

FOUR NEW SPECIES OF THE FAMILY OPHELIIDAE (POLYCHAETA) FROM SOUTHERN AUSTRALIA

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Recent examination of specimens of *Euzonus*, *Ophelia*, *Ophelina* and *Travisia* (Polychaeta: Opheliidae) in the South Australian Museum revealed a previously undescribed species in each genus: *Euzonus zeidleri* sp. nov., *Ophelia bulbibranchiata* sp. nov., *Ophelina longicirrata* sp. nov. and *Travisia oksae* sp. nov. The previous report of *Travisia forbesii* Johnston, 1840 from Victoria is referred to *T. oksae* sp. nov. *T. oksae* sp. nov. is known from South Australia and Victoria, the other three from South Australia only. *Euzonus zeidleri* sp. nov. represents the first record of its genus for Australia

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The family Opheliidae is widely distributed in the seas of all climatic zones from the polar regions to the tropics, and from shallow waters to abyssal depths. Most members of the family live as deposit-feeding burrowers in various types of sediment.

Six genera and 15 named species of opheliids have so far been reported from Australia (mainly from southern Australia and New South Wales): *Armandia* Filippi, 1861: *A. maculata* (Webster, 1884), *A. intermedia* Fauvel, 1902, *A. secundariopapillata* Hartmann-Schröder, 1984, *A. bilobata* Hartmann-Schröder, 1986; *Ophelia* Savigny, 1818: *O. ashworthi* Fauvel, 1917, *O. dannevigii* Benham, 1916, *O. elongata* Hutchings & Murray, 1984, *O. multibranchia* Hutchings & Murray, 1984, *Lobochesis* Hutchings & Murray, 1984: *L. bibranchia* Hutchings & Murray, 1984, *L. longiseta* Hutchings & Murray, 1984; *Ophelina* Örsted, 1843: *O. breviata* (Ehlers, 1913)¹, *O. gigantea* (Rullier, 1965); *Polyophthalmus* Quatrefages, 1850: *P. pictus* (Dujardin, 1839); *Travisia* Johnston, 1840: *T. lithophila* Kinberg, 1866, *T. olens* Ehlers, 1897 (Day & Hutchings 1979, Hutchings 1982, Hutchings & Murray 1984, Hartmann-Schröder 1980, 1984, 1985, 1986). A further species, *Travisia forbesii* Johnston, 1840, has been reported from Victoria (Poore *et. al.* 1975), but the specimens proved, upon examination, to have been misidentified (see below under *T. oksae* sp. nov.). A seventh genus, *Euzonus* Grube, 1866, has to date been reported in

Australasia only from New Zealand (*E. otagoensis* Probert, 1976).

MATERIALS AND METHODS

The present study is based largely on material in the South Australian Museum, *viz.* specimens of *Ophelia* and *Ophelina* obtained at Pearson Island in June 1973, a large series of *Travisia* from upper Spencer Gulf collected by E. Oks of the South Australian Fisheries Department in 1985–1987, and a large series of *Euzonus* collected at Reevesby Island in the Sir Joseph Banks Group in 1985 and 1986 by the junior author. This new material was augmented by a loan of *Travisia* from the NMV. Comparative material of previously described species included the four (of six) syntypes of *Ophelia ashworthi* in the SAM, and from the ZMH the syntypes of *Euzonus furciferus* (Ehlers, 1897), and the specimens of *T. forbesii*. The subfamilial and generic classification follows Hartmann-Schröder (1971).

Measurements are in millimetres, made with an eyepiece graticule. Drawings were executed with the aid of a camera lucida on a Zeiss microscope. Abbreviations of institutions mentioned are: AM, Australian Museum, Sydney; BMNH, Natural History Museum, London; NMV, Museum of Victoria, Melbourne; NTM, Northern Territory Museum, Darwin; SAM, South Australian Museum, Adelaide; USNM, National Museum of Natural History, Washington DC; ZMH, Zoological Museum, Hamburg. Material is deposited in the AM, NTM, SAM, USNM and ZMH.

* Shane Parker died on 21 November 1992.

¹ Listed as *Ophelia breviata* by Day & Hutchings (1979:129)

SYSTEMATICS

Family OPHELIIDAE Malmgren, 1867
Subfamily OPHELIINAE Malmgren, 1867

Genus *Euzonus* Grube, 1866

Euzonus zeidleri sp. nov.
(Figs 1–5)

Types (all collected on Reevesby Island, South Australia, by S. A. Parker, measurements for paratypes are of length of longest specimen in each sample).

Holotype: Haystack Bay, 20.i.1986, SAM E2145; length 28 mm, width (at thorax) 3.5 mm.

Paratypes (276 specimens): Haystack Bay, 21.i.1985, SAM 2146(36), 23 mm; Haystack Bay, 31.i.1985, SAM E2147(58), 22 mm; McCoy Bay, 22.i.1985, SAM E2148(36), 31 mm; McCoy Bay, 31.i.1985, SAM E2149(2), 19 mm; Haystack Bay, 20.i.1986, SAM E2150(73)/ZMH: P20816(6)/USNM 169135 (4)/AM W21745 (4)/NTM W6421–424(4), 27 mm; Haystack Bay, 22.i.1986, SAM E2151(14), 35 mm; Haystack Bay, 30.i.1986, SAM E2152(9), 28 mm; Haystack Bay, 1.ii.1985, SAM E2153(26), 24 mm.

