

Marine benthic flora of the Dampier Archipelago, Western Australia

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Abstract – There is a lack of information regarding the marine benthic flora of northwest Western Australia and a comprehensive flora for the region has never been produced. A checklist of the marine benthic flora of the Dampier Archipelago collected during the Western Australian Museum expeditions of 1998/1999 is presented. This list, however, must be viewed as preliminary, as many of the specimens collected are yet to be identified.

INTRODUCTION

The marine benthic flora includes photosynthetic organisms from a diverse range of taxonomic groups, including green, brown, and red algae (Chlorophyta, Phaeophyceae and Rhodophyta, respectively), angiosperms (Magnoliophyta) and bacteria (Cyanophyta or Cyanobacteria). Several recent publications have highlighted the lack of information regarding the marine benthic flora of northwest Western Australia (e.g. Huisman *et al.*, 1998). A compendium of records of marine algae from northern Australia (Lewis, 1984; 1985; 1987) included some 800 species, of which only nine were attributed to the Western Australian coast north of (and including) Northwest Cape. Several recent publications have increased the number of species recorded for the region (e.g. Phillips *et al.*, 1993; King and Puttock, 1994; Huisman, 1996; Phillips and Huisman, 1997; Phillips, 2000; Huisman, 2001; 2002) and many tropical species from the northwest were illustrated in the recent *Marine Plants of Australia* (Huisman, 2000). However, a comprehensive flora for the region has yet to be produced. This report provides a checklist of the marine benthic flora of the Dampier Archipelago collected during the Western Australian Museum expeditions of 1998/1999. It should be treated as a companion piece to Huisman and Borowitzka

(2003), which provides a more detailed list of species, including many not recorded during the museum expeditions. Both this list and that of Huisman and Borowitzka (2003) must be viewed as preliminary, however, as many of the specimens collected are yet to be identified.

MATERIALS AND METHODS

Specimens were collected by SCUBA, snorkel, or from the intertidal and preserved in a 5–10% solution of formalin/seawater. Refer to the Station Lists section of this volume for the diving (DA1/98, DA3/99) and dredging (DA2/99) expedition station data. Slide material was stained in a mixture of 1 g aniline blue powder, 70 mL Karo®, 30 mL distilled water and 5 mL acetic acid. All specimens are presently housed in the Herbarium of the School of Biological Sciences and Biotechnology, Murdoch University (MURU). Descriptions and locations of sites are given elsewhere in this volume (see Station Lists). The species are arranged into Divisions (Chlorophyta = green algae, Heterokontophyta: Phaeophyceae = brown algae, Rhodophyta = red algae, Cyanophyta = cyanobacteria = blue-green algae, Magnoliophyta = seagrasses), which are subdivided into families, generally arranged according to Silva *et al.*, 1996.

CHECKLIST

A Checklist of the Marine Benthic Flora of the Dampier Archipelago, Western Australia

Site Number *

Numbers refer to diving expedition (DA1/98 and DA3/99) sites; dredging expedition site numbers are prefixed by DA2/99

