

Part VI

Echinoderms

L.M. Marsh*

Abstract

The echinoderm fauna of the Rowley Shoals, Scott and Seringapatam Reefs (atolls arising from the depressed shelf edge off north-western Australia) is characteristic of oceanic reefs surrounded by clear, deep oceanic water.

Sampling sites included reef flat zones, outer slopes with differing exposures to wave action, lagoon knolls and soft substrates.

A total of 132 species is recorded, 117 from Scott and Seringapatam Reefs and 90 from the Rowley Shoals; 14 of these, excluding Holothurioidea, are new records for Western Australia (*Oxycomanthus bennetti*, *O. comanthipinna*, *Stephanometra indica*, *S. spicata*, *Decametra parva* and *Dorometra nana*; *Macrophiothrix aspidota*, *M. demessa*, *Ophiothrix* (*Keystonea*) *nereidina*, *Ophiomastix palaoensis*, *Ophiarachnella snelli* and *Ophioconis cupida*; *Parasalenia poehli* and *Fibularia ovulum*).

Three-quarters of the echinoderms are common between the Rowley Shoals and Scott Reef, but the latter apparently has a richer echinoderm fauna which may be due to greater proximity to the Indonesian archipelago. The fauna consists almost entirely of widespread Indo-West Pacific species together with a few which have a more restricted distribution to the north of Australia.

Background and discussion

The echinoderm fauna of the atolls off the north-western Australian coast was entirely unknown until recent years, when several small collections from the Rowley Shoals were deposited in the Western Australian Museum. Scott Reef was sampled by the USSR RV *Kallisto* expedition (1978) but no data are available on the collections. Echinoderms were collected at Seringapatam Reef by the USSR RV *Bogorov* expedition over three days in October 1978. Voucher specimens of 21 species, collected by B.R. Wilson during this expedition, were

* Western Australian Museum, Francis Street, Perth, Western Australia 6000.

deposited in the Western Australian Museum. The RV *Bogorov* occupied 12 stations, four on the reef front on the north, north-east, east and south-east sides from 1.5 to 65 m; three on the intertidal reef flat on the north-east and east sides; one on the back reef and lagoon on the east side and four in the lagoon on the north-east; east and south-east sides, 2 to 22 m. The collection was listed in an unpublished report to the Department of Foreign Affairs, Canberra by L.M. Marsh and F.W.E. Rowe. Wilson (1985) lists 20 of the commoner reef flat species. One species only, *Celerina heffernani*, collected by the RV *Bogorov* expedition was not subsequently found by the Western Australian Museum expedition at either Scott or Seringapatam Reefs.

The present collections from Scott and Seringapatam Reefs were made from 10 reef flat sites, five lagoon sites (with scuba) and six sites on the outer reef slopes (with scuba), 21 sites in all (described in Part I, Appendix Table 3 and Figures 7, 8). The 1982 Rowley Shoals collections were made from five reef flat sites (four on Clerke Reef and one on Mermaid Reef), eight lagoon sites (two at Clerke Reef and one at Mermaid Reef, by scuba diving and snorkelling and five by dredging at Clerke Reef) and three outer reef slope sites (6-30 m) at Clerke Reef. Low tide collections and weed washings were made at Bedwell Island (Clerke Reef), making a total of 17 sites (described in Part I, Appendix Table 1 and Figures 3, 4).

In all, 132 species of echinoderms are recorded, 117 from Scott/Seringapatam Reefs and 90 from the Rowley Shoals. This includes 42 species found at Scott Reef and not at the Rowley Shoals and 15 species found at the Rowley Shoals and not at Scott Reef. Marsh and Marshall (1983), using data from the Western Australian Museum 1982 Rowley Shoals expedition, the *Bogorov* collections from Seringapatam and Ashmore Reefs and material in the Western Australian Museum, listed 39 new Western Australian records of asteroids, echinoids and ophiuroids from the offshore reefs, with a further six new records from inshore reefs and the north-west coast. Thirty-four of these new records were from the Rowley Shoals and Seringapatam Reef. An additional 14 species (excluding Holothurioidea) are here recorded for the first time from Western Australia. The lists include data for all material in the Western Australian Museum from the Rowley Shoals and Scott and Seringapatam Reefs.

