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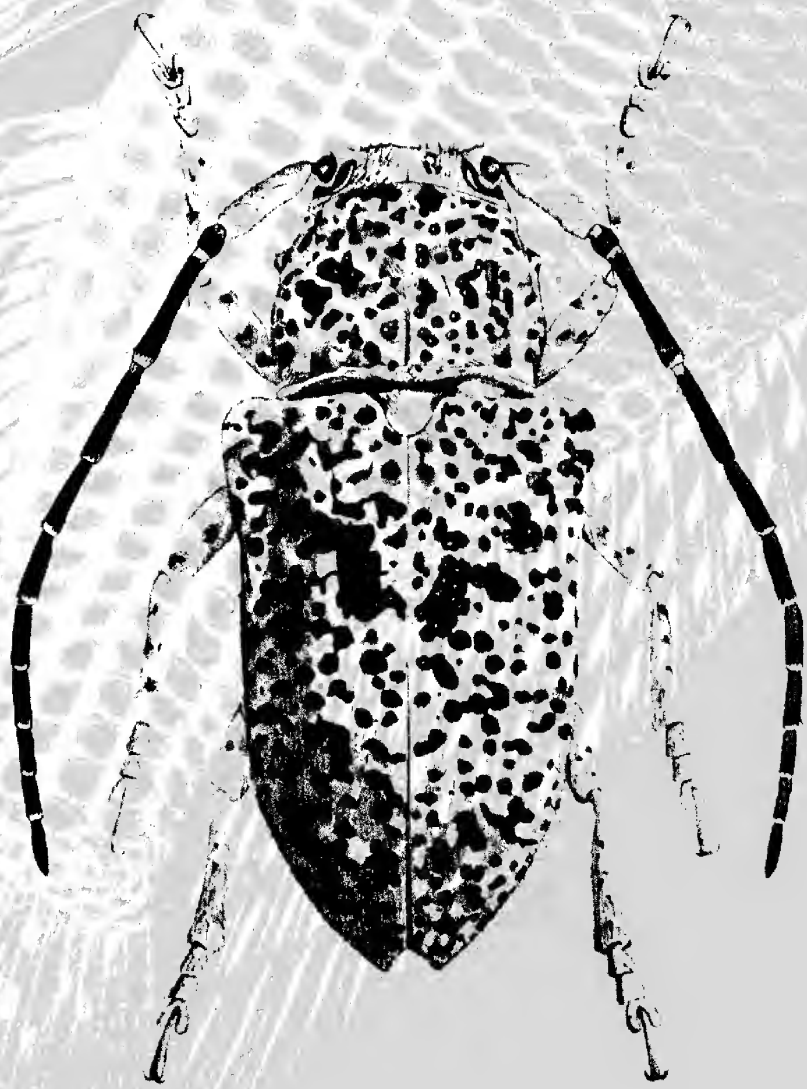

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The **cover** image is of a cerambycid beetle *Penthea adamsae.* When the Australian Museum entomologist Keith McKeown named this species in 1938 in *Records of the Australian Museum*, volume 20, p. 213, he described it as a "beautiful little [14 mm] insect... entirely unlike any of the described species of *Penthea*". Nancy B. Adams, was then an illustrator in the Department of Entomology and McKeown named the species "as a small tribute to her beautiful drawings of entomological subjects". The faded impression of a central Queensland freshwater fish—named *Aidapora carteri* by Australian Museum ichthyologist Gilbert Whitley—provides background; this species was also first reported in *Records of the Australian Museum* (volume 19, 1935).

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The Azooxanthellate Scleractinia (Coelenterata: Anthozoa) of Australia

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ABSTRACT. A total of 237 species of azooxanthellate Scleractinia are reported for the Australian region, including seamounts off the eastern coast. Two new genera (*Lissotrochus* and *Stolarskicyathus*) and 15 new species are described: *Crispatotrochus gregarius, Paracyathus darwinensis, Stephanocyathus imperialis, Trochocyathus wellsi, Conocyathus formosus, Dunocyathus wallaceae, Foveolocyathus parkeri, Idiotrochus alatus, Lissotrochus curvatus, Sphenotrochus cuneolus, Placotrochides cylindrica, P. minuta, Stolarskicyathus pocilliformis, Balanophyllia spongiosa*, and *Notophyllia hecki*. Also, one new combination is proposed: *Petrophyllia rediviva*. Each species account includes an annotated synonymy for all Australian records as well as reference to extralimital accounts of significance, the type locality, and deposition of the type. Tabular keys are provided for the Australian species of *Culicia* and all species of *Conocyathus* and *Placotrochides*. A discussion of previous studies of Australian azooxanthellate corals is given in narrative and tabular form. This study was based on approximately 5500 previously unreported specimens collected from 500 localities, as well as a re-examination of most of the types and previously reported specimens from the Australian region.

Fifty-six species are recorded as new to Australia; 183 state range extensions are listed; and 96 worldwide bathymetric range extensions are noted. In order to characterize the Australian fauna, all 703 known azooxanthellate species were tabulated as to coloniality, method of attachment, and depth range: 187 species are colonial, 516 solitary; 373 are attached, 265 free, and 54 transversely dividing; and 200–1000 m is the most common depth range. Compared to all azooxanthellate species, those from Australia have a slightly higher percentage of species that are solitary and unattached (or transversely dividing), due to a disproportionate number of species in the families Flabellidae and Turbinoliidae. Bathymetrically they are typical of the worldwide fauna. Sixty-seven species are endemic to the Australian region. Both UPGMA cluster analysis and MDS ordination reveal two main regions: a northern tropical region and a southern warm temperate region, consistent with zonation patterns of shallow-water marine invertebrates.

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Azooxanthellate corals comprise half of the species and genera of the order Scleractinia (Cairns, 1999b), and, with the publication of this paper, consist of 703 species. Two hundred thirty-seven species, or one-third, of the azooxanthellate species occur off Australia, making it one of the richest regions in the world for this type of coral. The purpose of this paper was not to re-describe the azooxanthellate coral fauna of Australia, as most of the species have been adequately described and figured within the last 15 years in papers about the Australian fauna or adjacent regions (Cairns, 1989a, 1994, 1995, 1998, 1999a; Cairns & Parker, 1992; Cairns & Zibrowius, 1997). Instead, the primary purpose is to document and verify all previously published records of the 237 Australian azooxanthellate species in the form of annotated synonymies, to augment these reports with additional records from the various Australian museums, and to list deposition of types and type localities for all species. This exhaustive compilation then provides the basis for a meaningful zoogeographic analysis of this fauna, the second goal of the paper.

Material

This study was based on an examination of approximately 5500 newly-reported specimens collected from 498 localities, many of which are recorded in the Station List. Over the course of the last 15 years, but primarily on a visit to Australia in January–February, 2002, I examined the azooxanthellate collections of most of the major Australian natural history museums, including those of: SAM, NMV, AM, Macleay, QMB, MTQ, AIMS, NTM, and WAM. Specimens were collected by over 34 vessels (see Station List), but most significant among those were the Australian vessels Kapala, Franklin, Soela, and Cidaris. Specimens from the first three vessels are housed at AM, and those from the Cidaris at MTQ. As a result, of the 237 azooxanthellate species known from Australia, original or additional records of 186 species (78.5%) are reported herein.

The study also involved the re-examination of virtually all specimens of azooxanthellates previously reported from Australian waters, as well as the type specimens on which they were based. In the latter case, the types of 214 of the 237 (90.3%) species have been examined; many of the remainder are considered to be lost.

Methods

Systematic part. Synonymies are purported to be complete regarding Australian records, and augmented with extralimital references that contain useful information on synonymy, inclusion in a key, distribution, illustration, and/or description. For each Australian synonymy entry the state from which the specimen was collected is indicated in bold face, or there is an indication of whether it was simply uncritically listed in that publication. The extralimital entries are also briefly annotated but without bold face emphasis, as these do not include Australian records. Only previously unpublished new records are listed for each species, as well as the type deposition and type localities of senior synonyms and Australian junior synonyms. Although Norfolk, Macquarie, Heard, Christmas, and Cocos-Keeling Islands, and part of the Antarctic continent are considered as Australian possessions, this study does not include those regions, but does include specimens from the seamounts of the Lord Howe Seamount Chain.

A particularly successful cruise was made by the R.V. Franklin (06/88/1–22) in August, 1988, which collected many and varied deep-water Scleractinia that are now deposited at the Australian Museum. Unfortunately, specific station numbers were not recorded for all specimens of this cruise. These undocumented stations are referenced as Franklin 06/88/x so as not to lose the unique records from this cruise. All stations were made between 10–12°S and 144–145°E at depths of 495–2523 m, a relatively circumscribed region off the coast of northeastern Cape York Peninsula.

The SEM was done by the author using an AMRAY 1810 scanning electron microscope.

Zoogeography. The zoogeographic affinities of the Australian azooxanthellate Scleractinia were analyzed based on their recorded presence in the seven states, but with Western Australia divided into a tropical and temperate zone at the Houtman Abrolhos Islands, and with three added categories of New Zealand, Indo-Pacific, and (east coast) Seamounts to facilitate subsequent comparisons (Tables 2 and 3). The methodology used follows that of Cairns & Chapman (2002), i.e., first constructing a cluster analysis of the regions using the UPGMA method, followed by a more detailed ordination, i.e., Non-Metric Multi-Dimensional Scaling (MDS). The program PC-ORD4 (McCune and Mefford, 1999) was used for both analyses. The 30 species restricted to a single locality were eliminated from the analyses, resulting in a data matrix of 207×11, or 2277 cells. In order to characterize and compare the groupings resulting from the MDS—as well as each region, all of Australia, and all known species—Table 3 was constructed listing the number and percentage of species having various morphological, bathymetric, and taxonomic characteristics. Although bathymetric ranges have been published for the azooxanthellate coral genera (Vaughan & Wells, 1943), Cairns (2001b) reported the ratio of colonial/solitary azooxanthellate species, and Cairns (1999b) the taxonomic percentages of each family, Table 3 is the first detailed compilation at the species level for depth of occurrence and mode of attachment for all azooxanthellate species, as well as updating the previously reported figures. This analysis was based on the list of species published by Cairns *et al.* (1999) as updated through this publication.

The following abbreviations are used in the text.

Museums

AIM	Auckland Institute and Museum, Auckland.
AIMS	Australian Institute of Marine Science, Townsville.
AM	Australian Museum, Sydney.
BM	British Museum, London (now The Natural History Museum).
MCZ	Museum of Comparative Zoology, Harvard University, Cambridge.
MNHN	Muséum national d'Histoire naturelle, Paris.
MTQ	Museum of Tropical Queensland, Townsville.
NMW	Naturhistorisches Museum, Wien.
NNM	Nationaal Natuurhistorisch Museum, Leiden (formerly RMNH).
NMV	National Museum of Victoria, Melbourne.
NTM	Northern Territory Museum, Darwin.
NZOI	New Zealand Oceanographic Institute, Wellington (now the National Institute of Water and Atmospheric Research).

POLIPI	Politbang Oseanologi (National Institute of Oceanology), Jakarta.
QMB	Queensland Museum, Brisbane.
QUO	Queen's University, Ontario.
SAM	South Australian Museum, Adelaide.
SMNH	Swedish Museum of Natural History, Stockholm.
TIUS	Institute of Geology and Paleontology, Tohoku (Imperial) University, Sendai, Japan.
USNM	United Stated National Museum, Washington, D.C. (now the National Museum of Natural History).
WAM	Western Australian Museum, Perth.
YPM	Yale Peabody Museum, New Haven.
ZMA	Zöologisch Museum, Amsterdam.
ZMB	Zoologisches Museum, Berlin.
ZMUC	Zoologisk Museum, Copenhagen.
ZMUZ	Zoologisches Museum der Universität Zürich, Switzerland.

Morphological terms

CD	Calicular diameter.
Cx, CSx, Px, Sx	Costae, costosepta, pali, or septa (respectively) of cycle designated by numerical subscript.
GCD	Greater calicular diameter.
GCD:LCD	Ratio of greater to lesser calicular diameter.
GSD:LSD	Ratio of greater to lesser basal scar diameter.
H:D	Ratio of height to diameter of a solitary corallum.
PD	Pedicel diameter.
PD:GCD	Ratio of pedicel diameter to greater calicular diameter.
Sx > Sy	In the context of a septal formula, septa of cycle *x* wider than those of cycle *y*.

Geographical designations

Aus	Australia
IP	Indo-Pacific
LHSMC	Lord Howe Seamount Chain
NSW	New South Wales
NT	Northern Territory
NZ	New Zealand
Qld	Queensland
SA	South Australia
SM	Seamounts
Tas	Tasmania
Vic	Victoria
WA	Western Australia
WA_1	tropical Western Australia
WA_2	temperate Western Australia

Previous studies on Australian Azooxanthellates

The first azooxanthellate scleractinian to be reported from Australia is believed to be *Tubastraea aurea* (=*T. coccinea*), collected on the "Astrolabe" Expedition from shallow water off Port Jackson (Quoy & Gaimard, 1833). And, with the exception of several species collected on the "Challenger" Expedition, all azooxanthellates reported for the next century would be from relatively shallow water (less than 200 m), resulting from a variety of short faunistic reports (Table 1). Only the more significant of the 63 papers that reported Australian azooxanthellates are discussed further (Table 1, asterisks).

Moseley (1876), in the preliminary report of the corals collected on the Challenger expedition, reported the first deep-water coral known from Australia: *Ceratotrochus* (=*Stephanocyathus*) *platypus* at a depth of 750 m off Sydney. He also reported two other species from Two Fold Bay, New South Wales: *Flabellum* sp. (which he later described as *F. australe*) and *Flabellum variabile* (an unidentified species of *Truncatoflabellum*). In his final report on the "Challenger" corals, Moseley (1881) listed those two species as well as adding three more relatively deep-water species: *Cyathoceras cornu* (=*Crispatotrochus inornatus*), *Flabellum transversale*, and *Balanophyllia bairdiana*, from New South Wales and Victoria.

During the five years between Moseley's two papers on the "Challenger" deep-water corals, Tenison-Woods had published seven papers (Table 1) on shallow-water azooxanthellates from eastern Australia, the most notable being Tenison-Woods (1878b). In that paper he described 12 species from Port Jackson, New South Wales (29–146 m), three from Princess Charlotte's Harbour, one from South Australia, and one from the "east coast", as well as reporting many other fossil species. Some of those species have been synonymized or transferred to different genera, but almost all of his specimens are still deposited at the Macleay Museum, Sydney. A biography of Tenison-Woods was published by Hepburn (1979) and remarks about his scientific career by Press (1979) and Player (1990); see also Cairns (2001b).

Like Tenison-Woods, Dennant published a series of four closely-spaced papers on fossil and Recent Australian corals, the most significant being those of Dennant in 1904 and 1906. These two papers focused on shallow-water azooxanthellates of South Australia dredged and donated by J.C. Verco, and from off Sydney, collected and donated by the independent collectors Hedley and Petterd. Most of the specimens described in these two papers are deposited at the NMV, as reviewed by Stranks (1993), but some type specimens are also deposited at SAM, AM, and even NNM, as documented throughout this text. A short obituary notice of Dennant was published in 1907 (Anonymous, 1907), and the dredgings of Verco are described by him (Verco, 1935).

What Tenison-Woods did for New South Wales and Dennant for South Australia, Folkeson did for Western Australia, i.e., provide a preliminary account of the shallow-water (11–42 m) azooxanthellates from that region. Folkeson (1919) reported 10 species, three of them new, from off Cape Jaubert and Broome resulting from the collections made by E. Mjöberg's Swedish Scientific Expeditions to Australia (1910–1913). Folkeson's specimens are deposited at the Swedish Museum of Natural History, Stockholm.

In 1933, a collection of 12 primarily deep-water scleractinian species was reported by Hoffmeister (1933), including three new species. The collection was made by the FIS "Endeavour" at localities off southeastern Australia to depths of 859 m. Most of these specimens are deposited at AM and USNM, but some of the "Endeavour" dendrophylliids appear to have been sent to van der Horst at ZMA, who placed manuscript names on some of them but did not publish the results (Wells, 1984b).

As a result of the BANZARE (1929–1931), Wells (1958) added six new records for Tasmania and one for Western Australia, these specimens are deposited at SAM. Wells also listed all azooxanthellate species ever collected from south of 25°S, which included 37 records from Australia, but I can find no justification for his listing of *Stephanocyathus nobilis* from South Australia.

Table 1. Literature on Australian azooxanthellate Scleractinia (citations with asterisks are discussed in the section entitled *Previous studies on Australian Azooxanthellates*).

*	1833	Quoy & Gaimard: **NSW**—First azooxanthellate scleractinian reported from Australia: *Tubastraea aurea* (=*T. coccinea*), from Port Jackson.
	1846	Dana: **NSW**—Another shallow-water species, *Culicia tenella*, also reported from shallow water of Port Jackson.
	1848*a*	Milne Edwards & Haime: **Qld**—*F. affine* (=*Truncatoflabellum spheniscus*) reported from Sir Charles Hardy Islands.
	1849	Milne Edwards & Haime: **Aus**—*Culicia verreauxii* (species dubium) described from "Australia".
	1850	Milne Edwards & Haime: **Aus**—*Amphihelia venusta* (=?*Madrepora oculata*) reported from "Australia".
	1857	Milne Edwards & Haime: **Aus**—Relisting of 1848, 1849, 1850 records (no new data).
	1862	Macdonald: **Qld**—Unidentified *Heterocyathus* from Moreton Bay.
*	1876	Moseley: **NSW**—Three deep-water species reported from "Challenger" expedition.
	1878	Studer: **Qld, WA**—Two shallow-water species reported from the "Gazelle" expedition: *Dendrophyllia granosa* and *Flabellum* (=*Truncatoflabellum*) *martensii*.
	1878*a*	Tenison-Woods: **NSW**—*Sphenotrochus variolaris* (=*Notophyllia recta* and *N. etheridgi*, in part) reported from Pt. Stephens.
*	1878*b*	Tenison-Woods: **NSW, Qld, SA**—Seventeen shallow-water species reported from eastern Australia.
	1879*a*	Tenison-Woods: **Qld**—*Psammoseris cyliciodes* (=*Heterocyathus sulcatus* and *Heteropsammia cochlea*) described from Princess Charlotte's Bay.
	1879*b*	Tenison-Woods: **Vic**—Two shallow-water species described: *Balanophyllia dentata* and *Vasillum* (=*Rhizotrochus*) *tuberculatum*.
	1879*c*	Tenison-Woods: **Qld**—*Placotrochus pedicellatus* (=*P. laevis*) described from Princess Charlotte Bay.
	1880*a*	Tenison-Woods: **Qld**—Various remarks on species of *Heterocyathus* from Australia.
	1880*b*	Tenison-Woods: **Vic**—*Flabellum tubuliferum* (=*Rhizotrochus tuberculatus*) described from Bass Strait.
*	1881	Moseley: **NSW, Vic**—Five deep-water species reported from "Challenger" expedition, two of which were reported in 1876.
	1892	Rehberg: **WA**—*Heterocyathus pulchellus* (=*H. sulcatus*) described from west coast of Australia.
	1902*a*	Dennant: **SA**—*Holcotrochus scriptus* described as fossil and Recent species.
	1902*b*	Dennant: **SA**—*Platytrochus hastatus* described as fossil and Recent species.
*	1904	Dennant: **SA, Vic**—Seven new shallow-water records, 6 from South Australia.
*	1906	Dennant: **SA, NSW**—Twelve new shallow-water records from South Australia and 3 from NSW.
	1909	Howchin: **SA**—Uncritical review of the 20 azooxanthellate species previously reported from South Australia.
*	1919	Folkeson: **WA**—Records of 10 shallow-water (11–42 m) azooxanthellates.
	1931	Thomson & Rennet: **Tas**—*Flabellum australe* reported from Maria Island, Tasmania.
*	1933	Hoffmeister: **SA, Vic, Tas, NSW**—Twelve primarily deep-water species collected by FIS "Endeavour".
	1939	Gardiner: **NSW**—*Turbinolia australiensis* (=*Conocyathus zelandiae*) described from Port Jackson.
	1952	Crossland: **Qld**—Nine shallow-water azooxanthellates reported from the Great Barrier Reef Expedition (1928–29).
	1952	Boschma: **Vic, NSW**—Revision of the genus *Notophyllia*, endemic to Australia.
	1952	Totten: **SA**—*Culicia tenella* (=*C. hoffmeisteri*) reported from Eyre's Peninsula.
	1955	Wells: **Qld**—Three shallow-water astrangiids, one new, reported from Moreton Bay.
	1956	Stephenson & Wells: **Qld**—Relisting of 14 azooxanthellate species previously reported by Crossland (1952) and Wells (1955), but also two new records (*Tubastraea diaphana* and *Thecopsammia* (=*Endopsammia) regularis*) and two new combinations.
*	1958	Wells: **SA, Vic, Tas** (south of 35°)—BANZARE: 6 new records from Tasmania and one from Western Australia; list of all 37 azooxanthellates from "southern" Australia.
	1959	Wells: **Qld**—Two shallow-water species (*Holcotrochus scriptus* and *Oryzotrochus* [=*Turbinolia*] *stephensoni*) reported from the GBR.
	1961	Squires: **SA, Vic, Tas**—Uncritical listing of the 41 azooxanthellate species known from southern Australia.
*	1964	Wells: **Qld, NSW**—List of 63 azooxanthellate species from eastern Australia, including 11 new records.
	1966	Squires: **SA**—Report of two shallow-water azooxanthellates, one of them new: *Culicia hoffmeisteri*.
	1973	Eguchi: **SA**—Report of two shallow-water azooxanthellates.
	1979	Wells & Alderslade: **Qld**—New species *Archohelia* (=*Petrophyllia) rediviva* from shallow-water.
	1980	Veron & Pichon: *Heteropsammia cochlea* discussed.
	1982	Wells: **Qld**—*Cladopsammia eguchii* (=*Balanophyllia dentata*) reported from 85 m.
	1982	Shepherd & Veron: **SA**—Short descriptions, key, and figures of 17 southern Australian azooxanthellates.
	1982	Coucom: **NSW**—Photographs of two common deep-water species.
	1982	Cairns: **SA, Tas**—Five records of deep-water species, including one new record: *Enallopsammia rostrata*.
	1984*a*	Wells: **Qld, WA**—Two new records, however, *Madrepora porcellana* (WA) remains undocumented.
*	1984*b*	Wells: **Qld, NSW, Vic, SA, Tas**—Unpublished and uncritical list of 116 "ahermatypic" species reported from eastern and southern Australia.
	1985	Zibrowius: **NSW**—*Balanophyllia stimpsonii* reported from NSW.
*	1986	Veron: **Aus**—108 azooxanthellate species listed for Australia, but 30 new records are undocumented.
	1989*a*	Cairns: **Qld**—Six new records for Queensland.
	1991	Hoeksema & Best: **Qld**—Lectotype designation for *Psammoseris cylicioides*.
	1991	Grygier: **Qld, WA**—Four species reported as hosts for petrarcid ascothoracidan Crustacea.
*	1992	Cairns & Parker: **Vic, Tas, SA**—44 azooxanthellate species reported, including 6 new species and 11 new to Australia; key to species.
*	1993	Stranks: **Vic, SA**—type deposition of species described by Dennant 1904, 1906, Tenison-Woods, 1879b, and Cairns & Parker 1992.
	1995	Cairns: **SM, Tas, Qld, Vic, WA**—Twenty-five new records, primarily from the Lord Howe Seamount Chain.
	1996	Grygier & Cairns: **WA**—*Madrepora oculata* deformed by barnacle galls.
*	1997	Cairns & Zibrowius: **Qld, Tas, SM, NT**—Thirty-four new records, mainly from off Northern Territory.
	1997	Cairns: **Aus**—Distributional records of all turbinoliids, some new combinations; no new records.
*	1998	Cairns: **WA, NT**—Review of 105 azooxanthellate species of Western Australia, including 57 new to Australia.
	1998	Koslow & Gowlett-Holmes: **Tas**—Discussion of three deep-water species that occur on seamounts south of Tasmania.
	1999*a*	Cairns: **Tas, Qld, NSW**—New Australian records of *Anthemiphyllia multidentata* and *Thalamophyllia tenuescens*.
	2000	Veron: **Aus**—Colour figures of several shallow-water azooxanthellates.
	2001*a*	Cairns: **Aus**—Distributional records of all dendrophylliids; no new records.
	2001	Koslow *et al*.: **Tas**—Ecology of *Solenosmilia variabilis* on seamounts south of Tasmania.

John Wells added substantially to our knowledge of Australian deep-water corals between 1955 and 1984 (see Table 1), but perhaps his most significant paper was in 1964, in which he added 11 new records (including 3 new species) to the Queensland fauna, most of these from one dredge off Jumpin Pin at 86 m. In this paper he also listed the 63 previously reported azooxanthellate species from the east coast of Australia. Although some of his identifications are disputed in this paper, it represents the first synthesis based on new material of the azooxanthellate corals from Queensland. Most of his specimens are deposited at QMB and USNM. Later, in 1984 (b), Wells produced an uncritical listing of the 116 species of "ahermatypic" corals known from eastern and southern Australia, complete with the museum of deposition of all taxa. This list was never published, but served as a guide to me for locating some of the specimens used in this study. As mentioned below, it apparently also served as a resource for the appendix of Australian azooxanthellates published by Veron (1986).

In his excellent review of the reef corals of Australia and the Indo-Pacific, Veron (1986) also added a chapter on the non-reefal (azooxanthellate) Australian Scleractinia, of which he listed 108 species. This included all previously reported species as well as about 30 new records for Australia, and constituted the first attempt at a complete listing of the Australian azooxanthellate species. Unfortunately, none of these records were documented geographically or by museum of deposition, and it is assumed that many of the new records were based on the unpublished, uncritical list of Wells (1984b). Although most of these new records subsequently have been validated, either by additional specimens or based on the original specimens upon which Wells made his list (many now deposited at USNM), at least six remain undocumented for Australia and are listed as such at the end of the taxonomic section (p. 320). Only documented records are considered to be valid in the context of this revision.

Based on a substantial amount of new material, Cairns & Parker (1992) reviewed the 44 azooxanthellate species occurring off South Australia, Victoria, and Tasmania, listing 13 new records, including six new species. All species were described, mapped, and illustrated, and a key was provided for their identification. This material is deposited primarily at SAM, USNM, and NMV.

In their revision of the azooxanthellates of the adjacent Indonesian region, Cairns & Zibrowius (1997) reported approximately 34 species from Australian waters, most of those from the continental shelf off the Cobourg Peninsula, Northern Territories (Karubar stations 61–68, 79, 82–86), which were incorrectly attributed to Tanimbar Island, instead of Australia. These specimens are deposited primarily at MNHN, USNM, and POLIPI.

Finally, in my (Cairns, 1998) revision of the azooxanthellates of Western Australia, I listed and discussed the 105 species that occur off that state, as well as some from off Northern Territory, including 11 new species and 57 new records for Australia. That study was based on new material from about 1700 specimens from 333 stations, most of which are deposited at WAM. Many of the types from that paper were catalogued by Griffith & Fromont (1998).

The current paper documents the addition of another 56 azooxanthellate species to the Australian fauna (Table 2, underlined taxa), including 183 range extensions for particular Australian states (Table 2, underlined state abbreviation), but including the seamounts (SM) as a "state". Not surprisingly, the highest number of new state records occur in those states not recently reviewed. Thus the new state records are: Southern Australia—0, Tasmania—4, Victoria—3, New South Wales—25, Seamounts—32, Queensland—94, Northern Territory—14, and Western Australia—11. Ninety-seven bathymetric range extensions (63 maximum, 34 minimum) are indicated in Table 2 by bold face.

Zoogeography

Australia vs the World. As mentioned in the introduction, of the 703 valid species of azooxanthellate corals, one-third (237 species or 33.7%) occur off Australia, making it one of the richest regions in the world for this type of coral (Table 3). The vast majority (73.4%) of azooxanthellates are solitary in habit, but this percentage is even higher in Australia where it is 84.4%, this probably due to the disproportionate number of turbinoliids and flabellids, both of which are exclusively solitary. Azooxanthellate coral species may be attached, unattached (free), or undergo a process of transverse division, whereby an attached anthocyathus buds off multiple unattached anthocyathi (Cairns,1989b). The predominant habit is to be attached (53.1%), followed in frequency by being free (37.7%), and a small but significant component (9.2%) of transversely dividing species. The latter category, once thought to be insignificant in number, comprises 65 species in 6 families and 17 genera, all but two of these genera being exclusively transversely dividing: *Anthemiphyllia* (2 of 8 species), *Trochocyathus* (5 of 27 species), *Bourneotrochus* (1), *Idiotrochus* (3), *Dunocyathus* (2), *Peponocyathus* (3), *Australocyathus* (1), *Kionotrochus* (1), *Blastotrochus* (1), *Placotrochides* (4), *Placotrochus* (1), *Truncatoflabellum* (31), *Truncatoguynia* (1), *Temnotrochus* (1), *Falcatoflabellum* (1), *Notophyllia* (4), and *Endopachys* (2). The Australian fauna has a higher than average number of free and transversely-dividing species, the latter also due to a disproportionately high number of transversely-dividing turbinoliids and flabellids, such as *Truncatoflabellum* and *Placotrochides*. The most common depth at which azooxanthellates live is between 200 and 1000 m (Table 3; Cairns, 1995, Cairns & Zibrowius, 1997), followed by the lesser depth categories of 50–200 m and 0–50 m. Only 132 species are known to occur deeper than 1000 m, and only 32 of those deeper than 2000, the deepest known coral having been collected at 6328 m (Keller, 1976). The bathymetric distribution of the Australian species is fairly consistent with the world averages, the deepest Australian species being *Fungiacyathus marenzelleri* at 4954 m. Whereas azooxanthellate corals occur in 12 scleractinian families (Cairns, 1999b), most (91.6%) occur in only six families (Table 3). The percentages of Australian species found in those six families are fairly consistent with the world averages, except for a slightly higher percentage of turbinoliids and flabellids at the expense of caryophylliids and dendrophylliids. Sixty-seven of the 237 Australian species (28.2%) are endemic to the continent.

Cluster and ordination analyses. The UPGMA cluster analysis (Fig. 1) of the eleven regions indicates two major groups: a northern "tropical" cluster (Fig. 1 II) and a southern "temperate" cluster (Fig. 1 I), which is consistent

Table 2. Distribution of the 237 azooxanthellate Scleractinia known from Australia. The 67 endemic species are marked *; 56 new records for Australia are underlined; records new to Australian states are underlined; fossil records are marked †; bathymetric range extensions in bold face. Coloniality: *S*, solitary; *C*, colonial. Attachment: *A*, attached; *F*, free; *T*, transversely dividing. Seamounts (SM) include (from south to north): Gascoyne, Taupo, Derwent Hunter, Elizabeth Reef, Britannia, Gifford, Argo, and Nova. Australian states are abbreviated: NSW, NT, Qld, SA, Tas, Vic, WA (the border between tropical [WA1] and temperate [WA2] Western Australia is considered to be the Houtman Abrolhos Islands); other abbreviations: ME & H, Milne Edwards & Haime; NZ, New Zealand; IP, Indo-Pacific.

	name	SA	Tas	Vic	NSW	SM	Qld	NT	WA1	WA2	NZ	IP	coloniality, attachment, & depth (m) off Australia
SUBORDER FUNGIINA													
	Family Fungiacyathidae												
*	*Fungiacyathus (B.) dennanti* Cairns & Parker, 1992	SA	Tas	Vic	NSW	…	Qld	…	…	…	…	…	S F 190–**1750**
	Fungiacyathus (B.) granulosus Cairns, 1989	…	…	…	…	SM	…	…	WA1	…	…	IP	S F 302–**1050**
	Fungiacyathus (B.) marenzelleri Vaughan, 1906	…	…	…	…	SM	…	…	…	…	…	IP	S F 4570–4954
	Fungiacyathus (B.) margaretae Cairns, 1995	…	…	…	…	…	Qld	…	…	…	NZ	IP	S F 366–1050
	Fungiacyathus (B.) turbinolioides Cairns, 1989	…	…	Vic	…	…	…	…	…	…	NZ	IP	S F 930
	Fungiacyathus (B.) variegatus Cairns, 1989	…	…	…	NSW	…	Qld	…	WA1	…	…	IP	S F 287–549
	Fungiacyathus (Fungiacyathus) fragilis Sars, 1872	…	…	…	NSW	…	…	…	WA1	…	NZ	IP	S F 400–1650
*	*Fungiacyathus (F.) multicarinatus* Cairns, 1998	…	…	…	…	…	…	…	WA1	…	…	…	S F 348–350
	Fungiacyathus (F.) paliferus (Alcock, 1902)	…	…	…	…	SM	…	…	WA1	…	…	IP	S F 101–425
	Fungiacyathus (F.) pusillus pacificus Cairns, 1995	…	…	…	…	SM	…	…	…	…	NZ	IP	S F 1050–**1400**
	Fungiacyathus (F.) sandoi Cairns, 1999	…	…	…	…	SM	Qld	…	…	…	…	IP	S F **77**–420
	Fungiacyathus (F.) stephanus (Alcock, 1902)	…	…	…	NSW	…	…	NT	WA1	…	NZ	IP	S F 251–925
	Family Micrabaciidae												
	Letepsammia fissilis Cairns, 1995	…	…	…	NSW	…	Qld	…	WA1	…	NZ	…	S F 201–**458**
	Letepsammia formosissima (Moseley, 1876)	SA	Tas	…	NSW	…	…	NT	WA1	…	NZ	IP	S F 128–500
	Letepsammia superstes (Ortmann, 1888)	…	…	…	…	…	Qld	…	…	…	NZ	IP	S F 414
	Rhombopsammia niphada Owens, 1986	…	…	…	NSW	…	Qld	NT	WA1	…	…	IP	S F 226–740
	Rhombopsammia squiresi Owens, 1986	…	…	…	…	…	…	…	WA1	…	…	IP	S F 850
	Stephanophyllia complicata Moseley, 1876	…	…	…	…	SM	Qld	…	WA1	…	NZ	IP	S F 260–495
	Stephanophyllia neglecta Boschma, 1923	…	…	…	…	…	Qld	…	…	…	…	IP	S F 295–309
SUBORDER FAVIINA													
	Family Rhizangiidae												
*	*Astrangia atrata* (Dennant, 1906)	SA	Tas	Vic	NSW	…	…	…	…	WA2	…	…	C A 3.5–**51**
*	*Astrangia woodsi* Wells, 1955	…	…	…	NSW	…	Qld	…	…	…	…	…	C A 18
	Cladangia exusta Lütken, 1873	…	…	…	…	…	Qld	…	…	…	…	IP	C A unknown
	Culicia australiensis Hoffmeister, 1933	SA	Tas	…	…	…	…	NT	WA1	WA2	…	IP	C A 3–**378**
*	*Culicia hoffmeisteri* Squires, 1966	SA	Tas	Vic	NSW	…	Qld	NT	…	WA2	…	…	C A 0–**51**
*	*Culicia quinaria* (Tenison-Woods, 1878)	…	…	…	NSW	…	Qld	…	…	…	…	…	C A **0.5–30**
*	*Culicia tenella* tenella Dana, 1846	…	…	…	NSW	…	Qld	…	…	…	…	…	C A 30
	Oulangia stokesiana s.str. ME & H, 1848	…	…	…	…	…	…	NT	WA1	…	…	IP	C A 0–22
	Family Oculinidae												
	Cyathelia axillaris (Ellis & Solander, 1786)	…	…	…	…	…	…	…	…	WA2	…	IP	C A **12**–40
	Madrepora oculata Linnaeus, 1758	…	…	Vic	NSW	…	Qld	…	WA1	…	NZ	IP	C A 304–1420
	Oculina virgosa Squires, 1958	…	…	…	…	SM	Qld	…	…	…	NZ	…	C A **1050**
*	*Petrophyllia rediviva* (Wells & A., 1979)	…	…	…	…	…	Qld	NT	…	…	…	…	C A 0–7
	Family Anthemiphylliidae												
	Anthemiphyllia dentata (Alcock, 1902)	…	…	…	NSW	SM	Qld	…	WA1	WA2	NZ	IP	S F 154–**1050**
	Anthemiphyllia macrolobata Cairns, 1999	…	…	…	…	SM	Qld	…	…	…	NZ	IP	S F 420–**650**
*	*Anthemiphyllia multidentata* Cairns, 1999	…	Tas	Vic	NSW	…	Qld	…	…	…	…	…	S F 128–270
	Anthemiphyllia pacifica Vaughan, 1907	…	…	…	…	SM	…	…	…	…	NZ	IP	S F 336–**342**
	Anthemiphyllia spinifera Cairns, 1999	…	…	…	…	SM	Qld	…	…	…	…	IP	S T 500–**650**
SUBORDER CARYOPHYLLIINA													
	Family Caryophylliidae												
	Anomocora marchadi (Chevalier, 1966)	…	…	…	…	…	Qld	…	WA1	…	…	IP	C F 144–270
	Aulocyathus recidivus (Dennant, 1906)	SA	Tas	Vic	NSW	…	Qld	…	…	…	NZ	IP	S F 128–1117
	Bourneotrochus stellulatus (Cairns, 1984)	…	…	…	…	SM	Qld	…	…	…	NZ	IP	S T **210**–531
	Caryophyllia (Acanthocyathus) decamera Cairns, 1998	…	…	…	…	…	…	NT	WA1	…	…	IP	S F **124**–260
	Caryophyllia (A.) grayi (ME & H, 1848)	…	…	…	…	…	Qld	NT	WA1	…	…	IP	S F 103–150
	Caryophyllia (A.) spinigera (Kent, 1871)	…	…	…	…	…	…	NT	…	…	…	IP	S F 239–251
	Caryophyllia (A.) unicristata Cairns & Zibrowius, 1997	…	…	…	…	…	Qld	NT	WA1	…	…	IP	S F **144**–570
	Caryophyllia (Caryophyllia) ambrosia Alcock, 1898	…	…	…	NSW	SM	Qld	…	WA1	…	NZ	IP	S F 512–1500
	Caryophyllia (C.) atlantica (Duncan, 1873)	…	…	…	…	…	Qld	…	WA1	…	NZ	IP	S A **298**–1050
	Caryophyllia (C.) crosnieri Cairns & Zibrowius, 1997	…	…	…	…	SM	Qld	…	WA1	…	NZ	IP	S A **133–1050**
	Caryophyllia (C.) diomedeae Marenzeller, 1904	…	Tas	Vic	…	SM	…	…	…	WA2	NZ	IP	S A **131**–1150
	Caryophyllia (C.) grandis Gardiner & Waugh, 1938	…	…	…	…	…	…	NT	WA1	…	…	IP	S F 251–596
	Caryophyllia (C.) hawaiiensis Vaughan, 1907	…	…	…	…	SM	…	…	…	…	NZ	IP	S A 183–**650**
	Caryophyllia (C.) lamellifera Moseley, 1881	…	…	…	…	SM	…	…	…	…	NZ	IP	S A 132–164

continued…

*	*Caryophyllia (C.) planilamellata* Dennant, 1906	SA	Tas	Vic	NSW	…	Qld	…	…	…	…	…	S	A	128–1220
	Caryophyllia (C.) quadragenaria Alcock, 1902	…	…	…	…	…	…	…	WA1	…	NZ	IP	S	A	154–201
*	*Caryophyllia (C.) ralphae* Cairns, 1995	…	…	…	…	SM	…	…	…	…	…	…	S	A	315–360
	Caryophyllia (C.) rugosa Moseley, 1881	…	…	…	…	SM	…	…	WA1	…	NZ	IP	S	A	143–360
	Caryophyllia (C.) scobinosa Alcock, 1902	…	…	…	…	SM	Qld	…	…	…	…	IP	S	F	**302–2450**
	Caryophyllia (C.) stellula Cairns, 1998	…	…	…	…	…	…	…	…	WA2	…	IP	S	A	240–402
	Caryophyllia (C.) transversalis Moseley, 1881	…	…	…	…	…	…	NT	WA1	…	…	IP	S	A	100–450
	Confluphyllia junta Cairns & Zibrowius, 1997	…	…	…	NSW	…	…	…	…	…	…	IP	C	A	**135**–135
	Conotrochus brunneus (Moseley, 1881)	…	…	…	…	SM	Qld	…	…	…	NZ	IP	S	A	**80**–1051
	Conotrochus funicolumna (Alcock, 1902)	…	…	Vic	NSW	SM	…	…	WA1	WA2	…	IP	S	A	240–**1078**
*	*Crispatotrochus gregarius* n.sp.	…	…	…	…	…	Qld	…	…	…	…	…	S	A	460
*	*Crispatotrochus inornatus* Tenison-Woods, 1878	…	…	Vic	NSW	…	…	…	WA1	…	…	…	S	A	**120**–400
	Crispatotrochus rubescens (Moseley, 1881)	…	…	…	…	…	Qld	NT	…	…	…	IP	S	A	246–512
	Crispatotrochus rugosus Cairns, 1995	…	…	…	…	SM	Qld	…	WA1	…	NZ	IP	S	A	296–**1050**
*	*Crispatotrochus woodsi* (Wells, 1964)	…	…	…	…	…	Qld	…	…	…	…	…	S	A	**77–87**
	Deltocyathus andamanicus Alcock, 1898	…	…	…	…	…	…	…	WA1	…	…	IP	S	F	360
	Deltocyathus cameratus Cairns, 1999	…	…	…	…	SM	…	…	…	…	…	IP	S	F	419–1078
	Deltocyathus magnificus Moseley, 1876	SA	…	Vic	NSW	…	Qld	…	WA1	…	…	IP	S	F	137–1500
	Deltocyathus ornatus Gardiner, 1899	…	…	…	…	SM	…	…	…	…	…	IP	S	F	315–360
	Deltocyathus rotulus (Alcock, 1898)	…	…	…	…	SM	Qld	…	…	…	…	IP	S	F	**143**–1192
	Deltocyathus sarsi (Gardiner & Waugh, 1938)	…	…	…	…	…	…	…	…	WA2	…	IP	S	F	80
	Deltocyathus stella Cairns & Zibrowius, 1997	…	…	…	…	SM	…	…	…	…	…	IP	S	F	420
	Deltocyathus suluensis Alcock, 1902	…	…	…	…	SM	Qld	NT	WA1	…	NZ	IP	S	F	246–**1050**
	Desmophyllum dianthus (Esper, 1794)	SA	Tas	Vic	NSW	SM	…	…	…	WA2	NZ	IP	S	A	37–1281
	Heterocyathus aequicostatus ME & H, 1848	…	…	…	…	…	Qld	NT	WA1	…	…	IP	S	F	0–20
	Heterocyathus alternatus Verrill, 1865	…	…	…	…	…	…	…	WA1	…	…	IP	S	F	0–9
	Heterocyathus hemisphaericus Gray, 1849	…	…	…	…	…	…	…	WA1	…	…	IP	S	F	2–**140**
	Heterocyathus sulcatus (Verrill, 1866)	…	…	…	…	…	Qld	NT	WA1	…	…	IP	S	F	9–287
	Labyrinthocyathus limatulus (Squires, 1964)	…	…	…	…	SM	…	…	…	…	NZ	…	S	A	315–360
	Lochmaeotrochus oculeus Alcock, 1902	…	…	…	…	…	…	…	WA1	…	…	IP	C	A	380–480
	Oxysmilia circularis Cairns, 1998	…	…	…	…	…	…	…	WA1	…	NZ	IP	S	A	201–404
	Paraconotrochus zeidleri Cairns & Parker, 1992	…	Tas	…	NSW	…	…	…	WA1	…	…	IP	S	F	304–520
*	*Paracyathus darwinensis* n.sp.	…	…	…	…	…	…	NT	…	…	…	…	S	A	0–26
	Paracyathus fulvus Alcock, 1893	…	…	…	…	…	…	…	WA1	…	…	IP	S	A	350–433
	Paracyathus rotundatus Semper, 1872	…	…	…	…	…	Qld	…	WA1	…	…	IP	S	A	30–40
*	"*Paracyathus*" *vittatus* Dennant, 1906	SA	…	…	…	…	…	…	…	…	…	…	S	A	31
	Premocyathus dentiformis (Alcock, 1902)	…	…	…	…	…	Qld	…	…	…	…	IP	S	F	300–**906**
	Rhizosmilia elata Cairns & Zibrowius, 1997	…	…	…	…	…	…	NT	…	…	…	IP	C	A	222–226
*	*Rhizosmilia multipalifera* Cairns, 1998	…	…	…	…	…	…	…	WA1	WA2	…	…	C	A	11–165
	Solenosmilia variabilis Duncan, 1873	SA	Tas	Vic	NSW	…	Qld	…	…	WA2	NZ	IP	C	A	640–1150
	Stephanocyathus (A.) explanans (Marenzeller, 1904)	…	…	…	…	…	…	…	WA1	WA2	…	IP	S	F	180–570
	Stephanocyathus (A.) spiniger (Marenzeller, 1888)	SA	…	Vic†	…	SM	Qld	NT	WA1	…	NZ	IP	S	F	142–**1188**
	Stephanocyathus (O.) coronatus (Pourtalès, 1867)	…	…	…	NSW	SM	Qld	…	…	…	NZ	IP	S	F	1051–**1989**
	Stephanocyathus (O.) weberianus (Alcock, 1902)	…	…	…	NSW	SM	Qld	…	WA1	…	…	IP	S	F	710–1045
*	*Stephanocyathus (Stephanocyathus) imperialis* n.sp.	…	…	…	…	…	Qld	…	…	…	…	…	S	F	2436–2474
	Stephanocyathus (S.) platypus (Moseley, 1876)	SA	Tas	Vic	NSW	…	…	…	…	…	NZ	…	S	F	**439**–1219
	Stephanocyathus (S.) regius Cairns & Zibrowius, 1997	…	…	…	…	…	Qld	…	WA1	…	NZ	IP	S	F	815–1564
*	*Stephanocyathus (S.)* sp. sensu Cairns & Parker, 1992	…	Tas	…	…	…	…	…	…	…	…	…	S	F	520
	Tethocyathus virgatus (Alcock, 1902)	…	…	…	…	SM	Qld	…	…	…	NZ	IP	S	A	419–**1200**
	Thalamophyllia tenuescens (Gardiner, 1899)	…	…	…	…	SM	Qld	…	WA1	…	NZ	IP	C	A	8–**360**
	Trochocyathus (A.) brevispina Cairns & Zibrowius, 1997	…	…	…	…	…	Qld	…	…	…	…	IP	S	F	458–500
*	*Trochocyathus* sp. cf. *T. (T.) aithoseptatus* Cairns, 1984	…	…	…	…	…	Qld	…	…	…	…	…	S	A	**86**–86
	Trochocyathus (T.) apertus Cairns & Zibrowius, 1997	…	…	…	…	…	…	…	WA1	…	…	IP	S	F	20–**230**
	Trochocyathus (T.) burchae (Cairns, 1984)	…	…	…	…	…	Qld	NT	…	…	…	IP	S	F	124–**144**
	Trochocyathus (T.) caryophylloides Alcock, 1902	…	…	…	…	…	…	NT	…	…	…	IP	S	A	226–235
	Trochocyathus (T.) cepulla Cairns, 1995	…	…	…	…	…	Qld	…	…	…	NZ	…	S	T	497–503
	Trochocyathus (T.) discus Cairns & Zibrowius, 1997	…	…	…	…	…	Qld	…	…	…	…	IP	S	T	458–500
	Trochocyathus (T.) maculatus Cairns, 1995	…	…	…	…	SM	Qld	…	…	…	NZ	IP	S	A	**77**–183
	Trochocyathus (T.) philippinensis Semper, 1872	…	…	…	…	…	…	…	WA1	…	…	IP	S	A	100–154
	Trochocyathus (T.) rhombocolumna Alcock, 1902	…	…	…	…	SM	Qld	NT	…	…	NZ	IP	S	A	415–**1050**
*	*Trochocyathus (T.) wellsi* n.sp.	…	…	…	…	…	Qld	…	…	…	…	…	S	A	75–86
	Vaughanella multipalifera Cairns, 1995	…	…	…	NSW	…	Qld	…	…	…	NZ	…	S	A	**920–3500**
	Vaughanella oreophila Keller, 1981	…	…	…	…	…	Qld	…	…	…	…	IP	S	A	1050–**1400**
	Family Turbinoliidae														
	Alatotrochus rubescens (Moseley, 1876)	…	…	…	…	…	Qld	…	WA1	…	NZ	IP	S	F	**180**–366
*	*Australocyathus vincentinus* (Dennant, 1904)	SA	…	…	…	…	…	…	…	WA2	…	…	S	T	16–148
*	*Conocyathus formosus* n.sp.	…	…	…	…	…	Qld	NT	…	…	…	…	S	F	320–367
*	*Conocyathus gracilis* Cairns, 1998	…	…	…	…	…	…	NT	WA1	…	…	…	S	F	22–291
	Conocyathus zelandiae Duncan, 1876	SA	…	Vic†	NSW	…	Qld	…	WA1	WA2	?	IP	S	F	**4–137**
	Cyathotrochus pileus (Alcock, 1902)	…	…	…	NSW	…	Qld	NT	WA1	…	NZ	IP	S	F	137–500
	Deltocyathoides orientalis (Duncan, 1876)	SA	…	…	…	SM	Qld	NT	WA1	…	…	IP	S	F	124–549
*	*Dunocyathus parasiticus* Tenison-Woods, 1878	SA	Tas	Vic	NSW	…	Qld	…	…	…	…	…	S	T	64–549
*	*Dunocyathus wallaceae* n.sp.	…	…	…	…	…	Qld	…	…	…	…	…	S	T	320–414
	Endocyathopora laticostata Cairns, 1989	…	…	…	…	…	…	NT	…	…	…	IP	S	F	fairly shallow

continued…

*	*Foveolocyathus kitsoni* (Dennant, 1901)	SA†F	...	Vic†	...	...	Qld	...	...	...	...	...	S	F	**342–367**
*	*Foveolocyathus parkeri* n.sp.	SA	...	...	...	...	...	...	...	WA2	...	...	S	F	73–183
*	*Foveolocyathus verconis* (Dennant, 1904)	SA	Tas	Vic	NSW	...	Qld	...	...	WA2	...	...	S	F	27–238
*	*Holcotrochus crenulatus* Dennant, 1904	SA	Tas	Vic	...	...	Qld	...	...	...	...	...	S	F	40–**414**
*	*Holcotrochus scriptus* Dennant, 1902	SA	Tas	Vic	...	...	Qld	...	...	...	...	...	S	F	9–**342**
	Idiotrochus alatus n.sp.	...	...	...	...	SM	Qld	...	...	...	...	IP	S	T	315–450
*	*Idiotrochus emarciatus* (Duncan, 1865)	SA F	...	Vic†	...	...	...	...	...	...	...	...	S	T	82–238
	Idiotrochus kikutii (Yabe & Eguchi, 1941)	...	...	...	...	...	Qld	...	WA1	...	...	IP	S	T	201–367
*	*Lissotrochus curvatus* n.sp.	...	...	...	...	...	Qld	...	...	...	...	...	S	F	342–367
	Notocyathus venustus (Alcock, 1902)	...	...	...	...	...	Qld	...	WA1	...	...	IP	S	F	90–414
	Peponocyathus folliculus (Pourtalès, 1868)	...	...	...	...	...	Qld	...	...	...	...	IP	S	T	458–500
	Peponocyathus minimus (Yabe & Eguchi, 1937)	...	...	...	...	...	Qld	NT	...	...	...	IP	S	F	235–458
*	*Platytrochus compressus* (Tenison-Woods, 1878)	...	...	...	NSW	...	...	...	...	...	...	...	S	F	64–**130**
*	*Platytrochus hastatus* Dennant, 1902	SA	Tas	Vic	...	...	...	...	...	WA2	...	...	S	F	27–148
*	*Platytrochus laevigatus* Cairns & Parker, 1992	SA	...	...	...	...	...	...	...	WA2	...	...	S	F	22–165
*	*Platytrochus parisepta* Cairns & Parker, 1992	SA	...	...	...	...	...	...	...	...	...	...	S	F	40–201
	Sphenotrochus cuneolus n.sp.	...	...	...	...	...	Qld	...	...	...	...	IP	S	F	42–342
*	*Sphenotrochus excavatus* Tenison-Woods, 1878	...	...	...	NSW	...	...	...	...	...	...	...	S	F	unknown
	Thrypticotrochus petterdi (Dennant, 1906)	...	...	...	NSW	...	Qld	...	...	...	NZ	IP	S	F	263–457
*	*Trematotrochus hedleyi* Dennant, 1906	...	...	...	NSW	...	Qld	...	...	...	...	...	S	F	**150**–458
	Tropidocyathus labidus Cairns & Zibrowius, 1997	...	...	...	...	...	...	...	WA1	...	...	IP	S	F	300–380
	Tropidocyathus lessonii (Michelin, 1842)	...	...	...	...	...	Qld	NT	WA1	...	...	IP	S	F	137–160
*	*Turbinolia stephensoni* (Wells, 1959)	...	...	...	...	...	Qld	NT	...	...	...	...	S	F	9–**32**
	Family Guyniidae														
	Guynia annulata Duncan, 1872	SA	...	...	...	...	Qld	...	WA1	...	...	IP	S	F	137–366
	Stenocyathus vermiformis (Pourtalès, 1868)	...	Tas	Vic	NSW	...	Qld	...	...	...	NZ	IP	S	F	131–1500
	Family Flabellidae														
*	*Flabellum (Flabellum) australe* Moseley, 1881	SA	Tas	Vic	NSW	SM	Qld	...	...	...	...	...	S	F	**36–1026**
*	*Flabellum (F.) folkesoni* Cairns, 1998	...	...	...	...	...	...	...	WA1	...	...	...	S	F	124–**430**
	Flabellum (F.) lamellulosum Alcock, 1902	...	...	...	NSW	...	...	NT	WA1	...	...	IP	S	F	246–**490**
	Flabellum (F.) magnificum Marenzeller, 1904	...	...	...	...	...	Qld	NT	WA1	...	...	IP	S	F	244–**740**
	Flabellum (F.) patens Moseley, 1881	...	...	...	...	...	...	...	WA1	...	...	IP	S	F	280
	Flabellum (F.) pavoninum forma *coalitum*	...	...	...	...	...	Qld	...	...	...	...	IP	S	F	124–144
	Flabellum (F.) politum Cairns, 1989	...	...	...	...	...	...	NT	WA1	...	...	IP	S	F	45–220
*	*Flabellum (F.) transversale* Moseley, 1881	...	...	Vic	NSW	...	Qld		...	...	...	...	S	F	55–**150**
	Flabellum (Ulocyathus) aotearoa Squires, 1964	...	...	...	...	SM	Qld	...	...	...	NZ	IP	S	F	183–291
	Flabellum (U.) conuis Moseley, 1881	...	...	...	...	...	Qld	...	...	...	...	IP	S	F	**949**–984
	Flabellum (U.) deludens Marenzeller, 1904	...	...	...	...	...	...	NT	WA1	...	...	IP	S	F	176–420
	Flabellum (U.) hoffmeisteri Cairns & Parker, 1992	...	Tas	Vic	NSW	...	...	...	WA1	...	NZ	IP	S	F	110–**842**
	Flabellum (U.) lowekeyesi Squires & Ralph, 1965	...	Tas	...	NSW	...	...	...	...	...	NZ	IP	S	F	823–**1100**
	Flabellum (U.) marenzelleri Cairns, 1989	...	...	...	...	...	...	NT	WA1	...	...	IP	S	F	**179**–348
	Flabellum (U.) sp. cf. *F. moseleyi* Pourtalès, 1880	...	...	...	...	...	Qld	...	...	...	NZ	IP	S	F	904–916
	Flabellum (U.) sexcostatum Cairns, 1989	...	...	...	...	...	Qld	...	...	...	...	IP	S	F	815–**1121**
*	*Flabellum (U.) tuthilli* Hoffmeister, 1933	SA	Tas	...	...	...	...	...	...	WA2	...	...	S	F	347–824
	Javania fusca (Vaughan, 1907)	...	...	...	...	SM	Qld	...	...	...	NZ	IP	S	A	315–1045
	Javania insignis Duncan, 1876	...	...	...	...	SM	...	...	...	...	...	IP	S	A	420–**1050**
	Javania lamprotichum (Moseley, 1880)	...	...	...	...	SM	Qld	...	WA1	...	NZ	IP	S	A	200–**881**
	Monomyces rubrum (Quoy & Gaimard, 1833)	...	...	...	NSW	...	...	NT	...	...	NZ	...	S	A	67–150
*	*Placotrochides cylindrica* n.sp.	...	...	...	...	...	Qld	...	...	...	...	...	S	T	1117–1402
	Placotrochides minuta n.sp.	...	...	...	...	...	Qld	...	...	...	...	IP	S	T	342–458
	Placotrochides scaphula Alcock, 1902	...	...	Vic	...	...	Qld	...	...	...	NZ	IP	S	T	930–1607
	Placotrochus laevis ME & H, 1848	...	...	...	...	...	Qld	NT	WA1	...	...	IP	S	T	9–174
	Polymyces wellsi Cairns, 1991	...	...	...	...	...	Qld	...	WA1	...	NZ	IP	S	A	400–**1203**
	Rhizotrochus flabelliformis Cairns, 1989	...	...	...	...	SM	Qld	...	...	...	NZ	IP	S	A	419–**1050**
	Rhizotrochus levidensis Gardiner, 1899	...	...	...	NSW	...	Qld	...	...	...	...	IP	S	A	**1**–10
*	*Rhizotrochus tuberculatus* (Tenison-Woods, 1879)	SA	Tas	Vic	...	...	...	...	...	WA2	...	...	S	A	0–73
	Truncatoflabellum aculeatum (ME & H, 1848)	...	...	...	...	...	Qld	NT	WA1	...	...	IP	S	T	11–**132**
*	*Truncatoflabellum angiostomum* (Folkeson, 1919)	...	...	...	...	...	...	NT	WA1	...	...	...	S	T	15–136
	Truncatoflabellum angustum Cairns & Zibrowius, 1997	...	...	...	...	...	Qld	...	WA1	...	NZ	IP	S	T	335–458
*	*Truncatoflabellum australiensis* Cairns, 1998	...	...	...	...	...	...	...	WA1	...	...	...	S	T	90–**220**
	Truncatoflabellum cumingi (ME & H, 1848)	...	...	...	NSW	...	Qld	...	WA1	...	...	IP	S	T	128–**132**
	Truncatoflabellum formosum Cairns, 1989	...	...	...	...	...	...	...	WA1	...	...	IP	S	T	103–173
*	*Truncatoflabellum macroeschara* Cairns, 1998	...	...	...	...	...	Qld	...	WA1	...	...	...	S	T	**18**–201
	Truncatoflabellum martensii (Studer, 1878)	...	...	...	...	...	Qld	...	...	...	...	IP	S	T	139
	Truncatoflabellum paripavoninum (Alcock, 1894)	...	...	...	...	...	...	...	WA1	...	NZ	IP	S	T	394–550
	Truncatoflabellum spheniscus (Dana, 1846)	...	...	...	...	...	Qld	NT	WA1	...	...	IP	S	T	16–55
*	*Truncatoflabellum veroni* Cairns, 1998	...	...	...	...	...	Qld	NT	WA1	...	...	...	S	T	15–119
	Truncatoflabellum vigintifarium Cairns, 1999	...	...	...	...	SM	Qld	...	...	...	...	IP	S	T	**179–1050**
	Family Gardinariidae														
	Gardineria hawaiiensis Vaughan, 1907	...	...	...	...	SM	...	...	WA1	...	NZ	IP	S	A	304–**1200**
	Gardineria philippinensis Cairns, 1989	...	...	...	...	...	...	NT	WA1	...	...	IP	S	A	220–224
	Gardineria sp. sensu Cairns, 1995	...	...	...	...	SM	Qld	...	...	...	NZ	...	S	A	55–378
*	*Stolarskicyathus pocilliformis* n.sp.	...	...	...	...	...	Qld	...	...	...	...	...	S	A	342–367

continued...

SUBORDER DENDROPHYLLIINA														
Family Dendrophylliidae														
* *Balanophyllia bairdiana* ME & H, 1848	SA	Tas	Vic	NSW	…	Qld	…	WA1	…	…	…	S	A	**6–548**
Balanophyllia carinata (Semper, 1872)	…	…	…	…	…	…	…	WA1	…	…	IP	S	F	112–**124**
Balanophyllia cornu Moseley, 1881	…	…	…	…	…	…	NT	WA1	…	…	IP	S	A	150–404
Balanophyllia crassitheca Cairns, 1995	…	…	…	…	SM	…	…	…	…	NZ	IP	S	A	360–430
* *Balanophyllia dentata* Tenison-Woods, 1879	…	…	Vic	NSW	…	Qld	…	…	…	…	…	S	A	**66–135**
Balanophyllia desmophyllioides Vaughan, 1907	…	…	…	…	SM	Qld	…	…	…	…	IP	S	A	419–**1050**
* *Balanophyllia dilatata* Dennant, 1904	…	…	Vic	…	…	…	…	…	…	…	…	S	A	shallow
Balanophyllia generatrix Cairns & Zibrowius, 1997	…	…	…	…	…	…	NT	WA1	…	…	IP	S	A	200–530
Balanophyllia gigas Moseley, 1881	…	…	…	…	SM	…	…	WA1	…	NZ	IP	S	A	260–450
Balanophyllia imperialis Kent, 1871	…	…	…	…	…	…	…	WA1	…	…	IP	S	A	100–150
* *Balanophyllia spongiosa* n.sp.	…	…	…	NSW	…	…	…	…	…	…	…	S	A	11–18
Balanophyllia stimpsonii (Verrill, 1865)	…	…	…	NSW	…	Qld	…	…	…	…	IP	S	F	68
* *Balanophyllia yongei* Crossland, 1952	…	…	…	…	…	Qld	…	…	…	…	…	S	A	unknown
Cladopsammia echinata Cairns, 1984	…	…	…	…	…	…	NT	…	…	…	IP	C	A	222–226
Dendrophyllia alcocki (Wells, 1954)	…	…	…	…	SM	Qld	…	WA1	…	NZ	IP	C	A	296–**1200**
Dendrophyllia arbuscula van der Horst, 1922	…	…	…	…	…	Qld	NT	…	WA2	NZ	IP	C	A	2–222
Dendrophyllia boschmai van der Horst, 1926	…	…	…	…	…	…	…	WA1	…	…	IP	C	A	200–**201**
* *Dendrophyllia granosa* Studer, 1878	…	…	…	…	…	…	…	WA1	…	…	…	C	A	91
Dendrophyllia ijimai Yabe & Eguchi, 1934	…	…	…	…	SM	…	…	…	…	…	IP	C	A	135
* *Dendrophyllia incisa* (Crossland, 1952)	…	…	…	…	…	Qld	…	…	…	…	…	C	A	reef
* *Dendrophyllia velata* Crossland, 1952	…	…	…	…	…	Qld	…	…	…	…	…	C	A	reef
Eguchipsammia fistula (Alcock, 1902)	…	…	…	…	SM	Qld	…	…	…	NZ	IP	C	A	**86**–336
Eguchipsammia gaditana (Duncan, 1873)	…	…	…	…	SM	Qld	…	…	…	…	IP	C	A	86–133
Eguchipsammia japonica (Rehberg, 1892)	…	…	…	…	SM	…	…	…	…	…	IP	C	A	**1050**
Enallopsammia pusilla (Alcock, 1902)	…	…	…	…	…	Qld	…	…	…	NZ	IP	C	A	>495
Enallopsammia rostrata (Pourtalès, 1878)	SA	Tas	Vic	NSW	SM	Qld		…	…	NZ	IP	C	A	640–1400
* *Endopachys bulbosa* Cairns & Zibrowius, 1997	…	…	…	…	…	…	NT	WA1	…	…	…	S	T	**220**–246
Endopachys grayi ME & H, 1848	…	…	…	NSW	…	Qld	…	WA1	…	NZ	IP	S	T	68–190
Endopsammia philippensis ME & H, 1848	…	…	…	…	…	Qld	…	…	…	…	IP	S	A	0–2
Endopsammia regularis (Gardiner, 1899)	…	…	…	…	…	Qld	…	…	…	…	IP	S	A	**8**–8
Heteropsammia cochlea (Spengler, 1781)	…	…	…	…	…	Qld	…	WA1	…	…	IP	S	F	**6**–283
* *Heteropsammia moretonensis* Wells, 1964	…	…	…	…	…	Qld	NT	…	…	…	…	S	F	11–46
* *Leptopsammia columna* Folkeson, 1919	…	…	…	…	…	…	…	WA1	…	…	…	S	A	20
* *Leptopsammia queenslandiae* Wells, 1964	…	…	…	NSW	…	Qld	…	…	…	…	…	S	A	**75**–86
* *Notophyllia etheridgi* Hoffmeister, 1933	SA	…	Vic	NSW	…	…	…	…	…	…	…	S	T	37–238
* *Notophyllia hecki* n.sp.	…	…	…	…	…	Qld	…	…	…	…	…	S	T	342–414
* *Notophyllia piscacauda* Cairns, 1998	…	…	…	…	…	…	…	…	WA2	…	…	S	T	22–51
* *Notophyllia recta* Dennant, 1906	SA	…	Vic	NSW	…	…	…	…	WA2	…	…	S	T	40–457
Rhizopsammia nuda van der Horst, 1926	…	…	…	…	…	…	NT	…	…	…	IP	C	A	**5.5**–5.5
Rhizopsammia verrilli van der Horst, 1922	…	…	…	…	…	Qld	NT	WA1	…	…	IP	C	A	**2**–38
Thecopsammia elongata Moseley, 1881	…	…	…	NSW	…	Qld	…	…	…	…	IP	S	A	271–**576**
Tubastraea coccinea Lesson, 1829	…	…	…	NSW	…	Qld	…	WA1	WA2	…	IP	C	A	0–20
Tubastraea diaphana (Dana, 1846)	…	…	…	…	…	Qld	…	WA1	WA2	…	IP	C	A	0–**30**
Tubastraea micranthus (Ehrenberg, 1834)	…	…	…	…	…	Qld	…	WA1	…	…	IP	C	A	4–33
	SA	Tas	Vic	NSW	SM	Qld	NT	WA1	WA2	NZ				
totals	33	27	32	57	57	137	50	99	26	…				

with the biogeographic zonation recognized by Wilson & Allen (1987) and Morgan & Wells (1991), i.e., the "Northern Australian Tropical Province" and the "Southern Australian Warm Temperate Province". These provinces were based on the distribution of shallow-water benthic and pelagic organisms subject to the hydrography of surface currents that rarely exceed 200 m in depth and thus should have little, if any, bearing on deep-water organisms such as azooxanthellate corals. Nonetheless, Cairns (1979, 1994, 1995, 1998, 2000) showed that the provinces defined for shallow-water animals also pertains to boundaries for deep-water animals (Briggs, 1974). Thus, the terminology of tropical and temperate provinces as applied to deep-water corals will be maintained in the following discussion. A superposition of the cluster analysis on the MDS ordination graph (Fig. 2) gives a better visual representation of the affinities of the various regions, the tropical province clearly separated from the temperate.

Considering the temperate province first (Fig. 1 I), the azooxanthellates of Tasmania, Victoria, South Australia, and to a lesser extent temperate southwestern Western Australia cluster together, as they are physically adjacent to one another and all under the influence of the West Wind Drift. The warmer southern flowing currents from the north (the Leeuwin and East Australian Currents) have attenuated or been deflected off the coast at these latitudes. There is no indication of a cold temperate, or Maugean Province, for the fauna of Tasmania. Although clearly part of the southern temperate cluster, the fauna of New South Wales is somewhat transitional between the two provinces, consistent with its physical location at the border of these two provinces and also consistent with the suggested "Eastern Overlap Zone" suggested by Allen & Wells (1987), a region in which the northern tropical and southern temperate fauna comingle depending on current strength and general climate fluctuations.

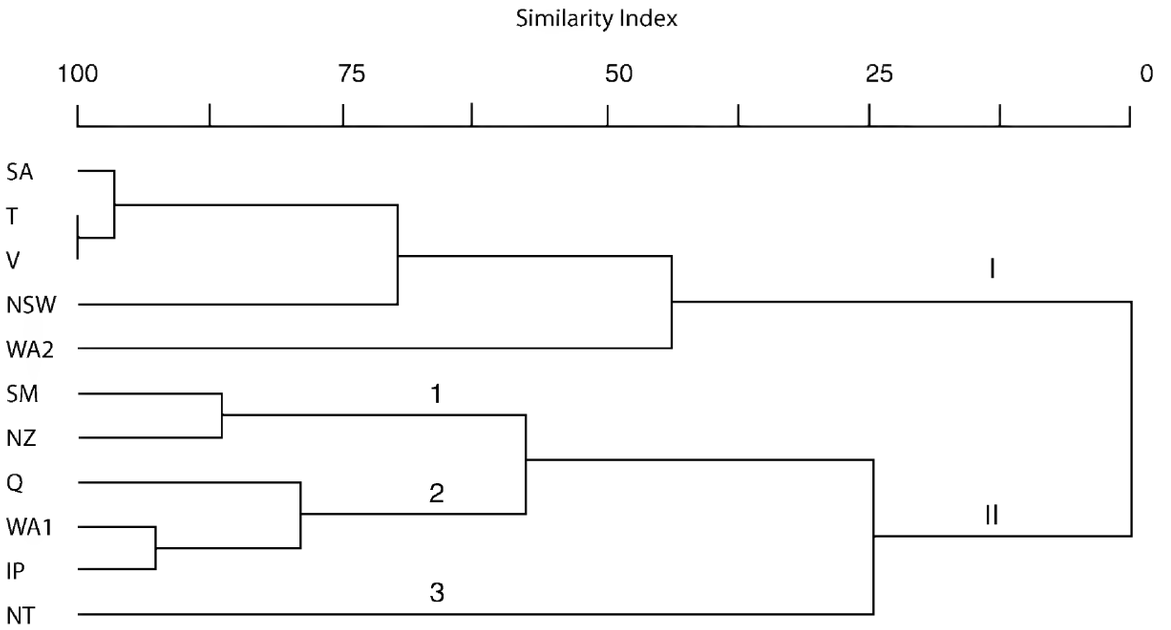

Fig. 1. The dendrogram of the nine Australian regions, as well as New Zealand and the Indo-Pacific, produced by UPGMA clustering. The two major clusters are warm temperate (I) and tropical (II), the latter group subdivided into three subclusters (1–3). Percent similarity indicated on top of scale.

Within the tropical province there are three subclusters (Figs. 1–2, II), the largest composed of the Indo-Pacific, Queensland and tropical Western Australia. This is easily explained as the influence of the vast Indo-Pacific realm on the directly adjacent regions of Queensland and north-western Western Australia as a result of the westerly flowing South Equatorial Current and its southerly following tributaries, the East Australian Current (influencing Queensland) and the Leeuwin Current (influencing Western Australia). The faunas of the Seamounts and New Zealand form a subcluster that plots closest to Queensland. These seamounts are formed along a north-south line 450–700 km off the east coast of Australia from Gascoyne Seamount

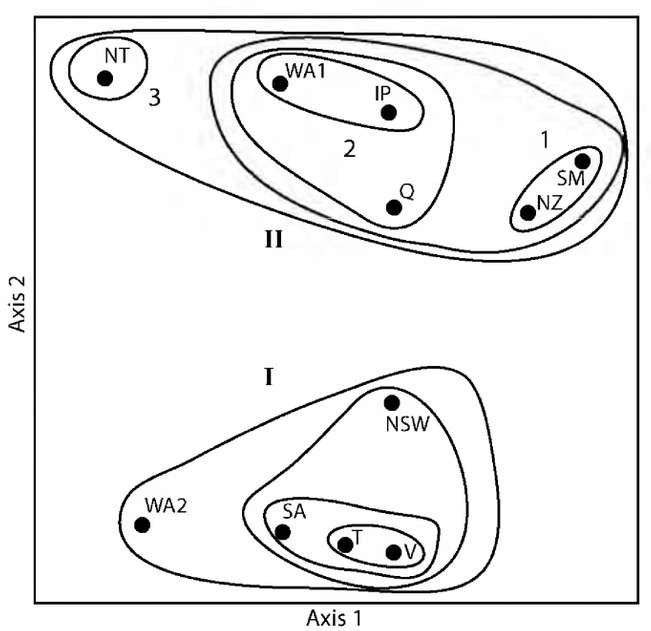

Fig. 2. Multi-Dimensional Scaling plot of the eleven regions, showing the two main clusters (I—warm temperate, II—tropical) and the subclusters of the tropical realm.

(off New South Wales: 36°42'S) to Nova Bank (off Queensland: 22°57'S) and eventually culminating in the uplifted Chesterfield Islands. These seamounts and guyots, rising to 130–1300 m depth, are in the ideal bathymetric range for azooxanthellate corals and may well form stepping stones to and from the New Zealand region. The reason why New Zealand appears to have a stronger affinity with Queensland than the geographically closer seamounts is probably because the fauna of New Zealand is quite well known (Cairns, 1995) whereas that of the seamounts much less known; additional collecting on these mountains will probably increase the resemblance of their fauna to that of tropical east Australia. One might expect the deep coral fauna of Northern Territory to be quite similar to that of the Indo-Pacific, Western Australia, and Queensland, but the ordination and cluster analyses place it as an outlier that is only adjacent to these regions. This is undoubtedly due to an artefact of collecting combined with the unique topography of the continental shelf off that state. Most of the region off Northern Territory is a vast relatively shallow-water sea, the Arafura Sea, the continental shelf stretching to New Guinea without ever attaining a depth greater than 200 m and thus not conducive to deep-water corals. Only in a relatively short region (about 120 km long) off the western coast does the shelf give way to a deeper slope, which is separated from the corresponding slope of the Lesser Sunda Islands by only 100 km. Only this relatively short stretch of continental slope would have the potential to host deep-water corals (and they do occur there in abundance), but they have been sampled by only a handful of stations by the KARUBAR expedition (Cairns & Zibrowius, 1997). When more intensively collected, the slope area will probably yield many more Indo-Pacific species and thus through these deeper water species the Northern Territory will show a greater affinity to the Indo-Pacific. Not surprisingly, Table 3 shows the Northern Territory to have a disproportionate percentage (39%) of shallow water species.

Table 3. Properties of the azooxanthellate scleractinian species of the world, Australia, various Australian states, and the two zoogeographic clusters determined in the cluster and MDS analyses, including: total number of species, corallum growth form, method of attachment, depth of occurrence, taxonomic ratio of families, endemic species per region, and number of species shared with the Indo-Pacific (IP). Numbers and percentages for various depth zones exceed 100% because individual species often occur in more than one depth zone. For the calculation of the percentages of worldwide depth ranges, the divisor of 677 species was used, as 26 of the 703 species are of unknown depth range. Likewise, the divisor of 235 was used for the Australian depth ranges, as 2 of the 237 Australian species are of unknown depth range.

	world	Australia	SA	Tas	Vic	NSW	SM	Qld	NT	WA_1	WA_2	tropical	temperate
species	703	237 (33.7%)	33	27	32	57	57	137	49	99	26	217	82
corallum													
colonial	187 (26.6%)	37 (15.6%)	5	5	5	10	8	23	9	14	7	34 (15.7%)	13 (15.8%)
solitary	516 (73.4%)	200 (84.4%)	28	22	27	47	49	114	40	85	19	183 (84.3%)	69 (84.2%)
attachment													
attached	373 (53.1%)	98 (41.4%)	10	10	14	22	31	53	16	35	14	95 (43.8%)	29 (35.4%)
free	265 (37.7%)	106 (44.7%)	18	16	14	30	22	61	27	50	9	94 (43.3%)	45 (54.9%)
transversely dividing	65 (9.2%)	33 (13.9%)	5	1	4	5	4	23	6	14	3	28 (12.9%)	8 (9.8%)
depth													
0–50 m	230 (34.0%)	64 (27.2%)	18	11	13	17	3	37	19	25	17	51 (23.6%)	30 (37.0%)
50–200 m	359 (53.0%)	93 (39.6%)	24	16	21	26	20	53	21	47	15	80 (37.0%)	41 (50.6%)
200–1000 m	431 (63.7%)	150 (63.8%)	21	23	25	37	48	91	32	71	12	146 (67.3%)	51 (63.0%)
1000–2000 m	100 (14.8%)	31 (13.2%)	8	10	13	16	18	23	2	12	4	30 (13.8%)	19 (23.5%)
> 2000 m	32 (4.7%)	3 (1.3%)	0	0	0	0	2	2	0	0	0	3 (1.4%)	0
taxonomic ratio													
Caryophylliidae	288 (41.0%)	77 (32.5%)	8	8	9	14	26	40	16	34	8	71 (32.7%)	22 (26.8%)
Dendrophylliidae	152 (21.6%)	44 (18.6%)	4	2	6	11	9	25	8	17	5	39 (18.0%)	14 (17.1%)
Flabellidae	97 (13.8%)	41 (17.3%)	3	5	5	8	7	25	10	21	2	38 (17.5%)	9 (11.0%)
Turbinoliidae	56 (8.0%)	33 (13.9%)	12	5	5	8	2	22	8	9	6	25 (11.5%)	17 (20.7%)
Rhizangiidae	31 (4.4%)	8 (3.4%)	3	3	2	5	0	5	3	2	3	7 (3.2%)	6 (7.3%)
Fungiacyathidae	20 (2.8%)	12 (5.1%)	1	1	2	4	5	4	1	6	0	11 (5.1%)	5 (6.1%)
endemic species		67 (28.2%)	3	1	1	3	1	14	1	5	1	30 (13.8%)	20 (24.3%)
shared IP species		162 (68.3%)	11	11	12	31	52	95	40	85	11	156 (71.9%)	42 (51.2%)

Again, based on shallow water fauna, Morgan and Wells (1991) characterized the Northern Tropical Province as having a high species diversity, a high overlap with Indo-Pacific species, and a relatively low rate of endemicity (10–22%). Conversely, the Southern Temperate Province was characterized as having a low species diversity, with less Indo-Pacific influence, and a very high endemicity (63–95%). The azooxanthellates found in the Northern Tropical Province are consistent with these findings, consisting of 217 of the 237 species known from the continent, having a 71.9% overlap with the Indo-Pacific, and an endemicity of only 30 species, or 13.8% (Table 3). Correspondingly, the azooxanthellates from the Southern Temperate Province have a lower diversity (82 species), a lesser Indo-Pacific influence (51.2%), but differs from prediction in having a relatively low rate of endemicity (only 24.3%), and this includes two species that are shared with temperate New Zealand (*Stephanocyathus platypus* and *Flabellum lowekeyesi*). The low endemicity is probably due to the larger ranges of deep-water species in general and the discovery of many species off Queensland that were once thought to be endemic to more southerly waters. In general, the temperate azooxanthellates can be farther characterized as having a more than average number of species in the lesser depth ranges; more corals that are free and less that are transversely dividing; and a higher percentage of turbinoliids and rhizangiids. In general, this corresponds to the diverse and unique shallow-water turbinoliid fauna, a hold over from the Eocene, and the lack of *Truncatoflabellum* from this region.

ORDER SCLERACTINIA

SUBORDER FUNGIINA

Family Fungiacyathidae Chevalier, 1987

Fungiacyathus (Bathyactis) dennanti Cairns & Parker, 1992

Bathyactis symmetricus.–Dennant, 1906: 161 (**SA**).–Howchin, 1909: 247 (**listed**).

