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Five athecate hydroids (hydrozoa: anthoathecata) from south-eastern australia

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Abstract Watson, J.E. 2015. Five athecate hydroids (hydrozoa: anthoathecata) from south-eastern australia. *Memoirs of Museum Victoria* 73: 19–26.

Hydractinia gelinea sp. nov. is described and *Amphinema dinema* recorded for the first time from south-eastern Australia. Three previously known species, *Eudendrium pennycuikae*, *Ectopleura exxonia* and *Pennaria wilsoni* are redescribed in detail.

Keywords Athecate hydroids, south-eastern Australia, new species, new record, redescription of species.

Introduction

This report describes a collection of five hydroid species from south-eastern Australia. A new species, *Hydractinia gelinea* is described. There is a new but somewhat doubtful record of *Amphinema dinema*. The range of *Eudendrium pennycuikae* is extended from subtropical Queensland to cool temperate southern Australia. *Pennaria wilsoni* and *Ectopleura exxonia* are redescribed in detail, the latter being recorded for the first time from New Zealand.

Type and voucher material is lodged in Museum Victoria (NMV).

Hydractiniidae L. Agassiz, 1862

Hydractinia van Beneden, 1841

Hydroid colony either stolonal with a reticular hydrorhiza of perisarc-covered stolonal tubes or covered by encrusting mat; hydrorhizal mat may secrete chitinous or calcareous skeleton or spines, pillars or branches. Polyps sessile, polymorphic, naked, gastrozooids with one or more whorls of oral filiform tentacles or with scattered tentacles on the distal half of body, dactylozooids when present with or without tentacles. Reproduction by sessile sporosacs or free medusa, gonophores typically borne on gonozooids; gonozooids with one or more whorls of oral tentacles or without tentacles and mouth, giving rise to fixed sporosacs, eumedusoids or free medusa.

Hydractinia gelinea sp. nov.

Figure 1A–D

Material examined. NMV F202870, holotype, female colony, Crawfish Rock, Western Port, Victoria, coll: J. Watson, 24/04/2006, depth 10 m; material fixed in 5% formalin, later transferred to 70% ethanol.

Description. Colony comprising individuals and clusters of female polyps on a dead crustose bryozoan; no gastrozooids or dactylozooids present. Hydrorhiza ramified, firmly adherent to substrate, stolons narrow, tubular, perisarc thin and smooth.

Gonozooids sessile, robust, with a whorl of 8–12 thick tentacles surrounding a prominent dome-shaped hypostome; tentacles with prominent whorls of nematocysts. Hypostome high dome-shaped. Gonophores fixed sporosacs borne in tight clusters of up to 15 on gonozooid well below tentacles. Immature female gonophore pyriform, containing many small ova, mature gonophore balloon-shaped to spherical, seated on a cushion–shaped pad on a short peduncle and enclosed in a thick gelatinous pellicle, surface of gonophore with abundant large scattered nematocysts.

Nematocysts, probably euryteles of two sizes; none discharged:

(i) capsule bun-shaped, 18–21 x 9–10 μm, on gonophores and body of gonozooid,
(ii) capsule ovoid, 9–12 x 6–7 μm, on gonozooid tentacles.

Colour (recently preserved material): stolons yellow, gonozooids and gonophores flesh pink.

Table 1. Measurements (μm) of *Hydractinia gelinea* (preserved material)

Hydrorhiza, width	48–72
Hydranth	
maximum length, base to tip of tentacles	1400
width of body	280–320
Sporosac, mature, maximum width	250–400

