

## THE MARINE FAUNA OF LUNDY

### PORIFERA (SPONGES):

#### A PRELIMINARY STUDY

By

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#### INTRODUCTION

This paper is one of a series describing the distribution and abundance of marine animals around Lundy. Hiscock (1974) [1975] has provided a general introduction to the marine fauna which includes a description of the marine environment of the area, a list of abbreviations, and a map showing the place names used in the text. In this paper, we have included a map of Lundy (Fig. 1) for immediate reference of the reader.

Sponges are a conspicuous and colourful element of the marine life around Lundy, yet poorly known because of the difficulties of identification. Traditionally, identification has been based upon examination of dead material which may bear little resemblance to the living animal. However, with the advent of SCUBA diving techniques it has become possible to study living sponges in their natural environment, thereby providing the possibility of additional characters for identification purposes. In this paper we have taken full advantage of field observations made over several successive years to assist in the identification of Lundy's commoner sponges. It is hoped that this paper will stimulate closer attention to the field identification characters used, in order that their diagnostic validity may be tested. Nevertheless, for positive identification of species it is still necessary to examine the skeleton and spicules. It is anticipated that any latent geographical variation within species will become apparent as knowledge of them increases, enabling circumscription of the species to proceed.

This paper lists conspicuous and usually widely-distributed sponges of the class Demospongiae. The less-common species, including many of the encrusters, will be dealt with in a later paper. These species, although relatively little-studied, are an important component of the fauna on mobile hard substrata in the strong tidal streams off the north-east and south-east coasts, and on vertical rock surfaces. Since they are often inconspicuous, and consequently easily overlooked, they include the more unusual species within such genera as *Halicnemis*, *Endectyon*, and *Microciona*. The class Calcarea will also be included in that later paper.

#### SAMPLING AND FIELD DESCRIPTIONS

Professor Harvey explored and sampled many of the accessible rocky shores around Lundy in the late 1940's and in the 1950's. Lists of the species encountered during the earlier surveys are given in Harvey (1950, 1951). Professor Harvey has also made available his detailed field data. Since 1969, sponges have been observed and sampled during both broad descriptive surveys of littoral and sublittoral communities and during detailed survey or sampling exercises. Some of these studies are reported (Boyden, 1971; Hiscock and Hiscock, 1979 [1980]; Hiscock, 1981, 1981 [1982]). During 1978, a special effort was made by JDG and SMKS to study the ecology of sponges at a variety of sites. Detailed descriptions of field characteristics were made and features such as the morphology, texture and colour of collected

specimens noted before preservation. The Methuen 'Handbook of Colour' was used for accurate descriptions of colour in daylight. Some additional information has been extracted from species record cards and from divers' logbooks. Most records include notes on the habitat and position on the shore, or depth in the sublittoral, at which a record was made, and also a note of the abundance of the sponge. During the preparation of this paper, numerous photographs of sublittoral sites from all around the island were used to assist in the description of the sponges and of their habitat preferences.

#### DISTRIBUTION ON THE SHORE

Sponges are not a conspicuous part of open-shore communities around Lundy. Records for most species are of small numbers of individuals at a few sites. *Halichondria panicea* is the most widely distributed, followed by *Hymeniacidon perleveren*; both of these species are particularly abundant in caves, where up to 10% cover has been recorded.

It is notable that some species of sponges commonly found on the shore in the 1950's, for instance *Microcionia atrasanguinea* and *Ophlitaspongia seriata*, have not been recorded recently from Lundy.

#### DISTRIBUTION IN THE SUBLITTORAL

The sublittoral sponge fauna is rich both in variety of species and in quantity at some locations. Most sponges, particularly the large erect species, are found in the circalittoral, below the shallow well-lit areas dominated by algae which extend down to about 13m. Erect forms are particularly noticeable whilst encrusting species are generally little-seen. Table 1 lists the recorded occurrence of the most widespread sublittoral sponges around Lundy. It is clear that some sponges occur all around the island, whilst others are recorded only at a restricted range of sites. In general, erect branching species, which are confined mainly to bedrock, thrive on wave-sheltered coasts or in water depths where wave action is greatly reduced. These species may also be found in gullies and potholes on wave-exposed coasts where there is local shelter. The horizontal tops of rocks off the west coast have a sparse fauna of sponges, but *Polymastia boletiforme* is often abundant here. Other species show habitat preferences related, for instance, to the proximity of soft substrata, and *Ciocalypia penicillus* and *Polymastia mamillaris* are found usually on rocks adjacent to and often partly buried in sediment. *Adreus fascicularis* has only been recorded on gravel-scoured or gravel-covered rock off the south coast. *Amphilectus fucorum* and *Halichondria panicea* are present in the infralittoral at most sites, but are generally observed in the circalittoral only at sites exposed to strong tidal streams. *Suberites carnosus* is restricted to wave-sheltered habitats in shallow water, and to deep water (40m) off the west coast where wave action is slight, even during storms.

Species distribution in relation to depth below chart datum has been specially studied at Dead Cow Point on the west coast and at Brazen Ward on the east coast of Lundy. The depth distribution patterns that have emerged from these and other data are displayed in Fig. 2. From the observations made on bedrock below 35m it appears that some sponges such as *Axinella polypoides*, *Raspailia hispida* and *Polymastia boletiforme* may not be as abundant as in shallow water. Some patterns of distribution in relation to gross water movements have emerged (Table 1), but in general it is too early to discern the microhabitat preferences of many of these complex filter-feeding animals.

#### CHANGES IN ABUNDANCE WITH TIME

The sponge populations around Lundy appear remarkably similar from year to year and it is suspected that the majority of conspicuous species are long-lived and are thus vulnerable to over-collecting. One individual of *Thymosia guernei*, photographed in August 1981 and again in August 1983, occupied exactly the same area of rock on both occasions. However, the abundance of *Leucosolenia botryoides* has possibly decreased since the mid-to-late 1970's and some encrusting sponges known to be initial colonising species doubtless show large fluctuations in abundance. The observation that very few erect sponges occur on boulders, stones and other potentially mobile substrata suggests that growth is not generally rapid.

Also, it is notable that on the wreck of the M.V. 'Robert', which sank off the east coast in 1975, only *Dysidea fragilis*, *Scypha ciliatum*, and encrusting sponges have been found.

#### RARE AND UNUSUAL SPECIES

**Thymosia guernei.** Since it was first described from Concarneau in France by Topsent (1896), this species had not been located again until it was dredged in 1956 from the Mewstone Grounds off Plymouth (Plymouth Marine Fauna, 1957), and later at Roscoff. The first sighting by a diver was made at Lundy in 1971. Since then, divers have shown it to have a south-westerly distribution in the British Isles where it is mainly confined to offshore islands, rarely being found on the mainland.

**Axinella damicornis** has long been known as a common sponge in the Mediterranean, and more recently it has been recorded as 'very frequent' at Roscoff. It has now been located in British waters. It was first collected from Lundy in 1971 and has been found since at several sites around the island. It also has been collected from Lough Hyne, South West Ireland, in 1980 by B. E. Picton, and more recently from along the north-west coast of Ireland.

**Homaxinella subdola** was first described by Bowerbank (1866) from a fragmentary specimen collected at Guernsey. It was not recorded again until Burton (1930) described a complete specimen from Plymouth. So far, it has not been recorded outside the British Isles, for instance, from across the Channel at Roscoff. Divers have shown it to be widespread but relatively uncommon in southern Britain although its northern limit has yet to be established. Its preference for sheltered gullies (difficult sites for dredging) might explain the lack of records between 1866 and 1930.

**Adreus fascicularis** is a very rare species in Britain to judge by the few records. It was described by Bowerbank (1866) from Guernsey and was not recorded again until it was collected in 1928 from the mouth of Plymouth Harbour (Plymouth Marine Fauna, 1957). It has been recorded from Roscoff, where it appears to be more frequent in dredgings below 20m. It is not immediately recognizable as a sponge due to its partly-buried habit, and this may account for it being overlooked. Certainly, at Lundy it is a rare species, only being found in one area.

**Tethyspira spinosa** is a British species described by Bowerbank (1874) from Fowey Harbour, but not recorded again in Britain until now, despite its widespread distribution along the continental Channel coast. It is found on the shore at Roscoff. It probably has been confused with another similar-looking species called *Rhaphidostyla incisa*, first collected from Sherkin Island, south-west Ireland, and cited by van Soest (1980). *Tethyspira* was first collected at Lundy in 1971 and has been found at several other sites around the island since.

It may be that many of the so-called 'rare' species have not been regularly recorded due to the inability of earlier collecting techniques to sample rocky outcrops and gullies favoured by these sedentary animals.

