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MELBOURNE



## PORT PHILLIP SURVEY 1957–1963.

## ISOPODA.

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## SUMMARY.

Twenty-six species of isopod crustaceans have been identified from Port Phillip. Synonymies are given for each species and, where necessary, descriptive notes are given. A table, map and appendix are given illustrating areas within the bay where each species was collected.

## INTRODUCTION.

This paper gives an account of the Crustacea: Isopoda collected during the ecological survey of Port Phillip throughout the period 1957–1963. It gives brief synonymies of each species identified and, where necessary adds to their descriptions, besides also commenting upon patterns of species distribution which are apparent within the Bay.

## IDENTIFICATION AND SYNONYMY.

Many of the genera recorded here have been identified using keys given by Hansen (1906), Hale (1929) and Hurley (1961), and many of the species, too, are identifiable in the keys given by Hale (1929). Additional literature used for identification is scattered and is discussed separately for each species, all of which are listed below in a classification which follows that of Hurley (1961).

## TRIBE VALVIFERA.

## Family IDOTEIDAE.

*Paridotea munda* Hale.

*Paridotea munda* Hale [Hale 1924b, Hale 1929, Nierstrasz 1941].

Five specimens (1 ♂ 23.0 mm. body length, 4 juveniles) agree with Hale's (1924b, 1929) descriptions of this species which previously has been recorded in southern Australia and Tasmania (Nierstrasz 1941).

*Paridotea unguata* (Pallas).

*Idotea unguata* (Pallas) [Miers 1881].

*Paridotea unguata* (Pallas) [Hale 1924b, 1929, Nierstrasz 1941, Sheppard 1957, Hurley 1961].

Five specimens (1 ♂ 39.0 mm., 1 ovigerous ♀ 25.5 mm. 1 ♀ with oöstegite precursors 29.0 mm., 2 juveniles 27.5 mm.) agree with this species which is widely distributed in fairly shallow water throughout the Pacific, Indian and S. Atlantic oceans (Nierstrasz 1941, Sheppard 1957).

*Crabyzos longicaudatus* (Spence Bate).

*Idotea longicaudatus* (Spence Bate) [Miers 1881].

*Crabyzos longicaudatus* (Spence Bate) [Hale 1924b, 1929, Nierstrasz 1941].

One young female specimen (12.5 mm., with oöstegite precursors) agrees with this fairly common species from southern Australia.

*Euidotea peronii* (Milne Edwards).*Idotea peronii* Milne Edwards [Milne Edwards 1840, Miers 1881].*Euidotea peronii* (Milne Edwards) [Hale 1924b, 1929, Nierstrasz 1941, Hurley 1961].

One juvenile (10.0 mm.) agrees with this species which is said to be very common in S. Australia (Hale 1929) and which is also recorded from S. Africa (Nierstrasz 1941) and New Zealand (Hurley 1961).

## TRIBE FLABELLIFERA.

## Family EURYDICIDAE.

*Cirolana woodjonesi* Hale.*Cirolana woodjonesi* Hale [Hale 1924a, 1929].

The sample contains a single immature specimen (14.5 mm.) of this common S. Australian species which is often found together with the next species (Hale 1929).

*Cirolana australiense* (Hale).*Cirolana cranchii* Leach var. *australiense* Hale [Hale 1925, 1929, Nierstrasz 1931].*Cirolana australiense* (Hale) [Naylor 1961, Hurley 1961].

The samples contain several specimens of this very common Australian species (Hale 1925, 1929, Nierstrasz 1931) which has also been recorded from New Zealand waters (Naylor 1961).

*Neocirolana obesa* Hale.*Neocirolana obesa* Hale [Hale 1925, Nierstrasz 1931].

One specimen (6.5 mm.) keys out to this species in Hale (1925) where it was first recorded from New South Wales.

## Family SEROLIDAE.

*Serolis tuberculata* (Grube).*Serolis tuberculata* (Grube) [Hale 1929, Nierstrasz 1931].

One female (12.5 mm., with oöstegite precursors) of this moderately common southern Australian species occurs in the samples; it was taken from sand at low tide.

## Family SPHAEROMIDAE.

## Group HEMIBRANCHIATAE.

*Zuzara venosa* (Stebbing).*Cyclura venosa* Stebbing 1876.*Zuzara integra* Haswell [Haswell 1881b, 1882, Richardson 1907].*Cycloidura venosa* Stebbing [Nierstrasz 1931].*Cycloidura integra* Haswell [Nierstrasz 1931].*Zuzara venosa* (Stebbing) [Baker 1910, Hale 1929].

Several males and females of this common and very distinctive species (see Baker 1910, Hale 1929) are present in the collections. There seems little doubt that the separate descriptions by Stebbing (1876) and Haswell (1881b) were of the same species, for which Stebbing's name *venosa* takes priority. The generic name *Zuzara* (Leach) is used here since it precedes that of *Cyclura* described by Stebbing (1876) (see also Hansen 1906).

*Cymodoce bidentata* Haswell.*Cymodocea bidentata* Haswell 1881b.*Cymodoce bidentata* Haswell [Baker 1926, Hale 1929].

One male (11.0 mm.) in the collections agrees closely with descriptions and figures of this species given by Baker (1926) and Hale (1929) except that the uropodal exopod of the present specimen is almost two-thirds the length of the endopod, which is longer than that illustrated by Baker (1926). In addition the present specimen has an additional pair of blunt tubercles situated slightly lateral to and behind the pair of upturned tubercles on the posterior part of the abdomen. The last feature is, however, described for *Cymodoce bidentata* var. *tasmanica* (Baker 1928), a variety whose status is perhaps worthy of investigation since present material came from the Australian mainland.

*Cymodoce coronata* Haswell.*Cymodocea coronata* Haswell 1881b.*Cymodoce coronata* Haswell [Baker 1928, Hale 1929].

Following Hansen (1906) and Hale (1929) specimens key out to the genus *Cymodoce* and they agree closely with Haswell's (1881b) original description of this species. However, there is some discrepancy between the original description and a description of this species given by Baker (1928), who, in addition, described two new varieties (*intermedia* and *fusiformis*) with which some present specimens also agree. In particular, whereas for the species Haswell (1881b) states that the mobile ramus (exopod of the uropod) is much shorter than the immobile ramus (endopod), Baker's (1928) figure shows the uropodal exopod only slightly shorter than the endopod. Forms in which the uropodal exopod is considerably shorter than the endopod are grouped by Baker (1928) in the variety *Cymodoce coronata* var. *fusiformis*, whilst other forms which show an intermediate condition are grouped in the variety *C. coronata* var. *intermedia*. In view of this and until more material of a wide size range is available, present material is all included under Haswell's original name and descriptive notes of these are given below.