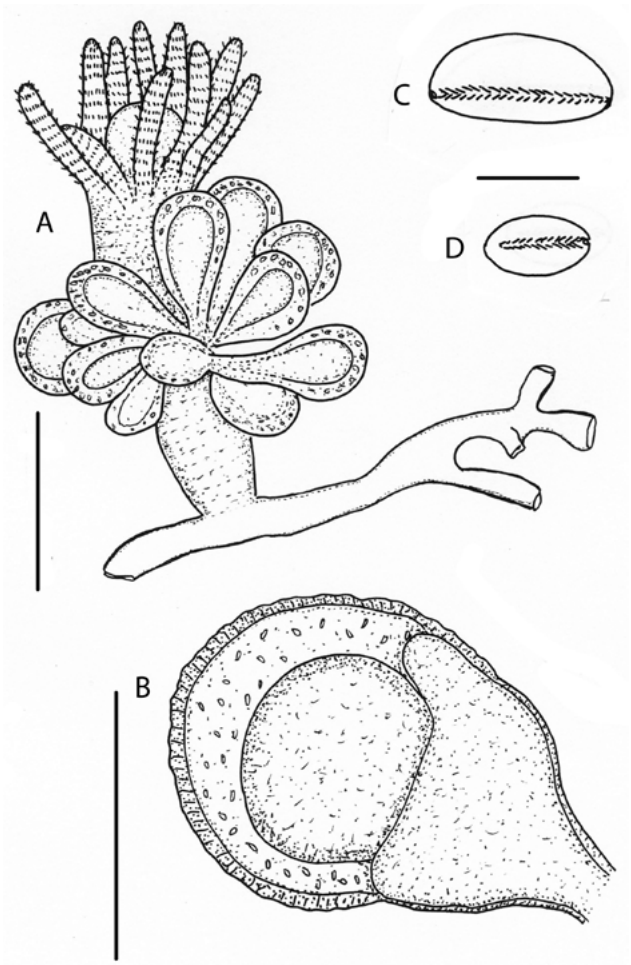

Figure 1A-D. *Hydractinia gelinea* sp. nov. Holotype (NMV F202870). A, hydranth with developing gonophores; B, mature gonophore with scattered nematocysts; C, undischarged heteroneme from hydranth body and gonophores; D, undischarged heteroneme from tentacles. Drawn from preserved material. Scale bar: A, 0.5 mm; B, 0.2 mm; C, D, 10 μm.

Remarks. The colony is clustered in the pores of a dead bryozoan *Celleporaria* sp., some polyps encroaching onto a small sponge growing on the bryozoan. No encrusting hydrorhizal mat or dactylozoids were found. The thick ectoderm enclosing the gonophore obscures the position of the spadix, masking its structural details. The immature female gonophore contains numerous small ova c. 40 μm in diameter.

There about 130 nominal species of Hydractiniidae, mostly recorded from the northern hemisphere, although many are inadequately described (Miglietta *et al*. 2009). The only presently known *Hydractinia* from south-eastern Australia is *H. betkensis* (Watson 1978).

Choice of substrate is important in the Hydractiniidae, encrusting colonies often being associated with mobile substrata while reticulate colonies (such as *H. gelinea*) are usually associated with immobile substrata (Miglietta and Cunningham 2012). Other known associations are with pebbles, barnacles, sponges and other hydroids (Schuchert 2008) but there are no records of association with bryozoans.

As the nematocysts were not discharged their exact identity could not be determined, but they are probably euryteles; no desmonemes were seen. Euryteles and desmonemes are known to comprise the cnidome of *Hydractinia* and these were recorded in *Hydractinia novaezelandiae* (Schuchert, 1996) and *Hydractinia rubricata* (Schuchert, 1996) from New Zealand.

Etymology. named for the cushion-like gelatinous pellicle supporting the sporosac.

Family **Pandeidae** Haeckel, 1879

Amphinema Haeckel, 1879

Diagnosis. Colonies stolonal**,** hydrorhiza creeping, hydrocaulus well developed, unbranched, covered by perisarc, longer than extended hydranth; hydranths spindle-shaped with one whorl of amphicoronate filiform oral tentacles, with conical hypostome. Gonophores arising either on stolon or caulus or both, releasing free medusae. Medusa generally with a large apical projection, with two opposite tentacles, without gastric peduncle, with marginal warts, manubrium with broad base and four simple lips, gonads on manubrium in adradial or interradial position, ocelli and marginal cirri may be present.

Amphinema dinema (Péron and Lesueur, 1810)

Figure 2A–G

Oceania dinema Péron and Lesueur, 1810: 346.
Perigonimus serpens Allman, 1863: 10.
Stomotoca dinema. – Mayer, 1910: 109, pl. 9, figs 8–10, pl. 10, figs 1–4.
Amphinema dinema. – Rees and Russell, 1937: 62, figs 1–4.– Russell, 1953: 180, pl. 10, figs 1, 2, 4, pl. 11, figs 1, 3, text-fig. 89.– Kramp, 1959: 117, fig. 109.– Kramp, 1961: 93.– Kramp, 1968: 42, fig. 108.– Goy *et al*. 1991: 109, fig. 24.– Schuchert, 1996: 63, fig. 36.

Material examined. NMV F202871, Clifton Springs jetty ruins, Port Phillip, fertile colony on mussel *Mytilus galloprovincialis*, depth 0.2 m, coll: J. Watson, 10/12/2008. Material fixed in 5% formalin later preserved in 70% ethanol.

Description (from live material). Colony stolonal, hydrorhiza reptant on substrate, stolons tubular, faintly rugose to smooth, perisarc relatively thick. Hydrothecal pedicels scattered along hydrorhiza, hydrocaulus erect, cylindrical, unbranched, of same diameter at base as hydrorhiza, diameter increasing distally, perisarc thin with several obscure corrugations above base, continuing upwards for variable distance, corrugations gradually becoming indistinct then fading out. Hydranth long spindle-shaped, extending well above hydrotheca, hypostome high-domed, quadrate when viewed from above, with 8-10 long tentacles in a single indefinite whorl held out stiffly below hypostome.

