

# A GUIDE TO SANDY BEACH FAUNA OF NEW SOUTH WALES

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## INTRODUCTION

During a 1980-1981 survey of 111 intertidal sand beaches of New South Wales (Dexter, ms 1.), a minimum of 118 species was collected. At least half of these are currently undescribed, which is not surprising, given the fact that there are no published accounts of the sandy beach fauna in New South Wales. However, many of the abundant sandy beach organisms have been described, so that taxonomic literature, at least, is available for these species. Information on density, zonation patterns, species associations, seasonality, and other aspects of community structure is presented elsewhere (Dexter, in press; Dexter, ms).

The purpose of this paper is to present a species list of organisms found along the sandy substrates of New South Wales, to identify the types of sand beaches where these organisms are found, to provide illustrations of the most abundant taxonomic groups, to summarise the literature which can be used for identification of the fauna, and to identify the taxonomists currently working on this fauna. The illustrations provide general impressions only and should not be relied upon for identification. For this, the taxonomic references should be consulted.

The details of field sampling techniques are presented in Dexter (in press). A 500 micron sieve was used, so that smaller interstitial and microscopic organisms were not included in the study. The beaches sampled are listed, in north-south order, in Table 1.

Beaches along the open exposed coast can be categorised into two main types: reflective and dissipative (Wright *et al.*, 1979). A reflective beach has a steep intertidal slope with a narrow surf zone such that surging waves break directly on the beach resulting in coarse grained sediments. A dissipative beach has a flat intertidal slope with fine grained sediments, a wide surf zone frequently with sand bars, such that wave energy dissipates before reaching the intertidal beach. Sand beaches occurring at inlets to bays are subjected to variable wave activity, from high to low, and can be characterised as semi-exposed sites. Within bays and estuaries, sand beaches can be divided into protected sites and very protected sites (in which epifauna are present).

Keys and further details of the various taxa are provided in such general references as Barnard (1969), Hale (1929), Macpherson and Gabriel (1962), Fauchald (1977), Schultz (1969) and Shepherd and Thomas (1982).

TABLE 1

Trial Bay - D	La Perouse, Botany Bay - SE
Crowdy Head - D	Port Botany, Botany Bay - P
Lighthouse Beach, Seal Rocks - D/R	Kogarah, Botany Bay - VP
Windy Wappa, Hawks Nest - D/R	Dolls Point, Botany Bay - P
Zenith Beach, Nelson Bay - D/R	Kyle Bay - VP
The Entrance - R	Towra Point, Botany Bay - P
Ocean Beach, Broken Bay - D	Quibray Beach, Botany Bay - VP
Patonga Beach, Broken Bay - R	Bells Point, Port Hacking - VP
Ettalong Beach, Broken Bay - P	Gunnamatta Bay, Port Hacking - VP
Towlers Bay, Pittwater - VP	Bundeena Beach, Port Hacking - SE
Snapperman Beach, Pittwater - SE	Jibbon Beach, Port Hacking - SE
Clareville Beach, Pittwater - P	Garie Beach - R
Palm Beach - R	Seven Mile Beach, National Park - D
Narrabeen Beach - R	Shoalhaven Head Inlet - VP
Narrabeen Lagoon - VP	Callala Beach, Jervis Bay - D/R
Clontarf Beach, Middle Harbour - P	Collingwood Beach, Jervis Bay - D/R
Balmoral Beach, Middle Harbour - SE	Green Patch Beach, Jervis Bay - SE

Table 1 (continued)

The Spit, Middle Harbour - P	Hyams Beach, Jervis Bay - R
Manly Cove, Port Jackson - SE	Lake Conjola - P
Shell Cove, Port Jackson - P	Racecourse Beach, Ulladulla - R
Rose Bay, Port Jackson - VP	Burrill Inlet - P
Coogee Beach - R	Pretty Beach, Kiola - D/R
Maroubra Beach - R	Surfside Beach, Batemans Bay - P

R = reflective

D = dissipative

D/R = intermediate between reflective and dissipative

SE = semi-exposed

P = protected

VP = very protected

## GUIDE

### PHYLUM CNIDARIA

Class Anthozoa

One unidentified burrowing anemone - Towra Point

### PHYLUM NEMATODA

Several unidentified species

### PHYLUM NEMERTEA

Several unidentified species. Dr Ray Gibson, Liverpool Institute of Technology, U.K., is working on these and other Australian nemertean

### PHYLUM PHORONIDA

*Phoronopsis* sp. - Quibray Beach

### PHYLUM MOLLUSCA

Dr Winston Ponder, The Australian Museum, Sydney, identified the molluscs

Class Gastropoda

Family Nassariidae (Dog Whelks)

*Nassarius burchardi* (see MacPherson and Gabriel 1962; the older generic name is *Parcanassa*) - Narrabeen Lagoon. *Nassarius jonasi* (Fig. 1-1, see also Allan, 1950; Robinson and Gibbs, 1982) - Narrabeen Lagoon, Dolls Point.