Species	Site Number*
CHLOROPHYTA	
CHAETOPHORALES	
Ulvellaceae	
<i>Stromatella monostromatica</i> (Dangeard) Kornmann and Sahling, 1985	48
<i>Ulvella lens</i> P. Crouan and H. Crouan, 1859	45
ULVALES	
Ulvaceae	
<i>Enteromorpha flexuosa</i> (Wulfen) J. Agardh, 1883	59, 62
<i>Enteromorpha flexuosa</i> (Wulfen) J. Agardh subsp. <i>paradoxa</i> (C. Agardh) Bliding, 1963	54
CLADOPHORALES	
Anadyomenaceae	
<i>Anadyomene brownii</i> (J.E. Gray) J. Agardh, 1887	03, 31, 37, 45, 46, 47, 51, 68, 70
Siphonocladaceae	
<i>Boergesenia forbesii</i> (Harv.) Feldmann, 1938	03, 17, 25, 28
<i>Boodlea composita</i> (Harv.) Brand, 1904	03, 31, 58
<i>Cladophoropsis</i> sp.	45, 47, 48, 70
<i>Dictyosphaeria cavernosa</i> (Forssk.) Børgesen, 1932	06, 17, 31, 38, 45, 51, 54, 70
<i>Dictyosphaeria versluysii</i> Weber-van Bosse, 1905	37
<i>Siphonocladus tropicus</i> (P. Crouan and H. Crouan) J. Agardh, 1887	48, 52
Valoniaceae	
<i>Valonia aegagropila</i> C. Agardh, 1823	70
<i>Valoniopsis pachynema</i> (Martens) Børgesen, 1934	48
<i>Ventricaria ventricosa</i> (J. Agardh) Olsen and J. West, 1988	29, 45
BRYOPSIDALES	
Bryopsidaceae	
<i>Pseudobryopsis hainanensis</i> Tseng, 1936	65
Caulerpaceae	
<i>Caulerpa brachypus</i> Harv., 1860	47, 70
<i>Caulerpa constricta</i> Price, Huisman and Borowitzka, 1998	70
<i>Caulerpa corynephora</i> Montagne, 1842	54, 61, 70
<i>Caulerpa cupressoides</i> (Vahl) C. Agardh, 1817	09, 37, 42, 61, 70
<i>Caulerpa lentillifera</i> J. Agardh, 1837	25, 28, 54, 61, 70
<i>Caulerpa racemosa</i> (Forssk.) J. Agardh, 1873	06, 23, 31
<i>Caulerpa racemosa</i> (Forssk.) J. Agardh var. <i>lamourouxii</i> (Turner) Weber-van Bosse, 1898	10, 54, 56, 61
<i>Caulerpa racemosa</i> (Forssk.) J. Agardh var. <i>laetevirens</i> (Montagne) Weber-van Bosse, 1898	54, 70
<i>Caulerpa racemosa</i> (Forssk.) J. Agardh var. <i>peltata</i> (J.V. Lamour.) Eubank, 1944	16, 17, 25, 61

Species	Site Number*
<i>Caulerpa serrulata</i> (Forssk.) J. Agardh, 1837	07, 25, 32, 37, 42, 61, 66
<i>Caulerpa sertularioides</i> (S.G. Gmelin) Howe, 1905	06, 09, 16, 17, 23, 25, 31, 37, 38, 42, 54, 61, 62
<i>Caulerpa taxifolia</i> (Vahl) C. Agardh, 1817	06, 56
<i>Caulerpa verticillata</i> J. Agardh, 1847	03, 18, 47
<i>Caulerpa webbiana</i> Montagne, 1837	40, 47, 53, 58
Codiaceae	
<i>Codium arabicum</i> Kütz., 1856	51
<i>Codium dwarkense</i> Børgesen, 1847	51
Halimedaceae	
<i>Halimeda cuneata</i> Hering in Krauss, 1846	37, 47, 68
<i>Halimeda cylindracea</i> Decne., 1842	03, 09, 14, 19, 25, 28, 37, 41, 42, 48, 51, 58, 61, 64, 68, DA2/99/95
<i>Halimeda discoidea</i> Decne., 1842	56
<i>Halimeda macroloba</i> Decne., 1841	14, 17, 54, 58
<i>Halimeda velasquezii</i> W.R. Taylor, 1962	09, 25, 53
Udoteaceae	
<i>Avrainvillea obscura</i> (C. Agardh) J. Agardh, 1887	51, 59
<i>Penicillus nodulosus</i> Blainville, 1834	51, 54, 59
<i>Udotea argentea</i> Zanardini, 1858	09, 37, 38, 45, 48, 51, 56, 58, 56, 68, 91
<i>Udotea flabellum</i> (Ellis and Sol.) Howe, 1904	09, 14
<i>Udotea glaucescens</i> Harv. ex J. Agardh, 1887	41
<i>Udotea orientalis</i> A. Gepp and E. Gepp, 1911	56, 65
DASYCLADALES	
Dasycladaceae	
<i>Bornetella oligospora</i> Solms-Laubach, 1892	06, 19, 25, 37, 47, 48, 61
<i>Bornetella sphaerica</i> (Zanardini) Solms-Laubach, 1892	06, 25
<i>Neomeris vanbosseae</i> Howe, 1909	06, 25, 36, 37
Polyphysaceae	
<i>Acetabularia calyculus</i> J.V. Lamour., 1824	56
HETEROKONTOPHYTA	
Phaeophyceae	
ECTOCARPALES	
Ectocarpaceae	
<i>Feldmannia indica</i> (Sond.) Womersley and Bailey, 1970	59
<i>Hincksia mitchelliae</i> (Harv.) Silva, 1987	48, 62
SPHACELARIALES	
Sphacelariaceae	
<i>Sphacelaria rigidula</i> Kütz., 1843	47, 62
<i>Sphacelaria tribuloides</i> Meneghini, 1840	37
CUTLERIALES	
Cutleriaceae	
<i>Cutleria kraftii</i> Huisman, 2000	57