Medusa buds globular, arising on short, corrugated pedicels along hydrorhiza. Prior to release one tentacle emerges, followed by a second tentacle one to two hours later. At release, medusa deep bell-shaped to hemispherical with two opposite tentacles on large tapering bulbs,

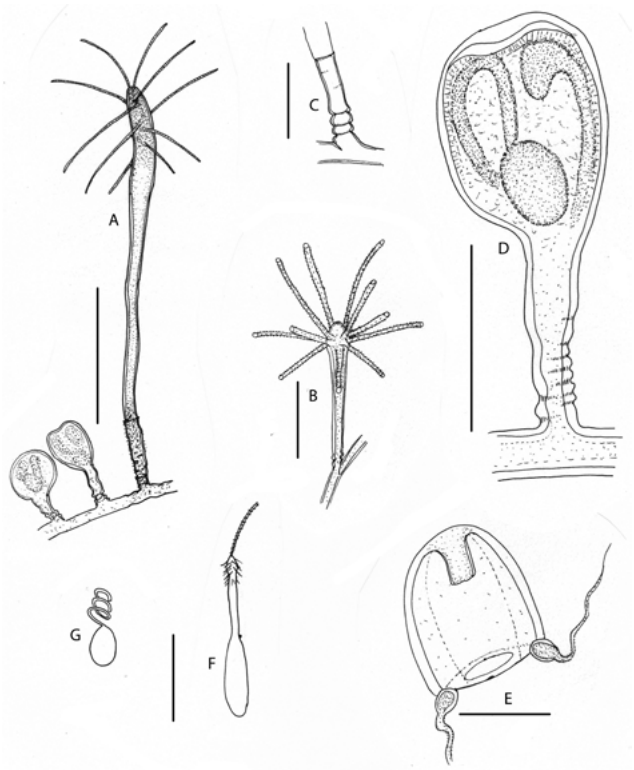

Figure 2A-G. *Amphinema dinema*. A, hydrocaulus with extended hydranth and gonophores on hydrorhiza. B, contracted hydranth, C, corrugated hydrocaulus. D, nearly mature gonophore. E, newly released medusa, F, eurytele from tentacles, G, desmoneme from hypostome. Scale bar: A, B, E, 0.5 mm, C, 0.3 m, D, 0.2 mm, F, G, 10 μm.

manubrium cylindrical in lateral view, quadrate in dorsal, umbrella without apical projection, small nematocysts sparsely scattered over bell, velum a broad shelf, radial canals thin, a small wart at base of each canal. After four days in the laboratory, medusa remained of same shape and size as at release; no apical projection, manubrium with four indistinct lips, a small marginal wart between radial canals. After five days, manubrium extending almost halfway down bell.

Cnidome comprising two categories of nematocysts:

(i) microbasic euryteles, capsule narrowly elongate, 7–10 x 2.5–3.5 μm (discharged), shaft thin, 7–10 μm, thread very long; abundant in tentacles of hydranth and medusa and scattered over bell of medusa; easily discharged.

(ii) desmonemes, almond shaped, 4–6 x 2.5–3.5 μm (undischarged) on hydranth.

Hydrorhiza pale brown, hydrocaulus, body of hydranth and tentacles translucent white, stomach region below tentacles orange. Umbrella of medusa and radial canals colourless, tentacle bulbs and manubrium orange-brown; colour fading after five days.

Table 2. Measurements (μm) of *Amphinema dinema* (live material)

Hydrorhiza width	44–80
Hydrotheca	
width at base	44–72
length	250–400
Hydranth	
length, fully extended	500–1200
length of extended tentacle	300–500
Medusa	
length of bud	30–35
height, 4 days old	70

Remarks. The hydrothecae vary considerably in length within and amongst the colonies, shorter hydrothecae having a slightly thicker and more visible perisarc while longer ones usually have a thinner, sometimes almost invisible perisarc. The perisarc is often lightly coated with fine sediment. The hydranth is very active, bending from side to side when disturbed; one was observed capturing and ingesting a small amphipod. When the hydranth is extended the tentacles are scattered over the distal body region but when contracted they appear as an indefinite whorl.

The tentacles of the medusa are remarkably long, about 20 times the length of the bell. The medusa is very active, swimming with rapid jerking movements.

Medusae of *Amphinema dinema* were originally reported from the English Channel and later from the plankton of north-eastern Australia (Kramp 1968). It was found in New Zealand (Schuchert 1996) so it was only a matter of time before also being recorded from southern Australia.

The present material agrees in most respects with Schuchert's (1996) description of the hydroid and early medusa stages of the New Zealand species but differs in: i) the manubrium of the newly released medusa is only one third the height of the bell, ii) the manubrium is yellow, not red as in the New Zealand material, iii) there was no indication of development of an apical projection in medusae up to five days old. While the apical projection is considered an important diagnostic character, in the present case it may have been due to retardation of growth in the laboratory. Despite these differences and until further material is available for study I refer the species to *Amphinema dinema*.