Family Naticidae

Three species of *Polinices* have been recorded, see MacPherson and Gabriel (1962) and Wilson and Gillett (1979) for illustrations of all three species (the older generic name is *Comber*)

*Polinices conicus* (Fig. 1-2) - Quibray Beach, Bells Point, Gunnamatta Bay

*Polinices sordidus* (Fig. 1-3) - Quibray Beach, Bells Point, Gunnamatta Bay

*Polinices incei* (Fig. 1-4) - Crowdy Head

Class Bivalvia

Family Donacidae (Pipis)

*Donax deltoides* (Fig. 2-10) - also known as *Plebidonax* - exposed beaches, both reflective and dissipative, including Trial Bay, Crowdy Head, Ocean Beach, Narrabeen Beach, La Perouse, Seven Mile Beach N.P., Callala Beach, Racecourse Beach and Surfside Beach

*Donax electilis* - also known as *Deltachion* and *Tentidonax* - [see MacPherson and Gabriel (1962) and Cotton and Godfrey (1938) for both species of *Donax*] - Surfside Beach

Family Laternulidae (Lantern shells)

*Laternula creocina* (see Cotton and Godfrey, 1938; Robinson and Gibbs, 1982) - Quibray Beach

Family Mactridae (Trough shells)

*Mactra pusilla* (Fig. 2-6) - known also as *Nanomactra* (see Cotton and Godfrey, 1938; Macpherson and Gabriel, 1962) - Dolls Point

*Mactra rufescens* (Fig. 2-7) - also known as *Austromactra* and *Mactra contraria*, see Cotton and Godfrey (1938), Allan (1950), Macpherson and Gabriel (1962), Dakin *et al.* (1952) - Ocean Beach

*Notoispisula trigonella* (see Cotton and Godfrey, 1938; May, 1923; Robinson and Gibbs, 1982) - Rose Bay, Dolls Point, Quibray Beach

Family Mesodesmatidae

*Mesodesma elongata* (Fig. 2-8) — also known as *Amesodesma* and *A. angusta*; see Cotton and Godfrey (1938), Dakin *et al.* (1952). Clean sand beaches such as Dolls Point, Towra Point, Callala Beach and Collingwood Beach

Family Montacutidae

*Myrella* sp. (see Robinson and Gibbs, 1982) — Dolls Point, Towra Point, Quibray Beach

Family Sanguinolariidae

*Sanguinolaria donacoides* (Fig. 2-9) — also known as *Soletellina* (see Cotton and Godfrey, 1938; MacPherson and Gabriel, 1962; Robinson and Gibbs, 1982) — very protected sand habitats such as Narrabeen Lagoon, Rose Bay, Kogarah and Gunnamatta Bay.

Family Tellinidae

*Tellina deltoidalis* (see Allan, 1950; Robinson and Gibbs, 1982) — Dolls Point

Family Veneridae

*Eumarcia fumigata* (Fig. 2-11) — see also MacPherson and Gabriel (1962), Robinson and Gibbs (1982). Found in protected sand habitats such as Towlers Bay, Dolls Point, Towra Point, Bells Point and Gunnamatta Bay

PHYLUM ECHINODERMATA

Class Ophiuroidea

Unidentified juvenile — Dolls Point

Class Asteroidea

*Astropecten polyacanthus* (Fig. 1-5) — see also Dakin *et al.* 1952. Clontarf Beach, Gunnamatta Bay

PHYLUM ANNELIDA

Class Polychaeta

The polychaetes were identified by Dr Pat Hutchings, The Australian Museum, with the exception of the Nephthyidae, which were identified by Hannalore Paxton, Macquarie University. A non-illustrated Key to many of the common polychaetes occurring in estuarine waters of New South Wales is that by Hutchings and Rainer (1979b)

Family Capitellidae

*Barantolla lepte* (Hutchings, 1974) — Towra Point, Quibray Bay

*Capitella capitata* (see Day, 1967; Warren, 1976; Hutchings, 1982) — Narrabeen Lagoon, Dolls Point, Towra Point and Quibray Beach

*Mediomastus californiensis* (Hartman, 1944) — Towra Point

Family Cirratulidae

*Caulleriella tricapillata* (Hutchings and Rainer, 1979a) — Towra Point, Quibray Beach, Gunnamatta Bay

*Cirriformia filigera* (see Day, 1967; Hutchings, 1982) — Towra Point

*Cirratulus* sp. — Narrabeen Lagoon

Unidentified genus — Towra Point

Family Dorvilleidae

*Protodorvillea* sp. — Towra Point

Family Glyceridae

*Glycera tridactyla* — also known as *G. convoluta* (see Day, 1967). Both protected and exposed beaches — Patonga Beach, Palm Beach, Maroubra Beach, La Perouse, Towra Point, Quibray Beach, Gunnamatta Bay and Garie Beach

Family Hesionidae

*Nerimyrma* sp. — Towra Point, Quibray Beach

Family Lumbrineridae

*Lumbrineris latreilli* (see Day, 1967) — Port Botany and Towra Point

Family Magelonidae

*Magelona* sp. — Quibray Beach

Family Nephthyidae

See Rainer and Hutchings, 1977 for a major revision of this family

*Nephtys australiensis* (Fig. 3-16, redrawn from Paxton, 1974) — Crowdy Beach, Ocean Beach, Towra Point, Quibray Beach and Gunnamatta Bay

*Nephtys longipes* (Fig. 3-17, redrawn from Paxton, 1974) — Crowdy Head, Ocean Beach, Towra Point

Family Nereididae

*Australonereis ehlersi* (Fig. 3-15, redrawn from Hartman, 1954). Present in protected (Dolls Point, Towra Point) and very protected (Towlers Bay, Rose Bay, Quibray Beach, Gunnamatta Bay and Shoalhaven Heads Inlet) sand beaches as well as in muddy sediments