#### ANNOTATED SPECIES LIST

The majority of species in this systematically-arranged list have been collected since 1969. Previous records are entirely those of Harvey (1950, 1951, unpublished field notes). Many of the species are widely distributed around Lundy and, for these sponges, a resumé of distribution and abundance data is given in Table 1. For species found at only a few sites, locations and abundance are recorded in the text. Where the abundance of a species is recorded, the notation corresponds to the following scale:

**Solitary species** (e.g. *Polymastia boletiforme*, *Cliona celata*, *Axinella polypoides*).

ABUNDANT	One or more per 0.1m <sup>2</sup> .
COMMON	One or more per 1m <sup>2</sup> .
FREQUENT	Less than one per 1m <sup>2</sup> , but more than about 20 individuals observed on a dive or during a shore search.
OCCASIONAL	About 3-20 observed.
RARE	One or two observed.

**Encrusting species** (e.g. *Amphilectus fucorum*, *Hemimycale columella*).

ABUNDANT	Large confluent colonies with more than 50% cover.
COMMON	Many small or a few large patches with 10-50% cover.
FREQUENT	Scattered patches, less than 10% cover overall.
OCCASIONAL	Scattered small patches, less than 1% cover overall.
RARE	Widely-scattered very small patches or individuals.

The systematic arrangement of species follows a classification scheme for British sponges being prepared for publication by one of us (SMKS). The concept of species adopted here is more restricted than that followed previously by many British sponge workers. For instance, some species have been separated if they show consistent differences in their field characteristics despite great similarities in internal morphology (e.g. *Raspallia hispida* and *R. ramosa*).

Because sponge literature is so scattered, special attention has been paid to citing the best species descriptions from reasonably accessible publications. The first reference given in full after the species name, is to the type description. A second full reference is given, where appropriate, to the author who has transferred the species to the currently-accepted genus. Any references following are to good species descriptions. The two authors most frequently quoted are Bowerbank (1866, 1874) and Arndt (1935). Bowerbank is quoted because of his specimen descriptions (1866) and illustrations of the whole animal (1874), and Arndt for details of spicule morphology and lists of synonyms. Lists of sponges from nearby areas are included in the Plymouth and Roscoff marine faunas (Plymouth Marine Fauna, 1957; Borojevic *et al.*, 1968 a).

Supplementary information (including colour photographs) on many of the species occurring around Lundy may be found in the guide to British sponges produced by the Marine Conservation Society. The species descriptions given there take account of the range of variations over a wider geographical area.

Phylum **PORIFERA**

Class **DEMOSPONGIAE**

Subclass **HOMOSCLEROMORPHA**

Order **HOMOSCLEROPHORIDA**

Family **OSCARSELLIDAE**

**Oscarella lobularis** (Schmidt, 1862)

Schmidt, 1862, p.80, as *Haliscarca*; Vosmaer, 1885 [1887], p.326.

Topsent, 1896, p.561, pl.23, figs.9-11; Arndt, 1935, p.23, fig.30.

Recorded by Harvey (1950) from under stones at Ladies Beach but has not been found since.

Subclass **TETRACTINOMORPHA**

Order **ASTROPHORIDA**

Family **PACHASTRELLIDAE**

**Dercitus bucklandi** (Bowerbank, 1858)

Bowerbank, 1858, p.288, as *Halina*; Gray, 1867, p.542

Bowerbank, 1866, p.226; 1874, p.95, pl.38, figs.9-12, as *Hymeniacion*; 1874, p.346, pl.92, fig.8, as *Battersbyia*; Topsent, 1896, p.528.

A distinctive dark brown or purple-black crevice-loving shallow water sponge, which can be easily overlooked or mistaken for an alga. It has a flat even surface patterned with irregular 'stretch-marks'. Surface looks slimy but has a rough feel.

Present in a crevice under an overhang at a depth of 3m south of Surf Point.

Family **GEODIIDAE**

**Pachymatisma johnstonia** (Bowerbank [in] Johnston, 1842)

(Plate 1a)

Bowerbank [in] Johnston, 1842, p.198, as *Halichondria*; Johnston, 1842, p.244.

Bowerbank, 1866, p.51; 1874, p.17, pl.8, figs.1-7; Topsent, 1894, p.321, pl.11, figs.4, 5, pl.16, figs.1-5; Arndt, 1935, p.28, fig.39.

A solid, lobular, grey or grey-purple clean smooth-surfaced sponge (up to 25cm across) which is firmly attached by a broad base to clean bedrock. Clusters of round

open oscules, with slightly raised light-coloured rims, occur at the summits of the lobes. The surface around the oscules may be darkened by the presence of algae, and specimens in dark crevices may have a light colouration.

Rare or occasional under overhangs and on vertical rock in the circalittoral all around the island, but recorded as common at some sites on the south and west coasts. Present in shallow water in Gannet's Bay and south of Rat Island. Found in crevices and shaded overhangs in the kelp forest at the Knoll Pins. Recorded on the carapace of the crab *Dromia personata* off the east coast.

Order HADROMERIDA

Family CHONDROSIIDAE

**Thymosia guernei** Topsent, 1896

(Plate 1b)

Topsent, 1896, p.574, pl.23, figs.6-8.

An eye-catching off-white spreading, sometimes lobular, encruster which occurs in patches (up to 30cm across) usually on vertical rock. It has an uneven but smooth surface often pitted with the mud-lined burrows of the polychaete *Polydora*. The small scattered oscules may be occupied by crustaceans and brittle-stars. It has a characteristic solid rubbery texture and lacks a hard internal skeleton.

Individuals have been recorded in the circalittoral mainly from the west and south coasts, although they have been found at east-coast sites.

Family TETHYIDAE

**Tethya aurantium** (Pallas, 1766)

(Plate 1c)

Pallas, 1766, p.357, as *Alcyonium*; Gray, 1848, p.2.

Bowerbank, 1866, p.92; 1874, p.38, pl.15, figs.17-22, as *Tethya lyncurium*; Topsent, 1900, p.294, pl.8, figs.8, 9, 14, 15, as *Tethya lyncurium*; Arndt, 1935, p.30, fig.43.

A distinctive yellow to orange globular sponge (diameter up to 5cm) whose upper surface is typically covered with a layer of silt. The surface appearance changes due to slow expansions and contractions. When expanded small islands of silt-covered tissue become isolated by meandering channels; when contracted it resembles a golf-ball with a crazed surface. The sponge is firmly attached to silt-covered bedrock. Its base is sometimes reinforced by 'rooting processes'.

Rare or occasional at many locations around the island but noted as frequent below 12m at Brazen Ward. Normally on vertical surfaces although it has been seen on upward facing rock in deeper water.

Family SUBERITIDAE

**Suberites carnosus** (Johnston, 1842)

(Plate 1d)

Johnston, 1842, p.146, pl.13, figs.7-8, as *Halichondria*; Gray, 1867, p.523.

Bowerbank, 1866, p.203; 1874, p.91, pl.36, figs.5-9, as *Hymeniacidon*; Topsent, 1900, p.233, pl.7, figs.1-5; Arndt, 1935, p.38, fig.61; Cabioch, 1968, p.216, fig.3 A-D.

A pale apricot to light-brown soft bag-like contractile species (up to 8cm long) with a stiff fleshy stalk by which it is attached to hard substrata. The asymmetrical fig-shaped, smooth, velvety body usually has one (at most 3) oscules located in a slight apical depression. The upper surface is often lightly coated with silt.

Rare or occasional on silt-covered rocks in areas sheltered from vigorous water movement. Consequently most observations are from the east coast. However, it is also found in muddy gullies on the west coast and has been recorded as frequent on open rock at a depth of 40m off Needle Rock and St. Philip's Stone.

**Suberites ficus** (Linnaeus, 1767)

Linnaeus, 1767, p.1295, as *Alcyonium*; Nardo, 1833, p.523.

Topsent, 1900, p.203, pl.5, figs.6-15, as *Ficulina*; Arndt, 1935, p.39, fig.64; Hartman, 1958, p.3, pl.1, fig.5.

A firm but compressible massive, usually lobular, sponge (up to 20cm across) varying in colour from brownish-orange to greyish-red, which is attached to hard

substrata. A few irregularly-shaped oscules are scattered on prominent parts of the smooth velvety body, which is often lightly coated with silt.

It has been recorded in sediment-rich circalittoral locations all around the island, but is found more commonly on the east coast.

[Around Lundy the common form of this species is Bowerbank's *Hymeniacion subereus*, in the past treated by British sponge workers as a synonym of *S. domuncula*.]

Family POLYMASTIIDAE

**Polymastia boletiforme** (Lamarck, 1815)

(Plate 1e)

Lamarck, 1815, p.332, as *Alcyonium*; Burton, 1959, p.11.

Bowerbank, 1866, p.62; 1874, p.23, pl.10, figs.5-8, as *P. robusta*; Bowerbank, 1866, p.58; 1874, p.20, pl.9, figs.13-16, as *P. ornata*; Bowerbank, 1866, p.61; 1874, p.23, pl.10, figs.1-4, as *P. bulbosa*; Topsent, 1900, p.147, pl.4, figs.3-7, 14, as *P. robusta*; Arndt, 1935, p.34, fig.51, as *P. robusta*; Cabioch, 1968, p.215, as *P. robusta*.