Fungiacyathus symmetricus.–Wells, 1958 (**listed**).–Squires, 1961 (**listed**).

Fungiacyathus symmetrica.–Veron, 1986: 598 (**listed**).

Fungiacyathus (B.) dennanti Cairns & Parker, 1992: 7–8, figs. 1d,e,g (**SA, Vic, Tas**).–Stranks, 1993: page 1 of addendum (**type deposition**).

New records. SOUTH AUSTRALIA: "35 miles sw of Neptune Island, 104 fathoms", 190 m, 3 fragments, AM G12060 (part of material reported by Dennant, 1906). —VICTORIA: Franklin Slope 69, 5, NMV F67775. —NEW SOUTH WALES: Franklin Slope 53, 1, NMV F67774. — QUEENSLAND: Franklin 03/99/D8, 6 fragments, USNM 1008200; Franklin 03/99/10, 8 fragments, USNM 1008199; Franklin 03/99/D11, 13 fragments, USNM 1008201.

Types. The holotype is NMV F56882; paratypes are shared between NMV and SAM (Cairns & Parker, 1992 and Stranks, 1993). Type Locality: 39°38.7'S 148°49.4'E (Flinders Canyon, Tasmania), 770 m.

Fungiacyathus (B.) granulosus Cairns, 1989

Fungiacyathus (B.) granulosus Cairns, 1989a: 11, pl. 1, figs. d–i (remarks); 1994: 39, pl. 15, figs. d,e (remarks)–Cairns & Zibrowius, 1997: 71 (diagnosis).–Cairns, 1998: 370–371 (**WA**); 1999a: 58 (remarks).

New records. SEAMOUNTS: Franklin 5/89/14 (Elizabeth Reef, LHSMC), 10, AM G15901; Franklin 5/89/15 (Elizabeth Reef), 1, AM G15905; Franklin 8/88/D22 (Britannia), 1, AM G16729. —WESTERN AUSTRALIA: Akademik Oparin 1987-1-1, 4, NTM C7789.

Types. The holotype is USNM 81751; paratypes are deposited at USNM and AM. Type Locality: 4°10'50"N 118°39'35"E (off Sabah, Celebes Sea), 567 m.

Fungiacyathus (B.) marenzelleri (Vaughan, 1906)

Bathyactis marenzelleri Vaughan, 1906: 66–67, pl. 4, figs. 1–1b.

Fungiacyathus marenzelleri.–Veron, 1986: 598 (**undocumented listing from "Australia"**).–Cairns,1994: 15–16, pl. 1, figs. a–f (synonymy, description); 1995: 33, pl. 1, figs. j,k (**"SM"**).

New records. None.

Types. The holotype is USNM 47415; paratypes are at MCZ (Cairns, 1995). Type Locality: 80°07.5'S 104°10.5'W (off Peru), 3820 m.

Remarks. Although listed as from a seamount environment in Table 2, the only Australian records of this species were reported from Dampier Ridge south of Lord Howe Island at abyssal depths (Cairns, 1995).

Fungiacyathus (B.) margaretae Cairns, 1995

Fungiacyathus margaretae Cairns, 1995: 33–34, pl. 2, figs. a–c; 1999a: 57–58, figs. 2b,c (remarks).

New records. SEAMOUNTS: Franklin 8/88/D4 (Argo Bank), 1, AM G16597; Franklin 5/89/47 (Britannia), 4, AM G16342. —QUEENSLAND: Franklin 03/99/D13 (Marion Plateau), 2, USNM 1008198; Franklin 03/99/D14 (Marion Plateau), 2, USNM 1008197.

Types. The holotype is NZOI H622; paratypes are split between NZOI and USNM. Type Locality: 27°20.8'S 179°20.9'W (Colville Ridge), 673 m.

Fungiacyathus (B.) turbinolioides Cairns, 1989

Fungiacyathus turbinolioides Cairns, 1989a: 12–13, pl. 6, figs. a–g; 1995: 34, pl. 2, figs. d,e (**Vic, NZ**).–Cairns & Zibrowius, 1997: 72 (diagnosis).

New records. None.

Types. The holotype is USNM 81750; paratypes are split between USNM and AM. Type Locality: 4°06'50"N 118°47'20"E (off Sabah, Celebes Sea), 635 m.

Fungiacyathus (B.) variegatus Cairns, 1989

Fungiacyathus variegatus Cairns, 1989a: 11–12, pl. 5, figs. a–h.–Cairns & Zibrowius, 1997: 71–72 (diagnosis).–Cairns, 1998: 370 (**WA**); 1999a: 58, fig. 2d (remarks).

New records. NEW SOUTH WALES: K77-03-09, 2, AM G16564. — QUEENSLAND: Cidaris 43-2, 25, MTQ G56407; Cidaris 46-2, 1, MTQ G56413; Cidaris 46-3, 1, MTQ G56414.

Types. The holotype is USNM 81761; most paratypes are also at USNM, one being at AM. Type Locality: 13°52'N 120°51'E (Verde Island Passage, Luzon), 291 m.

Fungiacyathus (F.) fragilis G.O. Sars, 1872

Fungiacyathus fragilis Sars, 1872: 58, pl. 5, figs. 24–32.–Cairns, 1995: 32, pl. 1, figs. d–f (synonymy, **NZ**); 1998: 369 (**WA**); 1999a: 55 (tabular comparison).

New records. NEW SOUTH WALES: Franklin Slope 9, 2: 1, NMV F67144, 1, USNM 92989; Franklin Slope 15, 1, NMV F67883.

Types. One syntype is known to exist (Cairns, 1995) at the Oslo Museum (B626). Type Locality: off Norway, 549 m.

Fungiacyathus (F.) multicarinatus Cairns, 1998

Fungiacyathus multicarinatus Cairns, 1998: 370, pl. 1, figs. a–c (**WA**).–Griffith & Fromont, 1998: 236–237 (**type deposition**).–Cairns,1999a: 55 (tabular comparison).

New records. None.

Types. The holotype, the only known specimen of this species, is WAM 547–84 (Griffith & Fromont, 1998). Type Locality: 15°51.2'S 120°44.3'E (off Dampier Land, WA), 348–350 m.

Fungiacyathus (F.) paliferus (Alcock, 1902)

Bathyactis palifera Alcock, 1902c: 38, pl. 5, figs. 34, 34a.–Not Hoffmeister, 1933: 14, pl. 4, fig. 6 (=*Deltocyathus magnificus*).

Fungiacyathus paliferus.–Not Wells, 1958: 262 (=*Deltocyathus magnificus*).–Cairns, 1989a: 9–10, pl. 2c–i, 3a–c (synonymy, description).–Not Cairns & Parker, 1992: 6–7, pl. 1, figs. a,b (=*Deltocyathus magnificus*).–Cairns & Zibrowius, 1997: 69–70 (synonymy); 1998: 369–370 (**WA**); 1999a: 57, fig. 2a (synonymy, tabular comparison).

Not *Fungiacyathus palifera*.–Veron, 1986: 598 (=*Deltocyathus magnificus*).

New record. SEAMOUNTS: Franklin 5/89/46 (Britannia), 1, AM G16344.

Types. Three syntypes are ZMA 1171 (Cairns, 1989a). Type Locality: Sulu Sea and off Moluccas, Indonesia, 141–350 m.

Fungiacyathus (F.) pusillus pacificus Cairns, 1995

Fungiacyathus pusillus pacificus Cairns, 1995: 32–33, pl. 1, figs. g–i,l; 1999a: 55, 56 (remarks, tabular comparison).

New record. SEAMOUNTS: Franklin 08/88/D22 (Britannia), 2, AM G16726.

Types. The holotype is NZOI H621; paratypes are split between NZOI and USNM. Type Locality: 30°43'S 173°16'E (northern Three Kings Ridge, New Zealand), 590–640 m.

Fungiacyathus (F.) sandoi Cairns, 1999

Fungiacyathus sp. Grygier, 1991: 33 (**Qld**).
Fungiacyathus sandoi Cairns, 1999a: 56–57, figs. 1f–h.

New records. SEAMOUNTS: Franklin 5/89/14 (off Elizabeth Reef, LHSMC), 1, AM G16735. —QUEENSLAND: Franklin 6/88/x, 6, AM G16684; Kimbla 1, 4, AM G15230 (specimen reported by Grygier, 1991) and G15232; Kimbla 2, 3, AM G16688.

Types. The holotype is deposited at MNHN; paratypes are split between MNHN and USNM. Type Locality: 12°30.8'S 176°40.3'W (Waterwitch Bank), 275–295 m.

Fungiacyathus (F.) stephanus (Alcock, 1893)

Bathyactis stephanus Alcock, 1893: 149, pl. 5, figs. 12, 12a.
Fungiacyathus stephanus.–Cairns, 1989a: 7–9, pl. 1a–k, 2a,b (description, synonymy); 1995: 31–31, pl. 1, figs. a–c (**NZ**).–Cairns & Zibrowius, 1997: 68–69 (**NT**).–Cairns, 1998: 369 (**WA**); 1999a: 54–56 (synonymy, tabular comparison).

New records. NEW SOUTH WALES: Kapala 75/5/5, 1, AM G16414; Kapala 78/27/5, 1, AM G16384; NZOI U219, 1, AM G16556; NZOI U222, 1, AM G16610. —WESTERN AUSTRALIA: Bhagwan 4, 1, WAM Z13056; Lady Basten 1031403, 1, WAM Z16002.

Types. The holotype is presumed to be deposited at the Calcutta Museum, India (Cairns, 1989a), although it has not been examined by the author. Type Locality: 15°43'30"N 81°19'30"E (off Kistna Delta, Bay of Bengal), 1240 m.

Family Micrabaciidae Vaughan, 1905

Letepsammia fissilis Cairns, 1995

Letepsammia fissilis Cairns, 1995: 35–36, pl. 3, figs. a–e (**NZ**); 1998: 371 (**WA**).

New records. NEW SOUTH WALES: Kapala 78/27/1, 1 fragment, AM G15275. —QUEENSLAND: Cidaris I 43-2, 30 fragments, MTQ G56431.

Types. The holotype is Museum of New Zealand, Wellington CO 281; paratypes are split among the Museum of New Zealand, NZOI, and USNM. Type Locality: 34°20'S 173°06'E (off North Cape, New Zealand), 163–168 m.

Letepsammia formosissima (Moseley, 1876)

Stephanophyllia formosissima Moseley, 1876: 561, 562.–Wells, 1958: 263, pl. 1, figs. 1–2 (**Tas**).–Squires, 1961: 19 (**listed**).
Leptopenus discus.–Dennant, 1906: 162 (**SA, NSW**).–Howchin, 1909: 248 (**listed**).–Wells, 1964 (**listed**).
Letepsammia formosissima.–Cairns, 1989a: 15–18, pl. 6j, 7g–i, 8a–d, text-fig. 1 (description, synonymy).–Cairns & Parker, 1992: 8–9, figs. 1f,h (**SA, Tas**).–Cairns,1995: 36–37, pl. 3, figs. f,g (**NZ**, diagnosis, synonymy).–Cairns & Zibrowius, 1997: 73–74 (**NT**, diagnosis, synonymy).–Cairns, 1998: 371 (**WA**).

New records. WESTERN AUSTRALIA: Bhagwan 1, 3, WAM Z13050; Bhagwan 7, 3, WAM Z13119; Bhagwan 17, 3, WAM Z13141; Lady Basten 95/LB08, 3, WAM Z16040.

Types. Five syntypes are deposited at BM (Cairns, 1989a). Type Locality: Philippines and Indonesia; 174–236 m.

Letepsammia superstes (Ortmann, 1888)

Stephanophyllia superstes Ortmann, 1888: 160–161, pl. 6, fig. 5.
Letepsammia superstes.–Cairns, 1995: 34–35, pl. 2, figs. f–i (synonymy, description, **NZ**).–Cairns & Zibrowius, 1997: 75 (remarks).

New record. QUEENSLAND: Franklin 3/99/D14, 2, USNM 1008202.

Types. The holotype is at the Strasbourg Zoological Museum (Cairns, 1995). Type Locality: Sagami Bay, depth unknown.

Rhombopsammia niphada Owens, 1986

Rhombopsammia niphada Owens, 1986: 252–255, figs. 2b, 3a–d.–Cairns, 1989a: 19–20, pl. 9d–i, 10a,b, text-fig. 2 (description, synonymy).–Cairns & Zibrowius, 1997: 75–76 (remarks).–Cairns, 1998: 371: (**WA**).

New records. NEW SOUTH WALES: Kapala 78/17/10, 2, AM G16432. —QUEENSLAND: 25 nm (=44 km) east of Stradbroke Island, 710–730 m, 1, SAM TH8591; "Iron Summer" station 2, 1, QMB GL10160; "Southern Intruder"station 3-39, 4, QMB GL10157. —WESTERN AUSTRALIA: Lady RW 96-30, 1, NTM C8159.

Types. The holotype (USNM 72802) and all paratypes are deposited at USNM. Type Locality: 31°38'30"N 129°19'E (East China Sea, Japan), 715 m.

Rhombopsammia squiresi Owens, 1986

Rhombopsammia niphada Owens, 1986: 250–252, figs. 1A–D, 2A.–Cairns, 1989a: 18–19, pls. 8e–j, 9a–c (synonymy, description).–Cairns & Zibrowius, 1997: 76 (remarks).

New record. WESTERN AUSTRALIA: Lady Basten 1031201, 1, WAM Z16014.

Types. The holotype (72797) and paratypes are deposited at USNM. Type Locality: 9°38'30"N 121°11'E (Philippines), 929 m.

Stephanophyllia complicata Moseley, 1876

Stephanophyllia complicata Moseley, 1876: 558–561, text fig.–Cairns, 1989a: 21 (tabular comparison); 1995: 37–38, pl. 3, fig. h, pl. 4, figs. a–e (description, **NZ**).–Cairns & Zibrowius, 1997: 77–78 (synonymy, diagnosis).–Cairns, 1998: 371 (**WA**); 1999a: 60 (remarks).

New records. SEAMOUNTS: Franklin 5/89/15 (off Elizabeth Reef, LHSMC), 2, AM G16725. —QUEENSLAND: Franklin 6/88/x, 3, AM G16739.

Types. Two syntypes are BM 1880.11.25.155a,b. Type Locality: 5°42'S 132°25'E (off Kai Islands, Banda Sea), 236 m.

Stephanophyllia neglecta Boschma, 1923

Stephanophyllia neglecta Boschma, 1923: 144–145, pl. 10, figs. 28–30.–Cairns, 1989a: 23–24, pl. 11c–j (description, synonymy, tabular comparison).–Cairns & Zibrowius, 1997: 77 (diagnosis).–Cairns, 1999a: 59 (remarks).

New record. QUEENSLAND: Cidaris I 46-3, 1, MTQ G55633.

Types. Three syntypes are ZMA 1102. Type Locality: 5°36.5'S 132°55.2'E (Kai Islands, Banda Sea), 90 m.

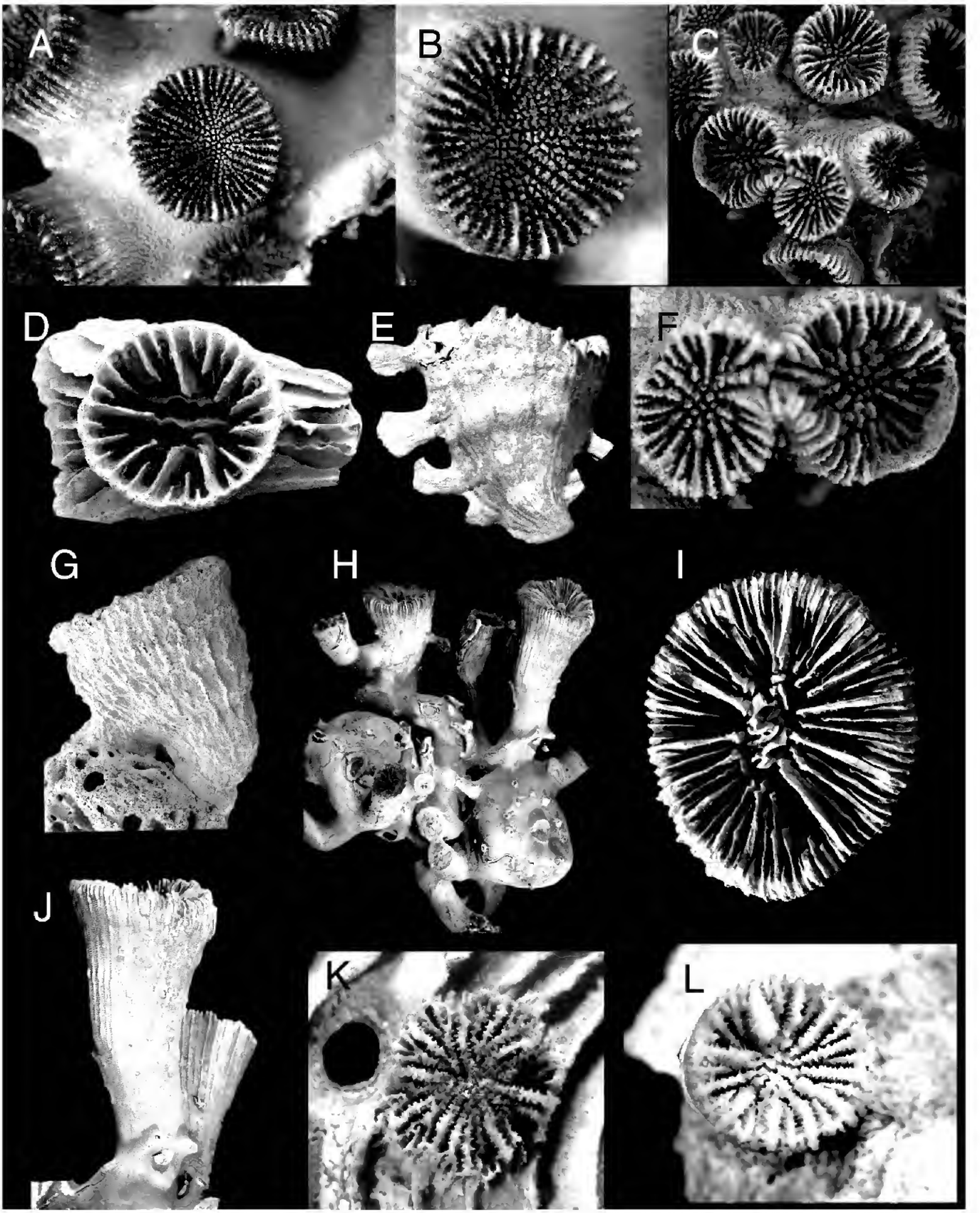

Fig. 3. (*A, B*), *Dendrophyllia (=Astrangia) atrata*, holotype, NMV F41517, calicular views, ×4.0, ×5.6, respectively (CD=6.9 mm). (*C, F*), *Cladangia exusta*, AM G7005, calicular views, ×4.25, ×8.0, respectively (largest calice 4.0 mm). (*D*), *Aulocyathus recidivus*, Cidaris I 1–2, SEM stub 1034, juvenile corallum showing continuity of septa from parent fragment to bud, ×8.9 (CD = 4.0 mm). (*E*), *Caryophyllia decamera*, WAM Z16042, lateral view showing spatulate edge spines, ×2.25, (GCD=15.6 mm). (*G*), *Conotrochus brunneus*, USNM 1008294, lateral view of juvenile corallum showing lateral thecal attachments, ×15.9 (CD=2.1 mm). (*H–J*), *Crispatotrochus gregarius*, syntypes, QMB GL10161, cluster of coralla, and calicular and side views of largest corallum, ×0.85, ×3.1, ×1.45, respectively (GCD=19.1 mm). (*K*), *Homophyllia (=Heterocyathus) incrustans*, holotype, NMV F41511, ×8.5 (GCD=4.2 mm). (*L*), *Paracyathus vittatus*, holotype, NMV F41514, ×8.4 (GCD=3.6 mm).

SUBORDER FAVIINA

Family Rhizangiidae d'Orbigny, 1851

Astrangia atrata (Dennant, 1906)

Figs. 3A,B

Dendrophyllia atrata Dennant, 1906: 163–165, pl. 6, figs. 5a,b (**SA**).–Howchin, 1909: 248 (**listed**).–Shepherd & Veron, 1982: 178, fig. 4.54g (**figured**).–Veron, 1986: 578 (**listed**).–Stranks, 1993: 21 (**type deposition**).

Tubastrea [sic] *atrata*.–Wells, 1958: 262 (**listed**).–Squires, 1961: 19 (**listed**).

Astrangia woodsi.–Shepherd & Veron, 1982: 176, fig. 5.54c (**figured**).–Veron, 1986: 601, 2 figs. (colour and black and white, **SA**).–?Veron, 2000: II, 318, fig. 3 (**NSW**).

Astrangia atrata.–Cairns & Parker, 1992: 14, figs. 3e–g (**SA, Vic, NSW**).–Cairns, 1998: 372 (**WA**).

New records. SOUTH AUSTRALIA: PL 94-50, 1 colony, QUO; Investigator Straits, 37 m, 1 corallite, AM G12061 (probably part of type series). —TASMANIA: Tangaroa 81-T-1-162, 1 colony, NMV F67800; Tangaroa 81-T-1-173, 1 corallite, NMV F67796. —NEW SOUTH WALES: 34°04.3'S 151°07.7'E (Port Hacking), subtidal, 19 November 1967, 1 colony of 19 corallites, AM G13674 and G13676; 34°04.3'S 151°07.7E (Port Hacking), 9 m, 26 March 1967, 1, AM G14457; 33°49.5'S 151°18'E (North Heads), 29 m, 26 May 1972, 1, AM G15333; 33°51'S 151°17'E (Watson's Bay, Port Jackson), 2 colonies, AM G7006; 33°59.6'S 151°13.7'E (Bare Island West), 3.5 m, November 1963, several corallites, AM G14459; 28°51'S 153°36'E (Richmond Dox), depth and date unknown, 1, AM G12893; 29°29'S 153°22'E (Angourie, Clarence River mouth), intertidal, September 1963, 1, AM G14458; 33°44'S 151°19'E (Long Reef, Collaroy, north of Port Jackson), 2 June 1957, 1, AM G14456; 35°03'S 150°44'E (Jervis Bay), depth and date unknown, 1, AM G958.

Types. Two syntypes are NMV F59349 and F41517 (Stranks, 1993). Type Locality: St. Vincent's Gulf, Investigator Straits, and Backstairs Passage, South Australia, 26–40 m.

Astrangia woodsi Wells, 1955

Astrangia woodsi Wells, 1955: 15, pl. 2, fig. 4, pl. 3, figs. 1–2 (**Qld**).–Stephenson & Wells, 1956: 55 (**listed**).–Wells, 1964: 109 (**listed**).–Not Shepherd & Veron, 1982: 176, fig. 5.54c (=*A. atrata*).–Not Veron, 1986: 601, 2 figs. (=*A. atrata*).–Veron, 2000: II, 318, fig. 4 (**NSW**).

New record. QUEENSLAND: 5 miles (=8 km) west of Tangalooma, Moreton Bay, 18 m, 1 colony, USNM 78557.

Types. Two paratypes are QMB G3018 and G3019. The holotype is identified in Wells' (1955) figure caption to pl. 3, figs. 1–2, although this specimen could not be located at QMB in 1988. Type Locality: Pumice Stone Passage, Bribie Island, Moreton Bay, shallow water and Pleistocene of Mud Island, Moreton Bay.

Cladangia exusta Lütken, 1873

Figs. 3C,F

Cladangia exusta Lütken, 1873: 65–68, 5 figs.; 1874: 29–30.–Pillai, 1969: 410–411, pl. 1 (redescription).

New records. QUEENSLAND: 27°25'S 153°20'E (Moreton Bay), depth and date unknown, 1 colony, AM G7005; Thursday Island, depth and date unknown, 1 colony, BM 1892.12.1.637.

Types. The deposition of the types is unknown. Type Locality: "Indian Ocean", depth unknown.

Diagnosis of colony from Moreton Bay. Colony plocoid, consisting of 15–17 corallites joined by a common basal coenosteum. Corallites closely spaced (adjacent to 1.2 mm apart), circular, cylindrical, and low (up to 1.7 mm), the largest corallite only 4.1 mm in CD. Costae granular; corallum white. Septa hexamerally arranged in 4 incomplete cycles, the largest corallite having 36 septa, or 1 pair of S4 in each system. S1 independent, bearing 1–3 discrete, rounded paliform lobes on their axial edges. S2 smaller, also bearing 2–3 rounded lobes. Axial edges of S3 loosely fuse to adjacent S2; axial edges of S4 fuse to adjacent S3. Columella papillose.

Remarks. Previously known only from the Indian Ocean, these are the first reports for the Australian coast. No previous or current records include a depth indication, although it is assumed to occur in relatively shallow water. *Cladangia* is quite similar to *Astrangia*, differing in having rather low lying corallites that are firmly immersed in the basal coenosteum. *Cladangia exusta* clearly differs from the two Australian *Astrangia* in having a white corallum and larger, rounded, more discrete paliform lobes of the S1–3.

Culicia australiensis Hoffmeister, 1933

Cylicia [sic] *rubeola*.–Dennant, 1904: 9 (**SA**).–Howchin, 1909: 247 (**listed**).

Culicia australiensis Hoffmeister, 1933: 12, pl. 3, figs. 3–4 (**SA**).–Wells, 1958: 263, pl. 1, figs. 3–4 (**WA**).–Squires, 1961: 18 (**listed**).–Veron, 1986: 600, black and white figure (**listed**).–Cairns & Parker, 1992: 12–13, figs. 2a,d,g (**WA, SA, Tas**).–Cairns, 1998: 371–372 (**WA, NT**).

Culicia (?) sp. cf. *C.* (?) *quinaria*.–Wells, 1958: 263–264, pl. 1, figs. 5–7 (**Tas**).–Squires, 1961: 18 (**listed**).

New records. SOUTH AUSTRALIA: PL94-36B, 1, QUO; PL94-68, 1, QUO; 32°46'S 133°18'E (15 miles (=24 km) south of St. Francis Island), 55 m, 1, AM E1072. —TASMANIA: Tangaroa 81-T-1-195, 1, NMV F67823. —WESTERN AUSTRALIA: Lady Basten 1030701, 2 colonies, WAM Z16024 and Z16023.

Types. Two syntypes, one colony with 17 corallites the other having 15, are AM E818. Type Locality: off Marsden Point, Kangaroo Island, S. A., 31 m.

Remarks. The colonies from Western Australia have very large corallites (up to 8.3 mm in diameter) and well-developed coenosteum between corallites.

Culicia hoffmeisteri Squires, 1966

Culicia tenella.–Hoffmeister, 1933: 11–12, pl. 3, figs. 1–2 (**SA, NSW**).–Totten, 1952: 975, 976, pl. 36, figs. 7–8 (**SA**).–Shepherd & Veron, 1982: 174–176, fig. 4.54e (**SA**).

Culicia hoffmeisteri Squires, 1966: 171–172, pl. 1, fig. 3 (**SA**).–Eguchi, 1973: 86, pl. 1, figs. 6–7 (**WA**).–Cairns & Parker, 1992: 13–14, figs. 3a–d (**WA, SA, Vic**).–Cairns, 1998: 372 (**WA**).

New records. TASMANIA: Hai Kung 81-HK-1-738, 1, NMV F67811; Bass Strait on a cable, 25 March 1910, 1, USNM 92987. —VICTORIA: Silver Gulf BSS 213, 1 colony with 100 corallites, NMV F67799; SPPS7, 1 colony, NMV F67901; Corinella, Western Port, several, NMV F67876; Cape Paterson-Inverloch, intertidal, 6 March 1982, 3 corallites, NMV F67797. —NEW SOUTH WALES: 35°11'S 150°38'E (Wreck Bay), 18 m, 9 April 1972, 1, AM G16505; off Sydney, 9 m, 2 colonies, USNM 78553; Cape Moreton, 7 May 1954, 1, USNM 78564; 33°50.9'S 151°14.5 (site 51), 0–5 m, 1, AM G16514. —QUEENSLAND: Roma-983, 17°01'30"S 140°21'05"E, 18 m, 2 colonies, AM G16531. —NORTHERN TERRITORY: Stoker Hill Wharf, Darwin Harbour, 1, 19 February 2002, NTM C8166; wreck of "Zealandia", Darwin Harbour, 2 colonies, 29 July 1994, NTM C7966; Fort Hill Wharf, Darwin Harbour, 1, 15 August 1998, NTM C8136.

Types. The holotype is AM E791; paratypes are also deposited at USNM (Cairns & Parker, 1992). Type Locality: "40 miles west of Kingston, South Australia", 55 m.

Culicia quinaria (Tenison-Woods, 1878)

Cylicia [sic] *rubeola*.–Tenison Woods, 1878b: 324–325 (AM G14437) (**NSW**).

Table 4. Distinguishing characteristics of the four Australian species of *Culicia* Dana, 1846.

	Culicia australiensis	*Culicia hoffmeisteri*	*Culicia quinaria*	*Culicia tenella tenella*
Calicular diameter (mm)	up to 6.3	5–9	4.0–5.5	3.5–4.0
Number of septa	48	24–26	24–36	24
Arrangement of septa	S1–2 > S3 > S4	S1–2 > S3	S1 > S2 > S3	S1–2 > S3
Axial edge of S1	large apical distal lobe, with 1–2 teeth on lower edge	3–4 coarse lobes	large apical distal lobe, smooth below	laciniate edge

Cylicia [sic] *quinaria* Tenison-Woods, 1878b: 326–327, pl. 5, figs. 3a–e (**NSW**).

Not *Culicia* sp. cf. *C. quinaria*.–Wells, 1958: 263 (= C. australiensis).

Culicia quinaria.–Cairns & Parker, 1992: 12, fig. 2h (remarks).

New records. NEW SOUTH WALES: 33°50.48'S 151°33'E (Chowder Bay), 0.5 m, 6 June 2001, 1, AM G16613; 33°51.29'S 151°12.11'E (Darling Harbour), 7 m, 21 May 2001, 1, AM G16614; 33°51.75'S 151°13.29'E (Garden Island), 7 m, 21 May 2001, 3 colonies, AM G16542; 33°50.57'S 151°11.52'E (Balls Head Bay), 3 m, 24 April 2001, 1 colony, AM G16537; 33°44'S 151°19'E (Long Reef, Collaroy), depth unknown, 1 large colony, AM G14451; 33°51'S 151°16'E (Port Jackson), depth and date unknown, 4 colonies, AM G14437. —QUEENSLAND: Square Reef, 10 m, 22 July 1973, 3 corallites, USNM 78554.

Types. Nine corallites (syntypes) are deposited at the Macleay Museum. Type Locality: near Port Jackson, New South Wales, depth unknown.

Culicia tenella tenella Dana, 1846

Culicia tenella Dana, 1846: 377–378, pl. 28, figs. 6a,b.–Not Hoffmeister, 1933: 11–12 (=*C. hoffmeisteri*).–Not Gardiner, 1939: 230 (= C. tenella natalensis).–Not Boshoff, 1981: 25 (=*C. tenella natalensis*).–Wells, 1955: 14 (**Qld**).–Stephenson & Wells, 1956: 55 (**listed**).–Squires, 1961: 18 (**listed**).–Wells, 1964: 109 (**listed**).–Veron, 1986: 600, figs. 1–3 (**NSW**).

Cylicia [sic] *tenella*.–Milne Edwards & Haime, 1857: 608 (in part: not specimen from Cape of Good Hope).–Tenison-Woods, 1878b: 325 (remarks).

New record. QUEENSLAND: 20°33.16'S 149°05.28'E (Thomas Island), 30 m, 3 November 1988, 1 colony, USNM 86002.

Types. The holotype is USNM 184. Type Locality: Port Jackson, New South Wales, depth unknown.

Remarks. At least four species of *Culicia* are known from Australia, all of them occurring off the coasts of the eastern states. Because they are found in shallow water they are easily and frequently collected, but all too often misidentified because this genus has never been revised. I have now examined the types of all four species as well as subsequently collected specimens from various museums, and present a table of differentiating characters (Table 4) to aid in the distinction of these species. Based on a combination of four characters (calicular diameter, number of septa, septal arrangement, and axial edge ornamentation) most specimens can be identified. To elaborate on Table 4, *C. tenella* can be distinguished by having relatively small corallites with laciniate axial septal edges. *Culicia australiensis* has three size classes of 48 closely-spaced septa and the S1 axial edge is entire except for 1–2 small teeth near the columella. *Culicia hoffmeisteri* has the largest corallites, only 24–26 well-spaced septa occurring in two size classes, and S1 axial edges that are coarsely lobate. *Culicia quinaria* has septal margins like those of *C. hoffmeisteri*, but are smaller in size and have a different septal arrangement.

Two other species of *Culicia, C. verreauxii* and *C. smithi*, have been reported from Australia, but both are considered to be dubious records (see p. 319). Finally, *Culicia magna* (Tenison-Woods, 1878) is a junior synonym of *Scolymia australis* (Milne Edwards & Haime, 1849).

Tenison-Woods (1878b: 325) made the confusing statement that "*Cylicia tenella* is said to come from Australia but Messrs. Ed. and H. refer it to the Cape." It is true that Milne Edwards & Haime (1857) refer *C. tenella* to both Australia and the Cape of Good Hope, but do not dispute that the type locality is Australia. Their African specimen is deposited at the BM and undoubtedly formed the basis for the description of *Culicia tenella natalensis* Duncan, 1876.

Oulangia stokesiana stokesiana Milne Edwards & Haime, 1848

Oulangia stokesiana Milne Edwards & Haime, 1848a: pl. 7, figs. 4, 4a.

Oulangia stokesiana stokesiana.–Cairns, 1998: 372, figs. 1d,e (**NT, WA**).

New records. NORTHERN TERRITORY: Stokes Hill Wharf, Darwin Harbour, 0 m, 19 February 2002, 2, NTM C8164 and C8163; wreck of "Zealandia", Darwin, 22 m, 1, NTM C8167.

Types. Types not traced. Type Locality: Philippines, depth unknown.

Family Oculinidae Gray, 1847

Cyathelia axillaris (Ellis & Solander, 1786)

Madrepora axillaris Ellis & Solander, 1786: 153, pl. 13, fig. 5.

Cyathelia axillaris.–Cairns, 1994: 43–44, pl. 18, figs. a–c (description, synonymy).–Cairns & Zibrowius, 1997: 84 (remarks, synonymy).–Veron, 1986: 599, fig. 2 (**WA**).–Cairns, 1998: 374 (**WA**).–Veron, 2000: II, 96 (colour fig. 2), 97 (fig. 5) (**WA**).

New records. None.

Types. Not traced. Type Locality: eastern Indian Ocean, depth unknown.

Madrepora oculata Linnaeus, 1758

Madrepora oculata Linnaeus, 1758: 798.–Cairns, 1995: 41, pl. 5, figs. e,f, pl. 6, figs. a,b (**NZ**).–Grygier & Cairns, 1996: 63–64, 68, figs. 1A–F (**WA**).–Cairns & Zibrowius, 1997: 79–80 (synonymy, remarks).–Cairns, 1998: 372–374, figs. 1f–i (**WA**); 1999a: 61, figs. 2e,f (synonymy, remarks).

?*Amphelia* [sic] *venusta* Milne Edwards & Haime, 1850: 86, pl. 4, figs. 3, 3a (**"Australia"**).

Madrepora kauaiensis.–Crossland, 1952: 121 (**Qld**, BM 1934.5.14.613).–Wells, 1964: 109 (**listed**).–Veron, 1986: 599 (**listed**).

Madrepora kauiensis.–Stephenson & Wells, 1956: 57 (**listed**).

Madrepora sp. Veron, 1986: 599, black and white fig. (**"Australia"**).

New records. VICTORIA: Kimbla K7/75/5, 1, NMV F67792. —NEW SOUTH WALES: Franklin Slope 7, 1 branch, USNM 1008877; Franklin Slope 9, 4 branches, NMV F67142; Franklin Slope 11, 5 branches, NMV F67146; Kapala 75/02/01, 1 branch, AIMS (AM G15047); Kapala 84/10/04, several branches, AM G16473; Kapala 84/11/08, 1 branch, AM G16475; NZOI U222, 1 branch, AM G16609; NZOI U223, many branches, AM G16696. —QUEENSLAND: Cidaris I 52-2, 2 branches, MTQ G55752–55753; Franklin 06/88/x, 3 branches, AM G16740.

Types. The types of *M. oculata* are lost (Zibrowius, 1980). Type Locality: off Sicily, Mediterranean, depth unknown.

The type of *A. venusta*, reputed to be at MNHN, Paris, has not been examined. Type Locality: Australia, depth unknown.

Remarks. Although not examined, the description and figures of *A. venusta* match those of *M. oculata*, although it would be unusual for a deep-water specimen to be available to Milne Edwards & Haime at that time.

Oculina virgosa Squires, 1958

Oculina virgosa Squires, 1958: 39, pl. 5, figs. 8–16 (**NZ**).–Cairns, 1995: 40, pl. 4f, i, pl. 5c,d (synonymy, description, **NZ**); 1999a: 60–61 (remarks).

New records. SEAMOUNTS: Franklin 08/88/D22 (Britannia), depth unknown, 10 branches, AM G16347. —QUEENSLAND: Franklin 06/88/x, 1 branch, AM G16676.

Types. The holotype and 3 paratypes are deposited at NZGS, the holotype numbered CO1219. Type Locality: Sandstone, Waitemata Group, the Funnel, Kaipara Harbour, Auckland, North Island, New Zealand (Altonian, early Miocene).

Petrophyllia rediviva (Wells & Alderslade, 1979), n.comb.

Archohelia rediviva Wells & Alderslade, 1979: 212–315, pl. 1a–c, 2a–e (**Qld**).–Veron, 1986: 599, colour fig. 1 and black and white fig. (**Qld**).–Cairns, 1991b: 46 (type deposition, **Qld**).–Veron, 2000: II, 96 (colour fig. 1), 97 (fig. 4) (**Qld**).

?*Amphihelia venusta*.–Tenison-Woods, 1878b: 316.

New records. QUEENSLAND: 21°55'S 149°25'E, 0 m, 1 large colony, MTQ G30593; Mother McGregor Island, 3 m, January 1978, 2 colonies, NTM C61854–5;—NORTHERN TERRITORY: East Point, Darwin, 7 m, 13 July 1993, 1 colony, NTM C7802.

Types. The holotype and 3 paratypes are deposited at QMB, the holotype numbered G9834; another paratype is deposited at AM (G14745) and three more paratypes taken from QMB paratype lot G9835 are deposited at USNM (Cairns, 1991b). Type Locality: east side of Rat Island off Gladstone, between Curtis Island and Facing Island, Queensland (23°46'S 151°19'E), 3.5 m.

Remarks. Since *Archohelia* Vaughan, 1919 was shown to be a junior synonym of *Petrophyllia* Conrad, 1855 (Cairns, 2001: 39), the proper combination for this species is *Petrophyllia rediviva*.

As noted above, the original description of *A. venusta* Milne Edwards & Haime, 1850 resembles the deep-water species *Madrepora oculata*, but the specimens subsequently reported by Tenison-Woods (1878b) as *Amphihelia venusta* and being common from the east coast of Australia at depths as shallow as 18 m could not be *M. oculata*. Although no specimens bearing this label were found at the Macleay or Australian Museums, it is suggested that Tenison-Woods may have been observing *P. rediviva*.

Family Anthemiphylliidae Vaughan, 1907

Anthemiphyllia dentata (Alcock, 1902)

Discotrochus dentatus Alcock, 1902c: 27, pl. 4, fig. 26.

Anthemiphyllia dentata.–Not Wells, 1958: 262, 264 (=*A. multidentata*).–Not Squires, 1961: 18 (=*A. multidentata*).–Veron, 1986: 604 (**listed**).–Grygier, 1991: 39–41 (in part: only Kimbla 3/2639, **Qld**).–Cairns & Parker, 1992: 16–17 (in part: only specimen from **WA**).–Cairns, 1995: 41–42, pl. 6, figs. c–g (synonymy, remarks, **NZ**).–Cairns & Zibrowius, 1997: 86 (synonymy, remarks); 1998: 374–375 (**WA**); 1999a: 63–65 (synonymy, tabular comparison).

New records. NEW SOUTH WALES: 31°01'S 153°13'E, 274 m, 1, AM G15506. —SEAMOUNTS: Franklin 5/89/15 (Elizabeth Reef, LHSMC), 1, AM G16737; Franklin 05/89/46 (Britannia), 6, AM G16587; Franklin 5/89/47 (Britannia), 4, AM G15916 and G16343; Franklin 08/88/D22 (Britannia), 9, AM G15891. —QUEENSLAND: Kimbla 3 (2639), 5, AM G15235.

Types. Seven syntypes are ZMA Coel. 716–718 (van Soest, 1979). Type Locality: Sulu Sea, 350–522 m.

Anthemiphyllia macrolobata Cairns, 1999

Anthemiphyllia macrolobata Cairns, 1999a: 66, figs. 3c,d.

New records. SEAMOUNTS: Franklin 05/89/14 (off Elizabeth Reef, LHSMC), 1 in AM; Franklin 05/89/15 (off Elizabeth Reef, LHSMC), 5, AM G15906. —QUEENSLAND: Franklin 06/88/x, 26, AM G16677.

Types. The holotype and paratypes are deposited at USNM, the holotype numbered 60559. Type Locality: 23°15'48"N 161°50'12"W (Hawaiian Islands), 369 m.

Anthemiphyllia multidentata Cairns, 1999

Anthemiphyllia dentata.–Wells, 1958: 262, 264, pl. 1, figs. 8–11 (**Tas**).–Squires, 1961: 18 (**listed**).–Grygier, 1991: 39–41, fig. 21C (in part: all but Kimbla specimen) (**Qld**).–Cairns & Parker, 1992: 16–17, figs. 4e,f (in part: all but Western Australian specimen, **Tas, Vic, NSW, Qld**).

Anthemiphyllia multidentata Cairns, 1999a: 65, figs. 3a,b (**Tas, Vic, NSW, Qld**).

New records. None.

Types. The holotype is USNM 83010; additional paratypes deposited at USNM, SAM, and NMV. Type Locality: Off Cronulla, New South Wales, depth unknown.

Anthemiphyllia pacifica Vaughan, 1907

Anthemiphyllia pacifica Vaughan, 1907: 79–80, pl. 7, fig. 5.–Cairns, 1999a: 65–66, figs. 2g,h (synonymy, remarks, tabular comparison).

Anthemiphyllia dentata.–Cairns, 1995: 41–42 (in part: NZOI K842, K872; **NZ**).

New record. SEAMOUNTS: NZOI U210 (Taupo), 1, AM G16552.

Types. The holotype (20765) and paratypes are deposited at USNM (Cairns, 1991b). Type Locality: 21°01'25"N 156°47'20"W (off Molokai, Hawaiian Islands), 225–252 m.

Anthemiphyllia spinifera Cairns, 1999

Anthemiphyllia spinifera Cairns,1999a: 67–69, figs. 4c–j, text-fig. A.

New records. SEAMOUNTS: Franklin 05/89/15 (off Elizabeth Reef, LHSMC), 1, AM G15902. —QUEENSLAND: Cidaris I 43-2, 9, MTQ G56425.

Types. The holotype is deposited at MNHN; the remaining paratypes are split between MNHN and USNM. Type Locality: 13°21.3'S 176°08.4'W (southeast of Wallis Island), 335–3340 m.

Remarks. The specimen from Franklin 05/89/15 is the largest specimen known, having a CD of 8.22 mm.

SUBORDER CARYOPHYLLIINA

Family Caryophylliidae Dana, 1846

Anomocora marchadi (Chevalier, 1966)

Dasmosmilia marchadi Chevalier, 1966: 944–949, pl. 5, figs. 3–4.
Asterosmilia marchadi.–Cairns & Zibrowius, 1997: 131–132, figs. 17a,b (synonymy, description).–Cairns, 1998: 386 (**WA**).
Anomocora marchadi.–Cairns, 2000: 130–131 (synonymy, remarks, new combination).

New records. QUEENSLAND: James Kirby 732, 20 specimens, MTQ G55643 and G55751. —WESTERN AUSTRALIA: Bhagwan 30, 1, WAM Z13187.

Types. The holotype is deposited at MNHN; 8 paratypes are at IFAN, Dakar (Cairns, 1979). Type Locality: off Senegal, eastern Atlantic, 97–98 m.

Aulocyathus recidivus (Dennant, 1906)

Fig. 3D

Ceratotrochus recidivus Dennant, 1906: 159–160, pl. 6, figs. 1–2 (**SA**).–Howchin, 1909: 246 (**listed**).–Stranks, 1993: 20–21 (**type deposition**).
Ceratotrochusu [sic] *typus*.–Wells, 1958: 265–266, pl. 1, figs. 14–15 (**Tas**).
Ceratotrochus typus.–Squires, 1961: 18 (**listed**).
Ceratotrochus recidivus.–Squires, 1961: 18 (**listed**).
Aulocyathus recidivus.–Cairns, 1982: 25–26, pl. 7, figs. 7–9, pl. 8, fig. 1 (synonymy, description, **NZ**).–Veron, 1986: 607 (**listed**).–Cairns & Parker, 1992: 22–24, figs. 6d,e,g,h (**Vic, Tas**).–Cairns, 1995: 75 (**NZ**).–Cairns & Zibrowius, 1997: 129–130 (synonymy).–Cairns, 1999a: 103–104 (synonymy, tabular comparison).

New records. TASMANIA: Franklin Slope 48, 1, NMV F67778. —NEW SOUTH WALES: Franklin Slope 7, 10, NMV F67143, 10, USNM 93259. —QUEENSLAND: Cidaris I 1-2, 8, MTQ G56390 (and USNM SEM 1034); Cidaris I 1-3, 3, MTQ G55621 and G56391; Cidaris I 5-2, 4, MTQ G56418; Cidaris I 9-2, 2, MTQ G56392; Cidaris I 20-2, 1, MTQ G56397.

Types. Five syntypes are NMV F41516 and F59348. Type Locality: off Cape Jaffa and southwest of Neptune Island, S. A., 165–190 m (Stranks, 1993).

Remarks. A juvenile specimen just beginning to bud from a parent fragment (Fig. 3D) shows that some of the septa of the parent fragment are continuous with some of the major septa of the juvenile.

Bourneotrochus stellulatus (Cairns, 1984)

Deltocyathus stellulatus Cairns, 1984: 15–16, pl. 3, figs. C–D.
Bourneotrochus veroni Wells, 1984a: 213–214, pl. 3, figs. 7–18 (**Qld**).
Bourneotrochus stellulatus.–Veron, 1986: 606 (**Qld**).–Cairns, 1995: 71–71, pl. 18, figs. f–i, pl. 19, figs. a–c (**SM, NZ**).–Cairns & Zibrowius, 1997: 115 (remarks).–Cairns, 1999a: 87–88, figs. 8c, 10d–g (synonymy, remarks).

New records. SEAMOUNTS: Franklin 05/89/47 (Britannia), 1, AM G16591. —QUEENSLAND: Cidaris I 43-2, 19, MTQ G56404; Franklin 03/99/D10, 2, USNM 1008204; Franklin 03/99/D11 (Marion Plateau), 7: 5, USNM 1008203, and 2, ZMUZ; Franklin 03/99/D12 (Marion Plateau), 2, USNM 1008205.

Types. The holotype of *D. stellulatus* is USNM 60516; paratypes are split between USNM and Bishop Museum. Type Locality: 19°48'N 154°58'W (Hawaiian Islands), 337.

The holotype (USNM 71852) and paratypes of *B. veroni* are deposited at USNM. Type Locality: east of Lady Elliot Island, 69 km north of Fraser Island, Queensland, 476–531 m.

Caryophyllia (Acanthocyathus) decamera Cairns, 1998

Fig. 3E

Caryophyllia (A.) dentata.–Cairns & Zibrowius, 1997: 98 (in part: seven lots of decameral specimens, figs. 8b,d, **NT**).
Caryophyllia (A.) decamera Cairns, 1998: 377–378, figs. 2d–f. (**WA**).–Griffith & Fromont, 1998: 230 (**type deposition**).

New records. NORTHERN TERRITORY: "San Pedro Sound", 9°30'S 132°34'E, 124 m, 1 juvenile, AM G15411. —WESTERN AUSTRALIA: Bhagwan 32, 1, WAM Z13137; Lady Basten 95/LB08, 8, WAM Z16042.

Types. The holotype is USNM 96858; paratypes are split between USNM and WAM. Type Locality: 5°32'S 132°36'E (Kai Islands, Banda Sea), 245 m.

Remarks. Specimens reported from Western Australia are the largest collected thus far (CD=15.5×11.0 mm) and demonstrate that up to three well-developed costal spines may also be present on the concave thecal edge, as well as six on the convex edge, all spines bring strongly flattened and in some cases spatulate (Fig. 3E).

Caryophyllia (A.) grayi (Milne Edwards & Haime, 1848)

Acanthocyathus grayi Milne Edwards & Haime, 1848a: 293, pl. 9, fig. 2.
Caryophyllia sp. Veron, 1986: 605 (colour figure).
Caryophyllia (A.) grayi.–Cairns, 1994: 49, pl. 21i–k (description, synonymy).–Cairns & Zibrowius, 1997: 97–98, figs. 7c,f,i (diagnosis, synonymy, key).–Cairns, 1998: 377 (**WA**); 1999a: 76 (remarks).

New records. QUEENSLAND: James Kirby 732, over 100 specimens, MTQ G55721; Soela 01/86/73, 2, AM G16709. —NORTHERN TERRITORY: "San Pedro Sound", 9°30'S 132°34'E, 124 m, 4, AM G15267; "San Pedro Sound", 8°09'S 134°50'E, 105 m, 2, AM G15270. —WESTERN AUSTRALIA: Lady Basten 1031502, 1, WAM Z16007.

Types. Five specimens of *C. grayi* are deposited at BM, collected from Japan (1840.9.29.42) and Australia (1852.1.31.6), but they are not labelled as types. Because of inconsistencies in the original description it may not be possible to determine the type specimen for this species. Type Locality: not stated.

Remarks. Veron (1986: 605) illustrated a rich deck haul of deep-water solitary corals from off Townsville (northeast of Dip Reef) at a depth of about 150 m. These corals, collected at "James Kirby" station 732, are deposited at the MTQ. Most of the specimens shown in Veron's figure are *Caryophyllia (A.) grayi*, although there are equally large numbers of *Endopachys grayi* and *Flabellum pavoninum coalitum*, as well as a good representation of *Heteropsammia cochleata, Heterocyathus sulcatus*, and *Asterosmilia marchadi*.

Caryophyllia (A.) spinigera (Saville Kent, 1871)

Acanthocyathus spiniger Kent, 1871: 275–276, pl. 23, figs. 1a–c.
Caryophyllia (A.) spiniger.–Cairns, 1994: 49–50, pls. 21l, 22a–d (synonymy, description).
Caryophyllia (A.) spinigera.–Cairns & Zibrowius, 1997: 99, figs. 7e,f (**NT**, remarks, key).

New records. None.

Types. Three syntypes are deposited at BM (unnumbered). Type Locality: "Japan", depth unknown.

Remarks. Specimens from two "Karubar" stations (62, 79) were incorrectly reported by Cairns & Zibrowius (1997) as being from off Tanimbar Islands, Indonesia, whereas they are more properly attributed to the continental shelf off Cobourg Peninsula, Northern Territory.

Caryophyllia (A.) unicristata Cairns & Zibrowius, 1997

Caryophyllia (A.) unicristata Cairns & Zibrowius, 1997: 101–102, figs. 9d,e (**NT**).–Cairns, 1998: 377 (**WA**).

New records. QUEENSLAND: James Kirby 732, off Townsville, 1, MTQ G56423. —WESTERN AUSTRALIA: Bhagwan 4, 1 living corallum attached to *Xenophora* gastropod shell, WAM Z13061; Bhagwan 19, 1, WAM Z13231; Bhagwan 20, 1, WAM Z13142; Bhagwan 25, 1, WAM Z13139; Lady Basten 1031402, 4, WAM Z16004.

Types. The holotype is deposited at MNHN; paratypes are split between MNHN, POLIPI, and USNM. Type Locality: 8°49'S 131°36'E (south of Tanimbar Islands), 400 m.

Caryophyllia (Caryophyllia) ambrosia Alcock, 1898

Caryophyllia ambrosia Alcock, 1898: 12, pl. 1, figs. 1, 1a.–Cairns, 1994: 48–49, pl. 21d–h (synonymy, description.); 1995: 53–54 (description, key, synonymy, **Qld, NSW, NZ**).–Cairns & Zibrowius, 1997: 95–96 (remarks, key); 1999a: 75–76 (remarks).

Caryophyllia communis.–Veron, 1986: 605 (**listed**).

New records. NEW SOUTH WALES: Kapala 75/05/05, 12, AM G16413; Kapala 75/09/03, 4, AM G16561; Kapala 76/23/01, 2, AM G16421; Kapala 76/24/03, 3, AM G16423; Kapala 77/13/10, 1, AM G16425; Kapala 77/21/01, 4, AM G16427; Kapala 77/23/04, 1, AM G16563; Kapala 77/23/06, 5, AM G16428; Kapala 78/17/10, 7, AM G16369; Kapala 78/17/21, 1, AM G16373; Kapala 78/26/16, 2, AM G16566; Kapala 78/27/05, 4, AM G16383; Kapala 79/20/03, 2, AM G16572; Kapala 79/20/04, 1, AM G16450; Kapala 79/20/07, 3, AM G16573; Kapala 79/20/12, 1, AM G16574; Kapala 86/01/09, 4, AM G16479; NZOI U218, 1, AM G16555; NZOI U222, 1, AM G16608; NZOI U223, 27, AM G16557 and G16558. —SEAMOUNTS: Franklin 05/89/22 (Lord Howe Rise), 1, AM G16584; Franklin 05/89/27 (Lord Howe Rise), 2, AM G15912. —QUEENSLAND: Franklin 06/88/4, 2, AM G16662, 5; Franklin 06/88/x, 2, AM G16672; Cidaris I 3-1, 3, MTQ G55724; Cidaris I 5-2, 2, MTQ G56417; Cidaris I 11-4, 1, MTQ G55725; Cidaris I 25-1, 1, MTQ G55726; Cidaris I 35-4, 1, MTQ G55727; Cidaris I 41-2, 4, MTQ G55728; Cidaris I 50-2, 1, MTQ G55729; Cidaris III 12-2, 1, MTQ G55730; 40 km east of Stradbroke Island, 710–730 m, 1, SAM TH8590; FNQ 79-33, 5, AM G16524; FNQ 79-33, 5, AM G16524. —WESTERN AUSTRALIA: off Carnarvon (station "D30"), 3, depth unknown, WAM Z20511; Lady Basten 1031103, 1, WAM Z16012; Lady Basten 1031201, 1, WAM Z16021.

Types. Syntypes are deposited at the Calcutta Museum, USNM, MNHN, ZMA, and NMW (Cairns, 1995). Type Locality: Laccadive Sea, Arabian Sea, 1829–1957 m.

Remarks. This is one of the more common deep-water corals collected off eastern Australia at slope depths, usually occurring deeper than 600 m.

Caryophyllia (C.) atlantica (Duncan, 1873)

Bathycyathus atlanticus Duncan, 1873: 318, pl. 48, figs. 1–2.

Caryophyllia atlantica.–Zibrowius, 1980: 56–57, pl. 20, figs. A–K (synonymy, description).–Cairns, 1995: 47–48, pl. 8d,e (synonymy, description, figs., key, **NZ**); 1998: 376 (**WA**).

New records. QUEENSLAND: Soela 06/85/02 (Marion Plateau), 1, NTM C5287; Franklin 03/99/D10 (Marion Plateau), 1, USNM 1008238. —WESTERN AUSTRALIA: Akademik Oparin 1987-1-1,1, NTM C7788.

Types. The lecto- and paralectotype of *B. atlanticus* are deposited at BM (Zibrowius, 1980). Type Locality: 39°39'N 9°43'W (off Portugal), 1355–2000 m.

Caryophyllia (C.) crosnieri Cairns & Zibrowius, 1997

Caryophyllia elongata Cairns in Cairns & Keller, 1993: 236–237, pl. 4, figs. A–B (junior homonym); 1995: 52, pl. 10d–f (**NZ**, description, key).

Caryophyllia crosnieri Cairns & Zibrowius, 1997: 89 (replacement name, key).–Cairns, 1999a: 70, figs. 5a,b (synonymy, remarks).

New records. SEAMOUNTS: Franklin 05/89/7 (Taupo), 1, AM G16482; Franklin 08/88/D22 (Britannia), 1, AM G15890. —QUEENSLAND: Franklin 06/88/x, 5, AM G16669. —WESTERN AUSTRALIA: Bhagwan 5, 2, WAM Z13073 and Z13071.

Types. The holotype is deposited at the Institute of Oceanology, Moscow. Type Locality: 33°17'S 44°55'E (off Walter's Shoal, Madagascar Plateau), 630–680 m.

Caryophyllia (C.) diomedeae Marenzeller, 1904

Caryophyllia diomedeae Marenzeller, 1904a: 79–80, pl. 1, fig. 2.–Cairns, 1995: 49–50, pl. 9, figs. a–d (synonymy, description, key, **SM, NZ**).–Cairns & Zibrowius, 1997: 88 (remarks, key).–Koslow & Gowlett-Holmes, 1998: 38 (listed: **Tas**).–Cairns, 1999a: 74 (remarks).

Caryophyllia profunda.–Cairns, 1982: 17–19 (in part: Eltanin-1403, **NZ**).

Caryophyllia sarsiae.–Cairns & Parker, 1992: 19–20, figs. 5c,e,f (**Vic, Tas**).

New records. NEW SOUTH WALES: 35°05'S 151°10'E (Jervis Bay, Kimbla), 600–800 m, 18 September 1980, 1, AM G16485. —WESTERN AUSTRALIA: 35°26'S 118°20'E, 900 m, 3, SAM H11238.

Types. A syntype is USNM 22083. Type Locality: 6°30'N 81°44'W (off Coiba Island, Pacific coast of Panama), 1043 m.

Caryophyllia (C.) grandis Gardiner & Waugh, 1938

Caryophyllia grandis Gardiner & Waugh, 1938: 177, pl. 1, fig. 2.–Cairns & Keller, 1993: 234 (remarks).–Cairns & Zibrowius, 1997: 96, figs. 7g,h (**NT**, remarks, key).–Cairns, 1998: 376 (**WA**).

?*Caryophyllia* sp. Veron, 1986: 605, black and white figure (**Australia**); 2000: II, 411, fig. 5 (**Australia**).

New records. WESTERN AUSTRALIA: Bhagwan 9, 1, WAM Z13094; Bhagwan 28, 1, WAM Z13190.

Types. Four syntypes are BM 1950.1.9.211–225. Type Locality: 4°58'42"N 73°16'24"E (west side of Fadiffolu Atoll, Maldive Islands), 494 m.

Caryophyllia (C.) hawaiiensis Vaughan, 1907

Caryophyllia hawaiiensis Vaughan, 1907: 76, pl. 5, figs. 4a,b.–Cairns, 1995: 44–45, pl. 7, figs. d–f (description, key, **NZ, SM**).–Cairns & Zibrowius, 1997: 93 (remarks, key).–Cairns, 1999a: 69–70 (remarks).

New records. SEAMOUNTS: Franklin 05/89/15 (off Elizabeth Reef, LHSMC), 1, AM G15903. —UNKNOWN LOCALITY: 1, AM G11951.

Types. Four syntypes are USNM 20749–50. Type Locality: 21°04'05"N 157°10'35"W (off Molokai, Hawaiian Islands), 168–388 m.

Caryophyllia (C.) lamellifera Moseley, 1881

Caryophyllia lamellifera Moseley, 1881: 140–141, pl. 1, figs. 7a,b.–Cairns, 1995: 51–52, pls. 9i, 10a–c (description, key, synonymy, **SM**).–Cairns & Zibrowius, 1997: 90 (remarks, key).–Cairns, 1999a: 74–74 (remarks).

New records. SEAMOUNTS: Franklin 05/89/04 (Gascoyne), 1, AM G16719; NZOI U212 (Taupo), 2, AM G16333.

Types. Two syntypes are deposited at BM (unregistered). Type Locality: 29°55'S 178°14'W (Kermadec Ridge), 1152 m.

Caryophyllia (C.) planilamellata Dennant, 1906

Caryophyllia planilamellata Dennant, 1906: 157–158, pl. 6, figs. 4a,b (**SA**).–Howchin, 1909 (**listed**).–Squires, 1961: 18 (**listed**).–Veron, 1986: 605 (**listed**).–Cairns & Parker, 1992: 17–19, figs. 4g–i (synonymy, description, **SA, Vic, Tas**).–Stranks, 1993: 20 (**type deposition**).

Caryophyllia cyathus.–Hoffmeister, 1933: 14, pl. 4, figs. 4–5 (**SA**).–Squires, 1961: 18 (**listed**).

Caryophyllia clavus.–Wells, 1958: 262, 265, pl. 1, figs. 12–13 (**Tas**).–Squires, 1961: 18 (**listed**).–Not Shepherd & Veron, 1982: 176–177, fig. 4.55b.

New records. SOUTH AUSTRALIA: PL94-22, 1, QUO; PL94-36, 1, QUO; PL94-53, 1, QUO; PL-94-54A, 1, QUO. —TASMANIA: Soela 05/84/51, 3, NMV F67786; Soela 04/84/03, 2, NMV F67788; Franklin Slope 84, 1, NMV F67141; Franklin 10/86/01, 1, AM G15885; Sprightly BMR S73-2051, 18, AM G15357. —NEW SOUTH WALES: Kapala, "between Sydney and Newcastle", 545–686 m, 2, AM G16578; NZOI U208, 3, AM G16607. —QUEENSLAND: Franklin 06/88/x, 2, AM G16668.

Types. The holotype is NMV F41521. Type Locality: Cape Jaffa (220–549 m) or off Beachport (201 m), South Australia (Stranks, 1993). Paratypes, or at least topotypic specimens from the original Verco collection, also present at SAM and USNM (Cairns & Parker, 1992).

Caryophyllia (C.) quadragenaria Alcock, 1902

Caryophyllia quadragenaria Alcock, 1902a: 91–92; 1902c: 10, pl. 1, figs. 4, 4a.–Cairns, 1994: 46–47 (description, synonymy).–Cairns, 1995: 45–46, pl. 7, figs. g,h (key, **NZ**).–Cairns & Zibrowius, 1997: 93 (synonymy, remarks, key).–Cairns, 1998: 375 (**WA**); 1999a: 73 (synonymy, remarks)

New records. None.

Types. Two of three syntypes are deposited at ZMA (van Soest, 1979). Type Localities: Indonesia (Makassar Strait, Banda Sea, and Timor Sea), 54–281 m.

Caryophyllia (C.) ralphae Cairns, 1995

Caryophyllia ralphae Cairns, 1995: 48–49, pl. 8, figs. f–i (**SM**).

New records. None.

Types. The holotype is NZOI H623; paratypes are also deposited at USNM and AM. Type Locality: 22°43'00"S 159°16'00"E (seamount south of Chesterfield Is), 328 m.

Caryophyllia (C.) rugosa Moseley, 1881

Caryophyllia rugosa Moseley, 1881: 141–143, pl. 1, figs. 8a,b.–Cairns, 1994: 47, pl. 20i, 21a (synonymy, description); 1995: 43–44, pl. 6, fig. h, pl. 7, figs. a–c (description, key, **NZ, SM**).–Cairns & Zibrowius, 1997: 91–92 (remarks, key).–Cairns, 1998: 375 (**WA**); 1999a: 71 (remarks).

Caryophyllia ?rugosa.–Veron, 1986: 605 (**listed**).

New record. SEAMOUNTS: Franklin 05/89/04 (Gascoyne), 1, AM G15896.

Types. The syntypes are deposited at BM. Type Localities: Banda and Sulu Seas, 187–230 m.

Caryophyllia (C.) scobinosa Alcock, 1902

Caryophyllia scobinosa Alcock, 1902c: 8, pl. 1, figs. 2, 2a.–Cairns, 1995: 52–53, pl. 10g–i, 11a–d (description, key, synonymy, **Qld, SM**).–Cairns & Zibrowius, 1997: 94 (remarks, key).–Cairns, 1999a: 75 (remarks).

Caryophyllia cultrifera.–Veron, 1986: 905 (**listed**).

New records. SEAMOUNTS: Franklin 05/89/17 (Lord Howe Rise), 3, AM G15907. —QUEENSLAND: Soela 01/86/54, 1, NTM C5339; Franklin 06/88/04, 3, AM G16658; Franklin 06/88/05, 3, AM G15494; Franklin 06/88/20, 7, AM G16663; Cidaris I 1-2, 6, MTQ G56389; Cidaris I 9-2, 2, MTQ G56393; Cidaris I 20-2, 1, MTQ G56398; Cidaris I 42-2, 1, MTQ G55722; Cidaris I 47-2, 1, MTQ G55723.

Types. Five syntypes are deposited at ZMA (Cairns, 1995). Type Localities: Flores and Sulu Seas, Indonesia, 535–794 m.

Caryophyllia (C.) stellula Cairns, 1998

Caryophyllia stellula Cairns, 1998: 375–376, figs. 2a–c (**WA**).–Griffith & Fromont, 1998: 230 (**type deposition**).

New records. None.

Types. The holotype is WAM 301-88; paratypes are split among WAM, USNM, and SAM. Type Locality: 31°48'S 114°08'E (west of Rottnest Island), 402 m.

Caryophyllia (C.) transversalis Moseley, 1881

Caryophyllia clavus var. *transversalis* Moseley, 1881: 134–135, pl. 1, figs. 2, 2a.

Caryophyllia transversalis.–Cairns & Zibrowius, 1997: 90–91, figs. 6f–h (**NT**, key, description).–Cairns, 1998: 375 (**WA**).

New records. WESTERN AUSTRALIA: Bhagwan 17, 44, WAM Z13144 and Z13199; Bhagwan 18, 17, WAM Z13213 and Z13217; Bhagwan 23, 1, WAM Z13149; Bhagwan 26, 1, WAM Z13147; Lady Basten 1031403, 1, WAM Z16019; Lady Basten 1031501, 30, WAM Z16015; Lady Basten 95LB08, 1, WAM Z16039.

Types. Syntypes are BM 1880.11.25.23. Type Locality: 5°42'S 132°25'E (Kai Islands, Banda Sea), 235 m.

Confluphyllia juncta Cairns & Zibrowius, 1997

Confluphyllia juncta Cairns & Zibrowius, 1997: 140, figs. 19d–g.

New record. NEW SOUTH WALES: 35°24'S 150°47 E (off Ulladulla), 135 m, 1 corallite, AM G16339.

Types. The holotype is deposited at MNHN; paratypes are split between MNHN and USNM. Type Locality: 5°25'S 132°51'E (Kai Island, Banda Sea), 318–352 m.

Conotrochus brunneus (Moseley, 1881)

Fig. 3G

Pleurocyathus brunneus Moseley, 1881: 159–160, pl. 2, figs. 1a–c.

Conotrochus brunneus.–Veron, 1986: 607, fig. (**Qld**, ?**NSW**, ?**Vic**).–Not Cairns & Parker, 1992: 22 (reference in discussion of *C. funicolumna*).–Cairns, 1995: 74–75, pl. 20, figs. a,b (**SM, NZ**, description, synonymy).–Cairns & Zibrowius, 1997: 127–128, fig. 16e (remarks).–Cairns, 1999a: 101 (remarks).

New records. QUEENSLAND: Franklin 03/99/D14, 7, USNM 1008294 (SEM 1006); Kimbla 1, east of Lady Elliot Island, 7, USNM 78626.

Types. The holotype is deposited at BM. Type Locality: 4°34'S 129°57'30"E (off Banda Island, Indonesia), 366 m (Cairns, 1995).

Remarks. Veron (1986: 607) listed this species as having an Australian distribution "from the Great Barrier Reef to the Bass Strait", but no records in any Australian museums could be found from New South Wales or Victoria.

A juvenile specimen (Fig. 3G) clearly shows the original attachment and the secondary lateral thecal adhesion, which is characteristic of this species.

Conotrochus funicolumna Alcock, 1902

Ceratotrochus (Conotrochus) funicolumna Alcock, 1902a: 93; 1902c: 11–12, pl. 1, figs. 6, 6a.

Conotrochus funicolumna.–Cairns, 1994: 58–59, pl. 24, fig. i, pl. 25, figs. g–l (description, synonymy).–Cairns & Zibrowius, 1997: 127 (remarks).–Cairns, 1998: 385 (**WA**); 1999a: 100–101 (remarks).

Conotrochus sp. cf. *funicolumna*.–Cairns & Parker, 1992: 22, figs. 6c,f (**Vic**).

Conotrochus brunneus.–Cairns & Parker, 1992: 22 (**WA**).

New records. NEW SOUTH WALES: Kapala 85/21/06, 2, AM G16576. —SEAMOUNTS: Franklin 05/89/14 (off Elizabeth Reef, LHSMC), 10, AM G15899; Franklin 05/89/15 (off Elizabeth Reef, LHSMC), 3, AM G15904; Franklin 05/89/24 (Lord Howe Rise), 1, AM G15910.

Types. Three syntypes are deposited at ZMA. Type Locality: Sulu Sea, 450–522 m.

Crispatotrochus gregarius n.sp.

Figs. 3H–J

Records/Types. About 30 coralla (syntypes), all originally part of one fused mass, now in two parts (QMB GL10161). Type Locality: "Southern Intruder" 15, 23°21'S 153°56'E (continental slope off Gladstone, Queensland), 460 m.

Description. Syntypes consist of a pseudocolony formed of 2 large coralla that are completely encrusted with about 30 smaller coralla, 6 of which are large and intact, the others broken at their bases, damaged, or juveniles. Initially, the corallum was thought to be a true colony, but closer examination showed that each corallum had an independent origin, not being a direct outgrowth of a parent corallite as in asexual reproduction. In fact, many of the larger basal coralla were long dead, whereas the smaller and some of the larger distal coralla still had tissue. Individual coralla ceratoid, elongate, and not flared distally, the largest intact specimen 19.3×15.8 mm in CD, 45 mm in height, and 6.7 mm in PD. Calice elliptical, the GCD:LCD ranging from 1.13 to 1.22. Pedicel robust (PD:GCD = 0.34–0.46), spreading basally to encrust the substrate, which in this case consisting of conspecific coralla. Upper half of theca bears low costal ridges corresponding to the 40 primary to tertiary septa, but these ridges diminish toward the base, being replaced by a low, transverse sculpturing. Corallum white.

Septa decamerally arranged in 4 systems, the complete number being 80 septa, but none of the coralla have that number. The largest 2 coralla of GCD 19.3 mm have an extra pair of fifth cycle septa (i.e., 84 septa), whereas a corallum of 17.0 mm GCD has 82 septa, and one of 17.4 mm lacks a pair of S4, resulting in 78 septa. The 10 primary septa are only slightly exsert (about 1.5 mm), their axial edges highly sinuous, standing directly adjacent to the columella. The 10 secondary septa are less exsert (0.6 mm), have equally sinuous axial edges, and are almost as wide as the primaries, being about 95% of their width. The 20 tertiary septa and all those of higher cycle have straight axial edges, and are about 75% the width of a primary, the quaternary septa being only about 15% the width of a primary. Fossa moderately deep, containing an elongate columella consisting of 10–15 loosely swirled lamellar plates that are interconnected among themselves, almost bridging the gap between the columella known for *Crispatotrochus* and *Labyrinthocyathus*.

Remarks. Two of the 11 Recent species of *Crispatotrochus* have decameral septal symmetry, *Cr. woodsi* (Wells, 1964) and *Cr. squiresi* (Cairns, 1979), as well as two unnamed species referred to as *Cyathoceras* sp. sensu Cairns, 1979 and *Cyathoceras* sp. A sensu Cairns, 1982. *Crispatotrochus gregarius* differs from these four taxa in having larger coralla with more septa (the other species having only 40 septa), having transverse thecal sculpture, and in having an interconnected columella (the elements of other species being discrete).

Etymology. *gregarius*, Latin for "pertaining to a flock", or "gathering objects together", an allusion to the quasicolonial nature of the coralla of the type specimens.

Distribution. Known only from the type locality off Gladstone, Queensland, 460 m.

Crispatotrochus inornatus Tenison-Woods, 1878

Crispatotrochus inornatus Tenison-Woods, 1878b: 309–310, pl. 6, figs. 2a–c (**NSW**).–Cairns, 1979: pl. 12, fig. 5 (remarks).–Cairns & Parker, 1992: 20–21, figs. 5a,d,g,h (**Vic, NSW**).–Cairns, 1998: 378, figs. 2g,h (**WA**).

Cyathoceras cornu Moseley, 1881: 156–157 (in part: "Challenger"-163, **NSW**).–Hoffmeister, 1933: 9–10, pl. 12, figs. 5–6 (**Vic**).–Wells, 1958: 261 (**listed**).–Squires, 1961: 18 (**listed**).–Wells, 1964: 109 (**listed**).–Veron, 1986: 606 (**listed**).

Ceratotrochus inornatus.–Squires, 1961: 18 (**listed**).–Wells, 1964: 109 (**listed**).

Cyathoceras inornatus.–Veron, 1986: 606 (**listed**).

New records. VICTORIA: unnumbered "Endeavour" station, east of Babel Island, 128 m, 27 June 1914, 1 in AM. —NEW SOUTH WALES: Shelf Benthic Survey, 33°58'S 151°33'E, 192 m, 9 August 1973, 1, AM G16508; Shelf Benthic Survey 33, 1, AM G16612; 35°20'S 150°47'E, May 1924, 135 m, 1, AM G16500; 34°15'S 151°05'E (Kimbla station 110°E of N from Bulli), 128 m, December 1963, 1, AM G16581; 34°04'S 151°16'E (off Cronulla), 120 m, 1966, 3, AM G15276 and G15365; Derwent Hunter 37, Botany Bay, 128 m, 1, AM G16617; 34°04'S 151°35'E, 188 m (DH25), 1, AM G15336; 33°51'S 151°16'E (off Port Jackson), depth and date unknown, 1, AM G7018.

Types. The holotype is deposited at the Macleay Museum. A specimen labelled as the type from "Port Jackson" is also deposited at AM (G7018), but must be a subsequently collected specimen, as the Macleayan type matches the original description. Type Locality: Port Stephens, 146 m.

Crispatotrochus rubescens (Moseley, 1881)

Cyathoceras rubescens Moseley, 1881: 157, pl. 2, figs. 8a–c.

Crispatotrochus rubescens.–Cairns, 1994: 51, pl. 22, figs. g,h (description, synonymy).–Cairns & Zibrowius, 1997: 103–104, figs. 10a–c (**NT**, synonymy, remarks).–Cairns, 1999a: 76–77 (remarks).

New record. QUEENSLAND: Cidaris I 52-2, 1, MTQ G55745.

Types. The holotype is lost (Cairns, 1984). Type Locality: 5°49'15"S 132°14'15"E (Kai Island, Banda Sea), 236 m.

Crispatotrochus rugosus Cairns, 1995

Crispatotrochus rugosus Cairns, 1995: 57, pl. 13, figs. a,b (**NZ, SM**).–Cairns & Zibrowius, 1997: 104 (remarks).–Cairns, 1998: 378 (**WA**); 1999a: 77 (remarks).

New records. SEAMOUNTS: Franklin 08/88/D22 (Britannia), 1, AM G16727. —QUEENSLAND: Franklin 03/99/D5 (Marion Plateau), 1, USNM 1008240.

Types. The holotype is NZOI H625. Paratypes are split between NZOI and USNM. Type Locality: 26°59.7'S 159°18.9'E (near Gifford Guyot, Lord Howe Seamount Chain), 376 m.

Crispatotrochus woodsi (Wells, 1964)

Cyathoceras woodsi Wells, 1964: 110–112, pl. 1, figs. 4–7 (**Qld**).–Veron, 1986: 606 (**listed**).

Crispatotrochus woodsi.–Cairns, 1991a: 15 (new combination); 1991b: 53 (**type deposition**).

New record. QUEENSLAND: Kimbla 1, 1, AM G16489.

Types. The holotype (USNM 68371) and 5 paratypes are deposited at USNM. Type Locality: 14 miles (=22.4 km) east of Jumpin Pin (27°45'S), a channel between North and South Stradbroke Islands, 86 m.

Deltocyathus andamanicus Alcock, 1898

Deltocyathus andamanicus Alcock, 1898: 16–17, pl. 1, figs. 5, 5a.–Veron, 1986: 606 (**listed**).–Cairns & Keller, 1993: 244–245, fig. 5F (remarks).–Cairns & Zibrowius, 1997: 124, fig. 15c (description, synonymy, key)

New record. WESTERN AUSTRALIA: Soela 04/82/8B, 1, WAM 84-83.

Types. The holotype is presumed to be deposited at the Indian Museum, Calcutta, but was not examined. Type Locality: Andaman Sea, 315–555 m.

Deltocyathus cameratus Cairns, 1999

Deltocyathus cameratus Cairns, 1999a: 95, figs. 12g–i, 13a.

New records. SEAMOUNTS: Franklin 05/89/15 (off Elizabeth Reef, LHSMC), 1, AM G16736; Franklin 05/89/24 (Lord Howe Rise), 2, AM G15911; Franklin 05/89/46 (Britannia), 1, AM G16589; Franklin 05/89/47 (Britannia), 3, AM G16732.

Types. The holotype is deposited at MNHN; paratypes are split between MNHN and USNM. Type Locality: 18°52'S 168°52'E (off Erromango Island, Vanuatu), 720–830 m.

Deltocyathus magnificus Moseley, 1876

Deltocyathus magnificus Moseley, 1876: 552–553.–Grygier, 1991: 43, fig. 21G (**WA**).–Cairns & Parker, 1992: 27–28, pl. 7, figs. j–l, pl. 8, fig. a (**SA, Vic**).–Cairns, 1994: 56, pl. 24d,e, g,h (description, synonymy).–Cairns & Zibrowius, 1997: 126–127 (remarks, key).–Cairns, 1998: 381–382, fig. 4a (**WA**); 1999a: 91 (remarks).

Bathyactis palifera.–Hoffmeister, 1933: 14, pl. 4, fig. 6 (**SA**).

Fungiacyathus paliferus.–Wells, 1958: 262 (**list**).–Veron, 1986: 598 (**listed**).–Cairns & Parker, 1992: 6–7 (**SA**).

Fungiacyathus sp. Veron, 1986: 598 (black and white fig.).

New records. VICTORIA: Southern Surveyor 05/94/83, 10, AM G16499. —NEW SOUTH WALES: Franklin Slope 57, 6, NMV F67773 and F67149; Kapala 74/15/28, 2, AM G15324; Kapala 75/08/01, 7, AM G16416; Kapala 76/20/02, 8 in AM; Kapala 77/23/08, 5, AM G16431; Kapala 78/03/03, 1, AM G16398; Kapala 78/23/09, 2, AM G16376; Kapala 78/27/13, 1, AM G16390; Kapala 78/27/16, 1, AM G16569; Kapala 79/03/18, 12, AM G15618 and G16454; Kapala 79/05/05, 15, AM G16457; Kapala 79/12/08, 31, AM G16441; Kapala 79/20/09, 1, AM G16463; Kapala 85/21/06, 2, AM G16477. —QUEENSLAND: Soela 06/85/05 (Marion Plateau), 1, NTM C5299; Soela 06/85/30 (Marion Plateau), 1, NTM C5300; Soela 01/86/50, 1, NTM C5352; Soela 01/86/51, 1, NTM C5326; Soela 01/86/52, 2, NTM C5327; Soela 01/86/54, 3, NTM C5340; Soela 01/86/69, 1, NTM C5224; Iron Summer 1, 1, QMB; Kimbla 3, 6, AM G16601; Kimbla 15, 5, AM G16600. —WESTERN AUSTRALIA: Lady Basten 95/LB08, 19, WAM Z16041.