**DESCRIPTION:**—Body hirsute, particularly in adult males (Fig. 1a), clypeus (epistome) very broad (Fig. 1c), eyes bulbous, particularly in young forms (Fig. 1b). Peraeopods of adult male all with pads of spinous hairs, peraeopod 1 having a row of prominent blunt spines along the mesial border, peraeopods 6 and 7 with many long tapering spines. Penis fairly short and pointed, appendix masculina narrowing sharply about two thirds of the way along its length and projecting as a fairly slender structure for the last third of its length beyond pleopod 2 (Fig. 1d). Abdomen rather depressed, covered with hairs and ornamented with a coronet of six pointed tubercles, 2 on the posterior border of the anterior part of the abdomen and 4 on the posterior part (Figs. 1a,b). Adult male telson with wide terminal notch and a mesial lobe which is dilate at its base and narrow posteriorly (Fig. 1a); lateral teeth hardly visible from above in small specimens (Fig. 1b). Uropods of adult males with long endopod projecting well beyond telson and a much shorter exopod, each with a smooth terminal point (Fig. 1a). Younger specimens have uropod rami less pointed, more equal in size and not projecting beyond telson (Fig. 1b).

**MATERIAL:**—Ten specimens of this common southern Australian form occur in the Port Phillip material. Adult males ranged from 11·2—13·5 mm. body length, immature males with penes but unseparated appendix masculina ranged from 8·5—10·8 mm., and two possible young females resembling Fig. 1b measured 8·2 and 12·4 mm. respectively.

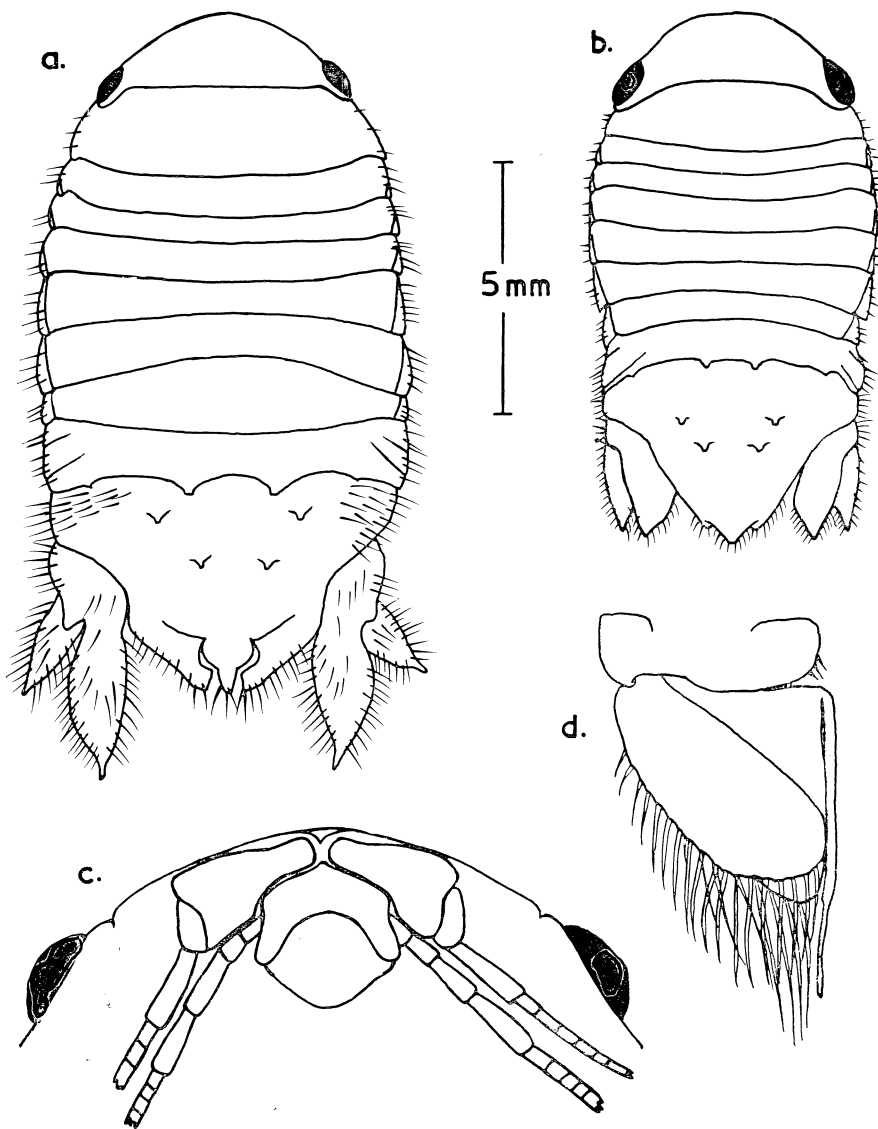


FIG. 1. *Cymodoce coronata* (a) adult of ♂ (b) young ♂ (c) ventral view of head of adult ♂ (d) appendix masculina of adult ♂.

*Cymodoce gaimardii* (Milne Edwards).

*Sphaeroma gaimardii* Milne Edwards 1840.

*Cymodoce gaimardii* (Milne Edwards) [Hansen 1906, Baker 1926, Hale 1929, Nierstrasz 1931].

Specimens key out to the genus *Cymodoce* (Hansen 1906, Hale 1926) and agree with brief descriptions of this species in Milne Edwards (1840) and Baker (1926). Descriptive notes and figures are included here to supplement rather limited information in the literature.