A numerical comparison of echinoderms found at the Rowley Shoals and Scott/Seringapatam Reefs (Table 1) shows a rather low number of species in common between the two areas, ranging from 50% for the echinoids to 65% for the asteroids (56.8% overall). However, this comparison is biased by the large number of species recorded from only one site, often represented by a single specimen, whose collection would be influenced by chance. If species represented by a single record are excluded (Table 2) there is a very strong similarity between the echinoderm faunas of the two reef groups (75.0% in common). However, the difference of 27 species between the two areas does seem to in-

dicating a genuinely richer fauna at Scott and Seringapatam Reefs which may be due to their greater proximity to the Indonesian archipelago.

It must be emphasised that these records are based on very limited collecting in both areas although an attempt was made to sample as many habitats as possible. Undoubtedly further detailed collecting will reveal additional species, particularly from the soft substrates.

The echinoderm fauna of the Rowley Shoals and Scott and Seringapatam Reefs consists almost entirely of widespread Indo-West Pacific species together with a few with a more restricted distribution to the north of Australia. No species endemic to north-western Australia was found, in contrast to the inshore and shelf areas where 13% of the echinoderm fauna is endemic (Marsh and Marshall 1983, and Rowe 1985).

Crinoidea

The crinoid fauna is small with a total of 17 species, 16 at Scott/Seringapatam Reefs and 10 species at the Rowley Shoals. Six species are recorded from Western Australia for the first time, marked by a • in the tables. For comparison, in Indonesia, 38 species were collected by the author from coral reefs of the northern Moluccas during an expedition of three weeks duration and a total of 91 species of crinoids are recorded from shallow water in the Indo-Malayan region (Clark and Rowe 1971). All the species found on the north-western Australian atolls also occur in Indonesia.

On the reef flats *Lamprometra palmata* is the most abundant species; it is cryptic during the day, emerging at dusk, on the rising tide, to feed. *Stephanometra indica*, *Comanthus* spp. and *Clarkcomanthus* spp. were the most common crinoids amongst corals in the back reef coral zone. *Oxycomanthus bennetti*, a large and conspicuous species, was not found by the Western Australian Museum expedition at the Rowley Shoals, and is recorded there only from a photograph, whereas it was moderately common at Scott Reef, perched on coral pinnacles on the reef slopes. *Decametra parva* was moderately common on gorgonians on the outer reef slope at 10-20 metres.

Comasterid nomenclature follows Rowe *et al.* (1986).

Asteroidea

Twenty-three species of Asteroidea are recorded, 21 at Scott and Seringapatam Reefs and 17 at the Rowley Shoals. Two species found at Rowley Shoals were not found at Scott Reef and six species found at Scott or Seringapatam Reefs were not found at the Rowley Shoals. The 1984 Scott Reef collections have not added any species to the nine recorded for the first time in Western Australia by Marsh and Marshall (1983) from offshore reefs.

Little significance is attached to the differences between the reefs which may be accounted for by patchiness in distribution and the limited collecting at both reefs e.g. *Ophidiaster granifer*, moderately common on the reef flat near Sandy

Islet, South Scott Reef, was found nowhere else on Scott Reef.

Most of the asteroids are widely distributed Indo-West Pacific oceanic species including five (*Choriaster granulatus*, *Asteropsis carinifera*, *Celerina heffernani*, *Fromia milleporella* and *Ophidiaster hemprichi*) which have not been found elsewhere in Western Australia and one (*Dactylosaster cylindricus*) collected only once previously (at North West Cape). Two species (*Fromia eusticha* and *Disasterina abnormalis*) have a restricted tropical distribution, the former found in the Philippines, Indonesia and New Guinea, the latter in north-eastern Australia and New Caledonia. *Ophidiaster cribrarius*, apparently rare at the Rowley Shoals was moderately common at four sites at Scott Reef and occurs as far south as the Houtman Abrolhos where it is again moderately common.

At both Scott Reef and the Rowley Shoals the most common reef flat species are *Linckia laevigata*, *Nardoa tuberculata* and *Echinaster luzonicus*. An undetermined species of *Echinaster* was found at two sites on a sheltered reef slope at Scott Reef. At both the Rowley Shoals and Scott and Seringapatam Reefs *Acanthaster planci* is rare. A single specimen was recorded from the Rowley Shoals and two specimens were found at Scott Reef.