Distribution. North-eastern Australia, India, Mediterranean Sea, north-western Europe, east coast of North America, New Zealand. This is the first record of *Amphinema dinema* from southern Australia.

Family **Eudendriidae** L. Agassiz, 1862

Eudendrium Ehrenberg, 1834

Diagnosis. Colony with erect, usually branched stems arising from a creeping hydrorhiza. Hydrocaulus enclosed in a firm perisarc extending to hydranth base; hydranth large with a pedunculated hypostome and one whorl of filiform tentacles; gonophores fixed sporosacs borne on hydranth body below tentacles, male gonophores usually with several chambers, female with a single egg.

Eudendrium pennycuikae Watson, 1985

Figure 3A–F

Eudendrium album Pennycuik, 1959: 167.
Eudendrium pennycuikae Watson, 1985: 183, figs 5–8.

Material examined. NMV F202872, jetty pontoon at Clifton Springs, Port Phillip, on ascidian *Molgula ficus*, depth 0.3 m, coll: J.Watson, 18/12/2013. Material examined alive, fixed in 4% formalin then transferred to 70% ethanol.

Description (from live material). Hydrorhizal stolons loosely reptant on ascidian. Hydrocaulus monosiphonic, of same diameter as stolon, to 16 mm high, sparsely and irregularly branched without definable main stem. Lowest branch with up to 15 wide annulations, upper branches with up to 10 proximal annulations at branch junction, younger branches smooth, older branches obscurely annulated or wrinkled but always smooth distally below hydranth.

Hydranth large, erect, terminal on branch, body constricted at base then becoming almost cylindrical, hypostome distinctly pedunculate, surrounded by 16-20 long tapering semi-amphicoronate tentacles. No nematocyst rings or pads.

Developing female gonophore encircled by a moderately thick unbranched spadix, gonophores at various stages of maturity scattered singly or in clusters of two to five on blastostyle. Spadix lost at maturity, hydranth tentacles shortening and becoming resorbed, mature gonophores with approximately 20 ova attached to blastostyle on short peduncles. Male gonophores comprising two to four (usually three) linear bead-like chambers in clusters of up to 12 on a blastostyle without hydranth, distal chamber flat bun-shaped with scattered nematocysts; no apical nematocyst pad.

Cnidome comprising microbasic euryteles of one size, capsule elongate elliptical, 11–12 x 5–5.5 μm (undischarged), 8–9 x 4 μm (when discharged), shaft 4–6 μm long with a few spines, thread long; in tentacles and coenosarc.

Stolons and older stems pale honey brown, younger stems paler, hydranth body flesh pink, tentacles transparent, male gonophores almost white, spadix pale brown, female gonophores pale yellow.

Remarks. This is the first description of *Eudendrium pennycuikae* from live material, the original description of Pennycuik (1959) and Watson's later redescription (1985) being from preserved material held by the Queensland Museum. The present record extends the range of *E. pennycuikae* from subtropical Queensland to cool temperate southern Australia.

The large elegant pink hydranths with a whorl of long sub-amphicoronate tentacles is a conspicuous character in live material, differing markedly from the small hydranths with a whorl of blunt tentacles typical of southern species of *Eudendrium*.

The capsule of the eurytele was found to shrink 15–20% during discharge; while capsules usually shrink about 10% at discharge (author's obsv.) such a large reduction in size is unusual.

Table 3. Measurements (μm) of *Eudendrium pennycuikae* (live material)

Hydrorhiza, stolon and branch width	100–150
Hydranth	
width across extended tentacles	1000–1800
length of tentacles	400–500
length of body including hypostome	420–.680
hypostome height	~100
maximum diameter of body	150–300
Gonophore	
mature female, diameter	200– 260
mature male, length of linear cluster	500–600
mature male diameter distal chamber	200–.230

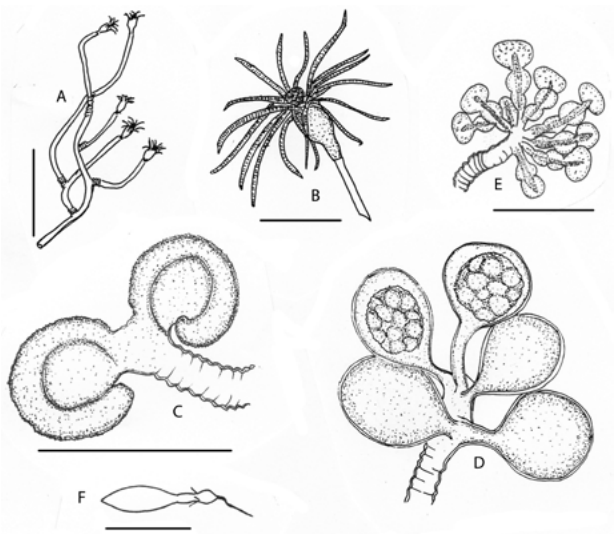

Figure 3A-G. *Eudendrium pennycuikae*. A, branch with hydranths; B, hydranth with extended tapering tentacles; C, developing female gonophores; D, mature female gonophores; E, cluster of male gonophores; F, eurytele from tentacles. Drawn from preserved material. Scale bar: A, 2 mm, B, 0.3 mm, C, D, E, 0.5 mm, F, 10 μm.