Other material examined

Euzonus furciferus (Ehlers, 1897): syntypes, Punta Arenas, Strait of Magellan, ZMH: V4869(7); Itanhan, Brazil, ZMH: P15144(1); Santos, Brazil, ZMH: P15421(4); Zapallar, Chile, ZMH: P15124(1).

Diagnosis

A *Euzonus* with bifurcate branchiae (character of subgenus *Thoracophelia* Ehlers, 1897 *sensu* Hartman 1956), with body formula $12a + 20b + 6a$ (i.e. branchiae occurring on setigers 13–32); all branchiae bifurcate; branches of branchiae subequal, superior one bearing 1–2 small pinnae; setae on segments 1–36; pygidium relatively large, broad, lacking elongated terminal (ventral) cirrus, 6–9 lateral cirri on each side.

Description

Body fusiform, 38 segments, 36 setigers, total length 9–35 mm; divided into three distinct regions: cephalic (prostomium and two setigers), thoracic (eight setigers) and abdominal (26 setigers and two asetigerous segments). All segments annulated. Prostomium with small apical point; eyes absent; nuchal pits present (Fig.

1). Thoracic region inflated, delimited from cephalic region by pronounced constriction, delimited from abdomen by thick, smooth lateral glandular ridges. Abdominal region comprising two prebranchial, 20 branchiate and six postbranchial segments (body formula thus $12a + 20b + 6a$, see Tebbble 1952). Last two asetigerous abdominal segments with close-set longitudinal furrows. Pygidium wide at base, broadly rounded at tip, not tapering to an elongated ventral cirrus; dorsal anal cirri disposed in a V over pygidium, 6–9 on each side (Fig. 5). Abdominal region bearing deep longitudinal midventral and lateral grooves, former continuing to pygidium, latter becoming shallower beyond last branchiate setiger (32nd).

Branchiae on setigers 13–32, bifurcate, branches subequal, superior branch bearing 1–2 small pinnae distally on dorsal surface (Fig. 2–4).

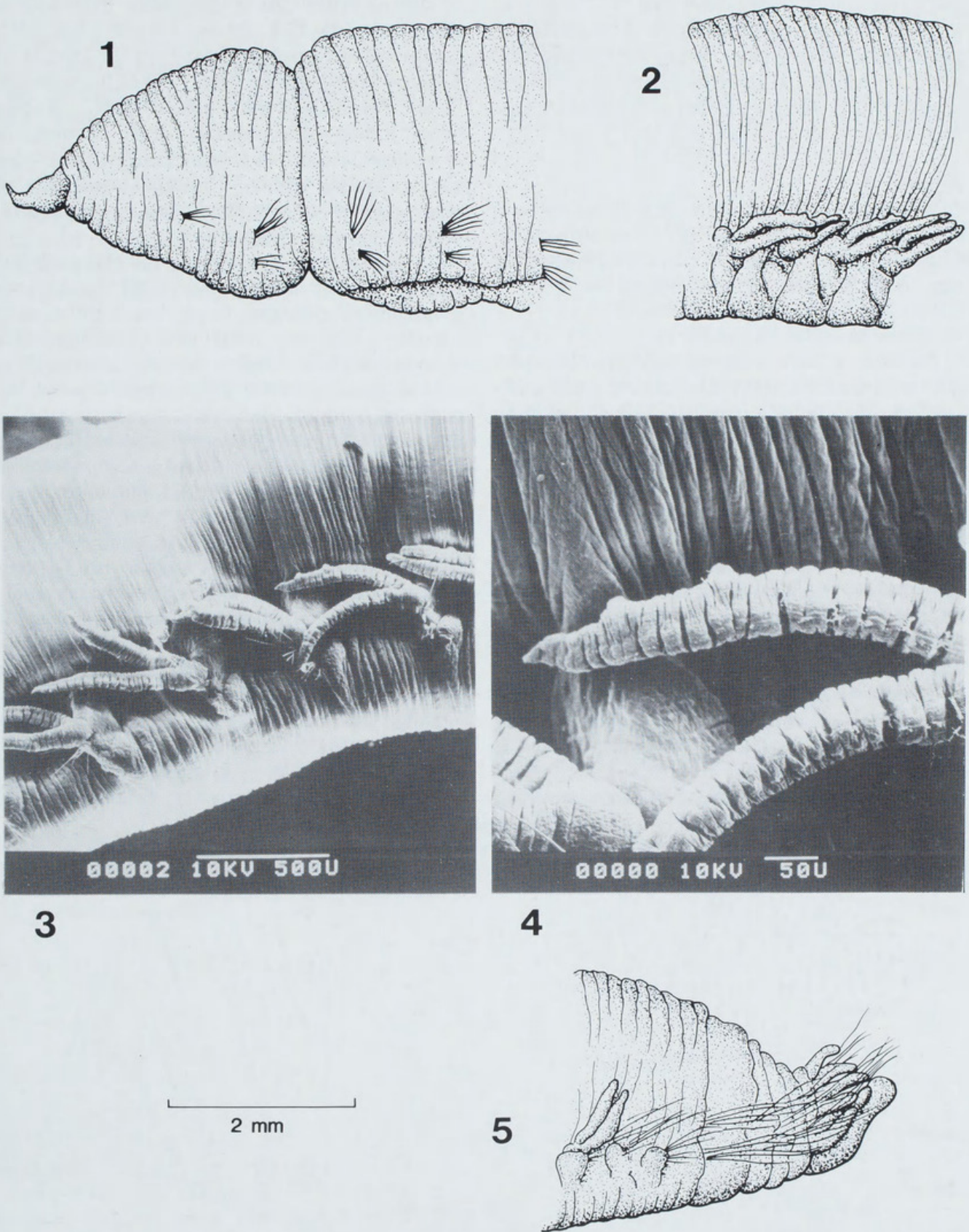
Parapodia barely or not visible, lobes immersed in surrounding tissue, from which bundles of setae appear to arise directly. Notosetae and neurosetae simple, capillary, 6–25 and 6–30 setae per bundle respectively, on segments 1–36. Neurosetae shorter than notosetae of same setiger, except on setigers 34–36, where they increase to a subequal length; also, setae of setdgers 34–36 markedly longer than those of preceding setigers, tending to curve and spread conspicuously (Fig. 5).