*Ceratonereis mirabilis* (see Hutchings, 1982) — Crowdy Head and Rose Bay

Family Onuphidae

*Onuphis mariahirsuta* (Paxton, 1979) — Crowdy Head

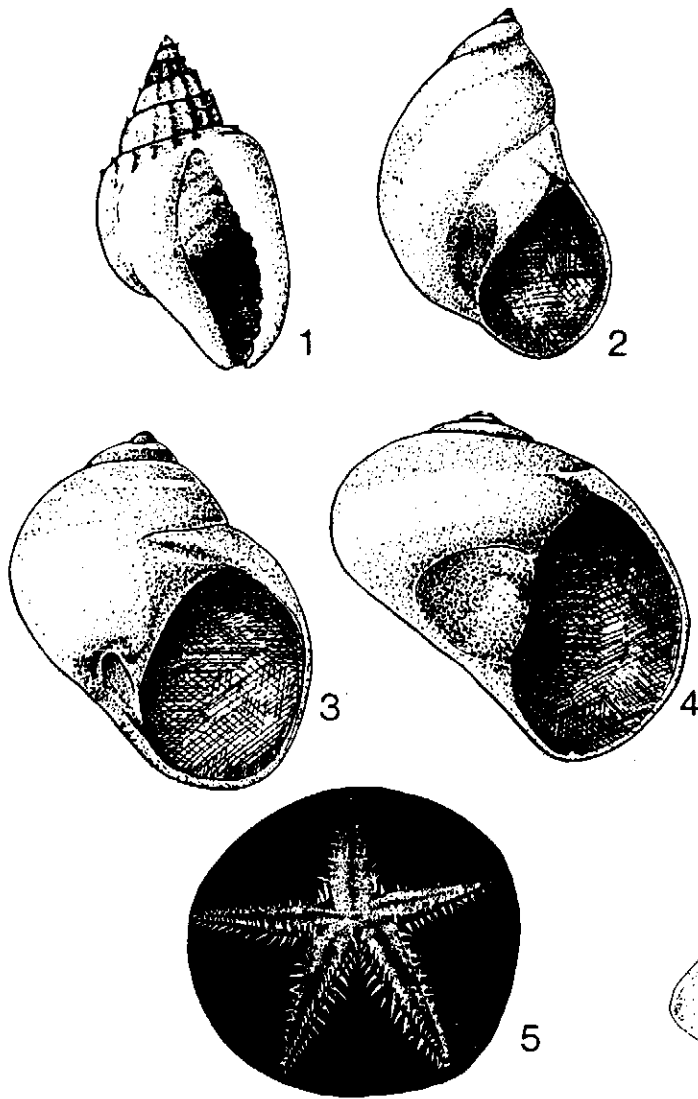


Figure 1

- |   |                           |   |                                 |
|---|---------------------------|---|---------------------------------|
| 1 | <i>Nassarius jonasi</i>   | 4 | <i>Polinices incei</i>          |
| 2 | <i>Polinices conicus</i>  | 5 | <i>Astropecten polyacanthus</i> |
| 3 | <i>Polinices sordidus</i> |   |                                 |

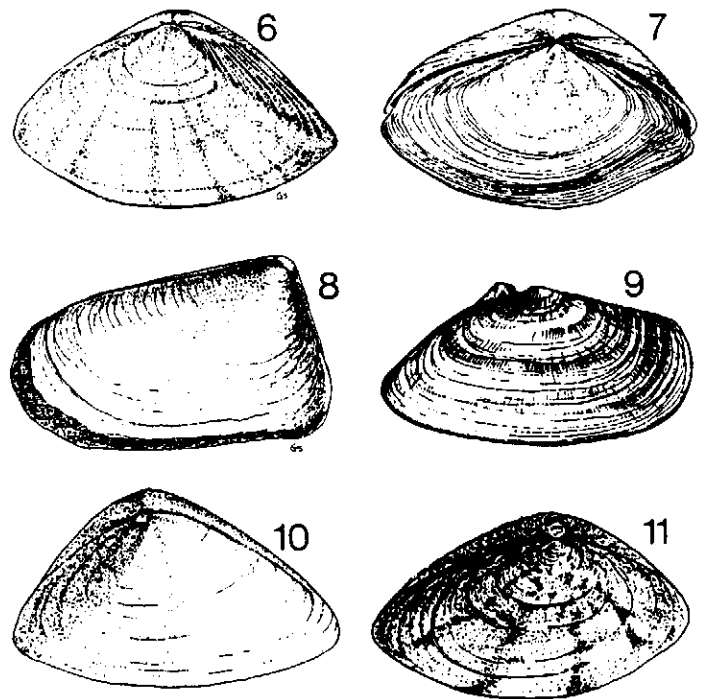
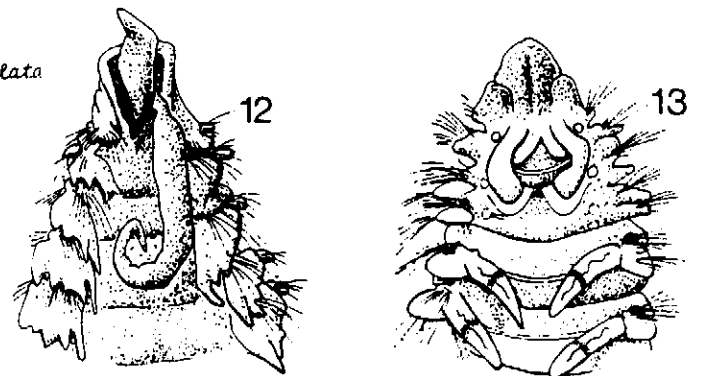


Figure 2

- |   |                                  |    |                               |
|---|----------------------------------|----|-------------------------------|
| 6 | <i>Mactra pusilla</i>            | 10 | <i>Donax deltoides</i>        |
| 7 | <i>Mactra rufescens</i>          | 11 | <i>Eumarcia fumigata</i>      |
| 8 | <i>Mesodesma elongata</i>        | 12 | <i>Scolelepis carunculata</i> |
| 9 | <i>Sanguinolaria donacioides</i> | 13 | <i>Spio pacifica</i>          |



*Diopatra* n. sp. Dolls Point; currently being described by Paxton.

Family Opheliidae

*Armandia intermedia* (see Day, 1967; Hutchings, 1982). Narrabeen Lagoon and Towra Point

*Ophelina* n. sp. — Dolls Point

New genus — Ocean Beach.