Types. One uncatalogued syntype is deposited at BM (Cairns, 1994). Type Locality: 5°49'S 132°14'E (off Kai Island, Banda Sea), 236 m.

Remarks. *Deltocyathus magnificus*, along with *Flabellum australe, F. hoffmeisteri, Paraconotrochus zeidleri*, and *Caryophyllia ambrosia*, are the five most commonly collected corals on the slopes of New South Wales, and yet it had never been reported from this region before.

Although I "examined" the specimen identified as *Bathyactis palifera* (AM E3737) by Hoffmeister (1933) in 1988 (Cairns & Parker, 1992), I did not realize at that time that it was in fact a typical specimen of *Deltocyathus magnificus*. The incorrect identification of Hoffmeister was also promulgated by Wells (1958) and Veron (1986). Indeed, three authors have independently misidentified specimens of *Deltocyathus magnificus* as a species of *Fungiacyathus* (Hoffmeister, 1933; Veron, 1986; and Cairns & Parker, 1992). Although similar is size and shape, *D. magnificus* can reliably be distinguished by lacking synapticular between its septa and in having highly ridged costae. The reidentification of this specimen is also much more consistent with the known distribution of these two species.

Deltocyathus ornatus Gardiner, 1899

Deltocyathus ornatus Gardiner, 1899: 163–164, pl. 20, figs. 25a,b.–Cairns, 1995: 72 (in part: only specimen from Franklin 05/89/40, **SM**); 1999a: 98, figs. 13h,i (synonymy, remarks, tabular comparison).

Deltocyathus ?ornatus.–Veron, 1986: 606 (**listed**).

New records. None.

Types. The unnumbered holotype is deposited at the University Museum of Zoology, Cambridge. Type Locality: Sandal Bay, Lifu, Loyalty Islands, 73 m.

Remarks. The Australian specimens (Gifford Guyot) reported by Cairns (1995) as AM G15501 have been re-catalogued as AM G15703.

Deltocyathus rotulus (Alcock, 1898)

Trochocyathus rotulus Alcock, 1898: 16, pl. 2, figs. 1, 1a.

Deltocyathus rotulus.–Cairns, 1994: 55–56, pl. 24, figs. j,k (description, synonymy).–Cairns & Zibrowius, 1997: 125–126, figs. 16a–c (remarks, key); 1999a: 91–92 (remarks).

New records. SEAMOUNTS: Franklin 05/89/14 (Gascoyne), 1, AM G16733. —QUEENSLAND: Cidaris I 1-2, 33, MTQ G55618; Cidaris I 1-3, 8, MTQ G55619 and G55620; Cidaris I 5-2, 14, MTQ G55639; Cidaris I 9-2, 20, MTQ G55622; Cidaris I 20-2, 10, MTQ G55625; Cidaris I 24-3, 10, MTQ G55626.

Types. The holotype is presumed to be deposited at the Indian Museum, Calcutta, but was not examined. Type Locality: off North Maldive Atoll, 1408–1756 m.

Deltocyathus sarsi (Gardiner & Waugh, 1938)

Fungiacyathus sarsi Gardiner & Waugh, 1938: 201, pl. 7, figs. 17–18.

Deltocyathus sarsi.–Cairns, 1998: 382, figs. 3k,l. (**WA**).

New records. None.

Types. Six syntypes are deposited at BM. Type Locality: 3°04'30"N 73°22'42"E (east side of Kolumadulu Atoll, Maldive Islands), 44 m.

Deltocyathus stella Cairns & Zibrowius, 1997

Deltocyathus stella Cairns & Zibrowius, 1997: 123–124, figs. 15f–h.–Cairns, 1999a: 96–97, figs. 13b,c (tabular comparison).

New record. SEAMOUNTS: Franklin 05/89/14 (Elizabeth Reef, LHSMC), 3, AM G16734.

Types. The holotype is deposited at MNHN; paratypes are split among MNHN, USNM, and POLIPI. Type Locality: 5°46'45"S132°11'10"E (Kai Islands, Banda Sea), 156–305 m.

Deltocyathus suluensis Alcock, 1902

Deltocyathus magnificus var. *suluensis* Alcock, 1902c: 20–21.–van Soest, 1979: 111, pl. 2, figs. 3–4 (type deposition).
Deltocyathus formosus Cairns, 1995: 73–74, pl. 19, figs. f,g (**NZ**).
Deltocyathus suluensis.–Cairns & Zibrowius, 1997: 125 (**NT**, synonymy, remarks, key).–Cairns, 1998: 382 (**WA**); 1999a: 92 (remarks).

New records. SEAMOUNTS: Franklin 085/88/D22 (Britannia), 1, AM G16720. —QUEENSLAND: Cidaris I 47-2, 2, MTQ G55634. —WESTERN AUSTRALIA: Akademik Oparin 1987-1-1, 11, NTM C8157; Bhagwan 4, 1 dead corallum attached to *Xenophora* gastropod shell, WAM Z13061; Bhagwan 20, 1, WAM Z13220; Bhagwan, 21, 5, WAM Z13146 and Z13185; Bhagwan 28, 2, WAM Z13189; Lady Basten 1031403, 1, WAM Z16013; Lady Basten 1031404, 1, WAM Z16018; Lady Basten 95/LB08, 1, WAM Z16043.

Types. Six syntypes are deposited at ZMA; another is at the Indian Museum, Calcutta (van Soest, 1979). Type Locality: Sulu Archipelago, 450–522 m.

Desmophyllum dianthus (Esper, 1794)

Madrepora dianthus Esper, 1794: pl. 69, figs. 1–3.
Desmophyllum cristagalli.–Hoffmeister, 1933: 8–9, pl. 2, figs. 1–4 (**Vic, NSW**).–Wells, 1958: 262 (**listed**).–Squires, 1961: 18 (**listed**).–Wells, 1964: 109 (**listed, NSW**).–Cairns, 1982: 29–30, pl. 8, figs. 8–12, pl. 9, figs. 1–3 (description, map).–Veron, 1986: 608. fig. (**listed**).–Cairns & Parker, 1992: 28–29, figs. 8b,c (**WA, SA, Vic, Tas, NSW**).
Desmophyllum dianthus.–Cairns, 1994: 26–27, pl. 9a–d (description, synonymy, neotype designation); 1995: 77, pl. 22, figs. d–f (synonymy, remarks, **NZ**).–Cairns & Zibrowius, 1997: 131 (remarks).–Cairns, 1998: 385–386 (**WA**).–Koslow & Gowlett-Holmes, 1998: 38 (listed, **Tas**).–Cairns: 1999a: 104–105 (remarks).
Desmophyllum sp. Veron, 2000: II, 411, fig. 12 (not 13).

New records. TASMANIA: Franklin Slope 47, 1, NMV F67148; Eltanin-1981, 5, USNM 80207. —VICTORIA: Kimbla 07/73/11, 1, NMV F67795; Franklin Slope 68, 7, NMV F67884; Franklin Slope 33, 1, NMV F67777. —NEW SOUTH WALES: Kapala 75/02/03, 4, AM G16411; Kapala 78/27/13, 18, AM G16386; Kapala 78/27/16, 12, AM G16404; Kapala 83/14/06, 2, AM G16472; NZOI U223, 3, AM G16559; Jervis Bay, 600–1000 m, 18 Sept. 1980, 2, AM G16349; NNE Sydney, 406 m, 17 July 1981, many, AM G16505; Franklin 10/86/07, 2, AM G15889. —SEAMOUNTS: Franklin 085/88/D22 (Britannia), 3, AM G15893. —WESTERN AUSTRALIA: "Orion", 35°26'S 118°20'E, 900 m, 1, SAM H11238.

Types. The neotype is deposited at USNM (92475). Type Locality: Sagami Bay, Japan, depth unknown.

Heterocyathus aequicostatus Milne Edwards & Haime, 1848

Heterocyathus aequicostatus Milne Edwards & Haime, 1848a: 324, pl. 10, fig. 8.–Folkeson, 1919: 8–10 (in part: pl. 1, figs. 8–9) (**WA**).–Crossland, 1952: 102–103 (**Qld**).–Stephenson & Wells, 1956: 57 (**listed**).–Wells, 1964: 108 (**listed**).–Zibrowius & Grygier, 1985: 121 (**Qld**).–Veron, 1986: 558–559 (in part: colour figure, not black and white, which is *Heteropsammia*) (**Qld**).–Hoeksema & Best, 1991: 226–230, figs. 1–11 (synonymy, description, key).–Cairns, 1998: 382–384, figs. 3a,b (**WA**).–Veron, 2000: 412–413, figs. 1–4 (**Qld, WA**).

New records. None.

Types. Not traced. Type Locality: Unknown.

Heterocyathus alternatus Verrill, 1865

Heterocyathus alternatus Verrill, 1865: 149.–Folkeson, 1919: 10–11, pl. 1, figs. 10–11 (**WA**).–Hoeksema & Best, 1991: 230–231, figs. 12–18 (synonymy, description, key).–Cairns, 1998: 384, figs. 3d,e (**WA**); 1999a: 99–100 (remarks).

New records. None.

Types. The holotype is YPM 6828. Type Locality: Gaspar Straits, between islands of Bangka and Belitung, Sumatra, Indonesia, depth unknown.

Heterocyathus hemisphaericus Gray, 1849

Heterocyathus hemisphaericus Gray, 1849: 77, pl. 2, figs. 3–4.–Cairns, 1998: 384–385, figs. 3g–j (**WA**).
Spongiocyathus typicus Folkeson, 1919: 11–12, pl. 1, figs. 12–15 (**WA**).
Psammoseris hemispherica.–Veron, 1986: 610, fig. (**WA**).

New records. WESTERN AUSTRALIA: Soela 05/82/48, 3, WAM 71-83 (AIMS); Woodside-Dampier DA2/99/08, 3, WAM Z16031; Woodside-Dampier DA2/99/29, 4, WAM Z16030; Woodside-Dampier DA2/99/32, 4, WAM Z16029; WA547, Flindersite 33, 1, AM G16539; 28°27.05'S 113°45.1'E, 38 m (WA 547), 30 May 1994, 1, AM G16539.

Types. *Heterocyathus hemisphaericus*: The holotype is deposited at BM. Type Locality: "Chinese Seas", depth unknown. *Spongiocyathus typicus*: Syntypes are SMNH 4753–4756. Type Locality: Cape Jaubert, W A, 11–43 m.

Heterocyathus sulcatus (Verrill, 1866)

Fig. 3K

Stephanoseris sulcata Verrill, 1866: 48.
Psammoseris cylicioides Tenison-Woods, 1879a: 10–11, pl. 1, figs. 1–5 (in part: not 4 specimens identified as *Heteropsammia cochlea*) (**Qld**); 1880a: 299–300 (**Remarks**).
Heterocyathus pulchellus Rehberg, 1892: 8–9, pl. 1, figs. 7a,b (**WA**).
Homophyllia incrustans Dennant, 1906: 161, pl. 6, figs. 3a,b (**SA**), new synonym.–Howchin, 1909: 247 (**listed**).–Stranks, 1993: 21 (**type deposition**).
Heterocyathus aequicostatus.–Folkeson, 1919: 8–10 (in part: pl. 1, figs. 4–7) (**WA**).
Heterocyathus cylicioides.–Wells, 1964: 109 (**listed**).
Heterocyathus sulcatus.–Hoeksema & Best, 1991: 231–233, figs. 19–23 (description, synonymy, lectotype designation).–Cairns, 1998: 384, figs. 3c,f (**WA, NT**); 1999a: 98–99, figs. 14a–d (remarks).

New records. QUEENSLAND: James Kirby 732, off Townsville, 124–144 m, 11, MTQ G55749; Cidaris I 46-2, 1, MTQ G56410; QLD-115, 11, AM G16516; QLD-128, 4, AM G16518; QLD-140, 1, AM G16521; 23°52'S 151°23'E (Gatcombe Head, Curtis Point), 22 m, 1929, 20, AM G14630 and G16611. —NORTHERN TERRITORY: Akademik Oparin Gulf-18, 10, NTM C6456. —WESTERN AUSTRALIA: Woodside-Dampier DA2/99/32, 1, WAM Z16044; Woodside-Dampier DA2/99/34, 1, WAM Z16032.

Types. *Heterocyathus sulcatus*: The holotype is YPM 764. Type Locality: Sri Lanka, depth unknown.

Psammoseris cylicioides: The uncatalogued lectotype, designated by Hoeksema & Best (1991: 233), along with 6 paralectotypes, are deposited at the Macleay Museum. Twenty-five additional paralectotypes, four of which are *Heteropsammia cochlea*, are deposited at AM (G7017). Type Locality: Princess Charlotte Bay, Queensland, depth unknown.

Heterocyathus pulchellus: Two syntypes were reported, originally deposited at the Godeffroy Museum (Hamburg), but are now presumed to be lost (Hoeksema & Best, 1991). Type Locality: west coast of Australia, depth unknown.

Homophyllia incrustans: The holotype is NMV F41511. Type Locality: St. Vincent Gulf, depth unknown.

Remarks. Unlike most *Heterocyathus*, which are attached to and totally encrust small gastropod and scaphopod shells that are inhabited by a sipunculid, the type of *H. incrustans* is a juvenile specimen attached to the outer surface a dead bivalve shell. Curiously, directly adjacent to the corallum there is a hole bored through the bivalve of the same diameter (1.5 mm) as a sipunculid efferent pore.

Labyrinthocyathus limatulus (Squires, 1964)

Ceratotrochus (C.) limatulus Squires, 1964: 3–5, pl. 1, figs. 5–9 (**NZ**).

Labyrinthocyathus limatulus.–Cairns, 1995: 58, pl. 13c–f (description, **NZ, SM**); 1999a: 77 (remarks).

New records. None.

Types. The holotype and 12 paratypes are deposited at AIM. Type Locality: 7.2 km northeast of the Aldermen Islands, off Coromandel Peninsula, New Zealand, 102 m.

Lochmaeotrochus oculeus Alcock, 1902

Lochmaeotrochus oculeus Alcock, 1902b: 117–118; 1902c: 13, pl. 2, figs. 9, 9a.–Cairns & Zibrowius, 1997: 128–129, figs. 16f–i (description).

New records. WESTERN AUSTRALIA: Bhagwan 6, 5 quasicolonies: 2, USNM 1009431, 3, WAM Z13081; Lady Basten 1031303, 1 pseudocolony of 13 coralla, WAM Z16028.

Types. Syntypes are ZMA Coel. 814 and 700. Type Locality: Indonesia, 411–487 m.

Remarks. This is the first record of this species from Australia and only the second report subsequent to its original description. Although there is little doubt that it is the same species, these specimens differ from those previously reported by having uniformly smaller "coralites", averaging 5 mm in CD and with a maximum of 5.8 mm, whereas the type corallites average 6–7 mm in CD and those reported by Cairns & Zibrowius (1997) average 8 mm in CD with a maximum of 11 mm.

Oxysmilia circularis Cairns, 1998

Oxysmilia circularis Cairns, 1998: 378, figs. 2i–k (**WA**).–Griffith & Fromont, 1998: 230–231 (**type deposition**).–Cairns, 1999a: 78, figs. 6g,h, 7a (**NZ**).

New records. None.

Types. The holotype is WAM 102–83; paratypes are split between WAM and USNM (Griffith & Fromont, 1998). Type Locality: 18°41'S 117°54'E (off Port Hedland, WA), 200–204 m.

Paraconotrochus zeidleri Cairns & Parker, 1992

Cyathoceras sp. Veron, 1986: 606, fig. (AM G15044).

Paraconotrochus zeidleri Cairns & Parker, 1992: 21–22, figs. 5i, 6a,b (**Tas, NSW**).–Cairns & Zibrowius, 1997: 130 (synonymy, remarks).–Cairns, 1998: 385 (**WA**).

Paraconotrochus sp. Veron, 2000: II, 411, fig. 7.

New records. TASMANIA: Soela 05/84/51, 5, NMV F67787 (topotypic); Soela 85/23, 4, NMV F67789. —NEW SOUTH WALES: Kapala 75/09/08, 2, AM G15044; Kapala 75/12/07, 1, AM G16419; Kapala 76/24/01, 1, AM G16422; Kapala 77/03/09, 2, AM G16565; Kapala 77/13/10, 1, AM G16426; Kapala 78/17/10, 1, AM G16371; Kapala 78/17/21, 1, AM G16372; Kapala 78/27/04, 2, AM G16391; Kapala 78/27/13, 1, AM G16389; Kapala 78/27/16, 3, AM G16403; Kapala 79/05/02, 1, AM G16570; Kapala 79/15/01, 3, AM G15540; Kapala 79/15/04, 1, AM G16571; Kapala 79/20/08, 6, AM G16451; Kapala 79/20/09, 5, AM G16462; Kapala 79/23/01, 2, AM G16467; Kapala 85/21/06, 6, AM G16476; NZOI U208, 2, AM G16549 and 3, USNM 94361; east of Bondi, 600 m, 9 Nov. 1987, 3, AM G16546. — WESTERN AUSTRALIA: Akademik Oparin 1987-1-1, 1, NTM C7787.

Types. The holotype is SAM H520; paratypes are split among SAM, AM, and USNM. Type Locality: 41°15'S 144°08'E (west of Richardson Point, Tasmania), 520 m.

Paracyathus darwinensis n.sp.

Figs. 4A,B

Records/Types. Holotype: 12°27.75'S 130°49.40'E (outside breakwater, Larrakeyah Naval Base), Darwin Harbour, NT (type locality), depth unknown, 20 August 1998, NTM C8139. Paratypes: 12°29.00'S 130 51.00'E (wreck of "Zealandia"), Darwin Harbour, NT, 22 m, 29 July 1994, 5: 3, NTM C7963 and 2, USNM 1008826; Kunmunyah BG-149, 12°04.98'S 131°08.40'E (east of East Vernon Island), NT, 26 m, 2, 10 October 1993, NTM C8035; Kunmunyah BG-141, 12°07.02'S 131°07.02'E (northeast of Glyde Park, Vernon Islands), NT, 20 m, 4, 10 October 1993, NTM C8034; 12°28.17'S 130°50.51'E (off Pontoon, Stokes Hill Wharf), Darwin, NT, surface, 1 in alcohol 19 February 2002, NTM C8161; 12°28.35'S 130°50.57'E (Iron Ore Wharf), Darwin Harbour, NT, depth unknown, 1 in alcohol, 16 August 1998, NTM C8143; 12°28.29'S 130°50.80'E (Fort Hill Wharf) Darwin Harbour, NT, depth unknown, 1 in alcohol, 19 August 1998, NTM C8144.

Description. Corallum ceratoid, the largest specimen (NTM 8161) 10.9×9.0 mm in CD and 9.5 mm in height, the holotype smaller, measuring 7.4×6.0 mm in CD and 9.0 mm in height. Calice elliptical, the GCD:LCD ranging from 1.07–1.27, younger coralla being more circular, larger more elliptical. Corallum attached by a robust pedicel (PD:GCD = 0.41–0.68), but not approaching subcylindrical. Costae flat to only slightly convex, all equal in width and prominence, all about 0.25 mm wide near calice, and separated by shallow, narrow intercostal striae. Corallum white, except for upper mm of theca and exsert portions of septa, which are light brown to light black in colour, appearing as a band or disconnected band around upper thecal circumference. Axial edges of S1–2 also pigmented the same colour, or, in rare cases, a light blue.

Septa hexamerally arranged in 5 cycles, the last cycle not complete. A complete fourth cycle (48 septa) is achieved at a GCD of 4–5 mm; above this GCD pairs of S5 are progressively inserted, usually in end half-systems, such that the largest specimen of GCD 10.9 mm has 80 septa, or 16 pairs of S5. Septal formula: S1–2>S3>S4>=S5. S1–2 moderately exsert (1.0–1.3 mm), with straight axial edges,

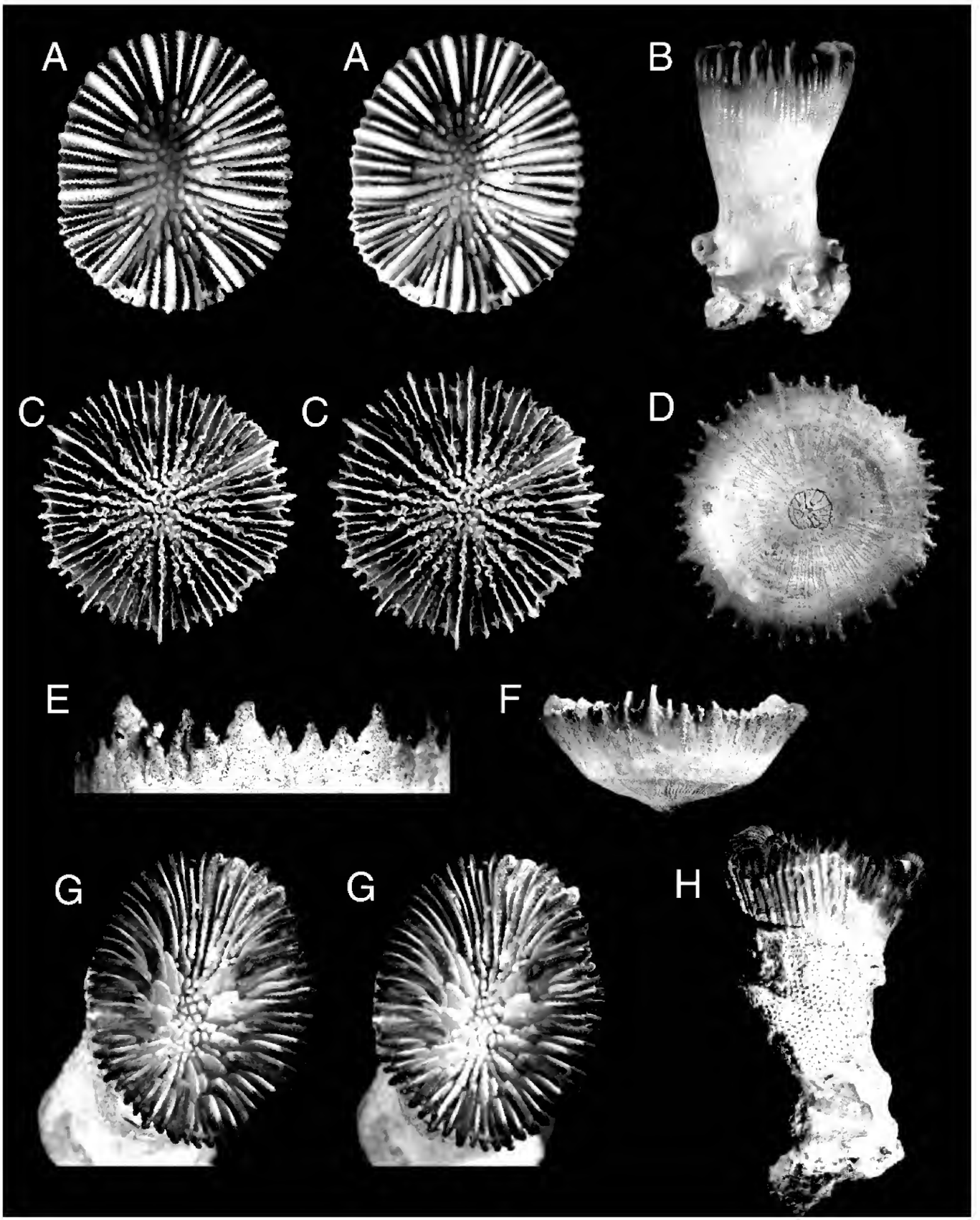

Fig. 4. (*A, B*), *Paracyathus darwinensis*, holotype, NTM C8139, stereo calicular and lateral views, ×7.0, 4.3, respectively (GCD=7.4 mm). (*C–F*), *Stephanocyathus imperialis*, holotype, MTQ G55640, CD=22.6 mm, stereo calicular (×2.3), basal (×2.3), close-up of calicular edge (×4.6), and lateral (×2.3) views. (*G, H*), *Trochocyathus* sp. cf. *T. aithoseptatus*, USNM 68373, calicular stereo and lateral views, ×3.8, ×2.7, respectively (GCD=13.8 mm)

each of which bears a single, slender, vertical paliform lobe, the lobes (P2) associated with the S2 being slightly larger and rising slightly higher in the fossa than those on the S1. S3 slightly less exsert (0.6 mm), about 0.8 width of the S1–2, each S3 bearing a prominent paliform lobe that rises higher in the fossa than the P1–2 and usually bears 3–4 smaller teeth that are inclined obliquely upward. This axial dentition blends into and is almost indistinguishable from the columellar elements. S4 about 0.5 mm exsert, and at upper thecal edge fuse to their adjacent S1 or S2, thus producing a characteristically jagged, or lancetted, thecal edge. S3 about 0.6 width of an S1–2, each bearing a very small paliform lobe, invariable fused to the adjacent much larger P3. If S5 present in a half-system, they assume the shape of the S4 as just described, and the flanked S4 assumes the shape and paliform lobe of the S3 as described above. Fossa deep, containing a well-developed columella composed of 20–25 slender papillose elements.

Remarks. It may seem inadvisable to describe yet another species of *Paracyathus*, when there are 17 species known from the Indo-West Pacific, most known only from their type specimens and rather terse descriptions (e.g., Alcock, 1893: northern Indian Ocean; Duncan, 1889: Mergui Archipelago). Nevertheless, *P. darwinensis* has a combination of characters that allows it to be distinguished from all congenerics previously described, i.e., a distinctive pigmentation of its upper theca and septa and the lancetted thecal edge. To a lesser extent its ceratoid corallum and number of septa are also of use in distinguishing it.

Etymology. Named for the town of Darwin, Australia, the type-locality of the species.

Distribution. Known only from the Darwin region, 0–26 m.

Paracyathus fulvus Alcock, 1893

Paracyathus fulvus Alcock, 1893: 139–140, pl. 5, figs. 2, 2a.–?Cairns, 1998: 380–381, figs. 4d,g (**WA**).

New records. None.

Types. The type is presumed to be deposited at the Indian Museum, Calcutta, but has not ben examined. Type Locality: Persian Gulf, depth unknown.

Paracyathus rotundatus Semper, 1872

Paracyathus rotundatus Semper, 1872: 253–254, pl. 20, figs. 15a,b.–Cairns & Zibrowius, 1997: 115–116, figs. 13d,e (description).–Cairns, 1998: 380 (synonymy, **WA**).

New records. QUEENSLAND: 20°33.16'S 149°05.28'E (Thomas Island), 30 m, 3 November 1988, 3, USNM 86001. —WESTERN AUSTRALIA: Woodside-Dampier DA2/99/05, 2, WAM Z16033.

Types. The holotype is NMW 8177. Type Locality: Lapinig Canal, Philippines, 11–18 m.

"Paracyathus" vittatus Dennant, 1906, incertae sedis

Fig. 3L

Paracyathus vittatus Dennant, 1906: 156, pl. 5, figs. 3a,b (**SA**).–Howchin, 1909: 246 (**listed**).–Wells, 1958: 262 (**listed**).–Squires, 1961: 18 (**listed**).–Shepherd & Veron, 1982: 176 (**listed**).–Veron, 1986: 608 (**listed**).–Cairns & Parker, 1992: 24. (remarks).–Stranks, 1993: 21 (**type deposition**).

New records. None.

Types. The holotype is NMV F41514. Type Locality: off Point Marsden, Kangaroo Island, South Australia, 31.1 m.

Remarks. Although listed and discussed several times, this species is known only from the holotype. Little can be added to the original description and illustration of this species, except to say that the columella is not really strongly developed, as Dennant suggests, but rather poorly developed. The paliform lobes (P1–2) are small, approximating paliform teeth, and not multiple, as is characteristic of *Paracyathus*. The specimen itself is quite small (GCD=3.6 mm, height = 3.55 m) and is undoubtedly a juvenile of an indeterminate genus.

Premocyathus dentiformis (Alcock, 1902)

Placotrochides dentiformis Alcock, 1902b: 121.

Caryophyllia compressa.–Cairns, 1994: 50–51, pl. 22, figs. e,f (description).

Premocyathus dentiformis.–Cairns & Zibrowius, 1997: 102–103, figs. 9f–j (synonymy, remarks).

New records. QUEENSLAND: Cidaris I 43-2, 4, MTQ G55630; Cidaris I 46-2, 1, MTQ G56411; Cidaris I 49-2, 1, MTQ G56415.

Types. The holotype is ZMA Coel.1093. Type Locality: 10°27.7'S 123°16.5'E (off Timor), 390 m.

Rhizosmilia elata Cairns & Zibrowius, 1997

Rhizosmilia elata Cairns & Zibrowius, 1997: 134–135, figs. 18a,b.

New records. None.

Types. The holotype is USNM 97304; additional paratypes are split among USNM, NNM, and MNHN. Type Locality: 6°52'N 126°14'E (Philippines), 313 m.

Remarks. A specimen reported from Karubar station 86 was incorrectly reported by Cairns & Zibrowius (1997) as being from off Tanimbar Islands, Indonesia, whereas it is more properly attributed to the continental shelf off Cobourg Peninsula, Northern Territory.

Rhizosmilia multipalifera Cairns, 1998

Paracyathus porphyreus.–Folkeson, 1919: 12–13, figs. 16–17 (**WA**).–Veron, 1986: 608 (**listed**).

Rhizosmilia multipalifera Cairns, 1998: 386–389, figs. 4 b,c, e,f (**WA**).–Griffith & Fromont, 1998: 231 (**type deposition**).

New records. None.

Types. The holotype is WAM 129–83; paratypes are split among WAM, USNM, and SMNH (Griffith & Fromont, 1998). Type Locality: 30°17.9'S 114°39.9'E (west of Jurien Bay, WA), 82 m.

Solenosmilia variabilis Duncan, 1873

Solenosmilia variabilis Duncan, 1873: 328, pl. 42, figs. 11–18.–Hoffmeister, 1933: 14, pl. 4, fig. 7 (**NSW**).–Wells, 1964: 109 (**listed: NSW**).–Cairns, 1982: 31, pl. 9, figs. 4–5 (synonymy, description).–Veron, 1986: 608 (**listed**).–Cairns & Parker, 1992: 29–30, figs. 8d,e (**SA, Tas, Vic, NSW, WA**).–Cairns, 1995: 82, pl. 23d,e (**NZ**, remarks); 1998: 388 (**WA**).–Koslow & Gowlett-Holmes, 1998: 38 (**listed: Tas**).–Koslow *et al.*, 2001: 115–123 (**Tas**).

New records. SOUTH AUSTRALIA: "F. V. Comet", 176 km SSE of Cape du Couedic, Kangaroo Island, 900–1000 m, 14 February 1988, 1 colony, USNM 86839. —VICTORIA: Franklin Slope 67, 2, NMV F67150; Franklin Slope 68, several fragments, NMV F67138. —QUEENSLAND: Franklin 06/88/x, 7 dead branches, AM G16710. —NEW SOUTH WALES: East of Eden, 12 December 1986, 1600 m, 2 branches, USNM 1008876. —WESTERN AUSTRALIA: "Orion", 35°26'S 118°20'E, 900 m, 1 branch, SAM H11238.

Types. The syntypes are deposited at BM. Type Locality: off southwestern Spain, 1190–2003 m.

Stephanocyathus (Acinocyathus) explanans (Marenzeller, 1904)

Stephanotrochus explanans Marenzeller, 1904b: 304–307, pl. 18, figs. 19a,b.

Stephanocyathus (A.) explanans.–Cairns & Zibrowius, 1997: 119, fig. 14e (synonymy, description).–Cairns, 1998: 381 (**WA**).

New records. WESTERN AUSTRALIA: Bhagwan 4, 1, WAM Z13060; Bhagwan 24, 2: 1, USNM 1009430, 1, WAM Z13184.

Types. Ten syntypes are deposited at ZMB, although they have not been examined by the author. Type Locality: off Sumatra, Zanzibar Island, and Pemba, southwest Indian Ocean, 245–614 m.

Stephanocyathus (A.) spiniger (Marenzeller, 1888)

Stephanotrochus spiniger Marenzeller, 1888: 20–21.

Stephanotrochus tatei Dennant, 1899: 117–119, pl. 3, figs. 1a–c (**Oligocene of Victoria**).

Odontocyathus sexradii.–Hoffmeister, 1933: 10, pl. 1, figs. 6–8 (**SA**).

Stephanocyathus (Odontocyathus) sexradiis.–Wells, 1958: 262 (**listed**).

Stephanocyathus spiniger.–Veron, 1986: 607 (**listed**).

Stephanocyathus (A.) spiniger.–Cairns & Parker, 1992: 26–27, figs. 7g–i (synonymy, description, **SA**).–Cairns, 1995: 67–68, pl. 17d–f, 18c (**NZ, SM**).–Cairns & Zibrowius, 1997: 118–119, figs. 13f, 14d (**NT**).–Cairns, 1998: 381 (**WA**); 1999a: 90 (remarks).

Stephanocyathus sp. Veron, 2000: II, 411, fig. 11.

New records. SEAMOUNTS: Franklin 05/89/14 (off Elizabeth Reef, LHSMC), 2, AM G15898. —QUEENSLAND: Soela 06/85/30, 1, NTM C5293; Soela 06/85/38, 1, NTM C5292; Soela 01/86/07, 7, NTM C5311; Soela 01/86/08, 7, NTM C5314; Soela 01/86/09, 5, NTM C5316; Soela 01/86/10, 1, NTM C5319; Soela 01/86/16, 2, NTM C5335; Soela 01/86/44, 3, NTM C5337; Soela 01/86/73, 1, NTM C5341; Cidaris I 42-2, 12, MTQ G55644–55645; Cidaris I 42-3, 12, MTQ G55646; Cidaris I 45-3, 1, MTQ G55647; Cidaris I 46-2, 1, MTQ G55632; Cidaris I 46-3, 4, MTQ G55648. —WESTERN AUSTRALIA: "Akademik Oparin" 1987-1-1, 1, NTM C7786; Bhagwan 1, 2, WAM Z13051; Bhagwan 5, 1, WAM Z13074; Bhagwan 17, 1, WAM Z13180.

Types. The holotype is deposited at NMW. Type Locality: Sagami Bay, Japan, depth unknown.

Stephanocyathus (Odontocyathus) coronatus (Pourtalès, 1867)

Platycyathus coronatus Pourtalès, 1867: 114.

Stephanocyathus (O.) coronatus.–Veron, 1986: 607 (**undocumented listing**).–Cairns, 1995: 69, pl. 17j–l, pl. 18a,b (**NZ, SM**); 1999a: 89, figs. 11d–f (synonymy, remarks).

New records. NEW SOUTH WALES: NZOI U218, 1. AM G16606; Kapala 78/17/10, 3, AM G16410; Kapala 78/09/05, 8, AM G16380; Kapala 78/23/09, 1, AM G16374. —SEAMOUNTS: Franklin 08/88/D4 (Argo Bank), 3, AM G16329; Franklin 05/89/24 (Argo Bank), 1, AM G15908; Franklin 05/89/33 (Lord Howe Rise), 1, AM G15914. —QUEENSLAND: Cidaris I 9-4, 1, MTQ G55661; Cidaris I 11-4, 1, MTQ G55662; Cidaris I 15-4, 1, MTQ G55663; Cidaris I 20-4, 1, MTQ G55664; Cidaris I 28-1, 8, MTQ G55665; Cidaris I 30-4, 8, MTQ G55673; Cidaris I 31-1, 18, MTQ G55666-55667; Cidaris I 32-2, 5, MTQ G55668; Cidaris I 33-1, 18, MTQ G55669; Cidaris I 35-4, 7, MTQ G55670-55671; Cidaris I 37-1, 4, MTQ G55672; Cidaris II 1-2, 5, MTQ G55674 and G56385; Cidaris II 9-1, 1, MTQ G55675; Cidaris II 10-1, 5, MTQ G55676; Cidaris III 12-2, 9, MTQ G55677; Franklin, 11°33'S 145°19'E, 1517–1611 m, 7, USNM 86562.

Types. The holotype is MCZ 2769 (Cairns, 1979). Type locality: 30°41'N 77°03'W (Blake Plateau off Florida), 841 m.

Stephanocyathus (O.) weberianus (Alcock, 1902)

Stephanotrochus weberianus Alcock, 1902a: 101–102.

?*Stephanocyathus nobilis*.–Wells, 1958: 262 (**listed: NSW**); 1964: 109 (**listed: NSW**).–Veron, 1986: 607 (**listed**).

Stephanocyathus (O.) weberianus.–Cairns, 1994: 57–58, pl. 25d–f (synonymy, description); 1995: 68, pl. 17g–i (**SM**).–Cairns & Zibrowius, 1997: 119–120, figs. 14g,h (synonymy, remarks).–Cairns, 1999a: 89–90.

New records. NEW SOUTH WALES: Kapala 76/24/03, 3, AM G16412; Kapala 79/20/13, 2, AM G15237. —WESTERN AUSTRALIA: off Carnarvon (station "D30"), 3, depth unknown, WAM Z13253; Lady Basten 1031201, 1, WAM Z16003. —QUEENSLAND: Franklin 06/88/04, 7: 1, MTQ G30350, and 6, USNM 86561; Franklin 06/88/20, 1, AM G16664; Cidaris I 1-3, 31, MTQ G55649–55650; Cidaris I 1-4, 7, MTQ G55651; Cidaris I 44-3, 2, MTQ G55655; Cidaris I 45-2, 1, MTQ G55656; Cidaris I 49-2, 9, MTQ G55652; Cidaris I 49-3, 16, MTQ G55653–55654; Cidaris I 50-2, 17, MTQ G55657–55658; Cidaris I 50-3, 9, MTQ G55659–55660; 11°35'S 144°11'E, 1006 m, 1, USNM 78617; 25 miles (=40 km) ne Stradbroke Island, 710–730 m, 1, SAM TH8592; FNQ 79-33, 5, AM G16523.

Types. The holotype is ZMA Coel. 1322. Type Locality: 8°43.1'S 127°16.7'E (Timor Sea), 828 m.

Remarks. It is unknown what data (?specimens) Wells (1958, 1964) had in hand when he reported *Stephanocyathus nobilis* from New South Wales. *Stephanocyathus nobilis* and *S. weberianus* are quite similar and have been confused before (Cairns, 1994), but *S. nobilis* has not yet been substantiated to occur off Australia. Wells may have observed specimens of *S. weberianus*, not *S. nobilis*.

Stephanocyathus weberianus and the previously discussed species, *S. coronatus*, are also quite similar, as discussed by Cairns (1995). To reiterate, *S. weberianus* can be distinguished by having 12–18 costal projections integrated into a continuous basal rim (vs 12 discrete, complexly ornamented costal tubercles); less exsert S1–2; and a smooth, flat (not convex, costate) base. Off eastern Australia the species are also separated bathymetrically, *S. weberianus* found only shallower than 1050 m, *S. coronatus* deeper than 1050 m.

Stephanocyathus (Stephanocyathus) imperialis n.sp.

Figs. 4C–F

Records/Types. Holotype: Cidaris II 15–1, MTQ G55640. Paratypes: Cidaris II 15–1, 2: 1, MTQ G56420, 1, USNM 1008827; Cidaris III, 14–2, 3, MTQ G55642 and 56421. Type Locality: 13°29.08'S 147°12.68'E (Coral Sea off Cape York Peninsula, Queensland), 2442–2457 m.

Description. Corallum bowl-shaped, almost hemispherical, the holotype measuring 22.6 mm in CD and 9.3 mm in height. Most of theca worn or chalky in texture, only a thin band 2.5–3.0 mm wide adjacent to calice and corresponding to the region of edge zone is smooth and porcellaneous. In well-preserved coralla, theca corresponding to C1–3 within the region of the edge zone bears small granules arranged in a continuous zig-zag pattern. Calice circular and coarsely serrate in lateral view, each septum rising from a equilateral triangular-shaped base (Fig. 4E). Corallum white.

Septa hexamerally arranged in 4 to 5 cycles, the fifth cycle never complete. There seems to be no absolute relationship between CD and number of septa, at least in the 6 specimens available for study, as the largest corallum (23.4 mm in CD) has only 48 septa, whereas the smallest corallum (18.4 mm CD) has 58 septa, and those of

intermediate size have a range of 42 to a maximum of 60 septa. S1 only independent septa, extending to the columella without merging with any other septa. S1 only slightly exsert (1.8 mm) and rather narrow, following the curvature of the theca, but near the columella each S1 bears 1 or more poorly differentiated paliform lobes which have highly sinuous axial edges. S2 slightly less exsert (1.3 mm) but similar to the S1, also reaching the columella and bearing sinuous poorly-defined paliform lobe (s). Remaining septa (S3–5) equally exsert (1.2 mm), the S3 similar in shape to the S1–2, but their axial edges loosely merging to their adjacent S2 near the columella. If unflanked by S5, the S4 extend about 2/3 the distance to the columella before loosely fusing to their adjacent S3; if flanked by a pair of S5, the S4 are similar in size and shape to an S3, and the S5 are then the smallest septa, similar in size and shape to an unflanked S4. Fossa relatively deep, containing an elongate columella consisting of 10–15 small intermingled papillae that are fused onto a circular base.

Remarks. *Stephanocyathus imperialis* differs from the three other congenerics known from the Australia region (*S. regius, S. platypus*, and *S.* sp. sensu Cairns & Parker, 1992) in having poorly-developed, highly sinuous paliform lobes; a coarsely serrate calicular edge; and a smaller corallum with fewer septa. It is also found much deeper than the other three species.

Etymology. *imperialis*, Latin for "of the emperor", in keeping with the names of several other species in this genus, as well as the genus name, that relate to aspects of royalty.

Distribution. Known only from the Coral Sea off Cape York Peninsula, 2436–2474 m.

Stephanocyathus (S.) platypus (Moseley, 1876)

Ceratotrochus platypus Moseley, 1876: 554 (**NSW**).
Stephanocyathus platypus.–Moseley, 1881: 154, pl. 3, figs. 4a,b (description).–Cairns, 1982: 24–25, pl. 7, figs. 3–6 (description, synonymy, **NZ**).–Veron, 1986: 607 (**listed**).–Cairns & Parker, 1992: 24–25, figs. 7a–c (**SA, Vic, Tas**).–Cairns, 1995: 66–67, pl. 17a–c (**NZ**).

New records. NEW SOUTH WALES: Kapala 75/05/05, 1, AM G16560; Kapala 78/27/05, 7, AM G15811; Kapala 78/27/13, 1, AM G16323; Kapala 79/20/13, 2, AM G15238; Kapala 84/08/05, 5, AM G16474.

Types. Two syntypes are BM 1880.11.25.57. Type Locality: 34°13'S 151°38'E (off Sydney, New South Wales), 750 m.

Stephanocyathus (S.) regius Cairns & Zibrowius, 1997

Stephanocyathus (S.) regius Cairns & Zibrowius, 1997: 117–118, figs. 14a–c (**NZ**).–Cairns, 1999a: 88–89, figs. 10h, 11a–c (remarks).

New records. QUEENSLAND: Cidaris I 1-3, 1, MTQ G55678–55679; Cidaris I 28-1, 2, MTQ G55680; Cidaris I 30-2, 2, MTQ G55681; Cidaris I 30-4, 1, MTQ G55682; Cidaris I 33-1, 1, MTQ G55683; Cidaris I 41-2, 5, MTQ G55684; Cidaris I 49-2, 1, MTQ G55685; Cidaris I 49-3, 2, MTQ G55637, G55686; Cidaris I 50-2, 2, MTQ G55687; Cidaris II 24-1, 2, MTQ G55688; Cidaris III 12-2, 3, MTQ G55689; 11°35'S 144°11'E, 1006 m, 1, USNM 78623; Franklin 06/88/04, 1, AM G16660; Franklin 06/88/05, 1, AM G15494; Franklin 06/88/12, 1, MTQ G30348; FNQ 79-33, 3, AM G16525. —WESTERN AUSTRALIA: Lady Basten 1031201, WAM Z16006.

Types. The holotype is USNM 97122; paratypes are split between USNM and MNHN. Type Locality: 9°27'S 127°58.6'E (Timor Sea, south of Leti Islands), 610–690 m.

Stephanocyathus (S.) sp.

Stephanocyathus (S.) sp. Cairns & Parker, 1992: 26, figs. 7–d–f (**Tas**).

New records. None.

Tethocyathus virgatus (Alcock, 1902)

Trochocyathus (Tethocyathus) virgatus Alcock, 1902a: 98–99.–Not Veron, 1986: 606 (listed, =*T. wellsi*, described herein.)
Tethocyathus virgatus.–Cairns, 1995: 65–66, pl. 16c–f (synonymy, description, **NZ**).–Cairns & Zibrowius, 1997: 114–115 (remarks).–Cairns, 1999a: 86 (remarks).

New records. SEAMOUNTS: Franklin 08/88/D4 (off Argo Bank), 1, AM G16595; Franklin 05/89/47 (Britannia), 2, AM G16593. — QUEENSLAND: Franklin 06/88/x, 1, AM G16682.

Types. Two syntypes are deposited at ZMA (Coel. 1328 and 1323). Type Locality: Sulu Archipelago, 275 m.

Thalamophyllia tenuescens (Gardiner, 1899)

Desmophyllum tenuescens Gardiner, 1899: 161–162, pl. 19, figs. 1a,b.–Veron, 1986: 608 (**undocumented Australian record**).
Thalamophyllia tenuescens.–Cairns, 1995: 78, pl. 21g–i (**NZ, SM**).–Cairns & Zibrowius, 1997: 133, figs. 17d,e (**Qld**).–Cairns, 1998: 386 (**WA**); 1999a: 105 (**SM**).

New records. None.

Types. Four of the seven syntypes are BM 1950.1.10.113–116, two more are deposited at the University Museum of Zoology, Cambridge. Type Locality: Sandal Bay, Lifu, Loyalty Islands, 73 m.

Trochocyathus (Aplocyathus) brevispina Cairns & Zibrowius, 1997

Trochocyathus (Aplocyathus) brevispina Cairns & Zibrowius, 1997: 113, figs. 12d–f (key).–Cairns, 1999a: 85–86 (tabular comparison).

New record. QUEENSLAND: Cidaris I 43-2, 2, MTQ G56432.

Types. The holotype is deposited at MNHN; paratypes are split among MNHN, USNM, NNM, ZMA, and POLIPI. Type Locality: 5°47'40"S 132°12'11"E (off Kai Islands, Banda Sea), 278–300 m.

Trochocyathus sp. cf. *T. (Trochocyathus) aithoseptatus* Cairns, 1984

Figs. 4G,H

Not *Paracyathus conceptus* Gardiner & Waugh, 1938: 184.
Paracyathus conceptus.–Wells, 1964: 113, pl. 1, figs. 11–12 (**Qld**).–Veron, 1986: 608 (**listed**).

Material examined. 14 miles (=22.4 km) east of Jumpin Pin, Queensland, 86 m, 1, USNM 68373.

Description of specimen reported by Wells, 1964 (USNM 68373). Corallum ceratoid: 13.8×10.2 mm in calicular diameter and 21.7 mm in height, firmly attached through a pedicel 7.3 mm in diameter. Costae well defined and granular, separated by intercostal grooves of equal width. Costae near calice and upper, outer edges of all septa chocolate brown, the remaining corallum white. Septa hexamerally arranged in 5 incomplete cycles (58 septa) according to the formula: S1>S2>S3>S4>S5, there being

little difference in the width of the S1–4. P1 small (0.6 mm wide) and sit very low in fossa. S2 slightly broader (0.8 mm) but also sit low in fossa, along with the P1 forming the lower palar crown. P3 much broader (1.25 mm) and project much higher in fossa, forming the upper crown of 12 elements. S4 flanked by a pair of S5 also bear a large prominent palus (P4), contributing to the upper crown. Fossa deep; columella consists of about 35 slender elements.

Remarks. The single specimen reported by Wells (1964: 113) from "14 miles due east of Jumpin Pin (27°45'S), 47 fms.", Queensland as *Paracyathus conceptus* differs from that species (syntypes of which are deposited at the BM 1950.1.9.839–850, 859–867) in having a thinner, non-epithecate wall; a pigmented corallum; and thinner septa. Indeed, Wells' specimen belongs in a different genus, *Trochocyathus*, as it has two discrete crowns of paliform lobes. Among the 25 species of *Trochocyathus* known from the Indo-West Pacific region (Cairns *et al.*, 1999), it is most similar to *T. aithoseptatus* Cairns, 1984 (known only from the Hawaiian Islands, 371–454 m), both species having the same number of septa, pigmentation pattern, and general shape. *Trochocyathus aithoseptatus* differs in having a thinner pedicel and more flared calice, a shallower fossa, pigmentation that extends to the pali, and pali of uniform size, often with poorly developed P4. Although the Queensland specimen probably represents an undescribed species, one specimen is not considered to be enough to properly distinguish or describe it.

Distribution. Known only from east of Jumpin Pin, Queensland, 86 m.

Trochocyathus (T.) apertus Cairns & Zibrowius, 1997

Premocyathus ?compressus.–Veron, 1986: 605, fig. (**WA**).
Trochocyathus (T.) apertus Cairns & Zibrowius, 1997: 109–110, figs. 11a–d (key).–Cairns, 1998: 380 (synonymy, **WA**).
Trochocyathus sp. Veron, 2000: II, 411, fig. 6 (**undocumented from Australia**).

New records. None.

Types. The holotype is USNM 97087; additional paratypes are split among USNM, MNHN, NNM, and ZMUC. Type Locality: 5°01'40"N 119°52'20"E (Sulu Archipelago), 33 m.

Trochocyathus (T.) burchae (Cairns, 1984)

Premocyathus burchae Cairns, 1984: 14, pl. 2, figs. G–H.
Trochocyathus burchae.–Cairns & Zibrowius, 1997: 110 (key, remarks).

New records. QUEENSLAND: James Kirby 732, 1, MTQ G56422. — NORTHERN TERRITORY: off Port Essington, Cobourg Peninsula, depth unknown, 1, NTM C8039.

Types. The holotype is deposited at USNM (60512); paratypes are split between USNM and BPBM. Type Locality: 20°43.7'N 156°54.6'W (Lanai, Hawaiian Islands), 64 m.

Trochocyathus (T.) caryophylloides Alcock, 1902

Trochocyathus caryophylloides Alcock, 1902a: 94.–Cairns, 1994: 52–53, pl. 23, figs. a–c,h (synonymy, description).–Cairns & Zibrowius, 1997: 106 (**NT**, remarks).

New records. None.

Types. Five of the six syntypes are deposited at ZMA. Type Locality: Celebes and Banda Seas, 115–304 m.

Remarks. Specimens from two "Karubar" stations (61, 86) were incorrectly reported by Cairns & Zibrowius (1997) as from off Tanimbar Islands, whereas they are more correctly attributed to the continental shelf off Cobourg Peninsula, Northern Territory.

Trochocyathus (T.) cepulla Cairns, 1995

Trochocyathus (T.) cepulla Cairns, 1995: 62–63, pl. 15a,b (**NZ**).

New record. QUEENSLAND: Cidaris I 47-2, 1, MTQ G55743.

Types. The holotype is NZOI H628; paratypes are split between NZOI and USNM. Type Locality: 32°10.5'S 167°21.2'E (Wanganella Bank, southern Norfolk Ridge), 449 m.

Remarks. The specimen reported herein is the largest known thus far, measuring 11.9×11.2 mm in CD and 11.8 mm in height.

Trochocyathus (T.) discus Cairns & Zibrowius, 1997

Trochocyathus (T.) discus Cairns & Zibrowius, 1997: 112, figs. 11g,h, 12 a–c (key).–Cairns, 1999a: 84 (remarks).

New record. QUEENSLAND: Cidaris I 43-2, 1, MTQ G55628.

Types. The holotype is deposited at MNHN; paratypes are split among MNHN, USNM, and POLIPI. Type Locality: 5°48'S 132°12'E (off Kai Islands, Banda Sea), 278–300 m.

Trochocyathus (T.) maculatus Cairns, 1995

Trochocyathus (T.) maculatus Cairns, 1995: 61, pl. 14c,d (**SM, NZ**).–Cairns & Zibrowius, 1997: 107 (remarks, key).–Cairns, 1999a: 81–82 (remarks).

New records. SEAMOUNTS: Franklin 05/89/06 (Taupo), 1, AM G16582; Franklin 05/89/07 (Taupo), 2, AM G16481; NZOI U212 (Taupo), 1, AM G16554. —QUEENSLAND: Kimbla-2, 5, AM G15933.

Types. The holotype is NZOI H626; paratypes are split among NZOI, USNM, and AM. Type Locality: 31°25.9'S 159°02.2'E (off Lord Howe Island), 183 m.

Trochocyathus (T.) philippinensis Semper, 1872

Trochocyathus philippinensis Semper, 1872: 253, pl. 20, fig. 16.–Cairns & Zibrowius, 1997: 107–108 (description, key).–Cairns, 1998: 380 (**WA**).

New records. None.

Types. Three syntypes are deposited at NMW (not seen). Type Locality: Pandanon, west coast of Bohol, Philippines, 27–54 m.

Trochocyathus (T.) rhombocolumna Alcock, 1902

Trochocyathus rhombocolumna Alcock, 1902a: 98.–Cairns, 1995: 60–61, pl. 13, fig. i, pl. 14, figs. a,b (synonymy, description, **NZ, SM**).–Cairns & Zibrowius, 1997: 106–107 (**NT**, key).–Cairns, 1999a: 81 (remarks).

New records. SEAMOUNTS: Franklin 05/89/48 (Britannia), 1, AM G16492; Franklin 085/88/D22 (Britannia), 5, AM G16712. — QUEENSLAND: Franklin 06/88/x, 39, AM G16681.

Types. The holotype is ZMA Coel. 1327. Type Locality: 5°43.5'N 119°40'E (Sulu Sea), 522 m.

Trochocyathus wellsi n.sp.

Figs. 5A,B

Not *Trochocyathus virgatus* Alcock, 1902a: 98–99.

Trochocyathus virgatus.–Wells, 1964: 112–113, pl. 1, figs. 8–10 (**Qld**).–Veron, 1986: 606 (**listed**).

Records/Types. Holotype: Kimbla-1, AM G16704. Paratypes: Kimbla-1, 17, AM G16335; "about 14 miles (=22.4 km) due east of Jumpin Pin (27°45'S.)", 86 m, 2 paratypes, USNM 68373 (Wells, 1964: 113). Type Locality: 27°31'S 153°40'E (off Moreton Island), 75–81 m.

Description. Corallum ceratoid, attached through a slender (PD:GCD = 0.32–0.49), elongate pedicel and a thin encrusting base. Holotype 7.8×6.8 mm in CD and 14.7 mm in height, having a PD of 3.6 mm. Upper part of corallum slightly flared; calice elliptical (GCD:LCD = 1.09–1.21). Calicular margin lancetted, each pair of CS4 adjacent to the 6 CS1 forming a rectangular projection on the calicular margin, a smaller lancet corresponding to the CS2 and their adjacent CS4. Costal granules on lower half of corallum low but arranged in faint transverse rows, whereas granules on upper half of corallum arranged on longitudinally oriented costae. Edge zone narrow, extending only about 2.5 mm from calicular edge, below which many kinds of encrusting organisms attach to the corallum, e.g., hydroids, foraminifera, serpulids, sponges, bryozoans, and small bivalves. Corallum uniformly white.

Septa hexamerally arranged in 4 cycles according to the formula: S1>S2>S4>S3, but few coralla have the full complement of 48 septa and there is no direct relationship between GCD and number of septa. For example, one of the smallest coralla (GCD=5.5 mm) has 48 septa, whereas the largest corallum (GCD=8.8 mm) has only 40 septa; the holotype has 42 septa. S1 are highly exsert (1.7–2.1 mm), have straight to only slightly sinuous axial edges, and in old specimens can be quite thick. S2 less exsert (about 1.2 mm) and about 80% the width of an S1. S3 about 0.4 mm exsert but dimorphic in width, those S3 flanked by S4 being the smallest of the septa (about 65% width of an S1), but those S3 unflanked by S4 being almost as wide as an S1. S4 also dimorphic in width, those adjacent to an S1 being slightly wider than the S3 they flank, those adjacent to an S2 being equal to or only slightly wider than the adjacent S3. A lamellar palus about 0.4 mm in width occurs before each S3 and is aligned with that septum; occasionally a second P3 occurs slightly closer to the columella. P1 and P2 are less distinctive, shaped as a papilla circular in cross section and about 0.2 mm in diameter, which is aligned with the axial edge of each S1, but P2 are difficult to distinguish. Fossa of moderate depth, containing a papillose columella of 6–10 spiny elements indistinguishable from the P1.

Remarks. *Trochocyathus wellsi* is easily distinguished from *Tethocyathus virgatus* by its lack of epitheca, white corallum, lancetted calicular edge, and its smaller corallum size and ceratoid shape. It also differs in its poorly defined palar ring structure, which distinguishes it from all other species of *Trochocyathus* and may be justification for ultimately placing it in a different genus.

Etymology. Named in honour of John W. Wells, who first examined this species and who significantly added to our knowledge of deep-water Australian corals (Wells, 1958, 1964).

Distribution. Known only from the region off Brisbane, Queensland, 75–86 m.

Vaughanella multipalifera Cairns, 1995

Vaughanella multipalifera Cairns, 1995: 70–71, pl. 18g,h (**NZ**).

New records. NEW SOUTH WALES: Franklin 10/86/10, 3, AM G15888. —QUEENSLAND: Cidaris I 49-3, 1, MTQ G55636.

Types. The holotype is deposited at NZOI (H629). Type Locality: 30°05.2'S 178°10.2'W (off Macauley Island, Kermadec Ridge), 1450 m.

Vaughanella oreophila Keller, 1981

Figs. 5C,D

Vaughanella oreophila Keller, 1981: 32–33, pl. 2, figs. 1a,b.–Not Cairns, 1995: 70, pl. 18d,e (=*V. concinna*); 1999a: 90 (remarks).

New records. QUEENSLAND: Franklin 06/88/x, 11: 10, AM G16707, and 1, USNM 1009245. —SEAMOUNTS: Franklin 08/88/D22, 1, AM G16713.

Types. The holotype is deposited at the Institute Oceanology, Moscow. Type Locality: 23°32'N 157°23'E (Marcus Necker Ridge), 1420 m.

Remarks. As Cairns (1999a: 90) pointed out, *Vaughanella oreophila* is distinguished from *V. concinna* by having a smaller corallum, less septa (no S5), and in lacking P3, which are quite prominent in *V. concinna*. *Vaughanella oreophila* does have well-developed P1 and P2, which are rudimentary in *V. concinna*. These are believed to be the first valid records of this species subsequent to its original description from the Markus Necker Ridge.

Family Turbinoliidae Milne Edwards & Haime, 1848

Alatotrochus rubescens (Moseley, 1876)

Fig. 5E

Platytrochus rubescens Moseley, 1876: 552.

Alatotrochus rubescens.–Cairns, 1994: 68–69, pl. 29g–l (description); 1995: 84, pl. 24a,b. (synonymy, **NZ**).–Cairns & Zibrowius, 1997: 141–142, fig.18h (remarks)–Cairns, 1998: 390 (**WA**); 1999a: 108–109 (remarks).

New records. QUEENSLAND: Franklin 03/99/D11, 10: 9 (including SEM 996), USNM 1008301, 1, ZMUZ; Franklin 03/99/D13, 1, USNM 1008300.

Types. Four syntypes are deposited at BM, one numbered 1880.11.25.163. Type Locality: 5°49'15"S 132°14'15"E (off Kai Islands, Banda Sea), 236 m.

Australocyathus vincentinus (Dennant, 1904)

Deltocyathus vincentinus Dennant, 1904: 6–7, pl. 2, figs. 1a–c (**SA**).–Howchin, 1909: 245 (**listed**).–Wells, 1958: 262 (**listed**).–Squires, 1961: 18 (**listed**).–Shepherd & Veron, 1982: 176, fig. 4.54a (**SA**).–Veron, 1986: 606 (**listed**).–Stranks, 1993: 21 (**type deposition**)

Australocyathus vincentinus.–Cairns & Parker, 1992: 39, figs. 12e–g, 13a,b (**WA, SA**).–Cairns, 1997: 15, pls. 1d, 4d, 7a–c (figs.).–Cairns, 1998: 364 (**listed**).

New records. None.

Types. The deposition of the holotype is not certain, but many paratypes are deposited at NMV (Stranks, 1993) and SAM (Cairns & Parker, 1992), and several are also at AM (G12059, G11830). Type Locality: various unspecified localities from the Verco collection off South Australia, 16–40 m.

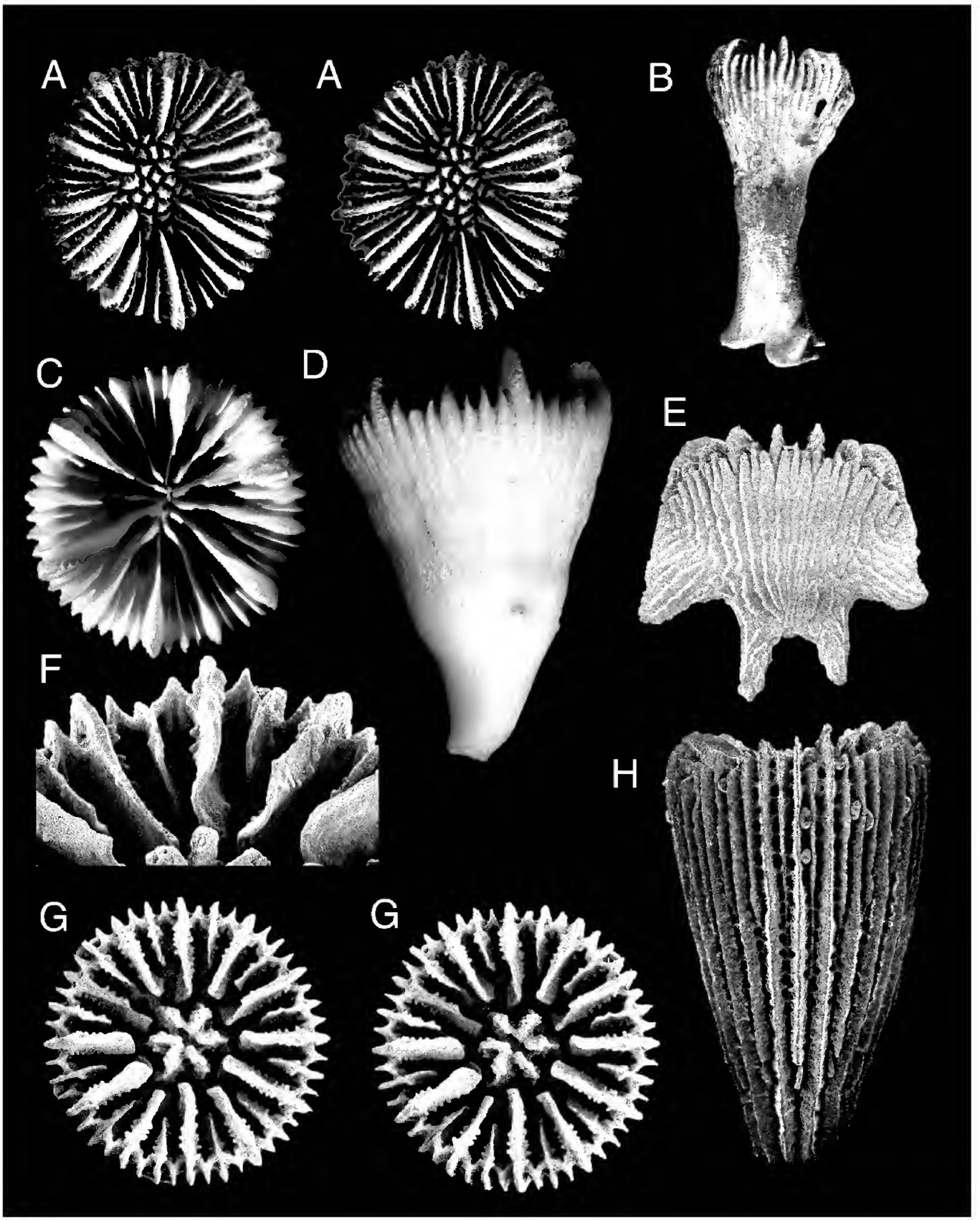

Fig. 5. (*A, B*), *Trochocyathus wellsi*, holotype, AM G16704, stereo calicular and lateral views, ×6.4, ×3.8, respectively (GCD=7.8 mm). (*C, D*), *Vaughanella oreophila*, Franklin 06/88/x, AM G16707, calicular and lateral views, both ×3.9 (CD=13.1 mm); (*E*), *Alatotrochus rubescens*, USNM 1008301 (SEM 996), juvenile corallum showing pronounced edge and basal crests, ×11.8 (GCD=3.6 mm). (*F–H*), *Conocyathus formosus*, holotype, AM G16743: (*F*), inner view of septa, ×35; (*G*), stereo calicular view, ×19.1; (*H*), lateral view, ×17.1 (CD=2.76 mm).

Conocyathus formosus n.sp.

Figs. 5F–H, 6A–C

Records/Types. Holotype: Franklin 03/99/D11, 20°14.49'S 151°47.53'E (Marion Plateau, Queensland), 342 m, (type locality), AM G16743. Paratypes: Franklin 03/99/D8 (Marion Plateau), 1, USNM 1008829; Franklin 03/99/D10, 12, USNM 1008830; Franklin 03/99/D11, 48: 43 (including SEM stub 1005), USNM 1008831, 2, ZMUZ, 3, WAM Z20515; Franklin, 03/99/12, 3, USNM 1008832; Franklin 03/99/D13, 1, USNM 1008833; 12°28.3'S 130°50.95'E (Darwin Harbour), depth unknown, 3, NTM 8138.

Description. Corallum conical and fairly slender (H:D = 1.62–1.88), with a circular calice and blunt base. Holotype (and largest specimen) 2.76 mm in CD and 4.55 mm in height. C1–2 extend from base to calice; C3 originate independently about 1.3 mm above the base, the C4 about 1.7 mm above the base. Proximal to the origin of each C3 is a short costal ridge about 0.35–0.45 mm in length that is initially aligned with the C3 but distally is curved outward toward its adjacent S1, terminating in the intercostal groove that will be aligned with the future C4, altogether resulting in a zone of 12 such short costal ridges at a height of 1.0–1.4 mm above the base (Fig. 6C). In upper corallum C1–3 equal in width (about 65 μm), whereas C4 are about half this width, but all costae equal in height and exsertness. But in the basal part of the corallum, below the origin of the C4, the C1–3 usually bear thin, continuous lateral ridges that project into the intercostal groove nearly obscuring it and essentially doubling the width of these costae. Intercostal grooves about 75 μm in width near calicular edge and bridged by regularly spaced bars, each bar 60–70 μm in width, delimiting rather deep, elliptical pits that are up to 100×70 μm in diameter, the greater diameter aligned with the groove. Approximately 20 pits occur in each intercostal groove adjacent to a C1.

Septa hexamerally arranged in 3 complete cycles (24 septa) having the septal formula: S1>S2>S3. S1 highly exsert (up to 0.3 mm), with extremely sinuous axial edges (Fig. 5F) that reach almost to the cental palar structure; S1 about 60 μm thick at calicular edge. S2 equally exsert, about 90% width of an S1, also having quite sinuous axial edges. S3 less exsert (0.15 mm), about 75% the width of an S1, and have sinuous axial edges that fuse with the axial edges of their adjacent S2 deep in the fossa, not easily visible in an intact specimen. Although C4 are well developed, there is no trace of S4. In fact, the region that would correspond to an S4 is slightly grooved internally (Fig. 5F). All septa bear tall (up to 50 μm), rounded granules on their faces arranged in rows in the crests of the septal undulations. Centre of fossa occupied by 6 robust, lamellar P2, each about 0.25 mm in width, the axial edges of the 6 P2 fused together and altogether forming a single robust axial structure that rises to the level of the calicular edge.

Remarks. As seen in Table 5, *C. formosus* is distinguished from the two other Recent species in the genus by having flanged costae; tall, but slender C4; sinuous septal axial edges; and pali that rise to the edge of the calice. Not noted in the table is the peculiarity that most specimens bear 12 short, disjunct C3 near the base of the corallum.

Etymology. *formosus*, Latin for "beautifully formed".

Distribution. Beagle Gulf, NT; Marion Plateau, Queensland; 320–367 m.

Conocyathus gracilis Cairns, 1998

Trematotrochus zelandiae.–Folkeson, 1919: 14 (**WA**).
Conocyathus zelandiae.–Wells, 1964: 113–114 (in part: **Western Australian** specimens).–Cairns, 1995: 83 (in part: USNM 80852, 80851).–Cairns & Zibrowius, 1997: 140–141 (**NT**).
Conocyathus gracilis Cairns, 1998: 388–390, figs. 5i, 6a–d (**NT, WA**).–Griffith & Fromont, 1998: 231–232 (**type deposition**).

New records. NORTHERN TERRITORY: "San Pedro Sound", 9°30'S 132°34'E, 124 m, 8, AM G15374; "San Pedro Sound", 10°17'S 132°38'E, 65 m, 2, AM G15287.

Types. The holotype is WAM 31–85; paratypes are split among WAM, USNM, and MNHN (Griffith & Fromont, 1998). Type Locality: 19°34.5'S 116°08'E (off Glomar Shoal, NW of Dampier Archipelago, Western Australia), 101 m.

Remarks. The additional specimens reported herein are considerably larger than those of the type series, the largest 3.25 mm in CD and 7.7 mm in height, but the coralla are distinctively slender (high D: H) and have deeply recessed paliform lobes (see Table 5).

Table 5. Distinguishing characteristics of the three Recent species of *Conocyathus* d'Orbigny, 1849.

	Conocyathus formosus n.sp.	*Conocyathus zelandiae*	*Conocyathus gracilis*
CD max.	2.67 mm	3.4 mm	3.25 mm
H:D	1.62–1.88	1.8	2.4–3.1
Costal shape	C1–3 flanged near base; each costa of uniform width	Evenly rounded (no lateral flange); individual costae vary in width	Rounded or ridged (no lateral flange); each costa of uniform width
Size of C4	As tall as C1–3 but thinner	As tall and wide as C1–3	Vestigial, low
Axial edges of S3	Fuse to axial edges of adjacent S2 low in fossa; sinuous	Fuse to outer edges of P2 high in fossa	Fuse to axial edges of adjacent S2 low in fossa; straight
Height of P2	Even with calicular edge	Exsert, above calicular edge	Deeply recessed in fossa
Columella	Solid fusion in centre (no central cavity)	Solid fusion in center, but with a central cavity	Fused in centre but with central cavity
Distribution	Northern Territory and Queensland; 320–367 m	Indo-West Pacific; 4–137 m	Western Australia and Arafura Sea; 22–291 m

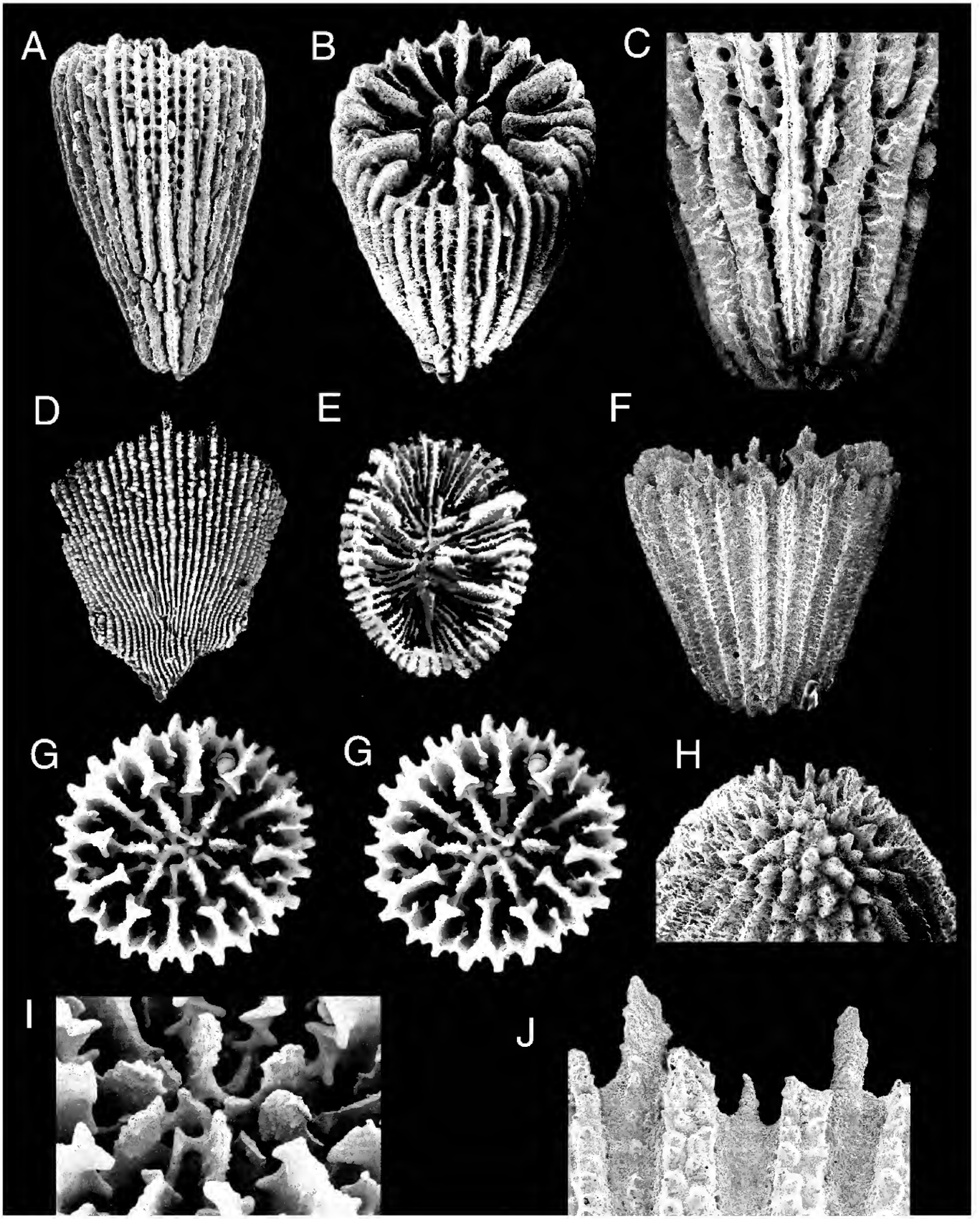

Fig. 6. (*A–C*), *Conocyathus formosus* (*A, C*, paratype, USNM 1008831, CD=2.5 mm; *B*, holotype, CD=2.76 mm): lateral, oblique calicular, and lateral basal views, the latter showing the short, disjunct costae, ×15, ×16.5, ×9.6 respectively. (*D, E*), *Endopachys australiae* (=*Cyathotrochus pileus*), holotype, Macleay Museum, lateral and oblique calicular views, both ×3.5 (GCD=12.4 mm). (*F–J*), *Dunocyathus wallaceae* (*F, G, I*, holotype, AM G16744, GCD=4.4 mm; (*H, J*), paratype, USNM 1008835, intercostal width = 0.23 mm): (*F, G*), lateral and stereo calicular views, both ×10.8; (*H*), spiny base, ×21; (*I*), palar and columellar region, ×21; (*J*), detail of thecal edge showing alternation of septa and costae, ×44.

Conocyathus zelandiae Duncan, 1876

Conocyathus zelandiae Duncan, 1876: 431, pl. 38, figs. 1–3.–Tenison-Woods, 1878b: 294, 295 (remarks).–Wells, 1958: 262 (**listed**); Squires, 1961: 18 (**listed**).–Wells, 1964: 113–114 (in part: all but Western Australian specimens, **Qld, NSW**).–Veron, 1986: 607 (**listed**).–Filkorn, 1994: 16 (remarks).–Cairns, 1995: 83–84 (in part: not USNM 80851, 80852, **WA, NSW**, **NZ**, synonymy, description).–Not Cairns & Zibrowius, 1997: 140–141 (=*C. gracilis*).–Cairns, 1997: 23 (listed); 1998: 388, figs. 5d–h (**WA**).

Conocyathus sulcatus.–Tenison-Woods, 1878b: 302 (**NSW**).–Squires, 1961: 18 (**listed**).

Conocyathus scrobiculatus Dennant, 1902b: 260–261, pl. 6, figs. 1a,b (Eocene of **Vic**).

Not *Trematotrochus zelandiae*.–Folkeson, 1919: 14 (=*C. gracilis*).

Turbinolia australiensis Gardiner, 1939: 332–333, pl. 21, figs. 1–2 (**NSW**).

New records. NEW SOUTH WALES: 33°50.6'S 151°16.6'E (Green Point, Watson's Bay, Port Jackson), 9–15 m, June 1865, 2, AM G16618; 33°50.8'S 151°16.7'E (Watson's Bay, Port Jackson), 50, AM G7023; 33°51'S 151°16'E (Port Jackson), depth and date unknown, 3, AM G381 and G7956; Green Point, Port Jackson, 1 specimen identified as *Turbinolia costata*, BM.

Types. Two syntypes of *C. zelandiae* are BM 1890.2.27.2–3. Type Locality: Cook Strait, New Zealand (but see Cairns, 1995), depth unknown.

The holotype of *C. scrobiculatus* is NMV P27097. Type Locality: Eocene of Spring Creek, near Geelong, Victoria.

The holotype of *T. australiensis* is presumed to be at BM, but has not been examined. Type Locality: Port Jackson, NSW, depth unknown.

Cyathotrochus pileus (Alcock, 1902)

Figs. 6D,E

Not *Trochocyathus victoriae* Duncan, 1870: 296.

Trochocyathus victoriae.–Tenison-Woods, 1878b: 304 (**NSW**).–Wells, 1964: 109 (**listed**).–Veron, 1986: 606 (**listed**).

Endopachys australiae Tenison-Woods, 1878b: 333, pl. 6, figs. 1a–c (**NSW**), new synonym.

Trochocyathus (T.) pileus Alcock, 1902c: 15–16, pl. 2, figs. 11, 11a.

Platytrochus victoriae.–Wells, 1958: 262 (**listed**).–Squires, 1961: 19 (**listed**).–Wells, 1964: 109 (**listed**).

Tropidocyathus pileus.–Cairns, 1989a: 34–35, pl. 17, figs. a–h (**Qld**, synonymy, description); 1994: 68, pl. 29, figs. d,e (description); 1995: 91, pl. 28a–c (**NZ**).–Cairns & Zibrowius, 1997: 147–148, figs. 19h,i (remarks).