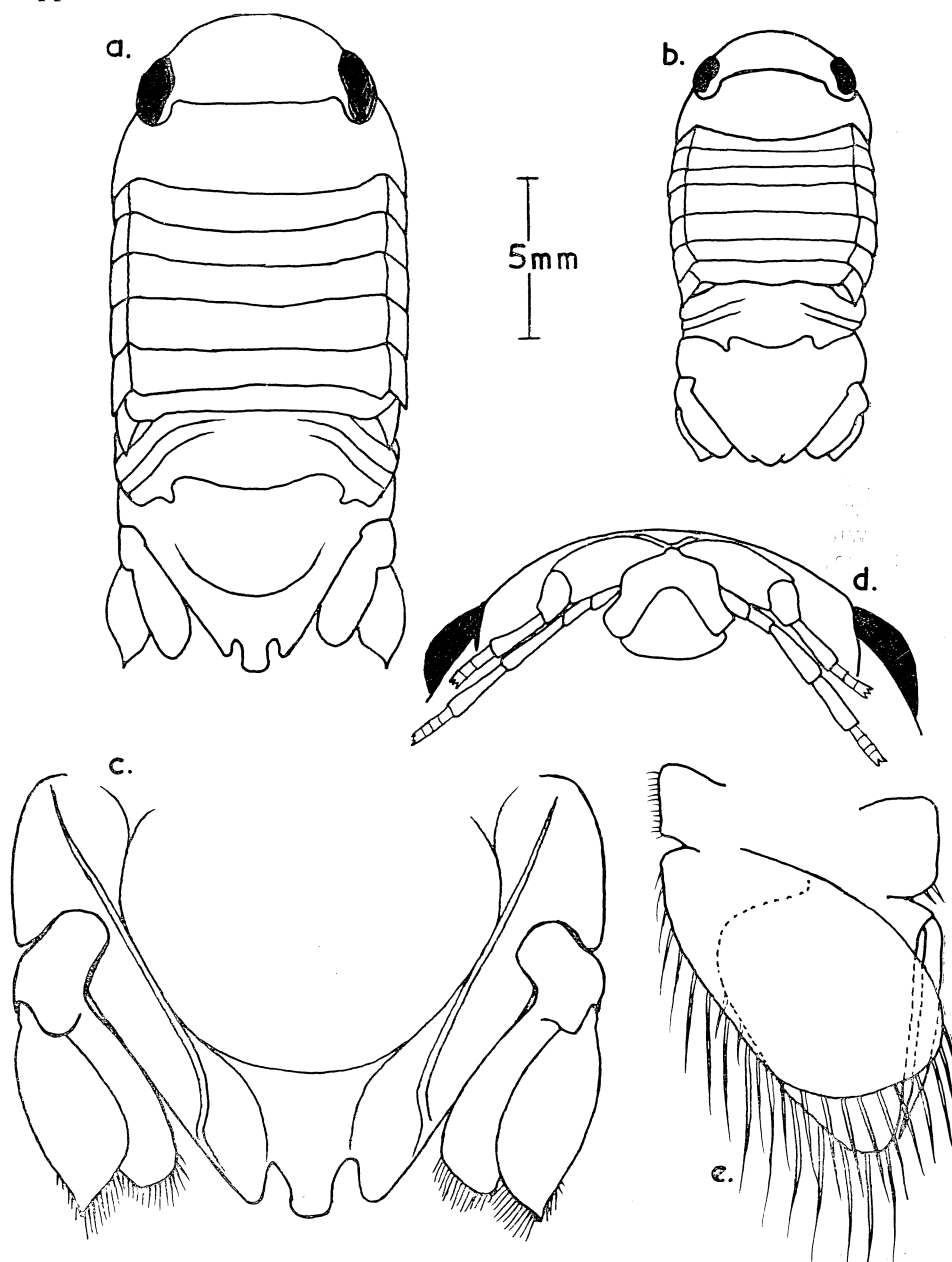


FIG. 2. *Cymodoce gaimardii* (a) adult ♂ (b) ♀ with oostegites and reduced mouthparts (c) ventral view of ♂ telson (d) ventral view of ♂ head (e) appendix masculina.

DESCRIPTION:—Body smooth, clypeus broad, eyes fairly bulbous (Fig. 2 a, b, d). Peraeopods of adult male all with dense pads of spinous hairs, peraeopod 1 with a row of prominent spines along the mesial border. Penes long and pointed, almost reaching posterior border of the exopod of pleopod 1 in fully mature specimens. Appendix masculina sharply pointed, almost reaching posterior border of endopod of pleopod 2 (Fig. 2e). Abdomen domed, with exopod of uropod extending as far as tip of telson in adult males (Figs. 2 a, c). Male telson trilobed, with median lobe square-cut (Figs. 2a, c). Telson border of immature males, juvenile and females less distinctly trilobed, with median projection bluntly rounded (Fig. 2b). Adult females have oöstegites on body segments 1–4 but incubate the brood internally; they have reduced mouthparts and, like males, have pads of spinous hairs on the peraeopods.

MATERIAL:—The collections contain 479 specimens of this species which is common on the coasts of southern Australia and Tasmania. Adult males ranged from 17.0–24.2 mm. body length, though some males up to 23.2 mm. were immature; ovigerous females ranged from 14.2–18.5 mm.

*Cymodoce multidentis* var. *australis* Baker.

One specimen (7.0 mm. body length) from Port Phillip keys out to the genus *Cymodoce* (Hansen 1906, Hale 1929, Hurley 1961) and agrees very closely with the description and figures of this form described by Baker (1928) from W. Australia. Unfortunately when erecting this varietal name Baker (1928) made no comparison between his specimens and the original description of *C. multidentis* from the Philippines given by Richardson (1910). With more material it would be useful to make such a comparison, for there appear to be differences particularly in the shape of the telson and the arrangement of spines on the head such that the Australian form should perhaps be designated as a separate species.

*Cymodoce pubescens* (Milne Edwards).

*Sphaeroma pubescens* Milne Edwards 1840.

*Cymodoce pubescens* (Milne Edwards) [Hansen 1905, Stebbing 1910, Nierstrasz 1931].

*Paracilicaea* (?) *pubescens* (Milne Edwards) [Baker 1926, Hale 1929].

Eight specimens key out to the genus *Cymodoce* (Hansen 1906, Hale 1929, Hurley 1961) and agree with descriptions of this species given by Milne Edwards (1840) and Stebbing (1910). Haswell's (1881a) description under this name seems more relevant to female *Cilicaea latreillei*, a species with which *Cymodoce pubescens* is often confused (see also Miers 1884). However, the presence in the Port Phillip material of adult males, like adult females, with both rami of the uropods well developed and without a median dorsal process on the anterior part of the abdomen (Fig. 3a) suggests that present specimens are correctly referred to the genus *Cymodoce*. Moreover, in the present investigation *Cilicaea latreillei* and *Cymodoce pubescens* were not found in the same areas (see Table 1 and Appendix). Baker (1926) doubtfully referred his material to *Paracilicaea pubescens* (Milne Edwards) and suggested that there might be two forms of male in this species, one with the uropodal endopod reduced and another with the uropodal rami subequal in size. Hale (1929) followed Baker in this interpretation but since there is no evidence of two male