These latter two species are currently being described by Hutchings and Murray (in ms, Rec. Aust. Mus.)

Family Orbiniidae

*Scoloplos simplex* (Fig. 3-14, redrawn from Hutchings, 1974). Very abundant in protected and very protected sand substrates such as Towlers Bay, Narrabeen Lagoon, Dolls Point, Towra Point, Quibray Beach, Bells Point, Gunnamatta Bay

Family Phyllodocidae

*Phyllodoce novaehollandiae* (see Augener, 1922) — Port Botany, Towra Point, Quibray Beach

Family Sabelliidae

*Euchone* sp. Dolls Point, Towra Point

*Fabricia* sp. Narrabeen Lagoon, Gunnamatta Bay

Family Sigalionidae

*Sigalion* sp. Towra Point, Quibray Beach, Gunnamatta Bay

Family Spionidae

*Carazziella victoriensis* (Blake and Kudenov, 1978) very abundant at Narrabeen Lagoon

*Scoelepis carunculata* (Fig. 3-12, redrawn from Blake and Kudenov, 1978), semi-exposed inlet beaches such as Snapperman Beach, Manly Cove and La Perouse and dissipative beaches such as Trial Bay, Crowdy Head, Ocean Beach and Collingwood Beach

*Spio pacifica* (Fig. 3-13, redrawn from Blake and Kudenov, 1978). The most abundant species of polychaete in protected sand beaches such as Dolls Point and Towra Point and also abundant in very protected localities such as Port Botany, Quibray Beach and Gunnamatta Bay.

Family Syllidae

*Typosyllis* sp. Dolls Point, Quibray Beach and Gunnamatta Bay

PHYLUM CRUSTACEA

Class Ostracoda

Four species recorded, one each from Towlers Bay, Snapperman Beach, Clontarf and Towra Point

Class Copepoda

Order Cyclopoida

Two species, one at Dolls Point and Quibray Beach, one at Narrabeen Lagoon

Order Harpacticoida

Two species, one at Towra Point and Quibray Beach, the other at La Perouse

Class Malacostraca

subclass Eumalacostraca

Order Mysidacea

*Gastrobaccus* n. sp. currently being described by Suzette Talbot, University of Sydney. Crowdy Head, Ocean Beach, Dolls Point, Towra Point, Seven Mile Beach, National Park, Callala Beach, Collingwood Beach, Green Patch Beach and Surfside Beach where it is especially abundant.

Order Tanaidacea

Two unidentified species currently being examined by Dr Jurgen Siez, Universitat Osnobruck, Vechta, West Germany. One species Balmoral Beach, The Spit, where it was very abundant, Shell Cove, Towra Point, Gunnamatta Bay; the other species at The Spit

Order Cumacea

The Cumacea were identified by Dr James Lowry, The Australian Museum

Family Bodotriidae

*Gephyrocuma pala* (Fig. 4-23, redrawn from Hale, 1929) is characteristic of open exposed beaches such as The Entrance, Palm Beach, Coogee, Garie Beach, Callala Beach, and was particularly abundant at Racecourse Beach. Two other species were found; one at Dolls Point, Towra Point and Gunnamatta Bay, the other at Snapperman Beach, Dolls Point and Towra Point

Family Diastylidae

One species — Crowdy Head

Family Leuconidae

One species — Towra Point

Order Isopoda

Most of the isopods, especially the anthurids, were identified by Dr Gary Poore, National Museum of Victoria.

Guide (continued)

The cirrolanids were identified by Dr Niel Bruce, University of Queensland, who is currently studying this family throughout Australia

Family Anthuridae

*Agulantha* sp. — Crowdy Head

*Apanthura* sp. — Crowdy Head, Towra Point, Quibray Beach

*Cyathura* n. sp. — Narrabeen Lagoon, Towra Point, Port Botany

*Ulkanthura namoo* — Crowdy Head

Family Cirolanidae

*Pseudolana concinna* (Fig. 5-24, redrawn from Bruce, 1980) — Very abundant on inlet beaches such as La Perouse and dissipative beaches such as Crowdy Head, Ocean Beach and Callala Beach

*Pseudolana towrae* — protected sand beaches including Clontarf, Dolls Point, Towra Point, Gunnamatta Bay and Lake Conjola (Bruce, in press)

Family Scyphacidae

*Actaeica pallida* (Fig. 4-22, redrawn from Hale, 1929). Abundant in the highest part of the intertidal zone — Patonga Beach, Towra Point, Garie Beach and Callala Beach

Family Sphaeromatidae

*Sphaeroma* sp. — Clontarf Beach, plus one unidentified genus from La Perouse

Order Amphipoda

Amphipods were identified by Dr James Lowry, The Australian Museum, and Margaret Drummond, National Museum of Victoria

Family Amphilochidae

Two species, one at Dolls Point and one from Towra Point

Family Amphithoidae

One species — Towra Point

Family Aoroidae

One species — Crowdy Head

Family Calliopidae

*Paracalliope* sp. — Narrabeen Lagoon

Family Corophiidae

*Corophium* sp. — Narrabeen Lagoon, Gunnamatta Bay

Unidentified genus — Quibray Beach

Family Dexaminidae

Two species, one from Gunnamatta Bay, one from Bundeena Beach

Family Eusiridae

One species — Dolls Point

Family Lysanassidae

One species — Ocean Beach

Family Exoedicerotidae

*Exoediceros* n. sp. — Lighthouse Beach, Windy Wappa, The Entrance, Narrabeen Beach, La Perouse, Maroubra Beach, Garie Beach, Green Patch Beach, Hyams Beach, Racecourse Beach, Pretty Beach

*Exoediceros fossor* (Fig. 4-21, illustration courtesy of Dr E.L. Bousfield, National Museum of Canada — see also Sheard, 1937; Barnard and Drummond, 1982a). This dominated the more protected beaches such as Ettalong Beach, Clareville Beach, Towra Point, Bells Point, Gunnamatta Beach, Shoalhaven Heads Inlet, Lake Conjola and Burrill Inlet.