A clean-surfaced bright yellow to orange soft bulbous sponge (up to 15cm in diameter) which is firmly attached to upward-facing rock. The body surface is covered with tapering contractile papillae. The papillae, which occasionally may be subdivided, are all of approximately the same length.

Generally present from the lower infralittoral downwards but tends to extend into shallower water on the east coast. At Brazen Ward it was rare at 6m and frequent to abundant in greater depths. At Dead Cow Point it was rare at 9m and frequent to common at 10, 12 and 14m.

**Polymastia mamillaris** (Müller, 1806)

(Plate 1f)

Müller, 1806, p.44, pl.158, figs.1-4, as *Spongia*; Bowerbank, 1864, p.178.

Bowerbank, 1866, p.71; 1874, p.31, pl.12, figs.1-11; Topsent, 1900, p.131, pl.4, figs.8-13; Arndt, 1935, p.33, fig.48.

Groups of creamy-white tapering firm, semi-contractile, papillae projecting vertically from sediment first draw attention to this sponge. Its body is a spreading hard flat pad (rarely more than 1cm thick) which is firmly attached to rock just beneath the sediment. The body surface is roughened by projecting spicules which favour the build-up of both sediments and epibiota. The papillae, which are variable in number and length, are apparently less prone to subdivision than those of *P. boletiforme*.

Present at the bedrock/sediment interface at several sites around the island. It appears to be more frequent on the east coast than the west, and can be found covered by a range of sediments from mud to fine gravel. At Brazen Ward it has been recorded as rare at 10m and common at 14 and 16m; at Dead Cow Point as rare at 14m.

[*P. mamillaris* is a polymorphic species and there is always the possibility that it may be confused with several other closely related species which are less common in the British Isles.]

Family THOOSIDAE

**Cliona celata** Grant, 1826

(Plate 2a)

Grant, 1826, p.78.

Bowerbank, 1866, p.354; 1874, p.165, pl.64, figs.1-5, as *Raphyrus griffithsii*; Topsent, 1900, p.32, pl.1, figs.5, 6-9; Arndt, 1935, p.44, fig.74; Hartman, 1958, pp.16, 87, pl.1, fig.4.

A solid, massive, clean-surface bright yellow sponge (up to 40cm maximum dimension) which is firmly attached by a broad base to clean bedrock. The large round oscules with raised rims often occur in lines along ridges. The surface around the oscules can sometimes be discoloured red by algae. Distinctive retractile inhalant papillae cover the smooth flanks of the sponge, their expanded openings being covered by a gauze-like membrane. In preserved specimens, however, the papillae appear as regular depressions.

Rare to frequent in the circalittoral all around the island but only rarely seen off the west coast. Individuals have also been seen in the infralittoral at a few sites. At Brazen Ward they were rare at 4m and occasional to frequent at 8m or deeper. It appears to be most abundant where tidal streams are strong.

[The boring form of *Cliona* is comparatively rare, only having been recorded from large dead shells on sediments off the east coast, in encrusting calcareous algae ('*Lithothamnion*') at Virgin's Spring, and from a small cave at about 3m depth south of Rat Island.]

#### Order AXINELLIDA

##### Family AXINELLIDAE

#### *Axinella damicornis* (Esper, 1794)

(Plate 2c)

Esper, 1794, p.249, pl.29, as *Spongia*; Schmidt, 1864, p.47.

Topsent, 1934, p.33; Siribelli, 1961, pp.1-24.

An erect, bright sulphur-yellow arborescent sponge (up to 5cm high) with short coalescing branches, which is attached to rock by a short stalk. The surface of the flexible convoluted lamellae formed by the coalescing branches has a characteristic mealy appearance as though dusted with small yellow particles. In addition, there is a surface 'pile' of spicules which sometimes traps silt. Membranous canals can occasionally be seen converging on the oscules situated at the edge of the lamellae.

Present on circalittoral rock at a few sites all around the island. Possibly this species recorded (as 'small yellow axinellid') at 12, 14, 16 and 18m at Dead Cow Point in densities of one or more per m<sup>2</sup>. Recorded from 10m in the infralittoral south of Rat Island.

[This highly variable species could be confused with *A. verrucosa*, recorded from Roscoff but not yet from Britain.]

#### *Axinella infundibuliformis* (Linnaeus, 1759)

(Plate 2e)

Linnaeus, 1759, p.1348, as *Spongia*; Burton, 1959, p.48.

Bowerbank, 1866, p.317; 1874, p.137, pl.54, figs.1-8, as *Isodictya*; Arndt, 1935, p.90, fig.192, as *Tragosia*.

A polymorphic, creamy-white or pale yellow sponge (up to 10cm across), basically shaped like an inverted cone and attached by a robust stalk to rock. Frequently, however, the cones are incomplete and the sponge has a lamellate or fan-like appearance. The cone walls, which are firm but resilient, are of regular thickness (normally 3-4mm) with a rounded rim, and have no obvious large oscular openings on either surface. However, the inner surface is covered with numerous, regularly-arranged small but distinct round holes which function as oscules.

Recorded as rare or occasional in the circalittoral from many localities on the east coast and from gullies on the wave-exposed west coast.

[The inverted cone may provide a sheltered habitat for mobile invertebrates and accommodate sessile organisms. This species could be mistaken for *Phakellia ventilabrum*, which is a large grey sponge from deeper water with thin walls that are easily torn.]

#### *Axinella polypoides* Schmidt, 1862

(Plates 2b and d)

Schmidt, 1862, p.62, pl.6, figs.4, 4a.

Bowerbank, 1866, p.240; 1874, p.103, pl.42, figs.1-4, as *Halichondria distorta*;

Bowerbank, 1866, p.318; 1874, p.139, pl.55, figs.1-3, as *Isodictya dissimilis*;

Topsent, 1934, p.34; Arndt, 1935, p.88, fig.187, as *A. distorta*; Cabioch, 1968, pp.221-222 (key).

An erect, clean-looking, golden-yellow to brownish-orange freely-branching large sponge (up to 40cm high) which is firmly attached to rock by a thick axially-strengthened stalk. The silt-free surface of the sturdy flexible branches (up to 2cm thick) is covered by a close-set 'pile' of projecting spicules, making it velvety to the touch. Regular, closely-spaced, small inhalant openings cover the entire surface. The oscules, situated in slight depressions on the branches and the stalk, are made

obvious by a characteristic stellate pattern of membranous canals converging on them. They are often concentrated along one side of a branch. Branching is basically in one plane and is usually dichotomous but this can be obscured by secondary growth, and fusion is common.

Occasional to common on upward-facing (rarely vertical) rock all around the island, being particularly abundant in sheltered muddy sites. On the west coast, the sponge is mainly confined to open gullies or other areas sheltered from severe wave action. Occasional to common below 8m at Brazen Ward and recorded as frequent at 18m at Dead Cow Point.

[Some authorities believe that it is possible to distinguish another species (*A. dissimilis*) within the *A. polypoides* complex, but individuals attributable to this species may well be no more than stressed, malformed examples of *A. polypoides*. A number of other branched axinellids have been recorded from the continental Channel coast but not as yet from Britain.]

**Homaxinella subdola** (Bowerbank, 1866)

(Plate 2f)

Bowerbank, 1866, p.247, as *Halichondria*; Koltun, 1955, p.49.

Bowerbank, 1874, p.106, pl.43, figs.14-16, as *Halichondria*; Burton, 1930, p.504, figs.8, 9, as *Pachaxinella*.

An erect, untidy-looking pale yellow to brownish-yellow, generally clean, smooth-surfaced branching sponge (up to 15cm high) which is firmly attached to rock by a short, very hard, wiry stalk. Repeated branching in three dimensions and almost at right angles to the main vertical axis results in a bush-like growth comprised of short, bluntly-ending, sausage-shaped (sometimes irregular) branches which often coalesce along their length or fuse at contact points. Individuals often appear 'knobbly' as a result of incipient secondary growth. Medium-sized oscules are scattered along the branches and at the tips. Branches collapse if compressed.

Frequent or common in the circalittoral on the east coast and in gullies and other sheltered areas at some sites on the north, south and west coasts. Records suggest that specimens are smaller on wave-exposed coasts.

[Small individuals of *Axinella polypoides* may possibly be confused with this species in the field.]

Family HEMIASTERELLIDAE

**Adreus fascicularis** (Bowerbank, 1866)

(Plate 2g)

Bowerbank, 1866, p.110, as *Dictyocylindrus*; Gray, 1867, p.545.

Bowerbank, 1874, p.45, pl.18, figs.1-4, as *Dictyocylindrus*.

An erect dirty yellow to light brown sponge (up to 15cm high) with smooth thin antler-like attenuated branches (2mm in diameter) lying in one plane, and with a short wiry stalk and basal disc. Oscules are not apparent. Many individuals, characteristically linked by their branches (possibly also connected by stolons), form patches up to 50cm across. One or two of the branches of an individual fuse at points of contact with one or more branches of close neighbours. The cluster of individuals is often partly buried in shell-gravel at the interface with the bedrock.

Found in the circalittoral off the south coast.