types in present collections the Port Phillip specimens are referred to the genus *Cymodoce*. It remains to be seen whether additional males are found or whether the cilicaeform males with reduced uropodal endopods described by Baker (1926) are the males of some other species. A striking feature which separates *Cymodoce pubescens* from *Cilicaea latreillei*, apart from the median projection on the anterior part of the abdomen and the lack of uropodal endopods in adult male *Cilicaea latreillei*, is the fact that the body of *Cymodoce pubescens* is covered with a "pubescence" of evenly spaced, small flexible scale-like structures each associated with a flexible seta (Fig. 3c). In addition *Cymodoce pubescens* lacks the prominent tubercle which projects forwards from the clypeus of Port Phillip specimens of *Cilicaea latreillei* (see Figs. 3d, e) and the conical bosses on the posterior part of the abdomen are much less pronounced than in the latter species (see Figs. 3a, d, e). Present material of *Cymodoce pubescens* includes two males (11.0 and 13.5 mm.) each having long pointed penes and a long, whip-like appendix masculina (Fig. 3b). There are also three small males (each 10.5 mm.) with small, blunt penes and appendix masculina unseparated from pleopod 2, one female (11.5 mm.) with reduced mouthparts and oöstegites, and two juveniles (each 9.0 mm.).

*Cymodoce tuberculosa* Stebbing.

*Cymodocea tuberculosa* Stebbing 1873.

*Cymodoce tuberculosa* Stebbing [Whitelegge 1902, Baker, 1908, 1810, Hale 1928, Nierstrasz 1931].

Eight male specimens (5–6 mm. body length) key out to the genus *Cymodoce* (Hansen 1906, Hale 1929, Hurley 1961) and agree with descriptions and figures of this species given by Stebbing (1873), Whitelegge (1902), Baker (1910) and Hale (1929), though the last author does not mention the presence of four or five diagnostic large teeth which project forwards from the base of each antennule (see Baker 1910). This species seems to be fairly widespread in southern Australia (Nierstrasz 1931), often in the cavities of sponges (Baker 1910).

*Cilicaea curtispina* Haswell.

*Naesa antennalis* White 1847—nom. nud.

*Cilicaea antennalis* White [Miers 1884, Stebbing 1905].

*Cilicaea antennalis* Miers [Nierstrasz 1931].

*Cilicaea curtispina* Haswell [Haswell 1881b, Baker 1908, 1929, Hale 1929, Nierstrasz 1931].

One male (14.0 mm. body length) and two females (7.2 and 8.0 mm.) key out to the genus *Cilicaea* (Hansen 1906, Hale 1929, Hurley 1961) and agree with descriptions of *C. curtispina* in Haswell (1881b) (who described the female) Baker (1908, 1928) and Hale (1929). The male specimen also agrees with a specimen in the British Museum (Nat. Hist.) labelled *Cilicaea antennalis* White (see also Miers 1884) which was listed by White (1847) as *Naesa antennalis* n.sp. This name clearly precedes that of Haswell (1881b) but it should probably be regarded as a *nomen nudum* since there appears to be no description accompanying the name in White (1847). Moreover, Miers' (1884) descriptive notes relevant to the specific name *antennalis* appeared later than Haswell's description of *C. curtispina*. The species is said to be very common in shallow water around the coasts of southern Australia.

*Cilicaea latreillei* Leach.

*Naesa latreillei* M. Edwards 1840.

*Cilicaea latreillei* Leach [Miers 1884, Stebbing 1905, Hale 1929, Nierstrasz 1931, Hurley 1961].

*Cilicaea classicaudata* Haswell 1881a.

Several Port Phillip specimens, including males (Fig. 3d) ranging up to about 11 mm. body length and females (Fig. 3e) ranging up to about 10 mm., key out to *Cilicaea* in Hansen (1906), Hale (1929) and Hurley (1961). All agree with descriptions of *C. latreillei* in Stebbing (1905) and Nierstrasz (1931) except that amongst present specimens adult males have uniramous uropods, not biramous structures as figured by the latter author. Moreover, a diagnostic feature on all present material is a prominent tubercle projecting forwards from the clypeus (Figs. 3c, d). The presence of this tubercle in both sexes clearly distinguishes *Cilicaea latreillei* from *Cymodoce pubescens*. In addition, though the appendix masculina is very long and slender, as in *Cymodoce pubescens*, the tip of this structure is more spatulate and not so finely pointed as in *Cymodoce pubescens* (Fig. 3f). *Cilicaea latreillei* is widely recorded from Australia, New Zealand, Ceylon, S. Africa and the Philippines (see Nierstrasz 1931). Haswell's (1881a) record of *Cymodoce pubescens* from S. Australia may well have been the female of *Cilicaea latreillei* (see p. 188) and his description of *Cilicaea classicaudata* agrees with males of this species (see also Stebbing 1905).

*Paracilicaea hamata* (Baker).

*Cymodoce hamata* Baker 1908.

*Paracilicaea hamata* (Baker) [Hale 1927, 1929, Nierstrasz 1931].

The genus *Paracilicaea* was erected by Stebbing (1910) and therefore does not appear in Hansen's (1906) key. One immature specimen (6 mm.) does, however, key out to this genus and species in Hale (1929) except that the two pairs of submedian tubercles on the abdomen and telson respectively are more prominent than is apparent in Hale (1929) and in the original description (Baker 1908). The species is reported to be fairly common amongst sponges in S. Australia (Hale 1929).

*Paracilicaea septemdentata* Baker.

*Paracilicaea septemdentata* Baker [Baker 1910, Hale 1929].

One male (6.0 mm.) and one damaged male specimen agree with this species, in which the dentition of the uropods and telson border are highly diagnostic (Baker 1910, Hale 1929).

*Cymodopsis crassa* Baker.

*Cymodopsis crassa* Baker [Baker 1926, Hale 1929].

One unsexed specimen (12.0 mm. body length) agrees very closely with the description of this new species and genus described by Baker (1926) and incorporated into a key by Hale (1929). Three additional small specimens (10.5, 5.0 and 5.0 mm.) also key out to the genus *Cymodopsis* (Hale 1929) and resemble *C. crassa* in having a pair of large conical bosses on the dorsal surface of the abdomen. However, unlike *C. crassa* which has a vestigial uropodal exopod, these three specimens have the exopod well developed. Whether this is characteristic of juvenile *C. crassa*, or whether the specimens belong to a different species, is worthy of further investigation with more material. The type material of *C. crassa* came from a depth of 6 fathoms in St. Vincent Gulf (Baker 1926).