Species	Site Number*
DICTYOTALES	
Dictyotaceae	
<i>Dictyopteris australis</i> (Sond.) Askenasy, in Engler, 1888	01, 06, 07, 09, 14, 23, 30, 31, 37, 54, 56, 57, 61, DA2/99/29, DA2/99/42, DA2/99/49, DA2/99/57, DA2/99/88, DA2/99/90
<i>Dictyopteris delicatula</i> J.V. Lamour., 1809	18
<i>Dictyopteris woodwardia</i> (R. Brown ex Turner) C. Agardh, 1817	37, 47
<i>Dictyota cervicornis</i> Kütz., 1859	07, 25, 37, 38, 45, 61
<i>Dictyota ciliolata</i> Sonder ex Kütz., 1859	10, 25, 37
<i>Dictyota friabilis</i> Setchell, 1926	16, 27, 67
<i>Lobophora variegata</i> (J.V. Lamour.) Womersley ex Oliviera, 1977	07, 09, 13, 16, 23, 29, 36, 37, 40, 41, 42, 45, 47, 57, 58, 69
<i>Padina australis</i> Hauck, 1887	01, 07, 10, 16, 28, 48, 54, 61
<i>Padina elegans</i> Koh ex Womersley, 1987	70
<i>Padina tenuis</i> Bory, 1827	03, 13, 16, 17, 31, 34, 40, 66, 70
<i>Spatoglossum macrodontum</i> J. Agardh, 1882	11, 16, 37, DA2/99/47, DA2/99/88
<i>Stoehospermum polypodioides</i> (J.V. Lamour) J. Agardh, 1848	09
<i>Styopodium flabelliforme</i> Weber-van Bosse, 1913	23, 31, 40
SCYTOSIPHONALES	
Chnoosporaceae	
<i>Chnoospora implexa</i> J. Agardh, 1848	14
Scytosiphonaceae	
<i>Colpomenia sinuosa</i> (Mertens ex Roth) Derbès and Solier in Castagne, 1851	01, 03, 4, 25, 37, 38, 45, 51, 57
<i>Hydroclathrus clathratus</i> (C. Agardh) Howe, 1920	07, 17, 34, 45, 47, 54, 62
<i>Rosenvingea nhatrangensis</i> Dawson, 1954	23
FUCALES	
Cystoseiraceae	
<i>Cystoseira trinodis</i> (Forssk.) C. Agardh, 1820	01, 09, 14, 23, 31, 37, 45
<i>Hormophysa cuneiformis</i> (Gmelin) Silva, 1897	14
Sargassaceae	
<i>Sargassum decurrens</i> (R. Brown ex Turner) C. Agardh, 1820	09, 16, 37
<i>Sargassum oligocystum</i> Montagne, 1845	09, 16, 25, 30, 37, 45
<i>Sargassum polycystum</i> C. Agardh, 1824	38, 45
<i>Turbinaria gracilis</i> Sonder, 1845	01, 45, 64
<i>Turbinaria ornata</i> (Turner) J. Agardh, 1848	03, 38, 42, 58
RHODOPHYTA	
GONIOTRICHALES	
Goniotrichaceae	
<i>Stylonema alsidii</i> (Zanardini) Drew, 1956	37
ERYTHROPELTIDALES	
Erythrotrichiaceae	
<i>Erythrotrichia carnea</i> (Dillwyn) J. Agardh, 1883	45
ACROCHAETIALES	
Acrochaetiaceae	
<i>Acrochaetium microscopicum</i> (Nägeli ex Kütz.) Nägeli, 1858	45
<i>Acrochaetium savianum</i> (Meneghini) Nägeli, 1862	46