**Stelligera rigida** (Montagu, 1818)

(Plate 3a)

Montagu, 1818, p.87, pl.11, fig.12, as *Spongia*; Arndt, 1935, p.86, fig.181.

Topsent, 1890, p.292, fig.'a', as *Raspallia*; Descatoire, 1969, p.18, fig.4.

An erect, brownish-yellow to brownish-orange sponge (up to 5cm high), usually with stubby coalescing branches, which is attached to rock by a short stalk. The firm, coalescing cylindrical to compressed branches have a surface 'pile' of spicules which project through the surface membrane in groups situated on minute papillae. Silt is trapped on the body surface by the spicules. Branching appears to be irregular and in three dimensions, often producing a rigid 'cauliflower head', but occasionally individuals have been found with their coalescing branches compressed into two dimensions. Oscules are not obvious.



Present on upward-facing circalittoral rock at a few sites all around the island. No records of abundance exist as yet for this species.

[It is possible that this species could be confused with *Axinella damicornis* in the field.]

***Stelligera stuposa*** (Ellis and Solander, 1786)

Ellis and Solander, 1786, p.186, as *Spongia*; Lendenfeld, 1896, p.43, pl.6, fig.52a, pl.7, fig.69a.

Bowerbank, 1866, p.116; 1874, p.47, pl.19, figs.1-7, as *Dictyocylindrus*; Arndt, 1935, p.86, fig.182; Descatoire, 1969, p.18, fig.4.

An erect brownish-yellow to brownish-orange branching sponge (up to 10cm high) which is firmly attached to rock by a thin strong stalk. The firm flexible compressed, sometimes cylindrical, obtuse-tipped branches are covered by a 'pile' of projecting spicules which traps a thin coating of silt. Branching is basically in one plane and is usually dichotomous or trichotomous, but is sometimes irregular due to secondary growth which may produce arborescent forms. The branches, which are rarely fused, have a surface that is sometimes discoloured red by algae. Oscules are not obvious.

Recorded on circalittoral rock from a few sites all around the island but is more common on the east coast where it has been recorded as frequent at Gull Rock. Occasional to common at 12m or below at Dead Cow Point.

[A syconid species of calcareous sponge is occasionally found attached to the branches. In some years the sponge may be partly covered by dense growths of the hydroid *Antennella secundaria*.]

Family RASPAILIIDAE

***Raspailia hispida*** (Montagu, 1818)

(Plate 3c)

Montagu, 1818, p.81, as *Spongia*; Topsent, 1890, p.294.

Bowerbank, 1866, p.108; 1874, p.43, pl.17, figs.1-5, as *Dictyocylindrus*; Crawshay, 1912, p.320; Arndt, 1935, p.83, fig.173.

An erect, pale brownish-yellow to ochre-yellow elegant-looking branching sponge (up to 15cm high) which is attached to rock by a strong stalk. The firm, flexible, cylindrical, sometimes compressed, obtuse-tipped branches are covered with a 'pile' of projecting spicules which traps a thin coating of silt. Branching is basically in one plane, and is usually dichotomous or trichotomous, but is sometimes irregular due to secondary growth which may produce arborescent forms. The branches are rarely fused. Inconspicuous oscules are scattered over the surface of the branches.

Occasional or frequent on upward-facing circalittoral rock at sites all around the island, but generally absent from open rock surfaces on the west coast. Present deeper than 7m and frequent below 10m at Brazen Ward.

[A syconid sponge is occasionally found attached to the branches, and bryozoans such as *Pentapora* sometimes occur around its stalk. There is as yet no satisfactory way of reliably distinguishing this species from *Stelligera stuposa* in the field. Identification *must* therefore be based on examination of spicules.]

***Raspailia ramosa*** (Montagu, 1818)

(Plate 3b)

Montagu, 1818, p.84, as *Spongia*; Topsent, 1890, p.204.

Bowerbank, 1866, p.103; 1874, p.41, pl.16, figs.6-12, as *Dictyocylindrus*; Crawshay, 1912, p.321; Arndt, 1935, p.83, fig.174.

An erect to repent, characteristically chocolate-brown, ungainly-looking branching sponge (up to 30cm high) which is attached to rock by a tough stalk. The thick, firm, flexible cylindrical branches (up to 1cm thick) are covered with a 'pile' of spicules which trap silt, frequently giving the darker-coloured branches a distinctive 'frosted' appearance. Branching is basically three-dimensional, and is usually dichotomous or trichotomous but is sometimes irregular due to secondary growth. Fusion of branches is rare. The oscules, which are scattered over the surface of the branches, show up as small silt-free patches.

Recorded on circalittoral rock (usually upward-facing, sometimes vertical) at a small number of sites all around the island, though favouring the sheltered sites of the east coast. Present deeper than 7m and frequent to common below 10m at Brazen Ward.

[A syconid sponge is occasionally found attached to the branches. It is possible that old degenerating *Axinella polypoides* individuals could be confused with this species in the field.]

**Tethyspira spinosa** (Bowerbank, 1874)

(Plate 3f)

Bowerbank, 1874, pp.274, 279, pl. 83, figs.17-22, as *Tethea*; Topsent, 1890, p.195. Topsent, 1900, p.257, pl.7, fig.7; Arndt, 1935, p.86, fig.180.

A slimy, dense but compressible sponge generally shaped like a humming top (up to 8cm across and 6cm deep) which is attached to rock by a relatively narrow base. The upper surface has a spiky appearance, somewhat similar to that of *Dysidea fragilis*, due to the surface membrane being caught up at intervals by the protruding ends of the spicule bundles. The bundles can sometimes be seen on the flanks of the sponge sweeping from the base to the upper surface. A few inconspicuous oscules occur over the upper surface. The deeper parts of the body show through the colourless surface layers as a tangerine to greyish-red colouration. The body will tear if handled carelessly.

Rare or occasional on rock in the circalittoral at wave-exposed sites on the north and west coasts.

[A small bivalve mollusc is often found partly embedded in the body of this sponge.]

Subclass CERACTINOMORPHA

Order HALICHONDRIDA

Family HALICHONDRIIDAE

**Ciocalypta penicillus** Bowerbank, 1864

(Plate 3d)

Bowerbank, 1864, p.180, pl.30, fig.360.  
Bowerbank, 1866, p.81; 1874, p.33, pl.13, figs.2-4; Topsent, 1921, p.687; Arndt, 1935, p.105, fig.225.

Groups of large colourless or cream-coloured translucent gradually tapering papillae projecting vertically from the sediment draw attention to this species. The papillae arise from an insubstantial body attached to rock under the sand and gravel. The coarse sediment becomes incorporated into the body as the individual grows. The stiff non-contractile papillae are variable in number and size, and have dense inner cores.

Recorded as rare or occasional at the bedrock/sediment interface in the circalittoral all around the island. Locally frequent, particularly off the south, north and north-west coasts. Unexpectedly recorded from mud-covered surfaces at Halftide Rock on the west coast and from large and small boulders off the Devil's Slide.

[Despite obvious differences in papillae small specimens may occasionally be confused with *Polymastia mamillaris* but tend to be associated with coarser sediments.]

**Halichondria panicea** (Pallas, 1766)

(Plate 3e)

Pallas, 1766, p.388, as *Spongia*; Fleming, 1828, p.520.  
Johnston, 1842, p.144, pls.10, 11, fig.5; Bowerbank, 1866, p.229; 1874, p.97, pl.39, figs.1-6, p.99, pl.40, figs.1-5; Lundbeck, 1902, p.17, pl.9, fig.1; Arndt, 1935, p.103, fig.221; Hartman, 1958, p.29, fig.9; Vethaak, Cronie & van Soest, 1982, p.82, pl.1, figs.1-5, pl.2, figs.1-5, pl.4, fig.4.

On Lundy this polymorphic species with a spreading habit occurs on the shore as a low-growing encruster, but subtidally it exists as a thicker, more lobular mass. The shore form often has oscules raised on regularly-spaced, volcano-shaped cones, whereas the oscules of the subtidal form are not on volcano-shaped cones, are not as

frequent, and are more irregularly arranged. In subtidal individuals canals can often be seen through the smooth body surface converging on the oscules. The body is firm but will tear if handled carelessly. Colouration varies from dark green to pale yellow, those in direct light tending to be darkest in colour.

Widely distributed on the lower shore in caves, under overhangs, and at the bases of algae. Occasional in the sublittoral fringe and in the circalittoral at sites exposed to strong water movement.

Family HYMENIACIDONIDAE

**Hymeniacion perleve** (Montagu, 1818)

Montagu, 1818, p.86, as *Spongia*; Bowerbank, 1866, p.179.  
Bowerbank, 1874, p.87, pl.34, figs.1-2; Arndt, 1935, p.105, fig.226, as *H. sanguinea*;  
Stone, 1970, p.443.

The shore form of this species usually occurs as a thin encrusting bright orange sheet. Subtidally it grows as a thick compressible pad with irregular surface processes and with no apparent oscules.

Present in caves and under overhangs on the lower shore. Generally distributed, reaching 5-10% cover on the walls of some caves. Recorded from Rat Island, Lametry Beach, Ladies Beach and in caves on the north coast. Seen subtidally at depths of 18-30m off the east coast.