Family **Tubulariidae** Fleming, 1828

Ectopleura L. Agassiz, 1862

Diagnosis. Hydroid solitary or colonial, hydrocaulus simple, with open lumen, without parenchymatic endoderm or longitudinal canals but weakly divided by two rarely up to five internal longitudinal endodermic ridges, perisarc thin, a collar on neck region that does not cover whole neck; hydranth vasiform with one whorl of filiform oral tentacles and a whorl of long, filiform aboral tentacles; gonophores borne above aboral tentacles producing either free medusae, eumedusoids or fixed sporosacs.

Ectopleura exxonia (Watson, 1978)

Figure 4A–H

Ectopleura exxonia Watson, 1978: 303, figs 1A, B.

Material examined. NMV F202873, Crib Point petroleum wharf, Western Port, Victoria, coll: J. Watson, 23/04/2006, depth 2 m; abundant fertile colonies on mussel (*Mytilus galloprovincialis*) shells. Hardened in 4% formalin later transferred to 70% ethanol. NMV F203425, from ropes at salmon farm, depth 5 m, Tory Channel, Marlborough Sounds, South Island, New Zealand, coll: J. Atalah, Cawthron Institute, Nelson, New Zealand.

Description (from preserved material, Western Port). Colonies growing thickly on mussel shells, hydrorhiza of matted closely ramified stolons. Stems crowded, to 80 mm long, unbranched but often entangled, several basal annulations on hydrocaulus and groups at intervals along stem, some stems completely annulated; perisarc smooth, firm. Hydrocaulus circular in section, with two internal longitudinal canals, one central inside the other. Distal end of hydrocaulus a shoulder surmounted by a short cylindrical section with thinner perisarc, a narrow circular indentation below hydranth, base of hydranth saucer–shaped. Hydranth with a single whorl of 12–15 short, thick oral tentacles surrounding a large hypostome and one whorl of 16–18 long, slender aboral tentacles.

Gonophores fixed sporosacs in various stages of development borne in tight clusters on short unbranched blastostyles at base of aboral tentacles. Gonophore spherical at maturity with a bun–shaped distal cap with emerging larval tentacles.

Cnidome comprising nematocysts in two categories:

(i) stenoteles, capsule spherical, diameter 11–13 μm, shaft wide; on hypostome and oral tentacles, a few on aboral tentacles; some discharged.

(ii) stenoteles, capsule spherical, diameter 5–7 μm, shaft wide; abundant on aboral tentacles, some on oral tentacles; a few discharged.

(iii) heteronemes, capsule 10–11 x 5–7 μm, abundant in tentacles and cauline coenosarc; undischarged.

Hydranths and gonophores rose pink, stems shining white, tentacles white.

Remarks. The holotype (NMV G2801) of *Ectopleura exxonia* (Watson, 1978) was a small sample collected from an oil production platform at a depth of 75 m in Bass Strait. The present abundant material permits additional description.

Table 4. Measurements (μm) of *Ectopleura exxonia* (preserved material)

Hydrorhizal stolon, diameter	260
Stem, diameter	220–540
Hydranth	
diameter at base	280–450
length of oral tentacles	360–400
length of aboral tentacles	1900–2000
Gonophore, diameter	320–400