Species	Site Number*
NEMALIALES	
Galaxauraceae	
<i>Galaxaura marginata</i> (J. Ellis and Sol.) J.V. Lamour., 1816	04, 13, 27, 32, 44, 53, 57
<i>Galaxaura obtusata</i> (J. Ellis and Sol.) J.V. Lamour., 1816	27, 56
<i>Galaxaura rugosa</i> (J. Ellis and Sol.) J.V. Lamour., 1816	01, 03, 09, 16, 31, 32, 37, 45
<i>Scinaia tsinglanensis</i> Tseng, 1941	56
<i>Tricleocarpa cylindrica</i> (J. Ellis and Sol.) Huisman and Borowitzka, 1990	06, 09, 32
Liagoraceae	
<i>Ganonema farinosum</i> (J.V. Lamour.) K.C. Fan and Yung C. Wang, 1974	25, 48
<i>Ganonema pinnatum</i> (Harv.) Huisman, 2002	47
<i>Ganonema borowitzkae</i> Huisman, 2002	38
<i>Liagora ceranoides</i> J.V. Lamour., 1816	14
<i>Liagora divaricata</i> Tseng, 1941	68
<i>Liagora valida</i> Harv., 1853	18
<i>Patenocarpus paraphysiferus</i> Yoshizaki, 1987	45, 47
<i>Yamadaella caenomyce</i> (Decne.) Abbott, 1970	03, 45
<i>Trichogloea requienii</i> (Mont.) Kütz., 1847	13, 16
GELIDIALES	
Gelidiaceae	
<i>Pterocladia caerulescens</i> (Kützling) Santelices and Hommersand, 1997	39
Gelidiellaceae	
<i>Gelidiella acerosa</i> (Forssk.) Feldmann and Hamel, 1934	01, 21, 37
GRACILARIALES	
Gracilariaceae	
<i>Gracilaria blodgettii</i> Harvey, 1853	68
<i>Gracilaria canaliculata</i> Sonder, 1871	03, 46, 48
<i>Gracilaria salicornia</i> (C. Agardh) Dawson, 1954	02, 07, 17, 23, 62
<i>Gracilaria urvillei</i> (Mont.) Abbott, 1991	06, 48
BONNEMAISONIALES	
Bonnemaisoniaceae	
<i>Asparagopsis taxiformis</i> (Delile) Trevisan, 1845	01, 09, 11, 16, 18, 23, 25, 31, 37, DA2/99/62
CORALLINALES	
Corallinaceae	
<i>Amphiroa foliacea</i> J.V. Lamour., 1824	22, 25, 32
<i>Amphiroa fragilissima</i> (L.) J.V. Lamour., 1816	22
<i>Haliptilon roseum</i> (Lamarck) Garbary and Johansen, 1982	14
<i>Jania adhaerens</i> J.V. Lamour., 1816	69
CERAMIALES	
Ceramiaceae	
<i>Aglaothamnion cordatum</i> (Børgesen) Feldmann-Mazoyer, 1941	55
<i>Anotrichium tenue</i> (C. Agardh) Nägeli, 1862	37
<i>Balliella subcorticata</i> (Itono) Itono and Tanaka, 1973	39, 46
<i>Centroceras clavulatum</i> (C. Agardh) Montagne, 1846	59
<i>Ceramium affine</i> Setchell and Gardner, 1930	34, 47
<i>Ceramium fimbriatum</i> Setchell and Gardner, 1924	59