*Exoediceros maculosus* (Fig. 4-20, redrawn from Sheard, 1937) dominated the semi-exposed beaches of inlets such as Snapperman Beach, Manly Cove, La Perouse, Bundeena Beach and Jibbon Beach.

These two species can be distinguished by several features: *E. maculosus* occurs at exposed habitats while *E. fossor* is found at protected localities and there is little overlap in distribution. *E. fossor* is much larger and has more uniform colouration than *E. maculosus* which is speckled with red chromatophores. *E. maculosus* has a much longer and sharper rostrum; the 3rd and 4th periopods and pleopods are very setose on *E. maculosus* and not on *E. fossor*. The eyes are smaller and nearer the top of the head in *E. fossor* while the eyes are larger and more widely spaced in *E. maculosus*.

Family Oedicerotidae

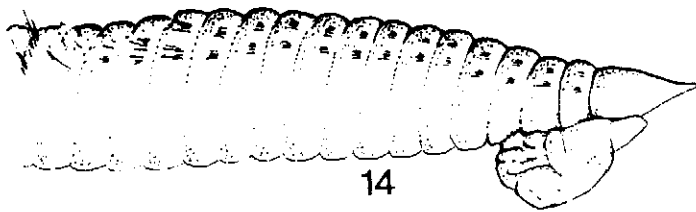
*Perioculopsis* sp. — Ocean Beach

New genus and species — La Perouse

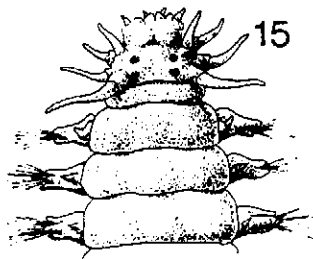
*Oedicerotid* sp. — Snapperman Beach, Dolls Point, Towra Point, Bells Point

Family Photidae

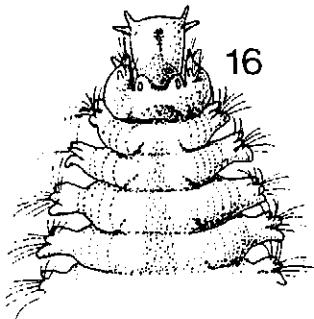
*Gammaropsis* sp. — Dolls Point, Towra Point



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15



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Figure 3

14 *Scoloplos simplex*

17 *Nephtys longipes*

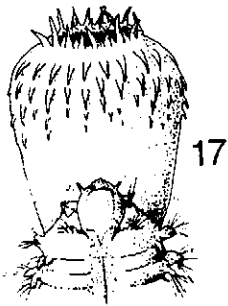
15 *Australonereis ehlersi*

18 *Uldanania pillare*

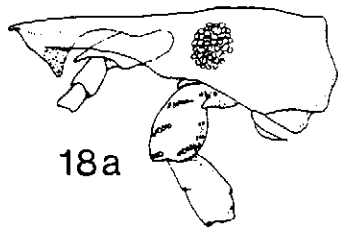
16 *Nephtys australienis*

a) head,

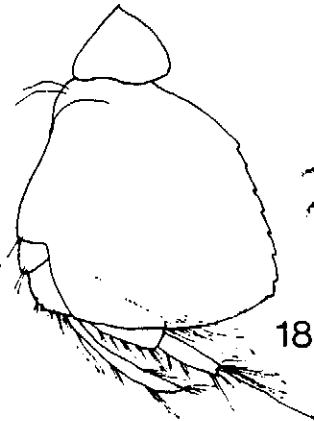
b) 5th pereopod



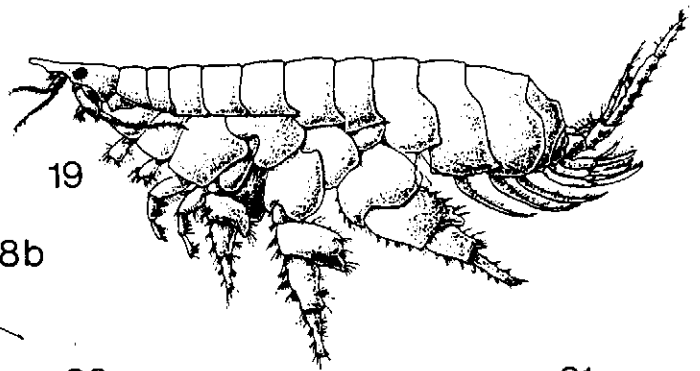
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18a