Colour of individuals in life bright red, especially at anterior end.

Comparisons with other species

Eleven species have been described to date (Rozbaczylo & Zamorano 1970, Probert 1976). Of these, six fall in the subgenus *Thoracophelia* Ehlers, 1897, *sensu* Hartman 1956, having the branchiae bifurcate rather than trifurcate or pectinate: *E. furciferus* (Ehlers, 1897, type species of *Thoracophelia*), *E. mucronata* (Treadwell, 1914), *E. williamsi* (Hartman, 1938), *E. profundus* Hartman, 1967, *E. otagoensis* Probert, 1976 and *E. heterocirrus* Rozbaczylo & Zamorano, 1970.

Within this group, *E. zeidleri* sp. nov. is most similar to *E. furciferus* of South America, the only member of the subgenus with a body formula of $12a + 20b + 6a$, i.e. twelve abbranchiate anterior segments, 20 branchiate segments and 6 posterior abbranchiate segments. The closest species geographically, *E. otagoensis* of New Zealand, differs in having a body formula of $14a + 18b + 6a$. From *E. furciferus*, *E. zeidleri* differs in possessing 1–2 small pinnae on the superior branch of the branchiae (absent in *E. furciferus*),



FIGURES 1-5. *Euzonus zeidleri* sp. nov. 1, anterior end, lateral view; 2, segments from middle of body, lateral view (setae omitted); 3, median body region showing branchiae; 4, branchiae, detail; 5, posterior end, lateral view (all of paratype ZMH: P-20816).

the last two segments asetigerous (last one asetigerous in *E. furciferus*), last 3–4 segments not telescoped together as in *E. furciferus*, pygidium relatively large, broad, bluntly rounded at tip, not small and tapering to elongated ventral cirrus as in *E. furciferus*, and 6–9 dorsal cirri on each side vs 4 on each side in *E. furciferus*.

Etymology

We name this species in honour of our colleague Wolfgang Zeidler, South Australian Museum, who led the 1985 and 1986 collecting trips to the Sir Joseph Banks Group.

Distribution and ecology

Euzonus zeidleri is known only from Haystack Bay and McCoy Bay, two quartz-grain surf-beaches on the eastern, weather side of Reevesby Island, Sir Joseph Banks Group, South Australia, where it was collected in damp sand of the lower and middle intertidal, within a spade's depth of the surface. Both beaches squeaked underfoot, and thus belong to the type known as singing beaches (for a discussion of this phenomenon, apparently produced by the shearing of the well-sorted, well rounded quartzgrains under pressure, see the account of Squeaky Beach, Victoria by Beasley 1972).

Subsequent to the discovery of *E. zeidleri*, S.A. P. sought the species in other exposed sandy beaches, e.g. on Younghusband Peninsula and at Cape Jaffa, Boatswain's Point and Robe, south-eastern South Australia. None of these contained

E. zeidleri, and none squeaked underfoot; all were of silicate rather than quartzgrains. In answer to our enquiry, Dr P. K. Probert (*in litt.* 11.iii.1992) confirmed our suspicion that the type locality of *Euzonus otagoensis* Probert, 1976 (Allan's Beach, Otago Peninsula, New Zealand) was a singing beach. It thus seems possible that the occurrence of *E. zeidleri* and *E. otagoensis* (and perhaps other species of the genus) coincides with that of singing beaches, with their characteristic well-sorted, well-worn quartzgrains.

E. zeidleri was more abundant at Haystack Bay than at McCoy Bay; at the latter locality the quartzgrains averaged larger but were equally rounded. The only other macroscopic species observed in these beaches were the cosmopolitan marine acanthodriline oligochaete *Pontodrilus litoralis* (Grube, 1855; first South Australian record) and a minute enchytraeid oligochaete; these were collected at Haystack Bay, from less damp sand of the upper subtidal.