Species	Site Number*
<i>Ceramium flaccidum</i> (Harv. ex Kütz.) Ardissonne, 1871	37, 43
<i>Ceramium isogonum</i> Harv., 1855	11
<i>Ceramium macilentum</i> J. Agardh, 1894	59, 66
<i>Ceramium borneense</i> Weber-van Bosse, 1923	46
<i>Crouania attenuata</i> (C. Agardh) J. Agardh, 1842	38
<i>Griffithsia metcalfii</i> Tseng, 1942	66
<i>Monosporus indicus</i> Børgesen, 1931	56
<i>Seirospora orientalis</i> Kraft 1988	37
<i>Spyridia filamentosa</i> (Wulfen) Harv., 1833	11, 25, 62
<i>Wrangelia</i> sp.	06, 11, 17, 23, 28
Dasyaceae	
<i>Dasya</i> sp.	06, 19, 23, 31, 45
<i>Heterosiphonia crassipes</i> (Harv.) Falkenb., 1901	06, 11, 45, 51, 62, 68
Delesseriaceae	
<i>Calloglossa leprieurii</i> (Montagne) Martens, 1869	62
<i>Cottoniella filamentosa</i> (Howe) Børgesen, 1920	39, 40
<i>Cottoniella amamiensis</i> Itono, 1972	69
<i>Hypoglossum caloglossoides</i> Wynne and Kraft, 1985	59
<i>Martensia fragilis</i> Harv., 1854	11, 31
<i>Platysiphonia delicata</i> (Clemente) Cremades, 1990	47
<i>Taenioma perpusillum</i> (J. Agardh) J. Agardh, 1863	66
Rhodomelaceae	
<i>Acanthophora spicifera</i> (Vahl) Børgesen, 1910	07, 11, 17, 19, 23, 31, 45, 51
<i>Bostrychia radicans</i> (Montagne) Montagne, 1842	62
<i>Chondria armata</i> (Kütz.) Okamura, 1907–1909	05, 17, 21, 48, 70
<i>Chondria dangeardii</i> Dawson, 1954	44
<i>Chondria</i> sp.	68
<i>Chondrophycus papillosa</i> (C. Agardh) Garbary and Harper, 1998	03, 48
<i>Digenea simplex</i> (Wulfen) C. Agardh, 1822	07, 14, 41, 45, 47, 66
<i>Echinophycus minutus</i> Huisman, 2001	DA2/99/32
<i>Herposiphonia secunda</i> (C. Agardh) Ambronn, 1880	37
<i>Laurencia majuscula</i> (Harv.) Lucas 1935	62
<i>Leveillea jungermannioides</i> (Hering and G. Martens) Harv., 1855	03, 23, 33, 44
<i>Osmundaria melvillii</i> (J. Agardh) R.E. Norris, 1991	48
<i>Polysiphonia ferulacea</i> Suhr ex J. Agardh, 1863	48
<i>Spirocladia barodensis</i> Børgesen, 1933	65
<i>Tolypocladia calodictyon</i> (Harv. ex Kützing) Silva, 1952	06, 11
<i>Tolypocladia glomerulata</i> (C. Agardh) F. Schmitz, 1897	11, 61
RHODYMENIALES	
Champiaceae	
<i>Champia compressa</i> Harv., 1838	46
<i>Champia parvula</i> (C. Agardh) Harveye, 1853	11
<i>Champia stipitata</i> Huisman, 2000	18
<i>Champia</i> sp.	5, 51
Lomentariaceae	
<i>Lomentaria corallicola</i> Børgesen, 1939	64
Rhodymeniaceae	
<i>Asteromenia peltata</i> (W.R. Taylor) Huisman and Millar, 1996	DA2/99/13

Species	Site Number*
<i>Ceratodictyon spongiosum</i> Zanardini, 1878	20, 25
<i>Chamaebotrys boergesenii</i> (Weber-van Bosse) Huisman, 1996	56
<i>Coelarthrum cliftonii</i> (Harv.) Kylin, 1931	DA2/99/30
<i>Coelarthrum opuntia</i> (Endl.) Børgesen, 1937	DA2/99/29
<i>Coelothrix irregularis</i> (Harv.) Børgesen, 1928	14, 21
<i>Gelidiopsis intricata</i> (C. Agardh) Vickers, 1905	20, 29
GIGARTINALES	
Dumontiaceae	
<i>Dudresnaya hawaiiensis</i> R.K.S. Lee, 1963	50
<i>Gibsmithia hawaiiensis</i> Doty, 1963	27, 65
Hypneaceae	
<i>Hypnea cornuta</i> (Kützling) J. Agardh, 1851	19
<i>Hypnea pannosa</i> J. Agardh, 1847	01, 10, 29
<i>Hypnea boergesenii</i> Tanaka, 1941	48
Nemastomataceae	
<i>Predaea weldii</i> Kraft and Abbott, 1971	22, 23, 46
Peyssonneliaceae	
<i>Peyssonnelia capensis</i> Montagne, 1847	39, 40, 43, 44, 46
Rhizophyllidaceae	
<i>Portieria hornemannii</i> (Lyngbye) P.C. Silva, 1987	03, 05, 06, 08, 09, 13, 16, 18, 22, 25, 27, 34, 40, 41, 42, 43, 46, 53, 58, 67
Schizymeniaceae	
<i>Platoma cyclocolpum</i> (Montagne) F. Schmitz, 1894	50
<i>Titanophora weberae</i> Børgesen, 1943	39, 40, 46, 56, 65, 69, 76
Sebdeniaceae	
<i>Sebdenia flabellata</i> (J. Agardh) Parkinson, 1980	47, 48, 52, 65, 76
Solieriaceae	
<i>Betaphycus speciosum</i> (Sond.) Doty, 1996	48
<i>Eucheuma denticulatum</i> (N.L. Burman) Collins and Hervey, 1917	10, 48
CYANOPHYTA	
Mastigocladaceae	
<i>Brachytrichia quoyii</i> (C. Agardh) Bornet and Flahault, 1886	51
Phormidiaceae	
<i>Symploca hydnoidea</i> (Harvey) Kütz., 1849	46
Oscillatoriaceae	
<i>Blennothrix lyngbyacea</i> (Kütz.) Anagnostidis and Komarek, 1988	70
<i>Lyngbya confervoides</i> C. Agardh, 1824	40, 41
<i>Lyngbya semiplena</i> (C. Agardh) J. Agardh, 1842	48