Cyathotrochus pileus.–Cairns, 1997: 16 (**NT**, new combination, synonymy); 1998: 392 (**WA**); 1999a: 110–111 (remarks)

New records. NEW SOUTH WALES: 31°01.9'S 153°13.9'E, 274 m, 1, AM G15536; 32°55'S 152°34'E (east of New Castle), 292 m, 2 July 1959, 1, AM G15415; 34°03'S 151°10'E (off Cronulla), depth and date unknown, 2, AM G15322 and G15416. —QUEENSLAND: Kimbla 3, 5, AM G16602; Kimbla 15, 1, AM G16580; Cidaris I 43-2, 10, MTQ G55740; Cidaris I 46-3, 3, MTQ G55741; Cidaris I 47-2, 4, MTQ G55742; Franklin 03/99/D10, 1, USNM 1008745. —WESTERN AUSTRALIA: Bhagwan 1, 1, WAM Z13052; Bhagwan 17, 9, WAM Z13197; Bhagwan 18, 12, WAM Z13130 and Z13183; Lady Basten 103403, 2, WAM Z16017.

Types. Four syntypes of *T. pileus* are ZMA Coel. 7352 and 1326. Type Locality: 5°43'N 119°40'E (Sulu Archipelago), 522 m.

The holotype of *E. australiae* (Figs. 6D,E) is deposited at the Macleay Museum. Type Locality: Port Stephens, NSW, 146 m.

Remarks. Although *Endopachys australiae* has nomenclatural priority over *C. pileus* by several decades, that name was never used a valid name after its original description, whereas *pileus* has been widely used and accepted for this common deep-sea coral. Thus, according to article 23.9.1 of the ICZN (1999), *Endopachys australiae* is considered to be a *nomen oblitum* and *C. pileus* to be a *nomen protectum.*

Deltocyathoides orientalis (Duncan, 1876)

Deltocyathus orientalis Duncan, 1876: 431, pl. 38, figs. 4–7.

Peponocyathus orientalis.–Veron, 1986: 608 (undocumented record from **Qld**).

Peponocyathus australiensis.–Cairns, 1989a: 30–32, pls. 14d–j, 15a–d (description, synonymy).–Cairns & Parker, 1992: 39–40, figs. 13c,d (**SA**).–Cairns, 1994: 65–66, pls. 28c–f, 41i (synonymy, description).

Deltocyathoides orientalis.–Cairns & Zibrowius, 1997: 144–145 (**NT**).–Cairns, 1997: 16–17, pls. 1h, 7f (discussion); 1998: 392 (**WA**); 1999a: 111 (remarks).

New records. SEAMOUNTS: Franklin 05/89/40 (Gifford Guyot), 4, AM G15501 and G15558. —QUEENSLAND: Cidaris I 43-2, 1, MTQ G56428. —NORTHERN TERRITORY: "San Pedro Sound", 9°30'S 132°34'E, 124 m, 1, AM G15268. —WESTERN AUSTRALIA: Bhagwan 15, 1, WAM Z13175.

Types. The holotype appears to be lost (Zibrowius, 1980). Type Locality: 34°12'N 136°20'E (southeastern Honshu, Japan), 95 m.

Dunocyathus parasiticus Tenison-Woods, 1878

Dunocyathus parasiticus Tenison-Woods, 1878b: 305, pl. 5, figs. 4a,b (**NSW**).–Dennant, 1906: 159 (**SA**).–Howchin, 1909: 246 (**listed**).–Wells, 1958: 266, pl. 1, figs. 16–17 (**Tas**).–Squires, 1961: 18 (**listed**).–Wells, 1964: 109 (**listed**).–Veron, 1986: 607 (**listed**).–Cairns & Parker, 1992: 41–42, figs. 13e, 14a, d (synonymy, description, **SA, Vic, Tas**).–Cairns, 1997: 21, pls. 2k, l, 5h, 8a. (synonymy, remarks).

Deltocyathus rotaeformis Tenison-Woods, 1878b: 306–307, pl. 5, figs. 2a,b (**NSW**).–Dennant, 1906: 154 (**SA**).–Howchin, 1909: 246 (**listed**).

New records. VICTORIA: Tangaroa 81-T-1-170, 2, NMV F67813. —NEW SOUTH WALES: Kapala 78/27/01, 13: 10, AM G15292 and 3, USNM 83012; Kapala 85/21/06, 1, AM G16575; Kapala 86/01/03, 2, AM G16577; Thetis 49, 26: 23, AM G12064 and G14469 and 3, USNM 83009; 33°50'S 151°39'E (east of Sydney), 150 m, 1, AM G15337; 33°53'S 151°13'E, 300 m, 5, AM G15508. —QUEENSLAND: Franklin 03/99/D7, 1, USNM 1008589; Franklin 03/99/D8, 2, USNM 1008585; Franklin 03/99/D10, 25, USNM 1008586; Franklin 03/99/D11, 132: 130, USNM 1008584 and 2, ZMUZ; Franklin 03/99/D12, 4, USNM 1008587; Franklin 03/99/D13, 1, USNM 1008588; Franklin 03/99/D14, 4, USNM 1008583; Cidaris I 43-2, 11, MTQ G56427; Kimbla 2, 3, USNM 78578 and 78579.

Types. *Dunocyathus parasiticus*: The holotype, labelled as "*Paracyathus australiae* TW" (an unpublished binomen), is deposited at the Macleay Museum. Type Locality: off Port Jackson, NSW, 45 fathoms (=82 m).

Deltocyathus rotaeformis: Although Tenison-Woods cited only 6 syntypes for this species, 18 syntypes are listed at AM G7020. Type Locality: Port Stephens, NSW, 71 fathoms (=130 m).

Dunocyathus wallaceae n.sp.

Figs. 6F–J

Records/Types. Holotype: Franklin 03/99/D11, AM G16744. Paratypes: Franklin 03/99/D8, 2 (including SEM 1001), USNM 1008835; Franklin 03/99/D10, 2, USNM 1008836; Franklin 03/99/D11, 21: 17, USNM 1008837, 2, WAM Z20516, and 2, ZMUZ; Franklin 03/99/D12, 2,

USNM 1008838; Franklin 03/99/D14, 1, USNM 1008839. Type Locality: 20°14.490'S 151°47.530'E (Marion Plateau, Queensland), 342 m.

Description. Corallum (anthocyathus) solitary, ceratoid to trochoid in shape (edge angle 30–35°), with a blunt, rounded, unattached base. Largest specimen (holotype) 4.4×4.1 mm in CD and 4.8 mm in height. Calice slightly elliptical, the GCD:LCD ranging from 1.07 to 1.14. Costae straight and continuous from calice to a point approximately 0.6–0.8 mm above the base, which corresponds to a corallum diameter of about 1.9–2.0 mm. This basal region is sometimes delimited by a faint circumferential line, below which the corallum bears 20–30 small (0.15–0.20 mm tall), triangular spines (Fig. 6H), and is assumed to be the region of the anthocyathus that is immersed in the basal anthocaulus just before dehiscence, although an anthocaulus has not been definitely identified in the material at hand. Costae near calice rectangular in cross section, as in *D. parasiticus*, with flat granular tops about 0.20 mm in width and vertical edges, but toward the base the costae become more triangular in cross section. Two mammiform granules occur across the width of a costa near the calice; granules 0.06–0.08 mm in diameter. Upper edges of costae exsert, projecting approximately 0.30 mm above the calicular edge, and alternate in position with the septa, as is characteristic for the genus. Intercostal grooves are wide (up to 0.25 mm near the calice) and flat (Fig. 6J). Corallum white.

Septa hexamerally arranged in 3 cycles (24 septa) according to the formula: S1>S2>>S3, the full third cycle present in a corallum as small as GCD 2.7 mm. S1 up to 0.5 mm exsert and have very sinuous axial edges, which in turn are bordered by very slender (0.15–0.20 mm) paliform lobes. S2 only slightly less exsert and wide as the S1, also having very sinuous axial edges, but bordered by much larger and taller paliform lobes, the width up to 0.50 mm, or about the same width as the septa they border. S3 less exsert, rising just above the level of the exsert costae, and are very narrow, having a finer axial edge sinuosity and a laciniate axial margin. Fossa relatively shallow, the upper edges of the P2 rising to the level of the calicular edge. The 6 P2 form a crown encircling a small papillose columella composed of 1–4 interconnected elements.

Remarks. Only one other species is known in this genus, *Dunocyathus parasiticus* Tenison-Woods, 1878, also known only from eastern Australia. They are similar in costal morphology, and septal and palar configuration and the fact that they have alternating costae and septa, but differ primarily regarding corallum shape, the anthocyathus of *D. wallaceae* being conical, that of *D. parasiticus* tympanoid (discoidal). *Dunocyathus wallaceae* also differs in having a tuberculate base, a coarser costal granulation, a slightly elliptical calice (that of *D. parasiticus* is circular), and less well-developed S3.

Etymology. Named in honour of Carden Wallace (MTQ), for her contributions to scleractinian taxonomy.

Distribution. Known only from the Marion Plateau, Queensland, 320–414 m.

Endocyathopora laticostata Cairns, 1989

Endocyathopora laticostata Cairns, 1989a: 39–40, pl. 21, figs. a–e.–Cairns & Zibrowius, 1997: 141 (remarks).–Cairns, 1997: 27, pls. 3l, 6d, 9g–i (remarks).

New record. NORTHERN TERRITORY: 12°28.35'S 130°50.95'E (Darwin Harbour), depth unknown but probably within SCUBA range, 3, NTM C8138.

Types. The holotype (USNM 81894) and paratypes are deposited at USNM. Type Locality: 6°44'45"N 121°48'E (Sulu Sea off Basilan Island), 46 m.

Foveolocyathus kitsoni (Dennant, 1901)

Figs. 7A–G

Trematotrochus Kitsoni Dennant, 1901: 50–51, pl. 2, figs. 2a–c (**SA** as a fossil).–Bell, 1981: 10 (**type deposition**).
Foveolocyathus kitsoni: Cairns, 1997: 27 (**listed**).

New records. VICTORIA: Balcombian (Late Miocene) of Port Philipp, 15 including SEM 1003, USNM 67981.—QUEENSLAND (Marion Plateau): Franklin 03/99/D10, 4, USNM 1008759; Franklin 03/99/D11, 18: 17 (including SEM 1002) USNM 1008764 and 1, ZMUZ; Franklin 03/99/D12, 2, USNM 1008760; Franklin 03/99/D13, 6, USNM 1008761.

Types. Dennant reported this species to be abundant in the fossil record of South Australia, and designated a single specimen as type (holotype), but Bell (1981) listed syntypes as NMV P27082. Type Locality: Eocene of South Australia.

Diagnosis (of Recent specimens). Corallum conical and slightly compressed, the GCD:LCD ranging from 1.13–1.27. Largest corallum (Franklin 03/99/D11) 3.77×2.98 mm in CD and 5.67 mm in height. Costae rounded and equal in width (0.15–0.18 mm), covered by low spines 30–35 µm in height that project outward from the costae as well as laterally into the intercostal spaces. Intercostal furrows quite deep, about the same width as a costa (0.15 mm) and periodically bridged by slender bars about 75 µm in width, delimiting depressions 0.11–0.13 mm in length. Although these depressions appear to be pores, they do not penetrate the theca and are thus more properly termed pits. Most costae run from calice to base, but the medial C2 is part of a costal trifurcation involving its pair of flanking C3, the trifurcation occurring just above the base (Fig. 7E). Another trifurcation involves the S3 in each of the four end half-systems and their adjacent pairs of C4, these trifurcations occurring half to three-quarters of the distance from the calice to the base. Septa hexamerally arranged in 3 cycles with an additional 4 pairs of S4 in the end half-systems, for a total of 32 septa. The 6 S1 and 2 medial S2 are equal in size, highly exsert (about 1 mm), and have slightly sinuous axial edges. The other 4 S2 are equally exsert but only about 85% the width of an S1. The 4 S3 in the 4 end half-systems are accelerated in size to about 75% the width of an S1, and each is flanked by a pair of S4. Their axial edges bend toward and fuse with their adjacent S2. The remaining 8 S3 and the 8 pairs of S4 are of equal exsertness (0.3 mm) and width (about 50% width of an S1). Axial edges of S1–2 and accelerated S3 are fused to a horizontal, central columella platform from which 2–4 slender columella papillae arise. Fossa very shallow, the columellar platform almost at the level of the calice.

Remarks. Four species of *Foveolocyathus* are known (Cairns, 1997): two Recent species endemic to eastern Australia and two Tertiary (Eocene to Miocene) species endemic to southern Australia. The shape of the corallum (GCD:LCD = 1.13–1.27) and number of septa (32) rule out an identification as either of the two Recent species, as well

as one of the fossil species. The specimens described above are remarkably similar to the fossil species *F. kitsoni*, heretofore known only from the Eocene of South Australia and herein reported from the Late Miocene (Balcombian) and Victoria (Figs. 7C,D,F). Although Dennant (1901) described the species based on a type with a GCD of 5.5 mm and having 40 septa, coralla less than 4.0 mm in GCD (e.g., some from USNM 67981), have only 30–32 septa arranged in the same manner as the Recent specimens, all of which are less than 4 mm in GCD and have 32 septa. Furthermore, the GCD:LCD range of 1.13–1.27 is consistent with that of the fossil specimens, 1.14–1.31 (including those from USNM 67981). The only substantive difference between the fossil and Recent specimens is that the intercostal width of the fossil coralla is only about half that (i.e., 65–80 μm) of the Recent specimens (Figs. 7F,G), which produces intercostal pits that are elongate (i.e., twice as long as wide) instead of circular, as in the Recent coralla. Even with this difference, the Recent specimens are considered to be morphologically indistinguishable in most respects from those in the Miocene, and thus is identified as such.

Foveolocyathus parkeri n.sp.

Trematotrochus verconis.–Cairns & Parker, 1992: 30–31, figs. 9a,e (**SA**).–Cairns, 1998: 388, figs. 4h,i, 5a–c (synonymy, **WA**).

Foveolocyathus verconis.–Cairns, 1997: 26–27, pls. 3e, 6b, 9f (remarks).

Holotype. The specimen incorrectly designated as neotype of *Trematotrochus verconis* by Cairns & Parker (1992): SAM 542. Type Locality: Cape Borda, Kangaroo Island, 101 m.

Remarks. As explained below, my previous concept of *F. verconis* was re-evaluated when I examined the rediscovered type material of *T. verconis* and realized that it was conspecific with *Foveolocyathus alternans* Cairns & Parker, 1992. Thus, the species *F. alternans* becomes a junior synonym of *F. verconis*, and the species I had understood as *F. verconis* and for which I designated a neotype (Cairns & Parker, 1982) requires a new name. For this species, fully described and illustrated by Cairns & Parker (1992) and Cairns (1998), I now rename *Foveolocyathus parkeri*, in honour of Shane Parker.

Distribution. Southwestern Australia and South Australia; 73–183 m.

Foveolocyathus verconis (Dennant, 1904)

Conocyathus compressus Tenison-Woods, 1878b: 302–303 (in part: paralectotype), **NSW**.

Trematotrochus verconis Dennant, 1904: 5–6 (pl. 1, fig. 4), **SA**.–Howchin, 1909: 45 (**listed**).–Wells, 1958: 262 (**listed**).Squires, 1961: 19 (**listed**).–Shepherd & Veron, 1982: 176, figs. 4.54b (**listed**).–Veron, 1986: 607 (**listed**).–Stranks, 1993: 21 (**type designation**).–Not Cairns, 1988: 388 (=*F. parkeri*).–Not Cairns, 1997: 26–27, pls. 3e, 6b, 9f (=*F. parkeri*).

Trematotrochus alternans Cairns & Parker, 1992: 31–32, figs. 8f–h, 9b,c (**SA, Vic, NSW, WA**).–Stranks, 1993: page 1 of addendum (**type deposition**).–Cairns, 1998: 364 (**listed**).

Foveolocyathus alternans.–Cairns, 1997: 27, pl. 6c (new combination).

New records. TASMANIA: Tangaroa 81-T-1-162, 1, NMV F67803; Tangaroa 81-T-1-194, 1, NMV F67822; 81-T-1-201, 2, USNM 92995. —NEW SOUTH WALES: Thetis 49, 2, AM G11963. —QUEENSLAND: Gillett Cay, Swain Reef, 64–73 m (station VI), 1, AM G15381.

Types. Dennant (1904: 6) described the species based on "the type" (=holotype) and an unspecified number of worn specimens from St. Vincent Gulf and Backstairs Passage. The holotype was stated to measure 6×3 mm in CD and 7.3 mm in height. Not able to find type material of *Trematotrochus verconis* Dennant, 1904, Cairns & Parker (1992) established a neotype (SAM H542) from the Verco collection that was collected close to the type locality. From Dennant's figures, they inferred that Dennant included two species in his description: a species having 40 septa and 4 size classes of septa, which Cairns & Parker considered to be typical *T. verconis*, and a species with a more elongate corallum and more septa, and only 3 size classes of septa, which they named *T. alternans* n.sp. But, a year later, Stranks (1993) discovered 17 of the purported types of *T. verconis* at the NMV (F43270). Ironically, all of these type specimens, including one that corresponds to the exact measurement of the holotype (recently recatalogued as F96127), correspond to the species Cairns & Parker described as *T. alternans*. According to the ICZN (1999: article 75.8), a neotype must be set aside if the original type material is discovered, so *F. verconis* is the name that must apply to the species having the more elongate calice and higher number of septa arranged in three size classes (*F. alternans* sensu Cairns & Parker, 1992). Thus, a new name must be provided for the species referred to as *F. verconis* by Cairns & Parker (1992), i.e., *F. parkeri*.

The holotype of *F. alternans* is deposited at the SAM (H547); paratypes are also deposited at the SAM, NNM, NMV, and USNM. Type Locality: St. Francis Island, South Australia, 27–37 m.

Holcotrochus crenulatus Dennant, 1904

Fig. 7H

Holcotrochus crenulatus Dennant, 1904: 3–4, pl. 2, figs. 4a–c (**SA**).–Howchin, 1909: 244 (**listed**).–Shepherd & Veron, 1982: 177–178 (**listed**).–Squires, 1961: 18 (**listed**).–Veron, 1986: 608 (**listed**).–Cairns & Parker, 1992: 34, figs. 10a, c, d (**SA**).–Stranks, 1993: 20, 23–24 (**type deposition**).–Cairns, 1997: 22 (**listed**).

Holcotrochus cuneatus.–Wells, 1958: 252 (**listed**).

New records. TASMANIA: Tangaroa 81-T-1-200, 2, NMV F67869 and F67825; Tangaroa 81-T-1-205, 1, NMV F67871; Hai-Kung 81-HK-1-125, 3, NMV. —VICTORIA: Hai-Kung 81-HK-1-121, 3, NMV F67817; Tangaroa 81-T-1-201, 1, NMV. —QUEENSLAND (Marion Plateau): Franklin 03/99/D10, 5 (including SEM 997), USNM 1008595; Franklin 03/99/D11, 10: 9, USNM 1008593 and 1, ZMUZ; Franklin 03/99/D13, 2, USNM 1008596; Franklin 03/99/D14, 1, USNM 1008594.

Types. The holotype appears to be lost (Stranks, 1993), although Bell (1981) lists a "hypotype" at NMV (P12431) and Stranks (1993) lists two specimens as possible types also at NMV. Type Locality: Backstairs Passage, South Australia, 40 m.

Holcotrochus scriptus Dennant, 1902

Holcotrochus scriptus Dennant, 1902a: 1–2, pl. 1, figs. 1a,b (fossil of **Vic**); 1904: 3 (**SA**).–Howchin, 1909: 244 (**listed**).–Wells, 1958: 262 (**listed**); 1959: 286, pl. 1, figs. 6–7 (**Qld**).–Squires, 1961: 18 (**listed**).–Wells, 1964: 109 (**listed**).–Shepherd & Veron, 1982: 177–178 (**listed**).–Veron, 1986: 608 (**listed**).–Cairns & Parker, 1992: 32–34, figs. 9d,f,g (**SA**, fossil of **Vic**).–Cairns, 1997: 22, pl. 2g (remarks).

New records. TASMANIA: Tangaroa 81-T-1-205, 2, NMV F67871; Hai-Kung 81-HK-1-125, 5: 2, ex NMV F67818, and 3, USNM 92991.

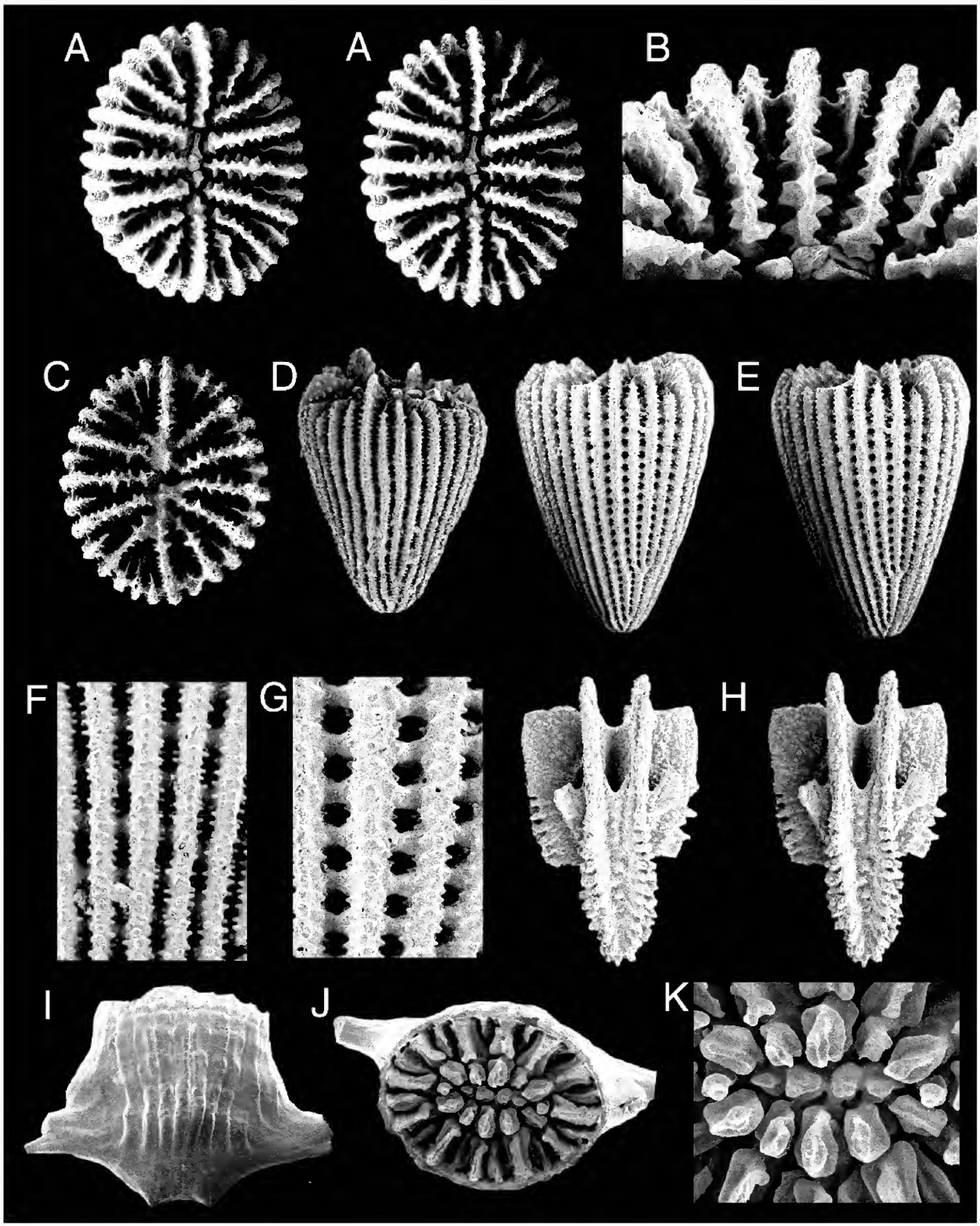

Fig. 7. (*A–G*), *Foveolocyathus kitsoni* (*A, B, E, G*, USNM 1008764, Franklin 03/99/D11, GCD=3.3 mm; *C, D, F*, Miocene, Victoria, USNM 67981, GCD=3.3 mm): (*A, B*), stereo calicular view and detail of septa, ×13, ×26, respectively; (*C, D*), calicular and lateral views of fossil specimen, both ×13; (*E*), stereo lateral view, ×10.5; (*F, G*), detail of costae and intercostal depressions of fossil and Recent specimens, both ×36. (*H*), *Holcotrochus crenulatus*, USNM 1008595, lateral view of juvenile specimen, ×26 (CD=1.15 mm). (*I–K*), *Idiotrochus alatus*, holotype, AM G16699: (*I, J*), lateral and calicular views, ×8.0, ×9.1, respectively; (*K*), detail of columella and pali, ×19.5 (GCD=4.21 mm).

—QUEENSLAND: Franklin 03/99/D11, 1, USNM 1008742; 23°32'S 151°44'E (off Masthead Island), depth unknown, June 1865, 3, AM G14467 and G16424.

Types. The holotype is NMV P27086. Type Locality: Middle Miocene of Muddy Creek, Victoria.

Idiotrochus alatus n.sp.

Figs. 7I–K, 8A–C

Records/Types. Holotype: Franklin 05/89/40, AM G16699. Paratypes: Franklin 03/99/D11 (Marion Plateau, Queensland), 3, USNM 1008840; Bathus 4–883 (southwest of New Caledonia), 1, USNM 1008841. Type Locality: 26°45.27'S 159°30.59'E (Gifford Guyot, LHSMC), 315–360 m.

Description. Corallum (anthocyathus) compressed-conical, having rounded thecal faces and edges, the latter diverging at an angle of about 25°, although this measurement is masked by the prominent edge spines. Largest specimen (holotype) 4.21×3.45 mm in CD and 4.85 mm in height. Calice elliptical, the GCD:LCD of larger specimens 1.2–1.3, whereas smaller coralla are more circular (GCD:LCD 1.1–1.2). Base of corallum terminates in a crescent-shaped scar, measuring 1.5–2.0×1.2–1.3 mm, which, in one paratype was overgrown by theca. Costae flat to slightly convex, smooth, often porcellaneous, 0.40–0.50 mm in width, alternating in position with the septa. Intercostal grooves narrow (0.04–0.06 mm) and fairly shallow, one corresponding to the midline of each septum. Prominent thecal edge spines occur on each thecal edge just above the basal scar, projecting perpendicular to the corallum as much as 3.4 mm in length and 1.5 mm in basal diameter. These spines appear to be a composite of 2 spines, a smaller lower spine having a distal diameter of about 0.25 mm and an upper larger spine having a diameter of about 0.5 mm, both having a common base and thus bifurcating distally. Each of these large spines is covered by 6 costae, the 3 on each side of a principal septum: the pair of costae that flank a principal septum cover the upper part of the spine; the costal pair adjacent to that cover the sides of the spine; and the costal pair adjacent to those fuse and cover the lower part of the spine. In the 2 larger coralla examined, just distal (0.5 mm up) to these basal thecal spines is an indication of another, much smaller spine, but in both specimens this spine was broken and occurred on only one side of the corallum. Corallum white. Anthocaulus unknown.

Septa hexamerally arranged in 3 complete cycles (24 septa) according to the formula: S1–2>S3. S1 have vertical, extremely sinuous axial edges that reach about half way to the columella; rounded upper edges that rise about 0.4 mm above the uppermost calicular edge; and outer edges that curve downward before meeting the theca, resulting in a thin, very delicate thecal rim extending only about 0.15 mm above the point at which the septa join the theca. S3 less exsert, about three-quarters width but much thinner than S1–2, also having sinuous axial edges. All septa bear prominent horizontal carinae on their faces, sometimes corresponding to the summits of the septal undulations, but sometimes occurring on opposite sides of a septum and wrapping around the axial edge, thus producing a small platform around the septum which usually overlaps with the platform of adjacent septa at a slightly different level. Paliform lobes of 3 size classes occur before the first 2 cycles of septa, forming an elliptical crown of 12 elements. The 2 smallest paliform lobes occur before the principal S1, and are about as wide as they are thick. The other 4 P1 are about 3 times the width of a principal P1. The 6 P2 are about 1.5 times as wide as the larger P1 and rise slightly higher in the fossa. All paliform lobes highly sinuous and ridged, like the septa, the characteristic horizontal septal platforms also present on the faces of the paliform lobes, often continuous with those of the septa. Fossa absent, the paliform lobes and columella rising to the calicular edge. Columella consists of 4 or 5 linearly arranged, twisted papillae.

Remarks. Three previously described species of *Idiotrochus* are recognized (Cairns, 1997): *I. emarciatus* Duncan, 1865 (Oligocene–Recent, Victoria and South Australia), *I. australis* (Duncan, 1865) (Middle Miocene, Victoria); and *I. kikutii* (Yabe & Eguchi, 1941) (western Pacific). The calicular (septa, paliform lobes, columella) and costal characteristics of these three species, as well as *I. alatus*, are remarkably similar, the species being differentiated essentially on the shape of their coralla. *Idiotrochus alatus* is most similar to *I. australis* (Figs. 8D,E) in corallum shape, both species having prominent thecal spines and a similar corallum size. *Idiotrochus alatus* differs in a variety of small ways, including having: two pairs of spines that are horizontally oriented (vs one pair oriented obliquely downward in *I. australis*), a thin thecal rim, thinner intercostal grooves, and platform-like septal carinae. Furthermore, the costae of *I. australis* are slightly granular, and large specimens have a vestigial costa associated with each principal S1, which continues down to the basal spine.

Etymology. *alatus*, Latin for "winged", an allusion to the prominent thecal edge spines.

Distribution. Marion Plateau, Queensland; Gifford Guyot; southwest of New Caledonia; 315–450 m.

Idiotrochus emarciatus (Duncan, 1865)

Sphenotrochus emarciatus Duncan, 1865: 183–184, pl. 8, figs. 2a–d (Miocene of **Vic**).

Sphenotrochus excicus Duncan, 1870: 298, pl. 19, fig. 6 (Miocene of **Vic**) (junior objective synonym).

Sphenotrochus emarciatus var. *perexigua* Dennant, 1906: 151–152 (**SA**).–Howchin, 1909: 245 (remarks).–Stranks, 1993: 20, 23 (remarks on types).

Idiotrochus emarciatus.–Wells, 1958: 262 (**listed**).–Squires, 1961: 18 (**listed**).–Cairns & Parker, 1992: 40–41, figs. 14e,f (**SA**).–Cairns, 1997: 21, pl. 2f, i.

Idiotrochus perexigua.–Cairns, 1989a: 36, pl. 18c (**SA**).

New records. None.

Types. The holotype of *S. emarciatus* is BM R29276. Type Locality: Miocene of Muddy Creek, Hamilton, Victoria.

The holotype of *S. excicus* is considered to be the same as that of *S. emarciatus*.

Nine syntypes were reported for *S. emarciatus* var. *perexigua*, six of which are deposited at SAM, NNM, and USNM (Cairns, & Parker, 1992; Stranks, 1993). Type Localities: Neptune Island, Cape Jaffa, and Beachport, South Australia, 82–238 m.

Remarks. *Sphenotrochus excicus* Duncan, 1870 is herein considered to be a junior objective synonym of *S. emarciatus* Duncan, 1865 because the descriptions (and figures) of both species are identical. One must assume that Duncan forgot that he had previously published this account in 1865 and inadvertently renamed it five years later.

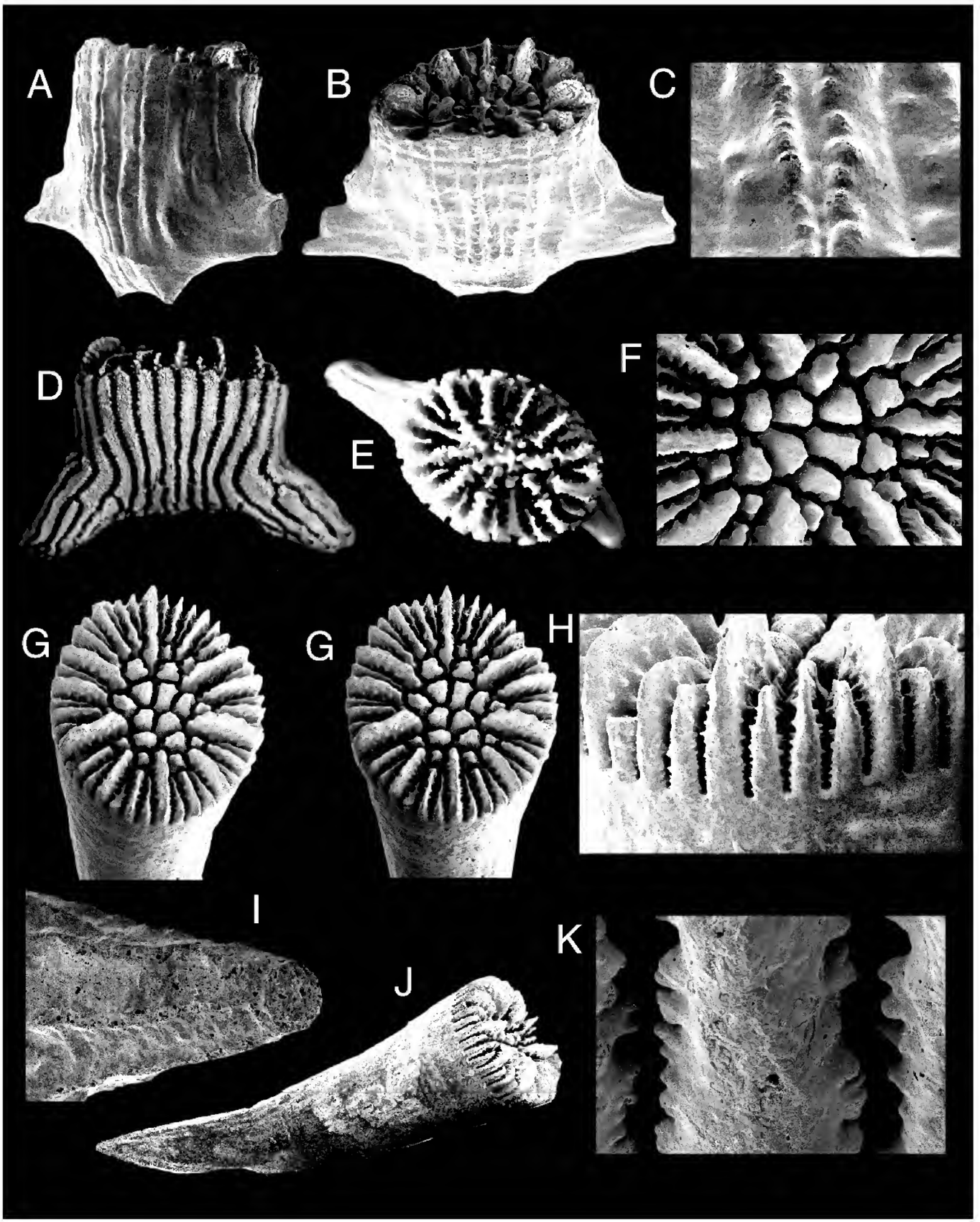

Fig. 8. (*A–C*), *Idiotrochus alatus*, holotype, AM G16699: (*A, B*), oblique edge and oblique lateral views, both ×9.8; (*C*), detail of coarsely granular costa, ×40, (GCD=4.21 mm). (*D, E*), *Idiotrochus australis*, Balcombian (Miocene) of Muddy Creek, Victoria, USNM 77059, lateral and calicular views, both ×7.2 (GCD=5.25 mm). (*F–K*), *Lissotrochus curvatus* (*F–H, J*, holotype, AM G16745, GCD=2.98 mm; *I, K*, paratype, USNM 1008844, basal disc=0.25 mm): (*F*), detail of columellar and palar region showing 14 paliform lobes and 4 columellar elements, ×26; (*G*), oblique stereo calicular view, ×13.5; (*H*), enlargement of thecal edge, ×34; (*I*), basal end, ×55; (*J*), lateral view of holotype, ×9.8; (*K*), enlargement of costae near calicular edge, ×195.

Idiotrochus kikutii (Yabe & Eguchi, 1941)

Placotrochides kikutii Yabe & Eguchi, 1941: 104, 3 figs.
Idiotrochus kikutii.–Cairns, 1989a: 36–37, pl. 18, figs. a,b, d–h (description, synonymy); 1994: 69, pl. 30a–d (remarks).–Cairns & Zibrowius, 1997: 148–149 (remarks).–Cairns, 1997: 20–21, pl. 5g, 7l (listed); 1998: 390 (**WA**); 1999a: 112–113 (remarks).

New records. Queensland (Marion Plateau): Franklin 03/99/D8, 2, USNM 1008746; Franklin 03/99/D10, 206, USNM 1008748; Franklin 03/99/11, 416: 396, USNM 1008768, 10, WAM Z20518, and 10, ZMUZ; Franklin 03/99/D12, 8, USNM 1008765; Franklin 03/99/D13, 27, USNM 1008767; Franklin 03/99/D14, 9, USNM 1008766.

Types. Six syntypes are TIUS 63088. Type Locality: Toyama Bay, Japan, depth unknown.

Remarks. The "new species" alluded to by Cairns & Parker (1992: 41) and Cairns (1997: 21), AM G15236, from Queensland at 150 m, originally thought to be different because of having basal thecal spines, is herein re-identified as *I. kikutii*, not *I. alatus*. From the many additional specimens available for study, it was noted that about 2.5% of the specimens possess short thecal spines, similar to those found on both specimens from AM 15236, but are easily differentiated from *I. alatus* in having parallel thecal edges and faces; only one set of thecal spines, which are considerable smaller; and a smaller corallum size.

Lissotrochus n.gen.

Diagnosis. Corallum ceratoid and cornute, with a pointed base. Calice elliptical in cross section; GCD up to 3.25 mm. Costae broad and rounded, bearing tiny spines laterally; intercostal regions deep and narrow, not pitted or porous; most of theca covered by a thin epitheca. Higher cycle costae originate by trifurcation; costae correspond to septa; C: S = 1. Septa exsert and hexamerally arranged in 4 incomplete cycles. Paliform lobes present before S2 and sometimes P3. Columella papillose.

Type species. *Lissotrochus curvatus*, here designated.

Remarks. Among the 28 turbinoliid genera (Cairns, 1997), *Lissotrochus* is most similar to *Cryptotrochus* and *Pleotrochus*, all three genera having an imperforate theca without transverse division, P2, a papillose columella, and four cycles of septa. But, *Lissotrochus* is quite different from both genera in its cornute, ceratoid shape; smooth (not serrate) costae; elliptical (not round) calice; presence of both P2 and P3 as paliform lobes; and in having an extensive epithecal covering. It is further distinguished from *Pleotrochus* by having costal trifurcations and the same number of costae as septa, and from *Cryptotrochus* by having independently arranged septa.

Etymology. *lissos*, Greek for "smooth" + *trochos*, Greek for "wheel", the latter a common suffix of coral generic names., an allusion to the smooth epitheca of this genus. Gender: masculine.

Lissotrochus curvatus n.sp.

Figs. 8F–K

Records/Types. Holotype: Franklin 03/99/D11, AM G16745. Paratypes: Franklin 03/99/D10, 25, USNM 1008843; Franklin 03/99/D11, 116: 108 (including SEM 1008 and 1009), USNM 1008844, 3, WAM Z20517, and 5, ZMUZ; Franklin 03/99/D12, 10, USNM 1008845; Franklin 03/99/D13, 4, USNM 1008846. Type Locality: 20°14.49'S 151°47.53'E (Marion Plateau, Queensland), 342 m.

Description. Corallum ceratoid, cornute (usually curved about 45° in plane of GCD), and free, the base pointed and about 0.30–0.45 mm in diameter. Largest corallum 3.25×2.95 mm in CD and 9.7 mm in height, the holotype being slightly smaller: 2.98×2.55 mm in CD and 9.2 mm in height. Calice slightly elliptical, the GCD:LCD ranging from 1.06–1.21. Sides of corallum almost completely covered by a thin, smooth epitheca, so thin that the underlying costae are clearly outlined, allowing the observation that the C4 originate by trifurcation with the C3 on the lower third of the corallum. The epitheca terminates about 0.3 mm from the calicular edge, distal to which are costae 0.12–0.15 mm wide and separated by deep, thin (0.03–0.04 mm) intercostal grooves characteristic of a turbinoliid. The sides of the costae bear very small (20 μm tall) blunt spines (Fig. 8K).

Septa hexamerally arranged in 4 incomplete cycles according to the formula: S1>S2–3>S4. Most coralla above a GCD of 2.0 mm contain 44 septa, lacking 2 pairs of S4 on opposites sides of the lateral half-systems. Only one corallum of GCD 2.41 had more septa: 46. A corallum of a GCD 1.8 mm has 36 septa and one of GCD 1.30 has 24. All S4 pairs are inserted into the end half-systems before any occur in the lateral half-systems. S1 moderately exsert (0.65 mm), having vertical sinuous axial edges. S2–3 less exsert, about 80% the width of an S1, also having sinuous axial edges. In some specimens, S3 slightly less wide then S2. S4 least exsert septa, about 65% width of an S1, and have straight axial edges. Fossa shallow, containing a variable number of elements ranging from 2 to 18. In most coralla there are 6 paliform lobes (P2) forming an elliptical crown before the S2, each of which is irregular in shape (not lamellar) and about 0.15 mm in diameter. Most coralla also have 2–6 larger (0.3 mm in diameter), similarly irregularly-shaped rods arranged in a rhomboidal to linear pattern, some, but not all, seemingly adjacent to various S1, resulting in a total of 8–12 fossular elements. These larger rods are interpreted as columellar rods. Finally, in a low percentage of coralla (e.g., the holotype), there is a small rod before some of the S3 that are flanked by pairs of S4, the largest number being eight in the holotype. These are interpreted as paliform lobes and not pali, the latter the result of septal substitution, as their presence is very erratic and often absent even when pairs of S4 are present. The holotype has 6 P2, 8 P3, and 4 columellar elements, for a total of 18 fossular elements (Figs. 8F,G).

Etymology. *curvatus*, Latin "curved", an allusion to the curved corallum of this species.

Distribution. Marion Plateau, Queensland, 342–367 m.

Notocyathus venustus (Alcock, 1902)

Citharocyathus venustus Alcock, 1902c: 22, pl. 3, figs. 19, 19a.
Notocyathus venustus.–Cairns, 1989a: 27–28, pl. 12c–h (description, synonymy); 1994: 64, pl. 27k,l (description, synonymy).–Cairns & Zibrowius, 1997: 143 (remarks).–Cairns, 1997: 17, pls. 1i, 4i, 7g; 1998: 390 (**WA**).

New records. Queensland (Marion Plateau): Franklin 03/99/D11, 1, USNM 1008597; Franklin 03/99/D14, 1, USNM 1008598.

Types. Three of four syntypes are ZMA Coel. 1244. Type Locality: 10°22.7'S 123°16.5'E (Savu Sea, Indonesia), 390 m.

Peponocyathus folliculus (Pourtalès, 1868)

Stephanophyllia folliculus Pourtalès, 1868: 139.
Peponocyathus folliculus.–Cairns, 1979: 113–115, pl. 22, figs. 1–4, pl. 20, fig. 11 (synonymy, description); 1989a: 32–33 (description); 1994: 66–67, pl. 28g–k (synonymy, description).–Cairns & Zibrowius, 1997: 146 (remarks).–Cairns, 1997: 30, pls. 3k, 6h–j; 1999a: 113, figs. 18a,b (synonymy).

New record. QUEENSLAND: Cidaris I 43-2, 9, MTQ G56429.

Type. The holotype is deposited at the MCZ (unnumbered). Type Locality: 24°12'40"N 81°19'25"W (Straits of Florida), 433 m.

Peponocyathus minimus (Yabe & Eguchi, 1937)

Discocyathus (Cylindrophyllia) minimus Yabe & Eguchi, 1937: 146–147, pl. 20. figs. 16–22.
Peponocyathus minimus.–Cairns & Zibrowius, 1997: 145–146, fig. 18i (**NT:** Karubar 61), synonymy, description.

New record. QUEENSLAND: Cidaris I 43-2, 1, MTQ G56430.

Types. Sixty-one syntypes are deposited at TIUS. Type Localities: Neogene of Taiwan and Recent of Toyama Bay, Japan, depth unknown.

Platytrochus compressus (Tenison-Woods, 1878)

Conocyathus compressus Tenison-Woods, 1878b: 302–303 (in part: lectotype, pl. 5, figs. 1a,b) (**NSW**).–Squires, 1961: 18 (**listed**).
Not *Platytrochus compressus*.–Dennant, 1904: 4–5 (=*P. laevigatus*).–Howchin, 1909: 245 (=*P. laevigatus*).–Eguchi, 1973: 85 (=*P. laevigatus*).–Shepherd & Veron, 1982: 178, fig. 4.54d.
Platytrochus compressus.–Howchin, 1909: 245 (**listed**, in part: specimens from type locality).–Wells, 1958: 262 (**listed**).–Squires, 1961: 18 (**listed**).–Wells, 1964: 109 (**listed**).–Veron, 1986: 608 (**listed**).–Cairns & Parker, 1992: 36 (lectotype designation, remarks, **NSW**).–Cairns, 1997: 29 (**listed**).

New records. None.

Types. The lectotype, designated by Cairns & Parker (1992), is deposited at the Macleay Museum; the paralectotype, which is *Foveolocyathus verconis*, is AM G7024. Type Locality: off Port Stephens, 130 m.

Platytrochus hastatus Dennant, 1902

Platytrochus hastatus Dennant, 1902b: 257–258, pl. 5, figs. 2a,b (**SA**).–Dennant, 1904: 4 (in part, **SA**).–Howchin, 1909: 245 (**listed**).–Wells, 1958: 262 (**listed**).–Squires, 1961: 18 (**listed**).–Bell, 1981: 10 (**type deposition**).–Shepherd & Veron, 1982: 178, fig. 4.54j (**SA**).–Veron, 1986: 608 (**listed**).–Cairns & Parker, 1992: 36–37, figs. 11a–f (**WA, SA, Vic**).–Cairns, 1997: 29 (**listed**); 1998: 364 (**listed**).

New records. TASMANIA: Hai Kung 81-HK-1-125, 16: 13, NMV F67818 and 3, USNM 92992; Hai-Kung 81-HK-1-194, 1, NMV F67821; Tangaroa 81-T-1-195, 2, NMV F67824. —VICTORIA: Hai-Kung 81-HK-1-118, 11: 7, NMV F67815 and 4, USNM 92993; Hai-Kung 81-HK-1-119, 7: 5, NMV F67812 and 2, USNM 92994; Hai-Kung 1981-HK-1-120, 3, NMV F67816; Tangaroa 81-T-1-201, 2, NMV F67870.

Types. Two syntypes are deposited at NMV (P27094). Type Locality: Middle Miocene (Balcombian) of Muddy Creek, Victoria.

Platytrochus laevigatus Cairns & Parker, 1992

Platytrochus compressus.–Dennant, 1904: 4–5, pl.1, figs. 3a,b (**SA**).–Howchin, 1909: 245.–Eguchi, 1973: 85, pl. 1, figs. 8–11 (**SA**).–Shepherd & Veron, 1982: 178, fig. 4.54b (**SA**).
Platytrochus laevigatus Cairns & Parker, 1992: 34–36, figs. 10b,e, f–h (**SA, WA**).–Stranks, 1993: addendum (**type deposition**).–Cairns, 1997: 29–30 (**listed**); 1998: 364 (**listed**).

New records. SOUTH AUSTRALIA: PL94-58, 1, QUO; PL94-63, 1, QUO; St. Vincent Gulf, depth unknown, 2, AM G12062.

Types. The holotype is SAM H569; additional paratypes are split among SAM, NNM, NMV, and USNM. Type Locality: St. Francis Island, South Australia, 27–37 m.

Platytrochus parisepta Cairns & Parker, 1992

Platytrochus hastatus.–Dennant, 1904: 4 (in part, **SA**).
Platytrochus parisepta Cairns & Parker, 1992: 37–38, figs. 12a–d (**SA**).–Cairns, 1997: 30 (**listed**).

New records. None.

Types. The holotype is deposited at SAM (H589); additional paratypes are split between SAM and USNM. Type Locality: Backstairs Passage, South Australia, 40 m.

Sphenotrochus cuneolus n.sp.

Figs. 9A–F

Sphenotrochus hancocki.–Cairns, 1989a: 38–39 (in part: *Albatross*-5145).

Records/Types. Holotype: Franklin 03/99/D11, AM G16746. Paratypes: Franklin 03/99/D8, 1, USNM 1008848; Franklin 03/99/D10, 6 (including SEM 999), USNM 1008849; Franklin 03/99/D11, 6: 5, USNM 1008850 and 1, ZMUZ; *Alb*-5145, 1, USNM 81896. Type Locality: 20°14.49'S 151°47.53'E (Marion Plateau, Queensland), 342 m.

Description. Corallum cuneiform, with planar thecal faces and rounded thecal edges and base, the edges being roughly parallel. Largest specimen (holotype) only 1.43×1.02 mm in CD and 2.78 mm in height, but judging from the high frequency of juvenile forms of other turbinoliids taken at this site, this may also represent a sub-adult size. Calice elliptical, the GCD:LCD about 1.4. Costal arrangement distinctive and consistent (Figs. 9B,C). The 12 C1–2 are continuous, all reaching the base of the corallum. The medial C2, which bisect the lateral faces, and the principal C1, which are on the corallum edges, are straight, whereas the 4 C1 and C2 on each face between the medial C2 and principal C1 curve slightly inward near the base of the corallum and then abruptly outward, producing a moderate sinuosity. C3 also continuous but do not extend entire distance to the base, their length progressively increasing away from the medial C2: those C3 adjacent to the medial C2 extend about 60% of the distance to the base, the next pair of C3 toward the principal C1 being slightly longer (about 65% of the distance to the base), and those C3 directly adjacent to the principal C1 extend about 75% to the base. Costae uniform in width and ridge-like, 0.06–0.07 mm in width, and separated by broad intercostal spaces about 0.09 mm in width. A series of small pores, each 10–11 μm in diameter, occurs along both edges of each intercostal region (Fig. 9D), each pore separated by 35–40 μm from one other and alternating in position from those on the opposite side of the intercostal space. Corallum white.

Septa hexamerally arranged in 3 complete cycles, resulting in 24 septa (S1–2>S3). All specimens reported dead when collected and thus not optimally preserved, but S1–2 equal in exsertness and width, having quite sinuous axial edges, the lower edges of which fuse to the columella in the case of the 6 S1–2 in the lateral corallum position. S3 considerably smaller and have straight axial edges. Fossa shallow, containing a robust, lamellar columella, the upper edge rising above the calicular edge.

Remarks. Among the nine Recent species in the nominate subgenus of *Sphenotrochus*, defined as those species bearing costae that are continuous (not fragmented into numerous short carinae, see Cairns, 1997), *S. cuneolus* is most similar to *S. hancocki* Durham & Barnard, 1952, a species known from throughout the tropical Pacific at 18–274 m (Cairns, 1989a). These two species are similar in size and septal and columellar morphology, but *S. cuneolus* differs in its costal arrangement and in having sinuous axial edges of its S1–2. *SSphenotrochus hancocki* not only has a different arrangement of costae but also a fragmentation of its costae near the base.

Etymology. *cuneolus*, Latin for "small wedge", an allusion to the small size of this cuneiform coral.

Distribution. Marion Plateau, Queensland; Sulu Archipelago, Philippines; 42–342 m.

Sphenotrochus excavatus Tenison-Woods, 1878

Figs. 9G,H

Sphenotrochus excavatus Tenison-Woods, 1878b: 308, pl. 4, figs. 1A–C (**NSW**).–Squires, 1961: 19 (**listed**).–Wells, 1964: 109 (**listed**).–Veron, 1986: 606 (**listed**).–Cairns, 1997: 25 (**listed**).

New records. None.

Types. The holotype is deposited at the Macleay Museum; it is uncatalogued. Type Locality: Port Jackson, New South Wales, depth unknown.

Redescription of holotype. Corallum 5.80×4.07 mm in CD (GCD:LCD= 1.43) and 9.44 mm in height. Costae continuous (not fragmented), all costae but the 4 C3 flanking the medial C2 reach the base, those 4 C3 reaching only about 90% of that distance. Costae on thecal faces wide near calice (0.38 mm), narrowing to about 0.16 mm near the base, but then widening to about 0.60 mm width at the base, producing a slightly bulbous basal region. Edge costae of uniform width, about 0.40 mm. Intercostal grooves deep, about 0.22 mm wide. Vertical faces of costae in region adjacent to calice and base, and entire length of principal costae an the costae that flank principal costae, are finely ridged or fluted, such that about 10 carinae occur every mm. Septa hexamerally arranged in 3 cycles (24 septa) according to the formula: S1–2>S3, but the 4 S2 adjacent to the principal S1 are somewhat smaller than those occurring in the lateral systems. S1–2 about 1 mm exsert and have vertical axial edges that bear small teeth that project horizontally into the fossa. S3 about 0.5 mm exsert, but are essentially vestigial inside the calice. Fossa quite deep, containing a small, deep-set, lamellar columella.

Remarks. This species is redescribed based on a re-examination of the holotype. It is unique, in that it is known from only one specimen and is quite unlike any of the other nine Recent species belonging to the nominate subgenus of *Sphenotrochus*. It differs from other species by having a full corallum shape with a relatively high GCD:LCD, a bulbous base, fluted costal edges, and a deeply-set columella. Given the large amount of collecting in the Sydney region since 1878, even though this species is relatively small, it is surprising that it has not been re-collected.

Thrypticotrochus petterdi (Dennant, 1906)

Trochocyathus petterdi Dennant, 1906: 153–154, pl. 5, figs. 2a,b (**NSW**).–Wells, 1958: 262 (**listed**); 1964: 109 (**listed**); Veron, 1986: 606 (**listed**).–Stranks, 1993: 20 (**type deposition**).

Thrypticotrochus multilobatus Cairns, 1989a: 37, pl. 19b–g (**Qld**), new synonym; 1995: 92, pl. 28, figs. d–h (**NZ**); 1997: 19, pls. 2h, 5b, 7h,i (remarks).–Cairns & Zibrowius, 1997: 149–150 (remarks).

Thrypticotrochus petterdi.–Cairns, 1989a: 37 (remarks); 1997: 19 (**listed**).

New records. NEW SOUTH WALES: Kapala 78/27/01, 1, AM G15289. —QUEENSLAND: Franklin 03/99/D10, 1, USNM 1008592; Franklin 03/99/D11, 13: 11, USNM 1008591 and 2, ZMUZ; Franklin 03/99/D14, 1, USNM 1008590; Cidaris I 43-2, 13, MTQ G56433.

Types. The holotype of *T. petterdi* is NMV F41515; 2 of 8 additional paratypes are AM G12050. Type Locality: 20 miles (=32 km) northeast of Port Jackson, New South Wales, 457 m.

The holotype of *T. multilobatus* is USNM 81901; additional paratypes are split among USNM, MNHN, and AM. Type Locality: 5°25'56"N 120°03'39"E (off Tawi Tawi, Sulu Archipelago), 507 m.

Remarks. In my original description of *T. multilobatus* Cairns, 1989, I noted that it was very similar and perhaps conspecific with *T. petterdi* but seemed to differ from the two paratypes by having wider costae than intercostae. Now that I have examined the holotype, I cannot find any basis to distinguish the two species. The holotype is unusual in that it has six pairs of S5 contained in only two systems for a total of 60 septa, but its costae are much wider than its intercostae and thus consistent with those described for *T. multilobatus*.

Trematotrochus hedleyi Dennant, 1906

Figs. 9I–L

Trematotrochus hedleyi Dennant, 1906: 152–153, pl. 5, figs. 1a,b (**NSW**).–Wells, 1958: 262 (**listed**); 1964: 109 (**listed**).–Veron, 1986: 607 (**listed**).–Stranks, 1993: 20 (**type deposition**).–Cairns, 1997: 28 (**listed**).

New records. NEW SOUTH WALES: Kapala 78/27/01, 3: 1, AM G15290, and 2 (including SEM 1007), USNM 82014. —QUEENSLAND: Kimbla 3, 1, AM G16604; Franklin 03/99/D7, 3, USNM 1008309; Franklin 03/99/D8, 1, USNM 1008308; Franklin 03/99/D10, 5, USNM 1008304; Franklin 03/99/D11, 1, USNM 1008306; Franklin 03/99/D12, 1, USNM 1008302; Franklin 03/99/D13, 3, USNM 1008303; Franklin 03/99/D14, 15: 13, USNM 1008305 and 2, ZMUZ; Cidaris I 43-2, 29, MTQ G56426; Kimbla 24, 1, USNM 78577.

Types. Four syntypes are deposited at NMV (F41519) and one is AM G12049. Type Locality: 20 miles (=32 km) northeast of Port Jackson, New South Wales, 457 m.

Tropidocyathus labidus Cairns & Zibrowius, 1997

Tropidocyathus labidus Cairns & Zibrowius, 1997: 148, pl. 20a–g.–Cairns, 1998: 392 (**WA**); 1999a: 110 (remarks).

New records. None.

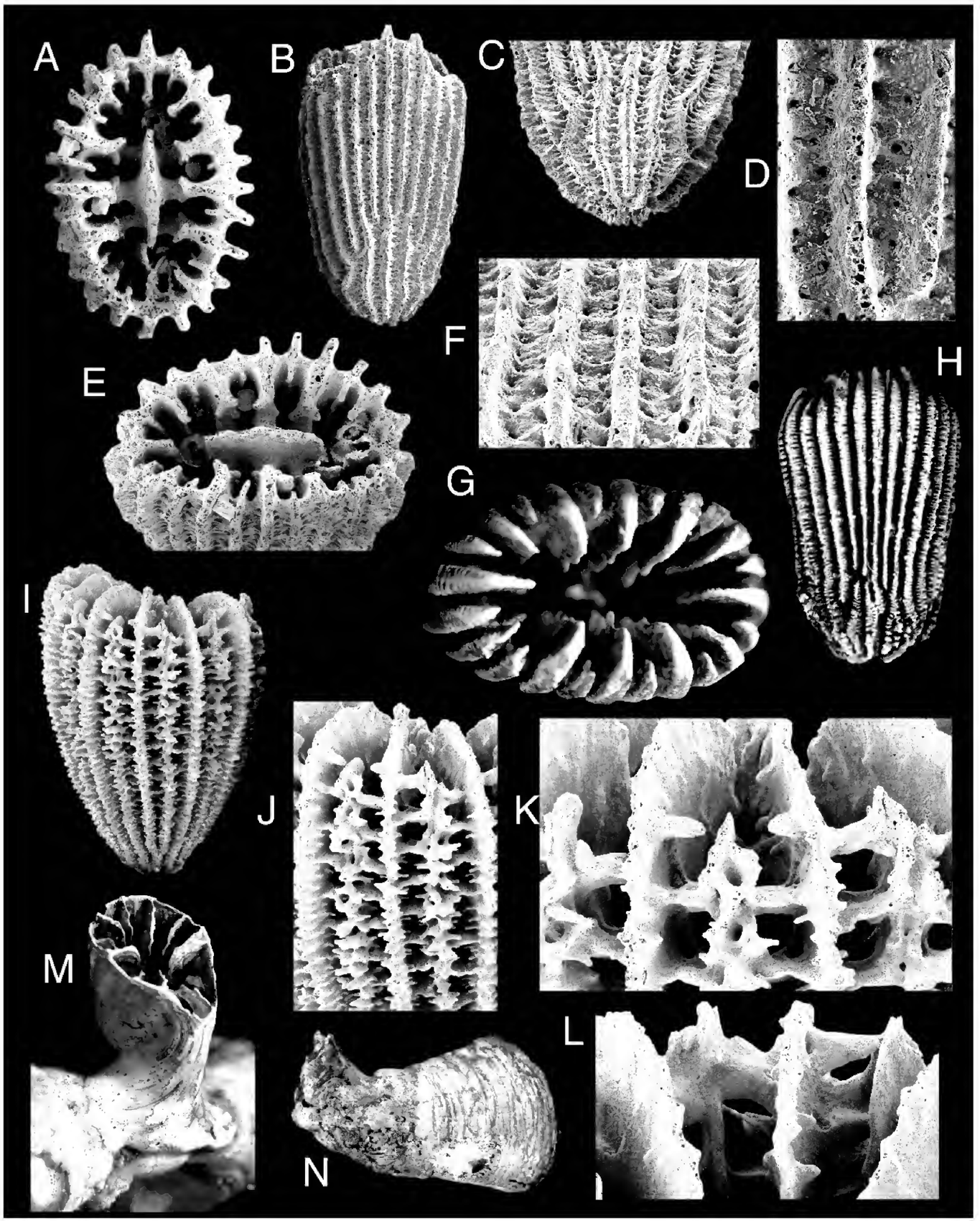

Fig. 9. (*A–F*), *Sphenotrochus cuneolus* (*A, E*, paratype, USNM 1008849, GCD=1.34 mm; *B–D, F*, holotype, AM G16746, GCD=1.43 mm): (*A, B*), calicular and lateral views, ×36, ×19, respectively; (*C*), detail of base showing origin of C3, ×30.5; (*D, F*), enlargement of costae showing alternate placement of pores in intercostal regions, ×115, ×75 respectively; (*F*), oblique calicular view, ×35. (*G, H*), *Sphenotrochus excavatus*, holotype, Macleay Museum, oblique calicular and lateral views, ×8.3, ×5.6, respectively (GCD=5.8 mm). (*I–L*), *Trematotrochus hedleyi*, USNM 82014, CD=3.6 mm: (*I–K*), progressive enlargements of theca showing costae and porous intercostal regions, ×10.1, ×17.7, ×40, respectively; (*L*), view from within calice of septa and costal porosity, ×40. (*M–N*), *Monomyces rubrum*: (*M*), AM G16298, lateral view showing contiguous basal rootlets, ×3.3 (GCD=5.0 mm); (*N*), USNM 1009341, lateral view of larger specimen showing lateral rootlets, ×2.8 (GCD=11.5 mm).

Types. The holotype is deposited at MNHN; additional paratypes are split among MNHN, USNM, NNM, ZMUC, and POLIPI. Type Locality: 5°47'00"S 132°11'35"E (Kai Islands, Banda Sea), 209–240 m.

Tropidocyathus lessonii (Michelin, 1842)

Flabellum Lessonii Michelin, 1842: 119.

Tropidocyathus lessoni.–Cairns, 1989a: 33–34, pl. 16d–l (synonymy, description); 1994: 67, pl. 29a,b (synonymy, description).

Tropidocyathus lessonii.–Cairns & Zibrowius, 1997: 146–147 (remarks).–Cairns, 1997: 15–16, figs. 1e, 4e, 7d; 1998: 390–392 (**WA, NT**); 1999a: 110 (remarks).

New record. QUEENSLAND: James Kirby 732, 4, MTQ G56424.

Types. The syntypes are deposited at MNHN. Type Locality: unknown.

Turbinolia stephensoni (Wells, 1959)

Oryzotrochus stephensoni Wells, 1959: 287, figs. 1–5 (**Qld**); 1964: 109 (**listed**).–Veron, 1986: 607 (**listed**).

Turbinolia stephensoni.–Cairns, 1997: 24, pls. 3c, 5k, 8d,g (**NT**, new combination).

New records. QUEENSLAND: 16 km south of Cape Sidmouth, 24 m, 10, Macleay Museum. —NORTHERN TERRITORY: 11°54'S 130°12'E, 32 m, 1, USNM 100318.

Types. The holotype (45383) and paratypes are deposited at USNM. Type Locality: 9°55'S 144°02'E (Murray Islands, Queensland), 9–15 m.

Family Guyniidae Hickson, 1910

Guynia annulata Duncan, 1872

Guynia annulata Duncan, 1872: 32, pl. 1, figs. 1–8.–Cairns, 1989a: 42–43, pl. 21, fig. f, pl. 22, figs. a–e (synonymy, description).–Cairns & Parker, 1992: 42–43, figs. 14g,h (**SA**).–Cairns & Zibrowius, 1997: 150 (remarks).–Cairns, 1998: 392 (**WA**); 1999a: 113–114 (remarks).

New records. QUEENSLAND: Franklin 03/99/D13 (Marion Plateau), 1, USNM 1008295; Kimbla 3, 1, AM G16603.

Types. Eighteen syntypes are BM 1883.12.10.110–120. Type Locality: Adventure Bank, Mediterranean, 168 m.

Stenocyathus vermiformis (Pourtalès, 1868)

Coenocyathus vermiformis Pourtalès, 1868: 133.

Not *Caryophyllia vermiformis*.–Thomson & Rennet, 1931: 40–41 (probably *Flabellum antarcticum* from a station other than Tasmania).–Wells, 1958: 262 (**listed**).

Stenocyathus decamera Ralph & Squires, 1962: 11–12, pl. 4, figs. 2–6 (**NZ**).

Stenocyathus vermiformis.–Cairns, 1979: 168–170, pl. 32, figs. 8–10, pl. 33, figs. 1–2 (synonymy, description); 1982: 52, pl. 16, figs. 8–11 (synonymy, description).–Veron, 1986: 609, fig. (**NSW, Qld**).–Cairns & Parker, 1992: 43, figs. 14b,c (**Vic, Tas**).–Cairns, 1995: 94–95, pl. 30c–g (**NZ**)

New records. VICTORIA: "Endeavour", 38°15'S 149°20'E, 1, NNM. —NEW SOUTH WALES: Kapala 75/02/03, 3, AM G16562; Kapala, 34°15'S 151°28'E, 457 m, 7, 31 July 1975, 7, AM G14706; Kapala, 78/27/13, 3, AM G16568; 35°05'S 151°10'E (off Jervis Bay), 600–1000 m, 18 September 1980, 1 in AM.

Types. 38 syntypes are deposited at MCZ (Cairns, 1979). Type Locality: off Florida Keys, 274–329 m.

Family Flabellidae Bourne, 1905

Flabellum (Flabellum) australe Moseley, 1881

Flabellum sp. Moseley, 1876: 546 (**NSW**).

Flabellum australe Moseley, 1881: 173–174, pl. 7, figs. 4–5 (**NSW**).–Not Alcock, 1902c: 30–31 (=*F. patens*).–Dennant, 1906: 151 (**SA**).–Howchin, 1909: 245 (**listed**).–Thomson & Rennet, 1931: 41 (**Tas**).–Veron, 1986: 603 (**listed**).–Cairns & Parker, 1992: 43–45, figs. 15a–c, f (**SA, Vic, Tas, NSW**).

Flabellum distinctum.–Tenison-Woods, 1878b: 311 (**NSW**).–Veron, 1986: 603 (**listed**).

Flabellum pavoninum typical.–Hoffmeister, 1933: 2–5 (in part: specimen #3, **SA**).–Shepherd & Veron, 1982: 177, fig. 4.54i (**listed**).–Wells, 1958: 262 (**listed**).–Squires, 1961: 18 (**listed**).–Wells, 1964: 114, pl. 1. figs. 13–14 (**Qld**).–Veron, 1986: 603 (**listed**).

Flabellum pavoninum var. *distinctum*.–Hoffmeister, 1933: 5–7 (in part: specimen #11, **SA**).–Squires, 1961: 18 (**listed**).

"beautiful coral" Coucom, 1982: 5, fig. upper right (**NSW**).

New records. TASMANIA: "Penghana", 42°35'40"S 148°11'20"E, 825–915 m, 25 March 1970, 1, AM G15939. —VICTORIA: Southern Surveyor 05/94/43, 4, AM G15937; Southern Surveyor 05/94/86, 4, AM G16497. —NEW SOUTH WALES: Kapala 75/08/01, 12, AM G16417; Kapala 75/08/03, 2, AM G16418; Kapala 75/12/07, 1, AM G16420; Kapala 77/01/13–15, 6, AM G16437; Kapala 77/13/10, 1, AM G16491; Kapala 77/23/08, 3, AM G15812; Kapala 78/03/03, 2, AM G16399; Kapala 78/21/06, 1, AM G16381; Kapala 78/21/10, 4, AM G16382; Kapala 78/22/02, 5, AM G16407; Kapala 78/22/04, 20, AM G16433 and G16434; Kapala 78/22/05, 10, AM G16408; Kapala 78/23/09, 3, AM G16375; Kapala 78/24/02, 12, AM G16406; Kapala 78/26/05, many, AM G16395; Kapala 78/26/10, 3, AM G16397; Kapala 78/27/01, over 60, AM G16379 and G16394; Kapala 78/27/04, 2, AM G16393; Kapala 78/27/09, 12, AM G16385; Kapala 78/27/13, 10, AM G16388; Kapala 78/27/16, 2, AM G16405; Kapala 79/03/18, 7, AM G16455; Kapala 79/05/01, 2, AM G16468; Kapala 79/05/02, 2, AM G16456; Kapala 79/05/05, 5, AM G16458; Kapala 79/08/06, 1, AM G16460; Kapala, 79/08/11, 1, AM G16469; Kapala 79/12/07, 6, AM G16438; Kapala 79/12/08, 17, AM G16439; Kapala 79/14/06, 3, AM G16442; Kapala 79/15/01, 3, AM G16444; Kapala 79/15/02, 8, AM G16543; Kapala 79/15/03, 9, AM G16445; Kapala 79/15/05, 2, AM G16471; Kapala 79/17/17, 1, AM G16449; Kapala, 79/20/08, 2, AM G16452; Kapala 79/20/09, 5, AM G16461; Kapala 79/23/01, 8, AM G16466; Kapala 80/20/11, 16 in AM; Kapala 86/01/02, 12, AM G16480; Kapala 95/18/57, 1, AM G15864; Thetis 4, 1, AM G15817; Thetis 17, 1, AM G15818; Thetis 46, 2, AM G15816; Thetis 56, 1, AM G15820; Thetis 57, 3, AM G15821; NZOI U208, 5, AM G16548; Madre 1515, 1 in AM; Franklin 10/86/05, 4, AM G15887; Southern Surveyor 05/94/107, 1, AM G16495; Southern Surveyor 05/94/129, 4, AM G16498. —SEAMOUNTS: Franklin 05/89/02 (Gascoyne), 22, AM G15895; Franklin 05/89/04 (Gascoyne), 4, AM G15897 and G15503; Franklin 05/89/10 (Derwent Hunter), 1, AM G15499. —QUEENSLAND: Soela 01/86/73, 4, NTM C5343; Cidaris I 41-2, 1, MTQ G55717; Cidaris I 43-2, 3, MTQ G55718; Cidaris I 47-3, 1, MTQ G55719; Moreton Bay, 36 m, 30, USNM 78512; Kimbla 22, 1, AM G16487; QLD 1256, 1, AM G15728.

Types. Two syntypes are BM 1880.11.25.81. Type Locality: "Challenger" 163D: 33°57'30"S 151°39'15"E (off Twofold Bay, New South Wales), 219 m.

Flabellum (F.) folkesoni Cairns, 1998

Flabellum (F.) folkesoni Cairns, 1998: 393–394, figs. 6e–i (**WA**).–Griffith & Fromont, 1998: 232 (**type deposition**).

New records. WESTERN AUSTRALIA: Bhagwan 5, 7, WAM Z13070; Bhagwan 8, 1, WAM Z13086; Bhagwan 13, 1, WAM Z13161; Bhagwan 15, 1, WAM Z13171; Bhagwan 19, 12: 9, WAM Z13195 and 3, USNM 1009548; Bhagwan 20, 2, WAM Z13215; Bhagwan 23, 5, WAM Z13182; Bhagwan 25, 1, WAM Z13138; Bhagwan 28, 1, WAM Z13191.

Types. The holotype is WAM 173–83; additional paratypes are split between WAM and USNM (Griffith & Fromont, 1998). Type Locality: between Shark Bay and Onslow, Western Australia, depth unknown.

Flabellum (F.) lamellulosum Alcock, 1902

Flabellum (F.) lamellulosum Alcock, 1902a: 105–106.–Cairns, 1989a: 52–53, pl. 27a–l (description, synonymy, tabular key).–Cairns & Zibrowius, 1997: 152–153, fig. 21a (**NT**).–Cairns, 1998: 393 (**WA**).

New records. NEW SOUTH WALES: Kapala 78/22/04, 16, AM G15936; Kapala 96/17/03, 2, AM G15874.

Types. The holotype is ZMA Coel. 1215. Type Locality: 5°28.4'S 132°02'E (Kai Islands, Banda Sea), 204 m.

Flabellum (F.) magnificum Marenzeller, 1904

Flabellum (F.) magnificum Marenzeller, 1904b: 276–277, pl. 17, fig. 13.–Cairns, 1989a: 50–51, pl. 25a–j (description, synonymy, tabular key).–Grygier, 1991: 43, fig. 21H (**WA**).–Cairns, 1994: 72, pl. 31j–l (remarks).–Cairns & Zibrowius, 1997: 151–152 (**NT**).–Cairns, 1998: 392–393 (**WA**).

New records. QUEENSLAND: Southern Intruder 3-39, 2, QMB GL10158; Cidaris I 49-2, 27, MTQ G55716. —NORTHERN TERRITORY: 9°46'S 129°54'E, 270–300 m, 2, NTM C6944. —WESTERN AUSTRALIA: Bhagwan 19, 6: 5, WAM Z13223 and 1, USNM 1009433; Lady Basten 1031402, 1, WAM Z16025; Lady Basten 1031403, 1, WAM Z16026; Akademik Oparin, 17°19.6'S 119°31.5'E, 368 m, 2, NTM C7785.

Types. The holotype is assumed to be lost (Cairns, 1989a). Type locality: 0°15.5'N98°04'E (off western Sumatra), 470 m.

Flabellum (F.) patens Moseley, 1881

Flabellum (F.) patens Moseley, 1881: 172 (in part: pl. 6, fig. 5).–Veron, 1986: 603 (**listed**).–Cairns, 1989a: 51–52. pl. 26a–l (synonymy, description, tabular key).–Cairns & Zibrowius, 1997: 152, fig. 20i (remarks).–Cairns, 1998: 393 (**WA**).
Flabellum australe.–Alcock, 1902c: 30–31.

New records. None.

Types. The lectotype (1880.11.25.79) and three of five of the remaining paralectotypes are deposited at BM (1880.11.25.79). Type Locality: 5°49'S 132°14'E (off Kai Islands, Banda Sea), 256 m.

Flabellum (F.) pavoninum forma *coalitum* Marenzeller, 1888

Flabellum coalitum Marenzeller, 1888: 48–49.–Cairns, 1989a: 46, 47, 50, pl. 24, figs. e,f, i–l (remarks)
Flabellum pavoninum.–Cairns, 1994: 70–71, pls. 30g–i, 31a–e (description, remarks).–Cairns & Zibrowius, 1997: 150–151, fig. 20h (remarks).–Cairns, 1999a: 115–116, figs. 18g–i (remarks).

New record. QUEENSLAND: James Kirby 732, over 100, MTQ G55720.

Types. The holotype of *F. coalitum* is NMW 8196. Type Locality: Japan, depth unknown.

Flabellum (F.) politum Cairns, 1989

Flabellum (F.) politum Cairns, 1989a: 53–54, pl. 28a–f.–Cairns & Zibrowius, 1997: 153–154 (**NT**).–Cairns, 1998: 394 (**WA**).

New record. WESTERN AUSTRALIA: Bhagwan 15, 1, WAM Z13172.

Types. The holotype (81945) and paratypes are deposited at USNM. Type Locality: 12°13'15"N 124°05'03"E (Samar Sea, Philippines), 216 m.

Flabellum (F.) transversale Moseley, 1881

Flabellum transversale Moseley, 1881: 174, pl. 6, figs. 6, 6a (*F. elongatum* in plate caption) (**Vic**).–Not Thomson & Rennet, 1931: 41 (=*F. impensum*).–Not Yabe & Eguchi, 1942: 99 (=*Truncatoflabellum* sp.).–Squires, 1961: 18 (**listed**).–Veron, 1986: 603 (**listed**).–Cairns & Parker, 1992: 45–46, figs. 15d,e, g (**Vic**).

New records. NEW SOUTH WALES: 33°39'S 151°30'E (Gascoyne, near Sydney), 146 m, May 1989, 2, AM G15339; 33°30'S 151°25'E (Cape Three Points), depth and date unknown, 1, AM G16701. —QUEENSLAND: Kimbla 1, 1, AM G16337.

Types. The holotype is BM 1880.11.25.84. Type Locality: 39°10'S 146°37'E (Bass Strait near Wilsons Promontory, Victoria), 70 m.

Remarks. The three specimens reported herein are considered to be juvenile specimens of *F. transversale*, the largest 10.4 mm in GCD and having only 48 septa (S1–2>>S3>S4). In this regard they are similar in size and shape to the subspecies reported as *F. transversale conicum* Yabe & Eguchi, 1942 from Japan.

Flabellum (Ulocyathus) aotearoa Squires, 1964

Flabellum (Ulocyathus) aotearoa Squires, 1964: 7–9, pl. 2, figs. 15–18 (**NZ**).–Cairns, 1995: 102–103, pl. 33, figs. d–f, i (**NZ, SM**); 1999a: 117, fig. 19e (remarks).

New records. QUEENSLAND: Soela 01/86/54, 2, NTM G5339; Nimbus 11, 1, USNM 78587; Nimbus 12, 1, USNM 78588; Nimbus 55, 1, USNM 78589.

Types. The holotype is deposited at AIM; a paratype is also deposited at USNM. Type Locality: 35°04'S 174°23.2'E (near Cape Brett, New Zealand), 184 m.

Flabellum (U.) conuis Moseley, 1881

Flabellum conuis Moseley, 1881: 165–166, pl. 7, figs. 6a,b.
Flabellum (U.) conuis.–Cairns, 1989a: 59–60, pl. 31, figs. c–g (description).–Cairns & Zibrowius, 1997: 160, figs. 21b,c (remarks).

New record. QUEENSLAND: Cidaris I 1-2, 1, MTQ G56387.

Types. The holotype is BM 1880.11.25.71. Type Locality: 2°33'S 144°04'E (Admiralty Islands), 1994 m.

Flabellum (U.) deludens Marenzeller, 1904

Flabellum deludens Marenzeller, 1904b: 269–272, pl. 17, figs. 10, 10a.–Veron, 1986: 603 (**listed**).
Flabellum (U.) deludens.–Cairns,1989a: 55–56, pl. 29a–f (synonymy, description); 1994: 73, pl. 32d,e (remarks, synonymy).–Cairns & Zibrowius, 1997: 154–156 (**NT**, remarks, tabular key).–Cairns, 1998: 395 (**WA**); 1999a: 117 (remarks).

New records. WESTERN AUSTRALIA: Lady RW 96-30, 4, NTM C8158; Lady Basten 95/LB08, 34, WAM Z16038.

Types. Two syntypes are ZMB 7086 and 5086. Type Locality: west of Sumatra, eastern Indian Ocean, 614–660 m.

Flabellum (U.) hoffmeisteri Cairns & Parker, 1992

Flabellum japonicum.–Hoffmeister, 1933: 7, pl. 1, figs. 1–2 (**Vic, Tas**).–Wells, 1958: 262 (**listed**).–Squires, 1961: 18 (**listed**).–Veron, 1986: 603 (**listed**).
"interesting coral" Coucom, 1982: 5, figure (lower right) (**NSW**).
Flabellum n.sp. Cairns, 1989a: 57, pl. 29j,k (**Vic, Tas**).
Flabellum (U.) hoffmeisteri Cairns & Parker, 1992: 47–48, figs. 16d–f (**Vic, Tas**).–Stranks, 1993: addendum, 1–2 (**type deposition**).–Cairns, 1995: 103–104, pl. 33 g,h (**NZ**).–Cairns & Zibrowius, 1997: 157–158 (remarks, tabular key).–Cairns, 1998: 394–395 (**WA**); 1999a: 118 (remarks).