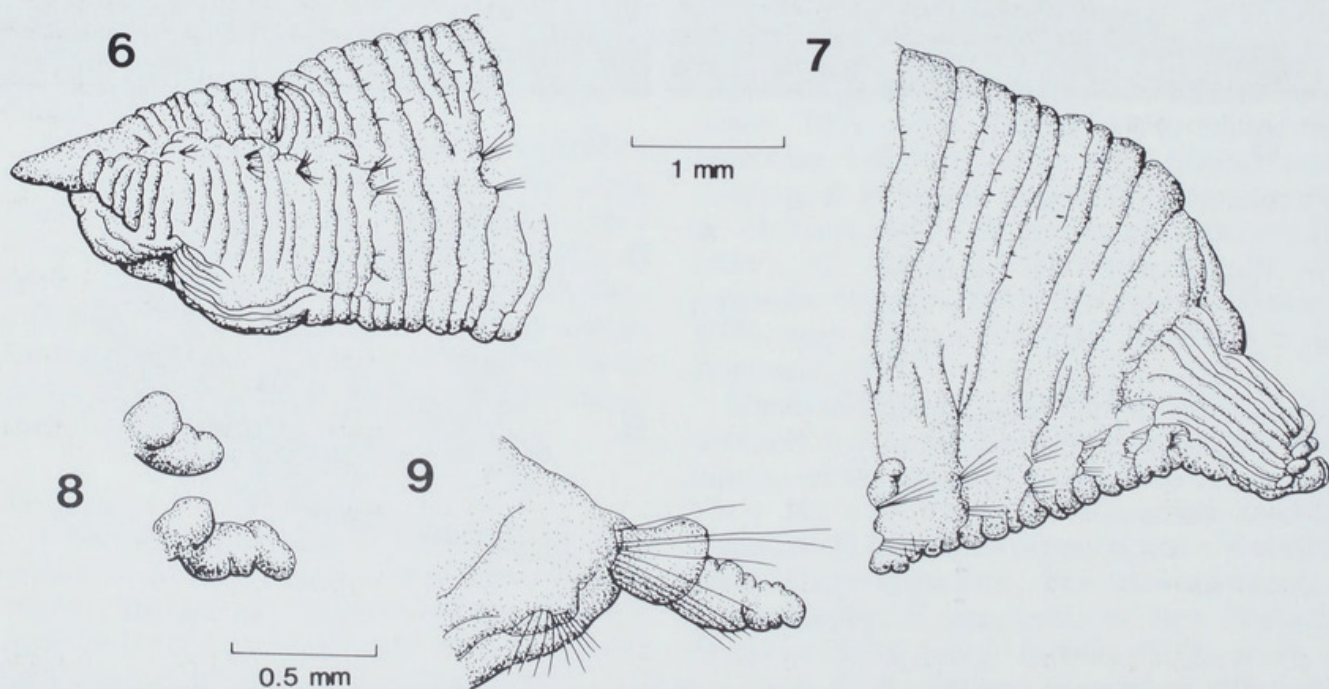
Genus *Ophelia* Savigny, 1818

Ophelia bulbibranchiata sp. nov. (Figs 6–9)

Types

Holotype: Pearson Island, Investigator Group, South Australia, 26.vi.1973 (?coll.), SAM E1604, 30 setigers, length 30 mm, width 4 mm.

Paratypes: Same data as holotype: SAM



FIGURES 6–9. *Ophelia bulbibranchiata* sp. nov. 6, anterior end, lateral view; 7, posterior end, lateral view; 8, first branchia from anterior segment; 9, parapodium from middle of body.

E1605(3), 30 setigers, length 2–27 mm; ZMH: P20667(1), 30 setigers, length 30 mm.

Other material examined

Ophelia ashworthi Fauvel, 1917; 'St Vincent and Spencer Gulfs', South Australia, SAM E306 (four syntypes).

Diagnosis

An *Ophelia* 24–33 mm long with 30 setigers (including 10 prebranchial and 5 postbranchial), 15 pairs of simple, bulbous-based branchiae, 7–9 small and two large anal papillae; posterior dorsolateral ridges absent.

Description

Body club shaped, divided into anterior region of nine setigers and a posterior region of 21 setigers; a faint constriction between setigers 2 and 3. Prostomium small, conical, with small nuchal organs basally. No eyes visible. All segments annulate, those of anterior region somewhat areolate (Fig. 6); last five to six segments decreasing in size. Lateral furrows and a ventral furrow from setiger 11. Posterior segments lack dorsolateral ridges. Branchial fenestrations absent. Pygidium cylindrical with longitudinal folds or furrows, bearing seven to nine small dorsal and lateral anal papillae and two large ventral papillae (Fig. 7). First bundle of setae very

small, easily overlooked, in region of mouth (Fig. 6). Subsequent parapodia with short, broadly rounded, postsetal lobes (Fig. 9). Setae capillary, notapodial slightly longer than neuropodial but nowhere obviously long. Fifteen pairs of branchiae from setiger 11 to setiger 25. Branchiae short, with bulbous bases, latter largest in middle branchiae (Fig. 8–9). Nephridial pores not visible.

Comparisons with other species

O. bulbibranchiata sp. nov. is unique among the known species of the genus in possessing bulbous bases to the branchiae.

Species of *Ophelia* with a similar number of setigers to *O. bulbibranchiata* (30) are *O. multibranchia* Hutchings & Murray, 1984 (27), *O. peresi* Bellan & Picard, 1965 (29), *O. celtica* Amoureux & Dauvin, 1981 (29), *O. elongata* Hutchings & Murray, 1984 (30), *O. bipartita* Monro, 1936 (31), *O. dannevigii* Benham, 1916 (32) and *O. ashworthi* Fauvel, 1917 (32). Of these, *O. peresi*, *O. celtica* and *O. bipartita* have not been recorded in Australia. For differences see Table 1.

Etymology

The epithet *bulbibranchiata* (L.), refers to the bulbous shape of the basal part of the branchiae, unique in the genus.