Ophiuroidea

Forty-two species of Ophiuroidea were collected, 36 from Scott and Seringapatam Reefs and 28 from the Rowley Shoals. Fourteen species were found at Scott Reef but not at the Rowley Shoals while seven species found at the Rowley Shoals were not found at Scott Reef. Most are widespread Indo-West Pacific species but two have a more restricted distribution: *Ophiocoma anaglyptica*, found from the central and western Pacific to Indonesia, Christmas and Cocos-Keeling Islands (the latter three records based on specimens in the Western Australian Museum collection), and *Ophioconis cincta*, found from Indonesia and the Philippines to Palau and northern Australia. Six species are here recorded for the first time in addition to the 16 recorded from these reefs by Marsh and Marshall (1983).

The reef flats and back reef areas have the richest ophiuroid fauna of all areas sampled. The most abundant reef flat species are *Ophiomastix annulosa*, *Ophiocoma erinaceus* and *Macrophiothrix longipeda*. A very large species, *Ophiarachna incrassata*, moderately common at some sites at Scott and Seringapatam Reefs, was not found at the Rowley Shoals. *Ophiocoma anaglyptica* was only found near the outer edge of the reef flats, among crustose coralline algae.

The lagoon knolls have a small echinoderm fauna but single specimens of seven species, not found elsewhere, were collected from this habitat at Scott Reef: two species of *Ophiactis*, *Ophiothrix (Keystonea) nereidina*, *Ophiomastix palaoensis*, *O. variabilis*, *Ophiarachnella snelli* and *Ophioconis cupida*. Of these only *Ophiomastix variabilis* was also found at the Rowley Shoals.

Few species were found on the outer slopes, the most common were *Ophiothrix (Acanthophiothrix) purpurea* and *Ophiothela danae* both of which live entwined amongst gorgonians.

Echinoidea

Twenty-two species of Echinoidea were recorded, 19 from Scott and Seringapatam Reefs and 14 from the Rowley Shoals. Eight species were found at Scott Reef but not at the Rowley Shoals and three species found at the Rowley Shoals were not collected from Scott Reef. Two species are here recorded for the first time from Western Australia in addition to the nine recorded from these reefs by Marsh and Marshall (1983). An undetermined, possibly undescribed, species of *Schizaster* from Scott Reef has not been found previously in Western Australia.

Most of the echinoids are widespread Indo-West Pacific species but two species usually common on coral reefs were rarely found. These were *Diadema setosum*, found only once at Scott Reef, and *Tripneustes gratilla*, found rarely at both Scott Reef and the Rowley Shoals although both species are frequently found on coral reefs elsewhere in Western Australia. *Echinometra mathaei* and *Echinothrix calamaris* are common and *E. diadema* locally common (on the reef flats near Sandy Islet, Scott Reef). *Metalia spatagus* is abundant at Scott Reef, and near Bedwell Island at Clerke Reef, in intertidal sandy areas while *M. dicrana* was found at several sites at the Rowley Shoals.

Holothurioidea

Twenty-eight species of holothurians were found, 25 at Scott Reef and 21 at the Rowley Shoals. Seven species found at Scott Reef were not collected from the Rowley Shoals and three found at the Rowley Shoals were not collected from Scott Reef. Most are widespread Indo-West Pacific species but a few have not been found previously in Western Australia and will be discussed elsewhere (Rowe 1985).

Several bêche-de-mer species were abundant at the Rowley Shoals, particularly on the broad western reefs, where a distinct zonation of holothurians across the reef was evident. In the back reef area, on sand amongst staghorn *Acropora*, *Thelenota ananas* was common and at a higher level of the back reef *Stichopus chloronotus* was abundant. *Holothuria atra* was abundant on the reef flat with *Actinopyga mauritiana* on the outer reef flat. *Holothuria (Microthele) nobilis*, the most highly-regarded bêche-de-mer species, was moderately common at two sites on Clerke Reef in the Rowley Shoals but very uncommon at Scott Reef where this species is selectively fished by visiting Indonesians.