New records. NEW SOUTH WALES: Kapala 77/23/08, 2, AM G16430; Kapala 78/06/02, 1, AM G16378; Kapala 78/17/10, 8, AM G16370; Kapala 78/22/05, 1, AM G16435; Kapala 78/23/09, 2, AM G16377; Kapala 78/27/04, 2, AM G16392; Kapala 78/27/13, 4, AM G16387; Kapala 78/27/16, 1, AM G16402; Kapala 79/05/05, over 60, AM G16459; Kapala 79/12/07, over 30, AM G16401; Kapala 79/12/08, 1, AM G16440; Kapala 79/14/06, 9, AM G16443; Kapala 79/15/02, 9, AM G16470; Kapala 79/15/03, 19, AM G16446; Kapala 79/15/04, 1, AM G16447; Kapala 79/20/08, 2, AM G16453; Kapala 79/20/09, 3, AM G16464; Kapala 79/23/01, 8, AM G16465; Kapala 80/06/01, 1. AM G16659; Kapala 82/20/08, 5, AM G15935; Kapala 85/21/06, 5, AM G16478; Kapala 96/07/02, 3, AM G15867; Kapala 96/09/04, 2, AM G15868; Kapala 96/10/02, 2, AM G15869; Kapala 96/17/03, 1, AM G15875; Kapala 96/18/06, 1, AM G15876; Kapala 96/18/07, 1, AM G15877; Kapala 96/21/19, 1, AM G15883; 33°50'S 151°55'E (40 miles (=64 km) east of Sydney), 457 m, 17 February 1997, 1, AM G16501; 35°05'S 151°10'E (Jervis Bay), 600–1000 m, 18 September 1980, 3, AM G16486. —WESTERN AUSTRALIA: Bhagwan 5, 2, WAM Z20512; Bhagwan 23, 1, WAM Z20514; Lady Basten 1031402, 1, WAM Z16016.

Types. The holotype is SAM H642; additional paratypes are split among SAM, USNM, and NMV. Type Locality: 37°59'S 150°05'E (off eastern Victoria near border with New South Wales), 452 m.

Flabellum (U.) lowekeyesi Squires & Ralph, 1965

Flabellum lowekeyesi Squires & Ralph, 1965: 259–261, figs. 1–2 (**NZ**).

Flabellum (U.) lowekeyesi.–Cairns, 1995: 100–101 (synonymy, description, **NZ, Tas**).

New record. NEW SOUTH WALES: Kapala 75/05/05, 2, AM G16415.

Types. The holotype is deposited at the Museum of New Zealand (CO185); the paratype is deposited at USNM. Type Locality: 42 km off Cape Brett, New Zealand, 732 m.

Flabellum (U.) marenzelleri Cairns, 1989

Flabellum (U.) marenzelleri Cairns, 1989a: 57–58, pl. 30a–e.–Cairns & Zibrowius, 1997: 156 (remarks, tabular key).–Cairns, 1998: 395 (**WA**).

New record. NORTHERN TERRITORY: 9°05'S 133°04'E, 20 October 1992, 179–205 m, 6, NTM C11471.

Types. The holotype (40686) and paratypes are deposited at USNM. Type Locality: 13°41'50"N 120°58'30"E (Verde Island Passage, Philippines), 315 m.

Flabellum (U.) sp. cf. *F. moseleyi* Pourtalès, 1880

Flabellum sp. Cairns & Zibrowius, 1997: 158–159, figs. 21d–f (**NZ**).

New record. QUEENSLAND: Cidaris I 49-2, 1, MTQ G55635.

Remarks. Although this taxon is probably an undescribed species, Cairns & Zibrowius (1997) did not describe it because they had only three poorly-preserved specimens available. The additional specimen reported herein, measuring 31.0×23.0 mm in CD and 30 mm in height, is also poorly preserved (dead when collected) and thus still does not provide enough material for a proper description and differentiation from the western Atlantic *F. moseleyi*.

Flabellum (U.) sexcostatum Cairns, 1989

Flabellum (U.) sexcostatum Cairns, 1989a: 59, pls. 30j, 31a,b.–Cairns & Zibrowius, 1997: 159 (remarks).

New records. QUEENSLAND: Cidaris I 1-3, 3, MTQ G55699–55700; Cidaris I 1-4, 1, MTQ G55701; Cidaris I 3-1, 4, MTQ G55702; Cidaris I 5-4, 1. MTQ G55703; Cidaris I, 9-3, 1, MTQ G55704; Cidaris I 11-4, 1, MTQ G55705; Cidaris I 12-1, 1, MTQ G55706; Cidaris I 15-4, 1, MTQ G55707; Cidaris I 41-2, 6, MTQ G55708–55709; Cidaris I 49-2, 1, MTQ G55710; Cidaris I 49-3, 2, MTQ G55711–55712; Cidaris I 50-2, 5, MTQ G55713; Cidaris I 50-3, 2, MTQ G55714; Franklin 06/88/04, 8: 1, MTQ G30349, 5, USNM 86560, and 2, AM G16661; Franklin 06/88/05, 1. AM G16494; FNQ 79-33, 19, AM G16522.

Types. The holotype is USNM 81934; paratypes are split between USNM and AM. Type Locality: 13°42'05"N 120°30'45"E (South China Sea off Philippines), 772 m.

Flabellum (U.) tuthilli Hoffmeister, 1933

Flabellum tuthilli Hoffmeister, 1933: 7–8, pl. 1, figs. 3–5 (**SA**).–Wells, 1958: 262 (**listed**).–Veron, 1986: 603 (**listed**).–Cairns & Parker, 1992: 46–47, figs. 16a–c (**SA, Tas**).–Cairns, 1998: 395 (**WA**).

New records. None.

Types. The holotype is AM E3732; of the remaining 12 paratypes, at least 5 are deposited at AM and 2 at USNM. Type Locality: Great Australia Bight, South Australia, 347–824 m.

Javania fusca (Vaughan, 1907)

Placotrochus fuscus Vaughan, 1907: 66–67, pl. 4, figs. 2–3.

Javania pachytheca Cairns, 1995: 112–113, pls. 36j–l, 37a (**SM, NZ**).–Cairns & Zibrowius, 1997: 165 (remarks).

Javania fusca.–Cairns, 1999a: 125–126, figs. 20g–i (remarks).

New record. QUEENSLAND: Franklin 06/88/x, 5, AM G16675 and 16321.

Types. Three syntypes of *P. fuscus* are deposited at USNM (Cairns, 1991b). Type Locality: Hawaiian Islands, 271 m.

The holotype of *J. pachytheca* is NZOI H631. Type Locality: 30°13.1'S 178°32.0'W (off Macauley Island, Kermadecs), 610 m.

Javania insignis Duncan, 1876

Javania insignis Duncan, 1876: 435, pl. 39, figs. 11–13.–Cairns, 1989a: 77–78, pl. 40d,e, g,h, k (synonymy, description); 1994: 80, pl. 341–k (remarks).–Cairns & Zibrowius, 1997: 163–164 (remarks).

New records. Britannia Seamount: Franklin 05/89/46, 1, AM G16588; Franklin 06/88/D22, 2, USNM 1010154; NZOI P925, 3, USNM 94364.

Types. The holotype is BM 1973.2.20.1. Type Locality: 34°13'N 136°13'E (Japan), 88 m.

Javania lamprotichum (Moseley, 1880)

Desmophyllum lamprotichum Moseley, 1880: 41–42, figs. 1–2.

Javania lamprotichum.–Cairns, 1995: 112 (synonymy, description, **NZ**).–Cairns & Zibrowius, 1997: 164 (synonymy, remarks).–Cairns, 1998: 403, figs. 8j,m (**WA**); 1999a: 124–125 (remarks).

New records. SEAMOUNTS: Franklin 05/89/46 (Britannia), 4, AM G16328. —QUEENSLAND: Cidaris I 49-3, 1, MTQ G55744. —WESTERN AUSTRALIA: Bhagwan 5, 1, WAM Z13075.

Types. The uncatalogued holotype is deposited at BM. Type Locality: unknown.

Monomyces rubrum (Quoy & Gaimard, 1833)

Figs. 9M,N, 10A

Turbinolia rubra Quoy & Gaimard, 1833: 188–189, pl. 14, figs. 5–9 (**NZ**).

Flabellum rubrum.–Tenison-Woods, 1878b: 311–313 (**Australia**).–Not Folkeson, 1919: 4–5 (=*Truncatoflabellum aculeatum* and *T. spheniscus*).–Not Crossland, 1952: 105–106

(=*Truncatoflabellum cumingi*).–Not Stephenson & Wells, 1956: 56 (**listed**).–Wells, 1958: 261 (**listed**).–Squires, 1963: 11–41, pls. 1–2 (synonymy, description, remarks, **NZ**).–Not Wells, 1964: 108 (=*Truncatoflabellum cumingi*).–Veron, 1986: 603 (**listed**).

Monomyces rubrum.–Cairns, 1995: 105–108, pl. 34a–i (synonymy, description, **NZ**).

New records. NEW SOUTH WALES: Kapala 78/26/08, 3, AM G16298; Kimbla 4, 1, AM G16341; Shelf Benthic Survey 33, 1, AM G16348; 34°04'S 151°16'E (off Cronulla), 120 m, 1966, 1, AM G15364; 35°20'S 150°47'E (off Ulladulla), 135 m, May 1954, 9: 2, USNM 1009342, 7, AM G16338. —NORTHERN TERRITORY: 12°34'S 130°34'E (East Point, Darwin), depth unknown, October 1965, 5, AM G14218.

Types. The lecto- and paralectotype are deposited at MNHN (designated by Squires, 1963). Type Locality: Cook Strait, New Zealand, 46 m.

Remarks. Both Squires (1963) and Cairns (1995) discounted the presence of *Monomyces rubrum* from Australia, considering the species to be endemic to New Zealand. Indeed, Crossland's (1952) report of *F. rubrum* is herein identified as a *Truncatoflabellum*, and the report by Tenison-Woods (1878b: 312) was stated by him to be of "doubtful" locality. Nonetheless, six lots including 20 specimens of typical *M. rubrum* are reported from New South Wales herein, the first substantiated records of the genus from Australia. All specimens were small, not exceeding 12 mm in GCD, and usually having only 48 septa, but all specimens had the typical asymmetrical basal polycyclic development characteristic of the typical form of the species (Fig. 10A).

Placotrochides cylindrica n.sp.

Figs. 10B–D

Records/Types. Holotype: Cidaris I 30–2, MTQ G55627. Paratypes: Cidaris I 9–2, 1, MTQ G56394; Cidaris I 20–2, 1, MTQ G56396; Cidaris I 30–2, 6 (4 in alcohol): 5, MTQ G56402–56403 and 1, USNM 1008851. Type Locality: 17°18.96'S 147°11.16'E (off Cairns, Queensland), 1402–1406 m.

Description. Corallum (anthocyathus) almost cylindrical, having rounded thecal faces and edges that are essentially parallel. Most coralla undergo slight periodic retrenchments of growth followed by continued upward growth, which results in slight decreases in the corallum diameter. Largest corallum 6.56×5.93 mm in CD and 8.40 mm in height, whereas the holotype measures 6.32×5.46 mm in CD, 5.51×4.30 mm in basal scar diameter, and 5.42 mm in height. Calice and basal scar only slightly elliptical to circular, and symmetric, the GCD:LCD ranging from 1.07 to 1.16 and the GCD:LSD from 1.00 to 1.28. In well-preserved coralla, the calicular edge is slightly scalloped, rising to a low peak corresponding to each S1–2. Basal scar flat, such that the corallum will easily sit in an upright position on a level surface; scar reveals septa of the incipient anthocyathus; GSD ranges from 4.21 to 5.51 mm. Theca somewhat rough, covered with small hispid granules as well as displaying closely-spaced, chevron-shaped growth lines that peak at the longitudinal insertion lines corresponding to the S1–2. Theca white. Anthocaulus unknown.

Septa hexamerally arranged in 4 cycles, the fourth cycle never complete, the maximum number of septa observed being 32, although 26 is most common. Twenty-four septa present in a corallum of GCD 4.4 mm, and additional pairs of S4 (up to 4 pairs) are added as pairs to lateral (not end) systems of coralla of larger size. Septa formula: S1>S2>>S3>S4. S1 non-exsert, having smooth, vertical, slightly sinuous axial edges that fuse with the columella low in fossa. S2 similar to S1 but only about 80% the width. S3, if unflanked by S4, quite small, sometimes vestigial, represented only by a series of disconnected spines located considerably beneath the calicular edge. If an S3 is flanked by a pair of S4, it is increased in size to that of an S2. S4 equivalent in size to unflanked S3. Faces of all septa covered with small spines. Fossa quite deep and commodious, the columella being fairly small, restricted to base of fossa just above basal scar.

Remarks. Among the four species in the genus (Table 6), *P. cylindrica* is most similar to *P. frustum*, both species being about the same size. *Placotrochides cylindrica* differs from *P. frustum*, as well as the two other species, in having a more rounded corallum (lower GCD:LCD and GSD:LSD), S1 that are larger than the S2, a flat basal scar, a rough theca, and a slightly scalloped thecal margin.

Etymology. From *cylindricus*, Latin for "in the form of a cylinder", an allusion to the corallum shape.

Distribution. Known only from off northeastern Queensland, 1117–1402 m.

Placotrochides minuta n.sp.

Figs. 10E–H

Records/Types. Holotype: Franklin 03/99/D11, AM G16747. Paratypes: Franklin 03/99/D10, 8, USNM 1008853; Franklin 03/99/D11, 31: 29 (including SEM 1022), USNM 1008854 and 2, ZMUZ; Franklin 03/99/D12, 8, USNM 1008855; Franklin 03/99/D13, 1, USNM 1008856; Cidaris I 43–2, 4, MTQ G56406; Karubar 7 (Banda Sea), 9, USNM 1008857. Type Locality: 20°14.49'S 151°47.53'E (Marion Plateau, Queensland), 342 m.

Description. Corallum (anthocyathus) compressed-cylindrical, having rounded thecal faces and edges, the latter almost parallel, diverging at an edge angle of 10–11°. Largest corallum (Cidaris I 43–2) 4.48×3.14 mm in CD and10.3 mm in height; the holotype measures 3.67×2.08 mm in CD and 3.23 mm in height, having a basal scar of 3.22×2.04 mm. Calice elliptical and usually symmetric, with a GCD:LCD of 1.43–2.00, but in some cases (about 20%) the curvature of one side of the calice has a slightly different radius, leading to an asymmetry of the calicular perimeter. Basal scar elliptical, projecting downward in a V-shape, 3.1–4.0 mm in greater diameter, and having a GSD:LSD of 1.58–1.94. The basal scar clearly reveals all 24 septa of the incipient anthocyathus (Fig. 10H). Basal scar usually not much smaller than calice, sometimes the same or even larger because many coralla undergo a retrenchment of growth 2–3 mm above the scar resulting in a slight reduction of the corallum diameter, above which it gradually expands again. Theca smooth and porcellaneous, covered with closely-spaced, chevron-shaped growth lines that peak at the longitudinal insertion lines corresponding to the S1–2. Flat costae 0.28–0.30 mm wide, separated by very thin (7–8 μm) intercostal striae. Theca white. Anthocaulus unknown.

Septa usually hexamerally arranged in 4 cycles, the fourth cycle never complete, the maximum number of septa observed being 38 arranged: S1–2>>S3>S4. As mentioned

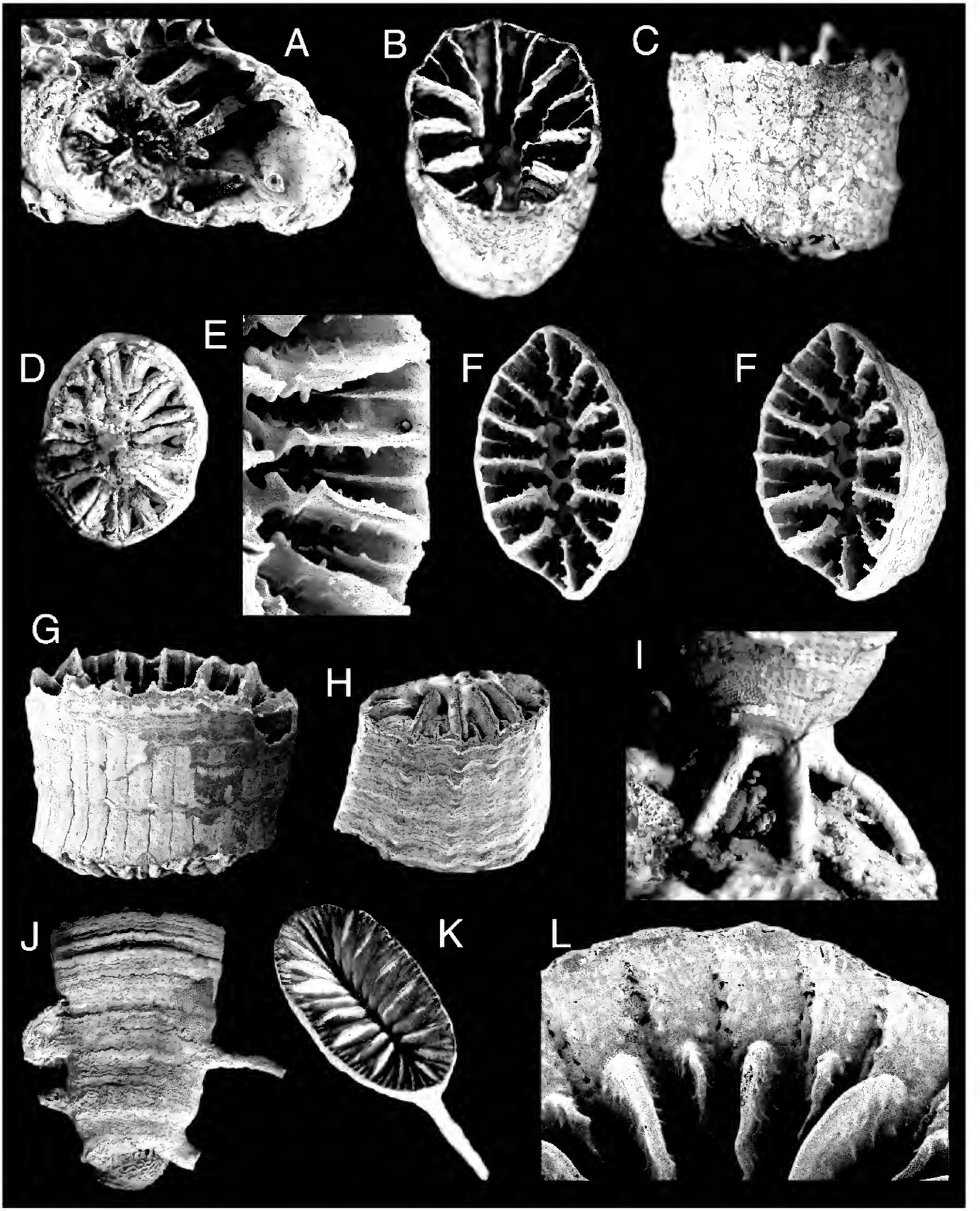

Fig. 10. (*A*), *Monomyces rubrum*, USNM 1009341, cross section through asymmetrical basal rootlets, ×7.5 (basal diameter 5.7 mm). (*B–D*), *Placotrochides cylindrica*, holotype, MTQ G55627, oblique calicular, lateral, and basal scar views, ×6.2, ×6.2, ×6.7, respectively (GCD=6.32 mm). (*E–H*), *Placotrochides minuta* (*E–G*, holotype, AM G16747, GCD=3.67 mm; *H*, paratype, USNM 1008854, scar length 2.7 mm): (*E*), view of axial septal edges, ×24; (*F, G*), stereo calicular and lateral views, both ×12.5; (*H*), oblique view of basal scar, ×12.5. (*I*), paratype of *Rhizotrochus radiatus*, NMV F43343, showing well-developed basal rootlets, ×3.0 (root diameter 1.85 mm). (*J, K*), *Flabellum irregulare* Tenison Woods (=*Truncatoflabellum cumingi*), holotype, Macleay Museum, lateral and calicular views, ×1.75, ×2.2, respectively (GCD=17.8 mm). (*L*), *Stolarskicyathus pocilliformis*, holotype, AM G16748, inner thecal rim broad longitudinal zones, ×24 (width of longitudinal zone 0.6 mm).

Table 6. Distinguishing characteristics of the four species of *Placotrochides* Alcock, 1902.

	P. scaphula	*P. frustum*	*P. minuta*	*P. cylindrica*
GSD max.; GSD:LSD	12.2 mm; 1.54–1.87	5.53 mm; 1.19–1.52	4.0 mm; 1.58–1.94	5.51 mm; 1.00–1.28
GCD max.; GCD:LCD	13.0 mm; 1.4–2.0	5.0 mm; 1.19–1.52	4.26 mm; 1.58–2.00	6.56 mm; 1.07–1.16
Septal symmetry and number	S1–2>>S3>S4; 48	S1–2>>S3; 26 (8–13 primary septa)	S1–2>>S3=>S4; 32 (11–14 primary septa)	S1>S2>>S3>=S4; 32
Shape of basal scar	V-shaped	V-shaped	V-shaped	flat
Axial edge of S1–2	slightly sinuous	slightly sinuous	very sinuous	slightly sinuous
Calice symmetry	often asymmetric	sometimes asymmetric	sometimes asymmetric	symmetric
Other	thecal edges slightly crested	—	—	theca rough; calice margin slightly scalloped
Distribution	Indo-West Pacific; 809–1628 m	amphi-Atlantic; 497–1378 m	off northeastern Australia and Banda Sea; 282–458 m	off northeastern Australia; 1117–1402 m

above, in some cases the calice is asymmetric, which leads to a slightly different length to each side of the calice and thus a different number of septa on each side; this occasionally also disrupts the hexameral nature of development, resulting in 11, 13, or 14 primary septa (S1–2). Nonetheless, coralla with a GCD less than 3.45 mm invariably have only 24 septa, those between 3.45 and 3.8 mm in GCD have 1–12 additional S4, usually added in pairs in the end half-systems, but not always in pairs or in those systems; and above a GCD of 3.8 mm most coralla have 32 septa. S1–2 non-exsert, rather narrow, and have very sinuous, smooth axial edges that solidly fuse to the columella lower in the fossa. Faces of S1–2 bear tall (up to 0.11 mm) slender spines but no crests. S3 about one-quarter width of an S1, having laciniate axial edges or simply consist of a disconnected series of tall spines, When present, S4 rudimentary. Fossa of moderate depth, containing an elongate, non-discrete columella composed of a loose fusion of trabeculae.

Remarks. Among the four species in the genus, *P. minuta* is most similar to *P. scaphula*, agreeing in almost every character listed in Table 6. *Placotrochides minuta* differs primarily in size, and in having correspondingly fewer septa at the same CD. *Placotrochides minuta* is not interpreted as an early ontogenetic stage of *P. scaphula* because, although the calicular diameter and number of septa usually increases with age, the size of the basal scar remains constant, and is thus probably a better differentiating character for this genus and others transversely dividing genera such as *Truncatoflabellum* than is calicular diameter. *Placotrochides minimus* also differs in having highly sinuous septal axial edges.

Etymology. *minutus*, Latin for "small", an allusion to the small size of the corallum in relation to congenerics.

Distribution. Banda Sea; off northeastern Queensland; 282–458 m.

Placotrochides scaphula Alcock, 1902

Placotrochides scaphula Alcock, 1902b: 121–122.–Cairns, 1989a: 78–79, pl. 40, fig. l, pl. 41, figs. a–e (synonymy, description).–Cairns & Parker, 1992: 48–49, figs. 15h,i (**Vic**).–Cairns, 1994: 79–80, pl. 34, figs. f–h (remarks); 1995: 116–117, pl. 38, fig. j, pl. 39, fig. a (**NZ**).–Cairns & Zibrowius, 1997: 174 (synonymy, remarks).

New records. QUEENSLAND: Cidaris I 9-2, 1, MTQ G55694; Cidaris I 11-2, 2, MTQ G55695; Cidaris I 30-2, 16, MTQ G55696; Cidaris I 35-2, 1, MTQ G55698; Cidaris I 35-3, 2, MTQ G55697.

Types. The holotype is ZMA Coel. 1094. Type Locality: 5°54.5'S 120°19.2'E (Flores Sea), 462 m.

Remarks. The holotype of *P. scaphula* was based on a specimen with a GCD (and basal scar) of 6.8 mm, but since then much larger specimens have been reported, up to 13 mm (Cairns, 1989a) and as small as 5 mm GCD (Cairns & Parker, 1992).

Placotrochus laevis Milne Edwards & Haime, 1848

Placotrochus laevis Milne Edwards & Haime, 1848a: 283, pl. 8, figs. 15, 15a.–Folkeson, 1919: 5–6 (**WA**).–Wells, 1964: 108 (**listed**).–Veron, 1986: 603, fig. (**listed**).–Cairns, 1989a: 75–76, pl. 39c–g (synonymy, description, **Qld, NT**).–Cairns & Zibrowius, 1997: 175 (**NT**).–Cairns, 1998: 401–403, fig. 8f (**WA**).–Romano & Cairns, 2000: 1048 (**NT**, molecular sequence).

Placotrochus candeanus Milne Edwards & Haime, 1848a: 283–284.–Tenison-Woods, 1878b: 314 (**Qld**).–Wells, 1984a: 108 (**listed**).–Veron, 1986: 603 (**listed**).

Placotrochus pedicellatus Tenison-Woods, 1879c: 134–135, pl. 13, figs. 7, 7a (**Qld**).–Wells, 1964: 109 (**listed**).–Veron, 1986: 603 (**listed**).

New records. QUEENSLAND: QLD-94, 1, AM G16621; QLD-114, 1, WAM 717-84; QLD-115, 3, AM G16515; QLD-128, 1, AM G16519; QLD-140, 5, AM G16520; Akademik Oparin Gulf 16, 2, NTM C10139; Akademik Oparin Gulf 17, 1, NTM C10143; Akademik Oparin Gulf 18, 12: 9, NTM C6451 and 3, USNM 93202; Akademik Oparin Gulf 19, 1, NTM C10158; 21°20'S 152°30 (station VI), 69 m, 17 October 1962, 2, AM G16528. —NORTHERN TERRITORY: 14°35'S 141°30'E (Horsey River, Gulf of carpenteria), depth and date unknown, 4, AM G4245.

Types. The holotype of *P. laevis* was not located. Type Locality: "Philippines", depth unknown.

The holotype of *P. candeanus* also is unknown. Type Locality: "Les mers de la China", depth unknown.

The holotype of *P. pedicellatus* is deposited at the Macleay Museum. Type Locality: Princess Charlotte Bay, Queensland, 18 m. This specimen was examined in 2002 and determined to be the typical anthocaulus stage of *P. laevis*.

Polymyces wellsi Cairns, 1991

Polymyces wellsi Cairns, 1991a: 22, pl. 8, figs. a,b; 1995: 108–109, pl. 35, figs. d–f (**NZ**).–Cairns & Zibrowius, 1997: 160–161 (remarks).–Cairns, 1998: 403–404 (**WA**); 1999a: 128 (remarks).

New records. QUEENSLAND: Cidaris I 3-1, 4, MTQ G55691; Cidaris I 4-1, 2, MTQ G55692; Cidaris I 24-1, 3, MTQ G55693.

Types. The holotype is USNM 84836; paratypes are split between USNM and NZOI. Type Locality: 1°18.7'S 89°48.8'W (Galápagos), 545–562 m.

Rhizotrochus flabelliformis Cairns, 1989

Rhizotrochus flabelliformis Cairns, 1989a: 81, pls. 41k,l, 42b,d; 1995: 109–110, pls. 35g–i, 36a,b (**NZ, SM**).–Cairns & Zibrowius, 1997: 161–162 (remarks).–Cairns, 1999a: 127 (remarks).

New records. Britannia Seamount: Franklin 05/89/46, 1, AM G16585; Franklin 08/88/D22, 14, AM G15894. —QUEENSLAND: Franklin 06/88/x, 36, AM G16680.

Types. The holotype is ZMA Coel. 1216. Type Locality: 6°08'N 121°19'E (Sulu Archipelago, Philippines), 275 m.

Rhizotrochus levidensis Gardiner, 1899

Rhizotrochus levidensis Gardiner, 1899: 162, pl. 19, figs. 2a,b.–Cairns & Parker, 1992: 49 (remark).

Monomyces levidensis.–Veron, 1986: 603 (**undocumented listing for Australia**).

New record. QUEENSLAND: Packer Reef, 1–10 m, 1 August 1973, 2, USNM 78583.

Types. Two of the three syntypes are BM 1970.1.26.9–10. Type Locality: Lifu, Loyalty Islands, 73 m.

Rhizotrochus tuberculatus (Tenison-Woods, 1879)

Fig. 10 I

Vasillum tuberculatum Tenison-Woods, 1879b: 93, pl. 10, figs. 3a,b (**Vic**).–Stranks, 1993: 21 (**type deposition**).

Flabellum tubuliferum Tenison-Woods, 1880b: 301 (**Vic**).–Veron, 1986: 603 (**listed**).

Rhizotrochus radiatus Dennant, 1904: 2–3 (**Vic**).–Howchin, 1909: 244 (**listed**).–Stranks, 1993: 21 (**type deposition**).

Monomyces radiatus.–Wells, 1958: 262 (**listed**).–Squires, 1961: 18 (**listed**); 1966: 172, pl. 1, figs. 1–2 (**Vic**).–Shepherd & Veron, 1982: 177, fig. 4.54f (**SA, Vic**).–Veron, 1986: 603 (**listed**).

Rhizotrochus tuberculatus.–Cairns & Parker, 1992: 49–50, figs. 16g–i (**WA, Vic, Tas**).–Johnson, Baarli & Scott, 1995: 95, fig. 9A–C (Pleistocene of **WA**).–Cairns, 1998: 403 (**WA**).

New records. VICTORIA: Wilson's Promontory, 6–12 m, 8 February 1982, 2, NMV F67801; Port Fairy, depth unknown, 1, NMV F67877; Tangaroa 81-T-1-190, 1, NMV F67820.

Types. The holotype of *V. tuberculatum* is NMV F59398. Type Locality: Bass Strait or Port Phillip Bay, Victoria, depth unknown.

The holotype of *F. tubuliferum*, reputed to be deposited at AM, could not be found there in 2002. Type Locality: Bass Strait, Victoria, depth unknown.

Possible paratypes of *R. radiatus* are deposited at NMV (Stranks, 1993). Type Locality: South Australia and Victoria, 27–40 m.

Truncatoflabellum aculeatum (Milne Edwards & Haime, 1848)

Flabellum aculeatum Milne Edwards & Haime, 1848a: 272, pl. 8, figs. 3, 3a.

Flabellum spinosum Milne Edwards & Haime, 1848a: 271, pl. 8, fig. 4.–Tenison-Woods, 1878b: 310 (**Qld**).–Wells, 1964: 109 (**listed**).–Veron, 1986: 603 (**listed**).

Flabellum rubrum.–Folkeson, 1919: 4–5 (in part: specimens 2, 3, 5).

Truncatoflabellum aculeatum.–Cairns, 1989a: 61, 64, pl. 31, figs. h–l, pl. 32, figs. a–c (synonymy, description, tabular key).–Cairns & Zibrowius, 1997: 166–167 (**NT, WA**).–Cairns, 1998: 399–400 (**WA**, tabular key); 1999a: 123 (remarks).

New records. QUEENSLAND: Akademik Oparin Gulf 13, 1, NTM C10111; Akademik Oparin Gulf 19, 1, NTM C10157; Akademik Oparin Gulf 20, 3, NTM C10150. —NORTHERN TERRITORY: Soela 7/80/31, 1, AM G16538; Soela 7/80/43, 3, AM G15942.

Types. The holotype of *F. aculeatum* is MNHN 1016. Type Locality: Philippines, depth unknown.

The type of *F. spinosum* is lost (Cairns, 1989a). Type Locality: off China, depth unknown.

Truncatoflabellum angiostomum (Folkeson, 1919)

Flabellum angiostomum Folkeson, 1919: 5, pl. 1, figs. 1–3 (**WA**).–Not Cairns, 1995: 99 (=*Flabellum arcuatile* Cairns, 1999).

Truncatoflabellum spheniscus.–Cairns & Zibrowius, 1997: 165–166 (in part: figs. 23a,b, KH72–1–29 and KH72–1–30, **NT, WA**).

Truncatoflabellum angiostomum.–Cairns, 1998: 395–396, figs. 7a–c, 8a (**WA, NT**, tabular key).

New records. NORTHERN TERRITORY: SK 6/1, 8–10 km north of Point Stuart, 16 m, 2, NTM C7431. —WESTERN AUSTRALIA: Akademik Oparin 1987-3, 1, NTM C7781.

Types. The holotype is deposited at SMNH. Type Locality: 72 km WSW Cape Jaubert, Western Australia, 22 m.

Truncatoflabellum angustum Cairns & Zibrowius, 1997

Truncatoflabellum angustum Cairns & Zibrowius, 1997: 172–173, figs. 23c–f (**NZ**).–Cairns, 1999a: 121, fig. 20b (synonymy, remarks).

New records. QUEENSLAND: Cidaris I 43-2, 3, MTQ G55629. —WESTERN AUSTRALIA: Bhagwan 18, 1, WAM Z13224.

Types. The holotype is deposited at MNHN; paratypes are split among MNHN, USNM, and POLIPI. Type Locality: 11°28.3'N 124°11.6'E (Philippines), 205–214 m

Truncatoflabellum australiensis Cairns, 1998

Truncatoflabellum australiensis Cairns, 1998: 396–399, figs. 7d–f, 8b (**WA**, tabular key).–Griffith & Fromont, 1998: 232–233 (type deposition).

New records. WESTERN AUSTRALIA: Akademik Oparin 1987-3-2, 51, NTM C7780; Akademik Oparin 1987-4-1, 3, NTM C7790; Bhagwan 15, 5, WAM Z13170; Bhagwan 32, 20: 3, USNM 1009434, 17, WAM Z13194.

Types. The holotype is WAM 169–83; remaining paratypes are split among WAM, USNM, and NTM (Griffith & Fromont, 1998). Type Locality: between Shark Bay and Onslow, Western Australia, depth unknown.

Truncatoflabellum cumingi (Milne Edwards & Haime, 1848)

Figs. 10J,K

Flabellum cumingii Milne Edwards & Haime, 1848a: 275, pl. 8, fig. 11.

Not *Flabellum irregulare* Semper, 1872: 242.

Flabellum irregulare Tenison-Woods, 1878b: 313 (**NSW**) new synonym.–Wells, 1964: 109 (**listed**).–Veron, 1986: 603 (**listed**).

Flabellum rubrum.–Crossland, 1952: 105–106 (**Qld**).–Stephenson & Wells, 1956: 56 (**listed**).–Wells, 1964: 108 (**listed**).

Truncatoflabellum cumingi.–Cairns, 1989a: 69, pl. 35f–i (synonymy, description, neotype designation).

New record. WESTERN AUSTRALIA: KH72-1-30, 1, USNM 97519.

Types. The neotype of *F. cumingii*, designated by Cairns (1989a), is deposited at USNM (81976). Type Locality: 1°08.6'N 128°01'E (Halmahera), 46–55 m.

The uncatalogued holotype of *F. irregulare* Tenison-Woods, 1878 is deposited at the Macleay Museum (Figs. 10J,K). Type Locality: off Port Stephens, New South Wales, 128 m.

Remarks. *Flabellum irregulare* Tenison-Woods, 1878b is a junior primary homonym of *Flabellum irregulare* Semper, 1872, both species now attributed to *Truncatoflabellum*. A replacement name for the Tenison-Woods species is not proposed as it appears to be a junior synonym of *T. cumingi*.

Truncatoflabellum formosum Cairns, 1989

Truncatoflabellum formosum Cairns, 1989a: 69–70, pls. 35j,k, 36a,b.–Cairns & Zibrowius, 1997: 169–170 (synonymy, remarks); 1998: 396 (**WA**, tabular key).

New record. WESTERN AUSTRALIA: Lady Basten 1031502, 1, WAM Z16009.

Types. The holotype (81953) and paratypes are deposited at USNM. Type Locality: 7°06'06"N 125°40'08"E (Philippines), 42 m.

Truncatoflabellum macroeschara Cairns, 1998

Flabellum sp. Veron, 1986: 603, black and white figure of anthocaulus and anthocyathus (**A**).

Truncatoflabellum macroeschara Cairns, 1998: 401, figs. 8d,e, g–i (**WA**, tabular key).–Griffith & Fromont, 1998: 233–234 (**type deposition**).

New records. QUEENSLAND: FNQ 79-49, 4, AM G16529; "Barrier Reef", depth unknown, 1, AM G301.

Types. The holotype is WAM 50–83; paratypes are split among WAM, USNM, NMV, and NTM (Griffith & Fromont, 1998). Type Locality: 19°52.3'S 117°16.1'E (east of Glomar Shoal, WA), 56–58 m.

Truncatoflabellum martensii (Studer, 1878)

Flabellum martensii Studer, 1878: 630–631, pl. 1, figs. 4a,b (**Qld**).

Flabellum mortensi.–Wells, 1964: 109 (**listed**).–Veron, 1986: 603 (**listed**).

Truncatoflabellum martensii.–Cairns, 1999a: 124 (synonymy, remarks).

New records. None.

Types. The holotype is ZMB 1798. Type Locality: 26°51.1'S 153°29.6'E (off Brisbane, Queensland), 139 m.

Truncatoflabellum paripavoninum (Alcock, 1894)

Flabellum pari-pavoninum Alcock, 1894: 187.

Truncatoflabellum paripavoninum.–Cairns, 1989a: 72–73, pls. 37j–l, 38a (synonymy, description, tabular key); 1995: 113–114, pl. 37d,e (**NZ**).–Cairns & Zibrowius, 1997: 169, pl. 22f (remarks).–Cairns, 1998: 399 (**WA**).

New record. WESTERN AUSTRALIA: Bhagwan 21, 1, WAM Z13181.

Types. The holotype is presumed to be deposited at the Indian Museum, Calcutta (Gardiner, 1902). Type Locality: 13°47'49"N 73°07'E (Laccadive Sea, Indian Ocean), 1163 m.

Truncatoflabellum spheniscus (Dana, 1846)

Euphyllia spheniscus Dana, 1846: 160–161, pl. 6, figs. 1a–c.

Flabellum affine Milne Edwards & Haime, 1848a: 274, pl. 8, fig. 10 (**Qld**).–Tenison-Woods, 1878b: 310–311 (**Qld**).–Squires, 1961: 18 (**listed**).

Flabellum rubrum.–Folkeson, 1919: 4–5 (in part: specimen 1, **WA**).

Truncatoflabellum spheniscus.–Cairns, 1989a: 65–66, pl. 32g–k (**Qld, WA**, description, synonymy, tabular key).–Cairns, 1994: 76 (synonymy).–Cairns & Zibrowius, 1997: 165–167 (in part: not fig. 23a,b, not specimens from Akademik Oparin or Hakuho Maru, **NT**).–Cairns, 1998: 399 (**WA**).

New record. QUEENSLAND: 20°03'S 148°15'E (Abbot Bay), depth and date unknown, 2, AM G7026.

Types. Four syntypes of *F. spheniscus* are deposited at USNM. Type Locality: Singapore, 3–6 m.

The holotype of *F. affine* is presumed to be lost (Cairns, 1989a). Type Locality: Sir Charles-Hardy Island, Blackwood Channel, Queensland, depth unknown.

Truncatoflabellum veroni Cairns, 1998

Truncatoflabellum spheniscus.–Cairns & Zibrowius, 1997: 165–166 (in part: Akademik Oparin 18, **Qld**).

Truncatoflabellum veroni Cairns, 1998: 400, figs. 7g–i, 8c (**WA, NT**).–Griffith & Fromont, 1998: 234–235 (**type deposition**).

New records. QUEENSLAND: Akademik Oparin Gulf 16, 1, NTM C10148; Akademik Oparin Gulf 17, 8, NTM C10142; Akademik Oparin Gulf 18, 14: 11, NTM C10148 and 3, USNM 93197; 22°05'S 152°30'E (Swain Reef), station 6, 30 m, 17 October 1962, 11, AM G15934 and G16527; 23°52'S 151°23'E (Gatcombe Head), 16–22 m, December 1929, 1, AM G16530. —WESTERN AUSTRALIA: Akademik Oparin 1987-3-2, 1, NTM ex C77881.

Types. The holotype is deposited at WAM (89–83); paratypes are split among WAM, USNM, and NTM (Griffith & Fromont, 1998). Type Locality: 19°59'S 117°16'E (off Port Walcott, WA), 50–52 m.

Truncatoflabellum vigintifarium Cairns, 1999

Truncatoflabellum vigintifarium Cairns, 1999a: 121–122, figs. 20c–f.

New records. SEAMOUNTS: Franklin 08/88/D22 (Britannia), 2, AM G16730. —QUEENSLAND: Franklin 06/88/x, 3, AM G16738; QLD 1259, 1, AM G15729.

Types. The holotype is deposited at MNHN; additional paratypes are split between MNHN and USNM.

Family Gardinariidae Stolarski, 1996

Gardineria hawaiiensis Vaughan, 1907

Gardineria hawaiiensis Vaughan, 1907: 65–66, pl. 4, fig. 1.–Cairns, 1995: 110–111, pl. 36, figs. c–f, i (**NZ**); 1998: 404 (**WA**); 1999a: 128 (synonymy, remarks).

New record. SEAMOUNTS: Franklin 08/88/D4 (Argo Bank), 1, AM G16596.

Types. The holotype is deposited at USNM (20731). Type Locality: 22°15'25"N 159°23'15"W (Hawaiian Islands), 497–541 m.

Gardineria philippinensis Cairns, 1989

Gardineria philippinensis Cairns, 1989a: 82, pl. 42, fig. a.–Cairns & Zibrowius, 1997: 162–163 (**NT**).–Cairns, 1998: 404 (**WA**).

New records. None.

Types. The holotype (82002) and paratypes are deposited at USNM. Type Locality: 13°20'N 123°14'15"E (Philippines), 192 m.

Gardineria sp. A

Gardineria sp. Not Gardiner, 1929: 125 (=*Crispatotrochus curvatus*).–?Veron, 1986: 603 (**Qld**, 55 m).–Cairns, 1995: 111, pl. 36g,h (**NZ, SM**).

New records. None.

Stolarskicyathus n.gen.

Gen. n. A Stolarski, 1996: 350, 362–364, figs 6, 11.

Diagnosis. Corallum conical (ceratoid) and firmly attached through a narrow pedicel (no secondary attachments or transverse division). Epitheca transversely corrugated, rising above the outer septal edges as a smooth, prominent thecal rim. Septa in 3 cycles; paliform lobes absent; columella labyrinthiform.

Discussion. *Stolarskicyathus* differs from the only other Recent gardineriid genus, *Gardineria*, in lacking paliform lobes and in lacking secondary pedicel attachments.

Type species. *Stolarskicyathus pocilliformis*.

Etymology. Named in honour of Jarosław (Jarek) Stolarski, for his pioneering work with scleractinian microstructure, especially with the fossil and lesser derived Recent forms. Gender: masculine.

Stolarskicyathus pocilliformis n.sp.

Figs. 10L, 11A–E

Records/Types: Holotype: Franklin 03/99/D11, AM G16748. Paratypes: Franklin 03/99/D10, 10, USNM 1008859; Franklin 03/99/D11, 56: 54 (including SEM 1012), USNM 1008860, and 2, ZMUZ; Franklin 03/99/D12, 3, USNM 1008861; Franklin 03/99/D13, 5, USNM 1008862. Type Locality: 20°14.49'S 151°47.53'E (Marion Plateau, Queensland), 342 m.

Description. Corallum conical (ceratoid), having an eccentrically circular calice. Largest specimen (holotype) 5.47 mm in CD and 9.48 mm in height. Coralla opportunistic in attachment, having been found firmly attached to: foraminifera, shell fragments, rocks, bryozoan colonies, and sand grains. Basal plate approximately 1 mm in diameter, having a scalloped perimeter composed of 6 smaller outpocketings (Fig. 11D), each bulge about 0.45 mm in diameter and corresponding to the region between each of the 6 S1. Just above these 6 protrusions the corallum narrows slightly to a diameter of 0.80– 0.85 mm, above which it expands at a constant angle of 18–20°, resulting in a H:D of 1.73–1.89. Epitheca finely transversely corrugated, as though lathed on a potter's wheel. Corallum uniformly white.

Septa hexamerally arranged in 3 complete cycles (24 septa) according to the formula: S1>S2>S3, the third cycle developing at a CD of about 1.6 mm. No coralla examined had over 24 septa. S1 have vertical, slightly sinuous axial edges that fuse to the columella low in the fossa; rounded upper edges that rise to the level of the uppermost calicular edge; and outer edges that curve downward before meeting the theca, resulting in a well-developed thecal rim extending as much as 0.9 mm above the point at which the septa join the theca. This rim is divided into 24 longitudinal zones, each zone 0.6–0.7 mm wide and up to 0.7 mm thick (Fig. 10L), the thickness resulting from internal stereome. These zones are covered with low rounded granules 30–35 μm in diameter and separated from each other by a narrow (65 μm) stria. In the centre of each zone is a septum, although the width of the septa is only about half the width of the zone. S2 about 85% width of an S1, of the same shape, and also having sinuous axial edges that fuse to the columella. S3 about 33% width of an S1, have sinuous axial edges, but do not fuse with the columella. All septal faces covered with pointed (75 μm tall) granules. Fossa of moderate depth, containing a robust, free-standing columella composed of 9–12 slender lamellae that are often slightly swirled. Axial edges of pairs of columellar lamellae sometimes fused, producing a V-shaped cross section (Fig. 11A), and the columellar lamellae are sometimes interconnected in a labyrinthiform arrangement.

Remarks. Stolarski (1996) described and nicely illustrated a congeneric to this species from the Loyalty Islands (MUSORSTOM 6, DW 468), classifying it as an undescribed genus and species in his newly erectly family Gardineriidae Stolarski, 1996. A specimen presumed to be the same as his undescribed species from off New Caledonia (MUSORSTOM 5–DW329: 20°22.90'S 158°46.50'E, 320 m, USNM 1008879) reveals that, although it is similar to *S. pocilliformis*, it differs in having a narrower corallum (H:D = 2.17); more exsert septa, which rise above the thecal rim; a lesser developed internal stereome; and occasionally black streaked epitheca. Stolarski (1996: 364) also implied that another species described and illustrated by Sieg & Zibrowius (1989: 192) from New Caledonia at 675–680 m (BIOCAL, DW 33) only as "a new species in a new genus of the Flabellidae" may also belong to this genus. Specimens of that undescribed species are also present at the NMNH (from BIOCAL DW33, as well as six stations from the Bathus 4 expedition), but differ from both of those previously discussed in having a curved corallum with a truncate base (the result of transverse division), slender paliform lobes (P1–2?), slender columellar elements, and an elliptical calice. Thus, this as yet undescribed species is not considered to be congeneric.

Etymology. *pocilliformis*, Latin for "having the form of a small cup".

Distribution. Known only from the Marion Plateau, Queensland, 342–367 m.

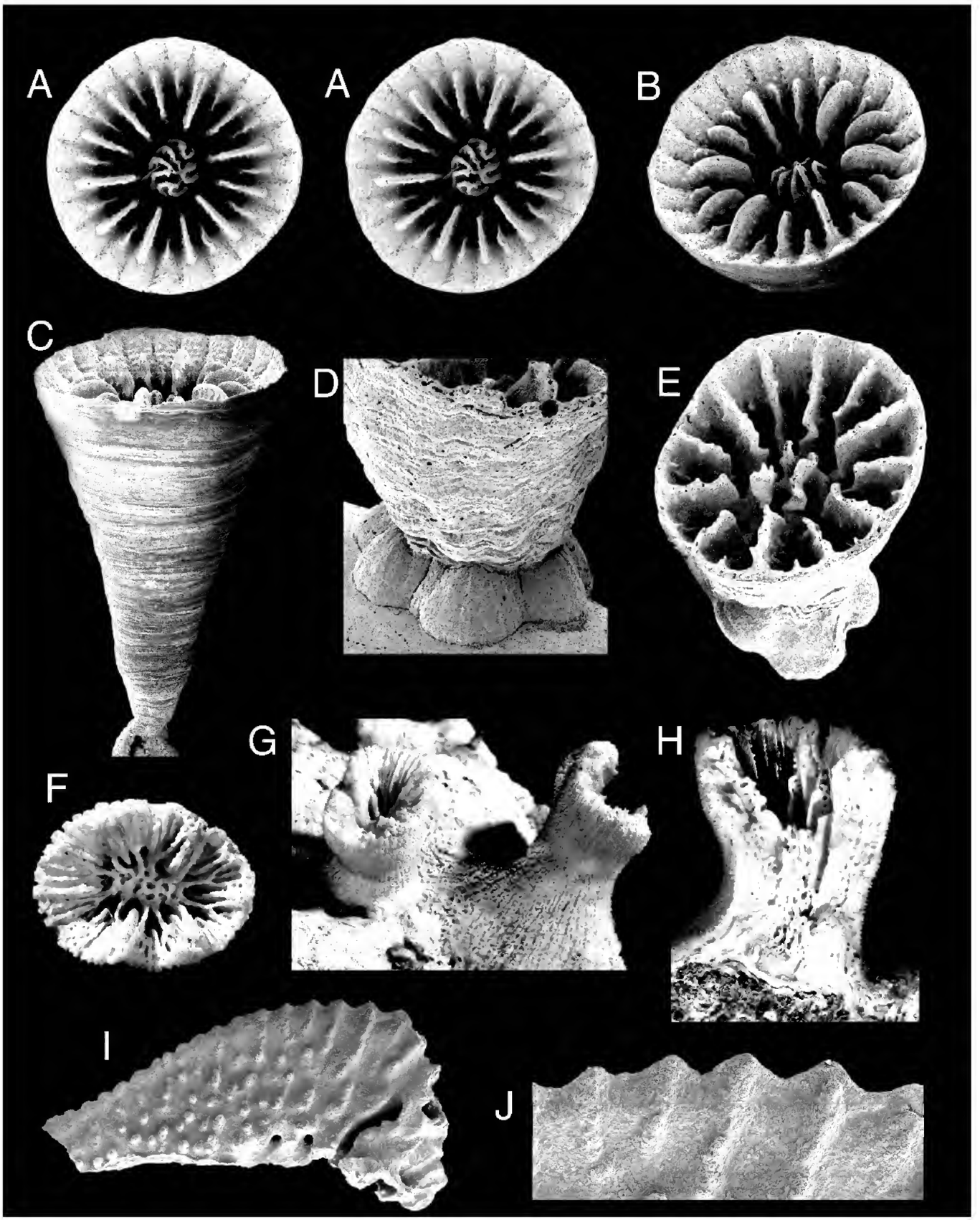

Fig. 11. (*A–E*), *Stolarskicyathus pocilliformis* (*A–C*, holotype, AM G16748, CD=5.47 mm; *D, E*, paratype, USNM 1008860): (*A–C*), stereo calicular, oblique calicular, and lateral views of holotype, all ×8.5; (*D*), basal view of juvenile showing the scalloped basal plate, ×43; (*E*), juvenile corallum, also showing scalloped basal plate, ×34, (GCD=1.43 mm). (*F–H*), *Balanophyllia dilatata*, syntypes, NMV F41512, GCD=8.8 mm: (*F*), calicular view, ×4.4; (*G*), lateral view of both syntypes, ×2.5; (*H*), longitudinal fracture of a syntype, ×3.6. (*I, J*), *Balanophyllia spongiosa*, holotype, SEM stub 1035 (USNM 1008863), fine dentition on axial edge of an S1, ×22, ×67, respectively.

SUBORDER DENDROPHYLLIINA

Family Dendrophylliidae Gray, 1847

Balanophyllia bairdiana Milne Edwards & Haime, 1848

Balanophyllia bairdiana Milne Edwards & Haime, 1848b: 87.–Moseley, 1881: 190–192, pl. 12, figs. 4–7 (**Vic, NSW**).–Wells, 1958: 262 (**listed**).–Squires, 1961: 18 (**listed**).–Wells, 1964: 109, 114 (**listed**).–Shepherd & Veron, 1982: 178, fig. 4.55a, pl. 201 (**Vic, NSW**).–Veron, 1986: 586–587, figs. 1–5 (**NSW**).–Cairns & Parker, 1992: 50, figs. 17a–c (**Vic, Tas, NSW, Qld**).–Veron, 2000: II, 387, figs. 8–10 (**SA**).–Cairns, 2001: 16 (**listed**).

Balanophyllia buccina Tenison-Woods, 1878b: 334–335, pl. 4, fig. 4, pl. 5, figs. 5a–d (**NSW**).–Wells, 1964: 109, 114 (**listed**).–Veron, 1986: 586 (**listed**).–Cairns, 2001: 16 (**listed**).

Heteropsammia elliptica Tenison-Woods, 1878b: 339–340, pl. 6, figs. 3a,b (**NSW**).–Wells, 1958: 262 (**listed**).–Squires, 1961: 18 (**listed**).–Wells, 1964: 109, 114 (**listed**).

Balanophyllia elliptica.–Tenison-Woods, 1880a: 296 (new combination).–Wells, 1964: 109 (**listed**).–Cairns, 2001: 16 (**listed**).

New records. VICTORIA: Kapala 77/1/13, 10, AM G16436; Kapala 96/12/05, 1, AM G15872; Kapala 96/21/06, 2, AM G15880; Kapala 97/01/05, 1, AM G15884; Southern Surveyor 05/94/43, 1, AM G16706; 37°34'S 149°25'E (off Gabo Island), 155 m, October 1929, 4, AM G13329. —TASMANIA: 40°24'S 148°15'E (24 km ENE Cape Barren Island), depth and date unknown, 1, AM E2256. —NEW SOUTH WALES: Franklin 10/86/05, 1, AM G16700; 34°03'S 151°10'E (south of Sydney), 36–55 m, 8, AM G16616; 34°00'S 151°14'E (off Bare Island, La Perouse, near Sydney), 8 m, January 1968, 1, AM G13670; 33°30'S 151°51'E (37 km off Cape Three Points), 1, AM G16540; Kapala 78/21/10, 1, AM G16567; Kapala 78/26/08, 5, AM G16396; Kapala 96/11/01, 1, AM G15871; 33°45'S 151°19'E, depth unknown, 1, AM G13609; 34°15'S 151°05'E (Kimbla station 110°E of N Bulli Point), 128 m, December 1963, 7, AM G16490; Shelf Benthic Survey 33, many, AM G16657. —QUEENSLAND: 27°25'S 153°20'E (east of Moreton Bay), 115–176 m, 1969, 4, AM G15385; 27°02'S 153°28'E (northeast of Cape Moreton), 115–124 m, 1967, 5, AM G15328; north of Cape Moreton, 36 m, 1, USNM 78650; 91 km SW of Cape Adieu, GBR, 79 m, 1, AM; Kimbla 1, 9, AM G16488. —WESTERN AUSTRALIA: Akademik Oparin 1987-3, 1, NTM C7782.

Types. The holotype of *B. bairdiana* is reputed to be at BM (Moseley, 1881), but has not been examined by the author. Type Locality: Unknown.

Four syntypes of *B. buccina* are deposited at the Macleay Museum. Type Locality: off Cape Three Points, NSW, 70 fm (=128 m).

The holotype of *H. elliptica* should be deposited at the Macleay Museum, but could not be located there or AM in 2002; it is presumed to be lost. Type Locality: Port Jackson, NSW, 16 fms (=29 m).

Balanophyllia carinata (Semper, 1872)

Rhodopsammia carinata Semper, 1872: 257, pl. 19, figs. 6a,b.

Balanophyllia carinata.–Zibrowius, 1985: 235–238, figs. 15–24 (remarks, synonymy).–Cairns & Zibrowius, 1997: 175–176 (remarks).–Cairns, 1998: 404 (**WA**).

New records. None.

Types. The syntypes of *R. carinata* are presumed to be lost (Zibrowius, 1985). Type Locality: Philippines, 55 m.

Balanophyllia cornu Moseley, 1881

Balanophyllia cornu Moseley, 1881: 192–193, pl. 12, figs. 11–15.–Cairns, 1994: 82–83, pl. 35, figs. f–i (synonymy, description).–Cairns & Zibrowius, 1997: 178–179, figs. 24d–f (**NT**, synonymy, remarks).–Cairns, 1998: 404–405 (**WA**).

New records. WESTERN AUSTRALIA: Bhagwan 15, 1, WAM Z13176; Bhagwan 23, 1 in WAM.

Types. Four syntypes are deposited at BM (1880.11.25.143). Type Locality: 5°42'S 132°25'E (Banda Sea), 236 m.

Balanophyllia crassitheca Cairns, 1995

Balanophyllia crassitheca Cairns, 1995: 120–121, pl. 40i, 41a,b (**NZ, SM**); 1999a: 131 (remarks).

New records. SEAMOUNTS: Franklin 05/89/14 (Elizabeth Reef, LHSMC), 5, AM G15900; Franklin 05/89/40 (Britannia), 1, AM G16599; Franklin 05/89/46 (Britannia), 2, AM G16586; Franklin 05/89/47 (Britannia), 3, AM G16327; Franklin 05/89/48 (Britannia), 1, AM G16484.

Types. The holotype is deposited at the Museum of New Zealand (CO222); paratypes are split among NZOI, USNM, and Museum of New Zealand. Type Locality: 37°17.0'S 176°51.0'E (Bay of Plenty, New Zealand), 251–308 m.

Balanophyllia dentata Tenison-Woods, 1879

Balanophyllia dentata Tenison-Woods, 1879a: 98–99, pl. 10, figs. 1, 1a (**"South Coast"**).–Squires, 1961: 18 (**listed**).–Veron, 1986: 586 (**listed**).–Cairns & Parker, 1992: 51, figs. 17d–g (**NSW**).

Balanophyllia affinis.–Wells, 1964: 109, 114–116, pl. 2, figs. 1–3 (**Qld**, USNM 68376).

Balanophyllia eguchii Wells, 1982: 211–213 (in part: specimen from **Queensland**, 85 m, USNM 68376).–Veron, 1986: 586 (**listed**).

New records. NEW SOUTH WALES: 33°48.1'S 151°17.6'E (Cabbage Tree Bay, Manly), depth and date unknown, 18, AM G11910; 33°51'S 151°16'E (Port Jackson), depth and date unknown, 9, AM G7940; Thetis 34, 1, AM G16619; Thetis 48, 2, AM G16535; 35°20'S 150°47'E, 135 m, May 1954, 2, AM G16654; Kimbla 1, 5, AM G16493; Kimbla 2, 9: 3, USNM 1009342, 6, AM G16708.

Types. The holotype is deposited at the Macleay Museum. Type Locality: "South Coast" of Australia, depth unknown.

Balanophyllia desmophyllioides Vaughan, 1907

Balanophyllia desmophyllioides Vaughan, 1907: 149–150, pl. 45, fig. 1.–Cairns & Zibrowius, 1997: 177–178, figs. 23g,h (description, synonymy).–Cairns, 1999a: 129–130, fig. 22c (remarks).

New records. SEAMOUNTS: Franklin 05/89/47 (Britannia), 4, AM G16718; Franklin 08/88/D22 (Britannia), 1, AM G16711. —QUEENSLAND: Franklin 06/88/x, 17, AM G16679.

Types. The holotype is deposited at USNM (20793). Type Locality: 20°16'10"N 155°53'20"W (Hawaiian Islands), 44–152 m.

Balanophyllia dilatata Dennant, 1904

Figs. 11F–H

Balanophyllia dilatata Dennant, 1904: 10, pl. 1, figs. 2a,b (**Vic**).–Wells, 1964: 114 (**listed**).–Veron, 1986: 586 (**listed**).–Cairns & Parker, 1992: 51 (incorrect synonymy).–Stranks, 1993: 21 (**type deposition**).

New records. None.

Types. Two syntypes are deposited at NMV (F41512). Type Locality: Port Phillip Bay, Victoria, depth unknown, although its attachment to an alga indicates a shallow habitat.

Remarks. Cairns & Parker (1992) implied that *B. dilatata* may be a junior synonym of *B. dentata* Tenison-Woods, 1878, although at that time the type of the former was not

available for study. The types of both species have now been compared, and, although the specimens are similar, *B. dilatata* differs from *B. dentata* in having a slightly different arrangement of its S4. In *B. dentata*, each S4 of a pair is roughly of the same width, meet on the axial side of the S3, and proceed directly toward the columella as a fused septum, whereas in *B. dilatata* the S4 in each pair are unequal in width, the S4 adjacent to the S1 being dominant, and, once fused, continue toward the columella in an oblique fashion, tending to curve toward the adjacent S2.

Balanophyllia generatrix Cairns & Zibrowius, 1997

Balanophyllia generatrix Cairns & Zibrowius, 1997: 183–184, figs. 25g–i, 26a,b (**NT**).–Cairns, 1998: 405 (**WA**).

New records. None.

Types. The holotype is deposited at MNHN; paratypes are split among MNHN, USNM, NNM, and ZMA. Type Locality: 9°30'00"S 131°02'41"E (continental slope off Melville Island, N.T.), 215–218 m. Originally the type locality was interpreted as off the Tanimbar Islands, but a more precise mapping indicates that it is off the continental slope of Northern Territory.

Balanophyllia gigas Moseley, 1881

Balanophyllia gigas Moseley, 1881: 193.–Cairns, 1994: 83, pl. 35j–l (synonymy, description); 1995: 119–120, pl. 40f–h (**NZ**).–Cairns & Zibrowius, 1997: 182 (remarks).–1998: 404 (**WA**); 1999a: 131 (remarks).

New records. SEAMOUNTS: NZOI U210 (Taupo), 13, AM G16553. —WESTERN AUSTRALIA: Bhagwan 5, 1, WAM Z20513.

Types. The holotype is deposited at BM (1876.10.11.23). Type Locality: Japan, depth unknown.

Balanophyllia imperialis Kent, 1871

Balanophyllia imperialis Kent, 1871: 284, pl. 23, figs. 5a,b.–Cairns & Zibrowius, 1997: 184–185, figs. 26c–f (synonymy, **WA**).–Cairns, 1998: 404 (**WA**).

New records. None.

Types. The holotype is deposited at BM. Type Locality: Singapore, South China Sea, depth unknown.

Balanophyllia spongiosa n.sp.

Figs. 11 I,J, 12A–C

Records/Types. Holotype (type locality): 34°00'S 151°13'E (Inscription Point, Kurnell, NSW), 10.7 m, 20 January 1968, AM G13677, and septal fragment as SEM 1035, USNM 1008863. Paratypes: from type locality, 7: 5, AM G13672 and 2, USNM 1008864; 33°59.6'S 151°13.8'E (West Bare Island, La Perouse, Sydney), depth unknown, April 1967, 1, AM G13678; 34°04'S 151°11'E (Cronulla), 18 m, early 1967, 1, AM G13671.

Description. Corallum ceratoid to subcylindrical, the holotype and largest corallum 14.1×10.8 mm in CD and 23.4 mm in height, having a PD of 5.3 mm (ceratoid), but a majority of the paratypes are subcylindrical, having a pedicel diameter almost equal to that of the calice. Calice elliptical: GCD:LCD = 1.17–1.45. Corallum usually epithecate on lower half, this region often completely eroded or encrusted with other organisms. Above epitheca, costae are poorly defined and very porous, consisting of small, linearly arranged spines separated by very thin, shallow intercostal striae. Corallum white, but tissue of living coral appears to have been purple (pers. comm., C.J. Lawler) or black.

Septa hexamerally arranged in 5 incomplete cycles, the holotype having 82 septa (i.e., 17 pairs of S5). S1–2 equal in size, independent, only slightly exsert (about 1.6 mm), and relatively narrow, having a slightly concave axial edge. Entire axial edge of S1–2 finely and regularly dentate, each triangular tooth 65–70 µm in height, about 5 occurring every mm (Figs. 11I,J). S3 about one-third size of the S1–2, also independent, and also having a dentate axial edge, the teeth being slightly coarser. Remaining septa (S4–5) arranged in a well-developed Pourtalès Plan, S5 adjacent to S1 and S2 always being much larger than those adjacent to S3, but the axial edges of each pair of S5 fusing before their adjacent S4 and this combined septum fusing again with the other S5 pair (or unflanked S4) within the half-system near the columella. Axial edges of S4–5 coarsely dentate to laciniate, and in the fusion region adjacent to the columella the axial protuberances are so well developed as to resemble columellar elements, giving the impression that the columella is extending outward and upward onto the septa (Fig. 12C). Fossa quite shallow, containing an elongate, robust columella that may occupy up to 30% width of calice. Columella non-discrete (in that it merges with the axial edges of many of the septa), essentially flat-topped, and composed of up to 100 small (0.1 mm diameter), interconnected papillae.

Remarks. Among the Australian and Western Pacific species of *Balanophyllia, B. spongiosa* can be distinguished by its finely dentate axial edges of the S1–2; its large, flat-topped columella; and the apparent extension of the columella onto the lower, axial edges of the S1–2, S5.

Etymology. *spongia*, Latin for "sponge" + *osus*, Latin suffix meaning "full of", an allusion to the spongy nature of the columella and lower, axial edges of the larger septa

Distribution. Known only from the region of Sydney, New South Wales, 11–18 m.

Balanophyllia stimpsonii (Verrill, 1865)

Eupsammia stimpsonii Verrill, 1865: 150.
Balanophyllia stimpsonii.–Zibrowius, 1985: 234–235, figs. 1–4 (synonymy, **NSW**).–Cairns & Zibrowius, 1997: 176–177 (synonymy, diagnosis).

New record. QUEENSLAND: Kimbla K4/69, 2, USNM 92986.

Types. Two syntypes are deposited at YPM. Type Locality: "North China Sea', depth unknown.

Balanophyllia yongei Crossland, 1952

Balanophyllia yongei Crossland, 1952: 167–169, pl. 14, fig. 2, pl. 15, fig. 3 (**Qld**).–Stephenson & Wells, 1956: 55 (**listed**).–Wells, 1964: 109 (**listed**).–Veron, 1986: 586 (**listed**).

New records. None; known only from type specimens.

Types. The holotype (1934.5.14.91) and all paratypes are deposited at BM. Type Locality: "station IX", Great Barrier Reef, Queensland, depth unknown.

Cladopsammia echinata Cairns, 1984

Cladopsammia echinata Cairns, 1984: 26–27, pl. 5, figs. F–G.–Cairns & Zibrowius, 1997: 191, fig. 29d (**NT**).

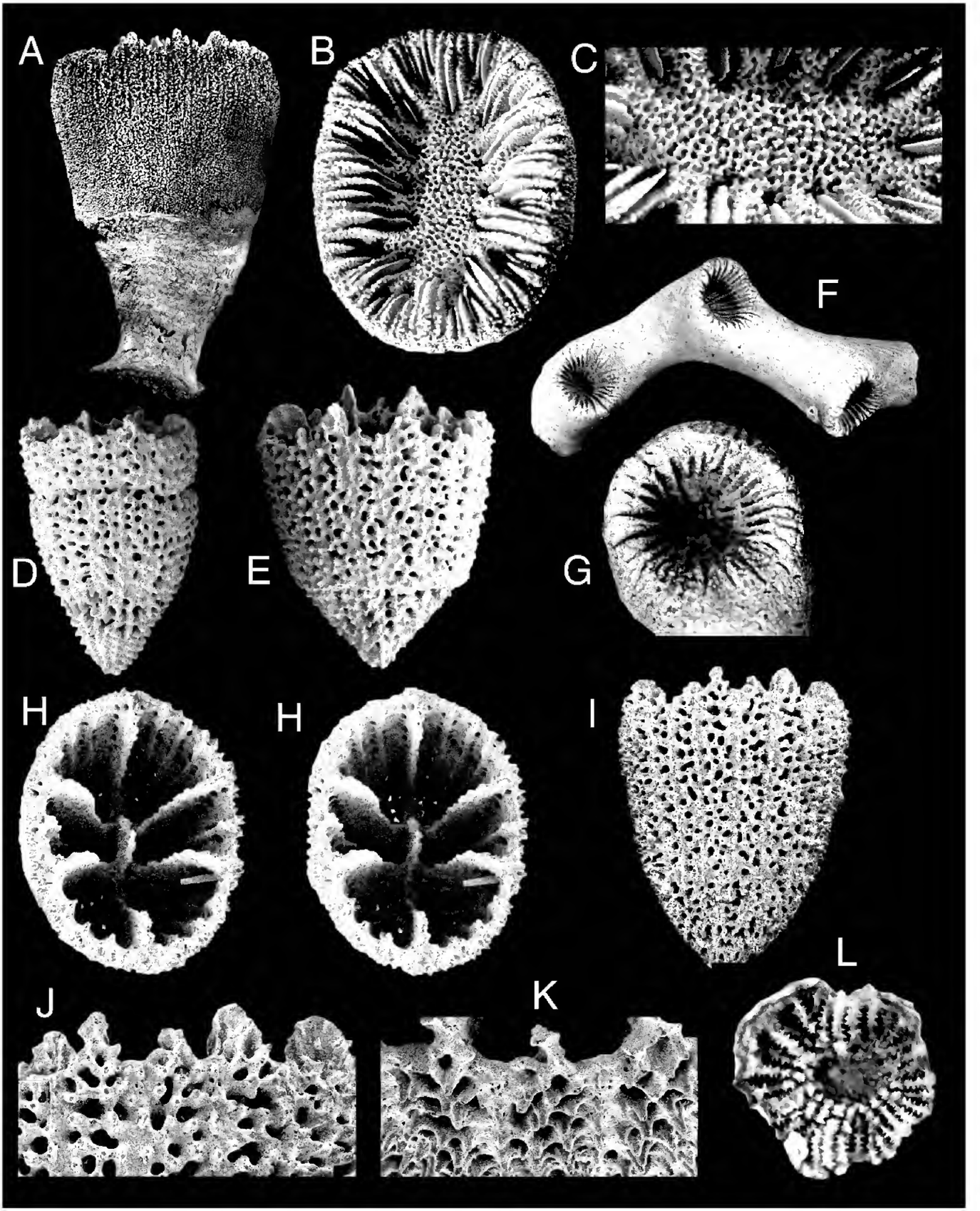

Fig. 12. (*A–C*), *Balanophyllia spongiosa*, holotype, AM G13677, GCD=14.1 mm: (*A, B*), side and calicular views, ×2.9, ×3.9, respectively; (*C*), enlargement of columella and adjacent axial septal edges, ×6.5. (*D, E, H–K*), *Notophyllia hecki* (*D, E*, paratype, USNM 1008867; *H–K*, holotype, AM G16749, GCD=3.45 mm): (*D*), anthocyathus still attached to anthocaulus, ×14 (GCD=2.3 mm); (*E*), juvenile detached anthocyathus, ×14 (GCD=2.9 mm); (*H, I*), stereo calicular and lateral views of holotype, ×14, ×11, respectively; (*J, K*), lateral and oblique views of spinose theca, ×25, ×16.5, respectively. (*F, G*), *Enallopsammia pusilla*, Franklin 06/88/x, in AM, branch fragment and calice, ×2.3, ×6.6, respectively (CD=5.6 mm). (*L*), *Tethocyathus minor* sensu Crossland (1952), BM 1984.6.11.1–3, calice, ×9.2 (CD=3.9 mm).

New records. None.

Types. The holotype is deposited at USNM (60518); paratypes are split between USNM and BPBM. Type Locality: 21°48'N 160°09.1'W (Hawaiian Islands), 298–408 m.

Dendrophyllia alcocki (Wells, 1954)

Sclerhelia alcocki Wells, 1954: 465–466, pl. 177, figs. 1–2.
Dendrophyllia alcocki.–Zibrowius, 1974: 570–573, figs, 10–14 (remarks).–Cairns, 1995: 126–127, pls. 43g–i, 44a,b (synonymy, **NZ, SM**).–Cairns & Zibrowius, 1997: 193 (remarks).–Cairns, 1998: 408, fig. 9g (**WA**); 1999a: 134 (remarks).

New records. SEAMOUNTS: Franklin 08/88/D4 (Argo Bank), 2 branches, AM G16598; Franklin 05/89/15 (Elizabeth Reef, LHSMC), 1 branch, AM G16326; Franklin 05/89/46 (Britannia), 7 branches, AM G16483; Franklin 05/89/47 (Britannia), 1 branch, AM G16592; NZOI U210 (Taupo), 2 branches, AM G16550. —QUEENSLAND: Cidaris I 52-2, 1 branch, MTQ G55638.

Types. The holotype, now broken into 4 pieces, is deposited at USNM and BM (Cairns, 1995). Type Locality: off Bikini Atoll, Marshall Islands, 177–243 m.

Dendrophyllia arbuscula van der Horst, 1922

Dendrophyllia arbuscula van der Horst, 1922: 53, pl. 8, fig. 6.–Crossland, 1952: 170–171, pl. 14, fig. 3 (**Qld**).–Stephenson & Wells, 1956: 55 (**listed**).–Wells, 1964: 108 (**listed**).–Cairns, 1994: 90–91, pl. 38i–l (synonymy, remarks); 1995: 125–126, pl. 43e,f (**NZ**).–Cairns & Zibrowius, 1997: 192–193, figs. 29a–c (**NT**, synonymy, remarks).–Cairns, 1998: 408–409 (**WA**); 1999a: 133–134 (remarks).
Dendrophyllia.–Veron, 1986: 578, black and white figure (**Australia**).

New records. NORTHERN TERRITORY: Fish Reef, Port Patterson, 12 m, 1 colony, NTM C5005; wreck of the "Zealandia", Darwin Harbour, 22 m, 1 colony, NTM C7965.

Types. Three syntypes are deposited at ZMA. Type Locality: Banda Sea, 45–90 m.

Dendrophyllia boschmai van der Horst, 1926

Dendrophyllia japonica van der Horst, 1922: 51, pl. 7, fig. 6 (junior primary homonym of *D. japonica* Rehberg, 1892).
Dendrophyllia boschmai van der Horst, 1926: 44.–Cairns, 1994: 91 (synonymy, remarks); 1998: 409 (**WA**).

New records. None.

Types. The holotype is deposited at ZMA (Coel. 5451). Type Locality: "Japan", depth unknown.

Dendrophyllia granosa Studer, 1878

Dendrophyllia granosa Studer, 1878: 653 (**WA**).–Cairns, 2001: 34 (**listed**).

New records. None.

Types. The holotype is presumed to be deposited at ZMB, although it has not been examined by the author. Type Locality: Dirk Hartog Island, Western Australia, 91 m.

Remarks. This species was overlooked by Cairns (1998) in his revision of the Western Australian azooxanthellate corals, although it might be one of the unidentified specimens he reported as *Dendrophyllia* spp. Indeed, this poorly known species has not been mentioned since its original description, and has never been illustrated.

Dendrophyllia ijimai Yabe & Eguchi, 1934

Dendrophyllia ijimai Yabe & Eguchi, 1934: 2026.–Cairns, 1994: 89, pl. 38c, f (description, synonymy); 1999a: 133 (remarks).
Dendrophyllia sp. cf. *D. ijimai*.–Cairns & Zibrowius, 1997: 191–192, fig. 29e (**SM**).

New records. None.

Types. The deposition of the holotype is unknown. Type Locality: Not stated, but presumed to be off Japan.

Dendrophyllia incisa (Crossland, 1952)

Balanophyllia incisa Crossland, 1952: 166–167, pl. 15, figs. 1–2 (**Qld**).–Wells, 1964: 109 (**listed**).–Veron, 1986: 586 (**listed**).
Dendrophyllia incisa.–Stephenson & Wells, 1956: 55 (**listed**).

New records. None.

Types. The holotype is BM 1934.5.14.369. Type Locality: Great Barrier Reef, depth unknown.

Remarks. Although often reported as a *Balanophyllia*, the type specimen is a colony, indicative of the genus *Dendrophyllia*. This species is known only from the type specimen.

Dendrophyllia velata Crossland, 1952

Dendrophyllia velata Crossland, 1952: 173–174, pl. 55, fig. 3 (**Qld**).–Stephenson & Wells, 1956: 55 (**listed**).–Wells, 1964: 109 (**listed**).–Veron, 1986: 578 (**listed**).

New records. None; this species is known only from the type specimen.

Types. the holotype is BM 1934.5.14.390. Type Locality: Great Barrier Reef, depth unknown.

Eguchipsammia fistula (Alcock, 1902)

Balanophyllia (Thecopsammia) fistula Alcock, 1902a: 109.
Dendrophyllia fistula.–Wells, 1964: 116, pl. 2, figs. 4–5 (**Qld**).–Veron, 1986: 578 (**listed**).
Eguchipsammia fistula.–Cairns, 1994: 86, pl. 36f,g (remarks); 1995: 123–124, pl. 42d–h (synonymy, description, **NZ**).

New record. SEAMOUNTS: NZOI U210 (Taupo), 7, AM G16551.

Types. Two syntypes are ZMA Coel. 563 and 564). Type Locality: Philippines, 270–275 m.

Eguchipsammia gaditana (Duncan, 1873)

Balanophyllia gaditana Duncan, 1873: 333.
Dendrophyllia praecipua.–Wells, 1964: 116, pl. 2, figs. 6–7 (**Qld**).–Veron, 1986: 578 (**listed**).
Eguchipsammia gaditana.–Cairns, 1994: 85–86, pl. 37d–f, h (synonymy, description); 1995: 122–123, pl. 42a–c (**NZ**).–Cairns & Zibrowius, 1997: 190 (remarks).

New record. SEAMOUNTS: Franklin 05/89/07 (Taupo), 1, AM G16583.

Types. The holotype is BM 1883.12.10.97. Type Locality: 36°20'N 6°47'W (Iberian-Morocco Gulf), 417 m.

Eguchipsammia japonica (Rehberg, 1892)

Dendrophyllia japonica Rehberg, 1892: 28–29, pl. 4, fig. 4.–Squires & Keyes. 1967: 28, pl. 6, figs, 6–8 (**NZ**).–Cairns, 1994: 90 (synonymy, description).
Eguchipsammia japonica.–Cairns, 1995: 124–125, pl. 43a–c (**NZ**).–Cairns & Zibrowius, 1997: 64 (**listed**).

New record. SEAMOUNTS: Franklin 08/88/D22 (Britannia), 1 colony, AM G16703.

Types. The syntypes have probably been destroyed (Cairns, 1994). Type Locality: "Japan", depth unknown.

Enallopsammia pusilla (Alcock, 1902)

Figs. 12F,G

Dendrophyllia (Coenopsammia) pusilla Alcock, 1902a: 113.
Enallopsammia sp. cf. *E. marenzelleri*.–Cairns, 1982: 57–58, pl. 18, figs. 5–6 (**NZ**); 1995: 128, pl. 44g,h (NZ).–Cairns & Zibrowius, 1997: 194, fig. 29f (synonymy, description).

New record. QUEENSLAND: Franklin 06/88/x, 1 branch, AM G16717.

Types. The holotype and paratypes are ZMA Coel. 6902 and 588, respectively). Type Locality: 5°56.5'S 132°47.7'E (Banda Sea), 595 m.