TABLE 1. Comparison of *Ophelia bulbibranchiata* sp. nov. with other species of the genus with similar number of setigers

	Number of setigers	size in mm	number of prebranchial segments	number of postbranchial segments	pairs of branchiae	shape of branchiae	anal papillae	posterior dorsolateral ridges
<i>O. multibranchiata</i>	27	4–6	7	3	17	simple	10 small ones	absent?
<i>O. peresi</i> ¹	29	1–12	10	4	15	simple	12 small ones	absent
<i>O. celtica</i> ¹	29	30–45	10	3	16	simple	12 small + 2 large ones	absent
<i>O. elongata</i>	30	4–7	8	6	16	simple	10 small ones	present
<i>O. bipartita</i> ¹	31	63	9	5	17	simple	16 small + 2 large ones	present
<i>O. dannevigii</i>	32	20	10	3	19	simple	16 small + 2 large ones	absent?
<i>O. ashworthi</i>	32	?	10	2	20	bifurcate	several small + 1 large one	absent?
<i>O. bulbibranchiata</i>	30	24–33	10	5	15	bulbous base	7–9 small + 2 large ones	present

¹ no records from Australia

Distribution and ecology

Known only from the type series obtained at Pearson Island, eastern Great Australian Bight in 1973. No notes on depth or habitat accompany the specimens.

Subfamily OPHELININAE Hartmann-Schröder, 1971

Genus *Ophelina* Örsted, 1843

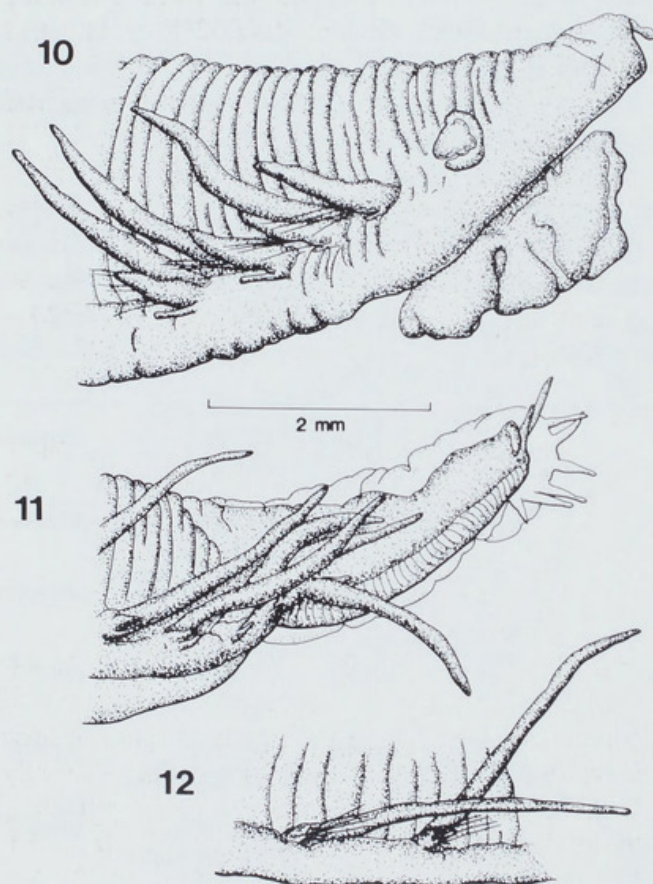
Ophelina longicirrata sp. nov.
(Figs 10–12)

Types

Holotype: Pearson Island, Investigator Group, South Australia, 26. vi. 1973 (?coll), SAM E1606, 41 setigers, length 52 mm, width 3.0 mm.

Other material examined

Ophelina breviata (Ehlers, 1913): holotype,



FIGURES 10–12. *Ophelina longicirrata* sp. nov. 10, anterior end, lateral view; 11, posterior end, lateral view (cuticulum lifted away from underlying tissue through fixation); 12, parapodia and branchiae of segments 34 and 35.

ZMH: V8583, Kaiser-Wilhelm-II-Land, Antarctica, P190559(10), P19728(3), Antarctica; ZMH V9548(2), Bass Strait, ZMH: V11871(1), Port Lockray, New South Wales (Augener 1927: 215, at 37°05'S, 150°05'E).

Diagnosis

A large *Ophelina* (52 mm long), with 41 setigers, long cirriform presetal lobes on anterior parapodia, long ventral cirri, anal tube cylindrical.

Description

Body fusiform, 41 setigers. Prostomium conical, longer than wide at base, with oblong palpode (Fig. 10). Proboscis a folded bag. No eyes visible. Nuchal organs slightly protruded, nuchal slits probably horseshoe-shaped. Segments strongly annulate. Anal tube cylindrical, annulate, only half width of last segments and as long as 5–6 last segments together. Anal opening ventroterminal, with 11 lanceolate anal papillae and a ventral cushion that may be base of a lost unpaired cirrus (Fig. 11). Presetal lobes of anterior parapodia long, cirriform, half as long as the branchiae on setiger 2, decreasing in size to setiger 12. From setiger 26, presetal lobes rounded-conical, with digitate extension of same length as ventral cirrus (Fig. 10–11). Ventral cirrus of setiger 1 small, filiform, increasing in size to setiger 14, thence of same length as presetal lobe (Fig. 11–12). Setae nowhere obviously long. Branchiae long, cirriform to filiform, overlapping on dorsum, absent only from setiger 1.