Thelenota anax is included in the list on the evidence of a photograph taken at Imperieuse Reef in the Rowley Shoals. Ashmore Reef is the only locality at which this species has previously been found in Western Australia.

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Table 1 A comparison of the total number of echinoderm species found in the two reef areas and the species in common.

	Rowley Shoals	Scott/Seringapatam Reefs	Species in common and (%)	Total spp.
Crinoidea	10	16	9(52.9)	17
Asteroidea	17	21	15(65.2)	23
Ophiuroidea	28	36	22(52)	42
Echinoidea	14	19	11(50)	22
Holothurioidea	21	24	18(64.3)	28
Total echinoderms	90	117	75(56.8)	132

Table 2 A comparison of echinoderm species excluding single records except where a species in common occurs at two or more stations in one reef group.

	Rowley Shoals	Scott/Seringapatam Reefs	Species in common and (%)	Total spp.
Crinoidea	8	14	9(64.3)	14
Asteroidea	12	16	13(76.5)	17
Ophiuroidea	17	24	19(79.2)	24
Echinoidea	11	16	11(57.9)	19
Holothurioidea	12	12	14(100)	14
Total echinoderms	60	82	66(75.0)	88

List of Echinoderms

Key to symbols

Numbers = sampling stations (see Part I, Figures 3, 4, 5, 7 and 8; Appendix Tables 1 and 3)

- = New record for Western Australia
- = New record in Marsh and Marshall (1983) published without full data
- V = Visual record
- P = Photographic record
- X = Collection without precise locality
- B = R.V. *Bogorov* collection, Seringapatam Reef

	Rowley Shoals	Scott/Seringapatam Reefs
Crinoidea		
COMASTERIDAE		
<i>Comanthus briareus</i> (Bell, 1882)	-	3, 4
<i>C. gisleni</i> Rowe <i>et al.</i> , 1986	6, 14	7
<i>C. parvicirrus</i> (Müller, 1841)	-	1, 17, 20
<i>C. wahlbergi</i> (Müller, 1843)	-	1, 3, 17
<i>Clarkcomanthus littoralis</i> (Carpenter, 1888)	-	11, 19
<i>C. luteofuscum</i> (H.L. Clark, 1915)	1, 2, 5, 10, 11	3
● <i>Oxycomanthus bennetti</i> (Müller, 1841)	P	3, 4, 12
● <i>O. comanthipinna</i> (Gislen, 1922)	-	15
<i>O. sp. aff. mirus</i> Rowe <i>et al.</i> , 1986	-	7, 19
<i>Comaster multifidus</i> (Müller, 1841)	11	1, 3
MARIAMETRIDAE		
<i>Lamprometra palmata</i> (Müller, 1841)	6, 7, 10, 11, 12	2, 7, 11, 17, 19, 21
● <i>Stephanometra indica</i> (Smith, 1876)	2, 5, 7, 10, 11, 12	2, 3, 7, 17, 19
● <i>S. spicata</i> (Carpenter, 1881)	2, 11	11, 16
COLOBOMETRIDAE		
● <i>Decametra parva</i> (A.H. Clark, 1912)	6, 8	3
<i>Oligometra serrtipinna</i> (Carpenter, 1881)	-	4
ASTEROPSEIDAE		
● <i>Dorometra nana</i> (Hartlaub, 1890)	5	3, 18, 19
<i>Antedonid indet</i>	8	-
Asteroidea		
OREASTERIDAE		
○ <i>Choriaster granulatus</i> Lütken, 1869	5, 9, 11v	5, 7v, 11v, 16
<i>Culcita novaeguineae</i> Müller and Troschel, 1842	2, 5v, 11v, X	1, 2v, 3v, 7v, 9, 11, 17, 20, B
ASTEROPSIDAE		
○ <i>Asteropsis carinifera</i> (Lamarck, 1816)	11, 12	2, 11, 14, 17, 19, B
OPHIDIASTERIDAE		
○ <i>Celerina heffernani</i> (Livingstone, 1931)	-	B
○ <i>Dactylosaster cylindricus</i> (Lamarck, 1816)	5, X	-
○ <i>Fromia eusticha</i> Fisher, 1913	14	-
<i>F. indica</i> (Perrier, 1869)	-	1, 5, 9, 11, 22
○ <i>F. milleporella</i> (Lamarck, 1816)	-	2, 9, 20
<i>F. monilis</i> Perrier, 1875	1, 6, 7, 8, 9	5, 13, 16, 18, 22, B
<i>Linckia guildingi</i> Gray, 1840	11	9, 11, 17
<i>L. laevigata</i> (Linnaeus, 1758)	2, 5v, 7, 10, 11	1v, 2, 3, 7v, 9v,
	12v, X	11v, 17, 19v, 21, B
<i>L. multifora</i> (Lamarck, 1816)	2, 5, 6, 7, 8,	1, 3, 15, 16, 17, B
	14v, X	
<i>Nardoa tuberculata</i> Gray, 1840	2, 5v, 7, 10, 12v,	2, 6, 7, 11, 17,
	X	19v, B