Enallopsammia rostrata (Pourtalès, 1878)

Amphihelia rostrata Pourtalès, 1878: 204, pl. 1, figs. 4–5.
Enallopsammia rostrata.–Cairns, 1982: 57, pl. 18, figs. 1–4 (synonymy, description, **NZ**).–Cairns & Parker, 1992: 52–54, figs. 18e–i (**SA, Tas, Vic**).–Cairns, 1994: 92–93, pl. 39d–f (remarks); 1995: 127–128, pl. 44c–f (**NZ**).–Cairns & Zibrowius, 1997: 195 (remarks).–Cairns, 1999a: 134–135 (remarks); 2001: 35, pl. 11l, 12d,e.

New records. TASMANIA: Franklin Slope 84, 1, NMV F67140. —VICTORIA: Soela 01/85/40, 3, NMV F67137. —NEW SOUTH WALES: "The Horseshoe", about 32 km east of Point Hicks, depth unknown, one large colony (NTM) and one branch (USNM 98440). —SEAMOUNTS: Franklin 08/88/D3 (Nova Bank), 2, AM G16324. —QUEENSLAND: Cidaris I 15-3, 6, MTQ G55623–55624.

Types. The syntypes are deposited at MCZ. Type Locality: 23°14'N 82°25'W (Straits of Florida), 1472 m.

Endopachys bulbosa Cairns & Zibrowius, 1997

Endopachys bulbosa Cairns & Zibrowius, 1997: 186, figs. 27a–g (**NT**).–Cairns, 1998: 405, figs. 8k,l (**WA**).

New records. None.

Types. The holotype is deposited at MNHN; the remaining paratypes are split between MNHN and USNM. Type Locality: 9°02'10"S 132°43'05"E (off Cobourg Peninsula, Northern Territory), 239–250 m.

Endopachys grayi Milne Edwards & Haime, 1848

Endopachys grayi Milne Edwards & Haime, 1848b: 82–83, pl. 1, figs. 2, 2a.–Veron, 1986: 610, fig. (**listed**).–Cairns, 1994: 84–85, pls. 36e, h, 37i (synonymy, description); 1995: 121–122, pl. 41c–h (**NZ**).–Cairns & Zibrowius, 1997: 185–186 (remarks).–Cairns, 1998: 405 (**WA**); 1999a: 132, fig. 22f (remarks); 2001: 25, pl. 7g.

New records. NEW SOUTH WALES: 34°04'S 151°14'E (off Jibbon, Pt. Hacking), 75–80 m, February 1964, 1, AM G15348. —QUEENSLAND: 27°02'S 153°28'E (northeast of Cape Moreton), 115–124 m, 1967, 4, AM G15377; 27°25'S 153°20'E (east of Moreton Bay), 126–175 m, 1969, 5, AM G15277; Kimbla K04/69, 4: 3, USNM 92988, 1, NMV F67794; Soela 01/86/73, 9: 5, NTM C5342, 4, AM G16705; James Kirby 732, over 100 specimens, MTQ G55748. —WESTERN AUSTRALIA: Bhagwan 15, 1, WAM Z13173.

Types. The holotype has not been located. Type Locality: Unknown.

Endopsammia philippensis Milne Edwards & Haime, 1848

Endopsammia philippensis Milne Edwards & Haime, 1848b: 91, pl. 1, figs. 5, 5a.–Cairns, 1991a: 26 (remarks).–Cairns & Zibrowius, 1997: 188, figs. 28c–e (synonymy, description, **Qld**).–Cairns, 2001: 23, pl. 5h,i (type deposition).
Endopsammia philippinensis [sic].–Wells, 1964: 118, pl. 2, figs. 12–13 (**Qld**).–Veron, 1986: 610 (**listed**).

New records. None.

Types. The holotype is BM 1855.12.27.25 or MNHN (Cairns, 2001). Type Locality: Philippines, depth unknown.

Endopsammia regularis (Gardiner, 1899)

Thecopsammia regularis Gardiner, 1899: 169–170, pl. 19, figs. a,b.–Stephenson & Wells, 1956: 59 (**Qld**).
Endopsammia regularis.–Cairns, 2001: 23 (remarks).

New records. QUEENSLAND: Boulton Reef, 8 m, 31 July 1973, 1, USNM 78572.

Types. Two syntypes are deposited at the University Museum of Zoology, Cambridge, England. Type Locality: Sandal Bay, Lifu, 73 m.

Heteropsammia cochlea (Spengler, 1781)

Madrepora cochlea Spengler, 1781: 240–248, figs. A–D.
Psammoseris cylicioides Tenison-Woods, 1879a: 10–11 (in part: 4 paralectotypes, **Qld**); 1880a: 297–299 (remarks).
Lobopsammia michelinii.–Tenison-Woods, 1880b: 295 (**Qld**).
Heteropsammia michelini.–Kent, 1893: 106, 177 (**Qld**).–Wells, 1964: 108, 120 (remarks).
Heteropsammia cochlea.–Veron & Pichon, 1980: 416–420, figs. 727–729 (synonymy, **Qld**).–Zibrowius & Grygier, 1985: 129, figs. 43–44 (**Qld**).–Veron, 1986: 576–577, colour figs. 1–2, but not black and white fig. (reversed with fig. of *Heterocyathus aequicostatus*, page 559) (**Qld, WA**).–Veron & Marsh, 1988: 123 (**WA**).–Hoeksema & Best, 1991: 234–237, figs. 24–28 (in part: not *H. moretonensis*; synonymy, remarks, key).–Grygier, 1991: 32 (**Qld**).–Cairns, 1998: 406–408 (**WA**); 1999a: 132–133 (remarks); 2001: 19–20, pls. 2h–j, 3a–e.

New records. QUEENSLAND: N. Wistari Reef, 2, NTM C7263; Lizard Island, 14, NTM C7267; Lizard Island, 14–21 m, 2, USNM 78600; James Kirby 732, 12, MTQ G55750; QLD 115, 2, AM G16517; Kimbla 22, 2, AM G16579. —NORTHERN TERRITORY: Gulf 18, 20, NTM C6454. —WESTERN AUSTRALIA: Soela 02/82/54a, 5, USNM 96696; Lady Basten 1031501, 3, WAM Z16010 and Z16027.

Types. The location of the type of *M. cochlea* is unknown. Type Locality: Tranquebar, off southeastern India, depth unknown.

Four paralectotypes of *P. cylicioides* that are conspecific with *H. cochlea*, as designated by Hoeksema & Best (1991: 233), are AM G7017. The lectotype and remaining paralectotypes are conspecific with *Heterocyathus sulcatus* (see Hoeksema & Best, 1991: 231); see account of that species. Type Locality: Princess Charlotte Bay, Queensland, depth unknown.

Heteropsammia moretonensis Wells, 1964

Heteropsammia moretonensis Wells, 1964: 118–120, pl. 3, figs. 1–7 (**Qld**).–Cairns, 2001: 20 (**listed**).
Heteropsammia cochlea.–Hoeksema & Best, 1991: 235 (in part: *H. moretonensis*).

New records. QUEENSLAND: Abbots Point, depth unknown, 4, WAM 712-84; Nimbus 8, 2, USNM 78601. —NORTHERN TERRITORY: Horsey River, 4 in AM; Alpha Helix M-13, 6, USNM 80008; Alpha Helix M-15, 7, USNM 80012.

Types. The holotype (68382) and one paratype are deposited at USNM; 5 additional paratypes are deposited at QMB (G7119, G7122). Type Locality: Pearl Channel, Moreton Bay, Queensland, 11 m.

Leptopsammia columna Folkeson, 1919

Leptopsammia columna Folkeson, 1919: 18, figs. 28–29 (**WA**).–Cairns, 1998: 365, pl. 9f, i (**listed**); 2001: 23 (**listed**).

New records. None; this species is known only from the holotype.

Types. The holotype is SMNH 4756. Type Locality: 45 miles (=72 km) WSW off Cape Jaubert, Western Australia, 20 m.

Leptopsammia queenslandiae Wells, 1954

Leptopsammia queenslandiae Wells, 1954: 117–118, pl. 2, figs. 8–11 (**Qld**).–Veron, 1986: 610 (**listed**).–Cairns, 2001: 23 (remarks).

New records. NEW SOUTH WALES: 33°51'S 151°16'E (Port Jackson), depth and date unknown, 4, AM G7933 and G16368; Green Point, Port Jackson, depth unknown, 3, AM G6677. —QUEENSLAND: Kimbla 678, 2, AM G15341; Kimbla 2, 2, AM G16724.

Types. The holotype (68379) and one paratype are deposited at USNM; 2 paratypes are also at QMB (G3541, G3550). Type Locality: about 14 miles (=26 km) east of Jumpin Pin (27°45'S), Queensland, 86 m.

Remarks. This is the first report of this species subsequent to its original description. The specimens from Kimbla 678 represent a size maximum for the species, the CD being 16.2 mm.

Notophyllia etheridgi Hoffmeister, 1933

Sphenotrochus variolaris Tenison-Woods, 1878a: 189–190 (in part: 15 of the 49 Recent specimens from Port Stephens, **NSW**); 1878b: 307 (in part, **NSW**).–Wells, 1958: 262 (in part, **listed**).–Squires, 1961: 19 (in part, **listed**).

Notophyllia recta Dennant, 1906: 163 (in part: specimens from Cape Jaffa, **SA**).–Howchin, 1909: 248 (in part: specimens from Cape Jaffa, **SA**).–Boschma, 1952: 239–245 (in part: pl. 1, figs. 1–3, 9–12, 14–16, 18–20, 27–30, **NSW**).

Notophyllia etheridgi Hoffmeister, 1933: 13–14, pl. 4, figs. 1–3 (**NSW**).–Boschma, 1959: 1 (remarks).–Cairns & Parker, 1992: 52, figs. 18b,c (description, synonymy, **Vic, NSW**).–Cairns, 1998: 406 (remarks); 2001: 26 (**listed**).

Notophyllia etheridgei.–Wells, 1958: 262 (**listed**).–Squires, 1961: 18 (**listed**).–Wells, 1964: 109 (listed).–Veron, 1986: 610 (**listed**).

Notophyllia variolaris.–Wells, 1964: 109 (in part, **listed**).–Veron, 1986: 610 (in part, **listed**).

New records. VICTORIA: Franklin Slope 41, 1, NMV F67147. —NEW SOUTH WALES: Franklin Slope 21, 1, NMV F67145; Port Stephens, 130 m, (labelled as "type of *Sphenotrochus spongiosa* T-W", an unpublished manuscript name), 1, Macleay Museum; 32°42'S 152°15'E (Port Stephens), depth and date unknown, 1, AM G16656; Shelf Benthic Survey 5, 67: 5, USNM 1009343, 62, AM G15349 and 16507; 34°03'S 151°10'E (off Cronulla), depth unknown, 6 November 1963, 7, AM G15321 and G15331; 33°50'S 151°40'E (east of Sydney), 150 m, date unknown, 2, AM G15338; Southern Surveyor 05/94/156, 30, AM G16496.

Types. The holotype (E6786) and 2 paratypes are deposited at AM; 2 paratypes are also at USNM (Cairns, 1991b). Type Locality: off Eden, New South Wales, 37–44 m.

Notophyllia hecki n.sp.

Figs. 12D,E,H–K

Records/Types. Holotype: Franklin 03/99/D12, AM G16749. Paratypes: Franklin 03/99/D10, 4, USNM 1008866; Franklin 03/99/D11, 36: 34, USNM 1008867 (including SEM stub 1020) and 2, ZMUZ; Franklin 03/99/D12, 7, USNM 1008868; Franklin 03/99/D13, 2, USNM 1008869; Franklin 03/99/D14, 1, USNM 1008870. Type Locality: 20°14.629'S 151°59.081'E (Marion Plateau, Queensland), 367 m.

Description. Corallum (anthocyathus) compressed-conical, with rounded thecal edges and faces, and a bluntly pointed base. GCD:LCD of larger specimens ranges from 1.16 to 1.32; small coralla, just above the basal transverse fracture, are more elliptical in cross-section, having a GCD:LCD of 1.5–1.6. Largest specimen (holotype) 3.45×2.71 mm in CD and 4.7 mm in height. Lower 1.3–1.5 mm of anthocyathus, corresponding to a GCD of 1.7–2.3 mm, represents that portion of the anthocyathus that was former immersed in the anthocaulus (basal scar region). Theca composed of alternating longitudinal regions of wide (0.3 mm) highly spinose and porous strips that correspond to septa and narrower (0.1 mm wide) flat, non-spinose strips corresponding to interseptal spaces. Spines of thecal costal regions prominent, up to 0.15 mm in height, and interspersed with rather large (0.1 mm diameter) irregularly shaped thecal pores (the synapticulotheca, Fig. 12J). Anthocaulus also compressed, reaching a height of about 2.1 mm and a GCD of 1.7–2.4 mm before budding an anthocyathus. Anthocaulus free, also with a blunted base.

Septa hexamerally arranged in 3 cycles, S3 not present in 2 lateral systems, which results in 20 septa. This number is present even in the smallest of anthocyathi, but anthocauli appear to be restricted to only 12 septa. S1 slightly exsert (0.45 mm), rather slender (extending only about half the distance to the columella in upper fossa), and have axial edges that fuse to the columella lower in the fossa, the 4 lateral S1 fusing slightly higher than the 2 principal S1. S2 less exsert (0.25 mm) and quite small, about one-sixth the width of an S1, at least in large coralla. In small coralla, S2 almost same width as S1. The 8 S3 are equally as small as the S2, each pair bending toward and fusing to its adjacent S2 quite low in the fossa, the axial edge of each S2 then usually fusing to the axial edge of the adjacent S1 (in the case of the end systems) or the columella (in the case of the 2 lateral systems). Axial edges of S1 smooth and slightly sinuous, whereas those of the S2–3 irregular and sometimes laciniate. Fossa quite deep and capacious, containing a thin (0.15 mm), rather short (0.7 mm), lamellar columella, rarely extending beyond the location of the 4 lateral S1.

Remarks. All seven species of *Notophyllia* are endemic to the southern and eastern coasts of Australia, four of which are known only from the Middle Miocene of Victoria, Australia (Cairns, 2001a). *Notophyllia hecki* most closely resembles *N. aperta* Dennant, 1899, a species known only from the two Middle Miocene (Balcombian) of Victoria. Only these species have the same number of septa (20) arranged in the same pattern (6: 6: 8), and a relatively low GCD:LCD ratio. *Notophyllia hecki* differs from this, as well as all other known species, by having a pointed or conical anthocyathus base (vs fish-tailed or straight-keeled), and a very low GCD:LCD ratio, approaching circularity in larger specimens. *Notophyllia hecki* is also the smallest of the eight species with a GCD max. of 3.45 mm, that of *N. apertum* being 6.0 mm.

Etymology. Named in recognition of Philipp Reza Heck, who collected and made available for study a large collection of deep-water corals from the Marion Plateau.

Distribution. Known only from Marion Plateau, Queensland, 342–414 m.

Notophyllia piscacauda Cairns, 1998

Notophyllia sp. Cairns & Parker, 1992: 52 (sixth undescribed species, **WA**).
Notophyllia piscacauda Cairns, 1998: 405–406, figs. 9a–e (**WA**).

New records. None.

Types. The holotype is SAM H664; additional paratypes are deposited at SAM and USNM. Type Locality: King George Sound, Western Australia, 40–51 m.

Notophyllia recta Dennant, 1906

Sphenotrochus variolaris Tenison-Woods, 1879a: 189–190 (in part: 34 of the 49 Recent specimens from Port Stephens, **NSW**); 1878b: 307 (in part, **NSW**).–Wells, 1958: 262 (in part, **listed**).–Squires, 1961: 19 (in part, **listed**).
Notophyllia recta Dennant, 1906: 163 (in part: pl. 5, figs. 4a,b, not specimens from Cape Jaffa; **NSW**).–Howchin, 1909: 248 (in part: not specimens from Cape Jaffa).–Boschma, 1952: 239–245 (in part: pl. 1, figs. 4–8, 13, 17, 21–26, **NSW**).–Wells, 1958: 262 (**listed**).–Boschma, 1959: 1 (**Remarks**).–Wells, 1964: 109 (**listed**).–Veron, 1986: 610 (**listed**).–Cairns & Parker, 1992: 51–52, figs. 17h, 18a,d (**WA, SA, NSW**).–Stranks, 1993: 21 (**type deposition**).–Cairns, 1998: 365, 406 (**Remarks**).
Notophyllia variolaris.–Wells, 1964: 109 (in part, **listed**).–Veron, 1986: 610 (in part, **listed**).

New records. VICTORIA: Tangaroa 81-T-1-Q634, 1, NMV F67810; Tangaroa 81-T-1-170, 1, NMV F67814. —NEW SOUTH WALES: Thetis 49, 56, AM G11950 and G14470; off Cronulla, depth unknown, 6 November 1963, 3, AM G15331; Kapala 78/27/01, 15, AM G15294; east of Sydney, depth unknown, 2, AM G15319; Reef Benthic Survey 5, 33: 5, USNM 1009242, 28, AM G16741.

Types. Three syntypes are NMV F41518 (Stranks, 1993). Type Locality: 20 miles (=32 km) northeast of Port Jackson, NSW, 457 m.

Remarks. Adult specimens of *N. etheridgi* and *N. recta* are fairly easy to distinguish (Cairns & Parker, 1992), but juvenile specimens of *N. etheridgi* of 5.5 mm or less GCD are very similar to adult coralla of *N. recta* of similar size, both having the same number of septa and a similarly shaped corallum. The only character distinguishing them at this size is that the ten secondary septa of *N. etheridgi* are much smaller (less than half the width) than the 10 primaries, their axial edges fusing with the columella quite low in the fossa, whereas the secondary septa of *N. recta* are almost the same width as the primaries, fusing to the columella high in the fossa, almost at the level of the primary fusion.

Rhizopsammia nuda van der Horst, 1926

Rhizopsammia nuda van der Horst, 1926: 50–51, pl. 2, figs. 10–12.–Cairns & Zibrowius, 1997: 189–190 (synonymy, description).

New record. NORTHERN TERRITORY: WTDSHW P2-7 (Stokes Hill Wharf, Darwin Harbour), 5.5 m, 2 corallites, NTM.

Types. Four of the five syntypes are deposited at ZMA and BM (Cairns & Zibrowius, 1997). Type Locality: Singapore, South China Sea, depth unknown.

Rhizopsammia verrilli van der Horst, 1922

Rhizopsammia verrilli van der Horst, 1922: 64–65, pl. 8, figs. 1–2.–Cairns, 1991a: 25, pl. 11, figs. C–E (synonymy, description).–Cairns & Zibrowius, 1997: 188–189, figs. 28f,g (remarks).–Cairns, 1998: 408 (**WA**); 2001: 27 (listed).

New records. QUEENSLAND: Yonge Reef, Lizard Island, 6–10 m, 6 colonies, NTM C7103, C7105, C7253; Heron Reef, 11 m, 1, NTM C7256; Plug south of S. Ribbon Reef, 10 m, 2 colonies, NTM C7627. —NORTHERN TERRITORY: Plater Rock, Port Darwin, 6–8 m, 1, NTM C8100.

Types. Most of the syntypes are deposited at ZMA (van Soest, 1979); one syntype is also NNM 10201. Type Locality: Indonesia, 54–278 m.

Thecopsammia elongata Moseley, 1881

Thecopsammia elongata Moseley, 1881: 196, pl. 12, figs. 1–3.–Veron, 1986: 610 (undocumented record from **Qld**).–Cairns, 2001: 24, pl. 6b, e (remarks, description, **Qld**).

New record. NEW SOUTH WALES: Kapala 78/22/02, 3, AM G16334.

Types. The holotype is BM 1880.11.25.148. Type Locality: 1°54'S 146°39'40"E (Nares Bay, Admiralty Islands), 274 m.

Remarks. The specimens reported by Cairns (2001) were the basis for the earlier undocumented report by Veron (1986).

Tubastraea coccinea Lesson, 1829

Tubastraea coccinea Lesson, 1829: 93.–Wells, 1983: 243–244, pl. 18, figs. 1–2 (synonymy).–Veron, 1986: 580–581, colour and black and white figs (**listed**).–Cairns, 1991a: 26–27, pl. 12, figs. c–e (synonymy, key, description); 1994: 93–94, pl. 39g–i (synonymy, description).–Cairns & Zibrowius, 1997: 197 (synonymy, remarks).–Cairns, 1998: 409 (**WA**); 2001: 29, pl. 10i–l (remarks).
Lobophyllia aurea Quoy & Gaimard, 1833: 195 (**NSW**).
Tubastrea [sic] *aurea*.–Stephenson & Wells, 1956: 59 (listed: **Qld**)–Wells, 1964: 109 (**listed**).–Squires, 1966: 169 (listed: **WA**).
Tubastraea aurea.–Veron, 1986: 584–585, fig. 1 (**WA**).

New records. QUEENSLAND: Heron Reef, 9.1 m, 1, NTM C7250; Heron Island, 5–7 m, 3, USNM 83640, 83652, 83649; Willis Island, depth unknown, 1, USNM 83696; off Mackay, depth unknown, 1, USNM 83691; Lizard Island, 18 m, 1, USNM; Pt. Newry, depth unknown, 1, USNM 83690; Wistari Reef, depth unknown, 1, USNM 83688. —WESTERN AUSTRALIA: Rottnest Island, 1 m, 2 colonies, USNM 83689 and 83687.

Types. The holotype of *T. coccinea* is deposited at MNHN (Wells, 1936: 132). Type Locality: Bora Bora, Society Islands, depth unknown.

The deposition of the type of *L. aurea* is unknown. Type Locality: Port du Roi George and Port Jackson, New South Wales, depth unknown.

Tubastraea diaphana (Dana, 1846)

Dendrophyllia diaphana Dana, 1846: 389, pl. 27, fig. 3.
Tubastrea [sic] *diaphana*.–Stephenson & Wells, 1956: 59 (listed from **Qld**).–Wells, 1964: 108 (**listed**)
?*Turbinaria* [sic] *diaphana*.–Squires, 1966: 169 (**WA**).
Tubastraea diaphana.–Veron, 1986: 580, 582 (fig. 2), 585 (centre unnumbered figure).–Cairns & Zibrowius, 1997: 196–197 (remarks, synonymy).–Cairns, 1998: 409–410 (**WA**).

New records. QUEENSLAND: Yonge Reef, 10 m, 1, NTM C7264; Yonge Reef, 20 m, 1, NTM C7266; 21°01.5'S 149°54.0'E (Penrith Island), 20 m, 3, USNM 85996; 21°01'30"S 149°54'00"E (Penrith Island), 20 m, 1, USNM 85998; Heron Island, 5 m, 2, USNM 78524 and 83676; Heron Island, depth unknown, 1, USNM 78517; 20°46'54"S 149°23'24"E (Cockermouth Island), 4 m, 2, USNM 85795. —WESTERN AUSTRALIA: 28°53'S 113°51'E (Green Island, Houtman Abrolhos), 3 m, 3 May 1972, 1, AM G15944; Rottnest Island, depth unknown, 1, USNM 83678.

Types. The holotype is USNM 180. Type Locality: Singapore, South China Sea, depth unknown.

Tubastraea micranthus (Ehrenberg, 1834)

Oculina micranthus Ehrenberg, 1834: 304.
Dendrophyllia nigrescens Dana, 1846: 387.–Vaughan, 1918: 143–144, pl. 60, figs. 1, 1a (**Qld**).–Stephenson & Wells, 1956: 55 (listed).–Wells, 1964: 108 (**listed**).
Dendrophyllia micranthus.–Crossland, 1952: 171–172 (remarks).–Stephenson & Wells, 1956: 55 (**listed**).
Dendrophyllia micranthus var. *grandis* Crossland, 1952: 173, pl. 55, fig. 1, pl. 56, fig. 1 (**Qld**).
Tubastrea [sic] *micrantha*.–Wells, 1964: 108 (**listed**).
Tubastraea micrantha.–Veron, 1986: 580, 583 (fig. 3, **Qld**), 585 (figs. 3, 7).
Tubastraea micranthus.–Cairns & Zibrowius, 1997: 195–196 (synonymy, description).–Cairns, 1998: 410 (**WA**).

New records. QUEENSLAND: northwest side Murray Island, 33 m, 4 branches, USNM 45507 (Vaughan, 1918); Piper Island, 5.5 m, 3 colonies, USNM 83682 and 78549; Lizard Island, 4–20 m, 13 colonies, USNM.

Types. Type not traced. Type Locality: Unknown.

Misidentified, Undocumented, and Dubious Records of Azooxanthellates from Australia

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1. Tenison Woods (1878b: 325) described *Cylicia (=Culicia) magna* from shallow waters of the Gulf of St. Vincent, South Australia. Totten (1952) also listed the record. This species was later shown by Squires (1966) and Veron & Pichon (1982) to be a junior synonym of the zooxanthellate species *Scolymia australis* (Milne Edwards & Haime, 1849). See also Cairns & Parker (1992) for an account of this species, and Stranks (1993) for the type deposition.

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2. *Culicia smithi* (Milne Edwards & Haime, 1849), doubtful record

Angia smithi Milne Edwards & Haime, 1849: 177 (**NZ**).
Cylicia [sic] *smithi*.–Milne Edwards & Haime, 1857: 608.
Cylicia [sic] *smithii*.–Tenison-Woods, 1878b: 325 ("**?Australia**").
Culicia smithii.–Squires & Keyes, 21–22, pl. 1, fig. 2 (**NZ**, description, synonymy, types, fig.).–Cairns, 1995: 39 (**"NZ"**, remarks).
Culicia smithi.–Veron, 1986: 600 (**listed**).

Types. Holotype reputedly deposited at the Otago Museum (Squires & Keyes, 1967). Type Locality: "Nouvelle-Zélande", depth unknown.

Remarks. Tenison-Woods (1878b) is responsible for the original listing of *C. smithi* from Australia, the Australian record being reiterated only once more by Veron (1986). I can find no basis for the Australian record of this species, and indeed, Tenison-Woods (1878b: 325) stated in reference to the Australian *Culicia*: "There is evidently some confusion about both the species and the habitats which I have not been able to clear up."

3. *Culicia verreauxii* (Milne Edwards & Haime, 1849), species dubium

Angia verreauxii Milne Edwards & Haime, 1849: 177 ("**Australia**").
Cylicia [sic] *verreauxi*.–Milne Edwards & Haime, 1857: 608.–Duncan, 1876: 440 (remark).–?Tenison-Woods, 1878b: 325 (**SA** fossil).
Culicia verreauxi.–Wells, 1955: 15 (**Qld**).–Stephenson & Wells, 1956: 55 (**listed**). Wells, 1964: 109 (**listed**).–Veron, 1986: 600 (listed).

Types. Cannot be found at BM. Type Locality: "Nouvelle-Hollande", depth unknown.

Remarks. The original description of *C. verreauxii* is inadequate to distinguish it from other species or identify it with any of the other four *Culicia* known from Australia. Furthermore, the type cannot be located. Although it may be a senior synonym of one of the other species, this cannot be established with certainty, and thus the species is treated herein as a *species dubium*.

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4. *Madrepora porcellana* (Moseley, 1881), undocumented record

Neohelia porcellana Moseley, 1881: 176–177, pl. 10, figs. 7, 7a.
Madrepora porcellana.–Wells, 1984a: 207 (**WA**).–Veron, 1986: 599 (**listed**).–Cairns, 1999a: 62–63 (remarks, synonymy).
Neohelia sp. cf. *N. porcellana*.–Cairns & Zibrowius, 1997: 84–85, figs. 5c–e, g,h (synonymy, description).

Remarks. Wells (1984a: 207) reported this species from "northwestern Australia, 140–141 m, 20.7°C", but no documentation exists for this record (Cairns & Zibrowius, 1997) at AIMS, AM or any other Australian Museum. It is therefore considered to be an invalid or undocumented record for Australia.

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5. Wells (1964: 108) listed *Paracyathus lifuensis* Gardiner, 1899 as an "unpublished record" from the Great Barrier Reef, but no specimen can be found in any Australian museum or USNM, to which Wells donated most of his coral specimens. This record is thus considered to be doubtful.

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6. The specimen reported as *Paracyathus profundus* Alcock, 1898 by Folkeson (1919) from off Western Australia is a poorly-preserved specimen of an indeterminate rhizangiid (Cairns, 1998).

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7. *Tethocyathus minor* (Gardiner, 1899)

Fig. 12L

Thecocyathus minor Gardiner, 1899: 163, pl. 19, figs. 3a,b.–Crossland, 1952: 103–104 (**Qld**).
Tethocyathus minor.–Stephenson & Wells, 1956: 59 (**listed**).–Wells, 1964: 108 (**listed**).–Veron, 1986: 605 (**listed**).
?*Polycyathus* sp. Veron, 1986: 606 (listed).

Remarks. The specimens reported from the Great Barrier Reef by Crossland (1952) as *Thecocyathus minor* are

deposited at BM (1984.6.11.1–3). They are not that species, but an indeterminate species of *Polycyathus*, similar to *P. andamanensis* Alcock, 1893.

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8. The specimen described as *Flabellum vacuum* Crossland, 1952 from the Great Barrier Reef is in fact the zooxanthellate species *Catalaphyllia jardinei* (Kent, 1893) (Veron & Pichon, 1980).

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9. The colour illustration of *Dendrophyllia* (=*Cladopsammia*) *gracilis* Milne Edwards & Haime, 1848 by Veron (1986: 578–579) from Heron Island cannot be verified from this picture.

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10. The listing of *Dendrophyllia* sp. cf. *D. robusta* (Bourne, 1905) by Wells (1964: 109) from Queensland is undocumented.

11–16. The following six species were listed by Veron (1986) in his account of non-reefal Australian Scleractinia, but they are undocumented by specimens and thus not included in this report: *Astrangia rathbuni, Flabellum* (=*Truncatoflabellum*) *stokesi, Flabellum elongatum, Trochocyathus meridionalis, Cylindrophyllia* sp., and *Tubastraea faulkneri*.

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Appendix. Station data.

station	latitude (S)	longitude (E)	depth (m)	date
AKADEMIK OPARIN (1987 CRUISE)				
1987-1-1	17°19.6'	119°31.5'	364–368	17 Jul 1987
1987-3-1	17°54.3'	119°36.5'	157	17 Jul 1987
1987-3-2	19°19.7'	119°08.8'	50	19 Jul 1987
1987-4-1	28°13.0'	113°22.8'	165	11 Jul 1987
AKADEMIK OPARIN ("GULF" CRUISE)				
13	15°21.10'	139°37.90'	55	02 Dec 1990
16	13°58.30'	141°04.60'	32	03 Dec 1990
17	13°57.60'	141°04.70'	32	03 Dec 1990
18	13°56.10'	140°57.40'	36	03 Dec 1990
19	12°12.70'	140°30.40'	61	04 Dec 1990
20	12°14.30'	140°45.40'	59	04 Dec 1990
ALPHA HELIX				
M-13	11°33.3'	135°52.3'	22	02 Jun 1979
M-15	11°31.5'	135°48.8'	24	02 Jun 1979
BATHUS				
4-883	22°03'43"	165°56'03"	450–600	01 Aug 1994
BHAGWAN (AIMS NORTH WEST CAPE SURVEY II—2002)				
1	21°28.96'	111°02.9'	300	19 Mar 2002
4	21°28.8'	113°57.93'	570	20 Mar 2002
5	21°27.56'	114°00.62'	430	21 Mar 2002
6	21°31.14'	114°02.54'	380–480	21 Mar 2002
7	21°29.2'	114°01.8'	320–340	22 Mar 2002
8	21°38.51'	113°58.72'	200–230	23 Mar 2002
9	21°27.54'	113°59.97'	440–460	24 Mar 2002
13	21°26.78'	114°01.71'	380	25 Mar 2002
15	21°32.08'	114°07.53'	190	25 Mar 2002
17	21°45.07'	114°07.47'	310	27 Mar 2002
18	21°45.48'	114°05.47'	335	27 Mar 2002
19	21°44.32'	114°03.49'	380	27 Mar 2002
20	21°47.18'	114°02'	360	27 Mar 2002
21	21°48.72'	113°96.88'	550	27 Mar 2002
23	21°45.84'	114°00.67'	430	Mar 2002
24	21°45.45'	113°99.98'	480	28 Mar 2002
25	21°47.66'	114°01.12'	400	28 Mar 2002
26	21°52.08'	114°01.99'	380	28 Mar 2002
28	21°42.68'	114°02.1'	410	29 Mar 2002
30	21°51.96'	114°05.06'	270	29 Mar 2002
32	21°51.09'	114°00.51'	220	30 Mar 2002
CIDARIS I				
1-2	18°04.29'	147°40.38'	949–984	06 May 1986
1-3	18°07.87'	147°35.7'	956–969	06 May 1986
1-4	18°08.69'	147°33.97'	962–966	06 May 1986
3-1	18°08.22'	147°48.05'	1044–1067	06 May 1986
4-1	18°11.52'	147°52.12'	998–1012	06 May 1986
5-2	18°09.15'	147°56.71'	1116	07 May 1986
5-4	18°11.56'	147°58.60'	1041–1058	07 May 1986
9-2	18°08.10'	148°22.43'	1117	07 May 1986
9-3	18°10.56'	148°21.61'	1109–1110	07 May 1986
9-4	18°09.40'	148°22.08'	1117–1122	07 May 1986
11-2	18°08.34'	148°33.90'	1103–1104	08 May 1986
11-4	18°10.06'	148°32.44'	1121–1123	08 May 1986
12-1	18°02.50'	148°36.19'	1039–1065	08 May 1986
15-3	17°45.49'	148°37.52'	945	09 May 1986
15-4	17°45.99'	148°39.09'	958–964	09 May 1986
20-2	17°42.85'	147°48.88'	1192	10 May 1986
20-4	17°45.04'	147°48.14'	1223–1228	10 May 1986
24-1	17°19.66'	147°49.09'	1162	11 May 1986
24-3	17°22.10'	147°48.27'	1187–1210	11 May 1986
25-1	17°1873'	147°37.20'	1128–1178	11 May 1986
28-1	17°18.21'	147°19.76'	1400–1414	12 May 1986
30-2	17°18.96'	147°11.16'	1402–1406	12 May 1986
30-4	17°19.12'	147°11.20'	1385–1403	12 May 1986
31-1	17°12.15'	147°10.80'	1489–1491	12 May 1986
32-2	17°05.89'	147°11.85'	1517–1539	13 May 1986
33-1	16°58.67'	147°11.40'	1545–1564	13 May 1986
35-2	16°52.58'	147°10.85'	1605–1606	13 May 1986
35-3	16°50.83'	147°10.61'	1607–1609	14 May 1986
35-4	16°54.54'	147°14.35'	1473–1590	14 May 1986
41-2	17°33.27'	146°59.99'	1026–1056	15 May 1986
42-2	17°21.77'	146°48.52'	296–302	15 May 1986
42-3	17°37.7'	146°50.2'	298–301	15 May 1986
43-2	17°34.58'	146°53.21'	458–500	15 May 1986
44-3	17°36.88'	146°57.43'	672–744	15 May 1986
45-2	17°32.70'	146°54.80'	854–916	16 May 1986
45-3	17°33.12'	146°55.92'	908–926	16 May 1986
46-2	17°57.06'	147°02.48'	287–300	16 May 1986
47-2	17°51.76'	147°07.95'	497–503	16 May 1986
47-3	17°51.35'	147°07.83'	503–505	16 May 1986
49-2	17°51.06'	147°09.85'	904–916	17 May 1986
49-3	17°51.71'	147°09.93'	881–920	17 May 1986
50-2	18°01.95'	147°21.94'	909–922	17 May 1986
50-3	18°01.69'	147°20.53'	891–918	17 May 1986
52-2	18°04.16'	147°17.17'	490–512	18 May 1986
CIDARIS II				
15-1	13°29.08'	147°12.68'	2457–2542	05 Sep 1988
24-1	14°51.83'	145°46.99'	1203	09 Sep 1988
CIDARIS III				
12-2	11°12.88'	146°07.36'	1426	14 Feb 1992
14-2	11°46.59'	146°21.27'	2436–2474	15 Feb 1992
FV DERWENT HUNTER				
37	Botany Bay, NSW		128	04 May 1960
USNS ELTANIN				
1981	47°21'	147°52'	910–915	24 Feb 1967
M/V ESPIRITU SANTO				
E68-743	19°29'	116°01'	137	01 Dec 1968
FNQ (FAR NORTH QUEENSLAND EXPEDITION)				
79-33	11°32'	144°10'	1000	12 Feb 1979
79-49	10°56'	143°46'	18	15 Feb 1979
RV FRANKLIN				
Slope 7	34°52.29'	151°15.02'	1096	15 Jul 1986
Slope 9	35°00.0'	151°16.3'	1100	15 Jul 1986
Slope 11	34°57.6'	151°16.2'	1402–1420	16 Jul 1986
Slope 15	34°58.4'	151°23.2'	1650–1750	16 Jul 1986
Slope 21	36°57.4'	150°18.8'	220	20 Jul 1986
Slope 33	38°19.6'	149°24.3'	930	23 Jul 1986
Slope 41	38°14.8'	149°09.3'	200	24 Jul 1986
Slope 47	41°58.6'	148°38.8'	500	27 Jul 1986
Slope 48	41°57.5'	148°37.9'	400	27 Jul 1986
Slope 53	34°52.72'	151°15.04'	990–996	22 Oct 1988
Slope 57	34°43.55'	151°13.16'	345–450	22 Oct 1988
Slope 67	38°23.95'	149°17.02'	1119–1277	25 Oct 1988
Slope 68	38°22.66'	149°18.41'	1073–1169	25 Oct 1988
Slope 69	38°29.33'	149°19.98'	1350–1840	25 Oct 1988
Slope 84	41°53.54'	148°39.07'	732	30 Oct 1988
10/86/01	40°40'	148°47'	280–350	09 Dec 1986
10/86/05	37°02'	150°20.1'	300	11 Dec 1986
10/86/07	36°57.95'	150°22'	960–1050	12 Dec 1986
10/86/10	36°57.75'	150°28.37'	3500	12 Dec 1986
06/88/04	10°34.28'	144°13.33'	815–825	20 Aug 1988
06/88/05	10°37.17'	144°21.99'	990–1053	21 Aug 1988
06/88/12	11°33'	145°19'	1517–1611	22 Aug 1988
06/88/20	18°07.76'	147°30.07'	925–932	25 Aug 1988
06/88/x	10°–12°	144°–146°	>495	Aug 1988
08/88/D3	22°57'	159°33'	1300–1600	09 Oct 1988
08/88/D4	23°21'	159°39'	1050–1250	09 Oct 1988
08/88/D22	28°21'	155°32'	1050–1400	14 Oct 1988
05/89/02	36°41.53'	156°08.91'	145	01 May 1989
05/89/04	36°43.11'	156°13.03'	143	01 May 1989
05/89/06	33°14.57'	156°09.59'	131	01 May 1989
05/89/07	33°14.21'	156°10.68'	133	02 May 1989
05/89/10	30°48.18'	156°13.27'	288	02 May 1989
05/89/14	29°53.82'	159°01.65'	420	03 May 1989
05/89/15	29°54.82'	159°00.85'	650	03 May 1989
05/89/17	29°42.06'	159°48.31'	2450	03 May 1989
05/89/22	28°44.08'	161°54.59'	1325	04 May 1989

station	latitude (S)	longitude (E)	depth (m)	date
05/89/24	28°06.87'	163°03.255'	1078	05 May 1989
05/89/27	27°59.3'	162°48.6'	1250	05 May 1989
05/89/33	27°13.34'	160°43.41'	1989	07 May 1989
05/89/40	26°45.27'	159°30.59'	315–360	08 May 1989
05/89/46	28°17.04'	155°36.46'	425	10 May 1989
05/89/47	28°17.47'	158°37.89'	419	10 May 1989
05/89/48	28°18.48'	155°38.62'	415	10 May 1989
03/99/D5	21°00.243'	152°50.114'	311	Mar 1999
3/99/D7	20°54.669'	152°35.081'	325	Mar 1999
3/99/D8	20°47.546'	152°16.504'	320	Mar 1999
3/99/D10	20°14.471'	151°47.523'	342	Mar 1999
3/99/D11	20°14.490'	151°47.530'	342	Mar 1999
3/99/D12	20°14.629'	151°59.081'	367	Mar 1999
3/99/D13	20°14.504'	151°58.98'	366	Mar 1999
3/99/D14	20°24.504'	152°40.458'	414	Mar 1999
FRV HAI-KUNG				
81-HK-1-118	39°06.0'	143°35.8'	95	31 Jan 1981
81-HK-1-119	39°06.7'	143°28.7'	92	31 Jan 1981
81-HK-1-120	39°01.0'	143°22.1'	84	31 Jan 1981
81-HK-1-121	39°01.1'	143°15.2'	84	31 Jan 1981
81-HK-1-125	40°47.4'	144°17.7'	99	02 Feb 1981
81-HK-1-194	39°26.3'	143°06.8'	115	21 Nov 1981
81-HK-1-738	40°09.0'	147°31.8'	51	06 Feb 1981
IRON SUMMER				
1	23°40'	153°57'	460–530	27 May 1983
2	27°59.37'	154°00.12'	590	31 Mar 1983
JAMES KIRBY				
732	NE of Dip Reef, Townsville		124–144	05 Jul 1980
FRV KAPALA				
74/15/28	33°17'	152°15'	457	10 Dec 1974
75/02/01	33°38'	151°56'	132	22 Apr 1975
75/02/03	34°18'	151°26'	458	29 May 1975
75/05/05	33°32'	152°04'	823	19 Aug 1975
75/08/01	32°38'	152°50'	384	01 Oct 1975
75/08/03	32°22'	152°58'	484	02 Oct 1975
75/09/08	29°26'	153°49'	457	12 Oct 1975
75/12/07	33°48'	151°48'	421	17 Dec 1975
76/20/02	33°31'	152°01'	494	17 Nov 1976
76/23/01	34°24'	151°25'	768	13 Dec 1976
76/24/01	33°42'	151°52'	461	20 Dec 1976
76/24/02	33°40'	152°56'	731	20 Dec 1976
76/24/03	33°32'	152°03'	823	20 Dec 1976
77/01/13	38°06'	149°58'	220	19 Jul 1977
77/03/07	35°32'	150°47'	549	28 Apr 1977
77/03/09	35°30'	150°48'	549	28 Apr 1977
77/13/10	29°52'	153°43'	512	23 Aug 1977
77/21/01	34°31'	151°20'	695	21 Nov 1977
77/23/01	33°46'	151°43'	176	05 Dec 1977
77/23/04	33°41'	151°56'	732	05 Dec 1977
77/23/06	33°40'	151°56'	732	06 Dec 1977
77/23/08	32°59'	152°34'	366	07 Dec 1977
78/03/03	32°19'	153°00'	366	05 Apr 1978
78/06/02	29°50'	153°43'	503	25 Apr 1978
78/09/05	28°02'	153°59'	549	02 Jun 1978
78/17/10	28°01'	154°00'	549	17 Aug 1978
78/17/21	28°41'	153°51'	156	18 Aug 1978
78/21/06	29°54'	153°37'	165	11 Oct 1978
78/22/02	32°52'	152°39'	576	17 Oct 1978
78/22/04	32°40'	152°49'	412	17 Oct 1978
78/22/05	32°34'	152°53'	457	17 Oct 1978
78/23/09	27°55'	154°03'	549	06 Nov 1978
78/24/02	37°05'	150°20'	275	22 Nov 1978
78/26/05	33°43'	151°50'	271	05 Dec 1978
78/26/08	32°52'	152°34'	150	06 Dec 1978
78/26/10	32°50'	152°41'	275	06 Dec 1978
78/26/16	33°47'	151°55'	824	07 Dec 1978
78/27/01	33°44'	151°48'	264	11 Dec 1978
78/27/04	34°50'	151°15'	842	12 Dec 1978
78/27/05	34°55'	151°13'	824	12 Dec 1978
78/27/09	34°21'	151°21'	282	13 Dec 1978
78/27/13	34°21'	151°23'	439	13 Dec 1978
78/27/16	34°22'	151°23'	439	14 Dec 1978
79/03/18	35°00'	151°07'	414	26 Apr 1979
79/05/01	34°05'	151°14'	97	21 May 1979
79/05/02	34°05'	151°14'	128	21 May 1979
79/05/05	34°08'	151°20'	137	23 May 1979
79/08/06	33°04'	152°30'	458	26 Jun 1979
79/08/11	34°21'	151°25'	457	19 Jul 1979
79/12/07	33°27'	152°05'	396	21 Aug 1979
79/12/08	33°32'	152°02'	366	21 Aug 1979
79/14/06	35°02'	151°06'	439	27 Sep 1979
79/15/01	33°48'	151°49'	440	02 Jul 1979
79/15/02	33°23'	152°08'	375	03 Oct 1979
79/15/03	33°31'	152°02'	403	03 Oct 1979
79/15/04	33°36'	151°57'	476	03 Oct 1979
79/15/05	33°45'	151°52'	512	03 Oct 1979
79/17/17	37°22'	150°18'	157	29 Oct 1979
79/20/03	33°33'	152°05'	750	04 Dec 1979
79/20/04	33°34'	152°04'	732	04 Dec 1979
79/20/07	33°36'	152°09'	1097	04 Dec 1979
79/20/08	33°28'	152°04'	458	05 Dec 1979
79/20/09	33°33'	152°02'	438	05 Dec 1979
79/20/12	33°26'	152°11'	869	06 Dec 1979
79/20/13	33°32'	152°06'	824	06 Dec 1979
79/23/01	33°43'	151°51'	464	17 Dec 1979
80/06/01	33°46'	151°50'	414	24 May 1980
80/20/11	33°52'	151°23'	80	11 Dec 1980
82/20/08	38°02'	150°04'	567	13 Nov 1982
83/14/02	35°27'	150°55'	1025	25 Oct 1983
84/08/05	35°40'	150°43'	851	23 May 1984
84/10/04	32°08'	153°09'	1053	18 Jul 1984
84/11/08	34°50'	151°17'	1135	02 Aug 1984
85/21/06	33°42'	151°54'	466	19 Dec 1985
86/01/02	33°36'	151°30'	75	10 Feb 1986
86/01/03	33°35'	151°41'	135	10 Feb 1986
86/01/09	33°29'	152°13'	1200	12 Feb 1986
95/18/57	29°29'	153°33'	65	12 Dec 1995
96/07/02	33°46'	151°49'	380	23 May 1996
96/09/04	33°39'	151°56'	439	06 Jun 1996
96/10/02	33°30'	152°02'	366	18 Jun 1996
96/11/01	37°05'	150°20'	269	02 Jun 1996
96/12/05	37°38'	150°14'	331	24 Jul 1996
96/17/03	33°38'	151°57'	490	17 Sep 1996
96/18/06	33°30'	152°04'	490	25 Sep 1996
96/18/07	33°29'	152°06'	611	25 Sep 1996
96/21/06	37°32'	150°15'	254	27 Oct 1996
96/21/19	37°39'	150°17'	558	31 Oct 1996
97/01/05	37°40'	150°11'	227	17 Apr 1997
KARUBAR				
7	5°47'35"	132°20'39"	282–289	22 Oct 1991
KH (HOKUHO MARU)				
72-1-30	12°24.8'	128°00.1'	115	25 Jun 1972
HMAS KIMBLA				
1	27°31.5'	153°40'	77–80	29 Mar 1969
2	27°27'	153°39'	77	29 Mar 1969
678	27°31'	153°40'	80	29 Mar 1969
4/69	26°03'	153°45'	68	1969
7/73/05	38°24.5'	149°25.5'	823	21 Nov 1973
7/73/11	38°05.6'	149°24'	274	
22	23°15.2'	152°24.1'	283	14 Dec 1977
3	24°03.7'	152°49.4'	150	04 Jul 1984
4	24°03.7'	152°49.4'	150	04 Jul 1984
15	23°52.5'	152°42.7'	296	07 Jul 1984
RV LADY				
RW96-30	13°07.89'	123°12.65'	420	19 Jun 1966
R/V LADY BASTEN (AIMS SURVEY, 1995)				
AIMS/95/LB08	17°45.97'	119°25.60'	250	18 Aug 1995

station	latitude (S)	longitude (E)	depth (m)	date
R/V Lady Basten (North West Cape Survey I—2001)				
103 0701	21°33.54'	114°11.93'	150–175	07 Mar 2001
103 0802	21°32.72'	114°15.78'	149	08 Mar 2001
103 1103	21°39.18'	113°51.44'	610–640	11 Mar 2001
103 1201	21°25.44'	113°47.73'	850	12 Mar 2001
103 1303	21°28.80'	113°59.79'	450	13 Mar 2001
103 1402	21°24.85'	114°00.28'	450	14 Mar 2001
103 1403	21°23.87'	114°04.47'	450	14 Mar 2001
103 1404	21°29.58'	114°00.78'	350	14 Mar 2001
103 1501	21°39.55'	114°06.99'	100	15 Mar 2001
103 1502	21°36.22'	114°11.11'	103	15 Mar 2001
Madre				
556	33°53.5'	151°13'	300	Dec 1978
1515	31°01.9'	153°13.9'	274	12 Oct 1970
Nimbus				
8	26°30'	153°15'	46	1968
11	26°31'	153°43'	183–186	1968
12	26°32'	153°45'	?	Jul 1968
55	26°27'	153°50'	270–272	1968
NZOI (RV Tangaroa)				
P-925	27°59.6'	153°37.5'	420	11 Dec 1979
U-208	34°13.8'	151°29.1'	466–498	05 Oct 1982
U-210	33°20.4'	156°07'	336–342	07 Oct 1982
U-212	33°06.2'	156°09.3'	154–164	07 Oct 1982
U-218	33°05.4'	152°40.1'	1500–1708	09 Oct 1982
U-219	33°02.4'	152°37.3'	910–925	09 Oct 1982
U-222	32°49.3'	152°49.1'	1040–1075	09 Oct 1982
U-223	32°49.3'	152°49.1'	951–1150	10 Oct 1982
PL				
94-22	35°25.84'	132°48.73'	300	1994
94-36	36°03.10'	135°45.69'	378	1994
94-36B	36°03.10'	135°45.69'	378	1994
94-50	36°15.88'	136°17.97'	114	1994
94-53	36°30.64'	136°18.12'	208	1994
94-54A	36°31.37'	136°18.31'	310	1994
94-58	35°40'	137°15'	unknown	1994
94-63	35°25.94'	137°21.87'	35	1994
94-68	35°13.45'	137°46.41'	32	1994
QLD				
94	19°53'	148°05'	10–11	19 Jun 1982
114	14°40'	145°28'	23	10 Feb 1987
115	19°53'	148°05'	6–18	10 Jun 1983
128	19°53'	148°05'	6–17.5	12 Jun 1983
140	19°53'	148°05'	4–6	11 Jun 1983
1256	21°59.43'	153°06.65'	199	10 Sep 1995
1259	22°00'	153°01'	179	11 Sep 1995
Roma				
983	17°01'30"	140°21'05"	18	15 Jun 1964
Reef Benthic Survey				
5	33°59.27'	150°16'48"	66	24 Apr 1973
Shelf Benthic Survey				
5	2.3 km e. Malabar, Sydney, NSW		66	30 Mar 1973
33	33°57.93'	151°17.88'	67	21 Feb 1973
Silver Gulf				
BSS 213	38°03'	147°50'	45	01 Oct 1983

station	latitude (S)	longitude (E)	depth (m)	date
FRV Soela				
7/80/31	25°11'01"	132°03'	32–33	14 Nov 1980
7/80/43	10°35'	133°45'		16 Nov 1980
2/82/54A	19°59'	117°16'	50–52	15 Apr 1982
4/82/8B	18°46'	117°41'	360	01 Aug 1982
5/82/48	18°42'	118°30'	140–141	03 Oct 1982
4/84/03	42°41.9'	148°25.1'	440	15 Aug 1984
5/84/51	41°15'	144°08'	520	20 Oct 1984
1/85/40	38°11.7'	149°48.7'	650	03 Feb 1985
6/85/02	19°37.8'	153°31.5'	312	15 Nov 1985
6/85/05	22°41.20'	154°05.70'	416–419	17 Nov 1985
6/85/23	41°32.5'	144°22.2'	538–556	29 Jan 1985
6/85/30	19°32.85'	152°34.80'	470–477	23 Nov 1985
6/85/38	18°45.45'	150°28.20'	1188–1200	25 Nov 1985
1/86/07	17°58.0'	147°02.2'	260	10 Jan 1986
1/86/08	17°58.5'	147°01.8'	264	10 Jan 1986
1/86/09	17°57.8'	147°01.5'	260–262	10 Jan 1986
1/86/10	17°58.6'	147°02.7'	256–260	10 Jan 1986
1/86/16	17°58.0'	147°05.4'	298–300	11 Jan 1986
1/86/44	17°59.9'	147°04.2'	260	16 Jan 1986
1/86/50	17°59.1'	147°06.2'	300	17 Jan 1986
1/86/51	17°58.7'	147°04.2'	300	17 Jan 1986
1/86/52	17°59.9'	147°06.4'	300	17 Jan 1986
1/86/54	17°59.9'	147°04.2'	300	17 Jan 1986
1/86/69	17°59.3'	147°05.4'	298–300	20 Jan 1986
1/86/73	17°54.3'	146°52.1'	140–142	21 Jan 1986
Southern Intruder				
3-39	23°47'	153°14'	740	
15	23°21'	153°56'	460	31 Aug 1983
SPPS				
7	38°18.7'	144°42.2'	12–15	28 Jun 1986
MT Sprightly				
BMS 73-2051	40°50.6'	148°46.5'	399	26 Mar 1973
Southern Surveyor				
5/94/43	38°43.8'	148°15.7'	80	26 Aug 1994
5/94/83	38°11.8'	149°16'	220	24 Aug 1994
5/94/107	37°23.9'	150°17.9'	170	01 Sep 1994
5/94/129	37°00.1'	150°02.9'	80	03 Sep 1994
5/94/86	37°39.6'	149°47.4'	80	30 Aug 1994
5/94/156	36°23.3'	150°10.6'	79	05 Sep 1994
Tangaroa				
81-T-1-162	40°09.4'	147°32.6'	51	14 Nov 1981
81-T-1-170	38°52.6'	148°25.2'	140	15 Nov 1981
81-T-1-173	39°26.3'	147°48.7'	49	17 Nov 1981
81-T-1-190	38°49.5'	142°35.4'	39	21 Nov 1981
81-T-1-194	39°26.3'	143°06.8'	115	15 Nov 1981
81-T-1-195	39°38.2'	143°07.2'	127	21 Nov 1981
81-T-1-200	40°00.0'	144°20.9'	48	22 Nov 1981
81-T-1-201	39°08.3'	144°43.9'	66	23 Nov 1981
81-T-1-205	39°13.6'	143°55.6'	85	
81-T-1-Q634	38°42.3'	148°48'	251	16 Nov 1981
H.M.C.S. Thetis				
4	33°18'	151°29'	101–154	21 Feb 1898
17	32°37'	152°23'	53–88	28 Feb 1898
34	33°50'	151°20'	71–66	10 Mar 1898
46	34°07'	151°15'	91–121	16 Mar 1898
48	34°27'	151°04'	101–102	18 Mar 1898
49	34°30'	151°03'	115–137	18 Mar 1898
56	34°02.5'	151°02.5'	144–146	22 Mar 1898
57	34°10'	151°11'	99–108	22 Mar 1898
Woodside-Dampier Expedition II—1999				
DA2/99/05	20°19.64'	116°53.85'	38	14 Jul 1999
DA2/99/08	20°22.76'	117°02.23'	30–31	15 Jul 1999
DA2/99/29	20°24.64'	116°44.05'	27–28	17 Jul 1999
DA2/99/32	20°26.95'	116°44.86'	15–16	18 Jul 1999
DA2/99/34	20°32.65'	116°39.14'	9–13	19 Jul 1999

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Corophiidea (Crustacea: Amphipoda) from Mauritius

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ABSTRACT. Twenty-three species of corophiidean amphipod are recorded from Mauritius of which six are new to science and five species are recorded for the first time from the island. Full descriptions and figures are provided for the six new species together with diagnoses and selected figures of other species recorded in the present work. A key to the species of the genera *Ampithoe, Cymadusa, Bemlos* and *Ericthonius* of Mauritius is also provided.

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Corophiideans are amphipods (Crustacea, Amphipoda, Corophioidea) characterized by a fleshy entire telson thickly attached at the base (J.L. Barnard & Karaman, 1991). Corophiideans of the Western Indian Ocean are not well known with the exception of the Aoridae which have been studied relatively extensively in the past thirty years in East Africa (Myers, 1975a, 1975b, 1985b; Griffiths, 1973, 1974a, 1974b), South Africa (Myers & Lyons, 1987) and Madagascar (Myers, 1972; Ledoyer, 1982, 1986).

This paper deals with the corophiideans of Mauritius. Those collected in the present study were: eleven species of Ampithoidae of which five are new to science and one was previously unrecorded from Mauritius, six species of Aoridae, one of which is new to science and two of which are recorded for the first time from Mauritius, two species of Photidae, one widespread in the Indo-Pacific, the other an unassigned species in the *Gammaropsis atlantica* complex, and three species of Ischyroceridae, two of which were previously known from the region and one of which is recorded from the Indian Ocean for the first time.

Diagnoses are provided for all species recorded in this study. Keys are provided for species of the genera *Ampithoe*, Cymadusa, *Bemlos* and *Ericthonius*. Full descriptions and figures are provided for new species and for species which are poorly known or for which there is some confusion with synonymy in literature [for example, *Cymadusa microphthalma* (Chevreux)]. Selected figures are provided for other species.

Materials and methods

Amphipods were collected from algae, seagrass and coral rubble from 24 sites (see Appadoo *et al.*, 2002: 767, fig.1) around the island of Mauritius and from Ile D'Ambre, a small island within the lagoon of Mauritius on the northeast coast from February 1998 to February 2000. The sites were visited at low tide and samples were collected from the intertidal and shallow subtidal zones. Algae and rubble were collected by scraping them off their substrates using a small hand trowel. Amphipods were extracted using the formalin-wash method (J.L. Barnard, 1976).

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Some of the substrates were also collected by snorkelling and diving from depths not exceeding 2–3 metres. The substrates were then transferred to a plastic bag and amphipods were subsequently extracted.

Prior to dissection the body length of amphipods was recorded by holding it straight and measuring the distance along the dorsal side of the body from the base of the first antennae to the base of the telson. A stereomicroscope with a micrometer scaled eyepiece was used to take the measurement.

Drawings were made using a Nikon compound microscope equipped with a drawing tube attachment.

Type material and additional representative material are deposited in the Australian Museum (AM). All other material is kept in the first author's collection. The terminology for cuticular extensions and setae follows that of Watling (1989).

Abbreviations used in figures. *A*, antenna (1–2); *C*, coxa; *D*, dactylus (3–7); *Ep*, epimeron; *G*, gnathopod (1–2); *L*, labium; *Md*, mandible; *Mx*, maxilla (1–2); *Mxp*, maxilliped; *P*, pereopod (3–7); *p*, palp; *T*, telson; *U*, uropods (1–3); *Ur*, urosomite. Geo-spatial co-ordinates were read from a map of scale 1:25 000.

Key to the genera of Corophiidea in Mauritius

1 Uropod 3 without rami ..... *Ritaumius*
—— Uropod 3 uniramous 2
—— Uropod 3 biramous 3

2 Uropod 3 ramus distally hooked ..... *Ericthonius*
—— Uropod 3 ramus without distal hooks ..... *Grandidierella*

3 Uropod 3 outer ramus with recurved robust setae 4
—— Uropod 3 outer ramus without recurved robust setae 7

4 Gnathopod 1 enlarged in male, larger than gnathopod 2 5
—— Gnathopod 2 enlarged in male, larger than gnathopod 1 6
—— Gnathopods 1 and 2 of similar size in both sexes ..... *Paradusa*

5 Outer ramus of uropod 3 broader than long, labium outer plate anterior margin un-notched ..... *Exampithoe*
—— Outer ramus of uropod 3 not broader than long, labium outer plate anterior margin notched ..... *Paragrubia*

6 Uropod 1 with acute disto-ventral spine ..... *Cymadusa*
—— Uropod 1 with rounded disto-ventral spine or lacking spine ..... *Ampithoe*

7 Urosome segment 1–3 fused ..... *Monocorophium*
—— Urosome segments free 8

8 Antenna 1 peduncle article 3 as long or longer than article 1 ..... *Gammaropsis*
—— Antenna 1 peduncle article 3 shorter than article 1 9

9 Gnathopod 1 male propodus not longer than carpus 10
—— Gnathopod 1 male propodus much longer than carpus 12

10 Male gnathopod 1 carpus with posterodistal spines ..... *Microdeutopus**
—— Male gnathopod 1 carpus without posterodistal spines 11

11 Male coxa 1 anteriorly acute ..... *Aora*
—— Male coxa 1 anteriorly rounded ..... *Aorcho*

12 Male gnathopod 1 palm with broad blunt spine; female gnathopod 1 propodus not markedly enlarged ..... *Bemlos*
—— Male gnathopod 1 without spine; female gnathopod 1 enlarged, similar to that of male ..... *Globosolembos*

* *Microdeutopus tridens* Schellenberg, 1938 (recorded from Mauritius by Ledoyer, 1978) is not attributable to *Microdeutopus* Costa, 1853 (see Myers, 1988a). It is keyed out here under that genus until further phylogenetic studies are carried out.

Key to male *Ampithoe* of Mauritius

1 Mandible palp slender, article 3 with two apical setae only 2
—— Mandible palp robust, article 3 with slender setae on lateral margin and apex 3

2 Gnathopod 1 carpus medially expanded; Gnathopod 2 carpus reduced, three times as broad as long, propodus longer than carpus, distally expanded, palm transverse, weakly sinuous ..... *Ampithoe lafkui*
—— Gnathopod 1 carpus not expanded medially; Gnathopod 2 carpus elongate, slightly less than two and half times as long as broad, propodus slender, subequal to carpus, palm oblique with a weak excavation ..... *Ampithoe longicarpus*

3 Gnathopod 2 palmar margin substraight or weakly sinuous 4
—— Gnathopod 2 palmar margin excavate with thumb-like process 5

4 Uropod 3 peduncle subrectangular, 2× as long as broad ..... *Ampithoe laxipodus*
—— Uropod 3 peduncle subsquare less than 1.5× as long as broad ..... *Ampithoe mascarenensis*

5 Antenna 2 flagellum longer than peduncle article 5 ..... *Ampithoe ramondi*
—— Antenna 2 flagellum shorter than peduncle article 5 ..... *Ampithoe kava*

Family Ampithoidae

Ampithoids are corophioidean amphipods characterized by a notched outer lobe of lower lip and/or uropod 3 outer ramus with 2 recurved robust setae.

Poore & Lowry (1997) give comprehensive diagnoses of the genera of ampithoids.

Genus *Ampithoe* Leach

For a diagnosis see Poore & Lowry, 1997.

Ampithoe kava Myers

Ampithoe ramondi J.L. Barnard, 1970: 50, figs. 18–19; not *Amphithoe ramondi* Audouin, 1826: 93.

Ampithoe kava Myers, 1985a: 22, fig. 15; 1986: 288.—Lyons & Myers, 1990: 1200, figs. 3–4.—Poore & Lowry, 1997: 909, figs. 6–9.

Material examined. 3♂♂, 8♀, AM P60553, from *Padina* sp., La Cuvette (20°00'S 57°34.2'E), 14 May 1998; 4♂♂, 13♀♀, AM P60554, from *Sargassum* sp., Bain Boeuf (19°59'S 57°36'E), 15 May 1998; 1♂, 2♀♀, AM P60555, from *Turbinaria ornata*, Bain Boeuf, 28 August 1998; 2♂♂, 2♀♀, 4 juv., AM P60556, 1♂, 7♀♀, AM P60557, from *Sargassum binderi*, La Cuvette, 28 August 1998; 1♂, 4♀♀, 4 juv., AM P60558, from Ile D'Ambre (20°02.2'S 57°42.2'E), 12 November 1998; 2♂♂, 1♀, AM P60559, from mixture of *Sargassum* sp., *Amphiroa* sp., *Pocockiella variegata, Amphiroa* sp., Bain Boeuf, 16 June 1999; 1♂, 2♀♀, AM P60560, from *Padina* sp., *Hypnea cornuta* and *Ulva lactuca*, Tamarin (20°19.5'S 57°22'E), 2 August 1999.

Diagnosis. Male antenna 2 peduncular articles 4 and 5 subequal; flagellum 10-articulate and shorter than length of peduncle article 5. Gnathopod 1 palm oblique. Gnathopod 2 basis, anterodistal lobe well developed with 5 stout setae; carpus subtriangular, 0.9× as long as broad; propodus 1.4× as long as broad, posterior margin produced into a short truncated thumb-like process separated from the palm by a narrow cleft, anterior margin with numerous groups of slender setae; dactylus short, stout, inner margin toothed. Pereopods 3–4 carpus short subquadrate, as long as broad. Pereopods 5–7 propodus with 4 robust setae on posterodistal margin. Uropod 1 peduncle, distal margin with well-developed rounded interramal spur. Telson subtriangular, distally rounded.

Female. Gnathopod 2 palmar margin weakly sinuous, posterodistal margin with 1 robust seta; dactylus fitting palm. Uropod 1 without interramal process.

Type locality. Taunovo Bay, Viti Levu, Fiji.

Distribution. Red Sea, Mauritius, Australia, Tonga, Fiji, Hawaii.

Habitat. *Ampithoe kava* lives mostly amongst brown algae, *Sargassum* sp. and *Padina* sp. and was collected at depths of less than 1 m. It occurs mostly on the north and east coast of the island.

Remarks. The material from Mauritius shows general agreement with the description given by Myers (1985a) from Fiji (the type locality) and with that of Poore & Lowry (1997) from Australia. A small difference is the number of robust setae on the anterodistal lobe of the basis in male gnathopod 2. In *A. kava* from Fiji, there are 3 robust setae in the 5 mm male as compared to 5 robust setae in the 3.8 mm male in this study.

This species resembles *Ampithoe ramondi* Audouin, but can be distinguished from it by the male gnathopod 2 having the thumb-like process on the palm separated from the palm by a narrow cleft as opposed to a round-bottomed excavation in *A. ramondi*, and by the presence in males of *A. kava* of a disto-ventral rounded spur on uropod 1 which is absent in *A. ramondi*. Other differences between the two species as highlighted by Myers (1985a) are, the shorter antenna 2 flagellum and the presence of striate robust setae in *Ampithoe kava* as opposed to non-striate robust setae on the propodus anterodistal margin in *Ampithoe ramondi*. This is the first record of the species from Mauritius.

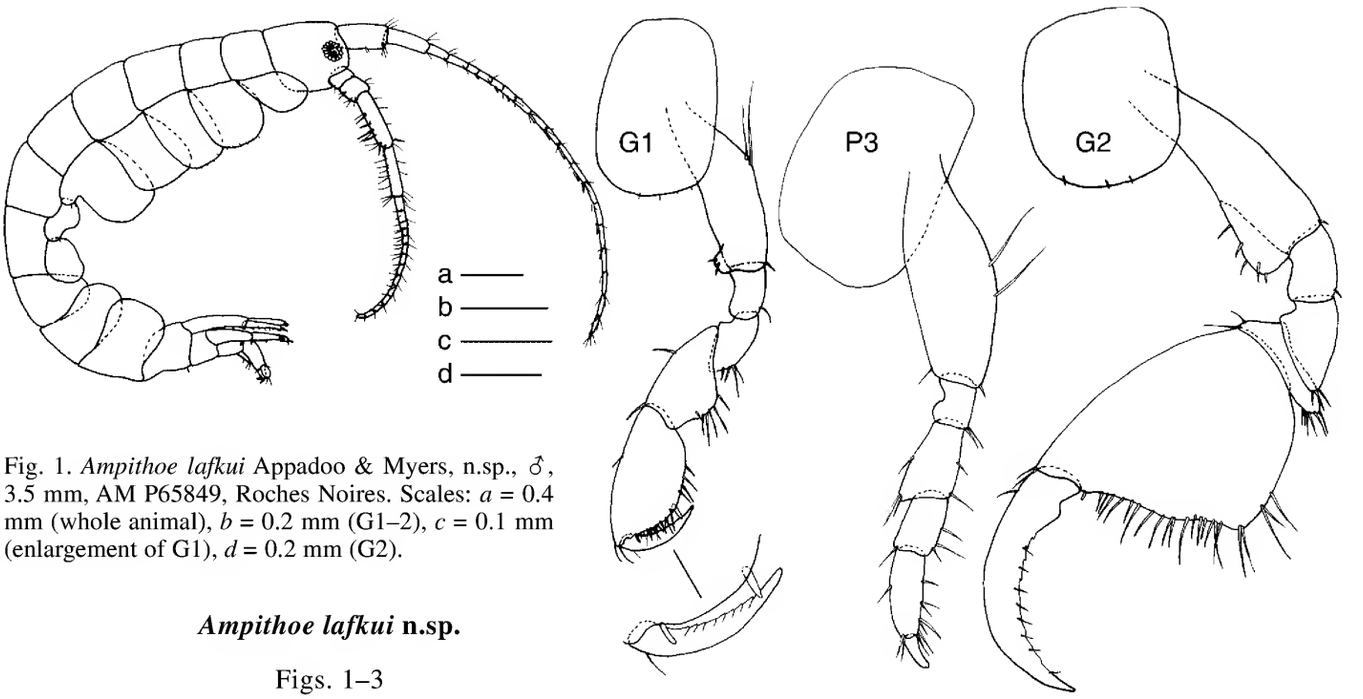


Fig. 1. *Ampithoe lafkui* Appadoo & Myers, n.sp., ♂, 3.5 mm, AM P65849, Roches Noires. Scales: *a* = 0.4 mm (whole animal), *b* = 0.2 mm (G1–2), *c* = 0.1 mm (enlargement of G1), *d* = 0.2 mm (G2).

Ampithoe lafkui n.sp.

Figs. 1–3

Ampithoe kulafi.—Ledoyer, 1982: 120, fig. 39.—Appadoo & Steele, 1998: 639; not *Ampithoe kulafi* J.L. Barnard, 1965: 542, fig. 34.

Type material. HOLOTYPE ♂, 3.5 mm, AM P65839, from *Sargassum* sp., *Dictyota* sp. and *Turbinaria* sp., Roches Noires (20°6.2'S 57°44.5'E) at depths less than 1 m, C. Appadoo, 15 May 1998. PARATYPES, 1♂, 2.8 mm, AM P65841, 1♀, 2.8 mm, AM P65840, 1♂, AM P60584, 1♂, 3♀♀, AM P60585, same data as holotype; 1♂, AM P60586, from *Gelidiella* sp., Albion (20°13'S 57°23.7'E), 22 October 1998; 2♂♂, 2♀♀, AM P60587, from *Dictyota divaricata*, Bain Boeuf (19°59'S 57°36'E), 10 February 1999; 1♂, AM P60588, from mixture of *Padina* sp., *Hypnea cornuta* and *Ulva lactuca*, Tamarin (20°19.5'S 57°22'E), 2 August 1999.

Description. Male, 3.5 mm. Head slightly longer than deep; eyes round, with well-developed ommatidial ring (transparent in alcohol) surrounding brown (in alcohol) speckled core. Antenna 1 article 2, 0.9× article 1; article 3, 0.5× article 1; flagellum 18-articulate, with short slender setae and aesthetacs. Antenna 2 moderately setose, robust; article 5, 0.8× article 4, flagellum 14-articulate. Mandible palp slender, article 3 longer than 2 with two apical slender setae; article 2 without setae. Lower lip outer lobe narrow, deeply notched, with well-developed conical robust seta; mandibular lobe rounded. Maxilla 1 inner plate subtriangular with one short seta. Maxilla 2 inner plate narrower than outer. Maxilliped palp article 3 slightly expanded, article 4 conical and terminating in an unguis. Gnathopod 1 coxa subrectangular, 1.4× as long as broad, distal margin with minute setae; basis 3.3× as long as broad, with small anterodistal lobe; carpus 1.7× as long as broad, posterior

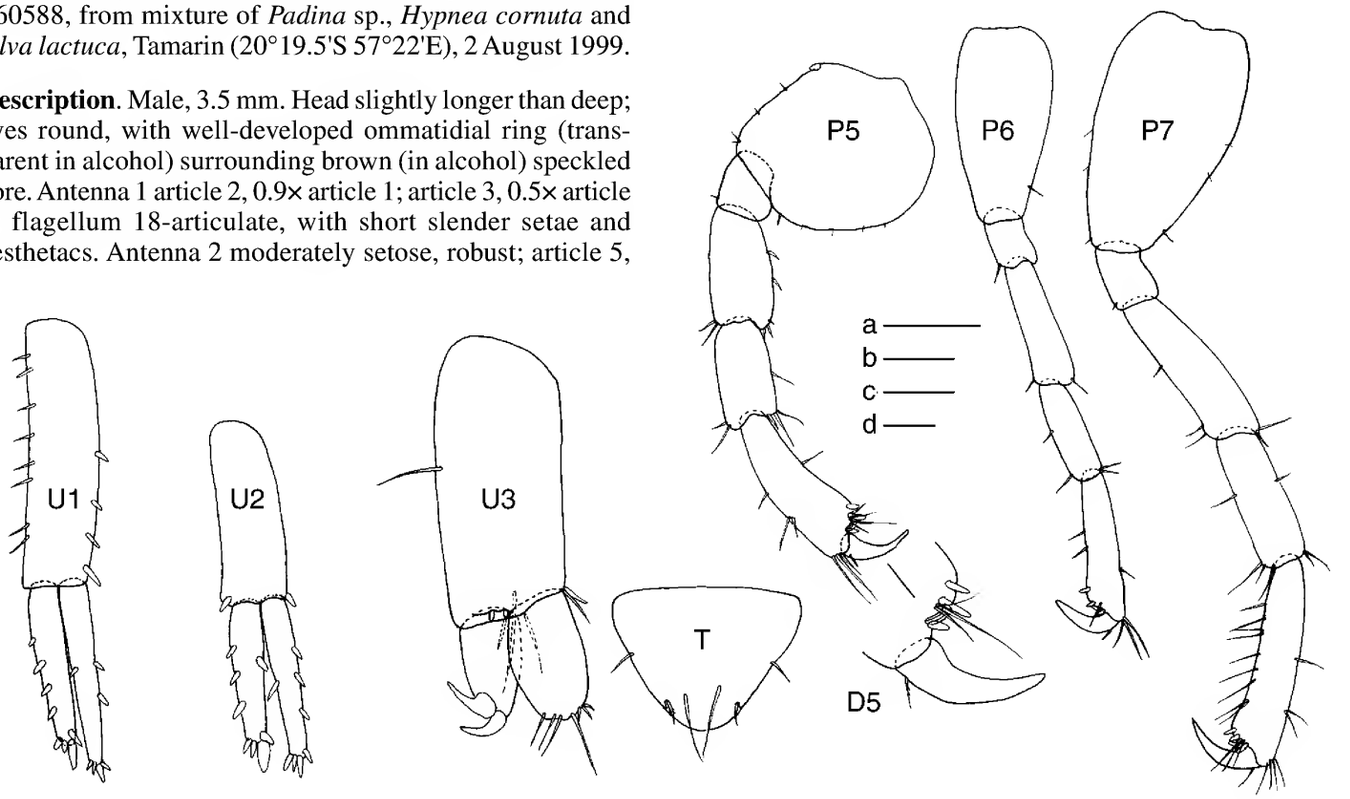


Fig. 2. *Ampithoe lafkui* Appadoo & Myers, n.sp., ♂ 3.5 mm (P5, D5, U1–2, U3, T), AM P65839, ♂, 2.8 mm (P6–7), AM P65840, Roches Noires. Scales: *a* = 0.2 mm (P5, P6–7), *b* = 0.1 mm (U1–2), *c* = 0.05 mm (U3, T), *d* = 0.05 mm (D5).

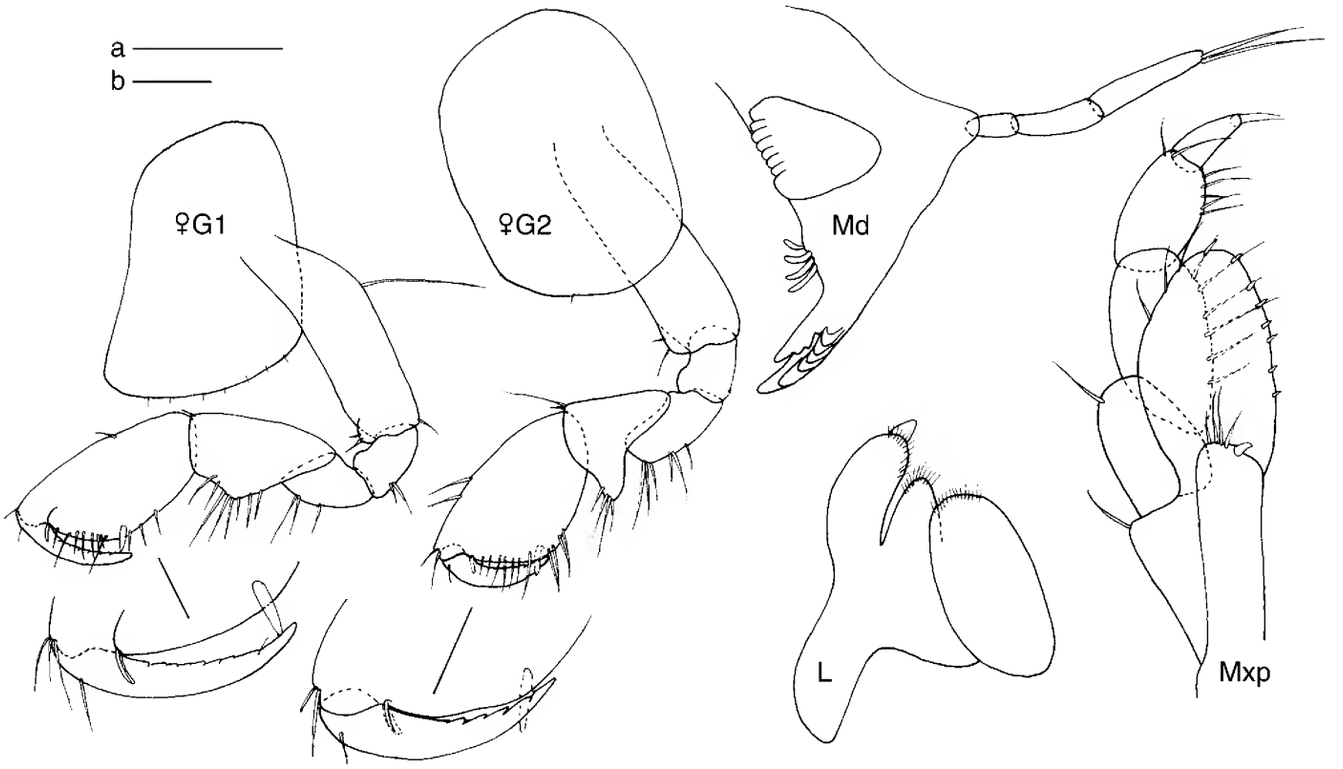


Fig. 3. *Ampithoe lafkui* Appadoo & Myers, n.sp., ♂, 3.5 mm, AM P65839, ♀, 2.8 mm, AM P65841, Roches Noires. Scales: *a* = 0.2 mm (♀G1–2), *b* = 0.05 mm (Md, L, Mxp, enlargements of ♀G1–2). Male unless stated otherwise.

margin sinuous; propodus 1.4× length of carpus, 2.2× as long as broad, palm oblique, evenly convex, with fine slender setae and 1 robust seta on posterodistal margin; dactylus inner margin toothed, overlapping palm. Gnathopod 2 coxa subrectangular, 1.2× as long as broad; basis 2.5× as long as broad, slender at base and expanded distally, anterodistal lobe weak with a few stout setae; carpus reduced, 3× as broad as long; propodus robust, 5.8× length of carpus, 1.3× as long as broad, palm sinuous; dactylus stout, falcate. Pereopods 3–4 coxa 1.5× as long as broad; basis moderately expanded, biconvex, 2.7× as long as broad, merus 1.7× as long as broad, anterior margin weakly expanded; carpus 1.8× as long as broad; propodus 2.8 as long as broad, dactylus relatively short. Pereopod 5 coxa with small posterior lobe; basis expanded, as long as broad; merus 1.8× as long as broad; carpus 1.8× as long as broad, propodus 3× as long as broad, posterodistal margin expanded with 4 robust setae, one of which is curved. Pereopods 6 and 7 (missing from described specimen; described from 2.8 mm male). Pereopod 6 basis slender, subrectangular, distally tapered, 2× as long as broad; carpus and merus slender, carpus 0.8× length of merus; propodus 1.4× length of carpus, distally expanded, with 4 robust setae on posterodistal margin. Pereopod 7 similar to pereopod 6 but basis 1.9× as long as broad, proximally expanded; merus, carpus and propodus slender. Epimera 1–3 posterodistal margin rounded. Uropod 1 peduncle 3.9× as long as broad, outer ramus 0.9× inner ramus. Uropod 2 outer ramus 0.9× inner ramus, 0.8× length of peduncle; both rami with several robust setae. Uropod 3 peduncle 2.4× as long as broad, distal margin with dorsal robust setae and a ventral group of slender setae; inner ramus subovate, with slender apical setae; outer ramus with 2 recurved robust setae. Telson subtriangular with few slender lateral and medial setae; telsonic cusps present on broadly rounded apex.