18b



19

Figure 4

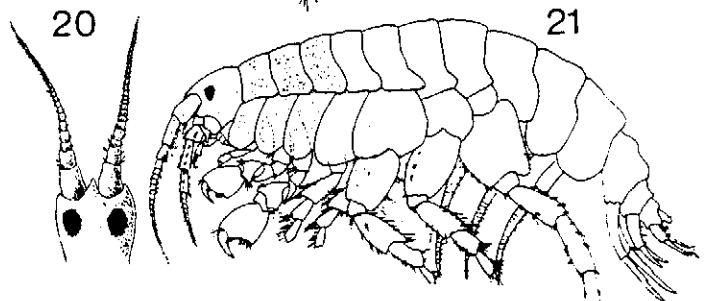
19 *Tittakunara katoa*

22 *Actaecia pallida*

20 *Exoediceros maculosus*

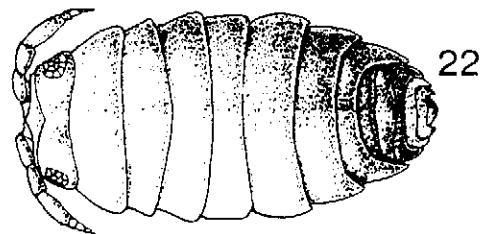
23 *Gephyrocuma pala*

21 *Exoediceros fossor*

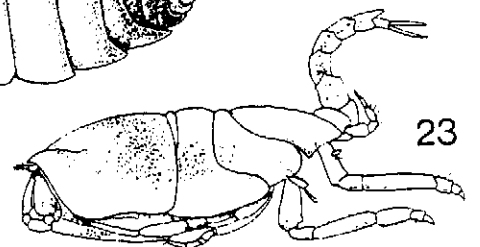


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23

Family Phoxocephalidae

This family has been recently revised by Barnard and Drummond (1978)

*Birubius batei* - Dolls Point and Towra Point

*Birubius eleebanus* - Towlers Bay

*Limnoporeia yarrague* - Towlers Bay

*Udanamia pillare* (Fig. 4-18, head, 5th pereopod; redrawn from Barnard and Drummond, 1978). Exposed coastline at dissipative beaches such as The Entrance, Ocean Beach, Seven Mile Beach National Park, Callala Beach, Collingwood Beach. Superficially this species resembles *Tittakunara katoa*. However, these species can be easily distinguished by comparing the 5th pereopods.

Family Platyischnopidae

*Tittakunara katoa* (Fig. 4-19, redrawn from Barnard and Drummond, 1979) - Lighthouse Beach, Windy Wappa, Zenith Beach, Pearl Beach, Palm Beach, Narrabeen Beach, Coogee Beach, Maroubra Beach, Garie Beach, Green Patch Beach, Hyams Beach, Racecourse Beach

Family Talitridae

*Hyale maroubrae* (Stebbing, 1906) - The Entrance

Unidentified genus - Crowdy Head

Family Urohaustoriidae

*Urohaustorius metungi* (see Fearn-Waman, 1968; Barnard and Drummond 1982b). The dominant amphipod at Trial Bay, Ocean Beach, Clontarf, Dolls Point and Lake Conjola.

*Urohaustorius parmigiis* (see Barnard and Drummond, 1982b) - Crowdy Head

*Urohaustorius gunni* (see Barnard and Drummond, 1982b) - Crowdy Head, Lighthouse Beach, Windy Wappa, Seven Mile Beach National Park, Callala Beach, Collingwood Beach, Racecourse Beach

Family Zobrachoidae

*Zobracho canguro* (see Barnard and Drummond, 1982b). Semi-exposed beaches such as Lighthouse Beach, Zenith Beach, La Perouse, Jibbon Beach

*Bumeralius buchalius*. Occurs together with *Urohaustorius metungi* at Clontarf, Dolls Point, Towra Point, Bells Point and Burrill Inlet

Order Decapoda

The decapods were identified by Dr James Lowry, The Australian Museum

Suborder Natantia

*Penaeus plebejus* (see Young, 1977). Juveniles found at Towlers Bay, Clontarf, Kogarah and Dolls Point

Suborder Reptantia

Family Callinassidae

*Callinassa arenosa* (see Poore and Griffin, 1979) - Towlers Bay, Dolls Point, Towra Point and Quibray Beach.

Family Paguridae

*Diogenes custos* (Fig. 5-26, redrawn from Alcock, 1905; see also Dakin *et al.* (1952) - Crowdy Head, Ocean Beach, La Perouse, Dolls Point, Callala Beach

Family Calappidae

*Mutata planipes* (Fig. 5-25, redrawn from Tindale-Biscoe and George, 1962; see also Healy and Yaldwyn, 1970) - Trial Bay

Family Grapsidae

Unidentified juvenile, Quibray Beach

Family Mictyridae

*Mictyris longicarpus* (Fig. 5-27, redrawn from McNeill, 1926) - Muddy sands and very protected sand habitats such as Towlers Bay, Narrabeen Lagoon, Kyle Bay

*Mictyris platycheles* (Fig. 6-28, redrawn from McNeill, 1926) - Cleaner and more exposed sand habitats such as Crowdy Head, Ocean Beach, Bells Point, Lake Conjola and Burrill Inlet. These two species are readily distinguished by differences in the shape of the anterior cephalothorax and rostrum

Family Ocypodidae

*Scopimera inflata* (see Dakin *et al.*, 1952) - Crowdy Head

Family Pinnotheridae

Unidentified juvenile - Towra Point

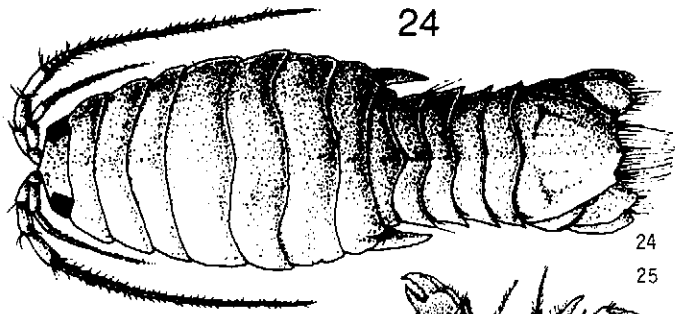
Family Portunidae

*Portunus pelagicus* (Fig. 6-29, see Dakin *et al.*, 1952) - La Perouse and Towra Point

ACKNOWLEDGEMENTS

Facilities for this study were provided by the Department of Zoology, University of Sydney. The illustrations were done by Geoffrey Stein.