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	Rowley Shoals	Scott/Seringapatam Reefs
<i>Ophidiaster cribrarius</i> Lütken, 1872	16	3, 11, 15, 17
<i>O. granifer</i> (Lütken, 1872)	5, 10, X	2, B
○ <i>O. hemprichi</i> Müller and Troschel, 1842	7, 10, 11, X	9, 11, 17
MITHRODIIDAE		
○ <i>Mithrodia clavigera</i> (Lamarck, 1816)	X	7
ASTERINIDAE		
<i>Asterina burtoni</i> Gray, 1840	-	2, 9, 11, 16, 17, 19, B
○ <i>Disasterina abnormalis</i> Perrier, 1875	10, X	2, 6, 9, 19
ACANTHASTERIDAE		
<i>Acanthaster planci</i> (Linnaeus, 1758)	X	18
PTERASTERIDAE		
<i>Euretaster insignis</i> (Sladen, 1882)	-	3
ECHINASTERIDAE		
<i>Echinaster luzonicus</i> (Gray, 1840)	2, 5, 7, 10, 11 16, X	1, 2, 3v, 4, 5v, 6, 7v, 9, 11v, 15, 17, 21, B
<i>Echinaster</i> sp.	-	3, 4
Ophiuroidea		
OPHIOMYXIDAE		
<i>Ophiomyxa australis</i> Lütken, 1869	10	2, 3, 9, 17
GORGONOCEPHALIDAE		
<i>Astroboa nuda</i> (Lyman, 1874)	-	3
AMPHIURIDAE		
<i>Amphipholis squamata</i> (Delle Chiaje, 1829)	1	-
OPHIACTIDAE		
<i>Ophiactis</i> sp. cf. <i>maculosa</i> von Martens, 1870	-	16
<i>O. savignyi</i> (Müller and Troschel, 1842)	1, 5, 9, 10, 12	1, 5, 16, 17, 18, 19, 21
<i>Ophiactis</i> sp.	-	16
OPHIOTRICHIDAE		
● <i>Macrophiothrix aspidota</i> (Müller and Troschel, 1842)	5	-
● <i>M. demessa</i> (Lyman, 1861)	10, 11	9, 19, 21
<i>M. longipeda</i> (Lamarck, 1816)	5, 7, 10, 11, X	1, 2, 6, 7, 9, 11, 14, 15, 17
● <i>Ophiothrix (Keystonea) nereidina</i> (Lamarck, 1816)	-	5