Female, 2.8 mm (ovigerous). Gnathopod 1 coxa 1.3× as long as broad; basis 3.2× as long as broad; carpus subtriangular, 1.8× as long as broad; propodus 1.4× length of carpus, palm oblique, evenly convex, with few slender setae and 1 robust seta at posterodistal margin; dactylus inner margin toothed. Gnathopod 2 coxa 1.5× as long as broad, anterodistal margin with short setae; basis 3.5× as long as broad, anterodistal lobe weak; carpus about as long as broad, posterior margin produced into a lobe; propodus 1.7× length of carpus, palm oblique with fine setae and 1 robust seta at posterodistal margin; dactylus inner margin toothed.

Distribution. Mauritius, Madagascar.

Habitat. *Ampithoe lafkui* was collected from brown and green algae at depths of less than 3 m. It was collected, in small numbers, from several sites around Mauritius and was moderately common at Ile D'Ambre where samples were taken from a mixture of algae, coral rubble and silt by diving.

Remarks. This species closely resembles *Ampithoe kulafi* J.L. Barnard (1965), but differs in the rounded (rather than acute) anterodistal margin of coxa 1, in the more slender basis of pereopods 6 and 7 and in lacking a seta on article 2 of the mandible palp. The male gnathopod 2 propodus differs subtly in shape, the palm is weakly sinuous in *A. lafkui*, whereas in *A. kulafi*, it is non-sinuous. This species is synonymous with the material described under the name *Ampithoe kulafi* by Ledoyer (1982).

Etymology. An anagram of the specific epithet *kulafi*.

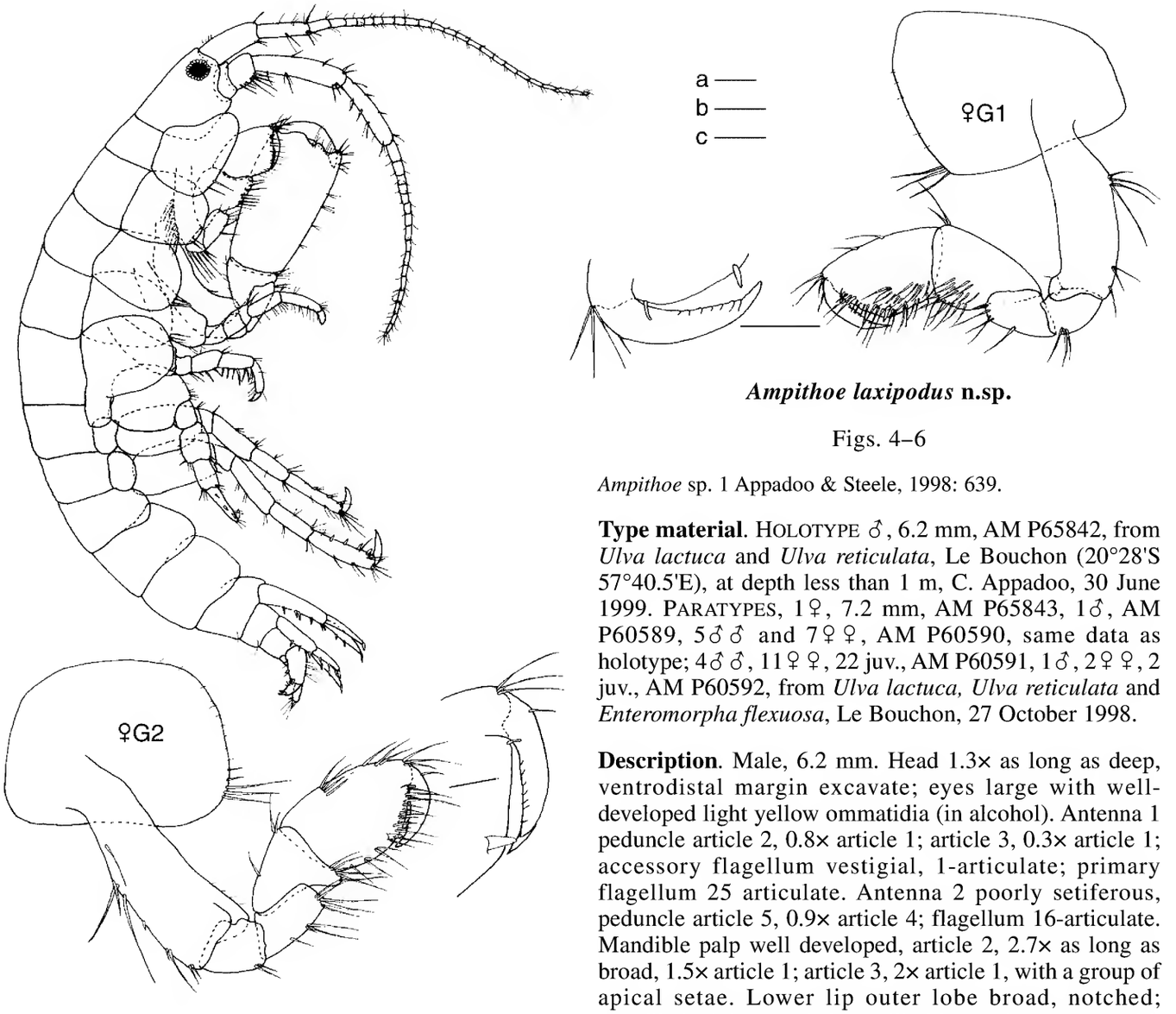


Fig. 4 (above). *Ampithoe laxipodus* Appadoo & Myers, n.sp., ♂, 6.2 mm, AM P65842, ♀, 7.2 mm, AM P65843, Le Bouchon. Scales: *a* = 0.4 mm (whole animal), b= 0.2 mm (♀G1–2), *c* = 0.1 mm (enlargements of ♀G1–2). Male unless stated otherwise.

Ampithoe laxipodus n.sp.

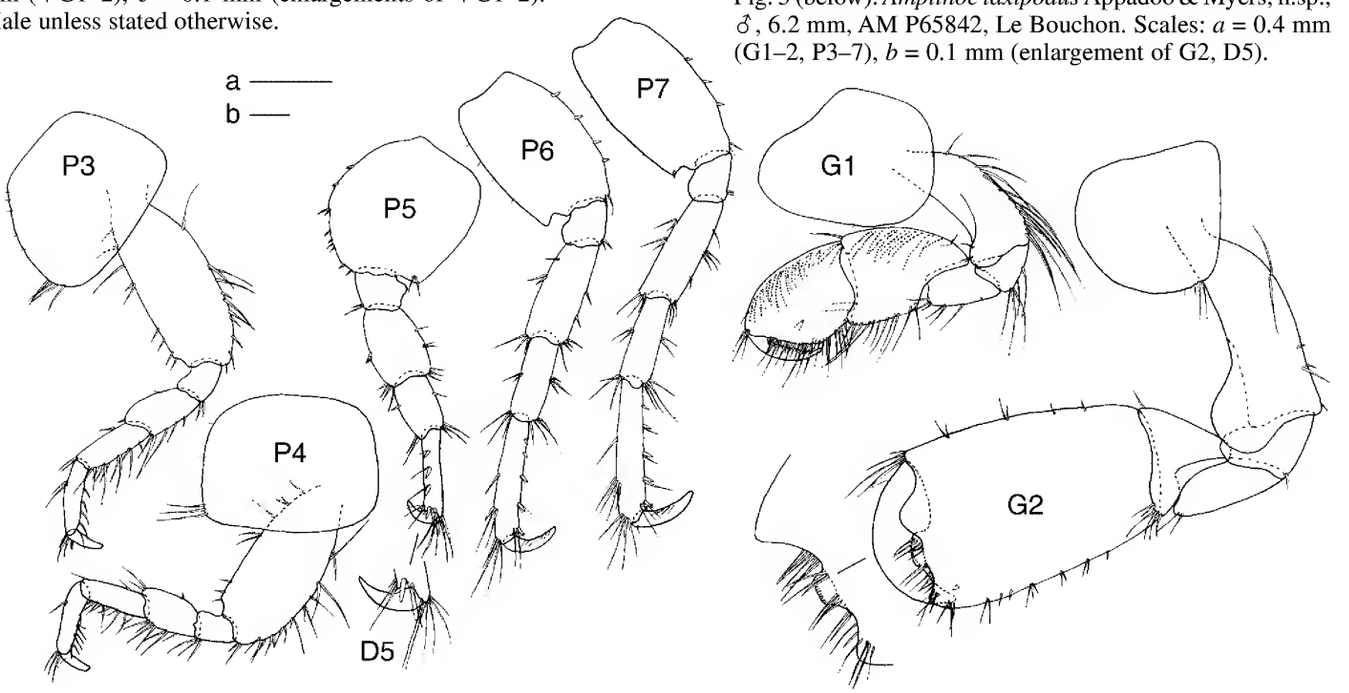
Figs. 4–6

Ampithoe sp. 1 Appadoo & Steele, 1998: 639.

Type material. HOLOTYPE ♂, 6.2 mm, AM P65842, from *Ulva lactuca* and *Ulva reticulata*, Le Bouchon (20°28'S 57°40.5'E), at depth less than 1 m, C. Appadoo, 30 June 1999. PARATYPES, 1♀, 7.2 mm, AM P65843, 1♂, AM P60589, 5♂♂ and 7♀♀, AM P60590, same data as holotype; 4♂♂, 11♀♀, 22 juv., AM P60591, 1♂, 2♀♀, 2 juv., AM P60592, from *Ulva lactuca, Ulva reticulata* and *Enteromorpha flexuosa*, Le Bouchon, 27 October 1998.

Description. Male, 6.2 mm. Head 1.3× as long as deep, ventrodistal margin excavate; eyes large with well-developed light yellow ommatidia (in alcohol). Antenna 1 peduncle article 2, 0.8× article 1; article 3, 0.3× article 1; accessory flagellum vestigial, 1-articulate; primary flagellum 25 articulate. Antenna 2 poorly setiferous, peduncle article 5, 0.9× article 4; flagellum 16-articulate. Mandible palp well developed, article 2, 2.7× as long as broad, 1.5× article 1; article 3, 2× article 1, with a group of apical setae. Lower lip outer lobe broad, notched; mandibular lobe rounded. Maxilla 2 inner plate narrow, with

Fig. 5 (below). *Ampithoe laxipodus* Appadoo & Myers, n.sp., ♂, 6.2 mm, AM P65842, Le Bouchon. Scales: *a* = 0.4 mm (G1–2, P3–7), *b* = 0.1 mm (enlargement of G2, D5).



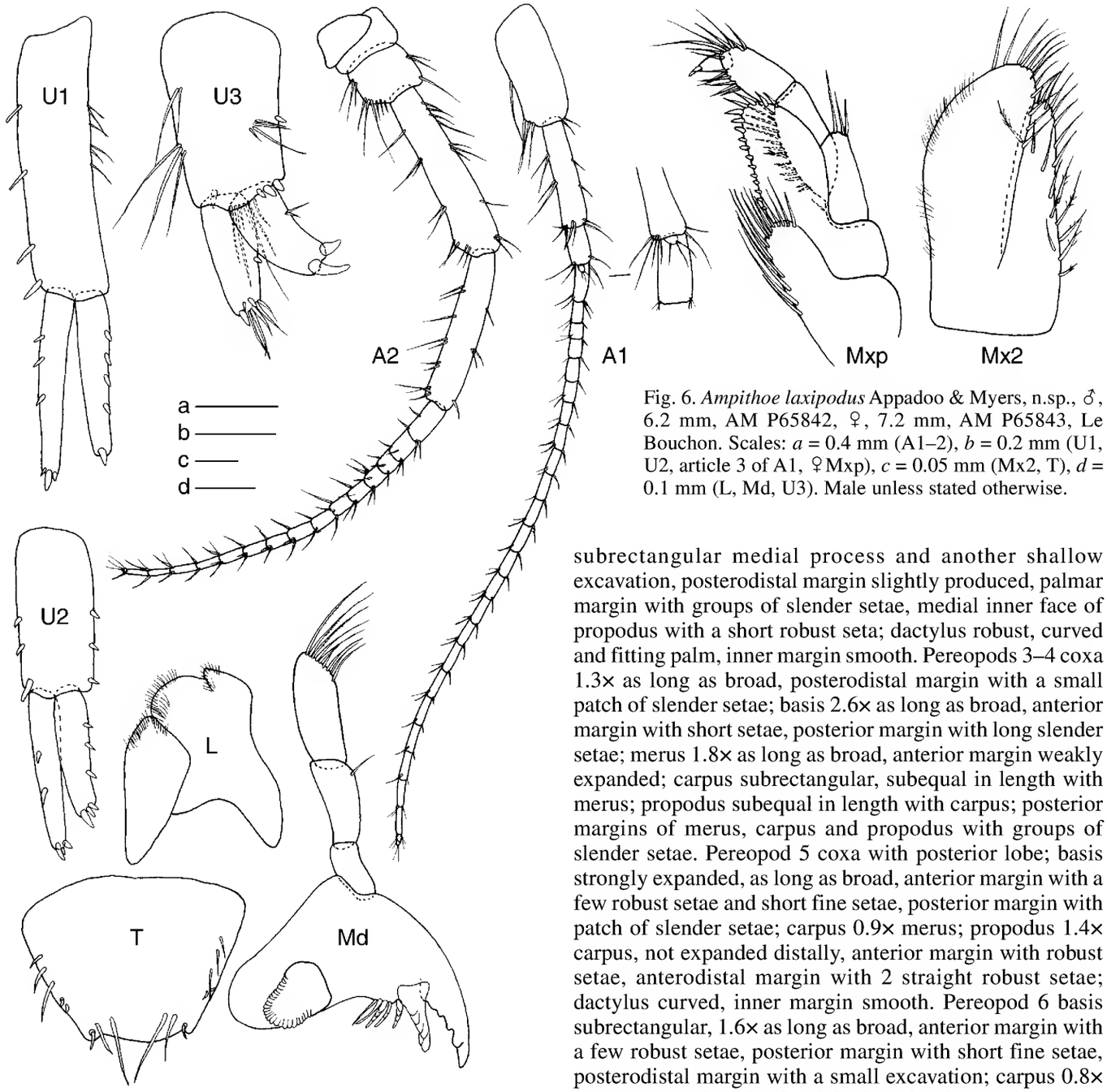


Fig. 6. *Ampithoe laxipodus* Appadoo & Myers, n.sp., ♂, 6.2 mm, AM P65842, ♀, 7.2 mm, AM P65843, Le Bouchon. Scales: *a* = 0.4 mm (A1–2), *b* = 0.2 mm (U1, U2, article 3 of A1, ♀Mxp), *c* = 0.05 mm (Mx2, T), *d* = 0.1 mm (L, Md, U3). Male unless stated otherwise.

apical, medial and an oblique row of setae; outer plate broad, with apical slender setae and fine short hair-like setae on outer margin. Maxilliped palp 4-articulate, article 4 conical with apical nail. Gnathopod 1 coxa breadth subequal to depth, anterodistal margin produced, rounded; basis 2.7× as long as broad, anterodistal lobe well developed, posterior margin with patches of long slender setae; carpus expanded, 1.3× as long as broad, anterior and posterior margins with long slender setae; propodus globular, 0.9× length of carpus, 1.4× as long as broad with groups of long slender setae on anterior margin, palm oblique with a robust seta at posterodistal corner, palmar margin with groups of slender setae; dactylus inner margin toothed. Gnathopod 2 coxa as long as broad, posterodistal margin with a small patch of short setae; basis 3× as long as broad, anterodistal lobe well developed; carpus subtriangular, 0.8× as long as broad; propodus subquadrate, 3× length of carpus, anterior and posterior margins with groups of short setae, palm transverse, with a shallow excavation followed by a subrectangular medial process and another shallow excavation, posterodistal margin slightly produced, palmar margin with groups of slender setae, medial inner face of propodus with a short robust seta; dactylus robust, curved and fitting palm, inner margin smooth. Pereopods 3–4 coxa 1.3× as long as broad, posterodistal margin with a small patch of slender setae; basis 2.6× as long as broad, anterior margin with short setae, posterior margin with long slender setae; merus 1.8× as long as broad, anterior margin weakly expanded; carpus subrectangular, subequal in length with merus; propodus subequal in length with carpus; posterior margins of merus, carpus and propodus with groups of slender setae. Pereopod 5 coxa with posterior lobe; basis strongly expanded, as long as broad, anterior margin with a few robust setae and short fine setae, posterior margin with patch of slender setae; carpus 0.9× merus; propodus 1.4× carpus, not expanded distally, anterior margin with robust setae, anterodistal margin with 2 straight robust setae; dactylus curved, inner margin smooth. Pereopod 6 basis subrectangular, 1.6× as long as broad, anterior margin with a few robust setae, posterior margin with short fine setae, posterodistal margin with a small excavation; carpus 0.8× merus; propodus slender 1.5× length of carpus, anterior margin with robust setae and fine setae, posterior margin with groups of slender setae, anterodistal corner with 2 straight robust setae and a group of slender setae; dactylus curved, inner margin smooth. Pereopod 7 similar to pereopod 6 but more slender. Epimera 1–3 posterodistal corner broadly rounded. Uropod 1 peduncle lacking interramal process with robust setae on inner margin and groups of short slender setae on outer margin; inner ramus 0.7× length of peduncle and subequal with outer ramus; both rami with robust setae. Uropod 2 peduncle with robust setae; inner ramus subequal to peduncle, 1.2× outer ramus; both rami with robust setae. Uropod 3 peduncle 1.9× as long as broad, inner margin with 2 groups of long slender setae, distal margin with one patch of long slender setae and a few robust setae; outer ramus 0.9× inner ramus, with one patch of short medial slender setae; inner ramus with 1 medial robust seta and a group of slender and robust setae at apex. Telson subtriangular, distally truncate with groups of dorsolateral and medial setae, telsonic cusps present.

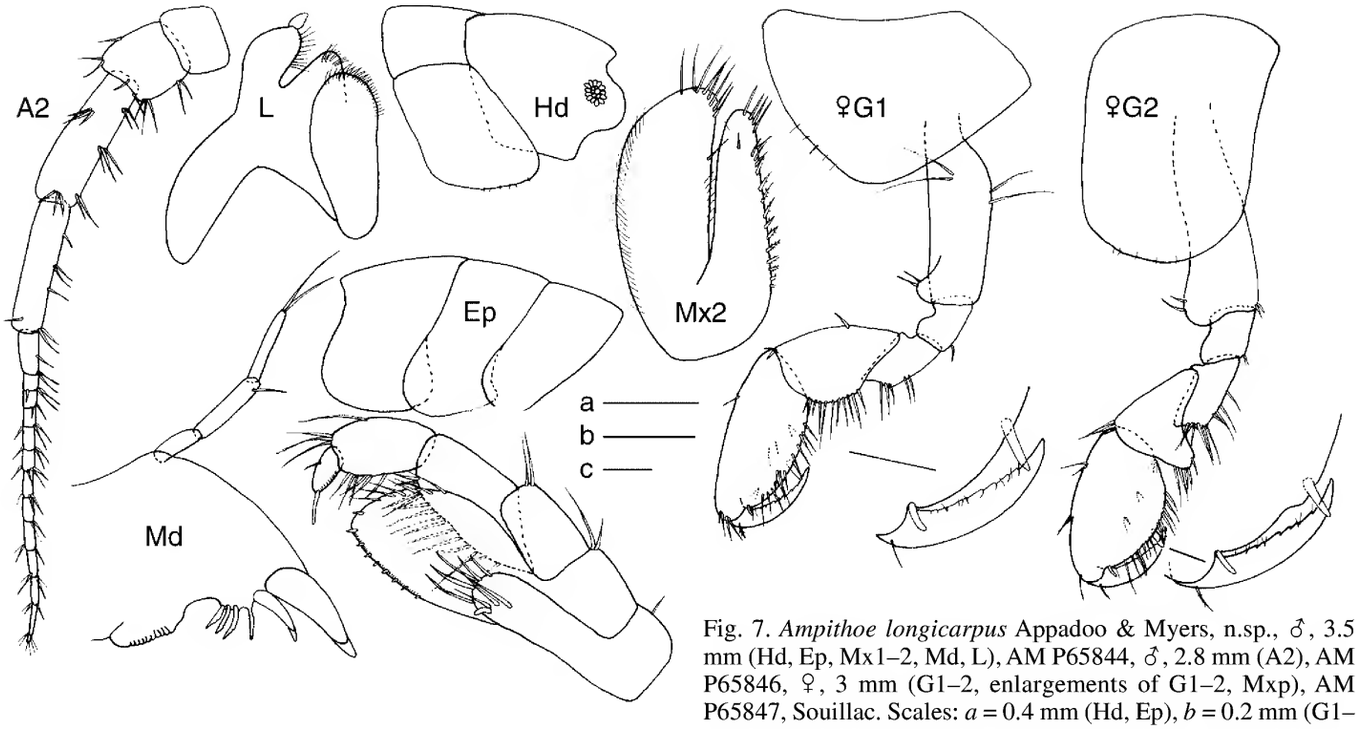


Fig. 7. *Ampithoe longicarpus* Appadoo & Myers, n.sp., ♂, 3.5 mm (Hd, Ep, Mx1–2, Md, L), AM P65844, ♂, 2.8 mm (A2), AM P65846, ♀, 3 mm (G1–2, enlargements of G1–2, Mxp), AM P65847, Souillac. Scales: *a* = 0.4 mm (Hd, Ep), *b* = 0.2 mm (G1–2, A2), *c* = 0.05 mm (Mx2, Md, L, Mxp, enlargements of G1–2).

Female, 7.2 mm (ovigerous). Gnathopod 1 coxa 1.3× as long as broad, anterodistal lobe produced, posterodistal margin with a small patch of slender setae; basis 3.2× as long as broad, anterodistal lobe well developed, posterior margin with few groups of slender setae; carpus 1.5× as long as broad; propodus subequal to carpus, in length and breadth, palm oblique with fine slender setae and one robust seta on posterodistal margin; dactylus inner margin toothed. Gnathopod 2 coxa 1.4× as long as broad, posterodistal margin with a small patch of slender setae; basis 3.2× as long as broad with well-developed anterodistal lobe, posterior margin with a few long slender setae; carpus subtriangular, as long as broad; propodus 1.4× as long as broad, palmar margin with groups of slender setae and 1 robust seta at posterodistal corner; dactylus inner margin toothed.

Distribution. Mauritius.

Habitat. This species was collected from one site, Le Bouchon at depths of less than half a metre. It lives amongst the green algae *Ulva lactuca* and *Ulva reticulata*.

Remarks. The presence of a vestigial accessory flagellum would align this species with the genus *Cymadusa*. However, the lack of a strong, acute, interramal process on uropod 1 removes it from that genus. Species of *Ampithoe* sometimes possess small rounded interramal processes but these are never spine-like and occur only in the male.

Ampithoe laxipodus n.sp. resembles *A. mascarenensis* n.sp. (for distinguishing features, see that species).

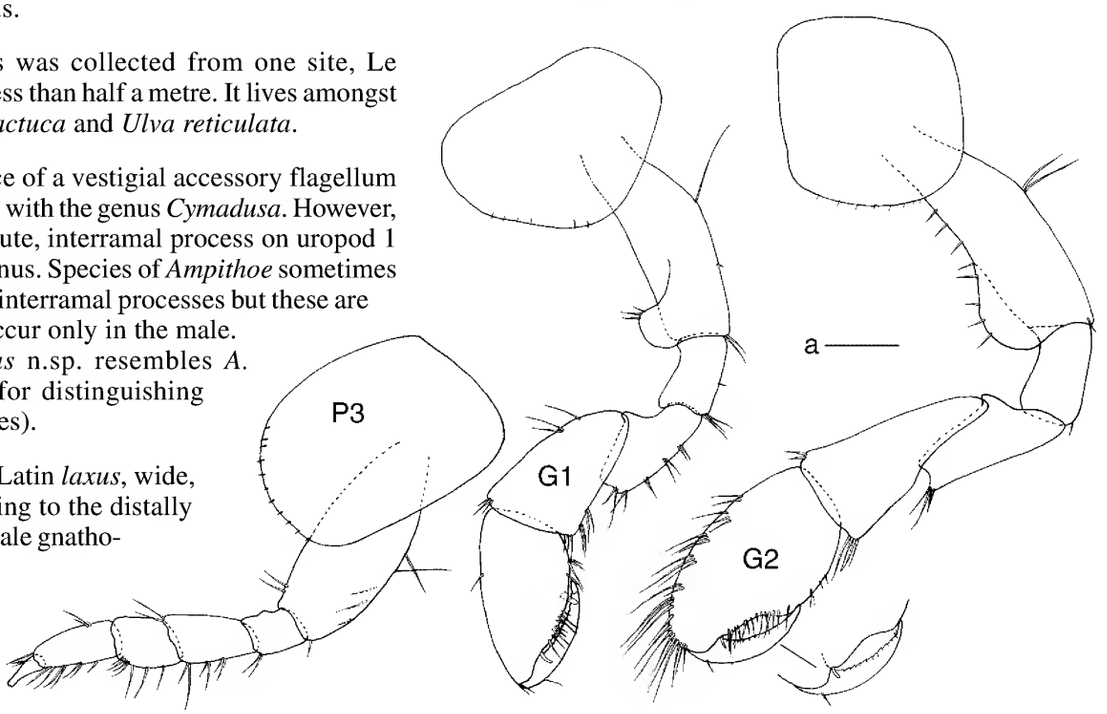
Etymology. From the Latin *laxus*, wide, and podus, foot, referring to the distally wide propodus of the male gnathopod 2.

Ampithoe longicarpus n.sp.

Figs. 7–9

Type material. HOLOTYPE ♂, 3.5 mm, AM P65844 from mixture of *Sargassum* sp., *Ulva reticulata* and *Gelidiella acerosa*, Souillac (20°31'S 57°30.7'E), at depth less than 1 m, C. Appadoo, 14 December 1999. PARATYPES, 1♂, 3.3 mm, AM P65845, 1♀, 3 mm, AM P65847, same data as holotype; 1♂, 2.8 mm, AM P65846, from *Amansia glomerata* and *Padina* sp., Souillac, 8 April 1999; 1♂, AM P60593, 3♂♂ and 2♀♀, AM P60594, from mixture of

Fig. 8. *Ampithoe longicarpus* Appadoo & Myers, n.sp., ♂, 3.5 mm, AM P65844, Souillac. Scale: *a* = 0.2 mm (G1–2, P3).



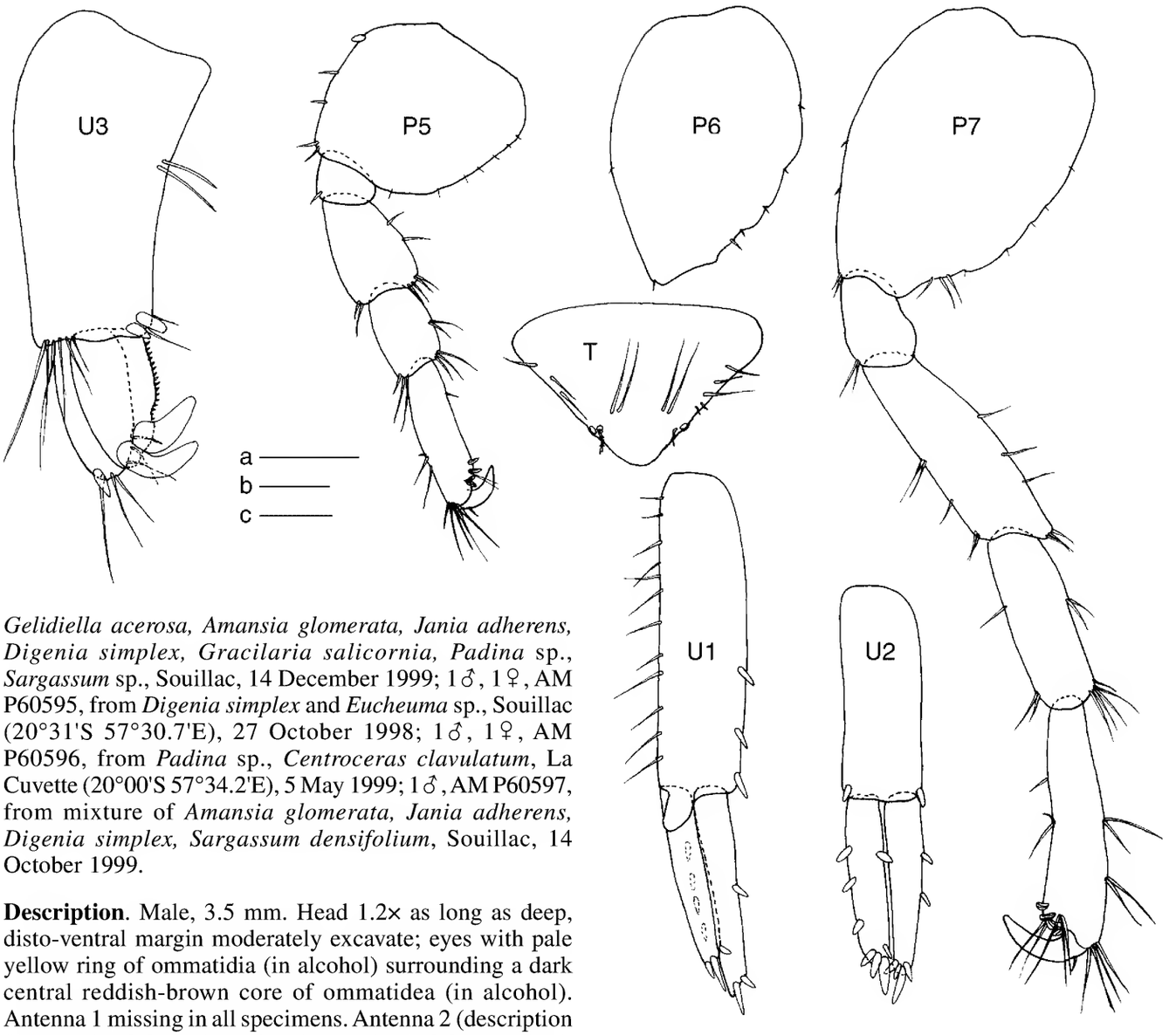


Fig. 9. *Ampithoe longicarpus* Appadoo & Myers, n.sp., ♂, 3.5 mm (U1–3, T), AM P65844, ♂, 3.3 mm (P5–7), AM P65845, Souillac. Scales: *a* = 0.2 mm (P5–7), *b* = 0.1 mm (U1–2), *c* = 0.05 mm (U3, T).

Gelidiella acerosa, Amansia glomerata, Jania adherens, Digenia simplex, Gracilaria salicornia, Padina sp., *Sargassum* sp., Souillac, 14 December 1999; 1♂, 1♀, AM P60595, from *Digenia simplex* and *Eucheuma* sp., Souillac (20°31'S 57°30.7'E), 27 October 1998; 1♂, 1♀, AM P60596, from *Padina* sp., *Centroceras clavulatum*, La Cuvette (20°00'S 57°34.2'E), 5 May 1999; 1♂, AM P60597, from mixture of *Amansia glomerata, Jania adherens, Digenia simplex, Sargassum densifolium*, Souillac, 14 October 1999.

Description. Male, 3.5 mm. Head 1.2× as long as deep, disto-ventral margin moderately excavate; eyes with pale yellow ring of ommatidia (in alcohol) surrounding a dark central reddish-brown core of ommatidea (in alcohol). Antenna 1 missing in all specimens. Antenna 2 (description from male, 2.8 mm), peduncle article 5, 0.9× article 4, flagellum longer than article 5, 13-articulate. Mandible palp slender, article 3, 0.9× article 2, with two terminal slender setae. Lower lip outer plate narrow, deeply notched, with well-developed robust seta; mandibular lobes produced and rounded distally. Maxilla 1 inner plate subovate with 1 slender sub-distal seta. Maxilla 2 inner plate much narrower than outer plate. Maxilliped (from female, 3 mm), palp 4-articulate, article 3, 1.6× as long as broad, article 4 triangular with terminal nail. Gnathopod 1 coxa 1.as long as broad, anterodistally produced, rounded, distal margin with minute setae; basis 2.9× as long as broad, anterodistal lobe well developed with 3 stout setae, posterior margin with few slender setae; ischium long, 1.5× as long as broad; carpus elongate, subtriangular, 1.8× as long as broad; propodus 1.1×carpus, 2× as long as broad, palm oblique and poorly defined with a robust seta on posterodistal corner; dactylus long, 0.7× length of propodus, inner margin toothed. Gnathopod 2 coxa subquadrate, as long as broad, distal margin with minute setae; basis 3× as long as broad, anterodistal lobe well developed bearing stout setae; ischium elongate, 1.7× as long as broad; merus with posterodistal process; carpus elongate, subtriangular, 2.3× as long as broad; propodus and carpus subequal in length; propodus 1.8× as long as broad, anterior margin with numerous groups of long slender setae, palm sinuous with a weak excavation and with slender setae; dactylus over-reaching palm, inner margin toothed. Pereopods 3–4 coxa 1.4× as long as broad, distal margin with minute seta; basis weakly expanded, 2.4× as long as broad; merus 1.7× as long as broad; carpus subrectangular, 1.3× as long as broad; propodus 2.6× as long as broad. Pereopod 5 missing on described specimen (description from 3.3 mm male); basis strongly expanded, subequal in length and breadth; carpus 0.8× merus; propodus 1.6× carpus, slightly expanded distally with 4 striate robust setae at posterodistal corner. Pereopod 6 (from male, 3.3 mm), basis pyriform, 1.3× as long as broad, posterior margin broadly sinuous and scalloped, with a few slender setae; carpus 0.8× merus; propodus 1.3× carpus, slightly expanded distally, with 4 striate robust setae at anterodistal margin. Pereopod 7 similar to pereopod 6 but basis 1.4× as long as broad, anteriorly expanded, distally tapered. Epimera 1–3 posterodistal margin broadly rounded. Uropod 1 peduncle 3.7× as long as broad, outer margin

with evenly spaced slender setae, inner margin with a few robust setae, distal margin with a short, rounded interramal process; outer ramus 0.9× inner ramus. Uropod 2 peduncle 2.8× as long as broad, outer ramus 0.9× inner ramus, rami with numerous robust setae. Uropod 3 peduncle 2.2× as long as broad, with one group of medial and one group of distal slender setae, distal margin with robust setae; inner ramus subovate with 1 robust and several slender distal setae; outer ramus with two large recurved robust setae at apex and small conical teeth on outer margin. Telson subtriangular with dorsolateral setae and two groups of slender medial setae; telsonic cusps small.

Female, 3 mm (ovigerous). Gnathopod 1 coxa 1.3× as long as broad, anterodistal margin produced, distal margin with minute setae; basis 3.1×s long as broad, anterodistal lobe moderately well developed; carpus 1.6× as long as broad; propodus elongate, 1.3× length of carpus, 2.6× as long as broad, palm oblique, poorly defined, with robust seta at posterodistal corner; dactylus 0.6× length of propodus, inner margin toothed. Gnathopod 2 coxa 1.4× as long as broad, distal margin with short setae; basis 3.3× as long as broad, anterodistal margin with robust setae; carpus subtriangular, 1.2× as long as broad; propodus 1.5× length of carpus, 1.8× as long as broad, palmar margin weakly sinuous with robust seta at posterodistal corner; dactylus slightly overlapping palm. Uropod 1 lacking an interramal process.

Distribution. Mauritius.

Habitat. This species was collected mostly from red algae at depths of less than 1 m. It was common among algae in rock pools at Souillac, in the south coast of the island.

Remarks. This species has prehensile pereopods 5 to 7 with large striate robust setae and a slender mandibular palp. It resembles *Ampithoe kaneohe kaneohe* J.L. Barnard (1970: 44, figs. 14–16, 24 l) and *Pleonexes kaneohe navosa* from Fiji (Myers, 1985a: 36, figs. 27–28). It differs from this species by being smaller in size and having a long slender carpus on the male gnathopod 2 (2.2× as long as broad as compared to being subequal in length and breadth in material described from Hawaii and 1.4× as long as broad in material from Fiji). It also differs from the *A. kaneohe kaneohe* from Hawaii, in the shape of the propodus, which is more subquadrate with an excavation in the present species, as compared to a subovate propodus and a strongly oblique palm with poorly defined palmar margin in *A. kaneohe*. Moreover, in *A. kaneohe kaneohe*, there are dense patches of setae on the posterior margins of propodus of male gnathopod 2. Another character of *A. longicarpus* n.sp. is the weakly scalloped posterior margin of the basis of pereopods 6 and 7, which appears smooth in *A. kaneohe kaneohe* (J.L. Barnard, 1970: 47, fig. 14).

Etymology. From the Latin *longus*, long, and *carpus*, referring to the long carpus of the male gnathopod 2.

Ampithoe mascarenensis n.sp.

Figs. 10–12

Ampithoe sp. 2 (Appadoo & Steele, 1998: 639).

Type material. HOLOTYPE ♂, 5.5 mm, AM P65848, from *Centroceras clavulatum*, Souillac (20°31'S 57°30.7'E), depth less than 1 m, C. Appadoo, 13 August 1998. PARATYPES, 1♀, 4.3 mm, AM P65849, 1♂, AM P60598, 4♂♂ and 10♀♀, AM P60610, same data as holotype; 3♂♂, 12♀♀, 6 juv., AM P60611, from *Centroceras clavulatum*; 1♂, 1 juv., AM P60612, from *Digenia simplex*, Souillac (20°31'S 57°30.7'E), 13 August 1998; 1♂ from *Amansia*

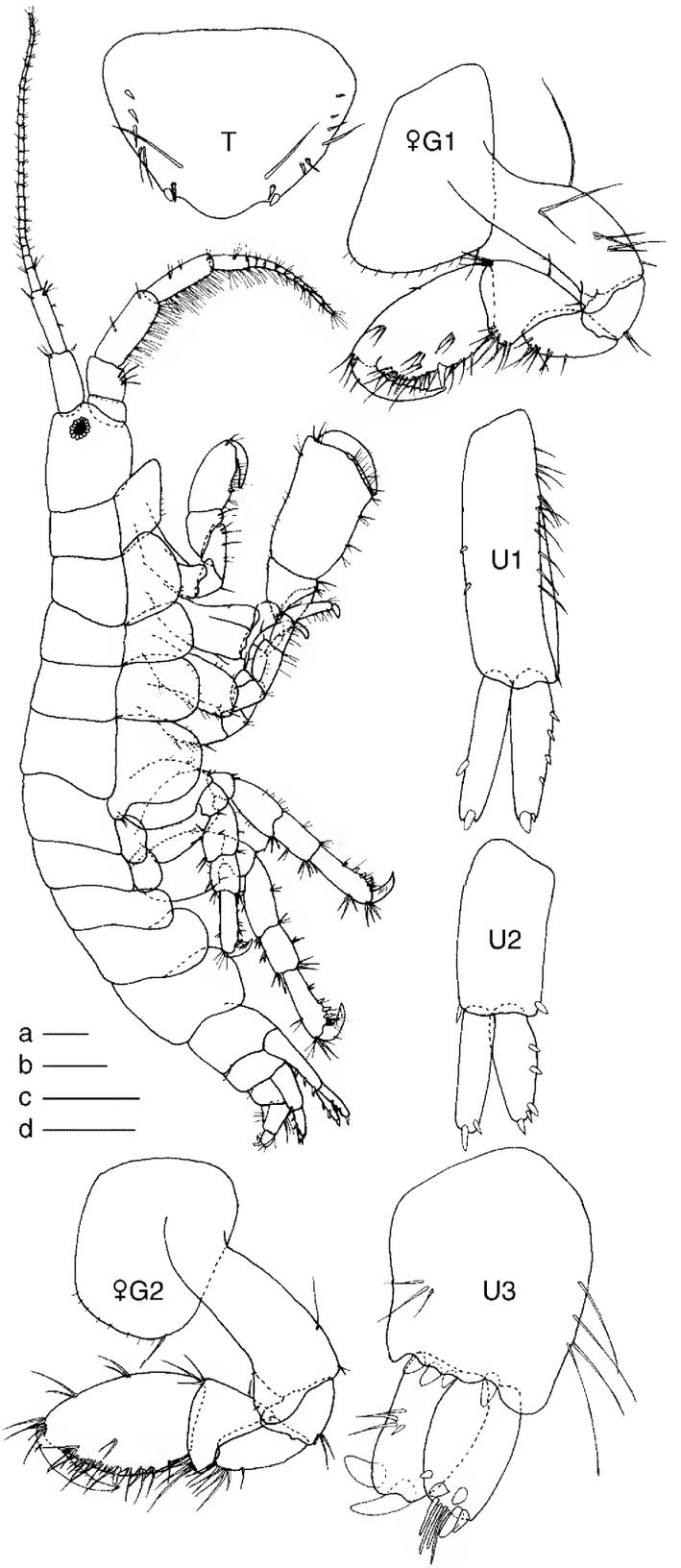


Fig. 10. *Ampithoe mascarenensis* Appadoo & Myers, n.sp., ♂, 5.2 mm, AM P65848, ♀, 4.3 mm, AM P65849, Souillac. Scales: *a* = 0.4 mm (whole animal), b= 0.2 mm (♀G1–2), *c* = 0.1 mm (U3, T), *d* = 0.2 mm (U1–2). Male unless stated otherwise.

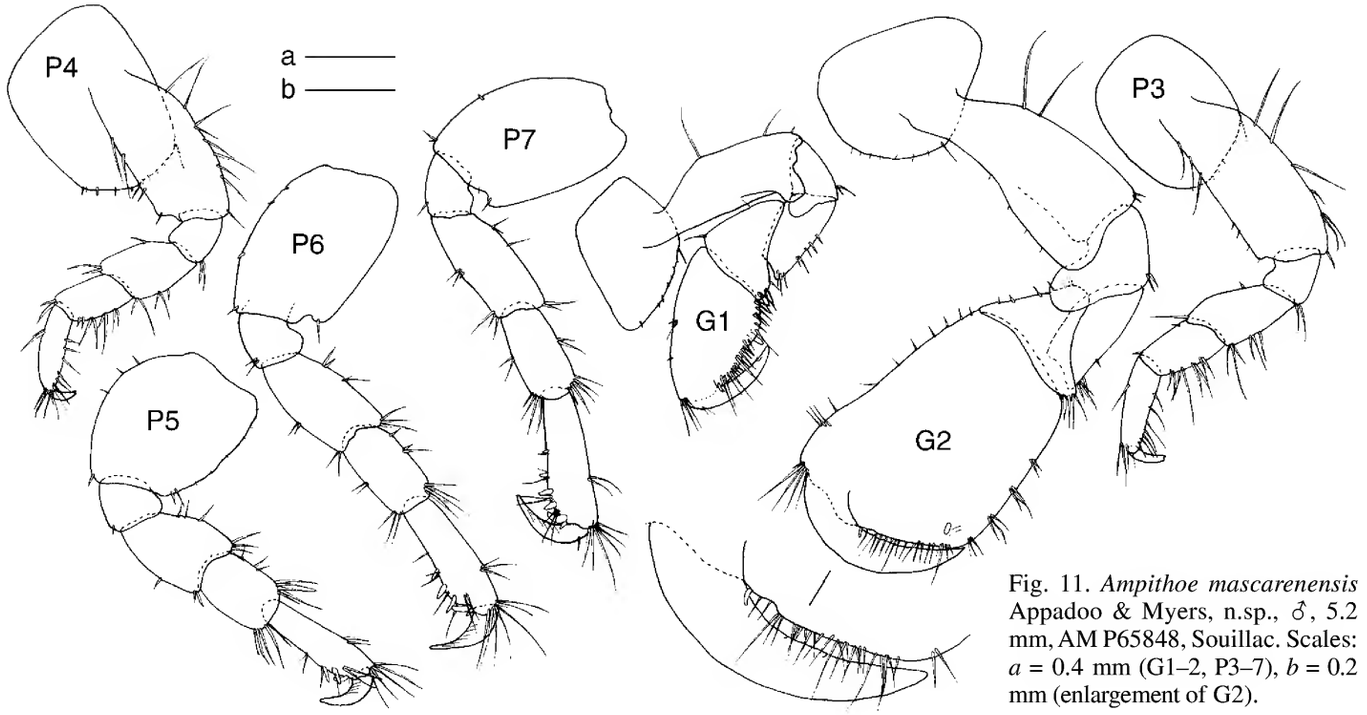
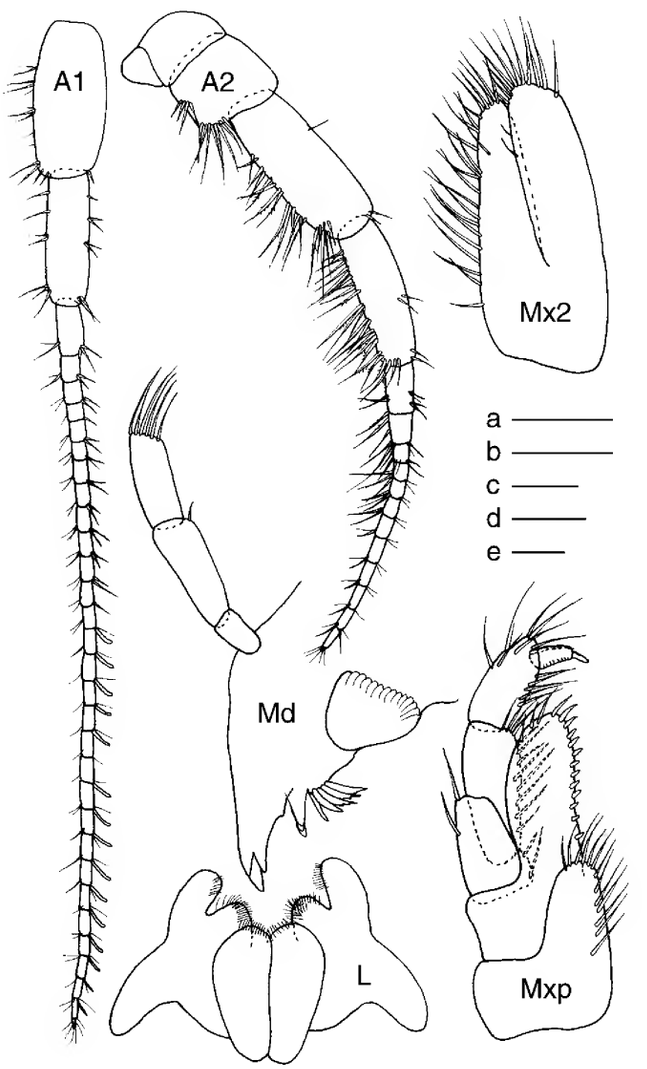


Fig. 11. *Ampithoe mascarenensis* Appadoo & Myers, n.sp., ♂, 5.2 mm, AM P65848, Souillac. Scales: *a* = 0.4 mm (G1–2, P3–7), *b* = 0.2 mm (enlargement of G2).

glomerata, AM P60613, Souillac, 4 August 1999; 3♂♂, 4♀♀, 4 juv., AM P60614, from *Digenia simplex*, *Padina* sp. and *Jania adherens*, Roches Noires (20°6.2'S 57°44.5'E), 6 August 1999; 2♂♂, 11♀♀, 2 juv., AM P60615, from *Digenia simplex, Padina* sp., *Jania adherens, Sargassum densifolium*, Roches Noires, 15 October 1999.

Description. Male, 5.2 mm. Head 1.2× as long as deep, disto-ventral margin weakly recessed; eyes of medium size with well-developed ommatidial ring surrounding a dark central core (reddish brown in alcohol). Antenna 1, 1.3× as long as antenna 2, peduncle articles 1 and 2 subequal; article 3, 0.4× article 1; primary flagellum 29-articulate and bearing aesthetacs. Antenna 2 robust, peduncle articles 4 and 5 posterior margins with groups of plumose setae, peduncle article 4, 2.4× as long as broad; article 5, 3.7× as long as broad, 0.9× length of article 4; flagellum 13-articulate, moderately setose. Mandible palp well developed, article 3, 0.7× article 1, with apical setae. Lower lip outer lobe strongly notched, mandibular lobes rounded. Maxilla 1 inner plate small, subtriangular. Maxilla 2 inner plate narrow, with setae at apex and on inner margin; outer plate broad with apico-medial setae. Maxilliped palp article 4 subquadrate with terminal nail. Gnathopod 1 coxa 0.8× as broad as deep, anterodistal margin weakly produced, rounded, distal margin with few very short setae; basis 3× as long as broad, anterodistal lobe well developed; carpus subtriangular, as long as broad; propodus 1.7× as long as broad, palm weakly sinuous with a large medial posterodistal robust seta; dactylus robust, inner margin toothed. Gnathopod 2 robust, coxa 1.2× as broad as deep, distal margin with a few short setae; basis 2.2× as long as broad with well-developed anterodistal lobe; carpus subtriangular, 0.7× as long as broad; propodus 1.3× s long as broad, slightly expanded at the anterodistal margin, anterior margin with short setae, posterior margin with few groups of setae, inner face with one robust seta palm with a small excavation close to base of dactylus, palm sub-straight,; dactylus robust reaching end of palm. Pereopods 3 and 4 similar; coxa subrectangular, 1.3× as long as broad, distal margin with very short setae;

Fig. 12. *Ampithoe mascarenensis* Appadoo & Myers, n.sp., ♂, 5.2 mm, AM P65848, Souillac. Scales: *a* = 0.4 mm (A1–2), *b* = 0.2 mm (L), c= 0.1 mm (Md, Mxp), *d* = 0.1 mm (Mx2).



basis slightly expanded, 2× as long as broad; merus 1.5× as long as broad; carpus and merus subequal; propodus 1.2× carpus. Pereopod 5 coxa as broad as deep, with small posterior lobe; basis expanded, about as broad as long, carpus subquadrate, subequal to merus; propodus 3.8× as long as broad, slightly expanded distally with 3 distal robust setae. Pereopods 6–7 similar, coxa broader than deep; basis slightly expanded, 1.4× as long as broad, posterior margin with a small excavation at the posterodistal corner; carpus subquadrate, 0.9× as long as merus; propodus 3.3× as long as broad, distally expanded, posterior distal margin with robust setae. Epimera 1–3 posterodistal margin rounded. Uropod 1 peduncle without interramal process, inner margin with robust setae, outer margin with fine slender setae; rami subequal and 0.6× length of peduncle. Uropod 2 rami subequal, 0.7× length of peduncle. Uropod 3 peduncle short, 1.2× as long as broad with few long slender seta on inner margin, with robust setae at the distal margin; outer ramus with a group of medial slender setae and 2 apical recurved robust setae; inner ramus 0.6× peduncle with apical slender and 5 robust setae. Telson subtriangular, distally rounded, telsonic cusps well developed, a few slender setae on medial face and lateral margins.

Female, 4.3 mm (ovigerous). Gnathopod 1 coxa 1.3× as long as broad, anterodistal margin weakly produced; basis 2.4× as long as broad, anterodistal lobe moderately developed; carpus subtriangular, 1.4× as long as broad; propodus 1.7× as long as broad, posterodistal margin with one robust seta, palm oblique; dactylus inner margin toothed. Gnathopod 2 coxa 1.4× as long as broad; basis 2.9× as long as broad, with well-developed anterodistal lobe; carpus 0.9× as long as broad; propodus 1.6× s long as broad, palm oblique with one robust seta at posterodistal corner; dactylus fitting palm, inner margin toothed.

Type locality. Souillac, Mauritius.

Distribution. Mauritius.

Habitat. This species was collected mostly amongst red algae at depths of less than 1 m. It occurred on sites that are exposed to heavy wave action (Souillac, Gris-Gris and Roches Noires).

Remarks. The presence of dense plumose setae on the peduncle of antennae 2 makes this species superficially similar to *Plumithoe hirsuta* (Ledoyer, 1978) and *Plumithoe plumicornis* (Ledoyer, 1979). It differs from both these species, however, by the absence of a peduncular process on uropod 1. *Ampithoe mascarenensis* n.sp. resembles *Ampithoe laxipodus* n.sp., by the subrectangular propodus in the male gnathopod 2 and the shape of the basis of pereopods 6 and 7. The two species differ in the antenna 2: *A. mascarenensis* has a densely setose antenna 2 as compared to a moderately setiferous one in *A. laxipodus*. The males of the two species also differ in the male gnathopod 1, in *A. laxipodus* the basis has groups of long setae and the propodus is globular as compared to a poorly setiferous basis and a slender propodus in *A. mascarenensis*. The male gnathopod 2 of the two species differ; *A. laxipodus* has a small medial subrectangular process on the palm, a feature not present in *A. mascarenensis*.

Etymology. Named after the Mascarene islands: Mauritius, Reunion and Rodrigues.

Ampithoe ramondi Audouin

Amphithoe ramondi Audouin, 1826: 93.—Krapp-Schickel, 1978: 1, figs. 1–2; 1982: 98, figs. 66–67.
Ampithoe ramondi.—J.L. Barnard, 1965: 25, figs. 15–16.—Myers, 1985a: 27, fig. 17.—Ledoyer, 1978: 221, fig. 9.—Appadoo & Steele, 1998: 639.

Material examined. 1 ♂, AC, from *Turbinaria ornata*, Ile D'Ambre (20°02.2'S 57°42.2'E), 12 November 1998; 1 ♂, AC, from *Padina* sp. and *Halimeda* sp., Grand Baie (20°0.5'S 57°34'E), 5 May 1999.

Diagnosis. Eyes large. Gnathopod 1 propodus subrectangular, 1.2× length of carpus, 2× as long as broad, palm short, posterodistal margin with 1 robust seta. Gnathopod 2 carpus subtriangular, as long as broad, anterior margin with a few robust setae; propodus 1.8× length of carpus, 1.5× as long as broad, anterior margin with groups of slender setae, posterior margin produced into a short thumb-like process, separated from the oblique palm by a wide round-bottomed excavation; dactylus relatively short and opposable to "thumb", inner margin strongly toothed. Uropod 3 peduncle 1.8× as long as broad. Telson subtriangular, apically convex telsonic cusps small.

Female not known.

Type locality. Egypt.

Distribution. As pointed out by Myers (1985a), the distribution of this species is not clear due to confusion with other species, but it is said to be cosmopolitan in tropical and warm temperate waters.

Habitat. This species was collected at depths of less than 1 m from brown algae. It was collected from two sites where there was suspended material in seawater (Grand Baie and Ile D'Ambre).

Remarks. The material from Mauritius most closely fits the description given by Myers (1985a) from Fiji and that of Ledoyer (1982) from Madagascar.

Key to male *Cymadusa* of Mauritius

1 Gnathopod 2 larger than gnathopod 1 in both sexes 2
—— Gnathopod 1 and 2 similar in size and form in both sexes ..... *Cymadusa mauritiensis*

2 Coxa 1–4 distal margin with one group of setae or without setae 3
—— Coxa 1–4 distal margin lined with dense slender setae, reaching up to half length of coxa ..... *Cymadusa filosa*

3 Gnathopod 1 carpus elongate, slightly less than three times as long as broad, palm with a deep triangular excavation. Gnathopod 2 propodus with a deep round-bottomed excavation; dactylus short, robust with a serrated rounded lobe at tip ..... *Cymadusa cavimana*
—— Gnathopod 1 carpus not elongate, palm without excavation. Gnathopod 2 palm with small subrectangular process and straight margin; dactylus medially expanded, distally tapered ..... *Cymadusa microphthalma*

Cymadusa brevidactyla is described and illustrated from Mauritius by Ledoyer (1978). It is not assignable to any of the species described herein from Mauritius, nor is it referable to *C. brevidactyla* (Chevreux, 1907: 417; 1908: 517, figs. 30–32). The very slender propodus of the male gnathopod 1, the setation of male gnathopod 2 (long setae on the coxae and on the anterior margin of the propodus), the shape of the palm and the long dactylus are all very different from those of *C. brevidactyla* (Chevreux).

Genus *Cymadusa* Savigny

For a diagnosis see Poore & Lowry, 1997.

Cymadusa cavimana (Sivaprakasam) n.comb.

Ampithoe cavimana Sivaprakasam 1970b: 65, fig. 1.—Ledoyer 1982: 116, fig. 37.—Appadoo & Steele, 1998: 639.

Material examined. 1♂, 5♀♀, 2 juv., AM P60625, 7♂♂, 10♀♀, 16 juv., AM P60626, from *Turbinaria ornata, Pocockiella variegata*, Balaclava (20°3.7'S 57°30.7'E), 10 September 1998; 3♂♂, 5♀♀, 12 juv., AM P60627, from *Halodule uninervis, Dictyota divaricata*, coral rubble, Albion (20°13'S 57°23.7'E), 22 October 1998; 2♂♂, 2♀♀, 14 juv., AM P60628, from *Padina* sp., *Dictyota divaricata, Gelidium* sp., Klondike (20°15.7'S 57°22'E), 9 November 1998; 4♂♂, 12♀♀, 4 juv., AM P60629, from *Amansia glomerata, Padina* sp. and *Sargassum* sp., Souillac, 8 April 1999; 1♂, 2♀♀, AM P60630, from *Padina* sp., *Ulva lactuca, Amphiroa* sp., Tamarin (20°19.5'S 57°22'E), 2 August 1999; 4♂♂, 6♀♀, 5 juv., AM P60631, from *Digenia simplex* and *Padina* sp., Roches Noires (20°6.2'S 57°44.5'E), 15 October 1999.

Diagnosis. Eyes medium in size with well-developed ommatidia. Antenna 1 accessory flagellum absent. Antenna 2 poorly setiferous, article 5, 0.8× article 4. Gnathopod 1 coxa 1.4× as broad as deep, anterodistal margin strongly produced and rounded; carpus elongate, 2.8× as long as broad weakly setiferous; propodus 0.75× length of carpus, palm oblique, with a deep, triangular excavation, posterodistal corner with 1 robust seta; dactylus overlapping palm, inner margin toothed. Gnathopod 2 coxa 1.5× as long as broad with a patch of slender setae at posterodistal corner; carpus subtriangular, as long as broad; propodus 1.7× as long as broad, palmar margin with a deep round-bottomed excavation, palmar margin with a few short slender setae; dactylus short, robust, inner margin with a rounded serrated lobe terminating in a tooth-like process. Epimera 2–3 with a small tooth at posterodistal corner. Uropod 1 peduncle distal margin with a well-developed acute interramal process. Uropod 3 peduncle with robust setae on distal margin. Telson subtriangular, distally truncate.

Female, Gnathopod 1 coxa 1.2× as long as broad, anterodistal margin moderately produced; carpus 1.9× as long as broad; propodus palm oblique. Gnathopod 2 propodus palm oblique evenly rounded; dactylus slightly overlapping palm.

Type locality. Gulf of Mannar, India.

Distribution. Madagascar, Mauritius, India.

Habitat. This species was collected at depths of less than 1 m. It occurred mostly on brown algae such as *Padina* sp. and *Pocockiella variegata*, together with coral rubble. It was abundant at sites such as Flic-en-Flac, Balaclava, Roches Noires, La Prairie, sites where coral rubble and brown algae are abundant.

Remarks. This species is here transferred from the genus *Ampithoe* Leach to the genus *Cymadusa* Savigny on the basis of the presence of a large acute distoventral interramal process on uropod 1 (see Poore & Lowry, 1997) and its large size.

Cymadusa cavimana from Mauritius agrees well with the description given by Sivaprakasam (1970b). This species is often confused with *Cymadusa brevidactyla*, but differs from that species in having an excavation in the male gnathopod 1 palm (smoothly convex in *C. brevidactyla*) and in lacking an accessory flagellum. The presence of only one patch of slender setae at the posterodistal margin of coxae 1–4 help to distinguish this species from *C. filosa* which has setae all along the distal margin of these coxae. The short dactylus on the male gnathopod 2 distinguishes males of this species from *Cymadusa microphthalma* (Chevreux).

Cymadusa filosa Savigny

Cymadusa filosa Savigny, 1816.—Krapp-Schickel, 1982: 106, figs. 71–72.—Ledoyer, 1982 (form of seagrasses): 135, fig. 45H.—Appadoo & Steele, 1998: 639.

Material examined. 14♂♂, 12♀♀, 7 juv., AM P60632, from *Padina* sp., La Cuvette (20°00'S 57°34.2'E), 14 May 1998; 8♂♂, 11♀♀, 6 juv., AM P60633, from *Enteromorpha* sp., *Sargassum* sp., *Hypnea*

sp., Tamarin (20°19.5'S 57°22'E), 11 October 1999; 8♂♂, 24♀♀, AM P60634, from *Padina* sp. Bain Boeuf, 13 December 1999; 7♂♂, 18♀♀, AM P60635, from *Halodule uninervis* and *Hypnea* sp., Flic-en-Flac (20°16.5'S 57°21.7'E), 27 January 2000.

Diagnosis. Antenna 1 accessory flagellum 2-articulate, article 2 small. Gnathopod 1 coxa distal margin lined along its whole length with slender plumose setae, 0.3× length of coxa; basis slender, 3.8× as long as broad, anterodistal lobe weakly developed, anterior margin with dense plumose setae; carpus elongate, 2.8× as long as broad; propodus, palm oblique. Gnathopod 2 coxa subquadrate, 1.3× as long as broad, distal margin lined with slender plumose setae 0.5× the length of coxa; basis 2.8× as long as broad, anterior margin with dense groups of long slender plumose setae; carpus subtriangular, subequal in length and breadth, anterior margin with dense groups of long slender plumose setae; propodus 1.6× as long as broad, anterior margin with dense groups of plumose setae; palm weakly excavate; dactylus robust, strongly curved and shorter than palm. Coxae 3–4 distal margin lined with long slender plumose setae. Epimera 1–3 produced into a small posterodistal tooth. Telson distally rounded, telsonic cusps present.

Female, antenna 2 similar to that of male but with groups of fine slender setae instead of dense plumose seta. Gnathopod 1 anterior margin of basis with few slender setae; carpus elongate, 1.8× as long as broad. Gnathopod 2, anterior margin of basis, carpus and propodus with few slender setae; propodus palmar margin weakly excavate.

Type locality. Egypt.

Distribution. Mediterranean, Madagascar, Mauritius.

Habitat. This is a very common and abundant species in the intertidal and shallow-subtidal zone and was collected from several sites at depths less than 1 m. It lives mostly amongst brown and green algae.

Remarks. Material from Mauritius agrees with the description given by Krapp-Schickel (1982) of material from the Mediterranean. It also closely resembles the *C. filosa* described by Ledoyer (1982) from seagrasses in Madagascar. Males and females of this species are distinguished from other species of *Cymadusa* from Mauritius by the presence of slender plumose setae along the entire distal margin of coxae 1–4.

Cymadusa microphthalma (Chevreux)

Grubia microphthalma Chevreux, 1901: 422, figs. 46–49.
Cymadusa microphthalma.—Appadoo & Steele, 1998: 639.

Material examined. 3♂♂, 3♀♀, 2 juv., AM P60636, from *Digenia simplex, Dictyota divaricata* and *Gracilaria salicornia*, Roches Noires (20°6.2'S 57°44.5'E), 9 April 1999; 6♂♂, 12♀♀, 16 juv., AM P60637, from *Digenia simplex, Padina* sp. and *Jania adherens*, Roches Noires, 6 August 1999; 1♂, 3♀♀, 3 juv., AM P60638, from *Sargassum* sp., *Amansia glomerata* and *Digenia simplex*, Souillac (20°31'S 57°30.7'E), 14 October 1999; 1♂, 6♀♀, 8 juv., AM P60639, from *Padina* sp. and *Digenia simplex*, Roches Noires, 24 January 2000.

Diagnosis. Antenna 1 accessory flagellum 2-articulate, article 2 rudimentary. Coxae 1–4 distal margin with very short setae. Gnathopod 1 propodus palm oblique. Gnathopod 2 carpus subtriangular; propodus 2.5× length of carpus, palm with a small excavation near base of dactylus followed by a subrectangular process and a straight margin, palm with short slender setae; dactylus robust, medially expanded. Telson distally truncate.

A full description is given for this species as there is some confusion about synonymies of the species in literature, see remarks.

Description. Male, 9 mm. Head about as long as deep, distoventral margin excavate; eyes large with well-developed pale yellow ommatidia (in alcohol). Antenna 1 peduncle article 2, subequal with article 1; article 3, 0.25× article 1; accessory flagellum 2-articulate, article 2 rudimentary; primary flagellum 41-articulate. Antenna 2 poorly setiferous, peduncle article 5, 0.9× article 4; flagellum 23-articulate. Mandible palp well developed, article 3, 2.1×article 1, with apico-medial setae. Lower lip outer lobe broad, moderately notched, without robust setae; mandibular lobe rounded. Maxilla 1 inner plate subovate with few medial slender setae. Maxilla 2 inner plate narrow. Maxilliped palp article 3 slightly expanded distally; article 4 slender, conical and terminating in a nail. Gnathopod 1 coxa subovate, about as long as broad, anterodistally moderately expanded, distal margin with very short setae; basis 2.5× as long as broad, anterodistal lobe weak; carpus elongate, 1.8× as long as broad; propodus subequal to carpus, 1.8× as long as broad, palm oblique with 1 robust seta at posterodistal margin; dactylus fitting palm. inner margin toothed. Gnathopod 2 coxa subrectangular, 1.3× as long as broad, distal margin with minute setae; basis with small rounded anterodistal lobe, 2.3× as long as broad; carpus subtriangular, 0.8× as long as broad; propodus 2.5× length of carpus, palm with a small excavation near base of dactylus followed by a subrectangular process and a straight margin, palm with short slender setae; dactylus robust, medially expanded, inner margin teeth poorly defined. Pereopods 3–4, coxa subrectangular, 1.4× s long as broad, posterodistal margin with 1 group of slender setae; basis weakly expanded, 2.8× as long as broad; merus 1.8× as long as broad, anterior margin weakly expanded; carpus elongate, 2.3× as long as broad, 0.8× length of merus; propodus subequal to carpus, with groups of slender setae on posterior margin. Pereopod 5 coxa with moderate posterior lobe; basis expanded, length subequal with breadth; carpus 0.9× merus; propodus 1.4× carpus, posterior margin with slender and straight robust setae. Pereopod 6 basis subrectangular 1.5× as long as broad, anterior and posterior margins with a few robust setae; merus elongate, 2.4× as long as broad; carpus 2.6× as long as broad, 0.9× length of merus; propodus slender, 5× as long as broad, 1.4× length of carpus, posterior margin with groups of slender setae, anterior margin with slender setae and straight robust setae. Pereopod 7 similar to pereopod 6 but basis 1.6× as long as broad. Epimera 1–3 posterodistal margin rounded. Uropod 1 peduncle 2.8× as long as broad, outer margin with short fine setae, inner margin lined with robust setae, distal margin produced into an acute interramal process; outer ramus 0.8× inner ramus, both rami with numerous robust setae. Uropod 2 peduncle 2.8× as long as broad, distal margin with a small triangular interramal process; outer ramus 0.9× inner ramus, both rami with numerous robust setae. Uropod 3 peduncle 1.8× as long as broad, distal margin with robust setae; inner ramus with slender and robust setae at apex, outer ramus with a group of medial slender setae and 1 robust seta, two recurved apical

robust setae. Telson distally truncate, with two groups of medial long slender setae.

Female, 10.3 mm (ovigerous). Gnathopod 1 coxa 1.3× as long as broad, anterodistal margin strongly produced, rounded, posterodistal margin with one group of slender setae, setae 0.3× length of coxa; basis 2.7× as long as broad, anterodistal lobe weak; carpus elongate, 1.6× as long as broad; propodus 1.2× length of carpus, 2× as long as broad, palm oblique with groups of slender setae and 1 robust seta at posterodistal margin; dactylus inner margin toothed. Gnathopod 2 coxa 1.5× as long as broad, posterodistal margin with 1 group of slender setae, setae 0.2× length of coxa; basis 2.6× as long as broad, anterodistal lobe weak; carpus cup-shaped, 0.9× as long as broad; propodus 1.7× length of carpus, palm oblique, weakly excavate with groups of slender setae, posterodistal corner with 1 robust seta; dactylus inner margin toothed.

Variation. Young males (5–6 mm): in gnathopod 2 the distal margin of the coxa has a group of slender setae, the propodus palm is barely excavate with fine slender setae and 1 robust seta on the inner face and the inner margin of the dactylus is strongly toothed. Young males (7.8 mm): the posterodistal corner of the coxa has fewer setae, the propodus lacks robust setae on the inner face, the palm is weakly crenate and the dactylus is strongly toothed.

Type locality. Seychelles.

Distribution. Seychelles, Mauritius.

Habitat. This species lives mostly amongst the brown algae, *Sargassum* sp. and *Padina* sp., and red algae. It was collected at depths of less than 1 m from several sites on the north, east and south coasts. It was common at Roches Noires on the east coast and Bain Boeuf on the north coast.

Remarks. This species resembles the species described by Ledoyer (1982) from Madagascar under the name *Cymadusa filosa* form "B". It differs from that species, however, in the male gnathopod 2 propodus palm, which is sinuous in present material but evenly convex in Ledoyer's species and in the dactylus, which is medially expanded and short, fitting the palm, in the present material, but elongate, slender and strongly overlapping the palm in Ledoyer's species. A comparison of the present material with *Grubia microphthalma* Chevreux (1901) is hampered by the fact that only a female was available to that author for the original description. Since the present material agrees well with the description of *G. microphthalma,* in all except secondary sexual male characters and since the type locality for this species is the Seychelles it seems reasonable, at least for the moment, to assign the present material to *Cymadusa microphthalma* (Chevreux).

It is doubtful whether the species described under the name *Cymadusa microphthalma* by Sivaprakasam (1970a: 573, fig. 12) belongs in this species.

Cymadusa microphthalma is distinguished from all other *Cymadusa* from Mauritius except *C. cavimana*, by having only one patch of setae on the distal margin of coxae 1–4. It can be distinguished from *C. cavimana* by the shape of the propodus of the hyperadult male gnathopod 2, which has a small process and by the length of the dactylus which reaches the end of the palmar margin.

Genus *Exampithoe* K.H. Barnard

For a diagnosis see Poore & Lowry, 1997.

Exampithoe (Melanesius) latibasis n.sp.

Figs. 13–15

Perampithoe falsa.—Appadoo & Steele, 1998: 639; non K.H. Barnard, 1932.

Type material. HOLOTYPE ♂, 3.3 mm, AM P65850, from *Padina gymnospora* and coral rubble, La Prairie (20°29'S 57°20.5'E), at depth less than 1 m, C. Appadoo, 14 October 1999. PARATYPES, 1♀, 3.3 mm, AM P64452, same data as holotype; 1♂, 3.3 mm, AM P64453, from *Sargassum* sp., Roches Noires (20°6.2'S 57°44.5'E), 20 January 1999; 1♂, AM P60640, 3♂♂ and 2♀♀, AM P60641, from *Sargassum* sp., *Gelidiella acerosa* and *Ulva reticulata*, Souillac (20°31'S 57°30.7'E), 14 December 1999; 2♂♂, AM P60642, from *Amansia glomerata* and *Padina* sp.; 1♂, 9♀♀, 1 juv., AM P60643, from *Sargassum* sp., Souillac (20°31'S 57°30.7'E), 8 April 1999; 3♂♂, 6♀♀, AM P60644, from *Sargassum* sp., La Cuvette (20°00'S 57°34.2'E), 12 October 1999; 1♀, AM P60645, from *Sargassum densifolium, Amansia glomerata, Jania adherens*, Souillac, 14 October 1999.

Description. Male, 3.3 mm. Head longer than deep, distoventral corner excavate; eyes small, round, pink (in alcohol). Antenna 1 article 2, 0.7× article 1; article 3, 0.25× article 1; accessory flagellum absent; primary flagellum 32-articulate and bearing aesthetacs. Antenna 2 peduncle article 5, 0.9× article 4, flagellum poorly setiferous and 21-articulate. Mandible palp absent. Lower lip outer lobe wide, mandibular lobe rounded. Maxilla 1 inner plate small and triangular, with one seta. Maxilla 2 inner and outer plates narrow with long slender terminal setae. Maxilliped palp article 2 broad, unguis minutely serrate; article 4 small. Gnathopod 1 slightly larger than gnathopod 2; coxa 1.2× as logs as broad, anterodistal margin rounded, unproduced; basis 2.5× as long as broad, anterodistal lobe well developed, with one seta; carpus 1.5× as long as broad; propodus 2.1×as long as broad, palm small and transverse with one robust setae at base, followed by an excavation and a large robust seta; dactylus strongly overlapping palm, 1.6× the length of palm, inner margin smooth with few short fine setae. Gnathopod 2 coxa subquadrate, posterodistal margin with a few slender setae; basis 3× as long as broad, anterodistal lobe moderately developed; carpus slender, 2.2× as long as broad; propodus subrectangular, 2.5× as long as broad, palm transverse with one robust seta at its base; dactylus strongly overlapping palm, inner margin smooth. Pereopods 3–4 coxa subquadrate, with few slender setae on posterodistal margin; basis strongly expanded, 2× as long as broad; merus 1.5× as long as broad, anterior margin strongly expanded; carpus 1.7× as long as broad; propodus 1.2× as long as carpus. Pereopod 5 basis weakly expanded, 1.7× as long as broad; carpus 0.8× merus, subrectangular, 1.7× as long as broad; propodus slightly expanded distally, 4× as long as broad, with three robust setae on palm, one of which is curved. Pereopods 6–7, basis weakly expanded, 1.7× as long as broad; carpus subrectangular, 0.8× merus, 2.3× as long as broad; propodus slightly expanded distally, 3.5× as long as broad, with three

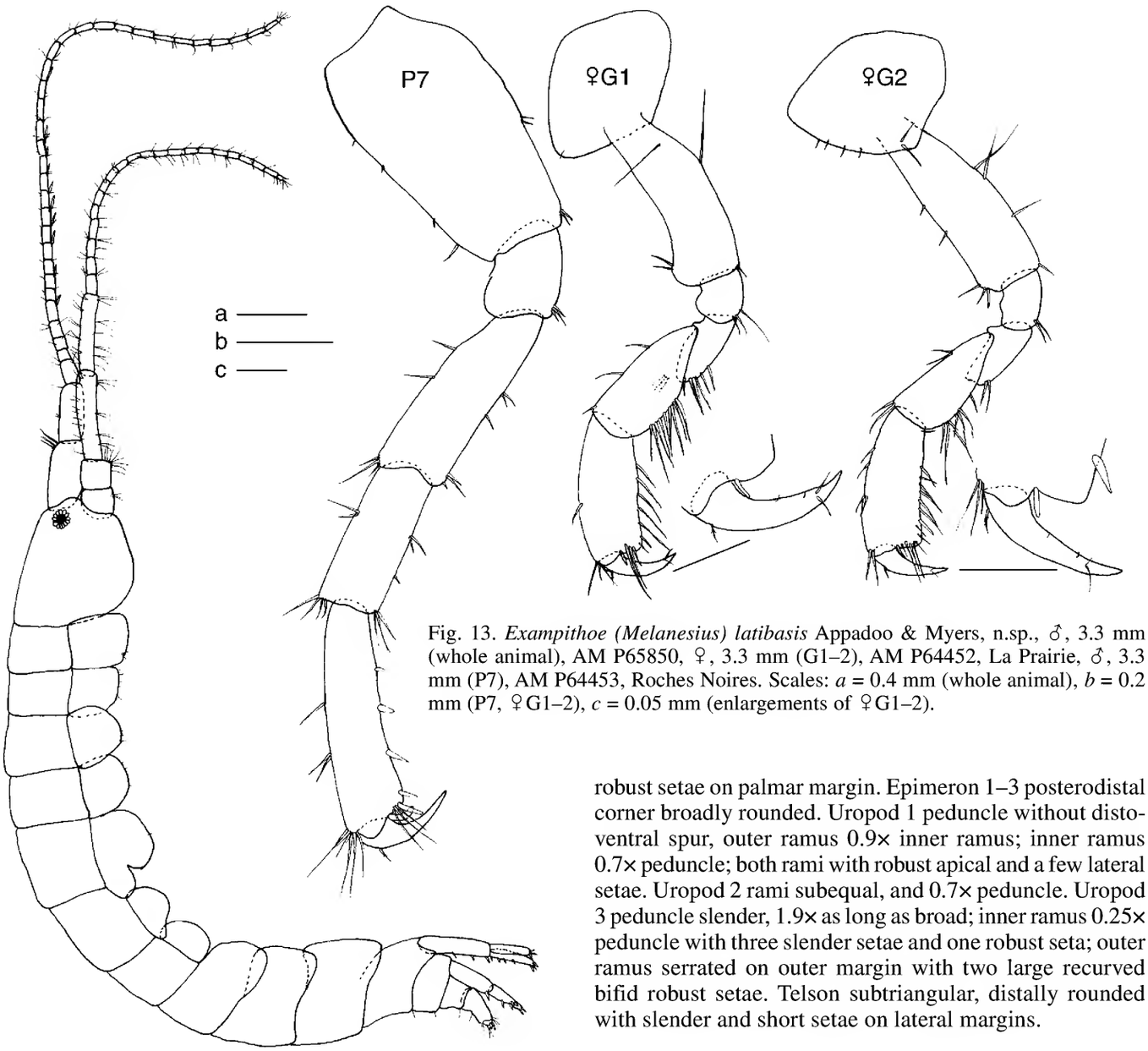
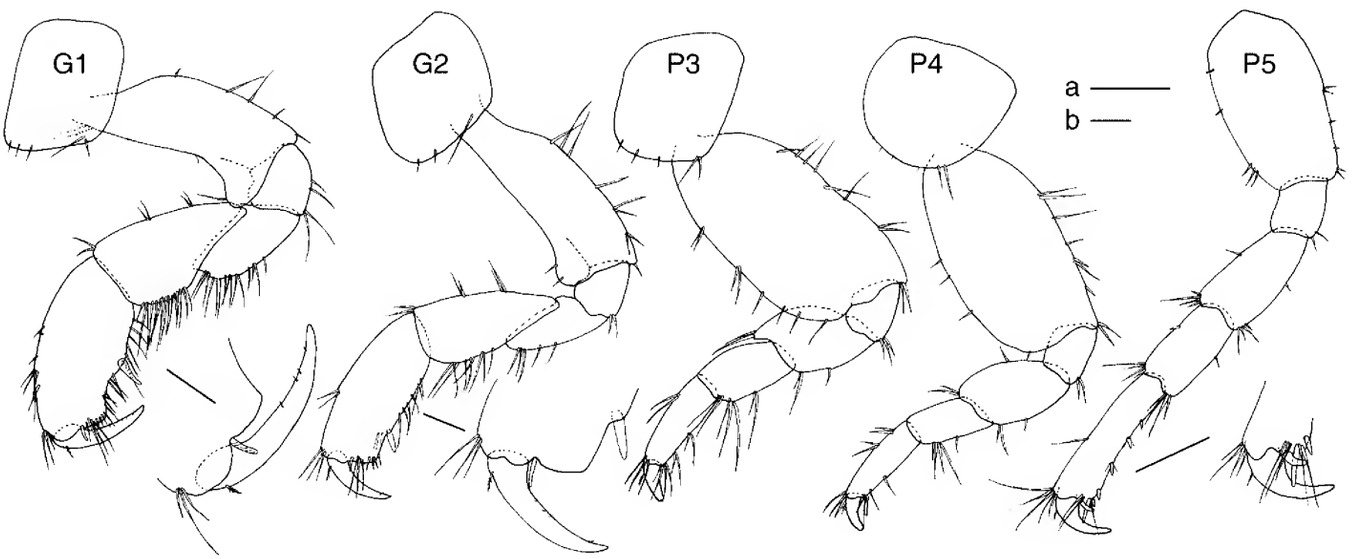


Fig. 13. *Exampithoe (Melanesius) latibasis* Appadoo & Myers, n.sp., ♂, 3.3 mm (whole animal), AM P65850, ♀, 3.3 mm (G1–2), AM P64452, La Prairie, ♂, 3.3 mm (P7), AM P64453, Roches Noires. Scales: *a* = 0.4 mm (whole animal), *b* = 0.2 mm (P7, ♀G1–2), *c* = 0.05 mm (enlargements of ♀G1–2).

robust setae on palmar margin. Epimeron 1–3 posterodistal corner broadly rounded. Uropod 1 peduncle without disto-ventral spur, outer ramus 0.9× inner ramus; inner ramus 0.7× peduncle; both rami with robust apical and a few lateral setae. Uropod 2 rami subequal, and 0.7× peduncle. Uropod 3 peduncle slender, 1.9× as long as broad; inner ramus 0.25× peduncle with three slender setae and one robust seta; outer ramus serrated on outer margin with two large recurved bifid robust setae. Telson subtriangular, distally rounded with slender and short setae on lateral margins.