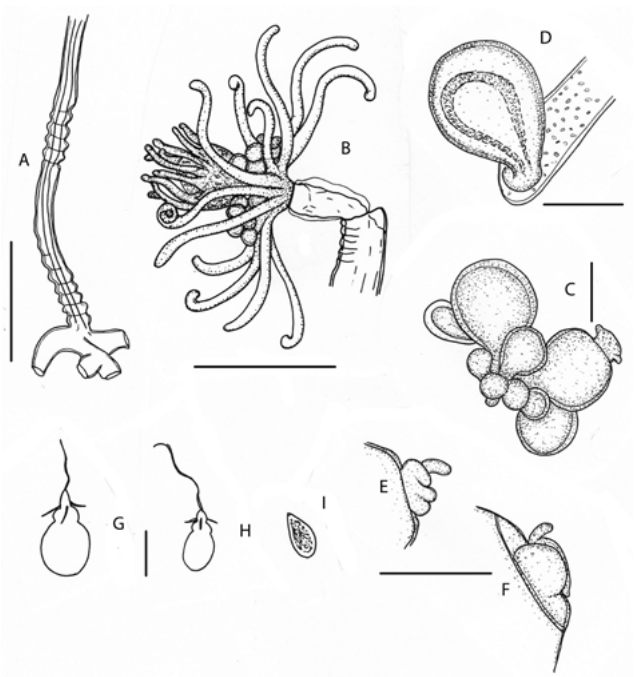

Figure 4A-I. *Ectopleura exxonia*. A, proximal stem and hydrorhiza; B, hydranth with immature gonophores (after Watson, 1978); C, cluster of developing gonophores; D, developing gonophore at base of aboral tentacle; E, F, apical process on nearly mature gonophore; G, stenotele from aboral tentacle; H, stenotele from oral tentacle; I, heteroneme from tentacles. Scale bar: A, B, 1 mm, C, 0.2 mm, D, 0.3 mm, G–I, 10 μm.

The hydrocaulus of *E. exxonia* was originally described as having four longitudinal internal canals. Examination of the present material shows however, there are only two canals – an outer perisarc-covered caulus and a single internal cylindrical canal passing up the centre of the stem.

The somewhat smaller size of the hydranths and gonophores of the Crib Point material than in the holotype may be due to the Crib Point colonies being less than eight weeks old, dating from the time of deployment of clean mussel substrate to the time of retrieval. Water temperature at deployment was 20°C declining over the immersion period to 15°C.

Schuchert (1996) predicted that *E. exxonia* would occur in New Zealand. Recent sampling at a salmon farm at a depth of 5 m in Tory Channel, Marlborough Sounds, South Island, New Zealand has confirmed his prediction, revealing well established colonies of *E. exxonia* growing on farm nets.

Family **Pennariidae** McCrady, 1859

Diagnosis. (modified after Calder 2010). Capitate hydroids with erect colonies; stems monosiphonic, branches giving rise to hydranth pedicels, perisarc firm. Hydranth naked, spindle-shaped, with an aboral whorl of long filiform tentacles semicapitate distally, an oral whorl of short, capitate tentacles. Eumedusa without manubrium, with four radial canals and four rudimentary tentacles bulbs, velum not penetrated.

Pennaria wilsoni (Bale, 1913)

Figures 5, 6A–J

Pennaria wilsoni Bale, 1913: 116.– Blackburn, 1937: 176, figs 8, 9.– Hirohito, 1988: 30, fig. 9e.

Halocordyle australis Bale, 1894: 94.– Pennycuik, 1959: 160, pl. 1, fig. 8.– Watson 1982: 88, fig. 4.6 g, h, pl. 10.2.

(?)*Pennaria wilsoni* Gibbons and Ryland, 1989: 388, fig. 6.– Kirkendale and Calder, 2003: 166.– Bouillon *et al*. 2006: 247.– Calder, 2010: 65.

Material examined. NMV F202880, Popes Eye reef, southern Port Phillip, on rubble, depth 8 m, coll: J. Watson, 26/08/2013. Material examined alive, later fixed in 4% formalin, then transferred to 70% ethanol.

Description (from live material). Mature colonies comprising one to many branched stems to 20 cm long arising from a ramified hydrorhiza, stolons tubular, almost smooth in young colonies to rugose and gnarled in older colonies.

Stems erect, monosiphonic, flexuous, cylindrical, perisarc smooth and shining, straight to weakly sympodial, a slight change of direction at origin of each primary branch; branches widely separated along stem in indefinite whorls of three, directed upwards at 30–40º to stem. Stem widest at base, narrowing slightly distally, ringed above base with up to 50 deep annulations and with up to 20 deep annulations above origin of older branches; sometimes groups of annulations along stem not associated with branching.

Hydranth pedicels variable in length (depending on age of colony), widely separated, given off more or less triserially, up to 15 on weakly annulated pedicels, sometimes with a smooth mid-section, branch always with a terminal hydranth. Hydranth long, cylindrical to spindle-shaped, hypostome flattened dome-shaped. Four to five, rarely six short capitate oral tentacles clustered around hypostome, tentacles transversely segmented, each segment with a small central reddish spot, capitala with batteries of nematocysts. Aboral tentacles long, slender, semicapitate, in one whorl of 7-8, arched in life, a thick fringe of nematocysts along the outer side of tentacle, inner side transversely segmented with large transparent cells with reddish inclusions.