	Rowley Shoals	Scott/Seringapatam Reefs
<i>O. (Keystonea) propinqua</i> Lyman, 1861	11	17
<i>O. trilineata</i> Lütken, 1869	1, 2, 9, 10, 12, 15	1, 2, 3, 7, 17, 18, 20
<i>Ophiothrix</i> sp. cf. <i>savignyi</i> (Müller and Troschel, 1842)	-	1
<i>Ophiothrix</i> spp.	2	-
○ <i>O. (Acanthophiothrix) purpurea</i> von Martens, 1867	6, 8	1, 3, 4, 15
<i>O. (Acanthophiothrix) armata</i> Koehler, 1905	-	4, 17, 20
<i>Ophiothela danae</i> Verrill, 1869	6, 8, 14	1, 4, 11
OPHIOCOMIDAE		
<i>Ophiarthrum elegans</i> Peters, 1851	5, 7, 10, 12, X	2, 3, 11, 17, 19, 21
○ <i>O. pictum</i> Müller and Troschel, 1842	7, 10	6, 14, 16, 19, B
○ <i>Ophiocoma anaglyptica</i> Ely, 1944	5, 10, X	14, 19
○ <i>O. brevipes</i> Peters, 1851	7, 10	-
<i>O. dentata</i> Mu		
<i>O. dentata</i> Müller and Troschel, 1842	-	2, 7
○ <i>O. doederleini</i> de Loriol, 1899	-	17, B
○ <i>O. erinaceus</i> Müller and Troschel, 1842	2, 5, 6, 7, 10, 12, 14, 16, X	1, 2, 3, 4, 7, 9, 11, 13, 15, 17, 19, 20
○ <i>O. pica</i> Müller and Troschel, 1842	2, 5, 10, X	1, 3, 7, 9, 15, 17, 19
○ <i>O. pusilla</i> (Brock, 1888)	2, 5, 10, 12	1, 3, 7, 9, 11, 17, 19
○ <i>O. scolopendrina</i> (Lamarck, 1816)	16	2, 14
<i>Ophiocomella sexradia</i> (Duncan, 1887)	-	15
○ <i>Ophiomastix annulosa</i> (Lamarck, 1816)	5, 7, 10, 12, X	2, 11, 14, 17, 19, 21
● <i>O. palaoensis</i> Murakami, 1943	-	8
<i>O. variabilis</i> Koehler, 1905	10	5
OPHIONEREIDIDAE		
○ <i>Ophionereis porrecta</i> Lyman, 1860	7	21, B
OPHIODERMATIDAE		
○ <i>Ophiarachna affinis</i> Lütken, 1869	10	3
○ <i>O. incrassata</i> (Lamarck, 1816)	-	2, 3, 17, 19, 21, B
<i>Ophiarachnella infernalis</i> (Müller and Troschel, 1842)	-	15
<i>O. septemspinosa</i> (Müller and Troschel, 1842)	10, 12, X	2v, 3, 9, 16, 17
● <i>O. snelli</i> (A.H. Clark, 1964)	-	18
○ <i>Ophiopeza spinosa</i> (Ljungman, 1867)	2, 7, 10, 12, X	2, 3, 6, 9, 11, 17

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	Rowley Shoals	Scott/Seringapatam Reefs
● <i>Ophioconis cupida</i> Koehler, 1905	-	1, 8
○ <i>O. cincta</i> Brock, 1888	11	-
○ <i>Ophiochaeta hirsuta</i> Lütken, 1869	10, X	-
OPHIURIDAE		
○ <i>Ophiolepis cincta</i> Müller and Troschel, 1842	7	9, 19
Echinoidea		
CIDARIDAE		
<i>Eucidaris metularia</i> (Lamarck, 1816)	11, 12v, X	2, 3, 15, 17, 21, B
DIADEMATIDAE		
<i>Diadema savignyi</i> Michelin, 1845	10	11, 14, 15, 17
<i>D. setosum</i> (Leske, 1778)	-	17, 21
○ <i>Echinothrix calamaris</i> (Pallas, 1774)	7, 10, 11, X	2, 11, 17, 19
○ <i>E. diadema</i> (Linnaeus, 1758)	7, 10, X	2, 17, B
TEMNOPLEURIDAE		
<i>Mespilia globulus</i> (Linnaeus, 1758)	-	1, 17
TOXOPNEUSTIDAE		
<i>Toxopneustes pileolus</i> (Lamarck, 1816)	-	2, 11
<i>Tripneustes gratilla</i> (Linnaeus, 1758)	10, X	2, 7
PARASALENIIDAE		
<i>Parasalenia gratiosa</i> A. Agassiz, 1863	-	8, B
● <i>P. poehli</i> Pfeffer, 1887	-	3
ECHINOMETRIDAE		
<i>Echinometra mathaei</i> (de Blainville, 1825)	2, 5, 7, 12, 14v, X	1, 11, 14, 15, 17
○ <i>Echinostrephus molaris</i> (de Blainville, 1825)	2v, 5, 8	1, 17
<i>Heterocentrotus mammillatus</i> (Linnaeus, 1758)	2, 11, X	-
ECHINONEIDAE		
○ <i>Echinoneus cyclostomus</i> Leske, 1778	5, 7, 10, 11, 12, X	2, 11, 17, B
CLYPEASTERIDAE		
○ <i>Clypeaster reticulatus</i> (Linnaeus, 1758)	10	3, 21
LAGANIDAE		
<i>Peronella orbicularis</i> (Leske, 1778)	16, X	-
FIBULARIIDAE		
● <i>Fibularia ovulum</i> Lamarck, 1816	-	20
<i>F. volva</i> L. Agassiz, 1846	-	19