[Includes *H. caruncula* of Harvey, 1950.]

Order POECILOSCLERIDA

Family MYCALIDAE

Subfamily ESPERIOPSINAE

**Amphilectus fucorum** (Esper, 1794)

(Plate 4a)

Esper, 1794, p.278, pl.49, figs.1, 2, as *Spongia*; Vosmaer, 1880, p.117.  
Johnston, 1842, p.112, pls.9, 12, fig.2, as *Halichondria*; Bowerbank, 1866, p.322;  
1874, p.142, pl.56, figs.16-19, as *Isodictya*; Burton, 1932, p.289, pl.54, figs.1-4;  
Arndt, 1935, p.53, figs.92, 92A.

A polymorphic intense orange encruster, with a soft delicate body, which often colonizes algae as well as hydroid and bryozoan mats. It has an open-structured clean surface with a few large scattered oscules slightly raised above it. In exposed conditions low-lying encrustations are formed, but in sheltered situations it may develop into thick irregularly-shaped masses with large open oscules. Tassel-like processes, with a tendency to fuse to each other, may be seen growing out from oscule rims and from the growing edges of the body.

Small patches form a conspicuous and characteristic part of the sublittoral fringe community at wave-exposed locations all around the island. The sponge often colonises holdfasts of *Laminaria hyperborea* in shallow depths. It has also been recorded from the lower infralittoral and circalittoral tide-swept areas of boulders and bedrock north-east of Rat Island and south-west of Black Rock. Rare at 4, 6 and 8m at Dead Cow Point.

**Hemimycale columella** (Bowerbank, 1874)

(Plate 4b)

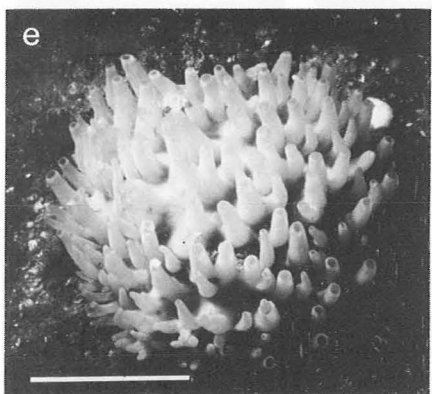
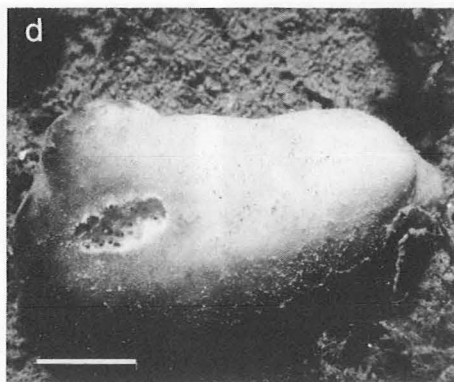
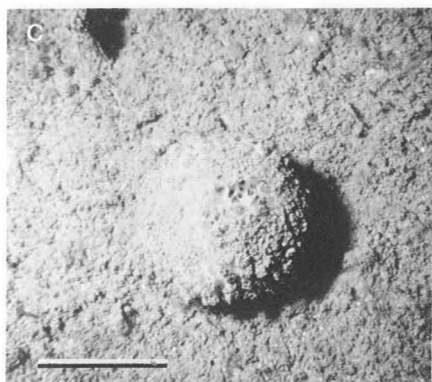
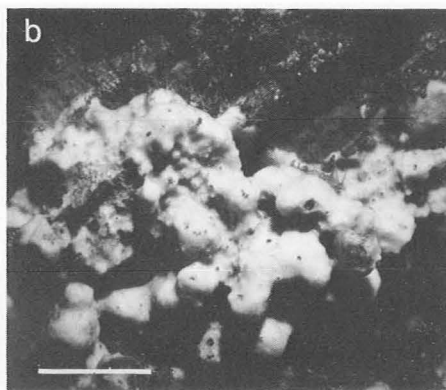
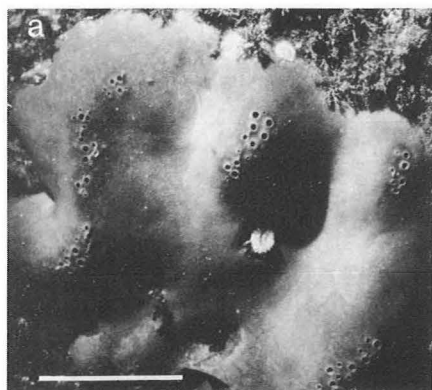
Bowerbank, 1874, pp.241, 243, pl.78, figs.6-8, as *Desmacion*; Burton, 1934, p.556, fig.10.

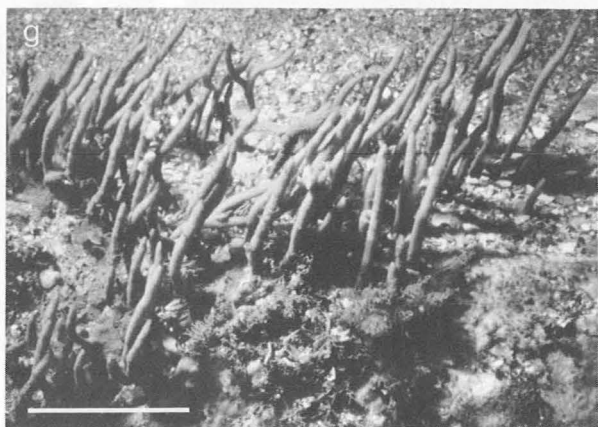
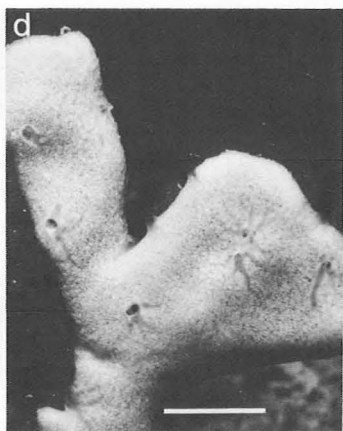
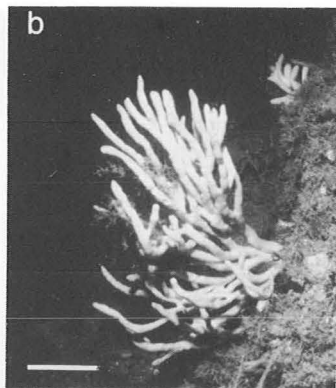
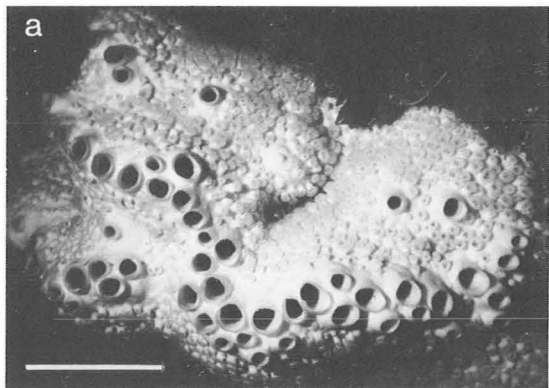
Topsent, 1925, p.642, as *Stylotella*; Arndt, 1935, p.55, fig.98, as *Stylotella*; Forster, 1955, p.553.