Table 5. Measurements (μm) of *Pennaria wilsoni* (live material)

Hydrorhiza, diameter	200–400
Stem	
width at base	200–500
distance between primary branches	375–570
width primary branch	200–500
Pedicel	
distance between pedicels	1000–3500
length	200–300
width	70–120
Hydranth	
body length extended	500–700
length of extended aboral tentacle	2000–3000
length oral (capitate) tentacle	250–350
Eumedusa at release	
length	1050
width at base of bell	1000

Gonophore eumedusoid, ovoid to oblong, one to four in various stages of development on short peduncles just above aboral tentacles. At release umbrella thick, evenly covered in nematocysts, radial canals straight, gonads large, brown, tentacles reduced to knobs, velum closed, female with large ova. Medusa pulsates feebly before and after release.

Perisarc of stem and branches thick, shining brown, hydranth pedicels paler brown; hydranth and tentacles translucent white, stomach brown to red. Medusa colourless, manubrium red, radial canals reddish before release, becoming brown after release.

Cnidome comprising four categories of nematocysts; stenoteles present in a wide range of shapes, sizes and abundances, even between hydranths on the same stem.

(i) stenoteles, capsule large, elongate ovoid, 51–56 x 27–31 μm, shaft 50 μm long, cylindrical, head 15 μm long with 2–4 long basal spines, distal part of head with many small bristles, spinous thread at least 30 μm long, in capitate tentacles and at base of medusa; easily discharged.

(ii) stenoteles, similar to but smaller than stenotele (i), capsule elongate ovoid 44–45 x 20–22 μm, shaft cylindrical, 40 μm long, base of head with 2–4 long spines, head distally with bristles, thread with many small spines; in capitate tentacles, easily discharged.

(iii) stenoteles, capsule ovoid, 19–20 x 14 μm, shaft stout, 19 μm long, head with several spines; in oral tentacles; easily discharged.

(iv) stenoteles, capsule ovoid, 11–13 x 8–10 μm, shaft 10 μm long, abundant in aboral tentacles; difficult to discharge.

(v) stenoteles, capsule inflated ovoid, 25 x 23 μm, in aboral tentacles; undischarged.

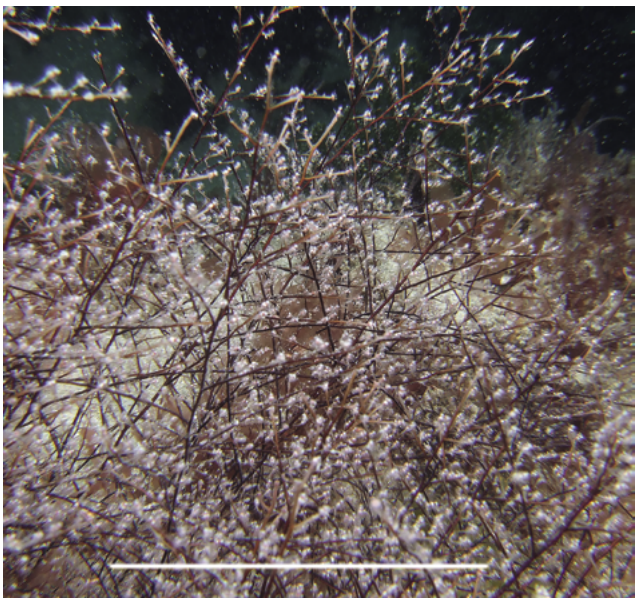

Figure 5. *Pennaria wilsoni*. *In situ* photograph of colony, Port Phillip Heads, depth 10 m, showing bushy growth habit (photograph by author). Scale bar: 5 cm.

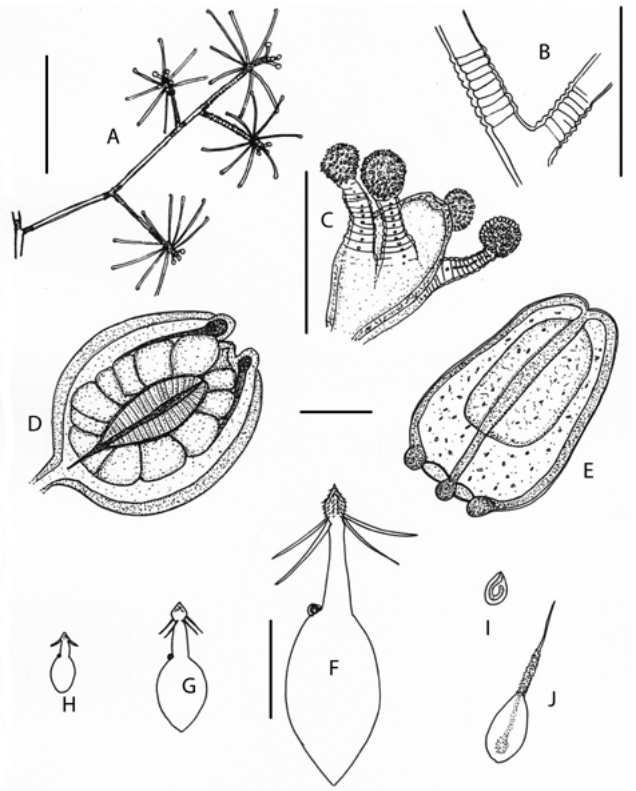

Figure 6A-J. *Pennaria wilsoni*. A, branch with extended hydranths; B, basal annulations of branch; C, capitate tentacles surrounding hypostome; D, developing female gonophore; E newly released released eumedusa with scattered nematocysts; F–H, stenoteles from oral and aboral tentacles; I, desmoneme from hypostome; J, microbasic mastigophore from aboral tentacles. Scale bar: A, 5 mm, B, D, E, 0.5, mm, C, 0.25 mm, F–J, 20 μm.