Comparisons with other species

Species of *Ophelina* with a cylindrical anal tube and cirriform presetal lobes are *O. hachaensis* Augener, 1934 and *O. fauveli* (Caullery, 1945), neither of which has been reported from Australia. *O. longicirrata* sp. nov. is much larger than *O. hachaensis*, with fewer setigers (52 mm, 41 setigers, vs 9 mm, 48 setigers), longer ventral cirri¹, and anal tube equal to the last 5–6 segments (vs the last 3–4 in *O. hachaensis*). *O. fauveli* has only 31 setigers and a length of 20 mm. The anal tube of both species is much shorter than that of *O. longicirrata*.

Besides *O. longicirrata*, two other species of *Ophelina* have been reported from Australia, *O. breviata* (Ehlers, 1913) of Bass Strait, New South Wales and Antarctica and *O. gigantea* (Rullier, 1965) of Queensland. *O. breviata* differs from *O.*

¹ Augener (1934) misinterpreted the long presetal lobe of *O. hachaensis* as a ventral cirrus.

longicirrata by its smaller size (28 setigers, 29 mm length). In *O. breviata* the branchiae are absent from the first and the last four segments, the posterior four segments are very short, and the presetal lobes are rounded rather than filiform. *O. gigantea* differs from the new species (and from all the other species discussed) in having the anal tube not cylindrical but spoon-shaped, open ventrally for the whole of its length. It is also larger (62–64 mm), with more setigers (65–68).

Etymology

The epithet *longicirrata* (L.) refers to the long cirriform ventral cirri.

Distribution and ecology

Known only from the unique holotype obtained at Pearson Island, eastern Great Australian Bight in 1973. No notes on depth or habitat accompany the specimen.

Subfamily TRAVISIINAE Hartmann-Schröder, 1971

Genus *Travisia* Johnston, 1840

Travisia oksae sp. nov.

(Figs 13–19)

Travisia forbesi: Poore, Rainer, Spies & Ward (*non* Johnston), 1975: 29, 56 (Port Phillip Bay, Victoria); Day & Hutchings (*non* Johnston), 1979: 129 (*pars*, Victoria).

Types

Holotype: Station 2, 32°35'04"S, 137°46'08"E, upper Spencer Gulf, South Australia 6 m, medium sand, coll. E. Oks, S. Aust. Fisheries Dept. xi.1985, SAM E2701, 27 segments, 24 setigers, length 15 mm, width 5.5 mm (moderately contracted).

Paratypes: (52 specimens, all collected by E. Oks, upper Spencer Gulf, 1985–1987): Station 2, SAM E2702 (4, in same sample as holotype) (27, 25, 20.5), SAM E2703(2) (27, 24, 12), SAM E2704(1) (26, 24, 8), SAM E2705(1) (26, 26, 5); Station 3, SAM E2706(1) (26, 25, 5), SAM E2707(4) (26, 24, 7), SAM E2708(6) (23, 20, 3), SAM E2718(1) (27, 24, 11); Station 4, SAM E2709(1) (26, 24, 4); Station 5, SAM E2710(3) (25, 25, 4.5); Station 6, SAM E2711(2) (26, 25, 9.5), SAM E2712(7)/USNM 169136 (1)/AM W21746 (1)/(26, 24, 9.5); Station 7, SAM E2713(1) (27, 25, 24); Station 8, SAM E2714(2) (27, 24, 19), ZMH: P20668(1) (27, 25, 19);

Station 9, SAM E2715(1) (26, 22, 4.9), SAM E2716(7)/NTM W6425(1) (27, 24, 16.5), SAM E2717(1) (26, 23, 6), ZMH: P20669(3) (27, 24, 155) (figures in parentheses after each sample refer to the number of segments, number of setigers and total length of the largest individual in the sample).

Other material examined

T. oksae sp. nov.: Victoria: Port Phillip Environmental and Benthic survey: Stn 974, 13.x.1971, NMV F60027(2), 60028(5), 60029(3) (Poore *et al.* 1975, under *T. forbesi*) Western Port Environmental Study: Stn 1704, NMV F60035(2), Stn 1722, NMV F60033(5), 60037(2), 60043(3), Stn 1723, NMV F60030(1), 60040(8), Stn 1724, NMV F60036(1), 60039(3), 60044(1), Stn 1727, NMV F60041(1), Stn 1731, NMV F60042(1), Stn 1733, NMV F60031(1), Stn 1735, NMV F60034(2), 60038(3) (ix. 1973, i. 1974).

T. olens Ehlers, 1897: syntypes, Punta Arenas, Chile, ZMH: V4865(7), 4866(4), 4807(20), 4868(1); Punta Arenas, ZMH: V11937(1), ZMH: PE1031(6); South Georgia, ZMH: V11877(1); Antarctica, ZMH: P19085(9); Exmouth Gulf, Western Australia, ZMH: P16892(1) (Hartmann-Schröder 1980: 74).