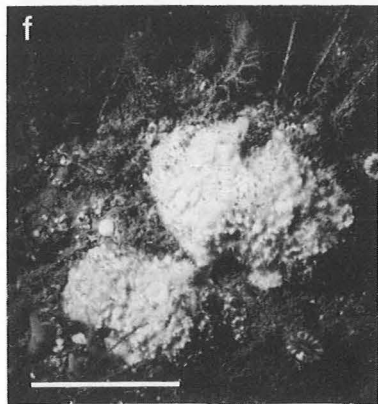
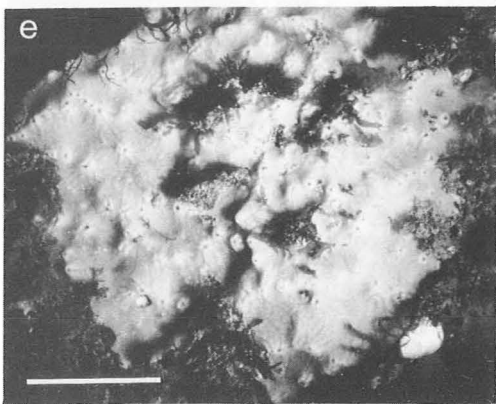
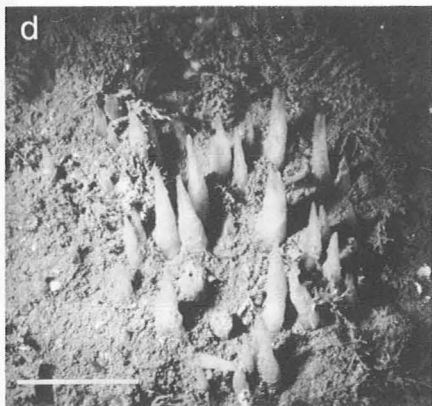
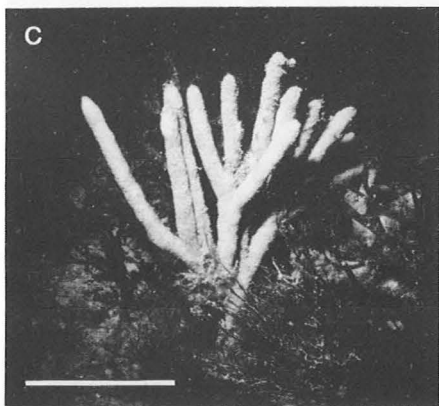
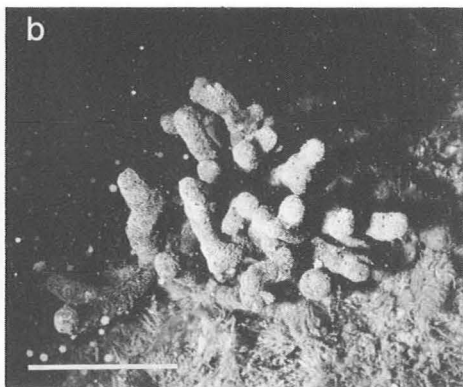
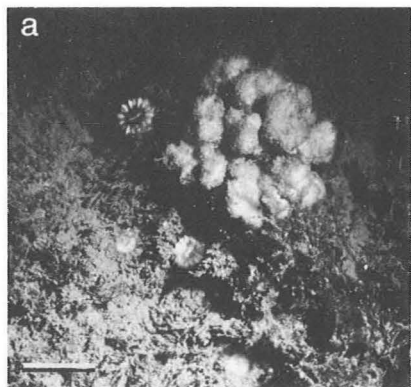
A characteristic salmon pink to bright red, thinly-spreading encruster (up to 3mm thick) with many conspicuous non-contractile inhalant sieves of varying diameters. The sieve rims are often, but not invariably, lighter in colour than the rest of the body. The multiple openings in the concavity beneath the fine mesh sieves can be closed. The oscules, which are large and infrequent, contract if disturbed.

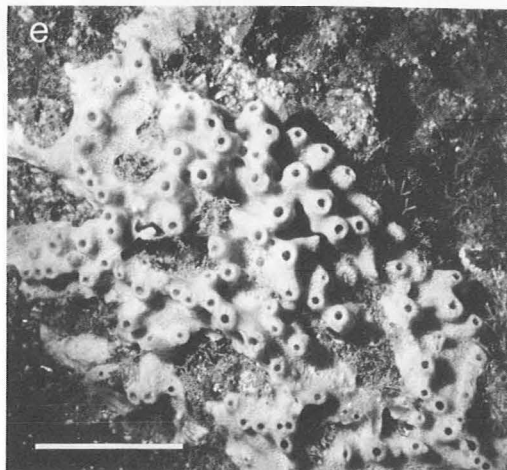
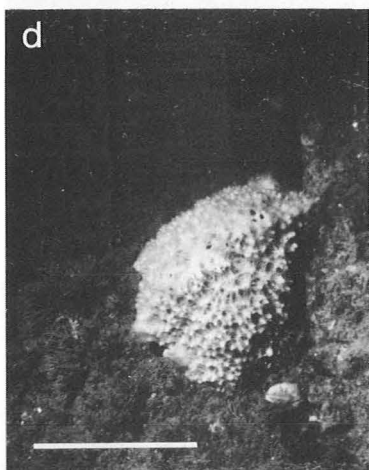
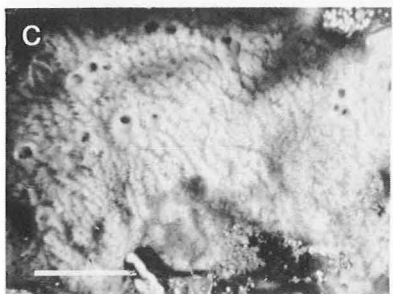
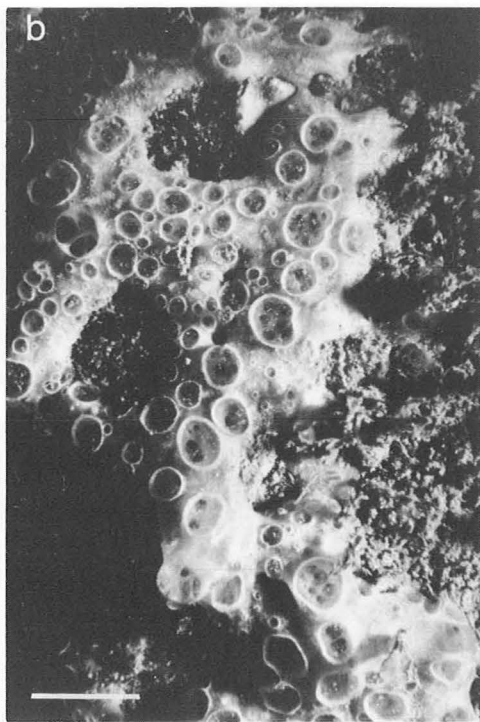
Recorded infrequently at a few sites of varying depth all around the island and usually on vertical rock.

[It is possible that this species could be confused with *Phorbas fictitius*.]









Family MYXILLIDAE  
Subfamily MYXILLINAE  
**Myxilla incrustans** (Johnston, 1842)  
(Plate 4c)

Johnston, 1842, p.122, pl.12, fig.3, pl.13, fig.5, as *Halichondria*; Levensen, 1893, p.419.

Bowerbank, 1866, p.249; 1874, p.108, pl.44, figs.7-12, as *Halichondria*; Lundbeck, 1905, p.132, pl.4, figs. 6, 7, pl.14, fig.3a-h; Arndt, 1935, p.58, fig.105.

A clean-looking primrose-yellow thick encruster (up to 20cm across) with a distinctive open structure to its level surface due to a sinuous maze of close-set deep channels. The appearance varies somewhat depending on whether or not the channels are covered by a surface membrane. The upper margins of the channel walls have an irregular fluted edge which loses its prominence when the membrane is drawn across. Occasional large oscules occur on elevations which are sometimes ridge-like. The surface feels crisp due to verticle spicule bundles supporting the channel walls.

Recorded from the circalittoral at Gannets' Rock, Lee Rocks and Black Rock.

**Myxilla rosacea** (Lieberkühn, 1859)

Lieberkühn, 1859, p.521, pl.11, fig.2, as *Halichondria*; Schmidt, 1862, p.71.

Lundbeck, 1905, p.138, pl.4, fig.8, pl.14, fig.4a-h; Arndt, 1935, p.59, fig.106; Topsent, 1936, p.21, as *M. incrustans* var. *rosacea*.

A clean-looking brownish-orange encruster forming a thick, irregularly-ridged or lobed, mass (up to 15cm across). As in *M. incrustans*, channels are present, but in this species they are covered by a slimy skin which obscures most structural detail. Occasional large oscules occur on prominences which are sometimes ridge-like.

More common than *M. incrustans* in the circalittoral of Lundy but, nevertheless, tending to be confined to areas of strong water movement at the north and south ends of the island.

Family MICROCIONIDAE

**Microciona atrasanguinea** Bowerbank, 1862

Bowerbank, 1862, p.824.

Bowerbank, 1866, p.138; 1874, p.63, pl.24, figs.14-19; Arndt, 1935, p.78, fig.160; Lévi, 1960, p.72.

Recorded by Harvey (1950) from under stones at Ladies Beach but has not been found since.

**Ophlitaspongia seriata** (Grant, 1826)

Grant, 1826, p.116, as *Spongia*; Bowerbank, 1874, p.167, pl.65, figs.1-4.

Bowerbank, 1866, p.376, as *Chalina*; Arndt, 1935, p.82, fig.170; Lévi, 1960, p.64; Simpson, 1968, p.37, 89-119, pl.9, figs.1-4, as *Microciona*.

Listed by Harvey (1950) but has not been recorded since.

Order HAPLOSCLERIDA

Family HALICLONIDAE

**Haliclona oculata** (Pallas, 1766)

Pallas, 1766, p.390, as *Spongia*; Grant, 1841, p.5.

Bowerbank, 1866, p.361; 1874, p.169, pl.66, figs.1-3, as *Chalina*; Arndt, 1935, p.100, fig.214; Hartman, 1958, pp.52, 85, pls.7-10.

This common British species occurs in a rather atypical form around Lundy, being represented by straw-coloured erect individuals (up to 30cm long) with few branches. The pliable branches are very attenuated, forked dichotomously, and are noticeably soft and velvety to the touch. Slightly-raised oscules are arranged linearly along the branches. Individuals are attached to rock and stones by a tough flexible stalk which enables the branches to stream out in fast currents.

Recorded as rare or occasional and only from circalittoral rocks and stones in localities on the south and east coasts where it is exposed to silt-laden flowing water.