(vi) isorhizas, capsule loaf–shaped 15 x 5–7 μm, thread long, abundant in aboral tentacles; difficult to discharge.

(vii) microbasic mastigophores, capsule elongate pyriform, 15–19 x 6 μm, shaft 12 μm, spinous, thread coiled in a circle at base of capsule, abundant in aboral tentacles and on medusa; difficult to discharge.

(viii) desmonemes, capsule almond shaped, 7 x 4.5–5 μm, rare in aboral tentacles and around hypostome; undischarged.

Remarks. *Pennaria* is a genus with five accepted species (Bouillon *et al*. 2006, Schuchert 2006). *Pennaria disticha* is the best known of the group with cosmopolitan distribution in tropical and temperate seas; it is present around Australia except in cooler Victorian waters (author's *pers. obsv.*).

P. disticha. Bale (1894) described *Halocordyle australis* from Capel Sound, Port Phillip. The hand written label on the presumed holotype microslide (NMV F58747) is not Bale's and may be that of the collector, John Bracebridge Wilson. Ralph (1966) reported *Pennaria disticha* from a benthic material from southern Port Phillip collected by the National Museum of Victoria Port Phillip (1957). Examination of this material (NMV F150168, F150169) shows it to be *Pennaria wilsoni*, not *Pennaria disticha*. The flexuous spirally branching habit of *P. wilsoni* easily distinguishes it from the pinnate stems of *P. disticha*. Bale (1913) renamed the species *Pennaria wilsoni* and Blackburn (1937) described and figured the gonophores of material from Western Port, Victoria.

Gibbons and Ryland (1989) reported fertile material as *Pennaria wilsoni* from Suva Barrier Reef, Fiji and Kirkendale and Calder (2003) also referred infertile tropical material from Guam to *P. wilsoni*. Gibbons and Ryland's microslide mount (GL 10177) loaned by the Queensland Museum contains several mature balloon–shaped gonophores approximately 1.5 mm long and 1.2 mm wide, but the contents are too degraded for description. I have examined four preserved samples of infertile material from the Pennycuik collection (QM 5513-5516 inclusive) loaned by the Queensland Museum. The material was collected from under coral reef shelves, 21–24th August, 1954, at a depth of 2 m at the Low Isles on the Great Barrier Reef, Queensland. The Fiji and Great Barrier Reef material are clearly the same species.

The only sure means of determining whether there are two or one geographically wide-ranging species is based on morphology of the cnidome. For comparison with *P. wilsoni* a small crushed hydranth of QM 5515 was examined under high magnification. The scarcely distinguishable nematocysts in the capitate tentacles comprised some undischarged ?stenoteles of three sizes: i) 28–36 x 20–24 μm, ii) 25 x 17 μm and iii) 11–12 x 8–9 μm. While allowing for approximately 10% shrinkage in preservation, the largest capsules are much

smaller than those of fresh *P.wilsoni*. Therefore, until the cnidome and gonophores of fresh tropical material are available for examination it the tropical material is best regarded as a different species.

The extensive and highly variable cnidome with nematocysts of four categories is similar to that described for *Pennaria disticha* (see Schuchert 1996), but in *P. wilsoni* the largest stenoteles are bigger than those of *P. disticha*. In *P. wilsoni* the relative abundance of the larger sizes of stenoteles varies between hydranths, sometimes from the same stem. The smaller stenoteles, microbasic mastigophores and isorhizas are present in all hydranths while desmonemes are sometimes rare. Uneven distribution of the large stenoteles may be related to maturity of the hydranth, the larger ones usually occurring on the older hydranths.

Pennaria wilsoni is known from several Victorian localities and is likely to be more widespread than is presently known. Colonies are most luxuriant in strong current flow on open reef at 6–10 m depth while in less rigorous environments they usually comprise only a few stems. Colonies persist throughout the year with major growth during winter months at water temperatures of 10–14ºC, becoming moribund over summer. Mature colonies are host to many epizooites including other small hydroids, anemones and ascidians; as the water temperature increases in late winter they are often overgrown by small filamentous red algae. Hydranths and gonophores are heavily preyed upon by the pycnogonid *Tanystylum* and several species of the nudibranch *Trinchesia*.

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