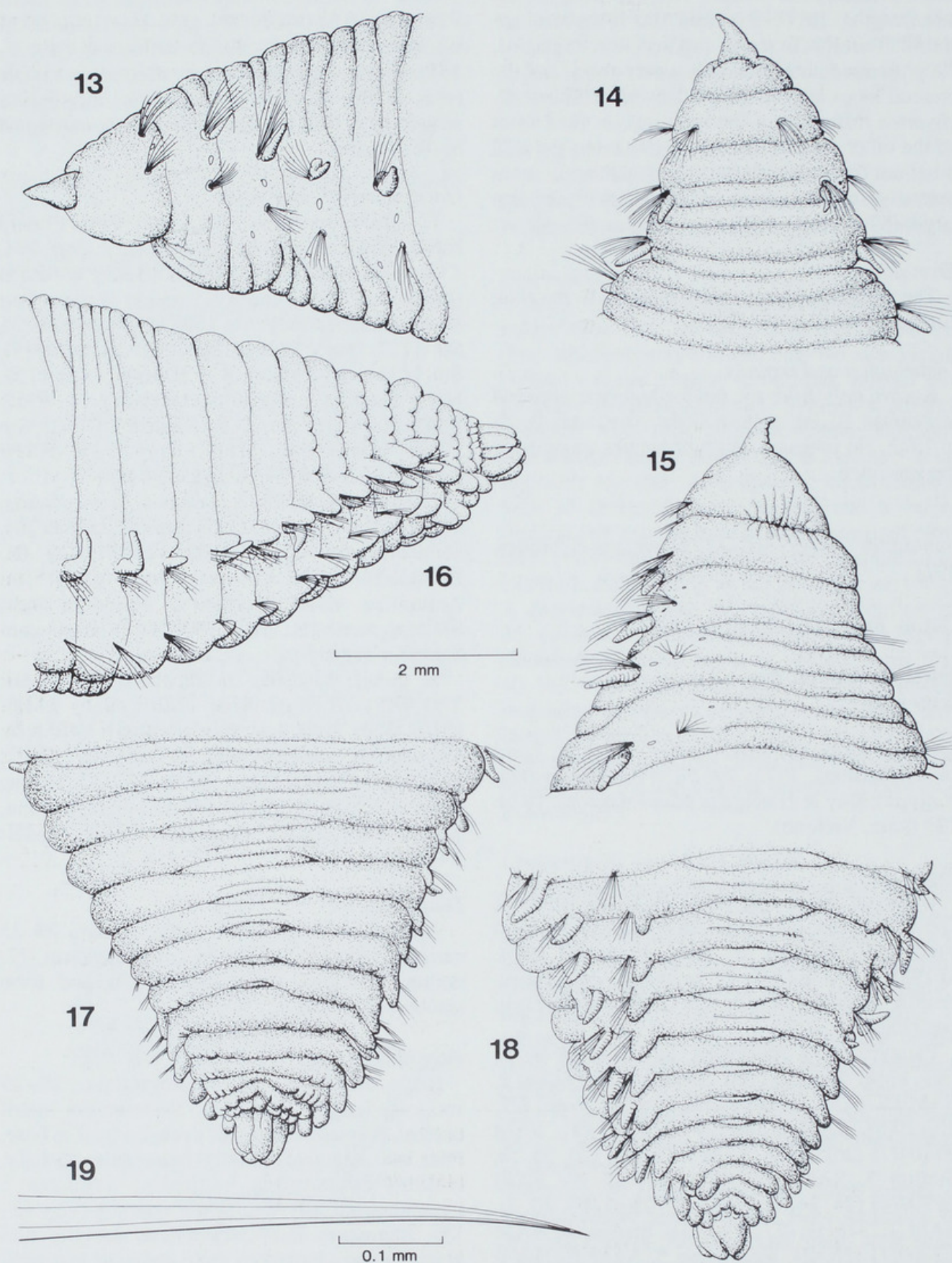
T. forbesi Johnston, 1840: North Sea, ZMH: V9190(5); Bay of Kiel, Baltic Sea, ZMH: P19241(22); Bohuslan, Sweden, ZMH: V5355(4); Tromso, Norway, ZMH: V7576(4), ZMH: PE1021(1); Spitzbergen, ZMH: PE1023(1); Jan Mayen, ZMH: V7527(1); Franz-Joseph-Land, ZMH: PE1025(4); Murman Coast, ZMH: V1439(2).

Diagnosis

A *Travisia* with 23–27 segments and 20–25 setigers, notopodial lobes from segment 15, neuropodial lobes from segment 16, and setae smooth, bilimbate.

Description

Body fusiform, 23–27 segments, 20–25 setigers, length 3–24 mm. Prostomium small conical, pointed, with small nuchal organs at base. First two segments faintly biannulate dorsally, lacking annulations ventrally. Segment 3 triannulate dorsally, biannulate ventrally (Figs 13–15). Segments 4–19 triannulate dorsally and ventrally, the annulations more and more restricted to the median part of dorsum and venter towards the posterior end of body (Figs 16–18). Segments 20–22 dorsally and segments 22–24 ventrally biannulate again; last five segments dorsally and last three segments ventrally lacking annulations.



FIGURES 13-19. *Travia oksae* sp. nov. 13, anterior end, lateral view; 14, anterior end, dorsal view; 15, anterior end, ventral view; 16, posterior end, lateral view; 17, posterior end, dorsal view; 18, posterior end, ventral view; 19, seta.

Posterior margin of the last nine segments with more or less obvious crenulations dorsally (Figs 16–17). Segment 27 very small and short. Anus terminal, encircled by seven blunt lobes (Figs 16–18). Entire surface of body (except the branchiae) covered with small pustules. Lateral parapodial region of body slightly swollen from segment 13 to end of body, expanding from parapodial region to near mid-dorsal and mid-ventral region in more posterior segments (Figs 16–18).

Fourteen anterior-most parapodia without lobes (Figs 13–15). Segment 15 with pair of minute notopodial lobes, above the bundle of notosetae; notopodial lobes increasing to ovoid lobes and still present on small last segment. Neuropodial lobes below neurosetae start on segment 16, similar in shape and size to notopodial lobes, but missing on segments 26 and 27 (Figs 16–18).