Species

Site Number*

MAGNOLIOPHYTA

Hydrocharitaceae

<i>Enhalus acoroides</i> (L.f.) Royle, 1839	14
<i>Thalassia hemprichii</i> (Ehrenb.) Aschers., 1871	03, 10, 11, 31, 45, 48, 51, 62, 66
<i>Halophila decipiens</i> Ostenfeld, 1902	42, DA2/99/38, DA2/99/66, DA2/99/67, DA2/99/95-97
<i>Halophila minor</i> (Zollinger) Hartog, 1957	54, 62
<i>Halophila ovalis</i> (R.Br.) J.D. Hooker, 1858	37, 41, 44, 45, 51, 53, 58, 64

Potamogetonaceae

<i>Halodule uninervis</i> (Forssk.) Aschers., 1882	07, 11, 31, 45, 51, 62
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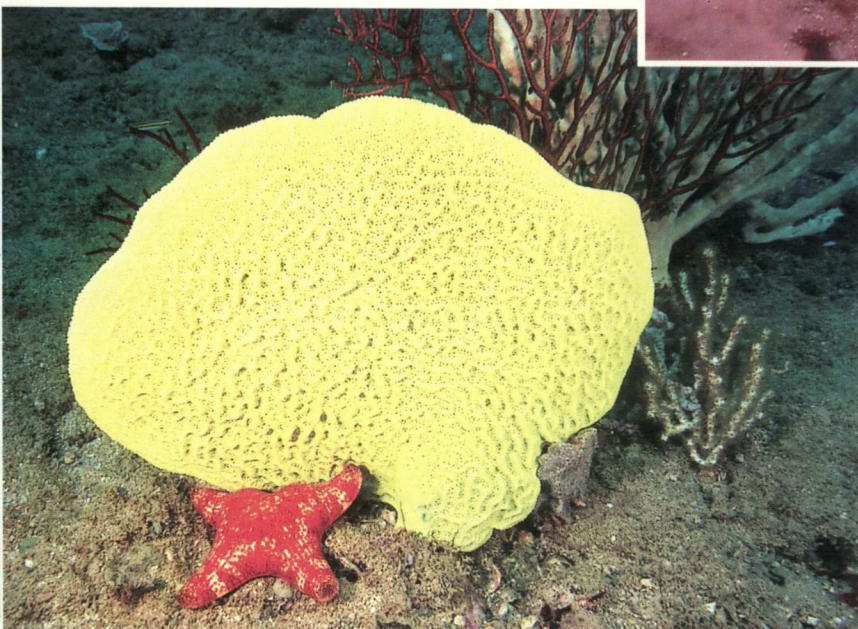
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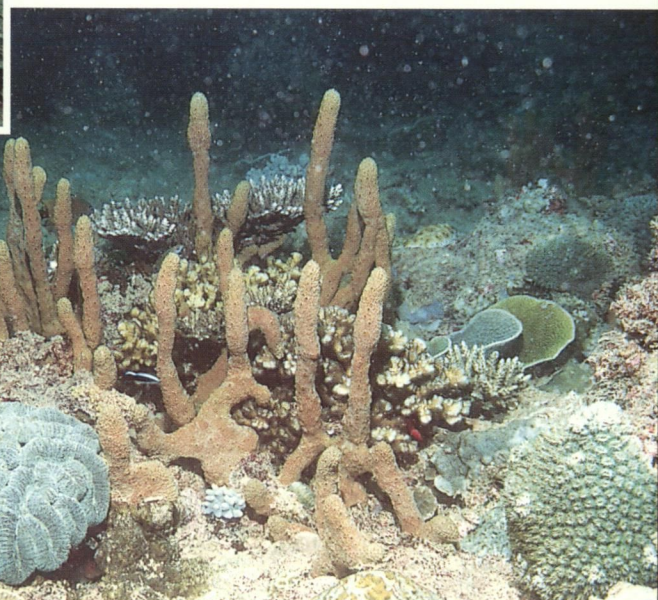
Theonella levior, in this study recorded for the first time from the Dampier Archipelago. Photograph: Jane Fromont, WA Museum.