Fig. 14. *Exampithoe (Melanesius) latibasis* Appadoo & Myers, n.sp., ♂ (G1–2, P3–4), 3.3 mm, AM P65850, La Prairie, ♂, 3.3 mm (P5, D5), AM P64453, Roches Noires. Scales: *a* = 0.2 mm (G1–2, P3–4; P5), *b* = 0.05 mm (enlargements of G1–2, D5).



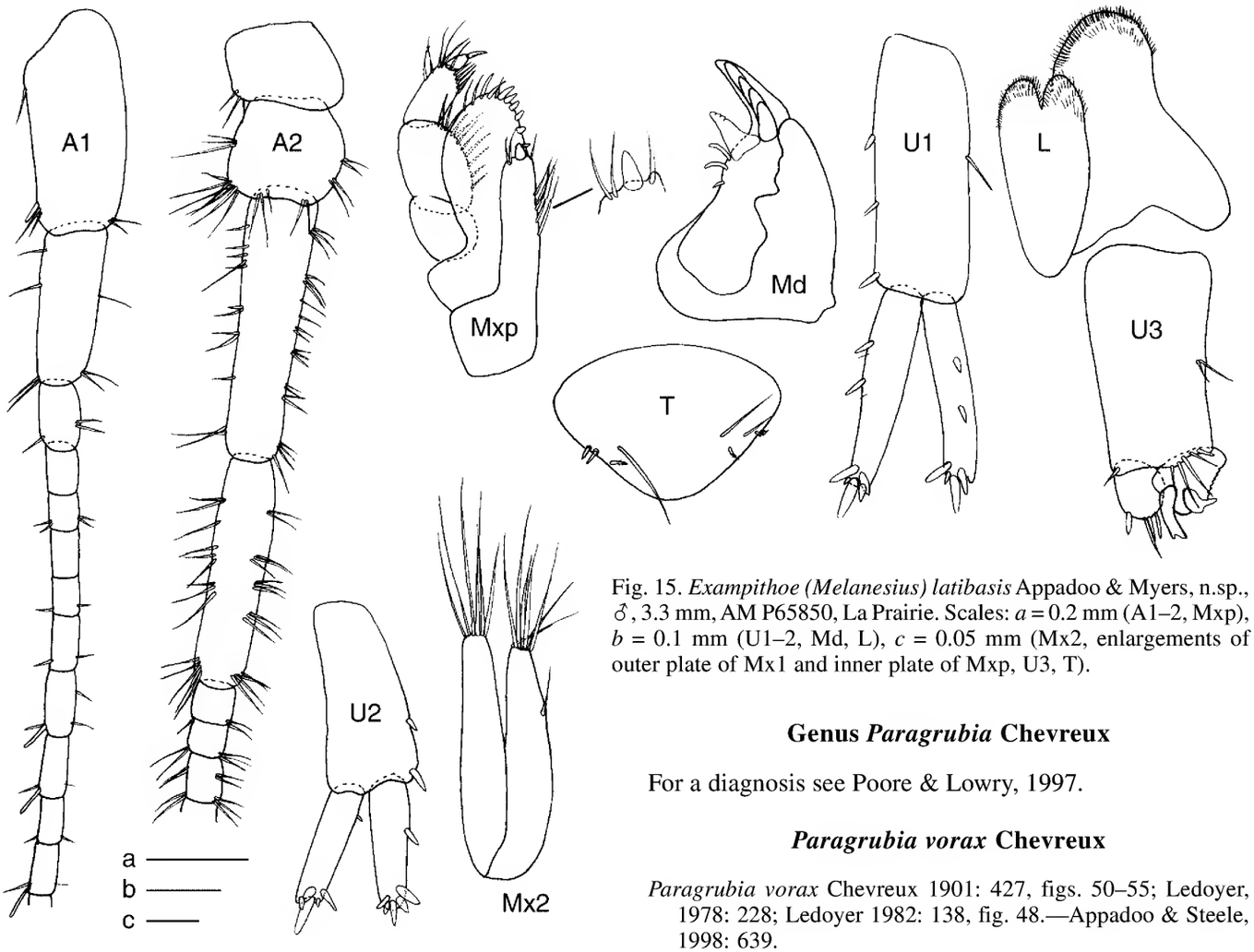


Fig. 15. *Exampithoe (Melanesius) latibasis* Appadoo & Myers, n.sp., ♂, 3.3 mm, AM P65850, La Prairie. Scales: *a* = 0.2 mm (A1–2, Mxp), *b* = 0.1 mm (U1–2, Md, L), *c* = 0.05 mm (Mx2, enlargements of outer plate of Mx1 and inner plate of Mxp, U3, T).

Female: 3.3 mm (ovigerous). Gnathopod 1 similar in size to gnathopod 2; coxa subquadrate; basis 3× as long as broad, with weakly developed anterodistal lobe; carpus 2.4× as long as wide; propodus subrectangular, 2.3× as long as wide, palmar margin small and transverse, dactylus strongly overlapping palm. Gnathopod 2 coxa subquadrate; basis 3× as long as broad; carpus 2.4× as long as broad; propodus subrectangular, 2.5× as long as broad, palm small; dactylus overlapping palm, 1.6× its length, inner margin smooth.

Distribution. Mauritius.

Habitat. This species lives mostly amongst the brown alga *Sargassum* sp. It was collected at depths of less than 1 m from four sites, Souillac, La Prairie, La Cuvette and Roches Noires.

Remarks. *Exampithoe (Melanesius) latibasis* n.sp. differs from *E. (M.) cooki* Ledoyer (1984) in having the male gnathopod 1 with a slender propodus with a short palm, followed by an excavation on the posterodistal margin. In *E. cooki*, the propodus is subovate and the posterodistal margin almost straight. The shape of the male gnathopod 1 propodus also distinguishes it from *E. (M.) kutti* Poore & Lowry (1997), where the palmar margin is convex in both males and females.

Etymology. From the Latin *latus* meaning wide and referring to the expanded flattened bases of pereopods 3–4.

Genus *Paragrubia* Chevreux

For a diagnosis see Poore & Lowry, 1997.

Paragrubia vorax Chevreux

Paragrubia vorax Chevreux 1901: 427, figs. 50–55; Ledoyer, 1978: 228; Ledoyer 1982: 138, fig. 48.—Appadoo & Steele, 1998: 639.

Material examined. 1♂, 1♀, 1 juv., AM P60646, from *Digenia simplex*, Albion (20°13'S 57°23.7'E), 22 October 1998; 2♂♂, 5♀♀, 4 juv., AM P60647, from *Pocockiella variegata, Padina* sp. and coral rubble, Flic-en-Flac (20°16.5'S 57°21.7'E), 5 April 1999; 3♂♂, 4♀♀, 4 juv., AM P60648, from *Turbinaria ornata* and *Pocockiella variegata*, Flic-en-Flac, 27 January 2000.

Diagnosis. Antenna 1 accessory flagellum 6-articulate. Coxae 1–4 with one patch of setae on distal margin. Gnathopod 1 larger and more robust than gnathopod 2; propodus 1.3× as long as broad, palmar margin with a deep excavation. Gnathopod 2, propodus 1.9× as long as broad, palm oblique. Uropod 1 with large acute disto-ventral spur. Uropod 3 outer ramus with one straight and one weakly curved seta at distal end. Telson distally truncate, with well-developed patches of slender setae.

Type locality. Seychelles.

Distribution. Madagascar, Mauritius, Seychelles.

Habitat. This species lives mostly amongst red and brown algae and was collected at depths of less than 1 m. It was collected mostly from sites on the west and northwest coasts such as Flic-en-Flac, Albion, and Balaclava.

Remarks. The fact that *Paragrubia vorax* is readily distinguished from other ampithoids by the strongly enlarged gnathopod 1 in males has led to the species being recorded from many parts of the Indo-Pacific. It is probable that more than one species exists in the *Paragrubia vorax*

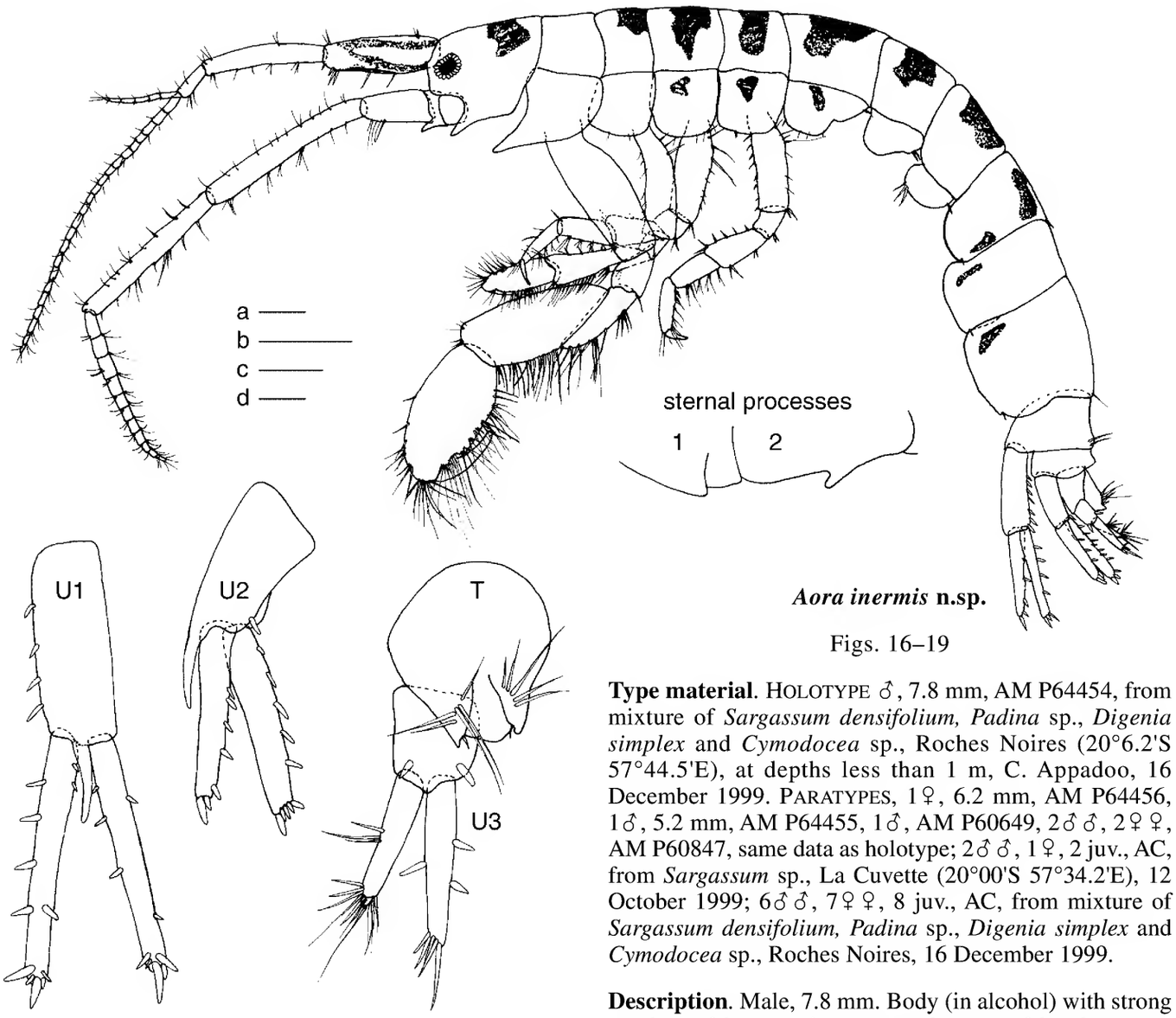


Fig. 16. *Aora inermis* Appadoo & Myers, n.sp., ♂, 7.8 mm, AM P64454, Roches Noires. Scales: *a* = 0.4 mm (whole animal), *b* = 0.4 mm (sternal processes), *c* = 0.2 mm (U1–2), *d* = 0.1 mm (U3, T).

complex. The material from Mauritius agrees with the description given by Chevreux (1901) from Seychelles (type locality) and also with that of Ledoyer (1982) in having a strongly excavate palm on the male gnathopod 1 propodus. Material described by J.L. Barnard (1970) from Hawaii and by Myers (1985a) from Fiji has a weakly excavate palm on the male gnathopod 1 and should probably be raised to the status of a new species.

Family Aoridae

Corophioidean amphipods with fleshy telson and glandular pereopods 3–5. Male gnathopod 1 larger than gnathopod 2. Uropod 3 much shorter than uropods 1–2 and rami with simple terminal spines.

Genus *Aora* Kroyer

For a diagnosis see Myers, 1988a.

***Aora inermis* n.sp.**

Figs. 16–19

Type material. HOLOTYPE ♂, 7.8 mm, AM P64454, from mixture of *Sargassum densifolium, Padina* sp., *Digenia simplex* and *Cymodocea* sp., Roches Noires (20°6.2'S 57°44.5'E), at depths less than 1 m, C. Appadoo, 16 December 1999. PARATYPES, 1♀, 6.2 mm, AM P64456, 1♂, 5.2 mm, AM P64455, 1♂, AM P60649, 2♂♂, 2♀♀, AM P60847, same data as holotype; 2♂♂, 1♀, 2 juv., AC, from *Sargassum* sp., La Cuvette (20°00'S 57°34.2'E), 12 October 1999; 6♂♂, 7♀♀, 8 juv., AC, from mixture of *Sargassum densifolium, Padina* sp., *Digenia simplex* and *Cymodocea* sp., Roches Noires, 16 December 1999.

Description. Male, 7.8 mm. Body (in alcohol) with strong patches of brown pigment on dorsum of head, pereon segments 2 to 7 and smaller patches of pigment on coxae 3–5 and pleonites 1–3. The dorsal surface of urosomite 1 bears a pair of slender setae. Sternal plate 1 has a transverse fold and sternal plate 2 has a well-developed forward facing process. Head anteroventral margin strongly produced; eyes subovate, with well-developed ring of ommatidia surrounding a dark core. Mandible palp articles in the ratios 7:11:20; article 2 distal end weakly expanded, with setae on inner margin; article 3 posterior margin straight, and setiferous, marginal setae of two distinct lengths. Labium outer plate distal margin with 8 to 12 robust setae. Maxilla 1 palp article 2 with 8 distal robust setae. Antenna 1 peduncle article 1 with a few robust setae on ventral margin; article 1 subequal to 2; article 3, 0.3× article 1; accessory flagellum 6-articulate, terminal article rudimentary; primary flagellum weakly setiferous and with 23-articles, aesthetacs present on articles 18 to 22. Antenna 2 robust and elongate, flagellum 11-articulate with small groups of setae. Male gnathopod 1 coxa strongly produced anterodistally, posteroproximal margin rounded; basis slender, anterior and posterior margin weakly convex; merus slender, 4× as long as broad and tapering distally; carpus elongate, 2.5× as long as broad, ventral margin with strong groups of setae; propodus subequal to length of carpus, anterior margin with

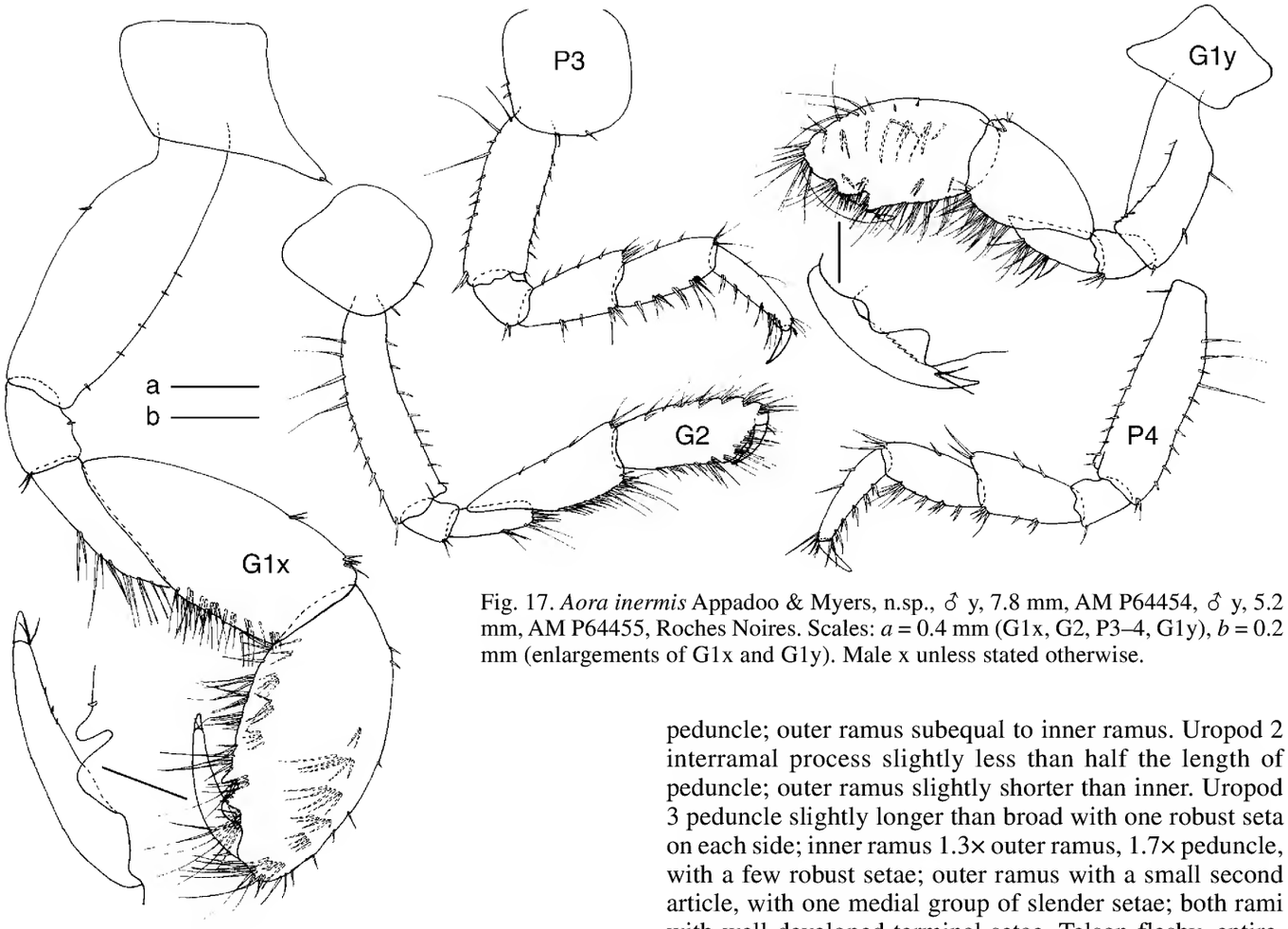


Fig. 17. *Aora inermis* Appadoo & Myers, n.sp., ♂ y, 7.8 mm, AM P64454, ♂ y, 5.2 mm, AM P64455, Roches Noires. Scales: *a* = 0.4 mm (G1x, G2, P3–4, G1y), *b* = 0.2 mm (enlargements of G1x and G1y). Male x unless stated otherwise.

groups of setae, posterior margin with strong groups of setae about two-third its length, palm slightly convex close to base of dactylus followed by a deep subquadrate excavation, with a defining tooth with round tip, palmar margin with dense groups of setae; dactylus elongate, greatly overlapping the short palm, inner margin with teeth small or obsolete. Gnathopod 2 coxa subquadrate, distal margin convex; basis slender nearly 4× as long as broad, anterior and posterior margins with short setae at regular intervals, posteroproximal margin with a few long setae; carpus elongate, over 3× as long as broad, posterior margin with dense short setae, anterior margin with a few setae; propodus slender, 2.5× as long as broad and slightly shorter than carpus, propodus anterior and posterior margin with groups of setae; dactylus fitting palm, inner margin with teeth. Pereopods 3–4 coxa subquadrate basis anterior margin and posterior margins with short setae, posteroproximal margin with a long slender setae; dactylus 0.4× propodus. Pereopods 5–7 missing. Pereopods 5 and 6 are described from smaller male of 5.2 mm: Pereopod 5 basis 1.6 times as long as broad, anterior margin with robust setae, anterodistal end with a group of slender setae, posterior margin with short setae, posterodistal end sinuous with one deep and one shallow excavation; merus distal end expanded and produced into rounded lobes; propodus slender, distal end with robust setae, dactylus 0.25× length of propodus. Pereopod 6 basis subquadrate, anterior margin with robust setae, posterior margin with short setae; propodus 1.8× carpus; dactylus 0.4× propodus. Epimera 1–3 posterodistal margins notched, with a short seta at notch. Uropod 1 peduncle and rami with robust setae. Uropod 1 interramal process 0.4× length of peduncle; outer ramus subequal to inner ramus. Uropod 2 interramal process slightly less than half the length of peduncle; outer ramus slightly shorter than inner. Uropod 3 peduncle slightly longer than broad with one robust seta on each side; inner ramus 1.3× outer ramus, 1.7× peduncle, with a few robust setae; outer ramus with a small second article, with one medial group of slender setae; both rami with well-developed terminal setae. Telson fleshy, entire, with 5 long slender setae on each side and a short seta on posterodistal margin.

Female, 6.2 mm, ovigerous. Antenna 1 slender; article 2, 1.2× article 1; article 3, 0.3× article 1; peduncular articles moderately setiferous; accessory flagellum long, 9 articulate, terminal article small; primary flagellum 24-articulate. Antenna 2 moderately setose, article 5, 1.1 times article 4; flagellum 8-articulate with a few robust setae. Gnathopod 1 coxa subquadrate, anteroventral margin rounded; basis robust, twice as long as broad; merus subquadrate, ventral margin with strong groups of setae; carpus 1.4× as long as broad; propodus 1.8× carpus, ventral margins with strong groups of setae, palmar margin straight anteriorly followed by a shallow semi-elliptical excavation and a poorly defined blunt tooth; dactylus slightly longer than palm, inner margin toothed. Female gnathopod 2 basis similar to that of male but less elongate; propodus subequal to carpus. Pereopod 5 basis anterior margin straight, anterior margin with robust setae, posterior margin with short setae. Pereopod 6 similar to that of male except merus, carpus and propodus with very long slender setae.

Variation. In younger males, one can observe the different degree of elongation of the anteroventral margin of coxa 1. In these males, the carpus of the gnathopod 1 is not very long and the propodus is about 1.4× the length of carpus (e.g., in male of 5.2 mm). The excavation in the palmar margins of gnathopod 1 is shallower, the dactylus only slightly overlaps the palm and the inner margin is strongly toothed. The posterior margin of the basis of pereopod 5 shows intermediate stages of excavation.

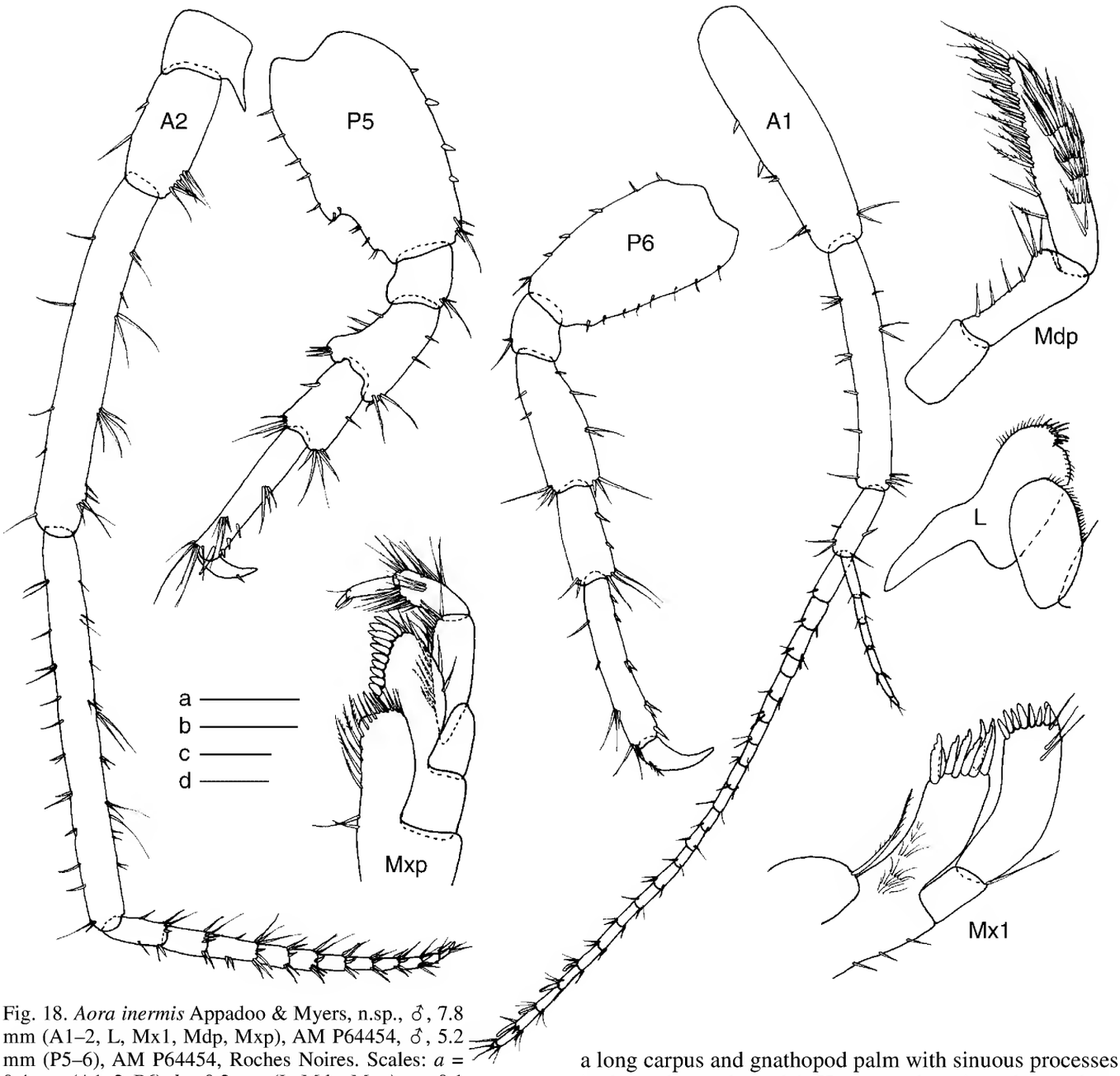


Fig. 18. *Aora inermis* Appadoo & Myers, n.sp., ♂, 7.8 mm (A1–2, L, Mx1, Mdp, Mxp), AM P64454, ♂, 5.2 mm (P5–6), AM P64454, Roches Noires. Scales: *a* = 0.4 mm (A1–2, P6), *b* = 0.2 mm (L, Mdp, Mxp), *c* = 0.1 mm (Mx1), *d* = 0.2 mm (P5).

Distribution. Mauritius.

Habitat. *Aora inermis* was collected at depths of less than 1 m from a sheltered site on the north coast and a wave-exposed site on the east coast of the island. This species lived mostly among *Sargassum* sp.

Remarks. *Aora inermis* n.sp. superficially resembles *Aora gracilis* (Bate, 1857) as figured and described by Myers (1982: 113, fig. 74), in having an excavation on the posterodistal margin of one of the pereopods of the male. However, in the present species, the excavation is on pereopod 5 whereas in *Aora gracilis* it is on pereopod 6. Another striking difference between the two species is the very long merus in the male gnathopod 1 of *Aora gracilis* compared to the short merus in *Aora inermis*.

Aora inermis resembles *?Aorcho curvipalma* of Ledoyer (1978) described from a single male (size 5 mm) by having a long carpus and gnathopod palm with sinuous processes in the male gnathopod 1. However, there is no long robust seta on the palmar margin in either large or younger males of *A. inermis* as illustrated for *Aorcho curvipalma* Ledoyer (1978: fig. 22, in part). Other differences include the convex male gnathopod 2 palmar margin (palm excavate in *A. curvipalma*), more robust basis in pereopod 5 and pereopod 6, the presence of a well-developed interramal process in uropod 1 (absent in *A. curvipalma*), the presence of dense groups of setae on the telson in *Aora inermis* (few setae in *Aorcho curvipalma*).

In lacking a produced, distally free merus on male gnathopod 1, this species differs from all other described species of *Aora*. However, it agrees with the diagnosis of *Aora* in all other respects and the diagnosis of *Aora* should be modified to accommodate this new species. *Aora inermis* differs from described species of *Bemlos* in its acute coxa 1.

Etymology. The species is named from the Latin *inermis* meaning unarmed as the male gnathopod 1 merus is not strongly produced.

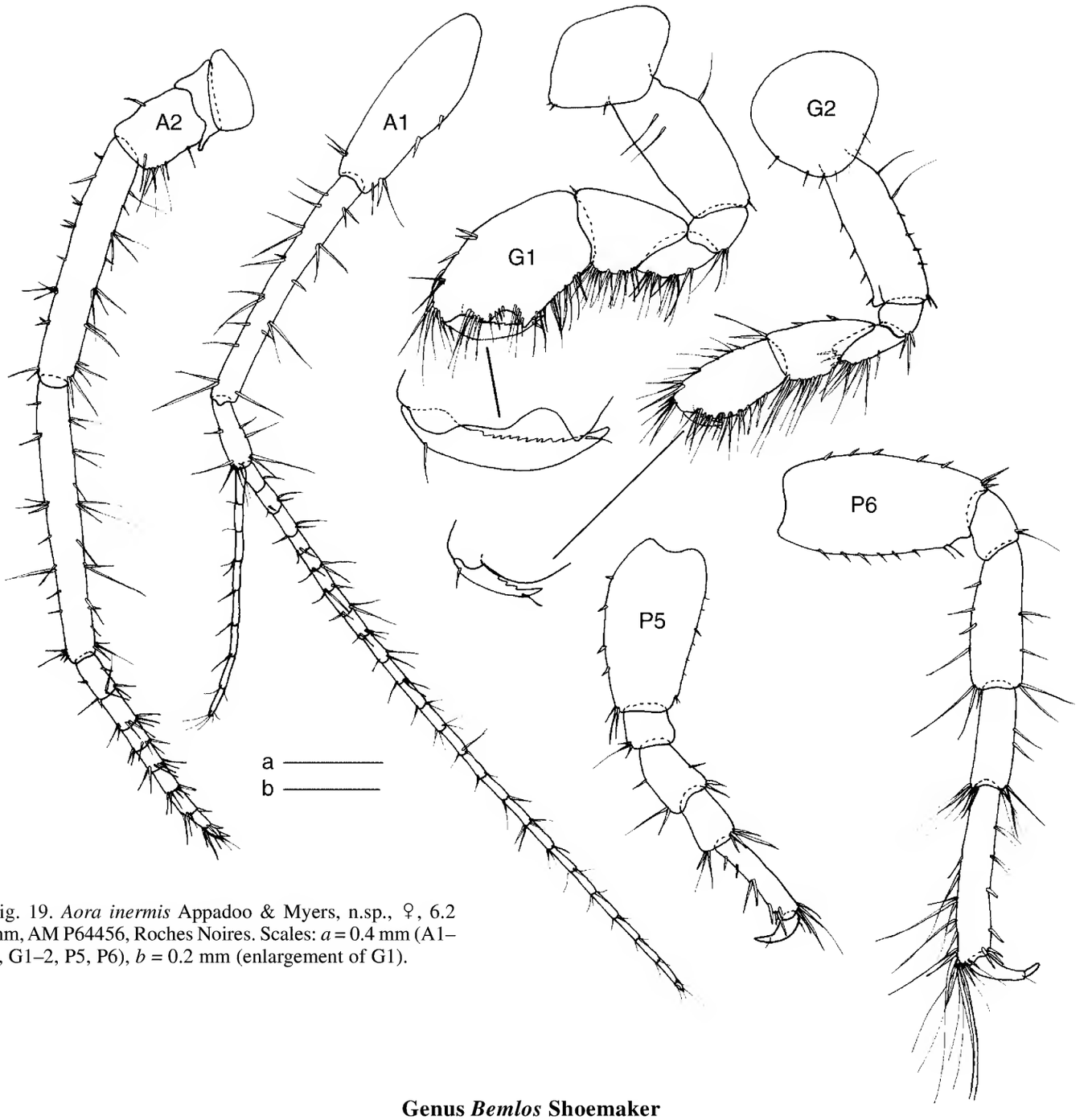


Fig. 19. *Aora inermis* Appadoo & Myers, n.sp., ♀, 6.2 mm, AM P64456, Roches Noires. Scales: *a* = 0.4 mm (A1–2, G1–2, P5, P6), *b* = 0.2 mm (enlargement of G1).

Genus *Bemlos* Shoemaker

For a diagnosis see Myers, 1988a.

Key to male *Bemlos* of Mauritius

1 Gnathopod 1 basis slender, four times as long as broad, propodus elongate, two and half times as long as broad, anterior margin substraight ..... *Bemlos teleporus*

—— Gnathopod 1 basis robust, one and half times as long as broad, propodus not elongate, anterior margin convex 3

2 Gnathopod 1 basis posterior margin densely setose; carpus posterior margin strongly produced into an acute tooth; propodus posterior margin weakly concave ..... *Bemlos pseudopunctatus*

—— Gnathopod 1 basis posterior margin with few or without setae; carpus posterior margin without tooth; propodus posterior margin straight ..... *Bemlos quadrimanus*

Bemlos quadrimanus (Sivaprakasam)

Lembos quadrimanus Sivaprakasam, 1970c; 81, fig. 1.
Lembos waipio?.—Ledoyer, 1972: 200, pl. 21A, 22, 24 = *Lembos quadrimanus Mozambicus*.
Lembos quadrimanus mozambicus Myers, 1975a: 359, fig. 33–39.
Bemlos quadrimanus.—Myers, 1988a: 188; 1988b: 282, fig. 14.
Bemlos waipio.—Appadoo & Steele, 1998: 640 = *Bemlos quadrimanus*.

Material examined. 8♂♂, 7♀♀, AM P60848, from *Turbinaria ornata* and *Pocockiella variegata*, Bain Boeuf (19°59'S 57°36'E), 28 August 1998. 1♂, 9♀♀, AM P60849, from *Sargassum* sp., *Padina* sp. and *Caulerpa sertulariodes*, Bain Boeuf, 6 April 1999. 1♂, AM P60850, from *Sargassum* sp., La Cuvette (20°00'S 57°34.2'E), 12 October 1999.

Diagnosis. Body with mottled brown pigmentation on head, pereon segments 2–6 and epimeron 1. Coxae and pereon segments 3–5 with well-developed acute sternal processes. Gnathopod 1 coxa 2.3× as broad as long; carpus 1.9× as broad as long, anterior margin with few setae; propodus globular, broad, 1.5× as long as broad, anterior margin with few groups of slender setae; distal end of palmar margin with a tooth-like process; dactylus robust, medially expanded, 1.8× length of palm. Gnathopod 2 carpus and propodus with few groups of setae on anterior margin.

Female gnathopod 1 not greatly enlarged; propodus 1.3× length of carpus, 1.8× as long as broad, palmar margin oblique and smooth with one robust seta at posterodistal corner.

Type locality. Appa Island, Gulf of Mannar.

Distribution. East Africa, Madagascar, Mauritius, India, Western Australia.

Habitat. *Bemlos quadrimanus* was collected from depths of less than 1 m from sites in the north coast of Mauritius and at Ile D'Ambre. It is mostly associated with the brown algae *Sargassum* sp. and the brown alga, which encrusts on corals, *Pocockiella variegata*. It was particularly very common at Bain Boeuf, a site on the north coast where the seawater has a high amount of detritus or suspended matter.

Remarks. The current material agrees with the description given by Myers (1975a: 359, fig. 33–39). One of the small difference being the lack of setae on epimera 1 and 2 as shown by Myers (1975a: 363, fig. 35).

Bemlos quadrimanus is distinguished from *Bemlos teleporus*, by the globular shape of the male gnathopod 1 propodus in *B. quadrimanus* compared to that of *B. teleporus*. One of the easily used distinguishing features of *Bemlos quadrimanus* is the mottled brown pigmentation on the body. The chromatophores are found on the head, coxae, pleon 3 to 5 and epimeron 1 sometimes extending onto epimeron 2. In *B. teleporus*, the chromatophores are present in a speckles rather than large blotches on the head, pleon 2–7 and epimeron 1 and 2. It differs from *B. pseudopunctatus* by the lack of a carpal tooth or teeth on the male gnathopod 1.

Bemlos teleporus (K.H. Barnard)

Lembos teleporus K.H. Barnard, 1955: 94, fig. 47.—Ledoyer, 1967: 133, fig. 16–17; 1969: 183; 1973: 52, 91; 1982: 291, fig. 108.—Griffiths, 1973: 280; 1974a: 180.
Lembos podoceroides.—Griffiths, 1973: 278—synonymized by Griffiths, 1976: 97.
Lembos teleporus.—Ledoyer, 1982: 291, fig. 108.
Bemlos teleporus.—Myers, 1988a: 188.

Material examined. 1♂, AM P60851, from *Turbinaria ornata* and *Pocockiella variegata* from Bain Boeuf (19°59'S 57°36'E), 28 August 1998; 1♂, 2♀♀, AM P60852, from *Padina* sp., Bain Boeuf, 13 December 1999.

Diagnosis. Body (in alcohol) with speckles of brown pigment on head, pleon 2–7 and epimera 1–2. Pereon segment 3 with a well-developed sternal process. Gnathopod 1 coxa subquadrangular; carpus 1.2× as long as broad; propodus narrow proximally, expanded distally, palmar margin with a rounded protuberance close to base of dactylus followed by a shallow semi-elliptical excavation and a weak protuberance at the distal end; dactylus robust, overlapping palm, inner margin weakly crenulate. Gnathopod 2 carpus elongate, 2.4× as long as broad; propodus subrectangular, slightly shorter than carpus; dactylus fitting palm. Epimera 1 and 2 ventral margin rounded; epimeron 3 posterodistal margin with a small notch into which a small seta is inserted. Uropod 3 rami slender, outer ramus 0.8× inner ramus, outer ramus with long; rami with robust setae and terminal setae less than length of rami. Telson with two slender setae on each side.

Female, gnathopod 1 propodus 1.6× carpus and 2× as long as broad, palmar margin with a small protuberance close to base of dactylus followed by a shallow semi-circular excavation and a weakly developed protuberance at distal end. Pereopod 7 long and slender.

Variation. In younger males less than 4.1 mm, a robust seta is present on the posterodistal margin of the palm of gnathopod 1; the dactylus of the male gnathopod 1 slightly overlaps the palm and the dactylus inner margin with well-developed teeth. In larger males, the robust seta disappears and the inner margin of the dactylus becomes smooth.

Type locality. South Africa.

Distribution. South Africa, Mozambique?, Madagascar, Mauritius.

Habitat. *Bemlos teleporus*, was collected from depths less than 1 m. It occurs in habitats similar to that of *B. quadrimanus*.

Remarks. This species is recorded for the first time from Mauritius. The material closely agrees with the description of *Bemlos teleporus* given by Ledoyer (1982: 291, fig. 108). The variation in the male gnathopod 1 in small and large specimen is consistent with the observations made by Ledoyer (1982). For differences between this species and *B. quadrimanus*, see remarks under that species.

Genus *Globosolembos* Myers

For a diagnosis see Myers, 1988a.

Globosolembos excavatus (Myers)

Lembos excavatus Myers, 1975b: 32, figs. 76–82.—Ledoyer, 1982: 218, figs. 104–105 (in part).
Lembos processifer.—Ledoyer, 1984: 35 (in part), fig. 16 ("forme 2") (not *L. processifer* Pirlot, 1938: 330, figs. 147–149).
Lembos (Globosolembos) excavatus Myers, 1985b: 363, fig. 234.
Globosolembos excavatus.—Myers, 1986: 285, figs. 11–12.—Myers, 1988b: 329.

Material examined. 1♂ from coral rubble, AM P60853, *Enteromorpha flexuosa* and *Pocockiella variegata*, Flic-en-Flac (20°16.5'S 57°21.7'E), 9 November 1998; 1♂, 7♀♀, 12 juv., AM P60854, from mixture of *Sargassum* sp., *Amphiroa* sp., *Pocockiella variegata* and *Cymodocea* sp., Bain Boeuf (19°59'S 57°36'E), 16 June 1999. 1♂, AM P60855, from mixture of *Sargassum* sp., *Ulva lactuca, Acanthophora spicifera*, Souillac (20°31'S 57°30.7'E), 14 October 1999.

Diagnosis. Sternal processes on sternal plates 2–4. Gnathopod 1 carpus triangular, as long as broad; propodus globular, anterior margin with few slender setae, 1.7× as long as broad, posterior margin with a deep sinuous excavation; palm reduced, crenulate; dactylus 1.6× length of palm. Gnathopod 2 carpus slender, longer than propodus; propodus palm oblique; anterior margins of carpus and propodus densely setose.

Female gnathopod 1carpus as long as broad; propodus globular, 1.4 as long as broad, anterior margin poorly setiferous; palm oblique, weakly sinuous.

Type locality. Watamu Bay, Kenya.

Distribution. East Africa, Madagascar, northeastern Australia, New Caledonia, Tonga.

Habitat. *Globosolembos excavatus* is common among the brown algae especially *Padina* sp. and *Pocockiella variegata* together with coral rubble substrata. It was collected at depths less than 2 m from several sites around the island and appears to have a wider distribution than *B. teleporus* or *B. quadrimanus*.

Remarks. This is the first record of *Globosolembos excavatus* from Mauritius.

The present material agrees with the description given by Myers (1975b: 32, fig. 76–82). The material examined has mottled brown pigmentation on the pleon and coxae 1 to 4, and a few patches of pigment on pleon 6 and 7. *Globosolembos excavatus* females can be distinguished from those of *B. quadrimanus* females by the more globose nature of the female gnathopod 1. In specimens where pigmentation is preserved, a quick character that can be used to distinguish these two females, is the chromatophores on the head, which are absent in *G. excavatus*. The two species *G. excavatus* and *G. indicus* in the current material could be distinguished using the same features mentioned by Ledoyer p.284 (1982). These include the poorly setiferous anterior margins of the propodus of the gnathopod 1 in males and females, the presence of sternal processes on sternal plates 2–4, and the more reduced carpus in the males gnathopod 1 in *G. excavatus* compared to *G. indicus*.

Globosolembos indicus (Ledoyer)

Lembos indicus Ledoyer, 1967: 133, fig. 18; 1972: 195, pl. 17A, 19, 24; Ledoyer, 1978: 253–1979: 42; Ledoyer, 1982: 284, fig. 105 (in part).
Lembos leapakaki.—Sivaprakasam, 1970c: 87, fig. 3.
Not *Lembos leapakaki* J.L. Barnard 1970: 79, figs. 39–40.
Lembos (Globosolembos) indicus.—Myers, 1985b: 348–353, figs. 224–227.
Globosolembos indicus.—Appadoo & Steele, 1998: 640.

Material examined. 1♂, AC, from *Sargassum* sp., *Ulva reticulata*, La Cuvette (20°00'S 57°34.2'E), 5 May 1999; 3♀♀, 1 juv., AC, from *Padina* sp. and *Halimeda* sp., Grand Baie (20°0.5'S 57°34'E), 5 May 1999.

Diagnosis. Gnathopod 1 carpus 1.3× as long as broad; propodus elongate, 1.9× as long as broad, anterior margin with dense groups of setae; palmar margin short, weakly crenulate; dactylus 1.6× length of palm. Gnathopod 2 carpus longer than propodus; palm oblique; anterior and posterior margin of carpus and propodus densely setose.

Female gnathopod 1 carpus cup-shaped, as long as broad; propodus 1.4× as long as broad, anterior margin with dense groups of setae; palm oblique.

Type locality. Tuléar, Madagascar.

Distribution. Madagascar, Mauritius, India.

Habitat. *Globosolembos indicus* was rarer among the substrates collected in the present study compared to *G. excavatus*. It was collected at depths of less than 0.5 m from two sites in the north coast among green and brown algae.

Remarks. The current material agrees with the descriptions of Ledoyer (1967: 133, fig. 18), Ledoyer (1982: 284, fig. 105) and Myers (1985b: 348–353, figs. 224–227). This species closely resembles *G. excavatus* and the pattern of chromatophores on the body segment is very similar. It is distinguished from the latter by the more setose anterior margin of the gnathopods 1 propodus in males and females, the lack of sternal processes on sternal plates 2–4, and the less reduced carpus in the male gnathopod 1.

Genus *Grandidierella* Coutiere

For a diagnosis see Myers, 1988a.

Grandidierella bonnieroides Stephensen

Grandidierella bonnieroides Stephensen, 1948: 12, fig. 3.—Myers, 1970: 141, fig. 1–2.—1972: 790.—Asari & Myers, 1982: 252, figs. 9–10.—Ledoyer, 1982: 245, fig. 89.
Grandidierella bonnieri.—Appadoo & Steele, 1998: 640.

Material examined. 7♂♂, 12♀♀, AM P60856, from *Acanthophora spicifera*, Anse la Raie (19°59.5'S 57°37.5'E), 15 May 1998. 7♂♂, 8♀♀, AM P60857, from *Ulva lactuca* and *Ulva reticulata*, Le Bouchon (20°28'S 57°40.5'E), 27 October 1998.

Diagnosis. Sternal process present on pereon segment 1. Coxal plates discontinuous, broader than deep. Antenna 2 robust, articles 4 and 5 subequal, flagellum 5-articulate. Gnathopod 1 carpus slender, subquadrate, 1.7× as long as broad, with parallel anterior and posterior margins, posterior

margin with few setae, inner face of carpus with a small process, distal margin with a medial finger-like process followed by a strong process on the posterodistal margin; propodus subquadrate, 2.5× as long as broad, anterior and posterior margins appear parallel; dactylus robust, inner margin crenulate with robust setae. Gnathopod 2 carpus, subovate, 2× as long as broad; propodus subrectangular, 0.6× length of carpus. Uropod 3 uniramous, ramus slightly over twice as long as peduncle, slender, 5× as long as broad with setae on margins and on distal end. Telson with two medial and one distal setae on each side.

Female, gnathopod 1 carpus 2.3× as long as broad, propodus medially expanded, slightly shorter than carpus, palm oblique.

Variation. In younger males (e.g., 2.8 mm) the sternal process is not developed. The gnathopod 1 carpus anterior margin is more convex and appears globular, distal finger-like process poorly developed; the propodus is 2× as long as broad, inner margin is more convex with strong groups of setae; dactylus is slender and inner margin is toothed with short setae.

Type locality. Salinja Paloe Lechi, Bonaire.

Habitat. *Grandidierella bonnieroides* was collected from depths less than 1 m on the north, east and south coasts of the island. It lives mostly amongst the green alga, *Ulva* sp. and red algae. It was very abundant at one site on the southeast coast, Le Bouchon, a site characterized by clay-like suspended matter in seawater and extensive green algae.

Distribution. Madagascar, Mauritius, India, Bonaire, Caribbean, Gulf of Mexico.

Remarks. The present material agrees with the description given by Asari & Myers (1982: 252, fig. 9–10). One small difference being the uropod 3 peduncle, which is broader in the material described by Asari & Myers (1982). The present material also agrees with the description given by Ledoyer (1982: 245, fig. 89) where the uropod 3 peduncle is slender. Two sternal processes are illustrated by Ledoyer (1982: 246, fig. 89), but only one is observed in the current material. Myers (1970: 138–139, fig. 2) points out that there may be considerable variation in the relative development of sternal processes on pereon segments 1 and 2 when he reviewed material of *G. bonnieroides* from the Caribbean and Gulf of Mexico.

Family Corophiidae

Head rostrum short; interantennal lobe prominent. Antenna 2 peduncle well developed, flagellum short. Lower lip outer lobes entire. Mandible palp weak, 1, 2 or 3 segmented. Coxae small, coxa 4 posterior margin excavate. Gnathopod 2 larger than gnathopod 1. Body depressed. Uropod 3 uniramous. Telson fleshy.

Genus *Monocorophium* Bousfield & Hoover, 1997

For diagnosis see Bousfield & Hoover, 1997.

Monocorophium acherusicum Costa

Corophium acherusicum A. Costa, 1851; 24 (*Audouinia acherusica* nom. nud.); Della Valle, 1893: 364, pl. 1, fig. 11; pl. 8, fig. 17, 18, 20–41; Chevreux & Fage, 1925: 368, fig. 376; Crawford, 1937: 617; Gurjanova, 1951: 977, fig. 680.—Myers, 1982; 186, fig. 124.—Appadoo & Steele, 1998: 640.
Monocorophium acherusicum Bousfield & Hoover, 1997: 117, fig. 30.

Material examined. 11♂♂, 30♀♀, AC, from *Acanthophora spicifera*, Anse la Raie (19°59.5'S 57°37.5'E), 15 May 1998.

Type locality. Lago del Fusaro (Napoli).

Distribution. Cosmopolitan (see Myers, 1982: 186).

Habitat. *Monocorophium acherusicum* was collected from only one site in the north coast of the island among the red alga, *Acanthophora spicifera*. The site is a sheltered site, with very little wave-action and the seawater has large amounts of suspended sand.

Remarks. *Monocorophium acherusicum*, is a species of very wide distribution. It is recognized by the small triangular rostrum, coalesced urosome segments, male antenna 2 article 4 with large terminal distal tooth and two small medial teeth. Females are recognized by the antenna 2 with article 4 with some paired robust setae and article 5 with 2 or more robust setae.

Family Photidae

Antennae slender, subequal. Coxae deep, coxa 4 posterior margin not excavate. Mandible palp slender, article 2 longest, article 3 with apical setae. Gnathopod 2 larger than gnathopod 1. Uropods 1–2 biramous. Uropod 3 biramous, outer ramus with simple robust setae.

Genus *Gammaropsis* Liljeborg

Body laterally compressed. Ocular lobes short to moderate, pointed. Antenna 1 accessory flagellum multi-articulate. Mandible palp, article 3 clavate, slightly shorter than article 2. Coxae strongly overlapping, coxa 4 not lobed. Gnathopods 2 greatly larger than 1, merus enlarged, fused distally along posterior margin of carpus. Uropod 1 peduncle with ventrodistal process. Uropod 3 biramous, rami pointed distally, elongate, outer ramus with vestigial article 2. Telson entire, short, ovate, as broad as long with 2 apical cusps.

This complex genus appears to be well represented in Mauritius (Ledoyer, 1978). A great deal of study is required to understand the many taxa in this genus. For the moment, a list of the taxa under the names in which they have been recorded from Mauritius includes:

Gammaropsis abbotti (J.L. Barnard).—Ledoyer, 1978: 238.

Gammaropsis afra Stebbing.—Ledoyer, 1978: 239, fig. 16.

Gammaropsis atlantica Stebbing.—Ledoyer, 1978: 241, fig. 17(I); Appadoo & Steele, 1998: 640.

Gammaropsis grandimana Ledoyer, 1978: 243, fig. 18(II).

Gammaropsis holmesi Stebbing.—Ledoyer, 1978: 245, fig. 17(II).

Gammaropsis mauritiensis Ledoyer, 1978: 246, fig. 18(I).

Gammaropsis photisimilis Ruffo.—Ledoyer, 1978: 248, fig. 19.

Gammaropsis pokipoki J.L. Barnard.—Ledoyer, 1978: 248, fig. 20.

Gammaropsis sp. (*G. atlantica* complex)

Fig. 20

Material examined. 2♀♀, AC, from mixture of *Centroceras clavulatum, Hypnea cornuta, Gracilaria millardetii*, green filamentous alga, Tamarin (20°19.5'S 57°22'E), 11 October 1999.

Habitat. This species was collected at depths less than 1 m from one site on the west-coast of the island. The site is moderately exposed to wave action and has some freshwater influence as it is located close to a river mouth.

Remarks. Only females of this species were recorded in the study and no attempt is made to provide a full description. The material collected is placed in the "*atlantica*" group because of the lageniform eye shape, the shape of the female gnathopod 2, pereopod 5, telson and uropod 3. The material appears to be similar to that described by Ledoyer (1982: 216, fig. 75) as form A of *Gammaropsis atlantica*.

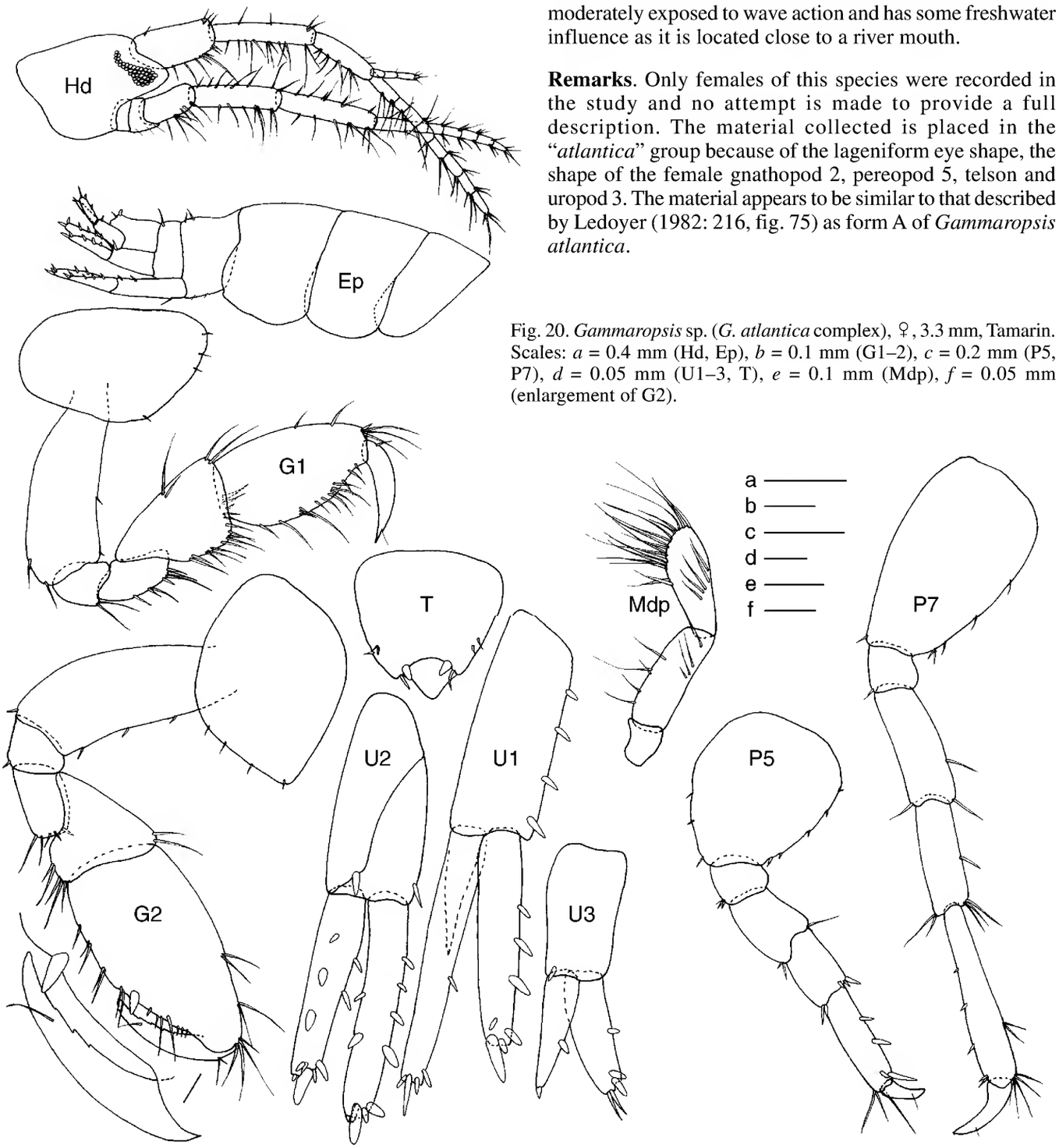


Fig. 20. *Gammaropsis* sp. (*G. atlantica* complex), ♀, 3.3 mm, Tamarin. Scales: *a* = 0.4 mm (Hd, Ep), *b* = 0.1 mm (G1–2), *c* = 0.2 mm (P5, P7), *d* = 0.05 mm (U1–3, T), *e* = 0.1 mm (Mdp), *f* = 0.05 mm (enlargement of G2).

Gammaropsis digitata (Schellenberg)

Eurystheus digitatus Schellenberg, 1938: 84.—J.L. Barnard, 1965: 535, fig. 30.—Sivaprakasam, 1970a: 570, fig. 10.
Gammaropsis digitata J.L. Barnard, 1970: 178, fig. 114.—Ledoyer, 1972: 239, pl. 54B.—Ledoyer, 1982: 227, fig. 82.—Myers, 1985a: 80, fig. 61–62.
Jassa sp. 1 Appadoo & Steele, 1998: 640.

Material examined. 18♂♂, 21♀♀, 18 juv., AM P60858, from *Amansia glomerata, Padina* and *Sargassum*, Souillac (20°31'S 57°30.7'E), 8 April 1999; 49♂♂, 13♀♀, 7 juv., AM P60859, from *Sargassum* sp. and *Ulva reticulata*, La Cuvette (20°00'S 57°34.2'E), 5 May 1999; 13♂♂, 21♀♀, 5 juv., AM P60860, from *Sargassum densifolium, Amansia glomerata* and *Digenia simplex*, Souillac, 4 August 1999; 14♂♂, 22♀♀, 12 juv., AM P60861, from mixture of *Sargassum densifolium, Padina* sp., *Digenia simplex* and *Cymodocea* sp., Roches Noires (20°6.2'S 57°44.5'E), 16 December 1999.

Diagnosis. Eyes oval. Male gnathopod 1, propodus 2.3× as long as broad, palm oblique defined by a weak protrusion bearing a robust seta. Gnathopod 2, carpus triangular, 1.2× as long as broad; propodus 2× as long as broad, posterior margin with a long slender proximal tooth and a short, stout, irregular distal protrusion forming a short, transverse palm; dactylus robust, 2.8× length of palm.

Female gnathopod 1, propodus with smoothly convex palm. Gnathopod 2 propodus slender, palm oblique.

Type locality. Nui, Tarawa.

Habitat. *Gammaropsis digitata* is very common in the north, east and south coasts of Mauritius and was collected at depths of less than 1 m. Three sites where it was very common are Souillac, Roches Noires and La Cuvette. This species lives amongst the red algae especially *Amansia glomerata* and *Digenia simplex*, algae which are very common at the wave-exposed sites such as Souillac and Roches Noires.

Distribution. Madagascar, Mauritius, India, Tarawa, Kiribati, Micronesia, Hawaii, Fiji.

Remarks. The material from Mauritius agrees with the description given by Myers (1985a: 80, fig. 61–62). This species is easily distinguished from *Gammaropis* species in the *G. atlantica* complex by the ovoid shape of the eyes, which have a purple-coloured core (in alcohol preserved material) surrounded by a lighter coloured ring of ommatidia.

The distinctive shape of the hyperadult male gnathopod 2 with a long proximal tooth on the posterior margin of the propodus helps to distinguish this species from all other *Gammaropsis* species from Mauritius. In younger males, the tooth is less well-developed and originates midway on the ventral margin of the propodus as compared to the proximal end in large adults. The gnathopod 2 of younger males superficially resembles that of *Gammaropsis photisimilis* Ruffo (1969), which also has a medial tooth on the posterior margin of the propodus. However, young males of *G. digitata* have a very narrow cleft between the sharp tooth and the palm as compared to a round-bottomed excavation separating the more blunt tooth from the palm in *G. photisimilis*.

Ledoyer (1978) recorded 7 species of *Gammaropsis* and only *Gammaropsis* sp. (*G. atlantica* complex) has been recorded again in this study. One of the reasons for this difference in species is probably due to the habitats sampled and also the depth of sampling; Ledoyer (1978) collected samples from depths up to 25 m and his substrates were mostly coral rubble.

Family Ischyroceridae

Body slightly depressed. Coxae shallow, contiguous; coxa 4 not excavate. Antenna 2 longer than 1. Gnathopod 2 larger than gnathopod 1; carpus short. Pereopods 3–4 basis expanded. Uropods 1–2 inner ramus longer than outer; interramal process present. Uropod 3 peduncle robust, rami very short, outer ramus curved with teeth-like processes near apex.

Genus *Ericthonius* Milne Edwards

Coxae small, weakly contiguous. Gnathopod 2 enlarged, merus extended along posterior margin of carpus, with process on posterodistal margin, dactylus long. Uropods 1–2 biramous, rami slightly unequal, shorter than peduncle, peduncle without interramal process. Uropod 3 small, uniramous, ramus short, apically curved with teeth-like processes. Telson short, entire, reduced, broader than long.

Key to male *Ericthonius* of Mauritius

1 Gnathopod 1 basis without knob-like process on posterior margin; coxa 2 broader than deep 2

—— Gnathopod 1 basis with knob-like process on posterior margin; coxa 2 deeper than broad ..... *Ericthonius brasiliensis*

2 Pereopod 5 basis with weakly-developed lobe on posterodistal margin 3

—— Pereopod 5 basis with strongly produced lobe, reaching up to end of ischium on posterodistal margin ..... *Ericthonius pugnax*

3 Gnathopod 2 basis uniformly broad, carpus posterior margin bearing robust setae, propodus subequal to carpus, enlarged and axe-shaped ..... *Ericthonius latimanus*

—— Gnathopod 2 basis bottle-shaped; carpus posterior margin without robust setae, propodus shorter than carpus, posterior margin weakly sinuous ..... *Ericthonius punctatus*

Ericthonius brasiliensis (Dana)

Pyctilus brasiliensis Dana, 1852b: 976, fig. 5a–h.
Ericthonius brasiliensis Bousfield, 1973: 175, pl. 59, fig. 2.—Myers, 1982: 200, figs. 136–137.—Myers & McGrath 1984: 382, fig. 1–2.—Appadoo & Steele 1998: 640.
Not *Ericthonius brasiliensis* Ledoyer 1986: 624, fig. 237A.

Material examined. 1♂, AM P60862, from mixture of *Sargassum* sp., *Amphiroa* sp., *Pocockiella variegata* and *Cymodocea* sp., Bain Boeuf, 16 June 1999; 1♂, AC, from *Acanthophora spicifera*, Anse la Raie (19°59.5'S 57°37.5'E), 15 May 1998. 1♂, 1♀, AC, from *Sargassum binderi*, Bain Boeuf (19°59'S 57°36'E), 16 June 1998.

Diagnosis. Body (in alcohol) with brown speckled pigmentation on head, coxae, pleon and urosome. Pereon segment 1 with a forward produced sternal process. Gnathopod 1 basis 2× as long as broad, posterior margin with a distinct knob-like process. Gnathopod 2 coxa deep, ventral margin rounded, with stridulations and a small group of setae; carpus 1.8× as long as broad anterior and posterior margins parallel, posterodistal margin with two teeth, the outer one longer, separated by a V-shaped incision. Pereopod 3–4 basis 1.5× as long as broad, widest medially.

Female gnathopod 1 basis slender; propodus palm oblique. Gnathopod 2 coxa deep; carpus posterior margin produced into a lobe with two robust setae and long slender setae; propodus tapered distally, slightly more than twice length of carpus, palm oblique with two robust setae.

Variation. In some males, the eyes are smaller and do not completely fill the eye-lobe.

Type locality. Rio de Janeiro

Habitat. *Ericthonius brasiliensis* was collected at depths of less than 1 m mostly from the north coasts. It was collected amongst brown algae and was more common at Bain Boeuf, a site with very little wave-action and large amounts of suspended sand.

Distribution. Venezuela, Brazil, West Indies, New England and the Mediterranean Sea, Mauritius.

Remarks. The material recorded from Mauritius agrees very well with the description given by Myers & McGrath (1984) of material from the type locality. Among a few differences are the large eye in the current material, pereopods 3 and 4 being widest medially and the weak setation of the propodus of the male gnathopod 2. The deep coxa 2 and the knob-like process on the basis of the gnathopod 1 in males are distinctive features of this species (Myers & McGrath, 1984). These two characters can also be used to distinguish the males of this species from the other species of the genus, *E. latimanus, E. pugnax* and *E. punctatus*, reported from the island.

Ericthonius pugnax Dana

Erichthonius [sic] *pugnax* Dana, 1852a: 213.
Ericthonius pugnax.—Stebbing, 1906: 672.—Pirlot, 1938: 352.—Nagata, 1960: 179, pl. 17.—Nagata, 1965: 320, fig. 40.—Ledoyer, 1969: 179, fig. 1.—Ledoyer, 1986: 628, fig. 239.—Myers, 1995: 80, figs. 40–42.
Erichthonius [sic] *macrodactylus* Dana, 1852a: 218.
Pyctilus pugnax Dana, 1852b: 975, pl. 67, fig. 4a–d.
Pyctilus macrodactylus Dana, 1852b: 974, pl. 67, fig. 3a–c.

Material examined. 1♂, AC, from *Sargassum* sp., La Cuvette (20°00'S 57°34.2'E), 14 May 1998.

Diagnosis. Alcohol preserved specimen cream-coloured. A flap-like sternal process is present on pereon segment 1. Gnathopod 1 basis slender, 2.5× as long as broad, posterior margin smooth. Gnathopod 2 coxa shallow, sub-triangular, 1.8× as broad as long, with stridulating ridges on the ventral margin; carpus anterior margin slightly convex with two distal teeth, the outer one longer, distal margin slightly deflected; propodus 0.8× carpus, posterior margin sinuous with slender setae; dactylus large, with a few setae on anterior margin and a group of apical setae. Pereopod 3–4 basis distally expanded. Pereopod 5 basis posterodistal margin produced into a lobe reaching to end of ischium, and bearing a few setae.

Type locality. Sulu Sea

Distribution. Indo-west Pacific

Habitat. This species was rare in the substrata sampled in this study and was collected at depths of less than 1 m at La Cuvette, in the north coast.

Remarks. This is the first record of the species from Mauritius. *Ericthonius pugnax* males are easily distinguished by the shape of the basis of the pereopod 5, which is strongly produced into a lobe on the posterodistal margin. The shape of the gnathopod 2 in the current material agrees with the description of Ledoyer 1986 (631, fig. 239) and Myers 1995 (78, fig. 40). No additional material is available here to show variation of the gnathopod 2 in much larger specimens as observed by Myers (1995).

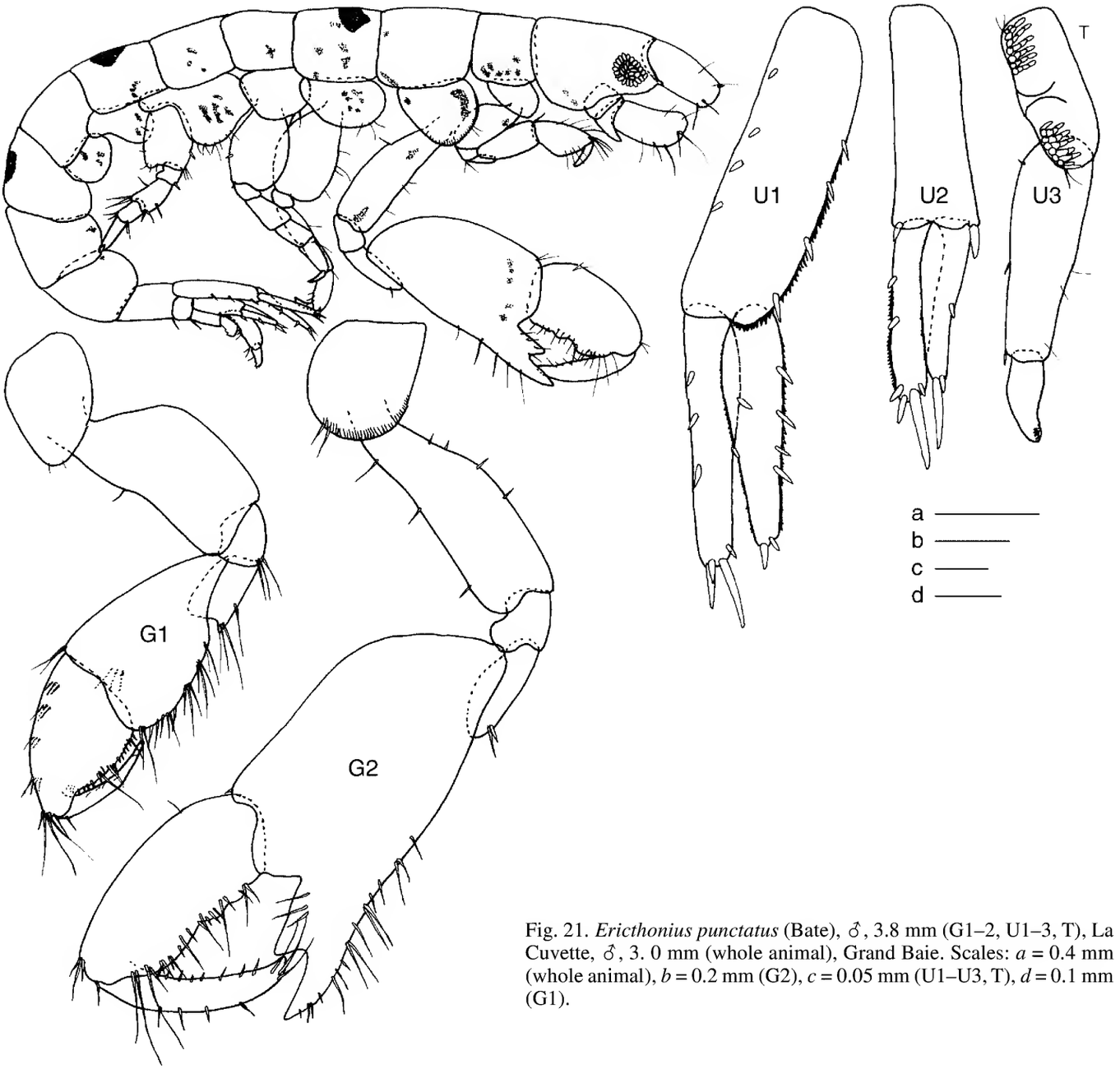


Fig. 21. *Ericthonius punctatus* (Bate), ♂, 3.8 mm (G1–2, U1–3, T), La Cuvette, ♂, 3. 0 mm (whole animal), Grand Baie. Scales: *a* = 0.4 mm (whole animal), *b* = 0.2 mm (G2), *c* = 0.05 mm (U1–U3, T), *d* = 0.1 mm (G1).

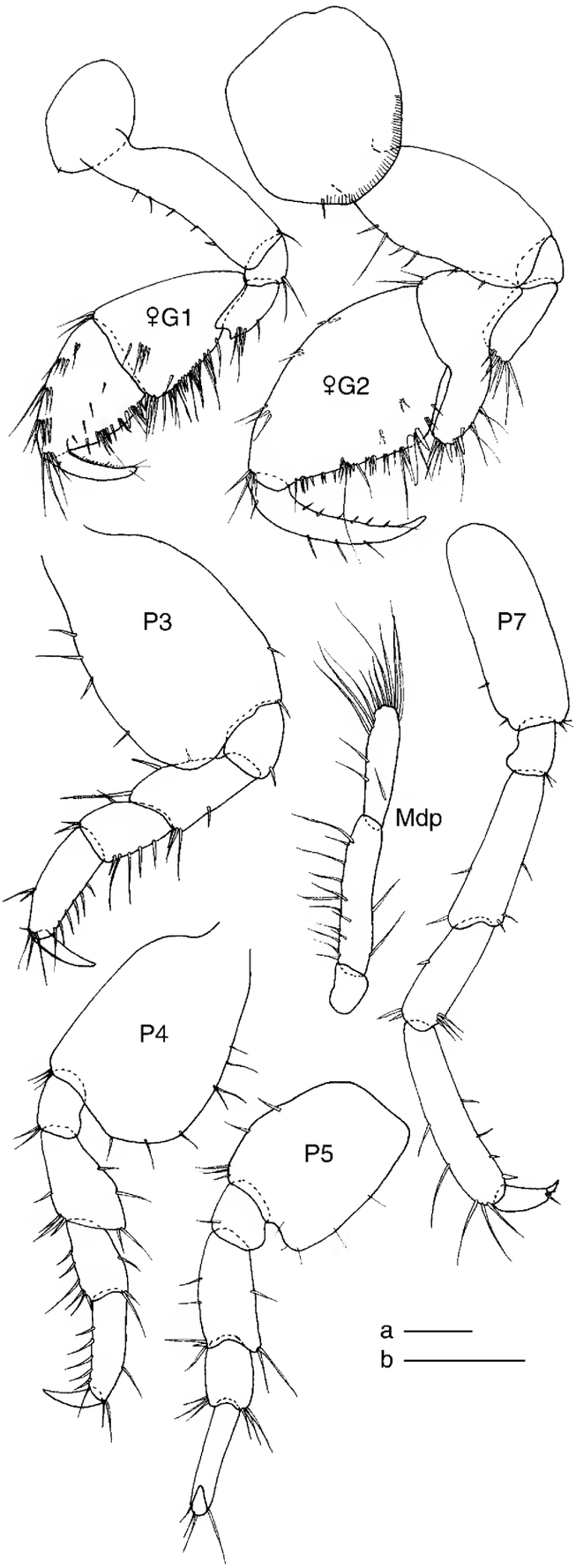


Fig. 22. *Ericthonius punctatus* (Bate), ♂, 3.8 mm, La Cuvette, ♀, 3.3 mm, Grand Baie. Scales: *a* = 0.1 mm (Mdp), *b* = 0.2 mm (P3–4, P5–7, ♀G1–2). Male unless stated otherwise.

Ericthonius punctatus (Bate)

Figs. 21–22

Podocerus punctatus Bate, 1857: 148.
Dercothoe punctatus Bate, 1862: 260.—Bate & Westwood, 1863: 461 (with un-numbered figure).
Ericthonius punctatus.—Myers 1982: 202, fig. 138.—Myers & McGrath, 1984: 285, figs. 3–4.
Ericthonius abditus Sars 1894: 602, pl. 215.
Erichthonius brasiliensis.—Chevreux & Fage, 1925: 353, fig. 360.
Ericthonius brasiliensis.—Schellenberg 1942: 212, fig. 173.—Gurjanova 1951: 948, fig. 659.—Lincoln, 1979; 560, figs. 268a–f, 269a–e.—Ledoyer, 1986: 624, fig. 237A.

Material examined. 2♂♂, AM P60863, from *Padina* sp. La Cuvette (20°00'S 57°34.2'E), 14 May 1998; 3♂♂, 1♀, AM P60864, from *Hypnea* sp., *Amphiroa* sp., *Caulerpa sertulariodes*, Tamarin (20°19.5'S 57°22'E), 18 June 1999.

Diagnosis. Body (in alcohol) with mottled-brown pigment concentrated on head, pereon and coxae. Pereon segment 1 with flap-like sternal process. Gnathopod 2 coxa moderately deep, with parallel lateral margins, ventral margin round and with stridulating ridges; basis lageniform, 3.2× as long as broad; carpus anterior margin strongly convex proximally, carpal processes on posterior margin deflected, with two-teeth separated from each other by a semi-elliptical depression; propodus 0.8× length of carpus, inner margin weakly sinuous; dactylus stout with short setae on inner and outer margins and long terminal setae. Pereopod 3–4 basis widest distally, anterior margin evenly convex.

Female gnathopod 1 coxa subround. Gnathopod 2, coxa moderately deep; carpus posterior margin produced into a lobe bearing robust setae and slender setae; propodus tapered at distal end, 2× length of carpus, palmar margin oblique with two stout robust proximal setae.

Type locality. Oxwich Bay, Glamorgan, Wales

Distribution. Norway to tropical West Africa, including the British Isles, Madagascar, Mauritius.

Habitat. *Ericthonius punctatus* was collected at depths of less than 1 m from sites in the west, north and east coasts of the island. It was more common in the north coasts at sites such as Grand Baie, la Cuvette and Bain Boeuf. It is lives mostly amongst the brown algae, *Sargassum* sp.

Remarks. This is the first record of the species from The Indian Ocean. It can be distinguished from *E. brasiliensis* by the pattern of pigmentation on the body surface and the lack of the knob-like process on the basis of the male gnathopod 1. It can be distinguished from *E. pugnax*, by the shape of the coxa 2 of the male, which is much more shallow in *E. pugnax*, the shape of the basis of the pereopod 5 and the strongly divergent teeth of the male gnathopod 2 carpus.

Because this species seems an unlikely occurrence in the tropical Indian Ocean, figures are provided here for comparative purposes. The possibility of introduction cannot be ruled out.

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