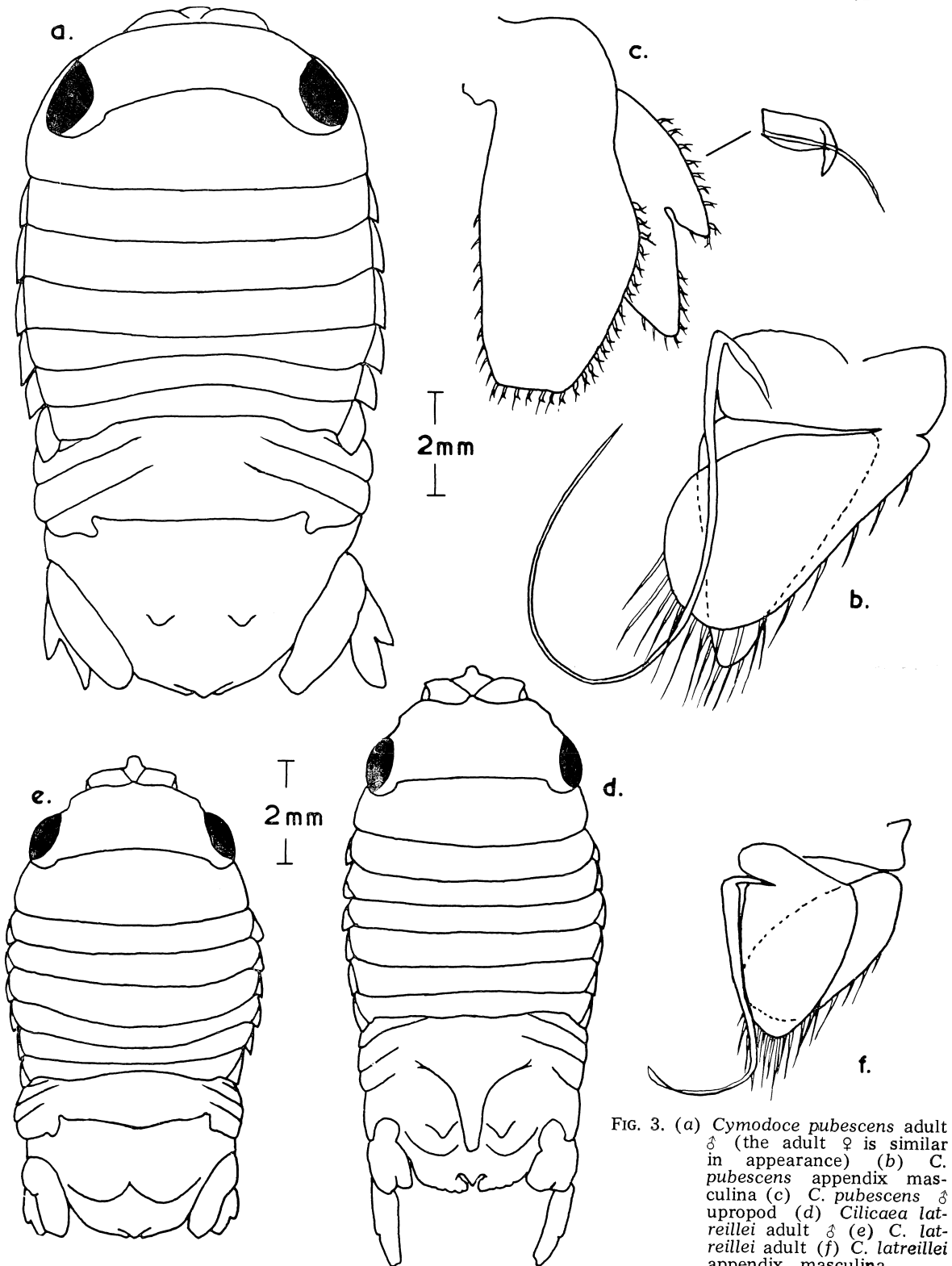


FIG. 3. (a) *Cymodoce pubescens* adult ♂ (the adult ♀ is similar in appearance) (b) *C. pubescens* appendix masculina (c) *C. pubescens* ♂ upropod (d) *Cilicaca latreillei* adult ♂ (e) *C. latreillei* adult ♂ (f) *C. latreillei* appendix masculina.

## Group EUBRANCHIATAE.

*Dynamenella parva* Baker.

*Dynamenella parva* Baker [Baker 1928, Hale 1928, Nierstrasz 1931].

A single female (6.0 mm. body length) of this species does not key out to *Dynamenella* in Hansen (1906) owing to the relative smallness of the uropodal exopod, but it agrees closely with descriptions and figures of this species in that genus in Baker (1928) and Hale (1929).

*Dynamenella rubida* Baker.

*Dynamenella rubida* Baker, Baker 1926, Nierstrasz 1931.

One specimen (♂ 4.8 mm.) closely agrees with this species described by Baker (1926) in which the rami of the uropods are sub-equal and the appendix masculina of the present specimen just reaches the posterior border of pleopod 2. The present specimen is damaged but it is evident that a comparison of this species with *D. huttoni* from New Zealand would be worthwhile (see Naylor 1961).

*Cerceis acuticaudata* (Haswell).

*Sphaeroma* (?) *acuticaudata* Haswell (1881b).

*Cerceis acuticaudata* (Haswell) [Hansen 1905, Baker 1908, Hale 1929, Nierstrasz 1931].

Specimens key out to the genus *Cerceis* (Hansen 1906, Hale 1929) and agree with descriptions of this species in Haswell (1881b), Baker (1908) and Hale (1929). Differences between this species (Fig. 4a, b, c) and a similar form *C. tridentata* (see below and Fig. 4d, e) are given by Hale (1929). Present material of this common S. Australian species includes three males (14.8, 16.5 and 16.0 mm.), two females (14.0 and 19.2 mm.) and 6 juveniles (7.0, 7.4, 7.5, 9.1, 11.3 and 13.9 mm. body length).

*Cerceis tridentata* Milne Edwards.

*Cerceis tridentata* Milne Edwards [Milne Edwards 1840, Baker 1908, Hale 1929, Nierstrasz 1931].

Two males (each 14.0 mm. body length) key out to this species (Hansen 1906, Baker 1908, Hale 1929) which is very close to the previous one apart from the shape of the telson and uropods (see Fig. 4a, d).

*Cerceis trispinosa* (Haswell).

*Cymodocea trispinosa* Haswell 1881b.

*Cerceis trispinosa* (Haswell) [Baker 1910, Hale 1929].

One female (8.5 mm.) with oöstegites and modified mouthparts agrees with this species following Baker (1910) and Hale (1929). Haswell's (1881b) original description refers only to the male.

*Haswellia anomala* [= *emarginata*] (Haswell).

*Sphaeroma* (?) *anomala* Haswell 1881a.

