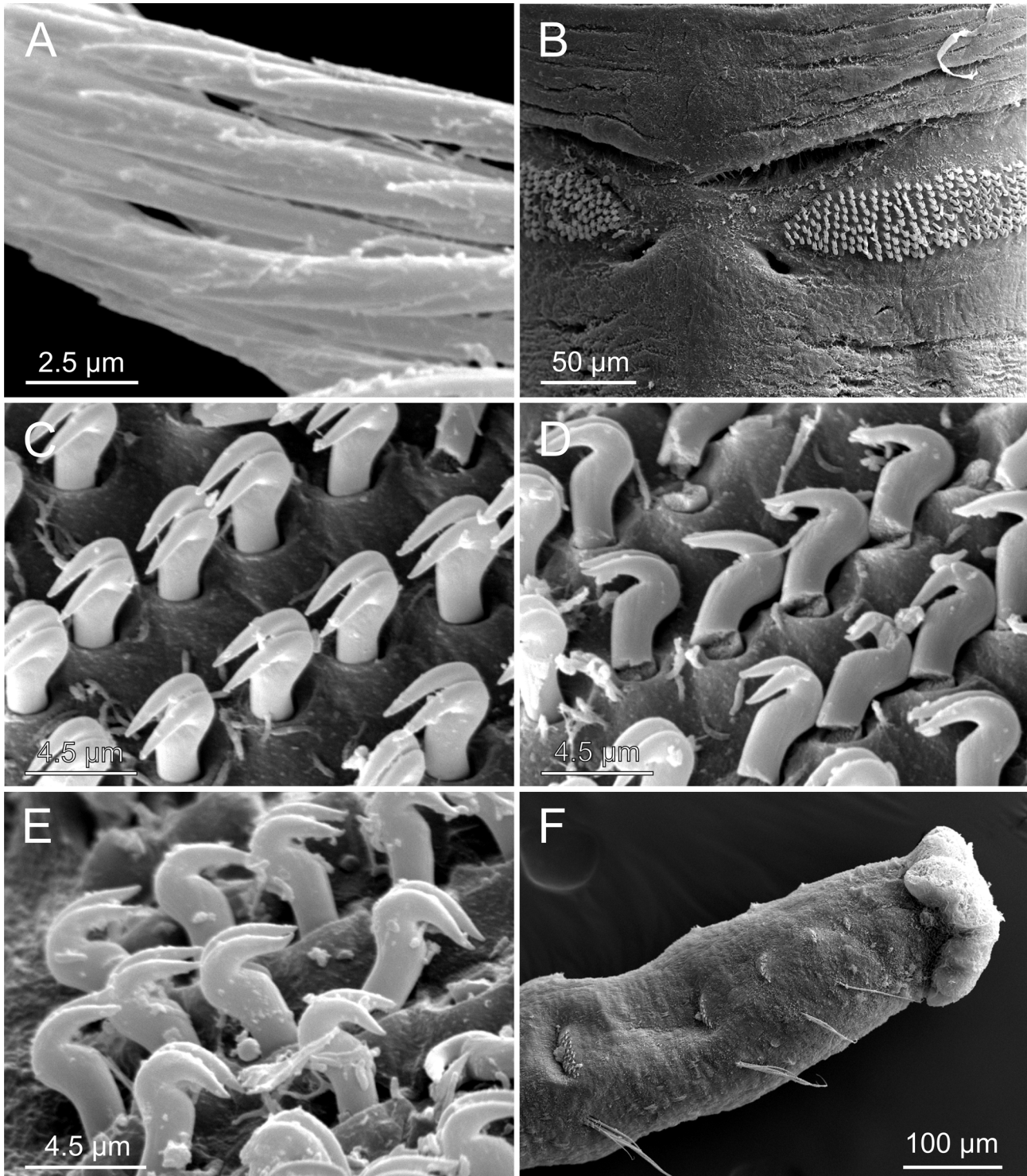


FIGURE 11. *Owenia picta* n. sp. SEM micrographs (AM W.47392, W.45876 and W.45856). A. Scale covering of thoracic notopodial capillary chaetae; B. First abdominal chaetiger (b1), ventral view; C–E. Abdominal neuropodial hooks, in top, lateral and oblique view; F. Posterior end, ventro-lateral view.