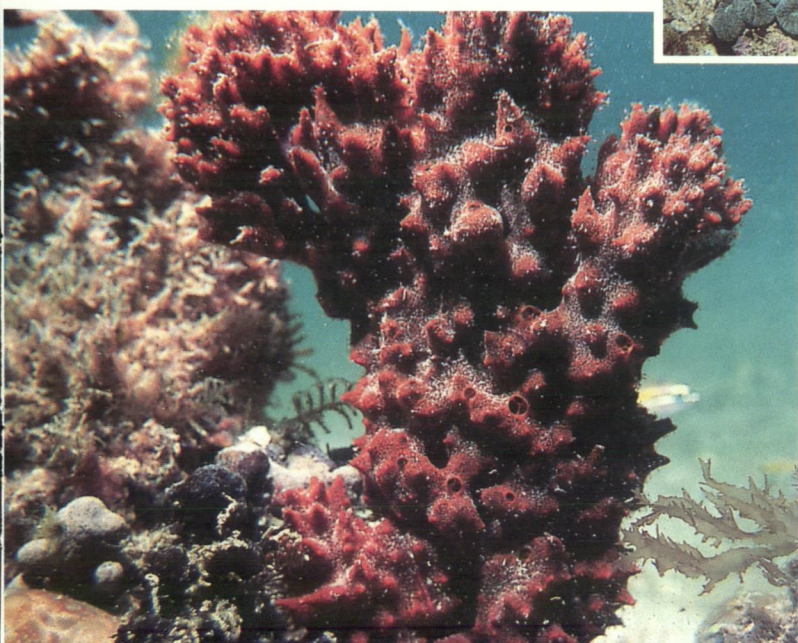
Ianthella flabelliformis in a sponge garden habitat. Photograph: Clay Bryce, WA Museum.



Amphimedon cf. *paraviridis* on a shallow coral reef. Photograph: Susan Morrison, WA Museum.



Mycale sp. 6, a tall brown sponge conspicuous on the reefs of the archipelago. Photograph: Jane Fromont, WA Museum.



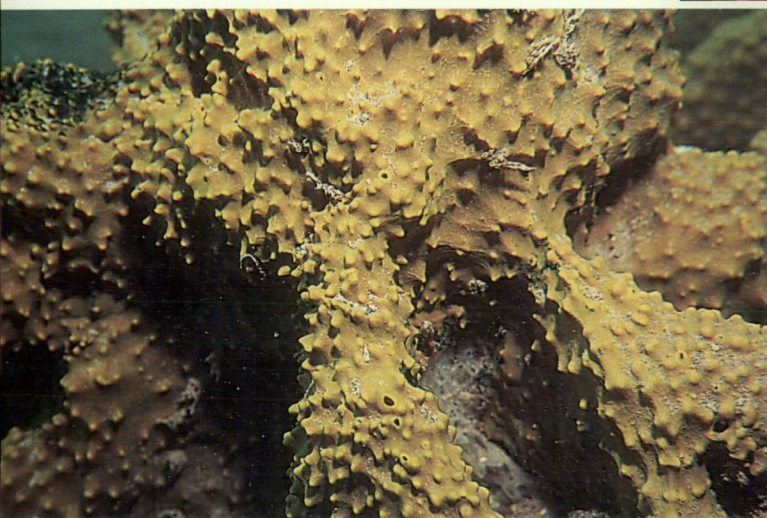
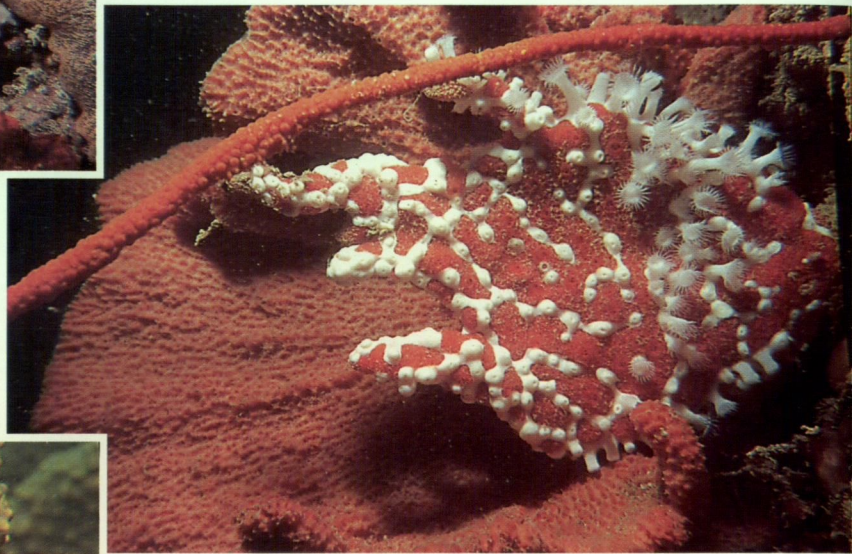
A tray of sponges waiting for processing after a dive. Photograph: Jane Fromont, WA Museum.