	Rowley Shoals	Scott/Seringapatam Reefs
SCHIZASTERIDAE		
<i>Schizaster</i> sp.	-	9, 21
BRISSIDAE		
○ <i>Brissus latecarinatus</i> (Leske, 1778)	10, 16	2, 3
○ <i>Metalia dicrana</i> H.L. Clark, 1917	A, F, 10, 16	-
○ <i>M. spatagus</i> (Linnaeus, 1758)	16	2, 3, 6, 14, 19, 21
Holothurioidea		
CUCUMARIIDAE		
<i>Pentacta lutea</i> (Sluiter, 1901)	-	22
PHYLLOPHORIDAE		
<i>Cladolabes acicula</i> (Semper, 1868)	-	11
HOLOTHURIIDAE		
<i>Actinopyga mauritiana</i> (Quoy and Gaimard, 1833)	2, 5v, 7, 10, 11v	2, 19
<i>A. obesa</i> Selenka, 1867	-	21
<i>Bohadschia argus</i> Jaeger, 1833	1, 2v, 11v, 12v	1v, 2, 3v, 9v, 14v, 17v, 19, 21v, B
<i>B. graeffei</i> (Semper, 1868)	9	15, 16v
<i>B. marmorata</i> Jaeger, 1833	6	2
<i>Labidodemas pertinax</i> (Ludwig, 1875)	-	21
<i>L. semperianum</i> Selenka, 1867	10, 11, 12	2, 9, 19
<i>Holothuria (Cystipus) inhabilis</i> Selenka, 1867	7	-
<i>Holothuria (Halodeima) atra</i> Jaeger, 1833	2, 5v, 7v, 10v, 11v, 12, X	1v, 2, 3v, 7v, 14v, 17v, 19v
<i>H. (H.) edulis</i> Lesson, 1830	2, 10v	1, 16v, 19v, 20v
<i>H. (Lessonothuria) pardalis</i> Selenka, 1867	2, X	2, 19
<i>H. (Mertensiothuria) leucospilota</i> (Brandt, 1835)	7v	2v, 3v, 14v
<i>H. (M.) pervicax</i> Selenka, 1867	-	2
<i>H. (Microthele) nobilis</i> (Selenka, 1867)	2, 12v	1, 14v, 19v, 21v
<i>H. (Platyperona) difficilis</i> Semper, 1868	7	3
<i>H. (Stauropora) olivacea</i> Ludwig, 1888	-	3
<i>H. (Thymiosycia) hilla</i> Lesson, 1830	7, 12v, X	2, 9, 17, 19
<i>H. (Thymiosycia) impatiens</i> (Forskål, 1775)	7, 10, 12	2
<i>H. (Thymiosycia) remollescens</i> Lampert, 1885	X	-
STICHOPODIDAE		
<i>Stichopus chloronotus</i> Brandt, 1835	2, 5v, 7	2, 7v, 19, B
<i>S. horrens</i> Selenka, 1867	2, 10	2

Echinoderms

	Rowley Shoals	Scott/Seringapatam Reefs
<i>S. variegatus</i> Semper, 1868	1	1
<i>Thelenota ananas</i> (Jaeger, 1833)	1, 5, 11v	1, 19v, 20v, B
<i>T. anax</i> H.L. Clark, 1921	P	-
SYNAPTIDAE		
<i>Euapta godeffroyi</i> (Semper, 1868)	-	21
<i>Synapta maculata</i> (Chamisso and Eysenhardt, 1821)	7	19
Total species	90	114

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