*Zuzara emarginata* Haswell 1881b.

*Haswellia emarginata* (Haswell) [Hansen 1906, Hale 1929].

*Haswellia anomala* (Haswell) [Baker 1926].

Specimens key out to *Haswellia* (Hansen 1906, Hale 1929) and agree with descriptive notes and figures of this species in Haswell (1881a, b). Baker 1926 and Hale (1929). Haswell (1881a) described the female of this species first as *Sphaeroma* (?) *anomala*, a specific name which should perhaps take priority. The male was described later (Haswell 1881b), as *Zuzara emarginata*, a name which appears to be of more common usage.

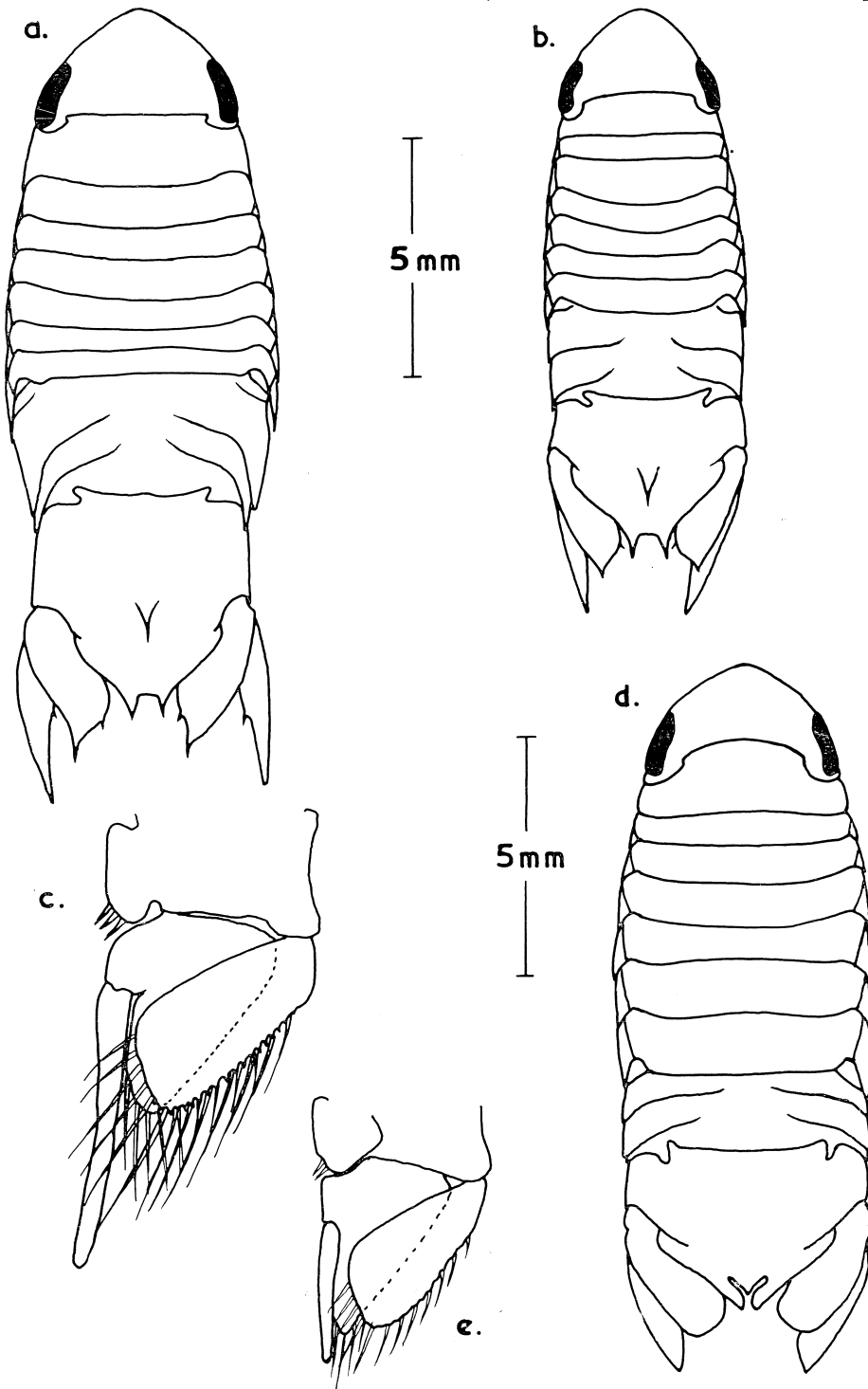


FIG. 4. (a) *Cerceis acuticaudata* adult ♂ (b) *C. acuticaudata* adult ♀ (c) *C. acuticaudata* appendix masculina (d) *Cerceis tridentata* adult ♀ (e) *C. tridentata* appendix masculina.

Baker (1926) pointed out that *H. anomala* is the female of another species of *Haswellia*, possibly *H. emarginata*, and Hale (1929) uses only the specific name *emarginata*, apparently for both. The species is common in the Port Phillip collections, males ranging up to 12 mm. and females up to 9 mm. body length.

#### DISTRIBUTION

Table 1 lists the sampling areas in Port Phillip Bay where one or more specimens of each species have been collected on one or more occasions, (see also Appendix). Of these species, *Paridotea munda*, *Cirolana woodjonesi*, *Crabyzos longicaudatus*, *Serolis tuberculata*, *Cymodoce multidentis* var. *australis*, *Paracilicæa hamata* and *Cerceis trispinosa*, occurred only at stations well within the bay whilst *Eudotea peronii*, *Neocirolana obesa*, *Zuzara venosa*, *Cymodoce bidentata*, *Paracilicæa septemdentata*, *Cymodopsis crassa* and *Dynamenella rubida* occurred only at the mouth of the bay. However, since many of these were recorded singly or as a few in only one area, it is difficult to be conclusive as to whether this reflects their true ecological distribution. The remaining species occurred more abundantly in the samples and mostly ranged into the bay from its mouth. Of particular interest amongst these is the relative distribution of the two most abundant species *Cilicæa latreillei* and *Cymodoce gaimardii* which tend to occur on the western and eastern sides of the bay, respectively (Fig. 5). Perhaps this is related to the fact