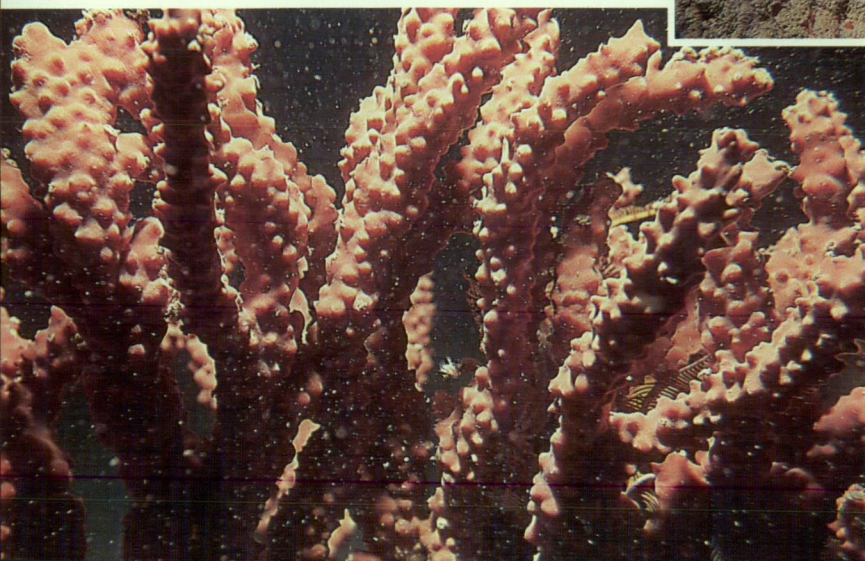
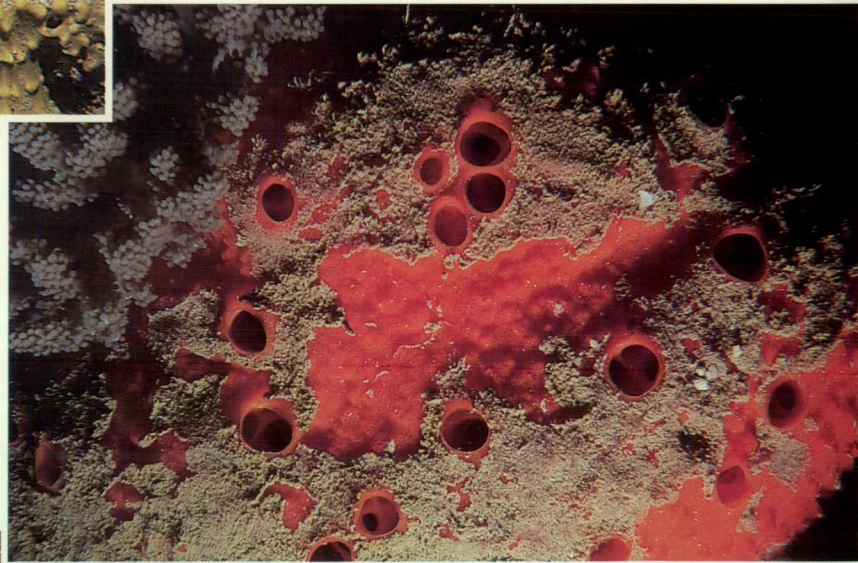
Hymeniacidon sp. 2, a brilliant red sponge that encrusts over reefs. Photograph: Jane Fromont, WA Museum.

Reniochalina stalagmitis (background) and *Trikentrion flabelliforme* covered in a white zoanthid. Photograph: Jane Fromont, WA Museum.



Pseudoceratina cf. *verrucosa*, a rich yellow and thickly encrusting sponge common on the reefs of the archipelago. Photograph: Jane Fromont, WA Museum.

In the present study, *Laxosuberites proteus* is recorded for the first time from the Dampier Archipelago. Photograph: Jane Fromont, WA Museum.



Clathria (*Thalysias*) *abietina* is found associated with reefs throughout tropical Australia. Photograph: Jane Fromont, WA Museum.