Key to Australasian, Southern Asia and Indo-Malay archipelago species of *Owenia*

The key provided below contains the two new species of *Owenia* described here from NE Australia plus other all species previously described or reported in Southern Asia and the Indo-Malay archipelago. The key is based in the most useful characters for non-specialists, i.e., the shape of the branchial crown, its relative size regarding thorax

length and the type of branchial ramification. The type locality of each species or the locality where it was reported in the case of non-indigenous species is indicated between brackets. Some references for *O. fusiformis* are also included (e.g., Imajima & Morita 1987; Caullery 1944) because they probably represent still undescribed taxa; the true distribution of *O. fusiformis* seems restricted to North Atlantic waters (e.g., Blake 2000; Koh *et al.* 2003; Parapar 2003; Ford & Hutchings 2005).

Some morphological features not explicitly mentioned by other authors have been extracted from illustrations.

1. Branchial crown almost same length as thorax; crown length to thorax ratio (C/T ratio) ≈ 0.85 2
- Branchial crown about half length of thorax; C/T ratio ≈ 0.65 3
- Branchial crown much shorter than thorax; C/T ratio ≈ 0.35 7
2. (1) Pigmentation present on ventral part of peristomium and first thoracic chaetiger (u1), latero-ventral groove in u1 *Owenia picta* n. sp. [Lizard Island, QLD, Australia]
- No body pigmentation, no latero-ventral groove in u1 *O. australis* Ford & Hutchings, 2005 [Clyde R., NSW, Australia]
3. (1) Crown longer than wide; length to width ratio (L/W ratio) ≥ 1.0 4
- Crown wider than long; length to width ratio (L/W ratio) < 1.0 6
4. (3) Three pairs of branchial lobes, peristomial collar absent *O. bassensis* Ford & Hutchings, 2005 [Bass Strait, Australia]
- Four pairs of branchial lobes, peristomial collar present 5
5. (4) Body pigmentation present; white spots at the base of branchial ramifications *O. fusiformis sensu* Caullery (1944) [Indonesia]
- Body pigmentation absent; mayor divisions of branchial crown only observed at distal end *O. petersenae* Koh & Bhaud, 2003 [New Zealand]
6. (3) Branchial stems speckled with white dots and white dorsolateral bands present from u1 and u2; five branchial stems mostly present; branchial main divisions not close to base *O. gomsoni* Koh & Bhaud, 2001 [South Korea]
- No body pigmentation; four branchial stems; branchial main division close to base. *O. mirrawa* Ford & Hutchings, 2005 [Darwin Harbour, NT, Australia]
7. (1) Four pairs of branchial tentacles; only one major division of branchial crown located close to base giving the impression of 8 pairs of bilobed branchial tentacles; RLTS: 1–2–1; no body pigmentation *Owenia dichotoma* n. sp. [Lizard Island, QLD, Australia]
- Three or four pairs of branchial tentacles; at least two major divisions of branchial crown giving the impression of more than 8 pairs of multilobed branchial tentacles; RLTS: 1–2–0.5; body pigmentation present in tentacles and dorsal region between collar and u1 *O. fusiformis sensu* Imajima & Morita (1987) [Japan]

Owenia orientalis (Grube, 1878) (Philippines) has not been included in the key because following Ford & Hutchings (2005) “attempts to locate the type material were unsuccessful and the brief description and the single figure make it impossible to relate this species to any currently accepted species”. The record of *Owenia lobopigidiata* Uschakov, 1950 from the Banda Trench (Kirkegaard 1956) seems doubtful because is based in posterior fragments and according to Kirkegaard (1956) “Ventral parapodia ... with numerous long-shafted uncini ... very similar to those of *Myriochele heeri*...”; in addition, this species was originally described from the Sea of Okhotsk (Uschakov 1950).

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