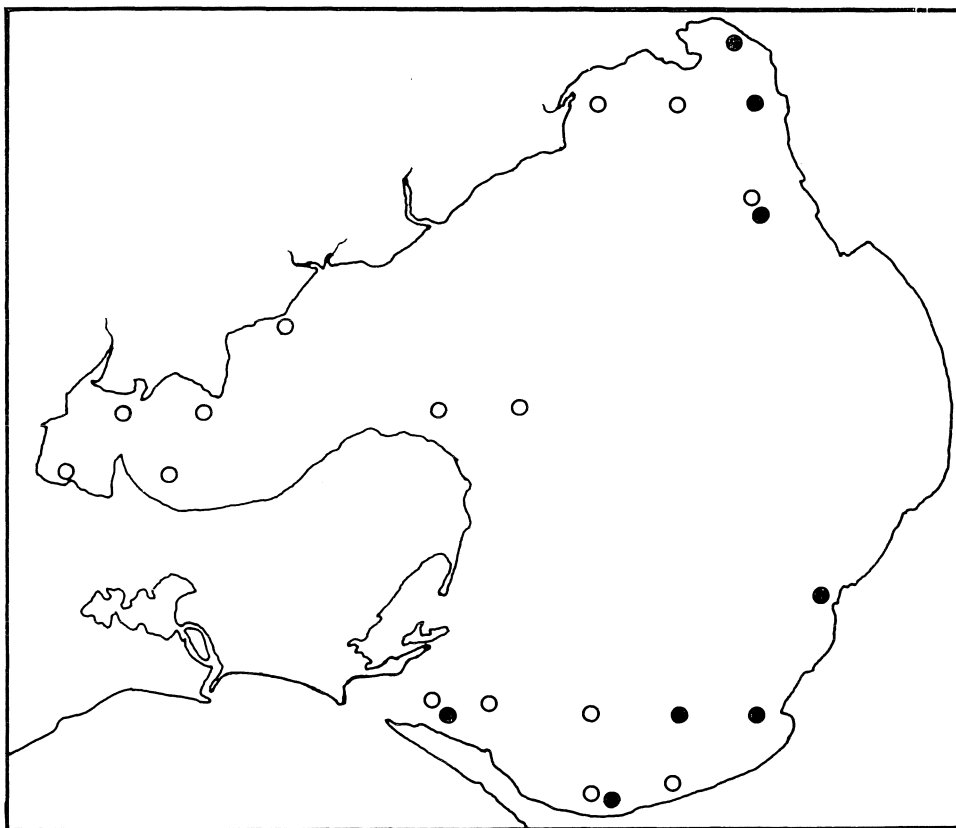


FIG. 5. Map of Port Phillip Bay showing the distribution of the most common species *Cymodoce gaimardii* (●) and *Cilicæa latreillei* (○).

that the north-western part of the bay has a clay or silt bottom whilst the south eastern portion is more sandy (A. Beasley and J. Hope Macpherson, personal communication). Amongst the other fairly common species no such clearly defined patterns of ecological distribution were apparent.

TABLE 1. AREAS AND STATIONS IN PORT PHILLIP BAY WHERE EACH SPECIES WAS COLLECTED.

Position of areas and stations are shown on Charts 1 and 2 (back of volume). Chart 1 is a bathymetric chart plotted from Admiralty Chart 1171 Port Phillip with the numbered Area grid superimposed.

Chart 2 shows position of the stations numbered 1—317 with the same grid superimposed to aid in location of the stations and for correlation with depth &c. Localities in the text are shown as area number followed immediately by the station number in brackets. Table A (back of volume) records station number, date, area, method of collecting (dive or dredge) and depth in fathoms.

Species.	Areas and Stations where collected.
<i>Paridotea munda</i>	6 (118) 2 specimens; 42 (intertidal) 1 specimen; 55 (35) 1 specimen; 63 (16) 1 specimen.
<i>Paridotea unguolata</i>	5 (intertidal) 1 specimen; 10 (103-6) 1 specimen; 49 (236) 2 specimens; 58 (87) 1 specimen.
<i>Crabyzos longicaudatus</i>	5 (intertidal) 1 specimen.
<i>Euidotea peronii</i>	66 (291) 1 specimen.
<i>Cirolana australiense</i>	59 (36) 6 specimens; (150-2) 4 specimens; 61 (37) 8 specimens; 66 (291-2) 1 specimen.
<i>Cirolana woodjonesi</i>	5 (168) 1 specimen
<i>Neocirolana obesa</i>	39 (312-4) 1 specimen.
<i>Serolis tuberculata</i>	5 (—) 1 specimen.
<i>Zuzara venosa</i>	58 (—) 16 specimens.
<i>Cymodoce bidentata</i>	59 (79) 1 specimen.
<i>Cymodoce coronata</i>	11 (190, 192) 2 specimens; 28 (285) 1 specimen; 50 (233) 1 specimen; 59 (23) 1 specimen, (150-2) 2 specimens; 63 (18) 2 specimens; 68 (158) 1 specimen?
<i>Cymodoce gaimardii</i>	3 (202) 3 specimens, (203) 4 specimens; 7 (204-8) 6 specimens; 13 (82) 1 specimen, (93) 8 specimens; 55 (147) 6 specimens; 59 (87); 1 specimen, (150-2) 1 specimen; 62 (96) 2 specimens; 63 (18) 7 specimens; 68 (155) 1 specimen, (158) 7 specimens.
<i>Cymodoce multidens</i> var. <i>australis</i>	6 (65) 1 specimen.
<i>Cymodoce pubescens</i>	50 (233) 3 specimens; 51 (250) 1 specimen, (270) 2 specimens; 58 (80) 2 specimens.
<i>Cymodoce tuberculosa</i>	5 (54) 1 specimen; 26 (—) 2 specimens; 59 (214) 15 specimens.
<i>Cilicaea curtispina</i>	42 (38) 1 specimen; 58 (150-2) 1 specimen; 59 (36) 1 specimen.
<i>Cilicaea latreillei</i>	5 (54) 6 specimens; 6 (65) 1 specimen; 10 (103-6) 3 specimens; 13 (93) 1 specimen; 16 (142-3) 2 specimens; 26 (—) 4 specimens; 27 (138-9) 7 specimens; 30 (280) 1 specimen; 31 (130) 4 specimens; (132) 1 specimen; 37 (40) 1 specimen; 39 (46) 1 specimen; (312-4) 1 specimen; 59 (214) 5 specimens; 61 (241-2) 29 specimens; 68 (158) 1 specimen; 68 (158) 1 specimen; 69 (221-2) 1 specimen.
<i>Paracilicaea hamata</i>	55 (147) 1 specimen.

Table 1 etc.—continued.