24

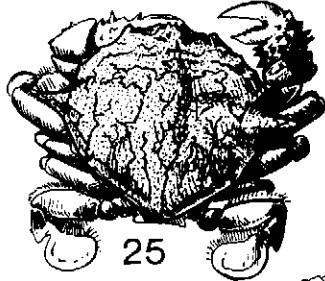
Figure 5

24 *Pseudolana conrinna*

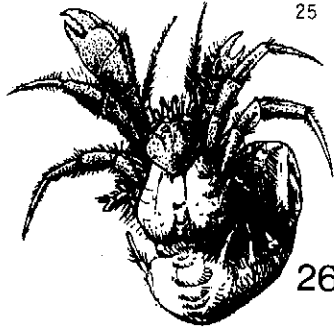
26 *Diogenes custos*

25 *Matuta planipes*

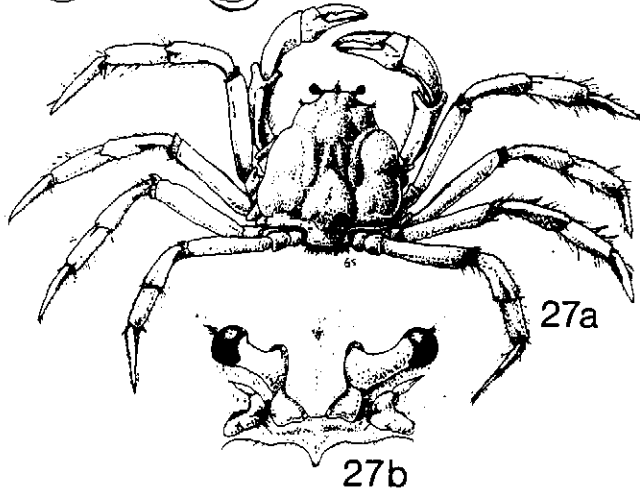
27 *Mictyris longicarpus*



25



26

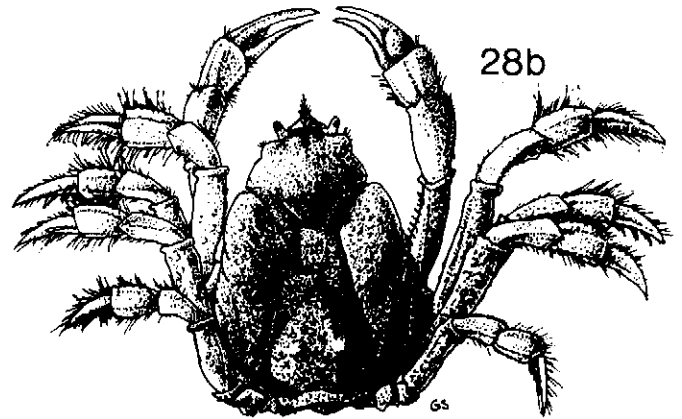


27a

27b



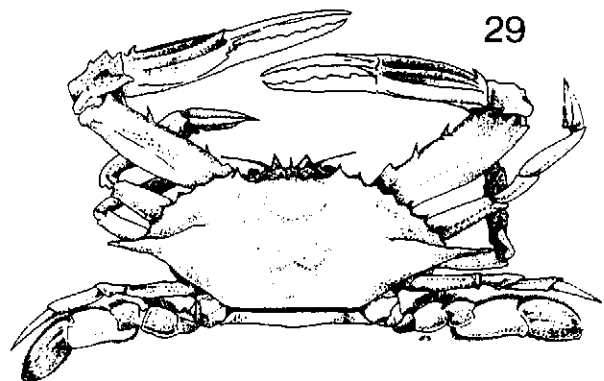
28a



28b

Figure 6

28 *Mictyris platycheles* 29 *Portunus pelagicus*



29

## REFERENCES

- Alcock, A. 1905. Catalogue of Indian Decapod Crustacea of the Indian Museum. Part II. Anomura. Trustees Indian Museum, Calcutta. 193 pp.
- Allan, J. 1950. Australian Shells. Georgian House, Melbourne. 470 pp.
- Augener, H. 1922. Revision der Australischen Polychaeten Typen von Kinberg. Ark. Zool. 14(3-4): 1-42.
- Barnard, J.L. 1969. The Families and Genera of Marine Gammaridean Amphipods. U.S. Nat. Mus. Bull. 271: 535 pp.
- Barnard, J. and M.M. Drummond. 1978. Gammaridean Amphipods of Australia. Part III. Smithsonian Contributions to Zoology No: 245: 551 pp.
- Barnard, J.L. and M.M. Drummond. 1979. Gammaridean Amphipods of Australia. Part IV. Smithsonian Contributions to Zoology. No: 269: 66 pp.
- Barnard, J.L. and M.M. Drummond. 1982a. Redescription of *Exoediceros fossor* (Stimpson, 1856), an Australian marine fossorial amphipod, the type genus of the new Family Exoedicerotidae. Proc. Biol. Soc. Wash. 95(3): 610-620.
- Barnard, J.L. and M.M. Drummond. 1982b. Gammaridean Amphipods of Australia Part V. Superfamily Haustorioidea. Smithsonian Contributions to Zoology. No: 360: 148 pp.
- Blake, J.A. and J.D. Kudenov. 1978. The Spionidae (Polychaeta) from Southeastern Australia and adjacent areas with a revision of the genera. Mem. Nat. Mus. Victoria. 39: 171-200.
- Bruce, N.L. 1980. The Cirolanidae (Crustacea: Isopoda) of Australia: The Genus *Pseudolana* from the Queensland Coast with descriptions of three new species. Pacific Sci. 34(2): 153-164.
- Bruce, N.L. In press. Diagnosis of *Pseudolana townae* sp. nov. (Crustacea, Isopoda, Cirolanidae) from New South Wales, Australia. Crustaceana.
- Cotton, B.C. and F.K. Godfrey. 1938. The Molluscs of South Australia. Part I. The Pelecypods. Government Printer, Adelaide. 362 pp.
- Dakin, W.J., I. Bennett, and I. Pope. 1952. Australian Seashores. Angus and Robertson, Sydney. 372 pp.
- Day, J.H. 1967. A Monograph on the Polychaeta of Southern Africa. Part I Errantia, Part 2 Sedentaria. The British Museum. London 878 pp.
- Dexter, D.M. (in press). Community structure of intertidal sandy beaches in New South Wales, Australia. In 'Sandy Beaches as Ecosystems'. Eds. T. Erasmus and A. McLachlan. Junk.
- Dexter, D.M. ms. Seasonality in community structure of four sandy beaches in New South Wales. Submitted for publication.
- Fauchald, K. 1977. The Polychaete Worms: Definition and Keys to the Orders, Families, and Genera. Los Angeles County Nat. Hist. Mus. Science Series 28: 188 pp.
- Fearn-Wannan, H.J. 1968. Littoral Amphipods of Victoria Part I. Proc. Roy. Soc. Vict. 81: 31-56.
- Hale, H.M. 1925. Review of Australian Isopods of the Cymothid Group. Part I. Trans. Roy. Soc. S. Austr. 49: 128-158.
- Hale, H.M. 1929. The Crustaceans of South Australia. Government Printer, South Australia. 378 pp.
- Hale, H.M. 1936. Three new cumacea from South Australia. Records of South Austr. Mus. 5(4): 395-438.