**Haliclona** sp.

[See MCS Sponge Guide as *Haliclona* 'M']

This distinctive light-brown species consists of one or more smooth soft tubes, each terminating in a large oscule. The tubes (up to 5cm in length) are joined at their bases to a rough thin flexible stalk which is attached to the substratum.

Recorded from circalittoral rock at Virgin's Spring and from stones in Lundy Roads.

**Haliclona** sp.

(Plate 4e)

[See MCS Sponge Guide as *Haliclona* 'rosea']

A spreading, often lilac-tinted, thick encruster (up to 25cm across) with large open oscules raised on chimney-like projections. The body has a surface with an open network appearance and is firm to the touch.

Recorded on vertical rock in the circalittoral of the south, west and north coasts.

Order DICTYOCERATIDA

Family DYSIDEIDAE

**Dysidea fragilis** (Montagu, 1818)

(Plate 4d)

Montagu, 1818, p.114, pl.16, figs.1, 2, as *Spongia*; Gray, 1848, p.19. Bowerbank, 1866, p.381; 1874, p.175, pl.69, figs.1-3; Burton, 1934, p.583, figs.18-33; Arndt, 1935, p.107, fig.231; Vacelet, 1959, p.67; Pulitzer-Finali and Pronzato, 1976 [1977], p.87.

A distinctive yet polymorphic species varying from off-white through grey to light brown in colour, which on Lundy forms discrete cushions (up to 10cm across) attached firmly to rock by a broad base. The surface has a characteristic spiky appearance caused by the projecting ends of skeletal fibres. When the sponge is fully expanded it looks as though it is covered with 'cobwebs' stretched between the stud-like projections. Occasional oscules may be raised above the surface on mounds or ridges. Initially it has a weak texture, which becomes stronger as an individual gets older due to incorporation of foreign matter into the skeletal fibre.

Occasional, usually on vertical rock, in the infralittoral and circalittoral all around the island. It has been recorded as frequent in the region of Rat Island at 0m, 11m, and on the plain of slate pebbles at 35m.

[The barnacle *Acasta spongites* is sometimes embedded in this sponge.]

Order DENDROCERATIDA

Family HALISARCIDAE

**Halisarca dujardinii** Johnston, 1842

Johnston, 1842, p.192, pl.16, fig.8.

See Topsent, 1896, p.562, for features separating this species from *Oscarella lobularis*; Arndt, 1935, p.109, fig.234; Vacelet, 1959, p.61. (not *Hymeniacion dujardinii* Bowerbank, 1866, p.224.)

Recorded by Harvey (1950) from under stones at Ladies Beach but not found since.

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TABLE 1

	Quarry beach to Gull Rock (nearshore boulder slope)	Brazen Ward (rock slopes)	Gannets' Rock (rock slopes)	North coast (Seals' Rock, Virgin's Spring, Hen and Chickens)	Long Roost (rock, sand patches, shell gravel)	St. John's Stone to St. Philip's Stone (rock)	Jenny's Cove and Needle Rock (rock)	Dead Cow Point (rock)	Battery to Half Tide Rock (rock)	South of Battery (rock)	Black Rock (stones and rock)	Rattles Anchorage (rock and shell gravel)	Lee Rocks and off Benjamin's Chair (rock)	South of Rat Island (including gullies)	South and east of Rat Island (deep stones and rock)	North-east of Rat Island (shallow rock)
<b>Present mostly on wave-exposed coasts</b>																
<i>Pachymatisma johnstonia</i>	—	R	P	R	P	P	O-F	P	O	P	F	R-O	P	R	—	—
<i>Thymosia guernei</i>	—	R	—	P	—	R	—	P	P	R	—	P	P	P	—	—
<i>Tethyspira spinosa</i>	—	—	P	—	P	—	O	R	P	P	O	—	—	—	—	—
<i>Myxilla rosacea</i>	—	—	—	—	P	—	—	—	—	—	P	P	P	P	—	P
<i>Haliclona</i> sp. (encruster)	—	—	—	—	P	—	—	R	P	—	—	P	P	O	—	R
<b>Present mostly on wave-sheltered coasts and in potholes and gullies on wave-exposed coasts</b>																
<i>Suberites carnosus</i>	O	O	F	R	?P	—	F*	F*	R	R	O	—	—	P*	—	O
<i>Suberites ficus</i>	P*	—	—	—	P	—	—	—	—	P	—	—	—	P	—	—
<i>Axinella polypoides</i>	F-C	C	F	O-F	F	P	O	O-F	F*	P	O	P	F	F	P	—
<i>Axinella infundibuliformis</i>	R	—	—	—	—	—	—	R	R	O	O	—	—	—	—	—
<i>Homaxinella subdola</i>	F-C	P	—	P	R	R	—	—	R	P	O	—	P	—	—	—
<i>Raspailia hispida</i>	F	P	F-C	O	P	—	O	—	R	—	O	R	P	O	—	O
<i>Raspailia ramosa</i>	O-F	P	F-C	O	P	—	O-F	P	P	O	—	—	P	—	—	P*
<i>Polymastia mamillaris</i>	F-C	—	F	—	O-F	P	—	P*	R	—	—	P	—	—	—	—
<b>Present mostly in shallow water around most of the island and in deep water at tide-exposed sites</b>																
<i>Halichondria panicea</i>	—	—	—	P*	O	O*	—	R	P	—	O*	O*	O	O	R	O
<i>Amphilectus fucorum</i>	O*	—	—	—	P*	P*	—	—	R*	P	P	O	—	O	R	F
<b>Present mostly at wave-sheltered, tide-exposed sites</b>																
<i>Ciocalypta penicillus</i>	O	O-F	F	P	F	O-P	O-P	P	P	P	O	R	F	C	—	O-R
<i>Hemimvcaea columella</i>	P	—	R	—	O	—	—	O	—	—	—	—	P	—	O	R
<i>Haliclona oculata</i>	R-O*	—	R-O	R-O	—	—	—	—	—	—	—	—	R-O	—	P	—
<b>Present in similar amounts all around the island or distribution patterns unclear</b>																
<i>Stelligera rigida</i>	P	P	—	P	P	—	—	—	P	—	—	—	P	P	P	—
<i>Stelligera stuposa</i>	F	P	—	R-O	P	—	—	O-C	—	—	—	P	—	—	—	—
<i>Tethya aurantium</i>	F	P	F	P	R	R	R	R	P	O	—	P	O	P	O	—
<i>Axinella damicornis</i>	P	—	—	—	P	—	—	—	F-C	—	—	P	P	—	P	—
<i>Polymastia boletiforme</i>	C	O	F	F	F	C	F	C	F	F	F	F	F	F-C	—	O
<i>Cliona celata</i>	O	O	O-F	O	O-F	O	O	O	O-F	R	P	P	O	F-C	R	O
<i>Dysidea fragilis</i>	O	O	R	O	O	O	O	O	O	R	P	P	O	P	O-F	O

Records from collected specimens only.

\*At 30, 40 and 42m.

\*Recorded at 20m in Lundy Roads as well as on inshore rocks.

\*At 18m in lee of rock.

Records from collected specimens only.

\*In a sheltered situation.

\*In gully at bedrock/sediment interface.

\*Records from shallow depths.

\*Records from infralittoral.

Present at bedrock/gravel interface.

\*Recorded at 30m in Lundy Roads.

Records from collected specimens only.

Records from collected specimens only.

Distribution and abundance of sublittoral sponges of the Class Demospongiae around Lundy. Only species recorded at five or more sites are included.

A = Abundant, C = Common, F = Frequent, O = Occasional, R = Rare, P = Present but no record of abundance.

## PLATE CAPTIONS

PLATES 1-4 Underwater photographs of sponges in their natural habitats around Lundy.

- Plate 1a. *Pachymatisma johnstonia* showing characteristic groups of oscules on raised areas of the body.  
Plate 1b. Some of the 'black specks' seen on the surface of this *Thyrosia guernei* are mud-filled pits occupied by the polychaete *Polydora*.  
Plate 1c. The globular body of this *Tethya aurantium* is camouflaged by a fine layer of silt.  
Plate 1d. This *Suberites carnosus* is attached to the rock by a narrow fleshy stalk seen on the right of the photograph.  
Plate 1e. A fully expanded *Polymastia boletiforme*.  
Plate 1f. Short tapering papillae protruding from the sediment are all that can be seen of this *Polymastia mamillaris*.

In a, b, c, e and f the scale bar is 5cm long. In d the bar is 1cm long.

- Plate 2a. A typically massive *Cliona celata* with prominent lines of open oscules.  
Plate 2b. A large, freely-branching *Axinella polypoides*.  
Plate 2c. *Axinella damicornis* showing the characteristic lamellate growth form and canals converging on the oscules.  
Plate 2d. *Axinella polypoides* can be recognised by the stellate patterns of converging canals leading to the oscules.  
Plate 2e. A lamellate growth form of the basically inverted-cone-shaped species *Axinella infundibuliformis*.  
Plate 2f. An erect arborescent knobby individual typical of *Homaxinella subdola*.  
Plate 2g. A large clump of *Adreus fascicularis* attached to rock partly buried in shell-gravel.