Species.	Areas and Stations where collected.
<i>Paracilicæa septemdentata</i>	66 (291-2) 2 specimens.
<i>Cymodopsis crassa</i>	58 (80) 1 specimen.
<i>Dynamenella parva</i>	61 (37) 1 specimen.
<i>Dynamenella rubida</i>	58 (150-522) 1 specimen.
<i>Cerceis acuticaudata</i>	30 (278) 1 specimen; 220 specimens; 39 (46) (23) 1 specimen; 61 (37) 6 specimens. 1 specimen; 50 (233) 1 specimen; 59
<i>Cerceis tridentata</i>	61 (37) 2 specimens.
<i>Cerceis trispinosa</i>	30 (278) 1 specimen.
<i>Haswellia anomala</i>	31 (130) 4 specimens; 31 (132) 4 specimens; 55 (147) 1 specimen; 58 (80) 3 specimens; 59 (23) 8 specimens, (25) 2 specimens, (36) 4 specimens, (150-2) 13 specimens; 61 (37) 5 specimens.

## APPENDIX: DETAILS OF INDIVIDUAL COLLECTIONS FROM EACH AREA.

(Numbers refer to areas and stations on Chart 2.)

Area and Station.	No. of Specimens.	Species.
3 (202)	3	<i>Cymodoce gaimardii</i>
3 (203)	4	<i>Cymodoce gaimardii</i>
5 (54)	6	<i>Cilicæa latreillei</i>
	1	<i>Cymodoce tuberculosa</i>
5 (168)	1	<i>Cirolana woodjonesi</i>
5 (—)	1	<i>Paridotea unguolata</i>
	1	<i>Crabzyos longicaudatus</i>
5 (—)	1	<i>Serolis tuberculata</i>
6 (65)	1	<i>Cilicæa latreillei</i>
	1	<i>Cymodoce multidentata</i> var. <i>australis</i>
6 118)	2	<i>Paridotea munda</i>
7 (204-8)	6	<i>Cymodoce gaimardii</i>
10 (103-6)	3	<i>Cilicæa latreillei</i>
	1	<i>Paridotea unguolata</i>
11 (190, 192)	2	<i>Cymodoce coronata</i>
13 (82)	1	<i>Cymodoce gaimardii</i>
13 (93)	8	<i>Cymodoce gaimardii</i>
	1	<i>Cilicæa latreillei</i>
16 (142-3)	2	<i>Cilicæa latreillei</i>
26 (—)	2	<i>Cymodoce tuberculosa</i>
	4	<i>Cilicæa latreillei</i>
27 (138-9)	7	<i>Cilicæa latreillei</i>
28 (285)	1	<i>Cymodoce coronata</i>
30 (278)	1	<i>Cerceis acuticaudata</i>
	1	<i>Cerceis trispinosa</i>
30 (280)	3	<i>Cerceis acuticaudata</i>
	1	<i>Cilicæa latreillei</i>
31 (130)	4	<i>Cilicæa latreillei</i>
	4	<i>Haswellia anomala</i>
31 (132)	1	<i>Cilicæa latreillei</i>
	4	<i>Haswellia anomala</i>
37 (40)	1	<i>Cilicæa latreillei</i>
39 (46)	1	<i>Cilicæa latreillei</i>
	1	<i>Cerceis acuticaudata</i>
39 (312-4)	1	<i>Cilicæa latreillei</i>
	1	<i>Neocirolana obesa</i>
42 (intertidal)	1	<i>Paridotea munda</i>
42 (38)	1	<i>Cilicæa curtispina</i>
47 (26)	1	<i>Haswellia anomala</i>
49 (236-7)	2	<i>Paridotea unguolata</i>
50 (228)	1	<i>Cymodoce coronata</i>
50 (230)	1	<i>Cymodoce coronata</i>
50 (233)	1	<i>Cerceis acuticaudata</i>
	3	<i>Cymodoce pubescens</i>
	1	<i>Cymodoce coronata</i>



## Appendix—Details etc.—continued.

Area and Station.	No. of Specimens.	Species.
51 (250)	1	<i>Cymodoce pubescens</i>
51 (270)	2	<i>Cymodoce pubescens</i>
55 (35)	1	<i>Paridotea munda</i>
55 (147)	1	<i>Haswellia anomala</i>
	6	<i>Cymodoce gaimardii</i>
	1	<i>Paracilicaea hamata</i>
58 (—)	16	<i>Zuzara venosa</i>
58 (80)	2	<i>Cymodoce pubescens</i>
	1	<i>Cymodopsis crassa</i>
	3	<i>Haswellia anomala</i>
58 (87)	1	<i>Paridotea unguolata</i>
58 (150-152)	7	<i>Haswellia anomala</i>
	1	<i>Cilicaea curtispina</i>
	1	<i>Dynamenella rubida</i>
59 (23)	1	<i>Cerceis acuticaudata</i>
	2	<i>Cilicaea latreillei</i>
	8	<i>Haswellia anomala</i>
59 (25)	2	<i>Haswellia anomala</i>
59 (36)	6	<i>Cirolana australiense</i>
	2	<i>Cilicaea latreillei</i>
	1	<i>Cilicaea curtispina</i>
	4	<i>Haswellia anomala</i>
59 (79)	2	<i>Cymodoce gaimardii</i>
	1	<i>Cymodoce bidentata</i>
59 (87)	1	<i>Cymodoce gaimardii</i>
59 (150-2)	1	<i>Cymodoce gaimardii</i>
	4	<i>Cirolana australiense</i>
	2	<i>Cymodoce coronata</i>
	13	<i>Haswellia anomala</i>
59 (214)	15	<i>Cymodoce tuberculosa</i>
	5	<i>Cilicaea latreillei</i>
61 (37)	2	<i>Cerceis tridentata</i>
	5	<i>Cerceis acuticaudata</i>
	8	<i>Cirolana australiense</i>
	5	<i>Haswellia anomala</i>
	1	<i>Dynamenella parva</i>
61 (241-2)	29	<i>Cilicaea latreillei</i>
62 (96)	2	<i>Cymodoce gaimardii</i>
63 (16)	1	<i>Paridotea munda</i>
63 (18)	2	<i>Cymodoce coronata</i>
66 (291)	3	? <i>Cymodopsis crassa</i>
66 (291)	1	<i>Euidotea peronii</i>
66 (291-2)	1	<i>Cirolana australiense</i>
	2	<i>Paracilicaea septemdentata</i>
68 (155)	1	<i>Cymodoce gaimardii</i>
68 (158)	1	? <i>Cymodoce coronata</i>
	7	<i>Cymodoce gaimardii</i>
	1	<i>Cilicaea latreillei</i>
68 (Off Rye)	2	<i>Cilicaea latreillei</i>
69 (221-2)	1	<i>Cilicaea latreillei</i>

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