Bundles of notosetae and neurosetae from segment 1 to segment 24; last three segments usually asetigerous (though setae occur up to last segment in at least one specimen, in sample SAM E2710). Notosetae and neurosetae may be of different length within a bundle, otherwise similar, smooth and bilimbate (Fig. 19).

Branchiae simple, cirriform, present from segment 2 to 23 (Figs 13–15, 18). Lateral organ a small pit between bundles of notosetae and neurosetae. Nephridial pores present on segments 3–14, very conspicuous on segments 7–14 (Figs 13, 15).

Comparisons with other species

Species of *Travisia* with a similar number of setigers to *T. oksae* sp. nov. (22–29) are *T. forbesii* Johnston, 1840, *T. olens* Ehlers, 1897, *T. antarctica* Hartman, 1967, *T. brevis* Moore, 1906, *T. chiloensis* Kükenthal, 1887, *T. kerguelenensis* McIntosh, 1885 and *T. doellojuradoi* Rioja, 1944. Of these, only *T. olens* has been authentically reported from Australia (see above).

The species appearing most similar to *T. oksae* is the Arctic-boreal *T. forbesii* (23–26 segments, 22–25 setigers). It is identical to the former in the annulations of the segments, in the origins and shape of the notopodial and neuropodial lobes and the presence of nephridial pores on segment 3–14. It differs in being on average larger (11–32, vs 3–14 mm) and in having the setae minutely hirsute (vs smooth and bilimbate in *T. oksae*).

Also similar to *T. oksae* is *T. olens* from New Zealand, Western Australia and South Africa, which differs in being larger (up to 72 mm) with a greater average number of segments and setigers (27–32 segments, 23–29 setigers, vs 23–27 and 20–25), in having the neuropodial lobes present (though small) from segment 1, becoming larger from about segments 12–15 (vs present from segment 16 only in *T. oksae*), and in having the setae minutely hispid. The reports of *T. forbesii* from South Africa and New Zealand by Ehlers (1904, 1907, 1908) were referred to *T. olens* by Augener (1922). By their descriptions, Day's

TABLE 2. Details of stations at which *Travisia oksae* sp. nov. was collected.

Survey	Station	Lat.(S)	Long (E)	Depth(m)	Quartzgrain size
1	2	32°35'04"	137°46'08"	6	medium
	3	32°37'17"	137°46'00"	12	medium
	4	32°40'00"	137°45'28"	13	medium
	5	32°42'20"	137°47'26"	15	medium/coarse
	6	32°45'00"	137°50'00"	16	coarse
	7	32°47'18"	137°49'12"	15	coarse
	8	32°47'18"	137°50'00"	11	coarse
	9	32°50'00"	137°49'00"	17	coarse
2	974	38°16.3'	144°44.7'	5	
3	1704	38°16.12'	145°24.52'	12	
	1722	38°16.23'	145°15.45'	9	
	1723	38°17.07'	145°14.86'	14	
	1724	38°18.56'	145°14.72'	18	
	1727	38°21.17'	145°15.93'	9	
	1731	38°25.83'	145°19.28'	8	
	1733	38°23.09'	145°27.31'	10	
	1735	38°21.60'	145°30.59'	9	

1. Upper Spencer Gulf Benthic Survey (South Australia)
2. Port Phillip Environmental and Benthic Survey (Victoria)
3. Western Port Bay Environmental Study (Victoria)

(1961, 1967) records of *T. forbesii* from South Africa are also referable to *T. olens*.

In *T. antarctica* (28 segments, 24 setigers), notopodial and neuropodial lobes are not mentioned, nor are there any figures by which one might ascertain whether they are present; the setae are described as 'long, slender and capillary'; the annulations of the segments are different (the first 16–17 segments are triannulate, followed by six biannulate segments, whereas in *T. oksae* segments 4–19 are triannulate followed by three biannulate segments); and each segment is crossed by circlets of papillae, "resembling closely strung beads". *T. brevis* (26–27 segments, 24–25 setigers) differs by its hirsute setae and by the nephridial pores being situated on segments 7–25. *T. chiloensis* (27 segments, 24 setigers) has two pairs of notopodial and neuropodial lobes starting at segment 20 or 21. In *T. kerguelensis* (23–27 segments, 21–23 setigers) segments 4–18 are biannulate; there are no triannulate segments; the posterior margins of the posterior 5–6 segments are strongly crenulated or lobed. *T. doellojuradoi* differs from *T. kerguelensis* only by its deep purple colour when alive (black in alcohol).

Apart from *T. olens* and *T. oksae*, the only other *Travisia* recorded from Australia is *T. lithophila* Kinberg, 1866, known by two specimens (47, 48 mm) from New South Wales (Kinberg 1866, Hutchings & Murray 1984). This species differs

from all the above in its greater number of setigers (44, 53); its notopodial and neuropodial lobes begin on setiger 12, and as in *T. olens* its setae are finely hispid.

Etymology

Named after Ene-mai Oks, collector of the type series.

Distribution and ecology

Travisia oksae is so far known from three areas of sheltered coastal waters in southern Australia: upper Spencer Gulf, South Australia (eight stations from 32°35'S to 32°50'S, in medium to coarse sand at 5–17 m), Port Phillip Bay, Victoria (a single station, 974, just inside entrance, in sand at 5 m) and Western Port Bay, Victoria (eight stations, all in sand).

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