In a, b, c, e, f and g the scale bar is 5cm long. In d the bar is 1cm long.

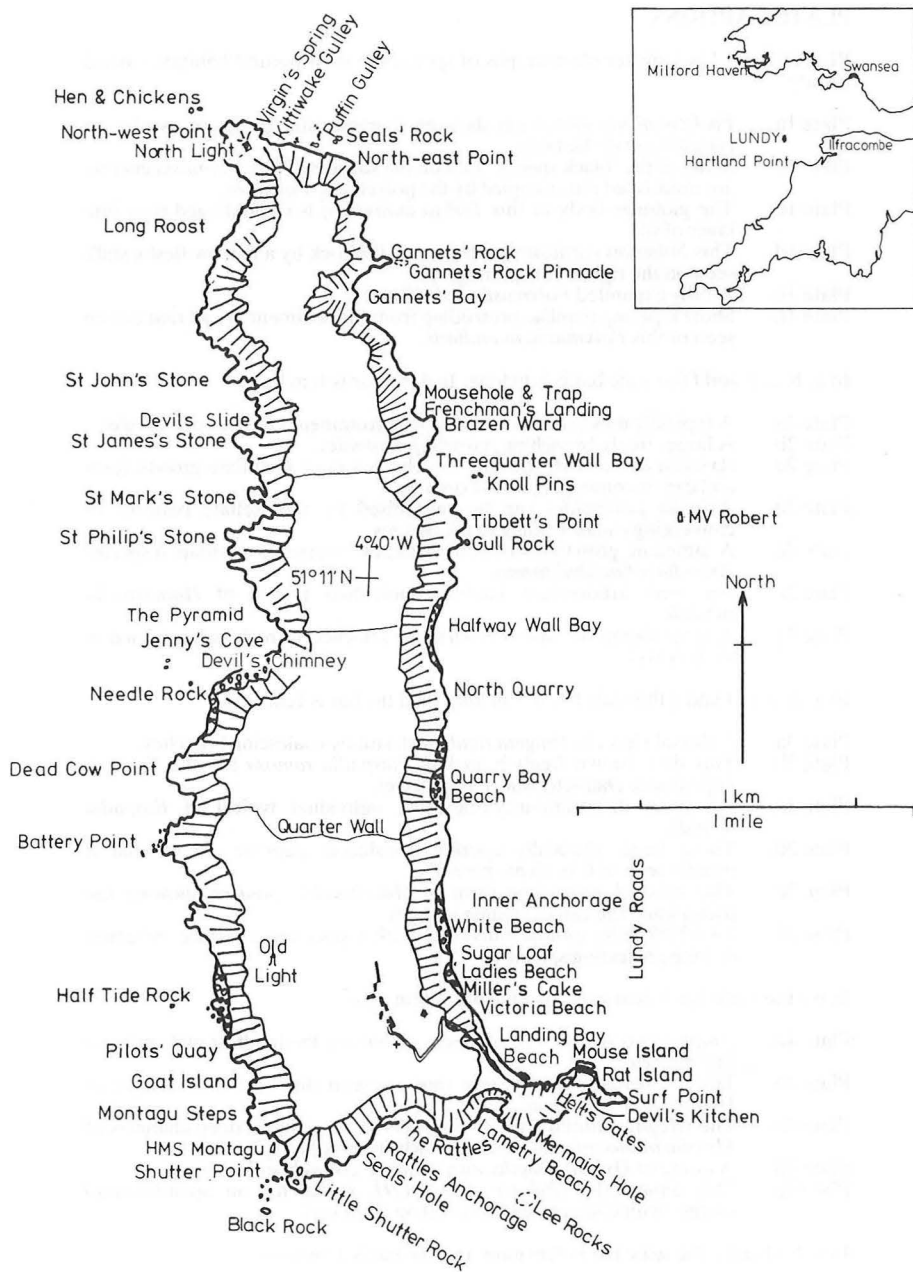
- Plate 3a. A dorsal view of *Stelligera rigida* with stubby coalescing branches.  
Plate 3b. This dark brown freely-branching *Raspailia ramosa* has the 'frosted' appearance characteristic of the species.  
Plate 3c. An erect dichotomously-branching individual typical of *Raspailia hispida*.  
Plate 3d. These large, gradually-tapering translucent papillae are all that is usually seen of *Ciocalypa penicillus*.  
Plate 3e. The subtidal encrusting form of *Halichondria panicea* showing the oscules and the canals leading to them.  
Plate 3f. Two *Tethyspira spinosa* individuals with a spiky upper surface and a fuzz of long projecting spicules.

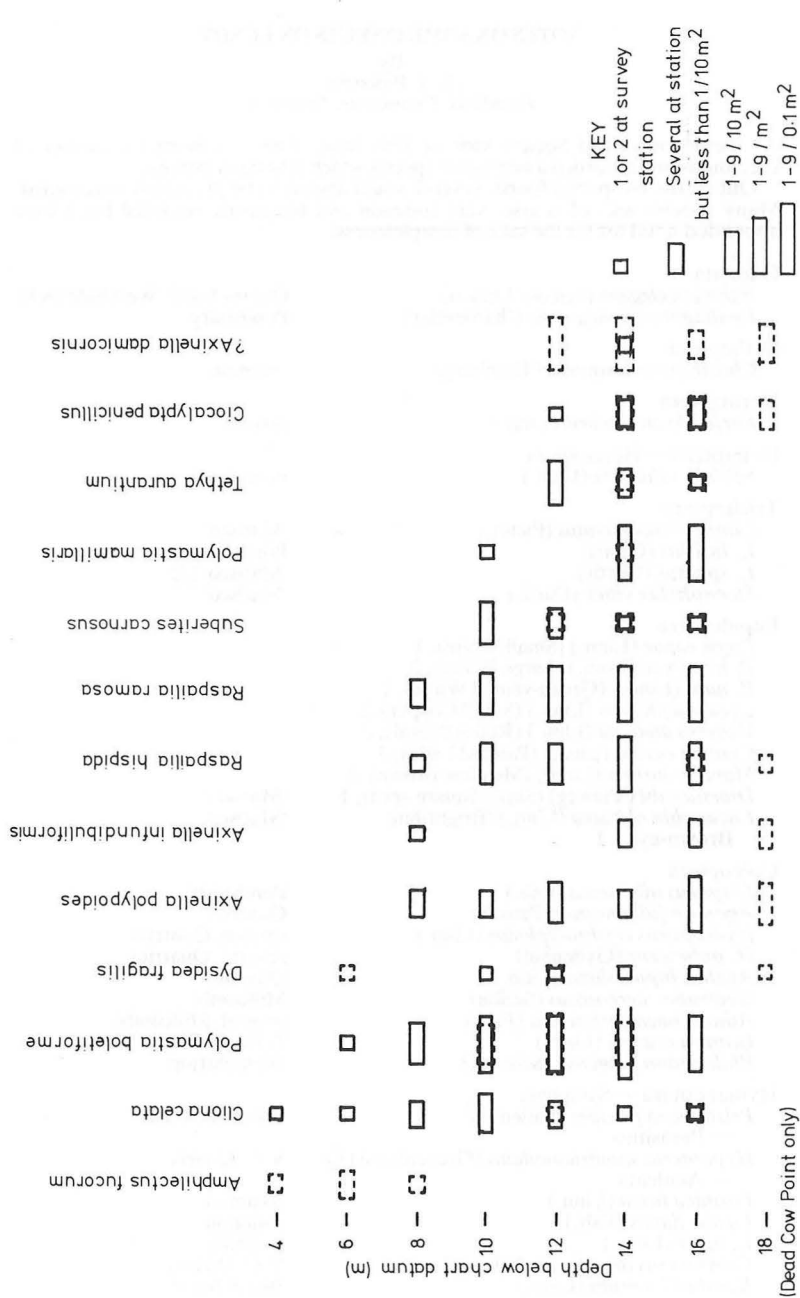
In b-f the scale bar is 5cm long. In a the bar is 1cm long.

- Plate 4a. *Amphilectus fucorum* is seen here colonising the holdfast of *Laminaria hyperborea*.  
Plate 4b. The distinctive inhalant sieve rims are seen clearly in this example of *Hemimycale columella*.  
Plate 4c. The irregular fluted edge of the walls of the sinuous deep channels of *Myxilla incrustans* can be seen clearly in this photograph.  
Plate 4d. A dome of *Dysidea fragilis* with its spiky 'cobwebbed' surface.  
Plate 4e. This unnamed *Haliclona* species (?*H. rosea*) has an open-textured surface with distinct oscules raised on chimneys.

In a, b, d and e the scale bar is 5cm long. In c the bar is 1cm long.

Hiscock *et al* Fig. 1. Lundy: location and coastal features.





Hiscock *et al.* Fig. 2. Abundance of conspicuous species recorded during a systematic survey at a sheltered site (Brazen Ward, solid lines), and an exposed site (Dead Cow Point, broken lines).