- Hartman, O. 1944. Polychaetous annelids from California including descriptions of two new genera and nine new species. Allan Hancock Pac. Exped. 10: 1-290.
- Hartman, O. 1954. Australian Nereidae including descriptions of three new species and one genus together with summaries of previous records and keys to species. Trans. Roy. Soc. S. Austr. 77: 1-41.
- Healy, A. and J. Yaldwyn. 1970. Australian Crustaceans in Colour. A.H. and A.W. Reed, Sydney. 112 pp.
- Hutchings, P. 1974. Polychaeta of Wallis Lake, New South Wales. Proc. Linn. Soc. N.S.W. 98(4): 174-195.
- Hutchings, P. 1982. Bristleworms (Phylum Annelida). In 'Marine Invertebrates of Southern Australia Part I' Eds. S.A. Shepherd and I.M. Thomas. Government Printer, South Australia.
- Hutchings, P. and S. Rainer. 1979a. The polychaete fauna of Careel Bay, Pittwater, New South Wales, Australia. J. Nat. Hist. 13: 745-796.
- Hutchings, P. and S. Rainer. 1979b. A key to estuarine polychaetes in New South Wales. Proc. Linn. Soc. N.S.W. 104(1): 35-48.
- MacPherson, J.H. and C.J. Gabriel. 1962. Marine Molluscs of Victoria, Melbourne Univ. Press. 475 pp.

- McNeill, F.A. 1926. Studies in Australian Carcinology No: 2. Rec. Austr. Mus. 32(6): 217-321.
- May, W.L. 1923. An Illustrated Index of Tasmanian Shells. Tasmanian Government Printer. 100 pp.
- Paxton, H. 1974. Contribution to the study of Australian Nephyidae (Polychaeta). Rec. Austr. Mus. 29(2): 197-208.
- Paxton, H. 1979. Taxonomy and aspects of the life history of Australian beachworms (Polychaeta: Onuphidae). Austr. J. Mar. Freshwater Res. 30: 265-294.
- Poore, G.C.B. and D.J. Griffin. 1979. The Thalassinidea (Crustacea: Decapoda) of Australia. Rec. Aust. Mus. 32(6): 117-321.
- Rainer, S. and P. Hutchings. 1977. Nephthyidae (Polychaeta: Errantia) from Australia. Rec. Aust. Mus. 31(8): 307-347.
- Robinson, K. and Gibbs, P. 1982. A Field Guide to the Common Shelled Molluscs of New South Wales Estuaries. Coast and Wetlands Society, Sydney.
- Schultz, G.A. 1969. The Marine Isopod Crustacea. Wm. C. Brown Co. Iowa. 359 pp.
- Sheard, K. 1937. Amphipods from a South Australian Reef. Part I. Rec. S. Austr. Mus. 5(4): 445-455.
- Shepherd, S.A. and I.M. Thomas. 1982. Marine Invertebrates of Southern Australia. Part I. Government Printer, South Australia. 491 pp.
- Stebbing, T.R.R. 1906. Amphipods I Gammaridea. Das Tierreich, Berlin 21: 1-806.
- Tindale-Biscoe, M. and R.W. George. 1962. The *Oxystomata* and *Gymnopleura* (Crustacea: Brachyura) of Western Australia with descriptions of two new species from Western Australia and one from India. J. Roy. Soc. W. Austr. 45(3): 65-96.
- Warren, L.M. 1976. A review of the genus *Capitella* (Polychaeta: Capitellidae). J. Zool. London. 180: 195-209.
- Wilson, B.R. and K. Gillett. 1979. A Field Guide to Australian Shells. Prosobranch Gastropods. A.H. and A.W. Reed, Sydney. 287 pp.
- Wright, L.D., J. Chappell, B.G. Thom, M.P. Bradshaw and P. Cowell. 1979. Morphodynamics of reflective and dissipative beach and inshore systems: Southeastern Australia. Mar. Geol. 32: 105-140.
- Young, P.C. 1977. A working key to the common species of juvenile penaeid prawns from Moreton Bay, Queensland, Australia (Penaeidae: Natantia). C.S.I.R.O. Div. Fisheries and Oceanog.II. Report No: 72. 12 pp.

